# USER GUIDES

1 **Source Guide**  
1.1 What is SecureDrop? .................................................. 3  
1.2 Suggested Devices for Using SecureDrop ............................. 4  
1.3 Choose the Right Location ............................................ 4  
1.4 Use Tor Browser ....................................................... 4  
1.5 Choose Who to Submit To ............................................ 5  
1.6 Making Your First Submission ....................................... 5  
1.7 Continuing the Conversation ....................................... 11

2 **Journalist Guide**  
2.1 Connecting to the Tor network in Tails ............................ 15  
2.2 Updating Your Workstation ......................................... 16  
2.3 Connecting to the *Journalist Interface* ............................ 17  
2.4 Daily Journalist Alerts About Submissions ......................... 19  
2.5 Interacting With Sources ............................................ 19  
2.6 Moving Documents to the *Secure Viewing Station* .......... 21  
2.7 Working with Documents ............................................ 26  
2.8 Moving Documents to Your Everyday Workstation ............... 32  
2.9 Decrypting and Preparing to Publish .............................. 35  
2.10 Deleting submissions and source accounts ....................... 36

3 **Admin Guide**  
3.1 Responsibilities ..................................................... 39  
3.2 The Admin Interface ................................................ 42  
3.3 Server SSH Access .................................................. 53  
3.4 The *securedrop-admin* Utility ................................... 55  
3.5 Frequently Asked Questions ....................................... 58

4 **Passphrase Best Practices**  
4.1 General Best Practices .............................................. 61  
4.2 For Sources .......................................................... 61  
4.3 For Journalists/Admins .............................................. 62

5 **Overview**  
5.1 Technical Summary ................................................ 63  
5.2 Infrastructure ......................................................... 64  
5.3 Operation ............................................................. 65

6 **Glossary**  
6.1 Admin Workstation .................................................. 67  
6.2 Application Server .................................................. 67
6.3 Export Device ................................................. 67
6.4 Journalist ....................................................... 67
6.5 Journalist Alert Public Key ............................... 68
6.6 Journalist Interface ......................................... 68
6.7 Journalist Workstation ..................................... 68
6.8 Landing Page .................................................. 68
6.9 Monitor Server ................................................ 68
6.10 Onion Service .................................................. 68
6.11 OSSEC Alert Public Key ................................. 69
6.12 Secure Viewing Station ................................. 69
6.13 Source .......................................................... 69
6.14 Source Interface .............................................. 69
6.15 Submission Key .............................................. 70
6.16 Transfer Device .............................................. 70
6.17 Two-Factor Authentication .............................. 70

7 Passphrases ....................................................... 71
7.1 Admin ............................................................. 71
7.2 Journalist ....................................................... 72
7.3 How to Generate a Strong, Unique Passphrase .... 73

8 Hardware .......................................................... 75
8.1 Hardware Overview .......................................... 75
8.2 Advice for users on a tight budget ...................... 76
8.3 Required Hardware .......................................... 76
8.4 Optional Hardware .......................................... 79
8.5 Specific Hardware Recommendations .................. 81

9 Before You Begin ............................................... 89

10 Create USB Boot Drives .................................... 91
10.1 Overview ....................................................... 91
10.2 Tails Introduction .......................................... 91
10.3 Ubuntu Introduction ....................................... 92

11 Set Up the Secure Viewing Station ....................... 95
11.1 Correct the System Time .................................. 95

12 Set Up the Transfer Device and the Export Device ... 97
12.1 Choose media types and encryption .................. 97
12.2 Decide how to manage encryption passphrases .. 98
12.3 Create USB Transfer Device ......................... 98
12.4 Create a USB Export Device ......................... 103

13 Generate the Submission Key .............................. 105
13.1 Create the Key .............................................. 105
13.2 Export the Submission Public Key ................... 108

14 Set up the Admin Workstation .......................... 111
14.1 Start Tails with Persistence Enabled ............... 111
14.2 Download the SecureDrop repository ............. 112
14.3 Create the Admin Passphrase Database ............ 114

15 Set Up the Network Firewall ............................. 117
15.1 Configuration: pfSense ................................ 117
15.2 Configuration: OPNSense ............................................................... 117
15.3 Configuration: Other Firewalls .................................................... 118

16 Setting Up a pfSense Network Firewall ........................................ 119
16.1 Before You Begin ........................................................................... 119
16.2 Initial Configuration ....................................................................... 120
16.3 Disable DHCP on the LAN .............................................................. 127
16.4 SecureDrop Configuration ............................................................... 133
16.5 Tips for Setting Up pfSense Firewall Rules .................................. 140
16.6 Keeping pfSense up to Date ............................................................ 140

17 Setting Up An OPNSense Network Firewall ................................. 145
17.1 Before You Begin ........................................................................... 145
17.2 Initial Configuration ....................................................................... 145
17.3 Disable DHCP on the Firewall ...................................................... 158
17.4 SecureDrop Configuration ............................................................... 163
17.5 Troubleshooting Tips ..................................................................... 172
17.6 Keeping OPNSense up to Date ....................................................... 172

18 Set Up the Servers ........................................................................... 173
18.1 Pre-Install Steps ............................................................................. 173
18.2 Install Ubuntu ................................................................................ 173
18.3 Test Connectivity .......................................................................... 176
18.4 Set Up SSH Keys .......................................................................... 177

19 Install SecureDrop ........................................................................... 179
19.1 Install Prerequisites ...................................................................... 179
19.2 Localization of the Source Interface and Journalist Interface .......... 180
19.3 Configure the Installation ............................................................... 180
19.4 Install SecureDrop Servers ............................................................ 182

20 Configure the Admin Workstation Post-Install and Create Backups .... 185
20.1 Auto-connect to the Authenticated Onion Services ...................... 185
20.2 Back Up the Workstations ............................................................. 186

21 Create an Admin Account on the Journalist Interface ...................... 187

22 Test the Installation .......................................................................... 189
22.1 Test Connectivity .......................................................................... 189
22.2 Sanity-Check the Installation ......................................................... 189
22.3 Test the Web Interfaces ................................................................. 190

23 Onboard Journalists ......................................................................... 191
23.1 Determine Access Protocol for the Secure Viewing Station .......... 191
23.2 Create a Journalist Tails USB ....................................................... 191
23.3 Set Up Automatic Access to the Journalist Interface .................... 192
23.4 Add an account on the Journalist Interface .................................. 193
23.5 Provision a personal Transfer Device and Export Device .......... 193
23.6 Verify Journalist Setup ................................................................. 193

24 Onboard Additional Admins ............................................................. 195

25 Overview .......................................................................................... 197

26 Landing Page .................................................................................... 199
26.1 URL and Location ........................................................................ 199
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.2</td>
<td>HTTPS Only (No Mixed Content)</td>
</tr>
<tr>
<td>26.3</td>
<td>Perfect Forward Secrecy</td>
</tr>
<tr>
<td>26.4</td>
<td>SSL Certificate Recommendations</td>
</tr>
<tr>
<td>26.5</td>
<td>Do Not Use Third-Party Analytics, Tracking, or Advertising</td>
</tr>
<tr>
<td>26.6</td>
<td>Do Not Hyperlink .onion Addresses</td>
</tr>
<tr>
<td>26.7</td>
<td>Avoid Direct Links to SecureDrop.org</td>
</tr>
<tr>
<td>26.8</td>
<td>Apply Security Headers</td>
</tr>
<tr>
<td>26.9</td>
<td>Additional Apache Configuration</td>
</tr>
<tr>
<td>26.10</td>
<td>Further Security Considerations</td>
</tr>
<tr>
<td>26.11</td>
<td>How to test your Landing Page using Tor Browser</td>
</tr>
<tr>
<td>26.12</td>
<td>Landing Page Content Suggestions</td>
</tr>
<tr>
<td>26.13</td>
<td>Minimum requirements for the SecureDrop environment</td>
</tr>
<tr>
<td>28.1</td>
<td>Whole Site Changes</td>
</tr>
<tr>
<td>29.1</td>
<td>Sample SecureDrop Privacy Policy</td>
</tr>
<tr>
<td>29.2</td>
<td>Collection of Information From Sources</td>
</tr>
<tr>
<td>29.3</td>
<td>Collection of Information About Journalists' Use of SecureDrop</td>
</tr>
<tr>
<td>29.4</td>
<td>Data Security</td>
</tr>
<tr>
<td>29.5</td>
<td>Children Under 13</td>
</tr>
<tr>
<td>29.6</td>
<td>Changes to This Policy</td>
</tr>
<tr>
<td>30.1</td>
<td>Promoting Your SecureDrop Instance</td>
</tr>
<tr>
<td>30.2</td>
<td>Make a High Profile Announcement</td>
</tr>
<tr>
<td>30.3</td>
<td>Provide a Clear Link on Your Homepage</td>
</tr>
<tr>
<td>30.4</td>
<td>Provide Links at the Bottom of Your Articles</td>
</tr>
<tr>
<td>30.5</td>
<td>Create an Instructional Video on How to Access and Use Your SecureDrop</td>
</tr>
<tr>
<td>30.6</td>
<td>Regularly Share Your SecureDrop Landing Page on Social Media</td>
</tr>
<tr>
<td>30.7</td>
<td>Target Potential Whistleblowers with Advertising</td>
</tr>
<tr>
<td>30.8</td>
<td>Put an Advertisement in Your Physical Paper</td>
</tr>
<tr>
<td>31.1</td>
<td>What Makes SecureDrop Unique</td>
</tr>
<tr>
<td>31.2</td>
<td>No Third Parties that Can Secretly be Subpoenaed</td>
</tr>
<tr>
<td>31.3</td>
<td>Limits the Metadata Trail as Much as Possible</td>
</tr>
<tr>
<td>31.4</td>
<td>Encrypted and Air-Gapped</td>
</tr>
<tr>
<td>31.5</td>
<td>Protects Against Hackers</td>
</tr>
<tr>
<td>31.6</td>
<td>Free and Open Source Software</td>
</tr>
<tr>
<td>32.1</td>
<td>Investigating Logs</td>
</tr>
<tr>
<td>32.2</td>
<td>Logs to examine on both servers</td>
</tr>
<tr>
<td>32.3</td>
<td>Application Server Logs</td>
</tr>
<tr>
<td>32.4</td>
<td>Monitor Server Logs</td>
</tr>
<tr>
<td>33.1</td>
<td>OSSEC Guide</td>
</tr>
<tr>
<td>33.2</td>
<td>Setting up OSSEC alerts</td>
</tr>
<tr>
<td>33.3</td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>33.4</td>
<td>Analyzing the alerts</td>
</tr>
<tr>
<td>34.1</td>
<td>Setting Up a Printer in Tails</td>
</tr>
<tr>
<td>34.2</td>
<td>Installing and Printing via the Tails GUI</td>
</tr>
<tr>
<td>34.3</td>
<td>Printing from the Command Line</td>
</tr>
</tbody>
</table>
45 BIOS Updates on the Servers
   45.1 What you need .......................................................... 299
   45.2 Perform Backups ......................................................... 299
   45.3 Prepare the USB Stick ................................................. 299
   45.4 Download and Verify Appropriate BIOS Files ..................... 299
   45.5 Update the BIOS ......................................................... 301

46 Off-board Administrators and Journalists .......................... 303
   46.1 Off-boarding checklist ............................................... 303
   46.2 Additional steps for off-boarding administrators ............... 303
   46.3 Rotate the Submission Key .......................................... 305
   46.4 Getting Support ......................................................... 309

47 Decommission SecureDrop ................................................. 311

48 Upgrade from 2.4.1 to 2.4.2 ............................................. 313
   48.1 Update Servers to SecureDrop 2.4.2 .............................. 313
   48.2 Update Workstations to SecureDrop 2.4.2 ....................... 313
   48.3 Troubleshooting Kernel Issues ..................................... 315
   48.4 Upgrade from Tails 4 to Tails 5 ................................... 316
   48.5 Getting Support ......................................................... 316

49 Upgrade from 2.4.0 to 2.4.1 ............................................. 317
   49.1 Update Servers to SecureDrop 2.4.1 .............................. 317
   49.2 Update Workstations to SecureDrop 2.4.1 ....................... 317
   49.3 Re-enabling codename filtering (if you previously disabled it) 320
   49.4 Upgrade from Tails 4 to Tails 5 ................................... 320
   49.5 Getting Support ......................................................... 320

50 Upgrade from 2.3.2 to 2.4.0 ............................................. 323
   50.1 Update Servers to SecureDrop 2.4.0 .............................. 323
   50.2 Update Workstations to SecureDrop 2.4.0 ....................... 323
   50.3 Tor Browser security issue ......................................... 325
   50.4 Upgrade from Tails 4 to Tails 5 ................................... 326
   50.5 Language support changes ......................................... 326
   50.6 Back Up the Tails Workstations .................................. 327
   50.7 Apply Any Available Firewall Updates ......................... 327
   50.8 Getting Support ......................................................... 327

51 Upgrade from 2.3.1 to 2.3.2 ............................................. 329
   51.1 Update Servers to SecureDrop 2.3.2 .............................. 329
   51.2 Update Workstations to SecureDrop 2.3.2 ....................... 329
   51.3 Upgrade to Tails 5.0 .................................................. 331
   51.4 Getting Support ......................................................... 332

52 Upgrade from 2.3.0 to 2.3.1 ............................................. 333
   52.1 Update Servers to SecureDrop 2.3.1 .............................. 333
   52.2 Update Workstations to SecureDrop 2.3.1 ....................... 333
   52.3 Update Tails .......................................................... 335
   52.4 Getting Support ......................................................... 336

53 Upgrade from 2.2.1 to 2.3.0 ............................................. 337
   53.1 Update Servers to SecureDrop 2.3.0 .............................. 337
   53.2 Update Workstations to SecureDrop 2.3.0 ....................... 337
   53.3 Update Tails .......................................................... 339
SecureDrop is an open-source whistleblower submission system that media organizations can use to securely accept documents from and communicate with anonymous sources.

This documentation is intended for sources, journalists, and administrators. If you would like to contribute to SecureDrop, please see our developer documentation.
Note: This guide provides an introduction to using SecureDrop as a source. It is not exhaustive, it does not address ethical or legal dimensions of whistleblowing, and it does not speak to other methods for confidentially communicating with journalists. Please proceed at your own risk. For additional background, also see the Freedom of the Press Foundation guide, How to Share Sensitive Leaks With the Press.

Warning: Freedom of the Press Foundation has no access to any other organization’s SecureDrop instance, and cannot assist directly in your communications with them. If you plan to use SecureDrop to maintain your anonymity, you should not discuss your own use of it with others via unsafe methods, including email to Freedom of the Press Foundation.

1.1 What is SecureDrop?

SecureDrop is a tool that news organizations and NGOs use that enables secure and anonymous communication between whistleblowers and journalists. No personal information is collected; information submitted to SecureDrop is encrypted, and SecureDrop is not a “cloud” service. If you don’t have sensitive information to send to a news organization, it may be okay to use a traditional methods such as phone or email when reaching out.

SecureDrop can accept both messages and individual file uploads (up to 500MB). If you have multiple files to submit, you may do that. As a source, you can also return to receive follow-up correspondence with an organization, or to send additional information. Dozens of news organizations — from ProPublica to The New York Times — use SecureDrop to accept tips securely and anonymously.

To truly protect your anonymity, it is important for you to take some extra precautions in advance. This resource will describe things you can do to help protect your anonymity when using SecureDrop. Note that your Internet Service Provider, or ISP (e.g., Comcast/Xfinity, Cox, Wave, etc), may already have a record of your visit to this website, docs.securedrop.org.

Before you begin…

- DO NOT access SecureDrop on your employer’s network.
- DO NOT access SecureDrop using your employer’s hardware.
- DO NOT access SecureDrop on your home internet network.
- DO carefully read the remaining instructions, that will carefully step-through the reasons why we advise the above, and provide guidance to minimize risk when using SecureDrop.
1.2 Suggested Devices for Using SecureDrop

When sensitive disclosures such as government improprieties are involved, we suggest you buy a new computer and at least one new USB flash drive. You should only use cash to make those purchases.

Many time-saving features of computers and phones can easily compromise your anonymity: bookmarks, recommendations, synchronization features, shortcuts to frequently opened files, etc. Those reasons and more are why using a dedicated computer for whistleblowing activities can be safer.

To build an even stronger buffer for yourself, we recommend booting the computer into the Tails operating system (typically from a USB stick). Tails is specifically designed to run on your computer without leaving traces of your activity. This may take some additional technical steps, but it is safer and fairly simple to get started. Even if you choose to use a dedicated computer for SecureDrop that will never be used for anything else, Tails will help to avoid leaving traces of your activity on the computer’s hard disk, in your ISP’s logs, or on cloud services.

1.3 Choose the Right Location

Find a busy cafe you don’t regularly go to and sit at a place with your back to a wall to avoid cameras capturing information on your screen or keystrokes. Be sure to also make any purchases while there (WiFi, tea, snacks) or on your way to the cafe (bus, train, gas) with cash.

1.4 Use Tor Browser

Each SecureDrop may only be reached through the Tor Browser. SecureDrop pages are only available as onion services—encrypted web pages that end in “.onion,” and only the Tor browser is able to open these pages.

Tor is an anonymizing network that makes it difficult for anybody observing the network to associate a user’s identity (e.g., the computer’s IP address) with their activity. Tor Browser can be downloaded from the Tor Project’s website. Tor Browser is a modified version of the Firefox web browser that also includes features protect your security and anonymity. If there is a chance that visiting the Tor Project’s website to download Tor Browser might raise suspicion, you have a couple of alternatives:

- If your mail provider is less likely to be monitored, you can send a mail to gettor@torproject.org with the text “linux”, “windows” or “osx” in the body (for your preferred operating system) and a bot will answer with instructions.
- You can download a copy of Tor Browser for your operating system from the GitLab mirror maintained by the Tor team.

While using Tor Browser on your personal computer helps hide your activity on the network, it will leave traces of its own installation on your local machine. Most operating systems keep logs, for example, any time an application is used. The sensitivity of the information you share and the capabilities of those who may not want you to share that information, should be considered when making these decisions.

**Important:** Tor protects your anonymity, but third parties who can monitor your network traffic can detect *that you are using Tor*. They may even be able to do so long after your browser session, using network activity logs. This is why we recommend using Tor Browser from a cafe you do not visit regularly.
1.5 Choose Who to Submit To

We recommend conducting all research related to your submission in Tor Browser. If you are unsure whether you are using Tor, you can visit the address https://check.torproject.org.

All organizations operating SecureDrop have a landing page that provides their own organization-specific recommendations for using SecureDrop. We encourage you to consider an organization’s landing page before submitting to them.

**Note:** Each SecureDrop instance is operated and administered independently by the organization you are submitting to. Only the journalists associated with that organization can see your submissions.

Most organizations make their SecureDrop prominently accessible from their main website’s homepage (for news organizations, typically under sections called “Tips” or “Contact us”). You can also find an incomplete list of organizations accepting submissions through SecureDrop in the SecureDrop Directory maintained by Freedom of the Press Foundation.

Using Tor Browser, find the “.onion” address for the SecureDrop for the organization that you wish to submit to.

**Tip:** If the organization does have an entry in the SecureDrop Directory, we recommend comparing the address of the entry with the one on the organization’s own SecureDrop landing page.

If the two addresses don’t match, please do not submit to this organization yet. Instead, please contact us through the SecureDrop website, using Tor Browser. For additional security, you can use our .onion service address in Tor: sdolvtfhatvsyse6134d65ymdwx1au5v7k5j4cy5ttz16fzvyd.onion/report-an-error

We will update the directory entry if the information in it is incorrect.

Once you have located the “.onion” address, copy it into the address bar in Tor Browser to visit the organization’s SecureDrop.

1.6 Making Your First Submission

Open Tor Browser and navigate to the .onion address for the SecureDrop you wish to make a submission to. The page will invite you to get started with your first submission or to log in. It should have a logo specific to the organization you are submitting to.
If this is the first time you’re using Tor Browser, it’s likely that you have JavaScript enabled and that the Tor Browser’s security level is set to “Low”. In this case, there will be a purple warning banner at the top of the page that encourages you to disable JavaScript and change the security level to “Safest”.

Click the Security Level link in the warning banner, and a message bubble will pop up explaining how to increase the security level to Safest.

1. Click the shield icon in the toolbar above
2. Click Change to open Security Level preferences
3. Select Safest and close the preferences tab

Refresh this page, and you’re done!

1. Click the shield icon in the toolbar
2. Click Change
3. Select **Safest**

**Security**

**Security Level**

Disable certain web features that can be used to attack your security and anonymity.

Learn more

- **Standard**
  
  All Tor Browser and website features are enabled.

- **Safer**
  
  Disables website features that are often dangerous, causing some sites to lose functionality.

- **Safest**
  
  Only allows website features required for static sites and basic services. These changes affect images, media, and scripts.
  - JavaScript is disabled by default on all sites.
  - Some fonts, icons, math symbols, and images are disabled.
  - Audio and video (HTML5 media), and WebGL are click-to-play.

**Note:** The “Safest” setting disables the use of JavaScript on every page you visit using Tor Browser, even after a browser restart. This may cause other websites you visit using Tor Browser to no longer work correctly, until you adjust the Security Level again. We recommend keeping the setting at “Safest” during the entirety of the session in which you access an organization’s SecureDrop instance.

The SecureDrop page should now refresh automatically and stop displaying the warning. If this is the first time you are using SecureDrop, click the **Get Started** button.
You should now see a screen that shows the unique codename that SecureDrop has generated for you. Note that your codename will not be the same as the codename shown in the image below. It is extremely important that you both remember this code and keep it secret. After submitting documents, you will need to provide this code to log back in and check for responses.

The best way to protect your codename is to memorize it. If you cannot memorize it right away, we recommend writing it down and keeping it in a safe place at first, and gradually working to memorize it over time. Once you have memorized it, you should destroy the written copy.

Tip: For detailed recommendations on best practices for managing your passphrase, check out Passphrase Best Prac-
Once you have generated a codename and put it somewhere safe, click **Submit Documents**.

You will next be brought to the submission page, where you may upload a document, enter a message to send to journalists, or both. You can only submit one document at a time, so you may want to combine several files into a ZIP archive if necessary. The maximum submission size is currently 500MB. If the files you wish to upload are over that limit, we recommend that you send a message to the journalist explaining this, so that they can set up another method for transferring the documents.

When your submission is ready, click **Submit**.

After clicking **Submit**, a confirmation page should appear, showing that your message and/or documents have been sent successfully. On this page you can make another submission or view responses to your previous messages.
Once you are finished submitting documents, be certain you have saved your secret codename and then click the Log out button.

The final step to clearing your session is to restart Tor Browser for optimal security. After logging out, you should see a new page recommending you to click the New Identity button in the Tor Browser toolbar.
You can either close the browser entirely or follow the instructions on the page:

1. Click on the **New Identity** button in the Tor Browser toolbar

2. Click **Yes** in the dialog box that appears to confirm you’d like to restart Tor Browser

### 1.7 Continuing the Conversation

If you have already submitted a document and would like to check for responses, click the **Log in** button on the media organization’s SecureDrop page.

The next page will ask for your secret codename. Enter it and click **Continue**.
If a journalist has responded, their message will appear on the next page. Before leaving the page, you should delete any replies. In the unlikely event that someone learns your codename, this will ensure that they will not be able to see the previous correspondences you had with journalists.
After you delete the reply from the journalist, make sure you see the confirmation message: “Reply deleted”.
Submit Files or Messages

You can submit any kind of file, a message, or both. If you are already familiar with GPG, you can optionally encrypt your files and messages with our public key before submission. Files are encrypted as they are received by SecureDrop. Learn more.

Read Replies

— No Messages —
Note: SecureDrop wants your feedback! Confused by something in our documentation? Let us know by opening an issue on GitHub or engaging in our community forum.

This guide presents an overview of the SecureDrop system for a journalist. It covers the core functions necessary to start working with the platform: logging in securely, viewing documents, editing documents, and interacting with sources.

2.1 Connecting to the Tor network in Tails

After you connect to the Internet, the Tor Connection assistant will start.

If you are operating in an environment with a high degree of political freedom, and you are able to access the Tor network reliably, you can accept the defaults:

1. Click “Connect to Tor automatically (easier)”
2. Leave the checkbox “Configure a Tor bridge” unchecked
3. Click “Connect to Tor”
For more information about alternative ways to connect to the Tor network, please see the section “Connecting to the Tor network” in the Tails documentation.

Note: The Tor Connection assistant may display an error message after connecting to the Tor network successfully. If the error message disappears after a few seconds, you can safely ignore it. The error is caused by SecureDrop-specific changes that briefly interrupt Tor connectivity.

### 2.2 Updating Your Workstation

You should keep your SecureDrop workstations updated with:

- Tails updates
- SecureDrop workstation updates

You should apply Tails updates to your Tails drive as they are released, as they often contain critical security fixes. The Journalist Workstation Tails drive, once booted and connected to Tor, will alert you if upgrades are available. For most Tails upgrades, you can simply follow the steps in the Tails Upgrader that appears on screen to update your Tails drive. However, sometimes Tails upgrades are “manual,” which means that you should follow the instructions in the Tails Upgrade Documentation to upgrade the drives. Talk to your SecureDrop administrator if you have trouble.

Admin and Journalist Workstations automatically check for updates on boot. An update window will pop up when updates are needed, and you should simply follow the prompts in the updater to perform the update.

Note: Note that you will need to have a Tails Administrator password configured to complete the update. If you forget to do so, you will need to reboot to enable it.
2.3 Connecting to the *Journalist Interface*

Journalists viewing documents on SecureDrop must connect to the *Journalist Interface* using the Tails operating system on a USB drive. As part of your on-boarding, your admin should have provided you with a Tails drive configured for this purpose, known as the *Journalist Workstation* USB drive.

If you do not have a USB drive clearly identified as the *Journalist Workstation*, ask your administrator for assistance before continuing.

**Note:** The Tails OS makes using SecureDrop very different from other computing experiences. The added layers of security mean extra steps each time you want to login. With practice, you will become increasingly comfortable with the process.

To use the *Journalist Interface*, you will visit a Tor Onion Service address in Tor Browser. By design, this Onion Service address is only accessible from your *Journalist Workstation*; it will not work in Tor Browser on another computer, unless explicitly configured with an access token.

To visit the *Journalist Interface*, click the *Journalist Interface* icon on the desktop. This will open Tor Browser to an “.onion” address. Log in with your username, passphrase, and two-factor authentication token. (If you have been provided with a YubiKey, see *Using YubiKey with the Journalist Interface* for detailed setup and usage information.)

![Login to access the journalist interface](image)

2.3.1 Reset Passphrase or Two-factor Authentication Credentials

If necessary, journalists may reset their user passphrase or two-factor authentication token in their user profile. To navigate to your user profile, log in to the *Journalist Interface* and click on the link in the upper right of the screen where it says *Logged on as <your user name>*,

If you have lost or forgotten your passphrase or your two-factor device (i.e. your mobile phone or security key), you will need to contact your SecureDrop admin for assistance.
Edit your account

Change Name
First name: 
Last name: 

Update

Reset Password

SecureDrop uses automatically generated diceware passwords.
Your password will be changed immediately, so you will need to save it before pressing the "Reset Password" button.

Please enter your current password and two-factor code.

Current Password
Two-factor Code

Your password will be changed to:

g
e

e

geologist pessimist image spoiling jackpot scowling recount

Reset Password

Reset Two-Factor Authentication

If your two-factor authentication credentials have been lost or compromised, or you got a new device, you can reset your credentials here. If you do this, make sure you are ready to set up your new device, otherwise you will be locked out of your account.

To reset two-factor authentication for mobile apps such as FreeOTP, choose the first option. For security keys like the YubiKey, choose the second one.

Reset Mobile App Credentials

Reset Security Key Credentials

Powered by SecureDrop 2.4.0.
2.4 Daily Journalist Alerts About Submissions

When a SecureDrop has little activity and receives only a few submissions every other week, checking the Journalist Interface daily only to find there is nothing is a burden. It is more convenient for journalists to be notified daily via encrypted email about whether or not there has been submission activity in the past 24 hours.

If the email shows submissions were received, the journalist can connect to the Journalist Interface to get them.

**Note:** For security reasons, the email will be sent every 24 hours, regardless of whether there are new submissions or not. The subject of the email will always be “Submissions in the past 24h”. To find out whether there were submissions or not, you must decrypt the contents of the email.

This is an optional feature that must be activated by the administrator. In the simplest case a journalist provides their email and GPG public key to the admin. If a team of journalist wants to receive these daily alerts, they should share a GPG key and ask the admin to setup a mail alias (SecureDrop does not provide that service) so they all receive the alerts and are able to decrypt them.

2.5 Interacting With Sources

If any sources have uploaded documents or sent messages, they will be listed on the homepage by codename.

Click on a codename to see the dedicated page for that source. You will see all of the messages that they have written and documents that they have uploaded.

**Tip:** You can also Star interesting or promising sources to easily return to them later. All starred sources will be bumped to the top of the list of sources.

If you want to reply to the source, write your message in the text field and click Submit.
Once your reply has been successfully submitted, you will be returned to the source page and see a message confirming that the reply was stored. The source will see your reply the next time they log in with their unique codename.

To minimize the impact of a source codename being compromised, the Source Interface encourages the source to delete the reply after reading it. Once a source has read your reply and deleted it from their inbox, a checkmark will appear next to the reply in the interface.

**Note:** Prior to SecureDrop 0.9.0, replies when deleted from the source inbox would also disappear from the journalist inbox. As such, if there are older conversations, there may be discontinuities in the conversation.

You may also delete replies if you change your mind after sending them.

Documents and messages are encrypted to the SecureDrop installation’s Submission Public Key. In order to read the messages or look at the documents you will need to transfer them to the Secure Viewing Station, which holds the Submission Private Key. To recall the conversation history between your organization and sources, you can also download replies and transfer them to the Secure Viewing Station for decryption.
2.6 Moving Documents to the Secure Viewing Station

2.6.1 Step 1: Download the encrypted submission

Documents and messages sent by sources can only be decrypted and viewed on the Secure Viewing Station. After clicking on an individual source, you will see a page with any documents or messages the source has sent you. Documents always end with -doc.gz.gpg, while messages always end with -msg.gpg.

Click on a document or message name to save it, or select a number of documents and save them all at once by clicking Download Selected.

A dialog box with two choices will appear, Cancel and Save file.

Click Save file. In the save dialog, select one of the two folders called Tor Browser and Tor Browser (persistent).
Note that the names may be abbreviated; you can view the full name by hovering the mouse over the shortcut.

The difference between these two folders is as follows:

- **Tor Browser**: Downloads saved to this folder will be stored in memory, which means that they will only be available for the duration of your current Tails session. The full path to this folder is `/home/amnesia/Tor Browser`.

- **Tor Browser (persistent)**: Downloads saved to this folder will be stored on your Tails USB drive in the special persistent volume that is only available if you have unlocked it on the Tails welcome screen. The full path to this folder is `/home/amnesia/Persistent/Tor Browser`.

Unless you have a reason to store encrypted submissions on the *Journalist Workstation*, we recommend using the non-persistent “Tor Browser” folder. In the recommended process, you will now move the submission to the *Secure Viewing Station*, and there is no need to leave a persistent copy behind.

**Important**: Attempting to download files to any other folder will fail. Tails only permits Tor Browser to access these two folders, so that even if your browser is compromised by malware, attackers cannot easily gain access to other data stored on the same computer.

See the Tails guide to *Browsing the web with Tor Browser* for more information.

### 2.6.2 Step 2: Copy the encrypted submission to the Transfer Device

Once downloaded to either folder, move the document to the designated USB stick you intend to use to transfer the documents from your *Journalist Workstation* to the *Secure Viewing Station*. This storage device is known as your *Transfer Device*.

**Note:**

If the *Transfer Device* was set up according to our recommendations, you will be prompted for a decryption passphrase on the *Journalist Workstation* and the *Secure Viewing Station* before being able to use it in a given session. We recommend storing this passphrase in your own personal password manager (e.g., on your smartphone), so that it is readily accessible to you whenever you need it.

You can right-click the file and select **Copy to**, then select the *Transfer Device* in the *Select Copy Destination* dialog.
This will leave a redundant copy behind in the Tor Browser folder. If you have downloaded the file to the non-persistent “Tor Browser” folder (as recommended), the redundant copy will disappear when the computer is shut down or rebooted.

“Eject” the Transfer Device by clicking the eject icon next to its name in the file manager. Wait for this operation to complete (the eject icon will disappear), then unplug the Transfer Device. “Ejecting” the drive in this manner ensures that all write operations are completed before you physically unplug it.

2.6.3 Step 3: Decrypt and view the submission on the Secure Viewing Station

Next, boot up the Secure Viewing Station using Tails and enter the passphrase for the Secure Viewing Station persistent volume. Once you have logged in, plug in the Transfer Device.

**Note:** The Secure Viewing Station and Journalist Workstation are on separate Tails USB drives.

Click on the Home icon on your desktop, then on the Transfer Device. Copy the file into your Persistent folder. You can do so by opening a new window with the Persistent folder and dragging the file from one window to another. A faster method is to drag the file to the Persistent shortcut in the list of places.
Important: Always copy submissions to the Persistent folder before decrypting them. Otherwise you might accidentally decrypt them on the USB stick, and they could be recoverable in the future.

After successfully copying them to the Secure Viewing Station, erase the files from your Transfer Device. Ensure you’re viewing the Transfer Device folder, then right click on the files that need removal and click “Wipe” to securely delete the files from your device.

To decrypt and view documents or messages, return to your Persistent folder. All key actions are initiated by double-clicking:

- Double-clicking archives in ZIP or gzip format will open the Archive Manager application (called file-roller on the command line), which allows you to extract the contents.

- On Tails 4, double-clicking files that end in .gpg will attempt to decrypt the contents to the same directory. If you have configured a passphrase for your Submission Key, you will be prompted for it.

  On Tails 5.1 or greater, double-clicking the .gpg file will launch an application called Kleopatra, from which you can decrypt the file and save the result to the same directory.

- Double-clicking decrypted messages or documents will attempt to open them in a default application suitable for the file type.

If the default application does not work, you can right-click on the document and choose Open with Other Application... to try opening the document with LibreOffice Writer, Document Viewer, or another application. You might also need to right-click on a file and choose Rename... to rename a document with an incorrect or missing file extension.
**Tip:** Always extract gzip archives with the *Archive Manager* application, which is the default when double-clicking the archive. Other methods may not preserve the filename contained in the archive.

For example, an archive called 1-artful_elevation-doc.gz might contain a file secrets.docx, but if you extract the contents by right-clicking the archive and selecting *Extract here*, the extracted file will be called 1-artful_elevation-doc instead of secrets.docx. This may result in problems when attempting to open the file due to the loss of its file extension.

When you double-click an archive to open it, you should see it in the *Archive Manager* application.

Click the **Extract** button to unpack the archive. Navigate to the folder containing the encrypted document message or document (ends with `.gpg`).

Double-click the file to decrypt it. On Tails 5.1 or greater, this will launch *Kleopatra*, from which you can decrypt the file and save the result to the same directory.

The decrypted file will have the same filename, but without `.gpg` at the end.

You can now double-click on the decrypted file to open it in its default application.

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2.6. **Moving Documents to the Secure Viewing Station**
2.7 Working with Documents

This section describes how to organize submissions, handle unusual file formats, safely research submissions, remove metadata, and mitigate risks from submitted malware.

Tip: This is only a very limited introduction. Freedom of the Press Foundation publishes and maintains digital security guides for journalists, many of which relate to these topics, and offers digital security training for news organization staff.

2.7.1 Organizing submissions

Whenever you download submissions using one of the Download buttons in the Journalist Interface, they will be organized as a ZIP archive with a built-in folder structure, which you can use as a template for organizing submissions on the Secure Viewing Station.

Submissions downloaded in this manner from the list of all sources will contain a structure like the following:

```
all
  └── recessive accreditation
      ├── 1_2019-07-07
      │   └── 1-recessive_accreditation-msg.gpg
      │
      └── 2_2019-07-07
           └── 2-recessive_accreditation-msg.gpg

  └── surviving authentication
      ├── 1_2019-07-07
      │   └── 1-surviving_authentication-doc.gz.gpg
      │
      └── 2_2019-07-07
           └── 2-surviving_authentication-msg.gpg
```

Submissions downloaded in this manner from the screen for an individual source will contain a similar structure, but without the parent folder all.

A folder like 1_2019-07-07 in the example above will always contain exactly one message or document. The numbers in the folder name (1, 2, etc.) correspond to the numbering in the Journalist Interface. The dates (2019-07-07 in the example above) are the day (in year/month/day format) of the last activity related to this source, at the time the archive was downloaded.
If you download messages or documents one at a time in the Journalist Interface, they will not be contained in a ZIP file at all. Instead, you will be dealing with individual files like 1-surviving_authentication-doc.gz.gpg, without a folder structure.

### 2.7.2 Handling File Formats

SecureDrop accepts submissions of any file type. Tails comes with pre-installed applications for securely working with documents, including an office suite, graphics tools, desktop publishing tools, audio tools, and printing and scanning tools.

For more information, visit the Tails guide to working with sensitive documents.

### 2.7.3 Pre-Encrypted Submissions

SecureDrop sources can optionally encrypt prior to submitting to SecureDrop. This means that once you decrypt the document as you usually do by double clicking the document in the file manager, there will be another layer of encryption.

Most often, the file will be encrypted to the SecureDrop key. If the file is encrypted to your SecureDrop key, you should be able to double click the file as usual once more in the SVS and it should decrypt.

However, it’s also possible the file is encrypted to another key, potentially your personal key. If this occurs, you will get an error message in Tails that reads “Decryption failed. You probably do not have the decryption key”. To determine which key was used, if you are comfortable at the command line, you can open the Terminal, navigate to the file, and use:

```
gpg --decrypt NAME_OF_FILE
```

replacing NAME_OF_FILE with the name of the file you wish to decrypt. This command will tell you what key was used to encrypt the file. If you are not comfortable at the command line, contact your SecureDrop admin or Freedom of the Press Foundation for assistance.

**Warning:** Do not transfer source material off the Secure Viewing Station for decryption. Instead, transfer cryptographic keys to the SVS device for decryption and metadata removal.

### 2.7.4 Researching Submissions

Journalists should take care to research submissions using the Tor Browser, ideally in a new Tails session on your Journalist Workstation for highly sensitive submissions.

### 2.7.5 Removing Metadata

**Tip:** For detailed information about removing metadata from documents, check out this in-depth guide to removing metadata.

Tails comes with the Metadata Anonymisation Toolkit 2 (MAT2) that is used to help strip metadata from a variety of types of files, including png, jpg, OpenOffice/LibreOffice documents, Microsoft Office documents, pdf, tar, tar.bz2, tar.gz, zip, mp3, mp2, mp1, mpa, ogg, and flac. We recommend using this and other tools to work with documents within Tails for as much of your workflow as possible.
Tails 4 replaces MAT with MAT2, which is usable via the command line and via a context menu in the Files application (called nautilus on the command line).

You can use MAT2 via the Files application by browsing to Places ➤ (Your file’s location) and right-clicking on your file. In the context menu, select Remove metadata.

Note that this does not alter the original file—it creates a clean copy.
To use MAT2 on the command line, type `man mat2` to see a list of available actions you can take with MAT2. For example, you can view the metadata of a file with `mat2 myfile --show`. 
You can create a “clean” version of the document with `mat2 myfile`, again noting that this does not erase the metadata on the original file. This is equivalent to the “Remove metadata” context menu option.

Note that even after running MAT2, you should carefully inspect files to ensure that all metadata has been wiped, or convert them to a simpler file format (for example, converting a .xls file to a .csv) to ensure that metadata is not left behind in error.

When you no longer need documents, right-click them in the Files application and choose **Wipe** to securely delete them.
2.7.6 Risks From Malware

SecureDrop does not scan for or remove malware in submissions you receive. There are important steps you can take to protect yourself:

1. **Keep the version of Tails on your Secure Viewing Station up-to-date.**
   
   Tails offers more protection against compromise than your everyday computer, and the air-gap prevents potential malware from “phoning home.” But if the version of Tails is outdated, an attacker can still attempt to exfiltrate or destroy information.

2. **Print documents from the Secure Viewing Station instead of exporting them digitally, whenever possible.**
   
   Printing documents prevents the proliferation of malware to your everyday workstation, and eliminates most categories of embedded metadata. Note that printing a document may still preserve watermarks, printer codes, steganographically encoded data, or other information not visible to the naked eye.

3. **Consult with your administrator or your digital security staff before copying files digitally.**
   
   If you must copy a file in digital form (because of its format, the volume of information, or for other reasons), we recommend taking the time to consult with technical experts within the organization.

   **Tip:** Converting files to simpler formats (e.g., PDF to PNG) can help reduce the risk of malware. Tails provides both graphical and command-line utilities that can be used for this purpose.

4. **Never scan QR codes embedded in documents using a network-connected device.**
   
   QR codes can contain malicious links that your device will automatically visit. In general, be careful when opening any links provided in a SecureDrop submission, as this can leak information to third parties. If you are unsure if a link is safe to click, you should consult internally, or contact Freedom of the Press Foundation for assistance.

5. **Don’t photograph submissions using your smartphone, and be careful with all digital photography.**
   
   Many smartphones are configured to back up photographs to cloud services, immediately or intermittently; newer digital cameras have similar functionality. Not all backup settings may be visible to you.
   
   Any digital photograph will include certain metadata by default, which may reveal sensitive information about your SecureDrop usage patterns (potentially including GPS coordinates) to anyone who gains access to the file.

Fully mitigating the risks of malware received via SecureDrop is beyond the scope of this documentation. If you have questions, you can contact us at securedrop@freedom.press (GPG encrypted) or via the support portal. Please do NOT disclose details about the contents of any submission you have received.
2.8 Moving Documents to Your Everyday Workstation

Important: As noted above, SecureDrop does not scan for or remove malware. If the file you received contains malware targeting the operating system and applications running on your everyday workstation, copying it in its original form carries the risk of spreading malware to that computer. Make sure you understand the risks, and consider other methods to export the document (e.g., print).

If you must copy a file from your Secure Viewing Station to your everyday workstation in digital form, our recommendation is that journalists are provided with an Export Device, typically a USB drive, which is encrypted using VeraCrypt. These instructions assume that you are following the recommended workflow. If you are unsure, ask your administrator.

Note: VeraCrypt support was added to Tails in version 3.9. We strongly recommend keeping your Secure Viewing Station up-to-date with each release of Tails.

To open the Export Device on the Secure Viewing Station, follow these steps:

1. If your Export Device has a physical write protection switch, make sure it is in the unlocked position.
2. Plug the Export Device into the Secure Viewing Station.
3. Click Applications ▶ Utilities ▶ Unlock VeraCrypt Volumes
4. Under “Partitions and Drives”, select the Export Device and click Unlock.
5. Enter your passphrase, which we recommend keeping in your own personal password manager (e.g., on your smartphone), not on KeePassXC.
6. Under “Partitions and Drives”, open the encrypted drive by clicking Open.

Steps 3-6 are illustrated below:
2.8. Moving Documents to Your Everyday Workstation
SecureDrop Documentation, Release stable

Chapter 2. Journalist Guide

Unlock VeraCrypt Volumes

File Containers

No file containers added

Partitions and Drives

32 GB Volume – UFD 3.0 Silicon-Power32G

Unlock

This application is not affiliated with or endorsed by the VeraCrypt project or IDRIX.

Enter a passphrase to unlock the volume

The volume UFD 3.0 Silicon-Power32G (32 GB Drive) might be a VeraCrypt volume as it contains random data.

- Hidden Volume
- Windows System Volume
- User Keyfiles

Password: ***************

Remember Password

Unlock
The Export Device should now open in the file manager. If there are still files on the Export Device from your last copy operation, securely delete them now.

Copy the file or files you want to access on your everyday workstation to the Export Device using the file manager.

### 2.9 Decrypting and Preparing to Publish

**Note:** To decrypt a VeraCrypt drive on a Windows or Mac workstation, you need to have the VeraCrypt software installed. If you are unsure if you have the software installed or how to use it, ask your administrator, or see the Freedom of the Press Foundation guide for working with VeraCrypt.

To access the Export Device on your everyday workstation, follow these steps:

1. If your Export Device has a physical write protection switch, make sure it is in the locked position.
2. Plug the Export Device into your everyday workstation.
3. Launch the VeraCrypt application.
4. Click Select Device and select the Export Device, then click OK.
5. Click Mount.
6. Enter the passphrase for your Export Device. You should find this in your own personal password manager.
7. Open the Export Device in your operating system’s file manager, and copy the contents of interest to your everyday workstation.
As a security precaution, we recommend deleting the files on the Export Device after each copy operation. If you are using write protection, you have to perform this step on the Secure Viewing Station to get the security benefits of write protection.

When you are done, switch back to the VeraCrypt window, and click Dismount.

You are now ready to write articles and blog posts, edit video and audio, and begin publishing important, high-impact work!

**Tip:** Check out our SecureDrop Promotion Guide to read about encouraging sources to use SecureDrop.

### 2.10 Deleting submissions and source accounts

As part of routine SecureDrop usage, we recommend that you establish data retention practices consistent with your organization’s threat model, data lifecycle and data retention policies. Regularly deleting submissions and source accounts can mitigate risks in the event that your SecureDrop servers or a source’s account details are compromised.

To delete sources, first select them in the list of all sources in the Journalist Interface, then click the Delete button. You will be given a choice to delete all messages and files for the selected sources, or to delete the source accounts.

If you delete messages and files for a source, the source will continue to appear in the list of sources in the Journalist Interface, and they will still be able to log into the Source Interface using their codename. Consider using this option as part of regular deletion of reviewed submissions, especially if you are not sure that all communication with the source has concluded.

**Note:** If you delete all messages and files, that includes all replies you have sent to the source, even if the source has not seen them yet. You will still be able to send new replies.
If you delete the entire source account, the source will not be able to log in again using their codename, and all information about them will be destroyed. Consider using this option if it is clear that all communication with the source has concluded, or if the source has requested that all information about them and their submissions should be removed.

You can more selectively delete source submissions and journalist replies by clicking the source’s two-word designation in the list of all sources. You will see a list of source messages (filenames end with -msg.gpg), file submissions (filenames end with -doc.gz.gpg) and journalist replies (filenames end with --reply.gpg).

Select the source data you wish to delete, then click the Delete button. You will be prompted for confirmation.

From the same page, you also have the option to delete the entire source account. To do so, click the button labeled Delete Source Account at the bottom of the page. You will be prompted for confirmation.
All messages, files, and replies from sources are stored as encrypted files for security. To read them, you will need to decrypt them on your Secure Viewing Station.

Select All  Select Unread  Select None  Download Selected  Delete Selected

Are you sure?

Deleting the account for bibliographic kicker will:

- prevent them from logging in with their codename again
- prevent your organization from sending replies

All files, messages, and replies will also be deleted when their account is deleted.

Cancel  Yes, Delete Source Account

You can write a secure reply to the person who submitted these messages and/or files:
Note: SecureDrop wants your feedback! Confused by something in our documentation? Let us know by opening an issue on GitHub or engaging in our community forum.

3.1 Responsibilities

The SecureDrop architecture contains multiple machines and hardened servers. While many of the installation and maintenance tasks have been automated, a skilled Linux admin is required to responsibly run the system.

3.1.1 Responsibilities of SecureDrop administrators

As a SecureDrop administrator, it is your responsibility to:

• manage users
• manage the system configuration
• ensure that servers, firewall and workstations are kept up-to-date
• monitor OSSEC alerts
• monitor the SecureDrop team’s release and security-related communications
• apply available firmware updates to all SecureDrop hardware
• ensure that the SecureDrop environment is physically secure and monitored
• investigate and respond to security incidents
• schedule and perform required maintenance tasks, such as operating system upgrades
• ensure that SecureDrop users adhere to the documented processes for checking SecureDrop, communicating with sources, and reviewing documents
• verify the integrity of SecureDrop code
• avoid the installation of unsupported code or patches
• decommission SecureDrop after it is no longer in use
3.1.2 Responsibilities of the SecureDrop team

The SecureDrop team employed by Freedom of the Press Foundation (FPF) and the SecureDrop community maintain and develop the SecureDrop software, which is offered as open source software, free of charge, and at your own risk.

FPF offers paid priority support services. We are happy to provide assistance with installing the system, with training of administrators and journalists, and with investigation of technical issues and incidents.

Note: Each SecureDrop instance is hosted and operated independently. Freedom of the Press Foundation does not offer systems administration, hosting or “remote hands” services.

When the SecureDrop team becomes aware of a security vulnerability in SecureDrop or its software dependencies, we assess the impact of the vulnerability in the context of existing security mitigations and our threat model. Based on this assessment, we prioritize technical work and external communications.

For high severity issues that require technical changes to SecureDrop, we will issue a point release as soon as possible. As part of issuing a release or advisory, we will post further details on the SecureDrop website and to the support portal.

In rare circumstances when a technical fix is extremely time sensitive, we may provide signed patches to impacted SecureDrop instances. Even in these cases, we ask that you never install code provided to you that is not signed using the current SecureDrop release key.

When in doubt how to resolve an issue, please avoid following technical instructions that have not been vetted by the SecureDrop team. If you encounter bugs, please report them. For sensitive matters, you can contact us via the SecureDrop Support Portal or via our contact form.

3.1.3 Managing Users

Admins are responsible for managing user credentials and encouraging best practices. (See Passphrases and Passphrase Best Practices.) The admin will also have access to the Journalist Interface, via her own username, passphrase, and two-factor authentication method (using a smartphone application or YubiKey).

See User Management for more information on adding and managing users.

3.1.4 Managing the System Configuration

Admins are responsible for configuring and maintaining the system. Several tools are available to support this:

- The Admin Interface allows the admin to manage users and configure web interface features such as organizations logos and submission preferences.
- Server SSH access is also available, to allow administrators to troubleshoot server issues and perform manual updates.
- The securedrop-admin utility is used via the Admin Workstation to configure and install SecureDrop, to perform operations including server backups and restores, and to update the server configuration after installation.
3.1.5 Keeping the System Updated

The admin is responsible for ensuring that updates are applied to SecureDrop. Where possible, updates are applied automatically, but some update operations require manual intervention.

Updates: Servers

The admin should be aware of all SecureDrop updates and take any required manual action if requested in the SecureDrop Release Blog (RSS feed). We also recommend registering with the SecureDrop Support Portal to stay apprised of upcoming releases.

Most often, the SecureDrop servers will automatically update via `apt`. However, occasionally you will need to run `securedrop-admin install` or take other manual steps. If you are onboarded to the support portal, we will let you know in advance of major releases if manual intervention will be required.

Updates: Network Firewall

Given all traffic first hits the network firewall as it faces the non-Tor public network, the admin should ensure that critical security patches are applied to the firewall.

Be informed of potential updates to your network firewall. If you’re using the network firewall recommended by FPF, you can subscribe to email updates from the Netgate homepage or follow the Netgate blog to be alerted when releases occur. If critical security updates need to be applied, you can do so through the firewall’s pfSense WebGUI. Refer to our Keeping pfSense up to Date documentation or the official pfSense Upgrade Docs for further details on how to update the suggested firewall.

Updates: Workstations

The admin should keep all SecureDrop workstations updated with:

- **Tails updates** for each Admin Workstation, Journalist Workstation, and Secure Viewing Station; and
- **SecureDrop workstation updates** for each Admin Workstation and Journalist Workstation.

You should apply Tails updates to your Tails drives as they are released, as they often contain critical security fixes. Subscribe to the Tails RSS Feed to be alerted of new releases. The online Tails drives, once booted and connected to Tor, will alert you if upgrades are available. Follow the Tails Upgrade Documentation on how to upgrade the drives.

Admin and Journalist Workstations automatically check for updates on boot. An update window will pop up when updates are needed, and you should simply follow the prompts in the updater to perform the update.

**Note:** Note that you will need to have a Tails Administrator password configured to complete the update. If you forget to do so, you will need to reboot to enable it.
3.1.6 Monitoring OSSEC Alerts

SecureDrop uses OSSEC to monitor the servers for unusual activity caused by system configuration issues or security breaches. The admin should decrypt and read all OSSEC alerts. Report any suspicious events to FPF through the SecureDrop Support Portal. See the OSSEC Guide for more information on common OSSEC alerts.

**Warning:** Do not post logs or alerts to public forums without first carefully examining and redacting any sensitive information.

3.1.7 Monitoring SecureDrop-related communications

Release announcements and security advisories are posted to the SecureDrop blog, which is also available as an RSS feed. You can also follow us on our social media accounts (Twitter and Mastodon).

We strongly recommend joining the SecureDrop support portal. As a member of the support portal, you will receive email notifications related to all major announcements, and you can open tickets in case of technical issues. Membership is free of charge.

3.2 The Admin Interface

The Admin Interface is an extended version of the Journalist Interface, that allows you to manage users and configure the appearance and behaviour of your instance’s web interfaces.

3.2.1 Logging in

To log in to the Admin Interface, start the Admin Workstation with persistence enabled and double-click the Journalist Interface icon on the Desktop. Tor Browser will start and load the login page for the Journalist Interface. Use your username, passphrase, and two-factor authentication token to log in.

By default, you will be logged in to the Journalist Interface’s source list page.

In the course of normal administration operations you should not need to view source communications, but if you do, you can find information on managing submissions in the journalist guide.

**Note:** If you have lost your login information or your two-factor authentication is no longer valid, you can create another account with admin privileges via the command line on the Application Server. See here for more information.
3.2.2 User Management

You can use the Admin Interface to add and remove users, and to reset their credentials if necessary. To open the Admin Interface, click Admin in the upper right corner of the Journalist Interface.

Adding Users

After logging in, you can add new user accounts for the journalists at your organization who will be checking the system for submissions. Make sure the journalist is physically in the same room as you when you do this, as they will have to be present to enable two-factor authentication. SecureDrop supports the use of either a smartphone authenticator app or a Yubikey for two-factor authentication. If an app is to be used, the journalist should install it before proceeding with the account setup.

Tip: We recommend using FreeOTP (available for Android and for iOS) to generate two-factor codes because it is Free Software. However, if it does not work for you for any reason, alternatives exist:

- Google Authenticator for Android and iOS (proprietary)
- authenticator for the desktop (Free Software)

1. Click Admin in the top right corner of the page to load the Admin Interface.

2. Click Add User to add a new user.
3. Hand the keyboard over to the journalist so they can create their own username.

4. Once they’re done entering a username for themselves, have them save their pre-generated Diceware passphrase to their password manager.

5. If the new account should also have admin privileges, allowing them to add or delete other journalist accounts, select **Is Admin**.

6. Finally, set up two-factor authentication for the account, following one of the two procedures below for your chosen method.

**Note:** The username **deleted** is reserved, as it is used to mark accounts which have been deleted from the system.
FreeOTP

1. If the journalist is using FreeOTP or another app for two-factor authentication, click Add User to proceed to the next page.

2. Next, the journalist should open FreeOTP on their smartphone and scan the barcode displayed on the screen.

3. If they have difficulty scanning the barcode, they can tap on the icon at the top that shows a plus and the symbol of a key and use their phone’s keyboard to input the two-factor secret into the Secret input field, without whitespace.

4. Inside the FreeOTP app, a new entry for this account will appear on the main screen, with a six-digit number that recycles to a new number every thirty seconds. The journalist should enter the six-digit number in the Verification code field at the bottom of the Enable FreeOTP form and click Submit.

If two-factor authentication was set up successfully, you will be redirected back to the Admin Interface and will see a confirmation that the two-factor code was verified.
YubiKey

1. If the journalist wishes to use a YubiKey for two-factor authentication, select Is using a YubiKey. You will then need to enter their YubiKey’s OATH-HOTP Secret Key. For more information on how to retrieve this key, read the YubiKey Setup Guide.

2. Once you’ve entered the Yubikey’s OATH-HOTP Secret Key, click Add User. On the next page, have the journalist authenticate using their YubiKey, by inserting it into a USB port on the workstation and pressing its button.

3. If everything was set up correctly, you will be redirected back to the Admin Interface, where you should see a flashed message that says “The two-factor code for user new username was verified successfully.”.

The journalist will require their username, passphrase, and two-factor authentication method whenever they check SecureDrop. Make sure that they have memorised their username and passphrase, or stored them in their password manager, and that they can keep their two-factor authentication device secure.
Passphrases and Two-Factor Resets

**Warning:** Both of these operations will lock a user out of their SecureDrop account. Users should be physically present when their passphrase or two-factor authentication method is reset. If this is not possible, store the passphrase and/or two-factor authentication secret in your own password manager before securely transmitting them to the user in question, and delete them once the user has confirmed they can successfully log in.

Even while following passphrase best practices, your journalists may occasionally lock themselves out of their accounts. This can happen if, for example, they lose their two-factor device or if they forget the passphrase to their password manager. When this happens, you can reset their account as follows:

1. Log in as an administrator to the *Journalist Interface*
2. Select *Admin* at the top right to open the *Admin Interface*
3. Find the user’s account name and select *Edit*
Next, you can either rotate their passphrase or reset two-factor authentication for their account.

To change their passphrase to the randomly-generated passphrase shown:

1. Have the journalist enter their current passphrase and two-factor code.
2. Make sure the new passphrase is saved in a password manager.
3. Click Reset Password
To reset two-factor authentication:

1. Click the button that corresponds to the user’s chosen two-factor authentication method:
   - Click **Reset Mobile App Credentials** for accounts using FreeOTP or a similar authentication app
   - Click **Reset Security Key Credentials** for accounts using a Yubikey
2. Follow the on-screen instructions to complete the process and verify their new two-factor authentication credentials.

**Off-boarding Users**

See our guide to off-boarding users from SecureDrop.

### 3.2.3 Instance Configuration

The Instance Configuration section of the *Admin Interface* allows you to:

- update the organization name and logo displayed on the *Source Interface* and *Journalist Interfaces*
- set submission preferences for the *Source Interface*
- send test OSSEC alerts.

**Updating the Organization Name**

Your organization name is used in page titles and logo ALT text on the *Source Interface* and *Journalist Interfaces*. By default, it’s set to SecureDrop. To change it, enter your desired name in the Organization Name field and click **Set Organization Name**.

**Updating the Logo Image**

You can update the system logo shown on the web interfaces of your SecureDrop instance via the *Admin Interface*. We recommend a size of 500px \( \times \) 450px. Only PNG-format images are supported. To update the logo image:

1. Copy the logo image to your admin workstation
2. Click **Browse** and select the image from your workstation’s filesystem
3. Click **Update Logo** to upload and set the new logo

You should see a message appear indicating the change was a success.
Log Image
Here you can update the image displayed on the SecureDrop web interfaces:

![New York World](image)

Browse... No file selected.
Recommended size: 500px * 450px

Update Logo
- Image updated.

Submission Preferences

- Prevent sources from uploading documents. Sources will still be able to send messages.
- Prevent sources from sending initial messages shorter than the minimum required length:
  - Minimum number of characters.
- Prevent sources from submitting their codename as an initial message.

Update Submission Preferences

Alerts
Send an encrypted email to verify if OSSEC alerts work correctly:

Send Test OSSEC Alert

Powered by SecureDrop 2.4.0.
Testing OSSEC Alerts

To verify that the OSSEC monitoring system’s functionality, you can send a test OSSEC alert by clicking Send Test OSSEC Alert.

Logo Image

Here you can update the image displayed on the SecureDrop web interfaces:

NEW YORK WORLD

Recommended size: 500px * 450px

Submission Preferences

☐ Prevent sources from uploading documents. Sources will still be able to send messages.

☐ Prevent sources from sending initial messages shorter than the minimum required length: 0 Minimum number of characters.

☐ Prevent sources from submitting their codename as an initial message.

Alerts

Send an encrypted email to verify if OSSEC alerts work correctly:

Test alert sent. Please check your email.
You should receive an OSSEC alert email at the address specified during the installation of SecureDrop. The email may take several minutes to arrive. If you don’t receive it, refer to the OSSEC Guide for information on troubleshooting steps.

### 3.2.4 Submission Preferences

The Submission Preferences subsection allows you to restrict the types of submissions accepted by your instance.

**Disabling Document Uploads**

By default, SecureDrop supports both text submissions and document uploads. If you only want to receive text messages, you can disable uploads as follows:

1. Check the **Prevent sources from uploading documents** checkbox
2. Click **Update Submission Preferences**

This change will be applied immediately on the Source Interface. Documents that were previously uploaded will still be available via the Journalist Interface.

**Preventing Short Initial Messages**

By default, SecureDrop does not apply a minimum length requirement to messages. If your instance is experiencing a high volume of short one-time messages with no actionable content, or if you would like to indicate to sources that their initial message should include enough information for journalists to respond to them effectively, you can set an initial message length as follows:

1. Check the **Prevent sources from sending initial messages shorter than the minimum required length** checkbox
2. Enter the desired minimum length in the field below the checkbox
3. Click **Update Submission Preferences**

This change will be applied immediately on the Source Interface. Initial messages that are too short will be rejected, with an error message informing sources of the requirement. This requirement will not be applied to initial messages that also include a document, or to subsequent messages in the conversation.

To remove the requirement, uncheck the checkbox and click **Update Submission Preferences**.

**Preventing Initial Messages Containing the Source’s Codename**

Sources should never need to share their seven-word codename with journalists. If your instance is receiving one-time messages consisting of the source’s codename, you can optionally reject those messages, before they are stored, as follows:

1. Check the **Prevent sources from submitting their codename as an initial message** checkbox
2. Click **Update Submission Preferences**

This change will be applied immediately on the Source Interface. Initial messages that contain the source’s codename will be rejected, with an error message reminding sources to protect their codename and keep it secret. To remove this restriction, uncheck the checkbox and click **Update Submission Preferences**.
3.3 Server SSH Access

Generally, you should avoid directly SSHing into the servers in favor of using the Admin Interface or securedrop-admin. However, in some cases, you may need to SSH in order to troubleshoot and fix a problem that cannot be resolved via these tools.

In this section we cover basic commands you may find useful when you SSH into the Application Server and Monitor Server.

Tip: When you SSH into either SecureDrop server, you will be dropped into a tmux session. tmux is a screen multiplexer - it allows you to tile panes, preserve sessions to keep your session alive if the network connection fails, and more. Check out this tmux tutorial to learn how to use tmux.

Tip: If you want a refresher of the Linux command line, we recommend this resource to cover the fundamentals.

3.3.1 Shutting Down the Servers

```
sudo shutdown now -h
```

3.3.2 Rebooting the Servers

```
sudo reboot
```

3.3.3 Investigating Logs

Consult our Investigating Logs topic guide for locations of the most relevant log files you may want to examine as part of troubleshooting, and for how to enable error logging for the Source Interface.

Note: You can use the securedrop-admin tool to extract logs to send to Freedom of the Press Foundation for analysis. Run the following command on your Admin Workstation:

```
cd ~/Persistent/securedrop
./securedrop-admin logs
```

This command will produce encrypted tarballs containing logs from each server. See the command output for more information.
3.3.4 Immediately Apply a SecureDrop Update

SecureDrop will update and reboot once per day. However, once a SecureDrop update is announced, you can opt to fetch the update immediately.

**Important:** Except where otherwise indicated, make sure to update both your *Application Server* and your *Monitor Server*.

To update your servers immediately, you can SSH into each server (via `ssh app` and `ssh mon`) and run the following commands:

```
sudo apt update
sudo unattended-upgrades
```

**Note:** Depending on the nature of the update (e.g., if the *tor* package is upgraded and you are using SSH-over-Tor), your SSH connection may be interrupted, and you may have to reconnect to see the full output.

3.3.5 Application Server

**Adding Users (CLI)**

After the provisioning of the first admin account, we recommend using the Admin Interface web application for adding additional journalists and admins.

However, you can also add users via `./manage.py` in `/var/www/securedrop/` as described *during first install*. You can use this command line method if the web application is unavailable.

**Restart the Web Server**

If you make changes to your Apache configuration, you may want to restart the web server to apply the changes:

```
sudo service apache2 restart
```

**Cleaning up deleted submissions**

When submissions are deleted through the web interface, their database records are deleted and their encrypted files are securely wiped. For large files, secure removal can take some time, and it’s possible, though unlikely, that it can be interrupted, for example by a server reboot. In older versions of SecureDrop this could leave a submission file present without a database record.

As of SecureDrop 1.0.0, automated checks send OSSEC alerts when this situation is detected, recommending you run `manage.py list-disconnected-fs-submissions` to see the files affected. As with any `manage.py` usage, you would run the following on the admin workstation:

```
ssh app
sudo -u www-data bash
cd /var/www/securedrop
./manage.py list-disconnected-fs-submissions
```

You then have the option of running:
to clean them up. As with any potentially destructive operation, it’s recommended that you *back the system up* before doing so.

There is also the inverse scenario, where a database record could point to a file that no longer exists. This would usually only have happened as a result of disaster recovery, where perhaps the database was recovered from a failed hard drive, but some submissions could not be. The OSSEC alert in this case would recommend running:

```
./manage.py list-disconnected-db-submissions
```

To clean up the affected records you would run (again, preferably after a backup):

```
./manage.py delete-disconnected-db-submissions
```

Even when submissions are completely removed from the application server, their encrypted files may still exist in backups. We recommend that you delete old backup files with `shred`, which is available on Tails.

### 3.3.6 Monitor Server

**Restart OSSEC**

If you make changes to your OSSEC monitoring configuration, you will want to restart OSSEC via OSSEC’s control script, `ossec-control`:

```
sudo /var/ossec/bin/ossec-control restart
```

### 3.4 The securedrop-admin Utility

#### 3.4.1 Using securedrop-admin

The securedrop-admin command-line utility is used from the *Admin Workstation* to perform common server administration tasks, including:

- configuring and installing SecureDrop
- backing up and restoring the servers (see *Backing Up and Restoring Servers*)
- retrieving server logs for troubleshooting (see *Investigating Logs*)
- updating the SecureDrop code and Tails configuration on the *Admin Workstation*
- updating your SecureDrop servers’ configuration post-install.

To use securedrop-admin:

1. Boot the *Admin Workstation* with persistence enabled and an admin password set
2. Open a terminal via *Applications > System Tools > Terminal*
3. Change directory to the SecureDrop installation directory: `cd ~/Persistent/securedrop`

You can list all available securedrop-admin actions using the command `./securedrop-admin --help`
Note: If your team has multiple admins, each with their own Admin Workstation, you must take steps to manually synchronize any configuration changes made via securedrop-admin with each other. See Managing Configuration Updates with Multiple Admins

3.4.2 Updating the Server Configuration

There are two primary reasons why you may want to update the system configuration:

- to change SecureDrop server configuration options. **Example:** You want to change the time of day at which the servers are automatically rebooted (default: 4:00 AM).
- to restore a valid configuration state on your servers. **Example:** Another admin has directly modified the iptables rules during troubleshooting, and you want to reinstate the correct rules.

In both cases, follow these steps:

1. Boot the Admin Workstation and unlock its persistent volume.
2. Open a terminal and type `cd ~/Persistent/securedrop`.
3. Run `git status`. If the output includes HEAD detached at followed by the version number displayed in the footer of your Source Interface, you are running the applicable version of the SecureDrop code on your workstation, and can proceed to the next step. If not, it is not safe to proceed. Follow the upgrade instructions associated with the release notes for the most recent release of SecureDrop. Apply all available updates, including for the Tails operating system.
4. Run `./securedrop-admin sdconfig`. This will display the current configuration, one line at a time, and allow you to change it. At this point, any changes you make are only saved on this Admin Workstation, to the following file:
   ```
   ~/Persistent/securedrop/install_files/ansible-base/group_vars/all/site-specific
   ```
5. Run `./securedrop-admin install`. This will apply the configuration to your Application and Monitor Server, and enforce the canonical state of the server configuration.

Note: If you see an error running `./securedrop-admin install`, and believe it may be an intermittent issue (for example, due to losing network connectivity to the servers), it is safe to run the `./securedrop-admin install` command again. If you see the same issue consistently, then you will need to troubleshoot it.

If you see the error message “timeout (62s) waiting for privilege escalation prompt”, try deleting the Ansible control path directory on your Admin Workstation (`rm -rf ~/.ansible/cp`) to reset the connection to the servers, then re-run the `./securedrop-admin install` command from within `~/Persistent/securedrop`.

If you encounter other errors, we encourage you to submit a bug report, or to contact us at securedrop@freedom.press (GPG encrypted).
3.4.3 Updating Localization for the Source Interface and the Journalist Interface

The Source Interface and Journalist Interface are translated in the following languages:

- Arabic (ar)
- Catalan (ca)
- Czech (cs)
- German (de_DE)
- Greek (el)
- Spanish (es_ES)
- French (fr_FR)
- Hindi (hi)
- Icelandic (is)
- Italian (it_IT)
- Norwegian (nb_NO)
- Dutch (nl)
- Portuguese, Brasil (pt_BR)
- Portuguese, Portuguese (pt_PT)
- Romanian (ro)
- Russian (ru)
- Slovak (sk)
- Swedish (sv)
- Turkish (tr)
- Chinese, Simplified (zh_Hans)
- Chinese, Traditional (zh_Hant)

At any time during and after initial setup, you can choose from a list of supported languages to display using the codes shown in parentheses.

Note: With a Source Interface displayed in French (for example), sources submitting documents are likely to expect a journalist fluent in French to be available to read the documents and follow up in that language.

To add or remove locales from your instance, you’ll need to update your system configuration as outlined above.

When you reach the prompt starting with “Space separated list of additional locales to support”, you will see a list of languages currently supported. Refer to the list above to see which languages correspond to which language codes. For example:

```
Space separated list of additional locales to support (ru nl pt_BR fr_FR tr it_IT zh_Hant sv hi ar en_US de_DE es_ES nb_NO): nl fr_FR es_ES
```

You’ll need to list all languages you now want to support, adding or removing languages as needed. Locale changes will be applied after the next reboot.
3.4.4 Managing Configuration Updates with Multiple Admins

Organizations with multiple admins should set up a way to synchronize any changes one admin makes to the server configuration, as by default those changes are stored only on their individual Admin Workstation.

Configuration changes will be flagged by OSSEC and will generate alerts, but if other admins don’t regularly review OSSEC alerts they may miss important changes, such as an update to the Submission Public Key. If they subsequently run ./securedrop-admin install from their Admin Workstation, they will revert the server configuration to an older version.

The simplest approach to keeping workstations in sync is to inform other admins of changes as you make them, for example via a secure Signal group chat. Any such communications should happen over a platform that provides E2EE, as you may need to share sensitive information.

Configuration information is stored in several files on the Admin Workstation under ~/Persistent/securedrop/:

- install_files/ansible-base/group_vars/all/site-specific contains settings written by ./securedrop-admin sdconfig - if it is changed other admins should be notified.
- The Submission Public Key and OSSEC Alert Public Key should be present under install_files/ansible-base. If these keys are rotated, the public keys should be updated on other Admin Workstations.
- Onion service information is stored in several files:

  ```
  install_files/ansible-base/app-ssh.auth_private
  install_files/ansible-base/mon-ssh.auth_private
  install_files/ansible-base/app-journalist.auth_private
  install_files/ansible-base/app-sourcev3-ths
  install_files/ansible-base/tor_v3_keys.json
  ```

If onion service addresses are changed, the files listed above should be shared securely with other administrators - preferably in person using an encrypted transfer USB, as they can be used to access the servers directly via SSH over Tor.

3.5 Frequently Asked Questions

Some initial troubleshooting steps for common scenarios follow. If you continue to have trouble after following these steps, you can contact the SecureDrop team for further assistance.

3.5.1 Generic Troubleshooting Tips

When troubleshooting, ensure you are on the latest version of SecureDrop in your Admin Workstation. This is done by accepting the update when prompted at boot in the GUI that appears.

3.5.2 I can’t SSH into my servers over Tor from my Admin Workstation. What do I do?

At any point after the successful installation of SecureDrop, if you cannot SSH into your Admin Workstation, you should first perform the following troubleshooting steps:

1. **Ensure that you are connected to Tor.** You can do this by browsing to any site in Tor Browser in your Admin Workstation.

2. **Ensure your servers are online.** Visit the Admin Interface to check your Application Server is online, and you can trigger a test OSSEC alert to verify your Monitor Server is online.
3. **Ensure that SSH aliases and onion service authentication are configured:**

   - First, ensure that the correct configuration files are present in `~/.Persistent/securedrop/install_files/ansible-base`:
     - `app-ssh.auth_private`
     - `mon-ssh.auth_private`
     - `app-journalist.auth_private`
     - `app-sourcev3-ths`
     - `tor_v3_keys.json`

   - Then, from `~/.Persistent/securedrop`, run `.securedrop-admin tailsconfig`. This will ensure your local Tails environment is configured properly.

4. **Confirm that your SSH key is available:** During the install, you configured SSH public key authentication using `ssh-copy-id`. Ensure this key is available using `ssh-add -L` If you see the output “This agent has no identities.” then you need to add the key via `ssh-add` prior to SSHing into the servers.

3.5.3 **I got a unusual error when running `.securedrop-admin install`. What do I do?**

   If the error message is not informative, try running it again. The Tor connection can be flaky and can cause apparent errors, but there is no negative impact of re-rerunning `.securedrop-admin install` more than once. The command will simply check which tasks have been completed, and pick up where it left off. However, if the same issue persists, you will need to investigate further.
All SecureDrop users—Sources, Journalists, and Admins—are required to memorize at least one passphrase. This document describes best practices for passphrase management in the context of SecureDrop.

### 4.1 General Best Practices

1. **Do** memorize your passphrase.

2. If necessary, do write your passphrase down temporarily while you memorize it.

   **Caution:** Do store your written passphrase in a safe place, such as a safe at home or on a piece of paper in your wallet. Do destroy the paper as soon as you feel comfortable that you have the passphrase memorized. Do not store your passphrase on any digital device, such as your computer or mobile phone.

3. **Do** review your passphrase regularly. It’s easy to forget a long or complex passphrase if you only use it infrequently.

   **Tip:** We recommend reviewing your passphrase (e.g. by ensuring that you can log in to your SecureDrop account) on at least a monthly basis.

4. **Do not** use your passphrase anywhere else.

   If you use your SecureDrop passphrase on another system, a compromise of that system could theoretically be used to compromise SecureDrop. You should avoid reusing passphrases in general, but it is especially important to avoid doing so in the context of SecureDrop.

### 4.2 For Sources

Your passphrase is associated with your pseudonymous account and all of your activity on the SecureDrop server. In order to preserve your anonymity, you should avoid creating physical or digital associations between yourself and your passphrase as much as possible.
4.3 For Journalists/Admins

While Sources only have one passphrase that they are required to manage, Journalists and Admins unfortunately have to manage a veritable menagerie of credentials.

We have tried to minimize the number of credentials that Journalists and admins actually have to remember by automating the storage and entry of credentials on the Tails workstations wherever possible. For example, shortcut icons are created on the Desktop of each Tails workstation to make it easy to access the onion services without having to look up their .onion addresses every time.

Ideally, each admin would only have to:

1. Keep track of their Admin Workstation Tails USB.
2. Remember the passphrase to unlock the persistent storage on that Tails USB.

And each Journalist would only have to:

1. Keep track of their Journalist Workstation Tails USB.
2. Keep track of their Secure Viewing Station Tails USB (and the associated Secure Viewing Station computer).
3. Remember the passphrases to unlock the persistent storage on both of these Tails USBs.

Memorizing further passphrases beyond the ones listed above is counterproductive: an attacker with access to any of those environments would be able to pivot to anything they wish to access, and increasing the burden of keeping track of additional credentials is unpleasant for journalists and admins and increases the risk that they will either forget their credentials, compromising the availability of the system, or compensate for the difficulty by using weak or reused credentials, potentially compromising the security of the system.

There is a detailed list of the credentials that must be managed by each end user role in Passphrases. We recommend using the KeePassXC password manager included in Tails to store your credentials and minimize the passphrases that you need to memorize to just the passphrases for the persistent storage on your Tails USBs.

For the Transfer Device and the Export Device, which are used to copy files to and from the air-gapped Secure Viewing Station, we recommend using encrypted USB drives with passphrases stored in the journalist’s own password manager (preferably one which is accessible on their smartphone). This ensures that the journalist will have quick access to these passphrases when they need them.

If your organization is not using a password manager already, please see the Freedom of the Press Foundation guide to choosing one.
SecureDrop is an open-source whistleblower submission system that media organizations can use to securely accept documents from and communicate with anonymous sources. It was originally created by the late Aaron Swartz and is currently managed by Freedom of the Press Foundation.

Tip: Check out What makes SecureDrop Unique to read more about SecureDrop’s approach to keeping sources safe.

5.1 Technical Summary

SecureDrop is a tool for sources to communicate securely with journalists. The SecureDrop application environment consists of three dedicated computers:

- **Secure Viewing Station:**
  A physically-secured and air-gapped laptop running the Tails operating system from a USB stick, that journalists use to decrypt and view submitted documents.

- **Application Server:**
  An Ubuntu server running two segmented Tor hidden services. The source connects to the Source Interface, a public-facing Tor Onion Service, to send messages and documents to the journalist. The journalist connects to the Journalist Interface, an authenticated Tor Onion Service, to download encrypted documents and respond to sources.

- **Monitor Server:**
  An Ubuntu server that monitors the Application Server with OSSEC and sends email alerts.

These computers should all physically be in your organization’s office.

In addition to these dedicated computers, each journalist will also need a computer to connect to SecureDrop:

- **Journalist Workstation:**
  The computer used by the journalist to connect to the Journalist Interface to download encrypted documents that they will transfer to the Secure Viewing Station. The Journalist Workstation is also used to respond to sources via the Journalist Interface.

Depending on the news organization’s threat model, the Journalist Workstation can either be the journalist’s every-day laptop or a dedicated computer. In either case, it is recommended that journalists always use the Tails operating system on their Journalist Workstation when connecting to the Journalist Interface.

SecureDrop administrators will also require a computer to connect to SecureDrop and perform administrative tasks via SSH or the Journalist Interface. This computer is referred to as the Admin Workstation, and must be capable of running the Tails operating system. The Admin Workstation may also be used as a Journalist Workstation if necessary.
Note: The SecureDrop installation guide includes documentation on setting up Tails-based *Admin Workstation* and *Journalist Workstation* USB sticks. It is strongly recommended that these be used in preference to other undocumented solutions.

## 5.2 Infrastructure

There are four main components of SecureDrop: the servers, the admins, the sources, and the journalists.

### 5.2.1 Servers

At SecureDrop’s heart is a pair of servers: the Application ("App") Server, which runs the core SecureDrop software, and the Monitor ("Mon") Server, which keeps track of the Application Server and sends out alerts if there’s a problem. These two servers run on dedicated hardware connected to a dedicated firewall appliance. They are typically located physically inside the newsroom.

### 5.2.2 Admins

The SecureDrop servers are managed by a systems admin; for larger newsrooms, there may be a team of systems admins. The admin uses a dedicated *Admin Workstation* running Tails, connects to the *Application* and *Monitor Servers* over authenticated onion services, and manages them using Ansible.
5.2.3 Sources

A source submits documents and messages by using Tor Browser (or Tails) to access the Source Interface: a public onion service. Submissions are encrypted in place on the Application Server as they are uploaded.

5.2.4 Journalists

Journalists working in the newsroom use two machines to interact with SecureDrop. First, they use a Journalist Workstation running Tails to connect to the Journalist Interface, an authenticated onion service. Journalists download GPG-encrypted submissions and copy them to a Transfer Device (a thumb drive or DVD). Those submissions are then connected to the airgapped Secure Viewing Station (SVS) which holds the key to decrypt them. Journalists can then use the SVS to read, print, and otherwise prepare documents for publication. Apart from those deliberately published, decrypted documents are never accessed on an Internet-connected computer.

Note: The terms in italics are terms of art specific to SecureDrop. The Glossary provides more-precise definitions of these and other terms. SecureDrop is designed against a comprehensive Threat Model, and has a specific notion of the roles that are involved in its operation.

5.3 Operation

5.3.1 Planning & Preparation

Setting up SecureDrop is a multi-step process. Before getting started, you should make sure that you’re prepared to operate and maintain it. You’ll need a systems admin who’s familiar with Linux, the GNU utilities, and the Bash shell. You’ll need the hardware on which SecureDrop runs — this will normally cost $2000-$3000. The journalists in your organization will need to be trained in the operation of SecureDrop, and you’ll need to publish and promote your new SecureDrop instance afterwards — using your existing websites, mailing lists, and social media.

It is recommended that you have all of this planned out before you get started. If you need help, contact the Freedom of the Press Foundation who will be glad to help walk you through the process and make sure that you’re ready to proceed.

5.3.2 Technical Setup

Once you are familiar with the architecture and have all the hardware, setting up SecureDrop will take at least a day’s work for your admin. We recommend that you set aside at least a week to complete and test your setup.

5.3.3 Provisioning & Training

Once SecureDrop is installed, journalists will need to be provided with accounts, two-factor credentials, workstations, and so on — and then trained to use these tools safely and reliably. You will probably also need to train additional backup admins so that you can be sure that your SecureDrop setup keeps running even when your main admin is on holiday.

Introducing staff to SecureDrop takes half a day. Training a group to use SecureDrop proficiently takes at least a day — and a single trainer can only work with so many people at once. You will probably need to run several training sessions to instruct an entire newsroom. Depending on staff availability, training and provisioning may take a week or more. If you have multiple offices, training will need to happen at each location. Again, the Freedom of the Press Foundation are happy to help you plan and train your team.
Once you have a SecureDrop instance and your team knows how to use it, you should test it thoroughly and then tell the world. The Freedom of the Press Foundation are happy to help you check that your SecureDrop setup is up-to-code and properly grounded. After that you’ll want to check out the best practices for your SecureDrop Landing Page and our guide to promoting your SecureDrop instance.
A number of terms used in this guide, and in the SecureDrop workflow diagram, are specific to SecureDrop. The list below attempts to enumerate and define these terms.

### 6.1 Admin Workstation

The *Admin Workstation* is a machine that the system admin can use to connect to the *Application Server* and the *Monitor Server* using Tor and SSH. The admin will also need to have an Android or iOS device with the FreeOTP app installed.

### 6.2 Application Server

The *Application Server* runs the SecureDrop application. This server hosts both the website that sources access (the *Source Interface*) and the website that journalists access (the *Journalist Interface*). Both are published through an *onion service* because sources, journalists, and admins may only connect to this server using Tor.

### 6.3 Export Device

The *Export Device* is the physical media (e.g., designated USB drive) used to transfer decrypted documents from the *Secure Viewing Station* to a journalist’s everyday workstation, or to another computer for additional processing.

Please see the detailed security recommendations for the choice, configuration and use of your *Export Device* in the *journalist guide* and in the *setup guide*.

### 6.4 Journalist

The *Journalist* uses SecureDrop to communicate with and download documents submitted by the *Source*. Journalists do this by using the *Journalist Workstation* to connect to the *Journalist Interface* through Tor.

The *Journalist* also uses a *Transfer Device* to move documents to the *Secure Viewing Station*. If a *Journalist* chooses to release any of these documents, they can be prepared for publication on the *Secure Viewing Station* before being transferred to an Internet-connected computer.

Instructions for using SecureDrop as a *Journalist* are available in our *Journalist Guide*. 

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GLOSSARY

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CHAPTER

SIX

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6.5 Journalist Alert Public Key

The *Journalist Alert Public Key* is used for encrypting the *daily alert* that notifies journalists via encrypted email about whether or not there has been submission activity in the past 24 hours. The journalist uses an associated private key to decrypt the alerts.

6.6 Journalist Interface

The *Journalist Interface* is the website that journalists access to download new documents and communicate with sources. This site is hosted on the *Application Server* and can only be accessed over Tor. In previous releases, this was called the *Document Interface*, but we have renamed it to avoid ambiguity.

Instructions for using the *Journalist Interface* are available in our *Journalist Guide*.

6.7 Journalist Workstation

The *Journalist Workstation* is a machine that is online and used together with the Tails operating system on the *online USB* stick. This machine will be used to connect to the *Journalist Interface*, download documents, and move them to the *Secure Viewing Station* using the *Transfer Device*.

Instructions for using the *Journalist Workstation* are available in our *Journalist Guide*.

6.8 Landing Page

The *Landing Page* is the public-facing webpage for a SecureDrop instance. This page is hosted as a standard (i.e. non-Tor) webpage on the news organization’s site. It provides first instructions for potential sources and includes the instance’s *Source Interface* address.

6.9 Monitor Server

The *Monitor Server* keeps track of the *Application Server* and sends out an email alert if something seems wrong. Only system admins connect to this server, and they may only do so using Tor.

6.10 Onion Service

Tor onion services provide anonymous inbound connections to websites and other servers exclusively over the Tor network. For example, SecureDrop uses onion services for the *Journalist Interface* and *Source Interface* websites, as well as for administrative access to the servers in SSH-over-Tor mode.

Onion services can be accessed by clicking a link or pasting the onion service address into Tor Browser. For example, sdolvtfhatvsvsyc6l34d65ymdwxcujausv7k5jk4cy5ttzhjoio6fzvyd.onion is the onion service address for the SecureDrop website.

Read more about onion services in Tor's glossary.
6.10.1 Onion Service versions

Distinguishing between different generations of onion services is easy: v3 addresses are longer (56 characters) than v2 addresses (16 characters).

The third generation of onion services (v3) provides stronger cryptographic algorithms than v2 onion services, and includes redesigned protocols that guard against service information leaks on the Tor network.

Only v3 onion services are supported by SecureDrop.

6.11 OSSEC Alert Public Key

The OSSEC Alert Public Key is the GPG key that OSSEC will encrypt alerts to. The associated private key is used by the admin to access encrypted OSSEC alerts from the Monitor Server. Instructions for setting up OSSEC alerts can be found in the OSSEC Guide.

6.12 Secure Viewing Station

The Secure Viewing Station (or SVS for short) is the computer you use to decrypt and view documents and messages submitted to your SecureDrop. This computer is permanently kept offline. It is “air-gapped”, meaning that there is a gap between it and any computer connected to the Internet.

You will boot the SVS from a designated USB stick running the Tails operating system. Once you have created it, you should never attach this USB stick to any Internet-connected device.

During the installation, the SVS is used to generate the Submission Key for encrypting and decrypting documents and messages submitted to SecureDrop. In addition, we recommend importing the public keys of individual journalists to the SVS, so you can securely encrypt files to their keys before exporting them.

Since this machine will never touch the Internet or run an operating system other than Tails on a USB, it does not need a hard drive or network device. We recommend physically removing the drive and any networking cards (wireless, Bluetooth, etc.) from this machine.

6.13 Source

The Source is the person who submits documents to SecureDrop and may use SecureDrop to communicate with a Journalist. A Source will always access SecureDrop through the Source Interface and must do so using Tor.

Instructions for using SecureDrop as a Source are available in our Source Guide.

6.14 Source Interface

The Source Interface is the website that sources will access to submit documents and communicate with journalists. This site is hosted on the Application Server and can only be accessed through Tor.

Instructions for using the Source Interface are available in our Source Guide.
6.15 Submission Key

The Submission Key is the GPG keypair used to encrypt and decrypt documents and messages sent to your SecureDrop. Because the public key and private key must be treated very differently, we sometimes refer to them explicitly as the Submission Public Key and the Submission Private Key.

The Submission Public Key is uploaded to your SecureDrop servers as part of the installation process. Once your SecureDrop is online, anyone will be able to download it.

The Submission Private Key should never be accessible to a computer with Internet connectivity. Instead, it should remain on the Secure Viewing Station and on offline backup storage.

6.16 Transfer Device

The Transfer Device is the physical media (e.g., designated USB drive) used to transfer encrypted documents from the Journalist Workstation to the Secure Viewing Station, where they can be decrypted.

Please see the detailed security recommendations for the choice, configuration and use of your Transfer Device in the journalist guide and in the setup guide.

6.17 Two-Factor Authentication

There are several places in the SecureDrop architecture where two-factor authentication is used to protect access to sensitive information or systems. These instances use the standard TOTP and/or HOTP algorithms, and so a variety of devices can be used to generate 6-digit two-factor authentication codes. We recommend using one of:

• FreeOTP for Android or for iOS installed
• A YubiKey

Tip: We recommend using FreeOTP (available for Android and for iOS) to generate two-factor codes because it is Free Software. However, if it does not work for you for any reason, alternatives exist:

• Google Authenticator for Android and iOS (proprietary)
• authenticator for the desktop (Free Software)
Each individual with a role (admin or journalist) at a given SecureDrop instance must generate and retain a number of strong, unique passphrases. The document is an overview of the passphrases, keys, two-factor secrets, and other credentials that are required for each role in a SecureDrop installation.

**Note:** We encourage each end user to use KeePassXC, an easy-to-use password manager included in Tails, to generate and retain strong and unique passphrases. The SecureDrop code repository includes a template that you can use to initialize this database for an Admin Workstation or a Journalist Workstation. For more information, see the KeePassXC setup instructions.

**Tip:** For best practices on managing passphrases, see Passphrase Best Practices.

### 7.1 Admin

The admin will be using the Admin Workstation with Tails to connect to the Application Server and the Monitor Server using Tor and SSH. The tasks performed by the admin will require the following set of credentials and passphrases:

- A passphrase for the persistent volume on the Admin Live USB.
- Additional credentials, which we recommend adding to Tails’ KeePassXC password manager during the installation:
  - The Application Server and Monitor Server admin username and password (required to be the same for both servers).
  - The network firewall username and password.
  - The SSH private key and, if set, the key’s passphrase.
  - The OSSEC Alert Public Key.
  - The admin’s personal GPG public key, if you want to potentially encrypt sensitive files to it for further analysis.
  - The account details for the destination email address for OSSEC alerts.
  - The onion services values required to connect to the Application and Monitor Servers.

The admin will also need to have a way to generate two-factor authentication codes.

**Tip:** We recommend using FreeOTP (available for Android and for iOS) to generate two-factor codes because it is Free Software. However, if it does not work for you for any reason, alternatives exist:
• Google Authenticator for Android and iOS (proprietary)
• authenticator for the desktop (Free Software)

And the admin will also have the following two credentials:
• The secret code for the Application Server’s two-factor authentication.
• The secret code for the Monitor Server’s two-factor authentication.

7.2 Journalist

The journalist will be using the Journalist Workstation with Tails to connect to the Journalist Interface. The tasks performed by the journalist will require the following set of passphrases:
• A master passphrase for the persistent volume on the Tails device.
• A master passphrase for the KeePassXC password manager, which unlocks the passphrase for logging into the Journalist Interface.

The journalist will also need to have a two-factor authenticator, such as an Android or iOS device with FreeOTP installed, or a YubiKey. This means the journalist will also have the following credential:
• The secret code for the Journalist Interface’s two-factor authentication.

7.2.1 Secure Viewing Station

The journalist will be using the Secure Viewing Station with Tails to decrypt and view submitted documents. The tasks performed by the journalist will require the following passphrases:
• A master passphrase for the persistent volume on the Tails device.

The backup that is created during the installation of SecureDrop is also encrypted with the application’s GPG key. The backup is stored on the persistent volume of the Admin Live USB.

7.2.2 Transfer Device and Export Device

As noted in the setup guide, we recommend using encrypted USB drives for transferring files to the Secure Viewing Station, and for exporting them from the SVS in situations where using a secure printer or a similar analog conversion is not an option.

For every copy operation, the user will need to enter the USB drive’s encryption passphrase at least twice (on the computer they’re copying from, and on the computer they’re copying to). To make it easy for them to find the passphrase, we recommend storing it in the journalist’s own existing password manager, which should be accessible using their smartphone.
7.3 How to Generate a Strong, Unique Passphrase

We recommend using a unique, 7-word passphrase for each case described above. You can create these passphrases either by using physical dice or with KeePassXC, a password manager included with Tails.

7.3.1 Using KeePassXC to Generate a Passphrase

To create a random passphrase using KeePassXC, launch the application, then click the dice icon. Then click the Passphrase tab and set the Word Count to 7. You can optionally set a Word Separator, for example a space or hyphen.
This document outlines the required hardware components necessary to successfully install and operate a SecureDrop instance, and recommends some specific components that we have found to work well. If you have any questions, please email securedrop@freedom.press.

8.1 Hardware Overview

For an installation of SecureDrop, you must acquire:

- 2 computers with memory and hard drives to use as the SecureDrop servers.
- Mouse, keyboard, monitor (and necessary dongle or adapter) for installing the servers.
- At least 2 dedicated physical computers that can boot to Tails: one computer for the Secure Viewing Station, and one or more computers for the Admin Workstation(s)/Journalist Workstation(s).
- Dedicated airgapped hardware for the mouse, keyboard, and monitor (only if you are using a desktop for the Secure Viewing Station).
- A dedicated network firewall with at least 4 NICs.
- At least 3 ethernet cables.
- Plenty of USB sticks: 1 drive for the master Tails stick, 1 drive for each Secure Viewing Station, 1 drive for each Transfer Device, 1 drive for each Export Device, and 1 drive for each admin and journalist.

Additionally, you may want to consider the following purchases:

- a printer without wireless network support, to use in combination with the Secure Viewing Station.
- an external hard drive to expand the storage capacity of the Secure Viewing Station.
- an external hard drive for server backups.
- a USB drive to store backups of your Tails workstation drives.
- a security key for HOTP authentication, such as a YubiKey, if you want to use hardware-based two-factor authentication instead of a mobile app.
- a USB drive with a physical write protection switch, or a USB write blocker, if you want to mitigate the risk of introducing malware from your network to your Secure Viewing Station during repeated use of an Export Device.
- CD-R/DVD-R writers, if you want to use CD-Rs/DVD-Rs as transfer or export media, and a CD shredder that can destroy media consistent with your threat model.

In the sections that follow, we provide additional details on most of these items.
8.2 Advice for users on a tight budget

If you cannot afford to purchase new hardware for your SecureDrop instance, we encourage you to consider re-purposing existing hardware to use with SecureDrop. If you are comfortable working with hardware, this is a great way to set up a SecureDrop instance for cheap.

Since SecureDrop’s throughput is significantly limited by the use of Tor for all connections, there is no need to use top of the line hardware for any of the servers or the firewall. In our experience, relatively recent recycled Dell desktops or servers are adequate for the SecureDrop servers, and recycled ThinkPad laptops work well for the Admin Workstation / Journalist Workstation.

Please note that very old laptops or desktops may not work for the workstations. Since the release of Tails 3.0, 32-bit computers are no longer supported.

If you choose to use recycled hardware, you should of course consider whether or not it is trustworthy; making that determination is outside the scope of this document.

8.3 Required Hardware

8.3.1 Servers

These are the core components of a SecureDrop instance.

- **Application Server**: 1 physical server to run the SecureDrop web services.
- **Monitor Server**: 1 physical server which monitors activity on the Application Server and sends email notifications to an admin.
- **Network Firewall**: 1 physical computer that is used as a dedicated firewall for the SecureDrop servers.

An acceptable alternative that requires more technical expertise is to configure an existing hardware firewall.

We are often asked if it is acceptable to run SecureDrop on cloud servers (e.g. Amazon EC2, DigitalOcean, etc.) or on dedicated servers in third-party datacenters instead of on dedicated hardware hosted in the organization. This request is generally motivated by a desire for cost savings and/or convenience. However: we consider it critical to have dedicated physical machines hosted within the organization for both technical and legal reasons:

- While the documents are stored encrypted at rest (via PGP) on the SecureDrop Application Server, the documents hit server memory unencrypted (unless the source used the GPG key provided to encrypt the documents first before submitting), and are then encrypted in server memory before being written to disk. If the machines are compromised then the security of source material uploaded from that point on cannot be assured. The machines are hardened to prevent compromise for this reason. However, if an attacker has physical access to the servers either because the dedicated servers are located in a datacenter or because the servers are not dedicated and may have another virtual machine co-located on the same server, then the attacker may be able to compromise the machines. In addition, cloud servers are trivially accessible and manipulable by the provider that operates them. In the context of SecureDrop, this means that the provider could access extremely sensitive information, such as the plaintext of submissions or the encryption keys used to identify and access the onion services.
- In addition, attackers with legal authority such as law enforcement agencies may (depending on the jurisdiction) be able to compel physical access, potentially with a gag order attached, meaning that the third party hosting your...
servers or VMs may be legally unable to tell you that law enforcement has been given access to your SecureDrop servers.

One of the core goals of SecureDrop is to avoid the potential compromise of sources through the compromise of third-party communications providers. Therefore, we consider the use of virtualization for production instances of SecureDrop to be an unacceptable compromise and do not support it. Instead, dedicated servers should be hosted in a physically secure location in the organization itself. While it is technically possible to modify SecureDrop’s automated installation process to work on virtualized servers (for example, we do so to support our CI pipeline), doing so in order to run it on cloud servers is at your own risk and without our support or consent.

8.3.2 Workstations

These components are necessary to do the initial installation of SecureDrop and to process submissions using the air-gapped workflow.

*Secure Viewing Station (SVS)*

1 physical computer used as an air-gap to decrypt and view submissions retrieved from the Application Server. The chosen hardware should be solely used for this purpose and should have any wireless networking hardware removed before use.

*Admin/Journalist Workstation(s)*

*At least 1* physical computer that is used as a workstation for SecureDrop admins and/or journalists. Each Admin and Journalist will have their own bootable Tails USB with an encrypted persistent partition that they will use to access SecureDrop. You will need at least one *workstation* to boot the Tails USBs, and may need more depending on: the number of admins/journalists you wish to grant access to SecureDrop, whether they can share the same workstation due to availability requirements, geographic distribution, etc.

8.3.3 USB Drive(s)

*At least 2* USB drives to use as a bootable Tails USB for the SVS and the Admin Workstation/Journalist Workstation. If only one person is maintaining the system, you may use the same Tails instance as both the Admin Workstation and the Journalist Workstation; otherwise, we recommend buying 1 drive for each admin and each journalist. We also recommend buying an additional USB drive for making regular backups of your Tails workstations.

One thing to consider is that you are going to have a lot of USB drives to keep track of, so you should consider how you will label or identify them and buy drives accordingly. Drives that are physically larger are often easier to label (e.g. with tape, printed sticker or a label from a labelmaker).
8.3.4 Two-factor Device

Two-factor authentication is used when connecting to different parts of the SecureDrop system. Each admin and each journalist needs a two-factor device. We currently support two options for two-factor authentication:

- Your existing smartphone with an app that computes TOTP codes (e.g. FreeOTP forAndroid and for iOS).
- A dedicated hardware dongle that computes HOTP codes (e.g. a YubiKey).

**Tip:** We recommend using FreeOTP (available for Android and for iOS) to generate two-factor codes because it is Free Software. However, if it does not work for you for any reason, alternatives exist:

- Google Authenticator for Android and iOS (proprietary)
- authenticator for the desktop (Free Software)

8.3.5 Transfer Device(s) and Export Device(s)

Journalists need physical media (known as the **Transfer Device**) to transfer encrypted submissions from the **Journalist Workstation** to the **Secure Viewing Station**, to decrypt and view them there. If they deem a submission to be newsworthy, they may need physical media (known as the **Export Device**) to copy it to their everyday workstation.

Our standard recommendation is to use USB drives, in combination with volume-level encryption and careful data hygiene. Our documentation, including the **journalist guide**, is based on this approach. We also urge the use of a secure printer or similar analog conversions to export documents from the Secure Viewing Station, whenever possible.

You may want to consider enforcing write protection on USB drives when only read access is needed, or you may want to implement a workflow based on CD-Rs or DVD-Rs instead. We encourage you to evaluate these options in the context of your own threat model.

Please find some notes regarding each of these methods below, and see our recommendations in the **setup guide** for additional background.

**USB drives**

We recommend using one or multiple designated USB drives as the **Transfer Device(s)**, and one or multiple designated USB drives as the **Export Device(s)**. Whether one or multiple drives are appropriate depends on the number of journalists accessing the system, and on whether the team is distributed or not.

Our documentation explains how the **Transfer Device** can be encrypted using LUKS, and how the **Export Device** can be encrypted using VeraCrypt (which works across platforms). We have not evaluated hardware-based encryption options; if you do select a hardware solution, make sure that both devices work in Tails, and that the **Export Device** also works on the operating system(s) used by journalists accessing the Secure Viewing Station.

**USB drives with write protection (optional)**

When it is consistently applied and correctly implemented in hardware, write protection can prevent the spread of malware from the computers used to read files stored on a **Transfer Device** or an **Export Device**.

It is especially advisable to enable write protection before attaching an **Export Device** to an everyday workstation that lacks the security protections of the Tails operating system. For defense in depth, you may also want to enable write protection before attaching a **Transfer Device** to the Secure Viewing Station.

The two main options to achieve write protection of USB drives are:

- drives with a built-in physical write protection switch
• a separate USB write blocker device as used in forensic applications.

**DVD-Rs or CD-Rs**

Single-use, write-once media can be used to realize a transfer and export workflow that is always one-directional: files are transferred to the *Secure Viewing Station* and the media used to do so are destroyed; files are exported from the *Secure Viewing Station* and the media used to do so are destroyed.

If you want to realize such a workflow, we recommend purchasing separate drives for each computer that will write to or read from the media, to minimize the risks from malware compromising any one drive’s firmware.

You will also need a stack of blank DVD/CD-Rs, which you can buy anywhere, and a method to securely destroy media after use. Depending on your threat model, this can be very expensive; a cheap shredder can be purchased for less than $50, while shredders designed for use in Sensitive Compartmented Information Facilities (SCIFs) sell for as much as $3,000.

**8.3.6 Monitor, Keyboard, Mouse**

You will need these to do the initial installation of Ubuntu on the *Application* and *Monitor Servers*.

Depending on your setup, you may also need these to work on the *SVS*.

**8.4 Optional Hardware**

This hardware is not *required* to run a SecureDrop instance, but most of it is still recommended.

**8.4.1 Offline Printer**

We highly recommend purchasing a printer for your *Secure Viewing Station* and using it as the preferred method to make copies of documents received via SecureDrop.

By printing a submission, even a non-technical user can effectively mitigate many of the complex risks associated with malware or hidden metadata embedded in files received via SecureDrop. Your organization may also already have robust procedures in place for destroying sensitive printed documents.

**Important:** To maintain the integrity of the air-gap, this printer should be dedicated to use with the *Secure Viewing Station*, connected via a wired connection, and should not have any wireless communication capabilities.

While printing is notable for what it strips away, it is also important to remember what it preserves: QR codes or links that journalists may scan or type in; printer tracking information included in a scanned document; other visually encoded information. See the *Risks From Malware* section in the Journalist Guide for further guidance on this subject.
8.4.2 Offline Storage

The SVS is booted from a Tails USB drive, which has an encrypted persistent volume but typically has a fairly limited storage capacity since it’s just a USB drive. For installations that expect to receive a large volume of submissions, we recommend buying an external hard drive that can be used to store submissions that have been transferred from the Application Server to the SVS.

Important: Like all storage media associated with SecureDrop, this drive should be encrypted and protected with a secure passphrase. We recommend using the tools built into Tails to encrypt the drive using LUKS.

If you are planning to use hardware RAID and/or hardware-based encryption, we recommend that you research Tails compatibility before a procurement decision.

8.4.3 Backup Storage

It’s useful to run periodic backups of the servers in case of failure. We recommend buying an external hard drive to store server backups.

Because this drive will be connected to the Admin Workstation to perform backups, it should not be the same drive used for Offline Storage.

Important: Like all storage media associated with SecureDrop, this drive should be encrypted and protected with a secure passphrase. We recommend using the tools built into Tails to encrypt the drive using LUKS.

If you are planning to use hardware RAID and/or hardware-based encryption, we recommend that you research Tails compatibility before a procurement decision.

8.4.4 Labeling Equipment

As you have probably noticed by now, a SecureDrop installation has a plethora of components. Some of these components can be hard to tell apart; for example, if you buy 3 of the same brand of USB sticks to use for the Admin Workstation, Journalist Workstation, and Secure Viewing Station, they will be indistinguishable from each other unless you label them. We recommend buying some labeling equipment up front so you can label each component as you provision it during the installation process.

There is a multitude of options for labeling equipment. We’ve had good results with small portable labelmakers, such as the Brother P-Touch PT-210 or the Epson LabelWorks LW-300. We like them because they produce crisp, easy-to-read labels, and it’s easy to customize the size of the label’s text, which is great for clearly labeling both large components (like computers) and small components (like USB sticks).

If you do not have a label maker available but have an inkjet printer available to you, it may also be possible to print and cut out labels using adhesive-backed paper and some scissors. These are some labels designed by our team which may be used for labeling:

- Admin Workstation Label
- Journalist Workstation Label
- Secure Viewing Station Label
- Firewall Label
- Application Server Label
- Monitor Server Label
• Admin TAILS USB Drive Label
• Journalist TAILS USB Drive Label
• Secure Viewing Station TAILS USB Drive Label
• File Transfer USB Drive Label

8.5 Specific Hardware Recommendations

8.5.1 Application and Monitor Servers

We currently recommend Intel 7-, 8-, 10-, and 11-series NUCs for SecureDrop servers.

Note: If using non-recommended hardware, ensure you remove as much extraneous hardware as physically possible from your servers. This could include: speakers, cameras, microphones, fingerprint readers, wireless, and Bluetooth cards.

The Intel NUC (Next Unit of Computing) is an inexpensive, quiet, low-power device that can be used for the SecureDrop servers. There are a variety of models to choose from.

NUCs typically come as kits, and some assembly is required. You will need to purchase the RAM and hard drive separately for each NUC and insert both into the NUC before it can be used. We recommend:

• 2x 240GB SSDs (2.5” or M.2, depending on your choice of kit)
• 1x memory kit of compatible 2x8GB sticks - You can put one 8GB memory stick in each of the servers.

Intel 11th-gen NUC

We have tested and can recommend the Intel NUC11PAHi3. It provides two storage options: M.2 SSD storage and a 2.5” secondary storage option (SSD or HDD).

The NUC11’s AX201 wireless hardware is not removable. Before installation of the RAM and storage, we recommend that you disconnect the wireless antennae leads from the AX201 component. They’re the black wires highlighted in the red box in the picture. Cover the free ends with electrical tape after disconnecting them.
Before the initial OS installation, boot into the BIOS by pressing **F2** at startup and adjust the system configuration:

- Under **Advanced ▶ Onboard Devices**, disable all onboard devices other than LAN: HD audio, microphone, Thunderbolt, WLAN, Bluetooth, SD card controller, and enhanced consumer infrared.
- Under **Boot ▶ Secure Boot**, disable **Secure Boot** using the drop-down menu.

**Note:** Unlike some previous generation NUCs we recommended, the NUC11PAHi3 does not support SGX. However, if you use a different type of 11th generation NUC that does have SGX support, disable it under **Security ▶ Security Features**, as it is not used by SecureDrop but may be targeted by active CPU exploits.

**Intel 10th-gen NUC**

We have tested and can recommend the Intel **NUC10i5FNH**. It provides two storage options: M.2 SSD storage and a 2.5” secondary storage option (SSD or HDD).

The NUC10’s AX201 wireless hardware is not removable. Before installation of the RAM and storage, we recommend that you disconnect the wireless antennae leads from the AX201 component. They’re the black and gray wires highlighted in the red box in the picture. Cover the free ends with electrical tape after disconnecting them.
Before the initial OS installation, boot into the BIOS by pressing **F2** at startup and adjust the system configuration:

- Under **Advanced ▶ Onboard Devices**, disable all onboard devices other than LAN: HD audio, microphone, Thunderbolt, WLAN, Bluetooth, SD card controller, and enhanced consumer infrared.

- Under **Security ▶ Security Features**, disable SGX support, which is not used by SecureDrop and may be targeted by active CPU exploits.

- Under **Boot ▶ Secure Boot**, uncheck the **Secure Boot** checkbox.

**Intel 8th-gen NUC**

We have tested and can recommend the **NUC8i5BEK**. It provides a single storage option: an M.2 NVMe or SATA SSD.

The NUC8i5BEK has soldered-on wireless components, which cannot easily be removed. Before installation of the RAM and storage, we recommend that you disconnect the wireless antennae leads:
Before the initial OS installation, boot into the BIOS by pressing **F2** at startup and adjust the system configuration:

- Under **Advanced ▶ Devices ▶ Onboard Devices**, disable all onboard devices other than LAN: audio, audio DSP, microphone, Thunderbolt, WLAN, Bluetooth, and SD card.

- Under **Advanced ▶ Security**, disable SGX support, which is not used by SecureDrop and may be targeted by active CPU exploits.

- Under **Advanced ▶ Boot ▶ Secure Boot**, uncheck the **Secure Boot** checkbox.

**Intel 7th-gen NUC**

We have tested and can recommend the **NUC7i5BNH**.

The NUC7i5BNH has soldered-on wireless components, which cannot easily be removed. Before installation of the RAM and storage, we recommend that you disconnect the wireless antennae leads:
Before the initial OS installation, boot into the BIOS by pressing F2 at startup and adjust the system configuration:

- Under **Advanced ▶ Devices ▶ Onboard Devices**, disable all onboard devices other than LAN: audio, audio DSP, microphone, Thunderbolt, WLAN, Bluetooth, and SD card.
8.5.2 Journalist Workstation and Admin Workstation

Both the Journalist Workstation and the Admin Workstation must be compatible with the Tails operating system. Compare any hardware you want to procure or allocate for this purpose against the list of known issues maintained by the Tails project, but please be advised that the list is far from exhaustive.

We advise against using Macs, as there are many Tails compatibility issues both with older and with newer models. Instead, we recommend the ThinkPad T series, and have had good experiences specifically with the T420 and T440. The ThinkWiki is an excellent, independently maintained resource for verifying general Linux compatibility of almost any ThinkPad model.

For any Tails workstation, we recommend at least 8GB of RAM.

8.5.3 Secure Viewing Station (SVS)

The Secure Viewing Station is a machine that is kept offline and only ever used together with the Tails operating system. This machine will be used to generate the GPG keys used by SecureDrop to encrypt submissions, as well as decrypt and view submissions. Since this machine will never touch the Internet or run an operating system other than Tails, it does not need a hard drive or network device; in fact, we recommend removing these components if they are already present.

As with the workstations, one good option is to buy a Linux-compatible laptop from the Lenovo ThinkPad T series. We have tested the T420 and successfully removed the wireless components with ease. It’s possible to re-purpose old laptops from other manufacturers, as long as the wireless components are removable.

Just as with the servers, you can also use an Intel NUC for the SVS. As noted before, NUCs do not ship with a hard drive, and older models can be configured without any wireless components. However, NUCs do contain an IR receiver, which we recommend taping over with opaque masking tape.

If you choose to use an Intel NUC, you must use an older model that offers wireless as an option (described as something like M.2 22x30 slot and wireless antenna pre-assembled (for wireless card support)). If a model is advertised as having “integrated wireless” (most newer NUC models), this means the wireless components are not physically removable, and these machines are not a suitable choice for the SVS.

8.5.4 Tails USBs

We strongly recommend getting USB 3.0-compatible drives to run Tails from. The transfer speeds are significantly faster than USB 2.0, which means a live operating system booting from one will be much faster and more responsive.

You will need at least an 8GB drive to run Tails with an encrypted persistent partition. We recommend getting something in the 16-64GB range so you can handle large amounts of submissions without hassle. Anything more than that is probably overkill.

8.5.5 Transfer Device(s) and Export Device(s)

For USB drives with physical write protection, we have tested the Kanguru SS3 on Tails, and it works well with and without encryption.

If you want to use a setup based on CD-Rs or DVD-Rs, we’ve found the CDR/DVD writers from Samsung and LG to work reasonably well; you can find some examples here.

Please see our recommendations in the setup guide for additional background.
8.5.6 Network Firewall

We currently recommend 3 network firewalls:

- the TekLager APU4D4, running OPNSense. It has 4 NICs and ports.
- the Netgate SG-4100 running pfSense. It has 4 discrete LAN ports and two dedicated WAN ports.
- the Netgate SG-6100 running pfSense. It also has 4 discrete LAN ports with multiple WAN port options. It has more ports than are typically required for SecureDrop, but can be used if the other cheaper firewalls can’t be procured.

8.5.7 Printers

Careful consideration should be given to the printer used with the SVS. Most printers today have wireless functionality (WiFi or Bluetooth connectivity) which should be avoided because it could be used to compromise the air-gap.

Unfortunately, it is difficult to find printers that work with Tails, and it is increasingly difficult to find non-wireless printers at all. To assist you, we have compiled the following partial list of air-gap-safe printers that have been tested and are known to work with Tails:

<table>
<thead>
<tr>
<th>Printer Model</th>
<th>Testing Date</th>
<th>Tails Versions</th>
<th>Printer Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP DeskJet F4200</td>
<td>06/2017</td>
<td>3.0</td>
<td>Color Inkjet</td>
</tr>
<tr>
<td>HP DeskJet 1112</td>
<td>06/2017</td>
<td>3.0</td>
<td>Color Inkjet</td>
</tr>
<tr>
<td>HP DeskJet 1110</td>
<td>08/2017</td>
<td>3.1</td>
<td>Color Inkjet</td>
</tr>
<tr>
<td>HP LaserJet 400 M401n</td>
<td>06/2015</td>
<td>1.4</td>
<td>Monochrome Laser</td>
</tr>
<tr>
<td>HP DeskJet 6940</td>
<td>04/2015</td>
<td>1.3.2</td>
<td>Monochrome Inkjet</td>
</tr>
</tbody>
</table>

Note: We’ve documented both the HP DeskJet F4200 and HP LaserJet 400 M401n with screenshots of the installation process, in our section on Setting Up a Printer in Tails. While the F4200 installed automatically, the 400 M401n required that we set “Make and model” to “HP LaserJet 400 CUPS+Gutenprint v5.2.9” when manually configuring the drivers.

If you know of another model of printer that fits our requirements and works with Tails, please submit a pull request to add it to this list.

8.5.8 Monitor, Keyboard, Mouse

We don’t have anything specific to recommend when it comes to displays. You should make sure you know what monitor cable you need for the servers, since you will need to connect them to a monitor to do the initial Ubuntu installation.

You should use a wired (USB) keyboard and mouse, not wireless.
BEFORE YOU BEGIN

Before you get started, read the Overview and familiarize yourself with the glossary and the passphrases involved in SecureDrop’s operations. You may wish to leave these documents open in other tabs for reference as you work.

SecureDrop is a technical tool. It is designed to protect journalists and sources, but no tool can guarantee safety. This guide will instruct you in installing and configuring SecureDrop, but it does not explain how to use it safely and effectively. Put another way: at the end of this guide, you will have built a car; you will not know how to drive. The Deployment Guide contains best practices for working with SecureDrop. Make sure to read it after completing the installation.

Installing SecureDrop is an extended manual process which requires extensive preparation, equipment, and organizational support. You will likely need to set aside a day to complete the install process. Installing SecureDrop requires an admin with at least basic familiarity with Linux, the GNU core utilities, and Bash shell. If you are not proficient in these areas, it is strongly recommended that you contact the Freedom of the Press Foundation for installation assistance.

Before you begin, you will need to assemble the required hardware.

To assist in the installation process, we offer a SecureDrop Installation Worksheet. It is critical that you destroy this worksheet when your installation is complete and all of your passphrases have been safely stored in a password manager.

When running commands or editing configuration files that include filenames, version numbers, usernames, hostnames, or IP addresses, make sure to use the appropriate values for your instance.

Once you’re familiar with SecureDrop, have made your plan, ensured your organization is ready to follow through, and assembled the necessary hardware, you’re ready to begin.

---

**Warning:** Remember to destroy the SecureDrop Installation Worksheet after the installation is complete.
10.1 Overview

For the initial SecureDrop setup, you will need three USB drives.

Two of them will be used for the Tails operating system, for creating the Admin Workstation and Secure Viewing Station.

The other USB drive will have the Ubuntu Server installer, which is needed to install the underlying server OS for your Application and Monitor Servers.

**Important:** As soon as you create a new drive, be sure to *label it immediately*. USB drives all look alike and you’re going to be juggling a whole bunch of them throughout this installation. Label immediately. Always.

10.2 Tails Introduction

*Tails* is a privacy-enhancing live operating system that runs on removable media, such as a DVD or a USB stick. It sends all your Internet traffic through Tor, does not touch your computer’s hard drive, and securely wipes unsaved work on shutdown.

Most of the work of installing, administering, and using SecureDrop is done from computers using Tails, so the first thing you need to do is set up several USB drives with the Tails operating system. To get started, you’ll need two Tails drives: one for the Admin Workstation and one for the Secure Viewing Station. *Later,* you’ll set up a bunch more Tails drives for your journalists and backups, but for now you just need two.

10.2.1 Install Tails

The *Tails website* has detailed and up-to-date instructions on how to download and verify Tails, and how to create a bootable Tails USB drive.

Follow the instructions at these links and then return to this page:

- Download and verify the Tails image file
- Install onto a USB drive

**Important:** Make sure you verify the Tails .img file using one of the methods described on the Tails website.

You will need to create 2 Tails USBs to perform the SecureDrop installation:
1. The Secure Viewing Station Tails USB.
2. The Admin Workstation Tails USB.

**Tip:** This process will take some time, most of which will be spent waiting around.

### 10.2.2 Enable Persistent Storage

By default, everything you save while running Tails will be securely erased and discarded when you power off or reboot your system.

Because we will need to keep certain settings and files saved between sessions, you will need to enable persistence. Creating an encrypted persistent volume will allow you to securely save information and settings in the free space that is left on your Tails drive. You will need to create a persistent storage on each Tails drive. Each drive’s persistent storage partition needs its own unique, complex passphrase that’s easy to write down or remember.

For instructions on how to generate a strong passphrase, see the [Passphrases page](#).

Please use the instructions on the Tails website to make the persistent volume on each Tails drive you create. When creating the persistence volume, you will be asked to select from a list of features, such as ‘Personal Data’. You should enable all features by selecting each item in the list.

Some other things to keep in mind:

- Right now, you need to create a persistent volume on both the Admin Workstation Tails drive and the Secure Viewing Station Tails drive.
- Each journalist will need their own Tails drive with their own persistent volume secured with their own passphrase — but that comes later.

**Note:** Tails doesn’t always completely shut down and reboot properly when you click “restart”, so if you notice a significant delay, you may have to manually power off and restart your computer for it to work properly.

**Warning:** Make sure that you never use the Secure Viewing Station Tails drive on a computer connected to the Internet or a local network. This Tails drive will only be used on the air-gapped Secure Viewing Station.

### 10.3 Ubuntu Introduction

**Note:** Installing Ubuntu is simple and may even be something you are very familiar with, but it is strongly encouraged that you read and follow this documentation exactly as there are some “gotchas’ that may cause your SecureDrop setup to break.

The SecureDrop Application Server and Monitor Server run **Ubuntu Server 20.04.5 LTS (Focal Fossa)**. To install Ubuntu on the servers, you must first download and verify the Ubuntu installation media.
10.3.1 Download the Ubuntu Installation Media

The installation media and the files required to verify it are available on the Ubuntu Releases page. You will need to download the following files:

- ubuntu-20.04.5-live-server-amd64.iso
- SHA256SUMS
- SHA256SUMS.gpg

Alternatively, you can use the command line:

```
cd ~/Downloads
curl -O https://releases.ubuntu.com/20.04.5/{ubuntu-20.04.5-live-server-amd64.iso,SHA256SUMS,SHA256SUMS.gpg}
```

10.3.2 Verify the Ubuntu Installation Media

You should verify the Ubuntu image you downloaded hasn’t been modified by a malicious attacker or otherwise corrupted. To do so, check its integrity with cryptographic signatures and hashes.

First, download both Ubuntu Image Signing Keys and verify their fingerprints.

```
gpg --recv-key --keyserver hkps://keyserver.ubuntu.com "C598 6B4F 1257 FFA8 6632 CBA7 4618 1433 FBB7 5451" "8439 38DF 228D 22F7 B374 2BC0 D94A A3F0 EFE2 1092"
```

**Note:** It is important you type this out correctly. If you are not copy-pasting this command, double-check you have entered it correctly before pressing enter.

Again, when passing the full public key fingerprint to the `--recv-key` command, GPG will implicitly verify that the fingerprint of the key received matches the argument passed.

```
gpg --keyid-format long --verify SHA256SUMS.gpg SHA256SUMS
```

Move on to the next step if you see “Good Signature” in the output, as below. Note that any other message (such as “Can’t check signature: no public key”) means that you are not ready to proceed.

```
gpg: Signature made Thu 11 Feb 2021 02:07:58 PM EST
    gpg: using RSA key 843938DF228D22F7B3742BC0D94A3F0EFE21092
    gpg: Good signature from "Ubuntu CD Image Automatic Signing Key (2012) <cdimage@ubuntu.com>" [unknown]
    gpg: WARNING: This key is not certified with a trusted signature!
    gpg: There is no indication that the signature belongs to the owner.
    Primary key fingerprint: 8439 38DF 228D 22F7 B374 2BC0 D94A A3F0 EFE2 1092
```

The next and final step is to verify the Ubuntu image.

10.3. Ubuntu Introduction
sha256sum -c <(grep ubuntu-20.04.5-live-server-amd64.iso SHA256SUMS)

If the final verification step is successful, you should see the following output in your terminal.

ubuntu-20.04.5-live-server-amd64.iso: OK

**Caution:** If you do not see the line above it is not safe to proceed with the installation. If this happens, please contact us at securedrop@freedom.press.

### 10.3.3 Create the Ubuntu Installation Media

The [Ubuntu website](#) has detailed instructions on how to create a bootable Ubuntu Server USB drive.

Follow the instructions at the link below, then return to this page:

- Create a bootable Ubuntu USB drive on Ubuntu, Windows, or Mac
The Secure Viewing Station is the computer where journalists read and respond to SecureDrop submissions. Once submissions are encrypted on the Application Server, only the Secure Viewing Station has the key to decrypt them. The Secure Viewing Station is never connected to the internet or a local network, and only ever runs from a dedicated Tails drive. Journalists download encrypted submissions using their Journalist Workstation, copy them to a Transfer Device (a USB drive or a DVD) and physically transfer the Transfer Device to the Secure Viewing Station.

Since the Secure Viewing Station never uses a network connection or an internal hard drive, we recommend that you physically remove any internal storage devices or networking hardware such as wireless cards or Bluetooth adapters. If the machine has network ports you can’t physically remove, you should clearly cover these ports with labels noting not to use them. For an even safer approach, fill a port with epoxy to physically disable it. We also recommend you remove the speakers from the device (or just cut the audio cables if that’s easier). This is to prevent exfiltration of data from the airgap via ultrasonic audio, which cannot be heard by humans. If you have questions about repurposing hardware for the Secure Viewing Station, contact the Freedom of the Press Foundation.

You should have a Tails drive clearly labeled “SecureDrop Secure Viewing Station”. If it’s not labeled, label it right now, then boot it on the Secure Viewing Station. After it loads, you should see the Tails Welcome Screen. Enter your passphrase to unlock the persistent storage, then press Unlock. Before starting Tails, set an administration password for use with this Tails session. To do so, click the + button under “Additional Settings”. Click Administration Password in the list of settings. Enter the password twice, click Add, then click Start Tails.

Note: The Tails administration password is a one-time password. It is reset every time you shut down Tails. Pick a password you will be able to remember for the length of this session.

We will now prepare the Secure Viewing Station.

11.1 Correct the System Time

After booting up Tails on the Secure Viewing Station, you will need to manually set the system time before you create the SecureDrop Submission Key. This operation requires the Tails administration password to be set (see above).

To set the system time:

1. Click the upper right down arrow in the menu bar and select the wrench icon:
2. Select the Details section, then click Date & Time.

3. Click Unlock. Type in the admin password you set when you started up Tails.

4. Set the correct time, region and city.

5. Click Lock, exit Settings and wait for the system time to update in the top panel.
SET UP THE TRANSFER DEVICE AND THE EXPORT DEVICE

Journalists copy submissions from their Journalist Workstation to the Secure Viewing Station using the Transfer Device.

For exporting submissions from the Secure Viewing Station, we recommend using a secure printer or a similar analog conversion process wherever possible. For cases where an electronic file transfer is necessary, we recommend setting up an Export Device, separate from the Transfer Device.

Important: Understand the security risks of working with files in digital form

After downloading a submission on the Journalist Workstation, a journalist will copy it to the Transfer Device and carry it to the air-gapped Secure Viewing Station to decrypt and review it. If the journalist then copies the decrypted file in its original form to an Internet-connected computer, they may expose themselves, their colleagues, or their sources to significant risks, e.g.:

- A submission may be infected with malware targeting your newsroom.
- If your Secure Viewing Station has not been updated in a while, it may have software vulnerabilities an attacker can exploit, e.g., to exfiltrate the Submission Private Key alongside a legitimate submission.
- The submission may contain metadata identifying the source which has not yet been cleaned up.

These risks are not specific to SecureDrop. They’re inherent to dealing with tips sent in digital form.

This is why we place the strongest emphasis on always picking the most secure available export method for a given submission. Printing documents or re-recording audio and video files can eliminate most categories of malware and metadata (QR code malware and tracking dots being the most notable exceptions).

If and when you do need to copy decrypted files in electronic form, the recommendations below are intended to establish a baseline of security. Please consider these recommendations in the context of your own threat model, and do not hesitate to contact us via securedrop@freedom.press (GPG encrypted) if we can help.

12.1 Choose media types and encryption

You will need to decide what storage media to use for the Transfer Device and the Export Device, and which encryption scheme to apply to each device. There are many options to consider: USB flash drives, write-once media like CD-Rs and DVD-Rs, external hard drives, and so on.

The following recommendation is intended to balance security, usability and cost considerations, and you may want to modify it based on your threat model:

- Use USB flash drives for both the Transfer Device and the Export Device.
- Encrypt the Transfer Device using LUKS, which works in the Tails environment and in other Linux environments.
- Encrypt the Export Device using VeraCrypt, which works across platforms.
If you follow this recommendation, it is important that the contents of the *Transfer Device* and the *Export Device* are always wiped after a copy operation is completed.

**Note:** You may want to purchase a USB device with a physical write protection switch for the *Export Device*, to enforce write protection whenever it is attached to an Internet-connected everyday workstation. This ensures that malware cannot spread from infected computers in your network to the *Secure Viewing Station*.

Another option is to purchase a hardware USB write blocker as used in forensics, and enforce its usage whenever the *Export Device* is attached to an Internet-connected workstation.

Write-once media like CDs and DVDs can be a reasonable alternative to this setup. If you implement a workflow based on CDs or DVDs, it is crucial that they are destroyed immediately after use. While you can find CD/DVD destroyers at a relatively low cost, those built to the highest standards of security sell in the $2,500 to $3,000 price range as of 2019.

### 12.2 Decide how to manage encryption passphrases

Because files are copied between multiple computers, KeePassXC in Tails is not necessarily the most convenient option for managing the encryption passphrases for your *Transfer Device* or your *Export Device*. While Tails itself gives you the option to “remember” passphrases, this option does not work across reboots.

A simple alternative is to make sure that every journalist stores the *Transfer Device* and *Export Device* passphrases in their own password manager, which ideally will synchronize to their smartphone. See the Freedom of the Press Foundation guide for choosing a password manager if you are not currently using one.

**Tip:** The user will have to enter this passphrase repeatedly. For this reason, we recommend using diceware instead of random character sequences that are difficult to type. If your password manager does not support generating diceware passphrases, see the EFF guide for information on how to do it yourself.

### 12.3 Create USB *Transfer Device*

The easiest and recommended option for a *Transfer Device* is a USB drive. If you have a large team of journalists you may want to *create several* of these. Here we’ll just walk through making one *Transfer Device*.

**Note:** This process will destroy all data currently on the drive.

First, label your USB drive “SecureDrop Transfer Device”.

On the *Secure Viewing Station*, open the Applications menu in the top left corner and select Utilities then Disks:

---

1 Tails screenshots were taken on Tails 4.0.0. Please make an issue on GitHub if you are using the most recent version of Tails and the interface is different from what you see here.
Connect your *Transfer Device* then pick your device in the menu on the left. Since we’re going to destroy all the data on this drive, it’s important that you pick the right drive. It should be named something that sounds similar to the manufacturer’s label on the outside of the drive, and it will only appear after you plug it in. Double check that you have clicked on the correct drive:

12.3. Create USB *Transfer Device*
Once you're sure you have the right drive, click the interlocking gears, then **Format Partition**….

**Note:** If there are multiple existing partitions on the drive, you should first click the “-” icon on the left of the interlocking gears icon to delete each partition, and then create another partition that fills all free space with the options as shown below.
Give the partition on your Transfer Device a descriptive name like “Transfer Device” and select the options as in the following screenshot:
You will then be prompted to set a password. As noted earlier, we recommend storing this passphrase in the password manager for every user who will copy files using the Transfer Device, not in KeePassXC. Because users will have to type in this passphrase every time they mount the Transfer Device in Tails, we recommend using a diceware passphrase.
After typing in the passphrase, click **Format** to continue. The Disks utility will ask you if you are sure: click **Format** to continue. After a few seconds, your new Transfer Device should be ready for use. If you haven’t already, make sure to label it.

### 12.4 Create a USB Export Device

We recommend using a fully encrypted USB drive for copying files off the Secure Viewing Station. This is even more important than for the Transfer Device, as the risk of accidentally leaving decrypted files on the Export Device is significant.

Because the Export Device will need to be mounted on both Tails and the journalist’s everyday workstation, you will need to use an encryption scheme that works on both operating systems.

We recommend the use of VeraCrypt. It is actively maintained cross-platform software that has been independently audited and is free to use.

VeraCrypt-encrypted media can be opened in the Tails operating system and on common Linux distributions without installing additional software. To open VeraCrypt media on Windows or Mac workstations, or to create VeraCrypt drives, you need to install the VeraCrypt software. The guide by Freedom of the Press Foundation provides instructions for encrypting storage media using VeraCrypt.

Keep in mind that each journalist using a Windows or Mac workstation will need to have the VeraCrypt software installed on their computer to access the encrypted Export Device.

**Note:** We recommend against installing the VeraCrypt software on the Journalist Workstation, the Admin Workstation or the Secure Viewing Station. The software installed in the persistent volume of these Tails drives should be kept to
a minimum. You do not need to install the software to decrypt VeraCrypt drives on these workstations, and you can create them from another computer.

Larger organizations may want to consider setting up a controlled environment for creating VeraCrypt-encrypted Export Devices and providing them to journalists, to ensure that each drive is provisioned in a secure manner.

As with the Transfer Device, we recommend storing the passphrase in the password manager of each user who will use a given Export Device.

Hardware-encrypted USB drives can be a reasonable alternative to VeraCrypt. We cannot currently offer a specific recommendation, but please bear in mind that the drive must work across platforms (including Tails). We recommend selecting a vendor that has fully opened the source code and specifications of their devices and encouraged third party audits.

12.4.1 Limiting write access

If you re-use the same Export Device for multiple copy operations, there is the risk of introducing malware to the Secure Viewing Station from your network. Depending on your threat model, there are steps you may want to take to mitigate that risk.

One option is to restrict write access to the Export Device before it is plugged into a device other than the Secure Viewing Station. Some USB flash drives come with a physical write protection switch, and write blockers are used in forensics to ensure storage media are not modified during examination.

Full-size SD cards also come with physical write protection switches. However, this write protection is fully host-based (the host operating system can choose to ignore it), and should therefore be considered less secure against sophisticated malware.

Tip: For defense in depth, consider implementing a similar write protection strategy for the Transfer Device (enabling write protection before attaching the Transfer Device to the Secure Viewing Station).

Please see our guide to working with documents for additional recommendations regarding malware mitigation.
GENERATE THE *SUBMISSION KEY*

When a document or message is submitted to SecureDrop by a source, it is automatically encrypted with the *Submission Key*. The private part of this key is only stored on the *Secure Viewing Station* which is never connected to the Internet. SecureDrop submissions can only be decrypted and read on the *Secure Viewing Station*.

We will now generate the *Submission Key*. If you aren’t still logged into your *Secure Viewing Station* from the previous step, boot it using its Tails USB stick, with persistence enabled.

**Important:** Do not follow these steps before you have fully configured the *Secure Viewing Station* according to the instructions. The private key you will generate in the following steps is one of the most important secrets associated with your SecureDrop installation. This procedure is intended to ensure that the private key is protected by the air-gap throughout its lifetime.

### 13.1 Create the Key

1. Navigate to Applications ▶ System Tools ▶ Terminal to open a terminal.
2. In the terminal, run `gpg --full-generate-key`: 
3. When it says **Please select what kind of key you want**, choose “(1) RSA and RSA (default)”.

4. When it asks **What keysize do you want?**, type `4096`.

5. When it asks **Key is valid for?**, press Enter. This means your key does not expire.

6. It will let you know that this means the key does not expire at all and ask for confirmation. Type `y` and hit Enter to confirm.
SecureDrop Documentation, Release stable

7. **Next it will prompt you for user ID setup. Use the following options:**
   - **Real name:** “SecureDrop”
   - **Email address:** leave this field blank
   - **Comment:** [Your Organization’s Name] SecureDrop Submission Key

8. GPG will confirm these options. Verify that everything is written correctly. Then type `O` for (O)kay and hit enter to continue:

```
$ gpg --full-generate-key
```

```console
amnesia@amnesia:~
```
```bash
$ gpg --full-generate-key
```
```bash
gpg (GnuPG) 2.1.18; Copyright (C) 2017 Free Software Foundation, Inc.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Please select what kind of key you want:
  (1) RSA and RSA (default)
  (2) DSA and Elgamal
  (3) DSA (sign only)
  (4) RSA (sign only)
Your selection? 1
RSA keys may be between 1024 and 4096 bits long.
What keysize do you want? (2048) 4096
Requested keysize is 4096 bits
Please specify how long the key should be valid.
  0 = key does not expire
  <n> = key expires in n days
  <n>w = key expires in n weeks
  <n>m = key expires in n months
  <n>y = key expires in n years
Key is valid for? (0)
Key does not expire at all
Is this correct? (y/N) y

GnuPG needs to construct a user ID to identify your key.
Real name: 
```
9. A box will pop up (twice) asking you to type a passphrase. Since the key is protected by the encryption on the Tails persistent volume, it is safe to simply click OK without entering a passphrase.

10. The software will ask you if you are sure. Click Yes, protection is not needed.

11. Wait for the key to finish generating.

### 13.2 Export the Submission Public Key

Navigate to Applications ➤ Accessories ➤ Kleopatra to open a graphical interface to manage GPG keys. Once Kleopatra opens you will find a list of keys, including the SecureDrop Submission Key you just created.

Click to select the key, then click the “Export…” button in the toolbar above.
Save the key to the *Transfer Device* by changing the location to `/media/amnesia/Transfer Device`, then set the filename to `SecureDrop.asc`. Once that is set, click the *Save* button to finish exporting the key to the transfer device.

**Note:** This is the public key only.
After exporting the public key, you will be returned back to the list of keys. You’ll need to provide the fingerprint of the *Submission Key* during the installation. Go ahead and double-click on the *Submission Key*, then write down the 40 hexadecimal digits under *Fingerprint*.

![Certificate Details — Kleopatra](image)

**Note:** Your fingerprint will be different from the one in the example screenshot.

At this point, you are done with the *Secure Viewing Station* for now. You can shut down Tails, grab the *Admin Workstation* Tails USB, and move over to your regular workstation.
Earlier, you should have created the *Admin Workstation* Tails USB along with a persistent volume for it. Now, we are going to add a couple more features to the *Admin Workstation* to facilitate SecureDrop’s setup.

If you have not switched to and booted the *Admin Workstation* Tails USB on your regular workstation, do so now.

### 14.1 Start Tails with Persistence Enabled

After you boot the *Admin Workstation* Tails USB on your normal workstation, you should see a “Welcome to Tails” screen with a field labeled “Encrypted Persistent Storage”. Enter your password and click **Unlock**. Do not click **Start Tails** yet. Under “Additional Settings” click +.

Click **Administration password**, enter a password for use with this specific Tails session, and click **Add**.

---

**Note:** The Tails administration password is a one-time password. It will reset every time you shut down Tails.

During the installation, you will need the unsafe browser to access the firewall configuration. To enable it, click “Unsafe Browser” and click **Add**.
Click **Start Tails**. After Tails finishes booting, make sure you’re connected to the Internet and that the Tor status onion icon is not crossed out, consulting the icons in the upper right corner of the screen.

### 14.2 Download the SecureDrop repository

The rest of the SecureDrop-specific configuration is assisted by files stored in the SecureDrop Git repository. We’re going to be using this again once SecureDrop is installed, but you should download it now. To get started, open a terminal. You will use this Terminal throughout the rest of the install process.

Start by running the following commands to download the git repository.

```bash
cd ~/Persistent
git clone https://github.com/freedomofpress/securedrop.git
```

**Note:** Since the repository is fairly large and Tor can be slow, this may take a few minutes.
Caution: Do not download SecureDrop Git repository as a Zip file, or any other means. Only download by using the given git command.

14.2.1 Verify the Release Tag

Important: It is crucial for the integrity of your installation that you carefully follow the instructions below. By following these steps, you will verify if your copy of the codebase has been approved by the SecureDrop development team.

Download and verify the SecureDrop Release Signing Key using the following command:

```
gpg --keyserver hkp://keys.openpgp.org --recv-key \\n"2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
```

If you are not copy-pasting this command, we recommend you double-check you have entered it correctly before pressing enter. GPG will implicitly verify that the fingerprint of the key received matches the argument passed.

If GPG warns you that the fingerprint of the key received does not match the one requested, do not proceed with the installation. If this happens, please contact us at securedrop@freedom.press.

Note: If the `--recv-key` command fails, first double-check that Tor is connected to Tor. Once you’ve confirmed that you’re successfully connected to Tor, try re-running the `--recv-key` command a few times.

If the command still fails, the `keys.openpgp.org` keyserver may be down. In that case, we recommend downloading the key from the SecureDrop website:

```
cd ~/Persistent
torify curl -LO https://securedrop.org/securedrop-release-key.asc
```

Before importing it, inspect the key’s fingerprint using the following command. The `--dry-run` option ensures that the key is not imported just yet:

```
gpg --with-fingerprint --import-options import-show --dry-run \n--import securedrop-release-key.asc
```

Compare the fingerprint in the output with the fingerprint at the beginning of this section. If the fingerprints match, you can safely import the key, using the following command:

```
gpg --import securedrop-release-key.asc
```

If you encounter any difficulties verifying the integrity of the release key, do not proceed with the installation. Instead, please contact us at securedrop@freedom.press.

Once you have imported the release key, verify that the current release tag was signed with the release signing key:

```
cd ~/Persistent/securedrop/
git fetch --tags
git tag -v 2.4.2
```

The output should include the following two lines:
Important: If you do not see the message above, signature verification has failed and you should not proceed with the installation. If this happens, please contact us at securedrop@freedom.press.

Verify that each character of the fingerprint matches what is on the screen of your workstation. If it does, you can check out the new release:

git checkout 2.4.2

Important: If you see the warning refname '2.4.2' is ambiguous in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

14.3 Create the Admin Passphrase Database

We provide a KeePassXC password database template to make it easier for admins and journalists to generate strong, unique passphrases and store them securely. Once you have set up Tails with persistence and have cloned the repo, you can set up your personal password database using this template.

Note: Earlier versions of Tails used KeePassX instead of KeePassXC. The provided template is compatible with both.

You can find the template in tails_files/securedrop-keepassx.kdbx in the SecureDrop repository that you just cloned. To use the template:

- Copy the template to the Persistent folder - from a terminal, run the command:
  
  ```
  cp ~/Persistent/securedrop/tails_files/securedrop-keepassx.kdbx \
  ~/Persistent/Passwords.kdbx
  ```

- Open the KeePassXC program which is already installed on Tails
- Select Database » Open database, and navigate to the location of ~/Persistent/Passwords.kdbx, select it, and click Open
- Leave the password blank and click OK. If you receive an “Unlock failed” prompt, click Retry with empty password.
- Edit entries as required.
- Select Database » Save Database to save your changes.

The next time you use KeepassXC, the database at ~/Persistent/Passwords.kdbx will be selected by default.

KeePassXC will show a warning every time you attempt to open a database without entering a password. Because your persistent volume is encrypted, setting up this additional password is not strictly required. It provides some additional protection, e.g., if a computer is left running, at the cost of convenience.

For passwordless access without warnings, you can protect the database using a key file, via Database » Database settings » Security » Add additional protection » Add Key File » Generate. This key file has to be stored in your Persistent folder and it must be selected when you open the database.
After configuring the password database, restart KeePassXC once to verify that you are able to access it as expected.

**Warning:** You will not be able to access your passwords if you forget the master password or the location of the key file used to protect the database.

In case you wish to manually create a database, the suggested password fields in the template are:

**Admin:**
- Admin account username
- App Server SSH Onion URL
- Email account for sending OSSEC alerts
- Monitor Server SSH Onion URL
- Network Firewall Admin Credentials
- OSSEC Alert Public Key
- SecureDrop Login Credentials

**Journalist:**
- Auth Value: Journalist Interface
- Onion URL: Journalist Interface
- Personal GPG Key
- SecureDrop Login Credentials

**Secure Viewing Station:**
- SecureDrop GPG Key

**Backup:**
- This section contains clones of the above entries in case a user accidentally overwrites an entry.
Now that you've set up your password manager, you can move on to setting up the Network Firewall. You should stay logged in to the Admin Workstation to access the Network Firewall’s web interface for configuration.

Unfortunately, due to the wide variety of firewalls that may be used, we do not provide specific instructions to cover every type or variation in software or hardware. However, if you have the necessary expertise, we provide abstract firewall rules that can be implemented with iptables, Cisco IOS etc. We recommend that you use a firewall with at least four physical interfaces.

The documentation linked below describes the configuration procedure for pfSense- and OPNSense-based firewalls. One option not covered in this guide is to build your own network firewall and install pfSense or OPNSense on it. However, for most installations, we recommend buying a dedicated firewall appliance with your firewall OS of choice pre-installed.

We currently recommend three firewalls in our Hardware Guide:

- The Netgate SG-4100, a pfSense-based firewall with 6 network interfaces: 2 WAN ports and 4 LAN ports.
- The Netgate SG-6100, a pfSense-based firewall with 8 network interfaces: 4 WAN ports and 4 LAN ports.
- The TekLager APu4D4, an OPNSense-based open-source hardware firewall with 4 network interfaces: WAN, LAN, OPT1, and OPT2.

### 15.1 Configuration: pfSense

If you are using a pfSense-based firewall such as the recommended SG-4100, follow the instructions to Configure a pfSense firewall for use with SecureDrop.

### 15.2 Configuration: OPNSense

If you are using an OPNSense-based firewall such as the recommended APu4D4, follow the instructions to Configure an OPNSense firewall for use with SecureDrop.
15.3 Configuration: Other Firewalls

If you are using a firewall based on an OS not listed above, you should still set it up use the same overall configuration and ruleset as defined for the supported models.

The Application and Monitor Servers should be set up on separate subnets configured on separate physical NICs, with the Admin Workstation also on a separate subnet if possible. Including the WAN connection, a minimum of 4 NICs must be available.

The abstract ruleset required by SecureDrop can be described as follows:

- Disable DHCP (in case the firewall is providing a DHCP server by default)
- Disallow all traffic by default (inbound or outbound)
- Allow UDP OSSEC (port 1514) from Application Server to Monitor Server
- Allow TCP ossec agent auth (port 1515) from Application Server to Monitor Server
- Allow TCP/UDP DNS from Application Server and Monitor Server to the IPs of known name servers
- Allow UDP NTP from Application Server and Monitor Server to all
- Allow TCP any port from Application Server and Monitor Server to all (this is needed for making connections to the Tor network)
- Allow TCP 80/443 from Admin Workstation to all (in case there is a need to access the web interface of the firewall)
- Allow TCP SSH from Admin Workstation to Application Server and Monitor Server
- Allow TCP any port from Admin Workstation to all

This can be implemented with iptables, Cisco IOS etc. if you have the necessary expertise.
16.1 Before You Begin

First, consider how the firewall will be connected to the Internet. You will need to provision several unique subnets, which should not conflict with the network configuration on the WAN interface. If you are unsure, consult your local system administrator.

Many firewalls, including the recommended pfSense-based devices, automatically set up the LAN interface on 192.168.1.1/24. This particular private network is also a very common choice for home and office routers. If you are connecting the firewall to a router with the same subnet (common in a small office, home, or testing environment), you will probably be unable to connect to the network at first. However, you will be able to connect from the LAN to the pfSense WebGUI configuration wizard, and from there you will be able to configure the network so it is working correctly.

16.1.1 Configuring Your Firewall

Since our recommended firewalls have at least 4 NICs, we will refer to the relevant ports as WAN[1], LAN[1], LAN2, and LAN3. (Bracketed numbers may be present on the physical ports’ labels but not in the pfSense UI.) In this case, we can now use a dedicated port on the network firewall for each component of SecureDrop (Application Server, Monitor Server, and Admin Workstation).

Depending on your network configuration, you should define the IP and subnet values your instance will use before continuing. We recommend the default values below:

**IP and subnet definitions:**

- Admin Subnet: 10.20.1.0/24
- Admin Gateway: 10.20.1.1
- Admin Workstation (LAN[1]): 10.20.1.2
- Application Subnet: 10.20.2.0/24
- Application Gateway: 10.20.2.1
- Application Server (LAN2): 10.20.2.2
- Monitor Subnet: 10.20.3.0/24
- Monitor Gateway: 10.20.3.1
- Monitor Server (LAN3): 10.20.3.2
16.2 Initial Configuration

Unpack the firewall, connect the power, and power on the device.
We will use the pfSense WebGUI to do the initial configuration of the network firewall.¹

16.2.1 Connect to the pfSense WebGUI

1. If you have not already done so, boot the Admin Workstation into Tails using its designated USB drive. Make sure to enable the unsafe browser on the “Welcome to Tails” screen under “Additional settings”.

2. Connect the Admin Workstation to the LAN[1] interface. You should see a popup notification in Tails that says “Connection Established”. If you click on the network icon in the upper right of the Tails Desktop, you should see “Wired Connected”:

![Wired Connected](image)

**Warning:** Make sure your only active connection is the one you just established with the network firewall. If you are connected to another network at the same time (e.g. a wireless network), you may encounter problems trying to connect the pfSense WebGUI.

3. Launch the Unsafe Browser from the menu bar: Applications ➤ Internet ➤ Unsafe Browser.

¹ Tails screenshots are current as of Tails 5.0. Please make an issue on GitHub if you are using the most recent version of Tails and the interface is different from what you see here.
Note: The Unsafe Browser is, as the name suggests, unsafe (its traffic is not routed through Tor). However, it is the only option because Tails intentionally disables LAN access in the Tor Browser.

4. A dialog will ask if you really want to “Launch the Unsafe Browser?”. Click Launch.

5. You will see a pop-up notification that says “Starting the Unsafe Browser…”
6. After a few seconds, the Unsafe Browser should launch. The window has a bright red border to remind you to be careful when using it. You should close it once you’re done configuring the firewall and use Tor Browser for any other web browsing you might do on the Admin Workstation.

7. Navigate to the pfSense WebGUI in the Unsafe Browser: https://192.168.1.1

**Note:** If you have trouble connecting, go to your network settings and make sure that you have an IPv4 address in the 192.168.1.1/24 range. You may need to turn on DHCP, else you can manually configure a static IPv4 address of 192.168.1.x with a subnet mask of 255.255.255.0. However, make sure not to configure your Tails device to have the same IP as the firewall (192.168.1.1).

8. The firewall uses a self-signed certificate, so you will see a “Potential Security Risk Ahead” warning when you connect. This is expected. You can safely continue by clicking Advanced, then Accept the Risk and Continue.
9. You should see the login page for the pfSense GUI. Log in with the default username and passphrase (`admin / pfsense`).
16.2.2 Alternate Hostnames

Before you can set up the hardware firewall, you will need to set the Alternate Hostnames setting after logging in. You will see the Setup Wizard but you should exit out of it by navigating to System -> Advanced. In the Alternate Hostnames dialog box, add 192.168.1.1 as well as the IP address of the Admin Gateway. If you decide against using our recommended defaults for the Admin Gateway, you should include that value here. After saving these settings you should be able to go back to System and select Setup Wizard.

Note: If you are using a different IP for the Admin Gateway you should enter that IP in the Alternate Hostname field. Failure to do so will result in an error with the text “An HTTP_REFERER was detected other than what is defined in System -> Advanced”. If you see this error you may have to do a factory reset of the firewall via the serial console.

16.2.3 Setup Wizard

1. If you’re setting up a brand new (or recently factory reset) router, logging in to the pfSense WebGUI will automatically start the Setup Wizard. Click Next, then Next again. Don’t sign up for a pfSense Gold subscription (unless you want to).

2. On the “General Information” page, we recommend leaving your hostname as the default (pfSense). There is no relevant domain for SecureDrop, so we recommend setting this to securedrop.1oca1 or something similar. Use your preferred DNS servers. If you don’t know what DNS servers to use, we recommend using Google’s DNS servers: 8.8.8.8 and 8.8.4.4. Click Next.
3. Leave the defaults for “Time Server Information”. Click Next.

4. On “Configure WAN Interface”, enter the appropriate configuration for your network. Consult your local sysadmin if you are unsure what to enter here. For many environments, the default of DHCP will work and the rest of the fields can be left blank. Click Next.

• If your firewall is behind another firewall or NAT device, you will need to deselect the Block private networks from entering via WAN option to allow traffic to and from your upstream network.

5. For “Configure LAN Interface”, use the IP address of the Admin Gateway (10.20.1.1) and the subnet mask (/24) of the Admin Subnet. Click Next.
6. Set a strong admin passphrase. We recommend generating a strong passphrase with KeePassXC, and saving it in the Tails Persistent folder using the provided KeePassXC database template. Click Next.

7. Click Reload. Once the reload completes and the web page refreshes, click the corresponding “here” link to “continue on to the pfSense webConfigurator”.

At this point, since you (probably) changed the LAN[1] subnet settings from their defaults, you will no longer be able to connect after reloading the firewall and the next request will probably time out. This is not an error - the firewall has reloaded and is working correctly. To connect to the new LAN[1] interface, unplug and reconnect your network cable to get a new network address assigned via DHCP. Note that if you used a subnet with fewer addresses than /24, the default DHCP configuration in pfSense may not work. In this case, you should assign the Admin Workstation a static IP address that is known to be in the subnet to continue.

Now the WebGUI will be available on the Admin Gateway address. Navigate to https://<Admin Gateway IP> in the Unsafe Browser, and login as before except with the new passphrase you just set for the pfSense WebGUI. Once you’ve logged in to the WebGUI, you are ready to continue configuring the firewall.

### 16.2.4 Connect Interfaces and Test

Now that the initial configuration is completed, you can connect the WAN port without potentially conflicting with the default LAN[1] settings (as explained earlier). Connect the WAN port to the external network. You can watch the WAN entry in the Interfaces table on the pfSense WebGUI homepage to see as it changes from down (red arrow pointing down) to up (green arrow pointing up). This usually takes several seconds. The WAN’s IP address will be shown once it comes up.

Finally, test connectivity to make sure you are able to connect to the Internet through the WAN. The easiest way to do this is to use ping (Diagnostics → Ping in the WebGUI). Enter an external hostname or IP that you expect to be up (e.g. google.com) and click “Ping”.

---

The information above is from the SecureDrop Documentation, Release stable.
16.3 Disable DHCP on the LAN

pfSense runs a DHCP server on the LAN[1] interface by default. At this stage in the documentation, the Admin Workstation likely has an IP address assigned via that DHCP server.

In order to tighten the firewall rules as much as possible, we recommend disabling the DHCP server and assigning a static IP address to the Admin Workstation instead.
16.3.1 Disable DHCP Server on the Firewall

To disable DHCP, navigate to Services ▶ DHCP Server in the pfSense WebGUI. Uncheck the box labeled Enable DHCP server on LAN interface, scroll down, and click the Save button.

![DHCP Server Setting](image)

16.3.2 Assign a Static IP Address to the Admin Workstation

Now you will need to assign a static IP to the Admin Workstation.

You can easily check your current IP address by clicking the top right of the menu bar, clicking on the Wired Connection and then clicking Wired Settings.
From here you can click on the cog beside the wired network connection:
This will take you to the network settings. Change to the **IPv4** tab. Ensure that **IPv4 Method** is set to **Manual**, and that the **Automatic** switch for **DNS** is in the “off” position, as highlighted in the screenshot below:
SecureDrop Documentation, Release stable

**Note:** The Unsafe Browser will not launch when using a manual network configuration if it does not have DNS servers configured. This is technically unnecessary for our use case because we are only using it to access IP addresses on the LAN, and do not need to resolve anything with DNS. Nonetheless, you should configure some DNS servers here so you can continue to use the Unsafe Browser to access the WebGUI in future sessions.

We recommend keeping it simple and using the same DNS servers that you used for the network firewall in the setup wizard.

Fill in the static networking information for the **Admin Workstation**:

- **Address:** 10.20.1.2
- **Netmask:** 255.255.255.0
- **Gateway:** 10.20.1.1

16.3. Disable DHCP on the LAN
Click Apply. If the network does not come up within 15 seconds or so, try disconnecting and reconnecting your network cable to trigger the change. You will need you have succeeded in connecting with your new static IP when you are able to connect using the Tor Connection assistant, and you see the message “Connected to Tor successfully”.

Troubleshooting: DNS Servers and the Unsafe Browser

After saving the new network configuration, you may still encounter the “No DNS servers configured” error when trying to launch the Unsafe Browser. If you encounter this issue, you can resolve it by disconnecting from the network and then reconnecting, which causes the network configuration to be reloaded.

To do this, click the network icon in the system toolbar, and click Disconnect under the name of the currently active network connection, which is displayed in bold. After it disconnects, click the network icon again and click the name of the connection to reconnect. You should see a popup notification that says “Connection Established”, and the Tor Connection assistant should show the message “Connected to Tor successfully”.

For the next step, SecureDrop Configuration, you will manually configure the firewall for SecureDrop, using screenshots or XML templates as a reference.
16.4 SecureDrop Configuration

SecureDrop uses the firewall to achieve two primary goals:

1. Isolating SecureDrop from the existing network, which may be compromised (especially if it is a venerable network in a large organization like a newsroom).

2. Isolating the Application Server and the Monitor Server from each other as much as possible, to reduce attack surface.

In order to use the firewall to isolate the Application Server and the Monitor Server from each other, we need to connect them to separate interfaces, and then set up firewall rules that allow them to communicate.

16.4.1 Set Up the Firewall Rules

Since there are a variety of firewalls with different configuration interfaces and underlying sets of software, we cannot provide a set of network firewall rules to match every use case.

The easiest way to set up your firewall rules is to look at the screenshots of a correctly configured firewall and edit the interfaces, aliases, and firewall rules on your firewall to match them.

Set Up LAN2

We set up the LAN[1] interface during the initial configuration. We now need to set up the LAN2 interface for the Application Server. Start by connecting the Application Server to the LAN2 port. Then use the WebGUI to configure the LAN2 interface. Go to Interfaces ▶ LAN2, and check the box to Enable Interface. Use these settings:

- IPv4 Configuration Type: Static IPv4
- IPv4 Address: 10.20.2.1 (Application Gateway IP)

Make sure that the CIDR routing prefix is correct (/24). Leave everything else as the default. Save and Apply Changes.
Set Up LAN3

Next, you will have to enable the LAN3 interface. Go to Interfaces ▶ LAN3, and check the box to Enable Interface. LAN3 interface is set up similarly to how we set up LAN2 in the previous section. Use these settings:

- IPv4 Configuration Type: Static IPv4
- IPv4 Address: 10.20.3.1 (Monitor Gateway IP)

Make sure that the CIDR routing prefix is correct (/24). Leave everything else as the default. Save and Apply Changes.

Use Screenshots of Firewall Configuration

Here are some example screenshots of a working pfSense firewall configuration. You will add the firewall rules until they match what is shown on the screenshots.

First, we will configure IP and port aliases. Navigate to Firewall ▶Aliases and you should see a screen with no currently defined IP aliases:

Next you will click Add to add each IP alias. You should leave the Type as Host. Make aliases for the following:

- admin_workstation: 10.20.1.2
• app_server: 10.20.2.2
• external_dns_servers: 8.8.8.8, 8.8.4.4
• monitor_server: 10.20.3.2
• local_servers: app_server, monitor_server

Click **Save** to add the alias.

Keep adding aliases until the screenshot matches what is shown here:
Finally, click **Apply Changes**. This will save your changes. You should see a message “The changes have been applied successfully”: 
Next click “Ports” for the port aliases, and add the following ports:

- OSSEC: 1514
- ossec_agent_auth: 1515

Your configuration should match this screenshot:
Next we will configure firewall rules for each interface. Navigate to **Firewall ▶ Rules** to add firewall rules for the LAN1, LAN2, and LAN3 interfaces.

**Warning:** Be sure not to delete the Anti-Lockout Rule on the LAN1 interface. Deleting this rule will lock you out of the pfSense WebGUI.

Add or remove rules until they match the following screenshots by clicking **Add** to add a rule.

**LAN[1] interface:**
LAN2 interface:

Finally, click Apply Changes. This will save your changes. You should see a message “The changes have been applied successfully”. Once you’ve set up the firewall, exit the Unsafe Browser, and continue with the “Keeping pfSense up to date” section below.
16.4.2 Configuration Reference Templates

As an alternative to the provided screenshots, you can examine the provided .xml templates as a reference:

- Interfaces config: install_files/network_firewall/interfaces-config-pfSense.xml
- Aliases: install_files/network_firewall/aliases-config-pfSense.xml
- Firewall rules: install_files/network_firewall/filter-config-pfSense.xml

**Note:** These will not load using pfSense Restore and are here as a reference only. See GitHub #2282 for more info.

16.5 Tips for Setting Up pfSense Firewall Rules

Here are some general tips for setting up pfSense firewall rules:

1. Create aliases for the repeated values (IPs and ports).

2. pfSense is a stateful firewall, which means that you don’t need corresponding rules to allow incoming traffic in response to outgoing traffic (like you would in, e.g. `iptables with --state ESTABLISHED,RELATED`). pfSense does this for you automatically.

3. You should create the rules on the interface where the traffic originates.

4. Make sure you delete the default “allow all” rule on the LAN interface. Leave the “Anti-Lockout” rule enabled.

5. Any traffic that is not explicitly passed is logged and dropped by default in pfSense, so you don’t need to add explicit rules (iptables LOGNDROP) for that.

6. Since some of the rules are almost identical except for whether they allow traffic from the Application Server or the Monitor Server, you can use the “add a new rule based on this one” button to save time creating a copy of the rule on the other interface.

7. If you are troubleshooting connectivity, the firewall logs can be very helpful. You can find them in the WebGUI in Status → System Logs → Firewall.

16.6 Keeping pfSense up to Date

Periodically, the pfSense project maintainers release an update to the pfSense software running on your firewall. You will be notified by the appearance of text saying that there is a new version in the Version section of the “Status: Dashboard” page (the home page of the WebGUI).
If you see that an update is available, we recommend installing it. Most of these updates are for minor bugfixes, but occasionally they can contain important security fixes. You should keep apprised of updates yourself by checking the pfSense Blog posts with the “releases” tag.

Note: You can subscribe to email updates on https://www.netgate.com.

To install the update, click the Download icon next to the update then click the “Confirm” button:
You will see a page with a progress bar while pfSense performs the upgrade:
Note: This may take a while, so be patient!

Once it is complete, you will see a notification of successful upgrade:
The *Network Firewall* configuration is now complete, allowing you to move to the next step: *setting up the servers.*
17.1 Before You Begin

First, consider how the firewall will be connected to the Internet. You will need to provision several unique subnets, which should not conflict with the network configuration on the WAN interface. If you are unsure, consult your local system administrator.

Many firewalls, including the recommended OPNSense device, automatically set up the LAN interface on 192.168.1.1/24. This particular private network is also a very common choice for home and office routers. If you are connecting the firewall to a router with the same subnet (common in a small office, home, or testing environment), you will probably be unable to connect to the network at first. However, you will be able to connect from the LAN to the firewall’s Web GUI, and from there you will be able to configure the network so it is working correctly.

The recommended TekLager APU4D4 has 4 NICs: WAN, LAN, OPT1, and OPT2. This allows for a dedicated port on the network firewall for each component of SecureDrop (Application Server, Monitor Server, and Admin Workstation).

Depending on your network configuration, you should define the following values before continuing.

- Admin Subnet: 10.20.1.0/24
- Admin Gateway: 10.20.1.1
- Admin Workstation: 10.20.1.2
- Application Subnet: 10.20.2.0/24
- Application Gateway: 10.20.2.1
- Application Server (OPT1): 10.20.2.2
- Monitor Subnet: 10.20.3.0/24
- Monitor Gateway: 10.20.3.1
- Monitor Server (OPT2): 10.20.3.2

17.2 Initial Configuration

Unpack the firewall, connect the power, and power on the device.

We will use the OPNSense Web GUI to do the initial configuration of the network firewall.
17.2.1 Connect to the OPNSense Web GUI

1. If you have not already done so, boot the Admin Workstation into Tails using its designated USB drive. Make sure to enable the unsafe browser on the “Welcome to Tails” screen under “Additional settings”.

2. Connect the Admin Workstation to the LAN interface. You should see a popup notification in Tails that says “Connection Established”. If you click on the network icon in the upper right of the Tails Desktop, you should see “Wired Connected”:

![Wired Connected](image)

**Warning:** Make sure your only active connection is the one you just established with the network firewall. If you are connected to another network at the same time (e.g. a wireless network), you may encounter problems trying to connect the firewall’s Web GUI.

3. Launch the Unsafe Browser from the menu bar: Applications ▶ Internet ▶ Unsafe Browser.
Note: The Unsafe Browser is, as the name suggests, unsafe (its traffic is not routed through Tor). However, it is the only option because Tails intentionally disables LAN access in the Tor Browser.

4. A dialog will ask “Do you really want to launch the Unsafe Browser?”. Click Launch.

5. You will see a pop-up notification that says “Starting the Unsafe Browser...”
6. After a few seconds, the Unsafe Browser should launch. The window has a bright red border to remind you to be careful when using it. You should close it once you’re done configuring the firewall and use Tor Browser for any other web browsing you might do on the Admin Workstation.

7. Navigate to the OPNSense Web GUI in the Unsafe Browser: https://192.168.1.1

**Note:** If you have trouble connecting, go to your network settings and make sure that you have an IPv4 address in the 192.168.1.1/24 range. You may need to turn on DHCP, else you can manually configure a static IPv4 address of 192.168.1.x with a subnet mask of 255.255.255.0. However, make sure not to configure your Tails device to have the same IP as the firewall (192.168.1.1).

8. The firewall uses a self-signed certificate, so you will see a “This Connection Is Untrusted” warning when you connect. This is expected. You can safely continue by clicking Advanced and Accept the Risk and Continue.
9. You should see the login page for the OPNSense GUI. Log in with the default username and passphrase (root / opnsense).

If this is your first time logging in to the firewall, the setup wizard will be displayed. You should not step through it at
this point, however, as there are other tasks to complete. To exit, click the OPNSense logo in the top left corner of the screen.

17.2.2 Enable Two-Factor Authentication

OPNSense supports two-factor authentication (2FA) via mobile apps such as Google Authenticator or FreeOTP. To set it up, first make sure you have a mobile device available with your choice of 2FA app.

Next, in the OPNSense Web GUI, navigate to System > Access > Servers and click + to add a new server.

On the next page, enter TOTP Local in the Descriptive name field and choose Local + Timebased One Time Password from the Type dropdown. Leave the other fields at their default values and click Save.

Next, navigate to System > Access > Users and click the edit button for the root user. On the subsequent page, first set a strong admin password. We recomend generating a strong passphrase with KeePassXC and saving it in the Tails Persistent folder using the provided KeePassXC database template. Then scroll down the page to the OTP seed section and check the Generate new secret (160bit) checkbox. Finally, click Save.
Once the page has reloaded, scroll down to the **OTP QR code** section and click **Click to unhide**, then scan the generated QR code with your mobile auth application of choice.
If you wish, you may also save the OTP seed value displayed above the QR code in your Tails KeePassXC database - this isn’t required, but will allow you to set up TOTP on another mobile device if you need to in the future.

### 17.2.3 Test your new login credentials

To verify that your new password and OTP secret are working, navigate to **System > Access > Tester**. Select **TOTP Local** from the **Authentication Server** dropdown, enter the *root* username in the **Username** field, and enter your OTP token and password concatenated like **123456PASSWORD** in the **Password** field. Then click **Test**.
If the test fails, make sure you have used the correct OTP code and password, and edit the root user record as necessary.

**Warning:** Do not skip this test, or proceed further until it passes, as you will be locked out of the firewall Web GUI and console if the account is not set up correctly!

Finally, navigate to System > Settings > Administration and scroll down to the Authentication section at the bottom of the page. In the Server dropdown, select TOTP Local and deselect Local Database. Click Save.
17.2.4 Set Alternate Hostnames

Before you can set up the hardware firewall, you will need to set the Alternate Hostnames setting.

First, navigate to System > Settings > Administration. In the Web GUI section, update the Alternate Hostnames field with the values 192.168.1.1 and the IP address of the Admin Gateway (10.20.1.1 if you are using the recommended default values), separated by a space.

Finally, scroll to the bottom of the page and click Save.
17.2.5 Configure Interfaces Via The Setup Wizard

To start the OPNSense Setup Wizard, navigate to System > Wizard and click Next.

1. **General Information**: Leave your hostname as the default, **OPNsense**. There is no relevant domain for SecureDrop, so we recommend setting this to **securedrop.local** or something similar. Use your preferred DNS servers. If you don’t know what DNS servers to use, we recommend using Google’s DNS servers: **8.8.8.8** and **8.8.4.4**. Uncheck the Override DNS checkbox.

   In the Unbound DNS section, uncheck **Enable Resolver**.

   Click **Next**.

2. **Time Server Information**: Leave the default settings unchanged and click **Next**.

3. **Configure WAN Interface**: Enter the appropriate configuration for your network. Consult your local sysadmin if you are unsure what to enter here. For many environments, the default of DHCP will work and the rest of the fields can be left at their default values.

   Click **Next** to proceed.

4. **Configure LAN Interface**: Use the IP address of the Admin Gateway (**10.20.1.1**) and the subnet mask (**/24**) of the Admin Subnet. Click **Next**.
5. **Set Root Password:** If the password was already reset during the 2FA setup, you don’t need to set it again. If it was not, then set a strong password now and store it in the Admin Workstation’s KeePassXC database. Click **Next** to continue.

6. **Reload Configuration:** Click **Reload** to apply the changes you made in the Setup Wizard.

At this point, since the LAN subnet settings were changed from their defaults, you will no longer be able to connect after reloading the firewall and the reload will time out. This is not an error - the firewall has reloaded and is working correctly.

To connect to the new LAN interface, unplug and reconnect your network cable to get a new network address assigned via DHCP. Note that if you used a subnet with fewer addresses than /24, the default DHCP configuration in OPNSense may not work. In this case, you should assign the Admin Workstation a static IP address that is known to be in the subnet to continue.

The Web GUI will now be available on the Admin Gateway IP address. Navigate to https://<Admin Gateway IP> in the Unsafe Browser and log in to the root account using an OTP token and the passphrase you just set.

---

**Note:** If 2FA is enabled, you must enter the OTP token and passphrase concatenated as a single string like 123456PASS\0RD in the **Password** field.

---

Once you’ve logged in to the Web GUI, you are ready to continue configuring the firewall.
17.2.6 Connect Interfaces and Test

Now that the initial configuration is completed, you can connect the WAN port without potentially conflicting with the default LAN settings (as explained earlier). Connect the WAN port to the external network. You can watch the WAN entry in the Interfaces table on the OPNSense Dashboard homepage to see as it changes from down (red arrow pointing down) to up (green arrow pointing up). This usually takes several seconds. The WAN’s IP address will be shown once it comes up.

Finally, test connectivity to make sure you are able to connect to the Internet through the WAN. The easiest way to do this is to open another tab in the Unsafe Browser and visit a host that you expect to be up (e.g. google.com).

17.2.7 Update OPNSense to the latest version

You should update OPNSense to the latest version available before proceeding with the rest of the configuration. Navigate to Lobby > Dashboard and click Click to check for updates to start the process, and follow any on-screen instructions to complete the update. Note that a reboot may be required, and you may also need to apply several updates in a row to get to the latest version.
17.3 Disable DHCP on the Firewall

OPNSense runs a DHCP server on the LAN interface by default. At this stage in the documentation, the Admin Workstation likely has an IP address assigned via that DHCP server.

In order to tighten the firewall rules as much as possible, we recommend disabling the DHCP server and assigning a static IP address to the Admin Workstation instead.

17.3.1 Disable DHCP Server on the LAN Interface

To disable DHCP, navigate to Services > DHCPv4 > [LAN] in the Web GUI. Uncheck the Enable DHCP server on the LAN interface checkbox, scroll down, and click Save.

17.3.2 Assign a Static IP Address to the Admin Workstation

Now you will need to assign a static IP to the Admin Workstation.

You can easily check your current IP address by clicking the top right of the menu bar, clicking on the Wired Connection and then clicking Wired Settings.
From here you can click on the cog beside the wired network connection:
This will take you to the network settings. Change to the IPv4 tab. Ensure that IPv4 Method is set to Manual, and that the Automatic switch for DNS is in the “off” position, as highlighted in the screenshot below:
SecureDrop Documentation, Release stable

- **IPv4 Method**
  - Automatic (DHCP)
  - Link-Local Only
  - Manual
  - Disable

- **Addresses**
  - Address
  - Netmask
  - Gateway

- **DNS**
  - Automatic
  - Separate IP addresses with commas

- **Routes**
  - Address
  - Netmask
  - Gateway
  - Metric

- **Note:** The Unsafe Browser will not launch when using a manual network configuration if it does not have DNS servers configured. This is technically unnecessary for our use case because we are only using it to access IP addresses on the LAN, and do not need to resolve anything with DNS. Nonetheless, you should configure some DNS servers here so you can continue to use the Unsafe Browser to access the WebGUI in future sessions.

We recommend keeping it simple and using the same DNS servers that you used for the network firewall in the setup wizard.

Fill in the static networking information for the **Admin Workstation**:

- **Address:** 10.20.1.2
- **Netmask:** 255.255.255.0
- **Gateway:** 10.20.1.1

17.3. Disable DHCP on the Firewall
Click **Apply**. If the network does not come up within 15 seconds or so, try disconnecting and reconnecting your network cable to trigger the change. You will need you have succeeded in connecting with your new static IP when you are able to connect using the Tor Connection assistant, and you see the message “Connected to Tor successfully”.

**Troubleshooting: DNS Servers and the Unsafe Browser**

After saving the new network configuration, you may still encounter the “No DNS servers configured” error when trying to launch the Unsafe Browser. If you encounter this issue, you can resolve it by disconnecting from the network and then reconnecting, which causes the network configuration to be reloaded.

To do this, click the network icon in the system toolbar, and click **Disconnect** under the name of the currently active network connection, which is displayed in bold. After it disconnects, click the network icon again and click the name of the connection to reconnect. You should see a popup notification that says “Connection Established”, and the Tor Connection assistant should show the message “Connected to Tor successfully”.

For the next step, SecureDrop Configuration, you will manually configure the firewall for SecureDrop, using screenshots or XML templates as a reference.
17.4 SecureDrop Configuration

SecureDrop uses the firewall to achieve two primary goals:

1. Isolating SecureDrop from the existing network, which may be compromised (especially if it is a venerable network in a large organization like a newsroom).

2. Isolating the Application Server and the Monitor Server from each other as much as possible, to reduce attack surface.

In order to use the firewall to isolate the Application Server and the Monitor Server from each other, we need to connect them to separate interfaces, and then set up firewall rules that allow them to communicate.

17.4.1 Enable The OPT1 And OPT2 Interfaces

The OPT1 and OPT2 interfaces will be used for the Application Server and Monitor Server respectively. To enable them, first connect the Application Server to the physical OPT1 port and the Monitor Server to the OPT2 port.

Next, navigate to Interfaces > Assignments. LAN and WAN will already be enabled. Click the + button in the New Interface section to enable the OPT1 interface on the next available NIC (igb2 in the screenshot below). Once OPT1 has been added, click + again to add OPT2 (on igb3 in the screenshot below).

Finally, click Save.
17.4.2 Configure the LAN, WAN, OPT1, and OPT2 interfaces

OPT1 and OPT2 need to be configured to use the subnets defined for the Application and Monitor Servers, and some additional configuration is required for the LAN and WAN interfaces, that is not covered by the Setup Wizard.

Configure the WAN interface

First, navigate to Interfaces > [WAN]. In the Basic configuration section, check the checkbox labeled Prevent interface removal.

In the Generic configuration section, make sure that the Block private networks and Block bogon networks checkboxes are checked.

Scroll down and click Save, then click Apply changes when prompted.

Configure the LAN interface

Next, navigate to Interfaces > [LAN]. In the Basic configuration section, check the checkbox labeled Prevent interface removal.

In the Generic configuration section, select Static IPv4 in the IPv4 Configuration Type dropdown, and None in the IPV6 Configuration Type dropdown.

Scroll down and click Save, then click Apply changes when prompted.

Configure the OPT1 interface

Next, navigate to Interfaces > [OPT1]. In the Basic configuration section, check the checkboxes labeled Enable interface and Prevent interface removal.

In the Generic configuration section, select Static IPv4 in the IPv4 Configuration Type dropdown, and None in the IPV6 Configuration Type dropdown.

Scroll down. In the Static IPv4 Configuration section, enter the Application Gateway IP address and routing prefix (10.20.2.1 and 24 if you are using the recommended values).

Click Save, then click Apply changes when prompted.

Configure the OPT2 interface

Finally, navigate to Interfaces > [OPT2]. In the Basic configuration section, check the checkboxes labeled Enable interface and Prevent interface removal.

In the Generic configuration section, select Static IPv4 in the IPv4 Configuration Type dropdown, and None in the IPV6 Configuration Type dropdown.

Scroll down. In the Static IPv4 Configuration section, enter the Monitor Gateway IP address and routing prefix (10.20.3.1 and 24 if you are using the recommended values).

Click Save, then click Apply changes when prompted.
17.4.3 Configure Firewall Aliases

In order to simplify firewall rule setup, the next step is to configure aliases for hosts and ports referred to in the rules. To start, first navigate to Firewall > Aliases. You should see some system-defined aliases as shown below:

Click the + button to add new aliases. You should add the aliases defined in the table below (assuming recommended values for IP addresses):

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>admin_workstation</td>
<td>Host(s)</td>
<td>10.20.1.2</td>
</tr>
<tr>
<td>app_server</td>
<td>Host(s)</td>
<td>10.20.2.2</td>
</tr>
<tr>
<td>external_dns_servers</td>
<td>Host(s)</td>
<td>8.8.8.8, 8.8.4.4</td>
</tr>
<tr>
<td>monitor_server</td>
<td>Host(s)</td>
<td>10.20.3.2</td>
</tr>
<tr>
<td>local_servers</td>
<td>Host(s)</td>
<td>app_server, monitor_server</td>
</tr>
<tr>
<td>OSSEC</td>
<td>Port(s)</td>
<td>1514</td>
</tr>
<tr>
<td>ossec_agent_auth</td>
<td>Port(s)</td>
<td>1515</td>
</tr>
<tr>
<td>antilockout_ports</td>
<td>Port(s)</td>
<td>80, 443</td>
</tr>
</tbody>
</table>

When complete, the Aliases page should look like this:
17.4.4 Configure Firewall Rules

Next, configure firewall rules for each interface.

Configure Firewall Rules on LAN

First, navigate to Firewall > Rules > LAN. The LAN interface should have one automatically-generated anti-lockout rule in place, in addition to two default-allow rules. The default-allow rules should be removed once the SecureDrop-specific rules below have been added. The anti-lockout feature should be disabled as a last step.

The rules needed are described in this table:

<table>
<thead>
<tr>
<th>Action</th>
<th>TCP/IP Version</th>
<th>Protocol</th>
<th>Src</th>
<th>Src port</th>
<th>Dest</th>
<th>Dest port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP</td>
<td>ad-min_workstation</td>
<td>•</td>
<td>local_servers</td>
<td>22 (SSH)</td>
<td>SSH access for initial install</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP</td>
<td>ad-min_workstation</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Tor from Tails</td>
</tr>
</tbody>
</table>
Add or remove rules until they match the following screenshot including ordering. Click the + button to add a rule.

Once the rules match, click **Apply Changes**.

Finally, remove the default anti-lockout rule. First, navigate to **Firewall > Settings > Advanced**. Scroll down to the **Miscellaneous** section and check the **Disable anti-lockout** checkbox. Then, click **Save**.
Configure Firewall Rules On OPT1

Next, navigate to Firewall > Rules > OPT1. There should be no rules defined on this interface. Add the rules below:
Table 3: Firewall Rules - OPT1

<table>
<thead>
<tr>
<th>Action</th>
<th>TCP/IP Version</th>
<th>Protocol</th>
<th>Src</th>
<th>Src port</th>
<th>Dest</th>
<th>Dest port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>UDP</td>
<td>app_server</td>
<td>•</td>
<td>monitor_server</td>
<td>OSSEC</td>
<td>OSSEC Agent</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP</td>
<td>app_server</td>
<td>•</td>
<td>monitor_server</td>
<td>os-sec_agent_auth</td>
<td>OSSEC initial auth</td>
</tr>
<tr>
<td>Block</td>
<td>IPv4</td>
<td>any</td>
<td>OPT1 net</td>
<td>•</td>
<td>LAN net</td>
<td>•</td>
<td>Block between OPT1 and LAN by default</td>
</tr>
<tr>
<td>Block</td>
<td>IPv4</td>
<td>any</td>
<td>OPT1 net</td>
<td>•</td>
<td>OPT2 net</td>
<td>•</td>
<td>Block between OPT1 and OPT2 by default</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP</td>
<td>app_server</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Tor from App Server</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP/UDP</td>
<td>app_server</td>
<td>•</td>
<td>external_dns_servers</td>
<td>53 (DNS)</td>
<td>Allow DNS</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>UDP</td>
<td>app_server</td>
<td>•</td>
<td>•</td>
<td>123 (NTP)</td>
<td>Allow NTP</td>
</tr>
</tbody>
</table>

Once they match the screenshot below, click **Apply Changes**.
Configure Firewall Rules On OPT2

Next, navigate to Firewall > Rules > OPT2. Similarly to OPT1, there should be no rules defined on this interface. Add the rules below until the rules in the Web GUI match those in the screenshot:
<table>
<thead>
<tr>
<th>Action</th>
<th>TCP/IP Version</th>
<th>Protocol</th>
<th>Src</th>
<th>Src port</th>
<th>Dest</th>
<th>Dest port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block</td>
<td>IPv4</td>
<td>any</td>
<td>OPT2 net</td>
<td>•</td>
<td>LAN net</td>
<td>•</td>
<td>Block between OPT2 and LAN by default</td>
</tr>
<tr>
<td>Block</td>
<td>IPv4</td>
<td>any</td>
<td>OPT2 net</td>
<td>•</td>
<td>OPT1 net</td>
<td>•</td>
<td>Block between OPT2 and OPT1 by default</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP</td>
<td>monitor_server</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Tor, SMTP from Monitor Server</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>TCP/UDP</td>
<td>monitor_server</td>
<td>•</td>
<td>external_dns_servers</td>
<td>53 (DNS)</td>
<td>Allow DNS</td>
</tr>
<tr>
<td>Pass</td>
<td>IPv4</td>
<td>UDP</td>
<td>monitor_server</td>
<td>•</td>
<td>•</td>
<td>123 (NTP)</td>
<td>Allow NTP</td>
</tr>
</tbody>
</table>

Finally, click **Apply Changes**.

The *Network Firewall* configuration is now complete, allowing you to move to the next step: *setting up the servers.*
17.5 Troubleshooting Tips

Here are some general tips for setting up OPNSense firewall rules:

1. Create aliases for the repeated values (IPs and ports).
2. OPNSense is a stateful firewall, which means that you don’t need corresponding rules to allow incoming traffic in response to outgoing traffic (like you would in, e.g. iptables with --state ESTABLISHED,RELATED).
3. You should create the rules on the interface where the traffic originates.
4. Make sure you delete the default “allow all” rule on the LAN interface.
5. If you are troubleshooting connectivity, the firewall logs can be very helpful. You can find them in the Web GUI in Firewall > Log Files

17.6 Keeping OPNSense up to Date

Periodically, the OPNSense project maintainers release an update to the OPNSense software running on your firewall. You can check for updates using the link on the OPNSense dashboard.

If you see that an update is available, we recommend installing it. Most of these updates are for minor bugfixes, but occasionally they can contain important security fixes. You should keep apprised of updates yourself by checking the OPNSense Blog or subscribing to the OPNSense Blog RSS feed.
CHAPTER
EIGHTEEN

SET UP THE SERVERS

18.1 Pre-Install Steps

18.1.1 Upgrade the Server BIOS

Before beginning the installation process, you should upgrade your servers’ BIOS to the most recent stable version available. This process will differ for each server make/model - if you are using one of the recommended NUC models, you can find instructions in *BIOS Updates on the Servers*.

18.1.2 Update BIOS Settings

Once the BIOS has been updated, you should boot into it again to disable any unused hardware, including:

- wireless LAN and Bluetooth
- Thunderbolt support
- audio support (output, speakers, microphones)
- other features supported by the hardware but not used by SecureDrop.

In most cases, you should enable support for LAN and USB ports only.

You should also check the servers’ boot settings. Ubuntu 20.04 supports both Legacy and UEFI boot modes, with UEFI preferred. You should also disable Secure Boot. SecureDrop uses a custom kernel with security patches, which is unsigned and will not boot if Secure Boot is enabled.

Our specific hardware recommendations enumerate recommended BIOS settings for hardware that we have tested.

18.2 Install Ubuntu

The SecureDrop Application Server and Monitor Server run **Ubuntu Server 20.04.4 LTS (Focal Fossa)**. To install Ubuntu on the servers, you must first download and verify the Ubuntu installation media.

You should have already performed this step while setting up the Tails USB Disks, but if not, or if you would like a refresher, please review the *Create USB Boot Disk documentation*.

With the Ubuntu Server install USB ready, you may now proceed to the installation.
18.2.1 Perform the Installation

The steps below are the same for both the Application Server and the Monitor Server.

Start by inserting the Ubuntu installation media into the server. Boot or reboot the server with the installation media inserted, and enter the boot menu. To enter the boot menu, you need to press a key as soon as you turn the server on. This key varies depending on server model, but common choices are Esc, F2, F10, and F12. Often, the server will briefly display a message on boot that shows which key should be pressed to enter the boot menu. Once you’ve entered the boot menu, select the installation media (USB or CD) and press Enter to boot it. After booting the Ubuntu image, select Install Ubuntu Server.

Follow the steps to select your language, country and keyboard settings. Once that’s done, let the installation process continue.

18.2.2 Configure the Network

On the Network connections screen, the installer will ask you to configure at least one interface for use by the server. Your server should only have one available, corresponding to its Ethernet, usually named eno1. Select its list entry using the arrow keys and press Enter; then select Edit IPv4 and press Enter again.

The Edit eno1 IPv4 configuration dialog will be displayed. In the IPv4 Method menu, select Manual, then add your server-specific settings.

**Note:** For a production install with a pfSense network firewall in place, the Application Server and the Monitor Server are on separate networks. You may choose your own network settings at this point, but make sure the settings you choose are unique on the firewall’s network and remember to propagate your choices through the rest of the installation process.

Below are the configurations you should enter, assuming you used the default network settings from the network firewall guide. If you did not, adjust these settings accordingly.

- **Application Server:**
  - Subnet: 10.20.2.0/24
  - Address: 10.20.2.2
  - Gateway: 10.20.2.1
  - Name servers: 8.8.8.8, 8.8.4.4
  - Search domains: *should be left blank*

- **Monitor Server:**
  - Subnet: 10.20.3.0/24
  - Address: 10.20.3.2
  - Gateway: 10.20.3.1
  - Name servers: 8.8.8.8, 8.8.4.4
  - Search domains: *should be left blank*

Select Save and press Enter to apply your settings. Then select Done and press Enter.

The default values on the Configure Proxy and Configure Ubuntu archive mirror screens should not need to be changed. Select Done for both.
18.2.3 Full Disk Encryption - pros and cons

The use of Full Disk Encryption (FDE) with SecureDrop is not recommended. While FDE does offer data protection for devices that are powered down, SecureDrop’s servers are designed to be always-on, with the exception of a nightly reboot after automatic upgrades are applied. Given this update schedule, with FDE enabled, the servers would become unreachable once every 24 hours until an administrator entered the full-disk encryption passphrase via the console, and during that time, sources and journalists would be unable to access your instance.

The increased responsibility for administrators, as well as the daily downtime and limited scenarios in which FDE would be a net security benefit, inform this recommendation, but you may make a decision based on your own requirements. (See this GitHub issue for more information.)

18.2.4 Setting up storage

On the Guided storage configuration screen, verify that Use an entire disk is checked, and that the server’s local disk is selected. Also verify that Set up this disk as an LVM group is selected.

If you decided to set up FDE, despite the implications for administration overhead, select Encrypt the LVM group with LUKS, and enter and confirm the disk passphrase. Store this passphrase securely, as it will be required to unlock storage on every reboot.

Select Done and press Enter to move to the Storage Configuration screen. Review the configuration and select Done and press Enter to continue. Then, choose Continue on the Confirm destructive action dialog.

18.2.5 Configure account and hostname

On the Profile setup screen, configure the server’s hostname and the administration account. The administrator account username and password should be the same for both servers:

- **Your name:** Specify the administrator account name, e.g. SecureDrop Admin
- **Your server’s name:** Use app for the Application Server, and mon for the Monitor Server
- **Pick a username:** Specify the administrator account username, e.g. sdadmin
- **Choose a password:** Specify a strong password for the administrator account. A Diceware-generated passphrase is recommended.
- **Confirm your password:** Enter the password chosen above.

Select Done and press Enter to proceed.

18.2.6 Ignore Enable Ubuntu Advantage

On the Enable Ubuntu Advantage screen, choose Done to proceed without entering a token. The SecureDrop servers should not be registered with Ubuntu Advantage.
### 18.2.7 Set up SSH access

On the **SSH Setup** screen, enable **Install OpenSSH server**. Verify that **No** is selected for the **Import SSH Identity** option, as a custom SSH key will be created for the administration account later in the installation process.

Verify that **Allow password authentication over SSH** is selected, and choose **Done** to proceed.

### 18.2.8 Finish the installation

On the **Featured server snaps** screen, ensure that no snaps are selected and choose **Done** to start the server installation process.

Once the server installation is complete, choose **Reboot Now** to reboot the system.

### 18.2.9 Save the Configurations

When you are done, make sure you save the following information:

- The IP address of the **Application Server**
- The IP address of the **Monitor Server**
- The non-root user’s name and passphrase for the servers.

### 18.3 Test Connectivity

Now that the firewall is set up, you can plug the **Application Server** and the **Monitor Server** into the firewall. If you are using a setup where there is a switch on the LAN port, plug the **Application Server** into the switch and plug the **Monitor Server** into the OPT1 port.

You should make sure you can connect from the Admin Workstation to both of the servers before continuing with the installation.

In a terminal, verify that you can SSH into both servers, authenticating with your passphrase:

```
$ ssh <username>@<App IP address> hostname
app
$ ssh <username>@<Monitor IP address> hostname
mon
```

**Tip:** If you cannot connect, check the network firewall logs for clues.
18.4 Set Up SSH Keys

Ubuntu’s default SSH configuration authenticates users with their passphrases; however, public key authentication is more secure, and once it’s set up it is also easier to use. In this section, you will create a new SSH key for authenticating to both servers. Since the Admin Workstation was set up with SSH Client Persistence, this key will be saved on the Admin Workstation and can be used in the future to authenticate to the servers in order to perform administrative tasks.

First, generate the new SSH keypair:

```
ssh-keygen -t rsa -b 4096
```

You’ll be asked to “Enter file in which to save the key” Type Enter to use the default location.

Given that this key is on the encrypted persistence of a Tails USB, you do not need to add an additional passphrase to protect the key. If you do elect to use a passphrase, note that you will need to manually type it (Tails’ pinentry will not allow you to copy and paste a passphrase).

Once the key has finished generating, you need to copy the public key to both servers. Use `ssh-copy-id` to copy the public key to each server, authenticating with your passphrase:

```
ssh-copy-id <username>@<App IP address>
ssh-copy-id <username>@<Mon IP address>
```

Verify that you are able to authenticate to both servers by running the below commands. You should not be prompted for a passphrase (unless you chose to passphrase-protect the key you just created).

```
$ ssh <username>@<App IP address> hostname
app
$ ssh <username>@<Monitor IP address> hostname
mon
```

If you have successfully connected to the server via SSH, the terminal output will be name of the server to which you have connected (‘app’ or ‘mon’) as shown above.
19.1 Install Prerequisites

SecureDrop has dependencies that need to be loaded onto the Admin Workstation before installing the servers. To install these dependencies, from the base of the SecureDrop repository (~/Persistent/securedrop/) run the following command:

```
./securedrop-admin setup
```

The package installation will take approximately 10 minutes or longer, depending on network speed and computing power.

**Note:** The apt persistence feature will prompt to install the package automatically from persistent storage on each boot. Click **Install Every Time**:

![Install Persistence Feature]

**Note:** Occasionally this command times out due to network latency issues. You should be able to re-run the command and complete the setup. If you run into a problem, try removing the ~/Persistent/securedrop/admin/.venv3/ directory and running the command again.

**Important:** The setup command should only be run as the amnesia user, not as root. Contact the SecureDrop team if the package installation encounters repeated errors.
19.2 Localization of the Source Interface and Journalist Interface

The Source Interface and Journalist Interface are translated in the following languages:

- Arabic (ar)
- Catalan (ca)
- Czech (cs)
- German (de_DE)
- Greek (el)
- Spanish (es_ES)
- French (fr_FR)
- Hindi (hi)
- Icelandic (is)
- Italian (it_IT)
- Norwegian (nb_NO)
- Dutch (nl)
- Portuguese, Brasil (pt_BR)
- Portuguese, Portuguese (pt_PT)
- Romanian (ro)
- Russian (ru)
- Slovak (sk)
- Swedish (sv)
- Turkish (tr)
- Chinese, Simplified (zh_Hans)
- Chinese, Traditional (zh_Hant)

During the installation you will be given the opportunity to choose from a list of supported languages to display using the codes shown in parentheses.

Note: With a Source Interface displayed in French (for example), sources submitting documents are likely to expect a journalist fluent in French to be available to read the documents and follow up in that language.

19.3 Configure the Installation

Make sure you have the following information and files ready before continuing:

- the Application Server local IP address
- the Monitor Server local IP address
- the Submission Public Key (from the Transfer Device)
- the Submission Key fingerprint
• the email address that will receive alerts from OSSEC
• the GPG public key and fingerprint for the email address that will receive the alerts
• connection information for the SMTP relay that handles OSSEC alerts (see the OSSEC Alerts Guide)
• the username of a journalist who will be using SecureDrop (you can add more later)
• the username of the system admin

Optionally, you can configure **daily email notifications** of submission activity for journalists. These help journalists avoid spending time checking the Journalist Interface when there are no submissions. For this you will need:

• the Journalist Alert Public Key
• the Journalist Alert Public Key fingerprint
• the email address that will receive the journalist alerts

**Note:** It is not possible to specify multiple email addresses for email notifications. If there are multiple intended recipients, use an alias or mailing list. However, all subscribers must share the GPG private key, as it is not possible to specify multiple keys.

**Note:** The journalist notification is sent after the daily reboot of the Application Server.

Before proceeding, you will need to copy the following files to **install_files/ansible-base**:

• the Submission Public Key file
• the OSSEC Alert Public Key

The Submission Public Key should be located on your Transfer Device from earlier. Its exact path will depend on the location where the USB stick is mounted. From the root of the SecureDrop repository, run:

```
cp /media/[USB folder]/SecureDrop.asc install_files/ansible-base
```

where /media/[USB folder]/ corresponds to the Transfer Device. (You can also use the copy and paste capabilities of the file manager.)

Repeat this step for the Admin GPG key.

Next, run the configuration playbook and answer the prompts with values that match your environment:

```
./securedrop-admin sdconfig
```

The script will automatically validate the answers you provided and display error messages if any problems are detected. The answers will be written to the file **install_files/ansible-base/group_vars/all/site-specific**.

When you’re done, save the file and quit the editor.
19.4 Install SecureDrop Servers

Now you are ready to install! This process will configure the servers and install SecureDrop and all of its dependencies on the remote servers.

```
./securedrop-admin install
```

You will be prompted to enter the sudo passphrase for the *Application Server* and *Monitor Server* (which should be the same).

The installation process will take some time. It will return you to the terminal prompt when complete.

If any errors occur while running the install, carefully inspect the error output. Considering saving any error messages for reference and troubleshooting.

**Note:** If you see an error running `./securedrop-admin install`, and believe it may be an intermittent issue (for example, due to losing network connectivity to the servers), it is safe to run the `./securedrop-admin install` command again. If you see the same issue consistently, then you will need to troubleshoot it.

If you see the error message “timeout (62s) waiting for privilege escalation prompt”, try deleting the Ansible control path directory on your *Admin Workstation* (`rm -rf ~/.ansible/cp`) to reset the connection to the servers, then re-run the `./securedrop-admin install` command from within `~/Persistent/securedrop`.

If you encounter other errors, we encourage you to submit a bug report, or to contact us at securedrop@freedom.press (GPG encrypted).

If needed, make edits to the file located at `install_files/ansible-base/group_vars/all/site-specific` as described above. If you continue to have issues, please submit a detailed issue notice on GitHub or send an email to securedrop@freedom.press.

**Note:** The SecureDrop install process configures a custom Linux kernel hardened with the grsecurity patch set. Only binary images are hosted in the apt repo. For source packages, see the Source Offer.

Once the installation is complete, addresses and credentials for each onion service will be available in the following files under `install_files/ansible-base`:

19.4.1 V3 onion services

- `app-sourcev3-ths` contains the v3 `.onion` address of the Source Interface.
- `app-journalist.auth_private` contains the onion address and private key providing access to the Journalist Interface.
- `app-ssh.auth_private` contains the onion address and private key providing SSH access to the Application Server.
- `mon-ssh.auth_private` contains the onion address and private key providing SSH access to the Monitor Server.
- `tor_v3_keys.json` contains the keypairs required for access to the Journalist Interface and SSH access to the servers - it is required for future runs of `./securedrop-admin install`. 
**Warning:** The three .auth_private files and the tor_v3_keys.json file contain secret keys that should not be shared with third parties, or copied from the Admin Workstation for any purpose other than tasks such as performing backups or onboarding new users.

The dynamic inventory file will automatically read the onion addresses from the app-ssh.auth_private and mon-ssh.auth_private files and use them to connect to the servers over SSH during subsequent playbook runs.
CHAPTER
TWENTY

CONFIGURE THE ADMIN WORKSTATION POST-INSTALL AND CREATE BACKUPS

20.1 Auto-connect to the Authenticated Onion Services

The SecureDrop installation process adds multiple layers of authentication to protect access to the most sensitive assets in the SecureDrop system:

1. The *Journalist Interface*, because it provides access to submissions (although they are encrypted to an offline key), and some metadata about sources and submissions.

2. SSH on the *Application Server*

3. SSH on the *Monitor Server*

The installation process blocks direct access to each of these assets, and sets up authenticated onion services to provide authenticated access instead. Authenticated onion services share the benefits of regular onion services, but are only accessible to users who possess a shared secret (*auth-cookie* in the Tor documentation) that is generated during the onion service setup process.

In order to access an authenticated onion service, you require its authentication secret. SecureDrop includes a set of scripts to configure Tails access to the authenticated onion services. In order to persist these changes across reboots, persistence must be enabled in Tails.

To install the auto-connect configuration, start by navigating to the directory with these scripts (~/*Persistent/securedrop/), and run the install script:

```
./securedrop-admin tailsconfig
```

Type the Administration Password that you selected when starting Tails and hit **Enter**. This script installs a persistent script that runs every time you connect to a network in Tails, and automatically configures access to the *Journalist Interface* and to the servers via SSH. The HidServAuth info is collected from files in ~/*Persistent/securedrop/install_files/ansible-base and stored in ~/*Persistent/securedrop/torrc_additions thereafter.

In addition, the script creates desktop and menu shortcuts for the Source and *Journalist Interfaces*, directs Tails to install Ansible at the beginning of every session, and sets up SSH host aliases for the servers.

The only thing you need to remember to do is enable persistence when you boot the *Admin Workstation*. If you are using the *Admin Workstation* and are unable to connect to any of the authenticated onion services, restart Tails and make sure to enable persistence.
20.2 Back Up the Workstations

USB drives can wear out, get lost, or otherwise become corrupted, making it very important to be sure to keep current backups. Follow the Backup the Workstations document to create a backup of your Secure Viewing Station, Admin Workstation, and Journalist Workstations after you’ve completed the installation and post-installation steps.
CREATE AN ADMIN ACCOUNT ON THE JOURNALIST INTERFACE

In order for any user (admin or journalist) to access the Journalist Interface, they need:

1. The auth-cookie for the Journalist Interface’s ATHS
2. An account on the Journalist Interface, which requires the following credentials to log in:
   - Username
   - Passphrase
   - Two-factor authentication code

You should create a separate account on the Journalist Interface for each user who needs access. This makes it easy to enable or disable access to the Journalist Interface on an individual basis, so you can grant access to new users or revoke access for users who have left the organization or should no longer be allowed to access the Journalist Interface.

There are two types of accounts on the Journalist Interface: admin accounts and normal accounts. Admins accounts are like normal accounts, but they are additionally allowed to manage (add, change, delete) other user accounts through the web interface.

You must create the first admin account on the Journalist Interface by running a command on the Application Server. After that, the Journalist Interface admin can create additional accounts through the web interface.

To create an admin account via the command line, SSH to the Application Server, then:

```bash
sudo -u www-data bash
cd /var/www/securedrop
./manage.py add-admin
```

Follow the prompts.

A secure diceware passphrase will be generated by manage.py. You will see output like this:

```
This journalist's passphrase is: delivery propose requisite stunner dragonfly unstamped...
  → stowaway
```

Passphrases include the spaces between the words, but not leading or trailing whitespace. Be sure to save this passphrase in the appropriate KeePassXC database.

Once that’s done, you should open Tor Browser and navigate to the Journalist Interface’s .onion address. Verify that you can log in to the Journalist Interface with the admin account you just created.

For adding more user accounts, please refer now to our Admin Interface Guide.

Note: You can now set a custom logo image on your web interfaces by following the Updating the Logo Image documentation.
22.1 Test Connectivity

22.1.1 SSH to Both Servers Over Tor

Assuming you haven’t disabled SSH over Tor, SSH access will be restricted to the Tor network.

On the Admin Workstation, you should be able to SSH to the Application Server and the Monitor Server.

```bash
ssh app
ssh mon
```

The SSH aliases should have been configured automatically by running the `./securedrop-admin tailsconfig` tool. If you’re unable to connect via aliases, try using the verbose command format to troubleshoot:

```bash
ssh <username>@<app.onion>
ssh <username>@<mon.onion>
```

Tip: Check the `app-ssh.auth_private` and `mon-ssh.auth_private` files in the `install_files/ansible-base` directory to find the ssh onion service addresses. The files contain one line with 4 colon-delimited fields. The address is the first 56-character field, just add a `.onion` at the end.

22.1.2 Log in to Both Servers via TTY

All access to the SecureDrop servers should be performed over SSH from the Admin Workstation. To aid in troubleshooting, login via a physical keyboard attached to the server is also supported.

22.2 Sanity-Check the Installation

On each server:

1. Check that you can execute privileged commands by running `sudo su`.
2. Verify that you are booted into a grsec kernel: run `uname -r` and verify that the name of the running kernel ends with `-grsec`.
3. Check the current applied iptables rules with `iptables-save`. It should output approximately 50 lines.
4. You should have received an email alert from OSSEC when it first started. If not, review our OSSEC Alerts Guide.

On the Application Server:

1. Check the AppArmor status with `sudo aa-status`. On a production instance all profiles should be in enforce mode.

### 22.3 Test the Web Interfaces

1. Make sure the Source Interface is available, and that you can make a submission.
   
   - Open the Source Interface in Tor Browser by clicking on its desktop shortcut. Proceed through the code-name generation (copy this down somewhere) and submit a test message or file.
   
   - Usage of the Source Interface is covered by our Source User Manual.

2. Test that you can access the Journalist Interface, and that you can log in as the admin user you just created.
   
   - Open the Journalist Interface in Tor Browser by clicking on its desktop shortcut. Enter your passphrase and two-factor code to log in.
   
   - If you have problems logging in to the Admin/Journalist Interface, SSH to the Application Server and restart the time synchronization daemon to synchronize the time: `sudo systemctl restart systemd-timesyncd`. Also check that your smartphone’s time is accurate and set to network time in its device settings.

3. Test replying to the test submission.
   
   - While logged in as an admin, you can send a reply to the test source submission you made earlier.

   - Usage of the Journalist Interface is covered by our Journalist User Manual.

4. Test that the source received the reply.
   
   - Within Tor Browser, navigate back to the Source Interface and use your previous test source codename to log in (or reload the page if it’s still open) and check that the reply you just made is present.

5. Remove the test submissions you made prior to putting SecureDrop to real use. On the main Journalist Interface page, select all sources and click Delete selected.

Once you’ve tested the installation and verified that everything is working, see How to Use SecureDrop.
Congratulations! You’ve successfully installed SecureDrop.

At this point, the only person who has access to the system is the admin. In order to grant access to journalists, you will need to do some additional setup for each individual journalist.

In order to use SecureDrop, each journalist needs two things:

1. A Journalist Tails USB.

   The Journalist Interface is only accessible as an authenticated onion service. For ease of configuration and security, we require journalists to set up a Tails USB with persistence that they are required to use to access the Journalist Interface.


   The Journalist Interface allows journalists to download submissions from sources, but they are encrypted to the offline private key that is stored on the Secure Viewing Station Tails USB. In order for the journalist to decrypt and view submissions, they need access to a Secure Viewing Station.

### 23.1 Determine Access Protocol for the Secure Viewing Station

Currently, SecureDrop only supports encrypting submissions to a single public/private key pair - the Submission Key. As a result, each journalist needs a way to access the Secure Viewing Station with a Tails USB that includes the Submission Private Key.

The access protocol for the Secure Viewing Station depends on the structure and distribution of your organization. If your organization is centralized and there are only a few journalists with access to SecureDrop, they should be fine with sharing a single Secure Viewing Station. On the other hand, if your organization is distributed, or if you have a lot of journalists who wish to access SecureDrop concurrently, you will need to provision multiple Secure Viewing Stations.

### 23.2 Create a Journalist Tails USB

Each journalist will need a Journalist Tails USB and a Journalist Workstation, which is the computer they use to boot their Tails USB.

To create a Journalist Interface Tails USB, just follow the same procedure you used to create a Tails USB with persistence for the Admin Workstation, as documented in the Tails Setup Guide.

**Note:** As with your Admin Workstation, you can use a fresh copy of the blank KeePassXC template in the repository to initialize the password database on the Journalist Workstation. You can safely edit this copy to remove sections
or fields that are not relevant for the journalist you are onboarding. For example, the admin section of the password
database should never be filled in on a Journalist Workstation.

Once you’re done, boot into the new Journalist Tails USB on the Journalist Workstation. Enable persistence and set an
admin passphrase before continuing with the next section.

### 23.3 Set Up Automatic Access to the Journalist Interface

Since the Journalist Interface is an authenticated onion service, you must set up the Journalist Workstation to auto-
configure Tor, similarly to the Admin Workstation. The procedure is essentially identical, except the SSH configuration
will be skipped, since only admins need to access the servers over SSH.

- First, boot into the Admin Workstation and copy the following v3 service files to a Transfer Device:
  ```
  ~/Persistent/securedrop/install_files/ansible-base/app-sourcev3-ths
  ~/Persistent/securedrop/install_files/ansible-base/app-journalist.auth_private
  ```

  Then, boot into the new Journalist Workstation USB.

  **Warning:** Do not copy the app-ssh.auth_private, mon-ssh.auth_private, or tor_v3_keys.json files to
  the Journalist Workstation. Those files contain private keys and authentication information for SSH server access.
  Only the Admin Workstation should have shell access to the servers.

- Install the SecureDrop application code on the workstation’s persistent volume, following the documentation for
  cloning the SecureDrop repository.

- Copy the files from the Transfer Device to ~/Persistent/securedrop/install_files/ansible-base

- Open a terminal and run the following commands:
  ```
  cd ~/Persistent/securedrop
  ./securedrop-admin setup
  ./securedrop-admin tailsconfig
  ```

  **Note:** The setup command may take several minutes, and may fail partway due to network issues. If so, run it
  again before proceeding.

- Once the tailsconfig command is complete, verify that the Source and Journalist Interfaces are accessible at
  their v3 addresses via the SecureDrop desktop shortcuts.

- Securely wipe the files on the Transfer Device, by right-clicking them in the file manager and selecting **Wipe.**

  **Warning:** The app-journalist.auth_private file contains secret authentication information for the authen-
ticated onion service used by the Journalist Interface, and should not be shared except through the onboarding
process.
23.4 Add an account on the **Journalist Interface**

Finally, you need to add an account on the *Journalist Interface* so the journalist can log in and access submissions. See the section on *Adding Users* in the admin Guide.

23.5 Provision a personal **Transfer Device and Export Device**

In small organizations, a team of journalists may want to share a single Transfer Device and a single Export Device. In larger organizations, you may want to provision a personal Transfer Device and Export Device for each journalist who may need to copy files off the *Secure Viewing Station*. Please see the *setup guide* for more information.

23.6 Verify Journalist Setup

Once the journalist device and account have been provisioned, then the admin should run through the following steps with each journalist to verify the journalist is set up for SecureDrop.

The journalist should verify that they:

1. Have their own *Journalist Workstation* USB drive that they are able to boot on the computer designated for this purpose (which can be their everyday laptop).

   **Note:** It is important that they test exactly on the computer they will be using as the *Journalist Workstation*, as there can be differences in Tails compatibility between different laptop models.

2. Verify they are able to decrypt the persistent volume on the *Journalist Workstation*.

3. Ensure that they can connect to and login to the *Journalist Interface*.

4. Ensure that they have a *Transfer Device*, and access to its passphrase.

5. Verify they have access to the *Secure Viewing Station* by plugging in the *Secure Viewing Station* USB drive into the air-gapped computer designated for this purpose, booting, and verifying they can decrypt the persistent volume.

   **Note:** It is especially important to only boot the *Secure Viewing Station* USB drive on the air-gapped computer designated for this purpose.

6. Verify the *Submission Private Key* is present in the *Secure Viewing Station* persistent volume by clicking the clipboard icon 📋 in the top right corner of the Tails desktop and selecting “Manage Keys”. When clicking “GnuPG keys” the key should be present.

   **Tip:** The journalist should have all the credentials used in this checklist saved in the KeePassXC database stored in the persistent volume of the *Journalist Workstation*.

7. If you are using a printer, verify that they are able to print a document from the *Secure Viewing Station*. If you are using an *Export Device*, verify that they are able to unlock the encrypted volume.

At this point, the journalist has verified they have the devices and credentials they need and can proceed to a walkthrough of the entire SecureDrop workflow.
ONBOARD ADDITIONAL ADMINS

If you are the only admin for your SecureDrop, you can skip this chapter. It instructs you how to create additional Admin Workstation USB drives. Each Admin Workstation will have its own SSH keypair.

This chapter assumes that you have one working Admin Workstation. If you’ve not completed that part of the setup yet, see Set up the Admin Workstation. If your Admin Workstation is corrupted or lost, and you don’t have a backup, see Rebuilding an Admin Workstation USB.

Important: If you make configuration changes on your servers using one Admin Workstation, they may be overwritten by another Admin Workstation if its local copy of the configuration is not identical. When working with multiple admins, it is therefore important to establish protocols for coordinating configuration changes. See Managing Configuration Updates with Multiple Admins.

To onboard an additional administrator, you will need:

• your existing Admin Workstation USB drive (referred to as AW1 below)
• an additional empty USB drive (referred to as AW2 below)

To set up AW2, follow these steps:

1. Boot AW1, unlock its persistent volume, and set an admin password on the welcome screen.
2. Ensure that Tails and the SecureDrop version on AW1 are up-to-date. If not, update now by following the most recent upgrade guide.
3. Insert the empty AW2 USB drive.
4. Launch the Tails installer (Applications ▶ Tails ▶ Tails Installer) and install Tails on AW2. This will delete all data on the AW2 USB drive.
5. Shut down AW1.
8. Reboot AW2, unlock its persistent volume, and set an admin password on the welcome screen.
9. Open the file manager (Applications ▶ Accessories ▶ Files).
10. Insert AW1. It should show up in the list of storage devices in the file manager under a label like “7.0 GB Encrypted”. Click the label and enter the drive password when prompted to unlock it.
11. In a terminal, type the following command:

   rsync -a /media/amnesia/TailsData/Persistent/securedrop ~/Persistent
This will copy only the securedrop directory from AW1 to AW2.

12. Generate a new keypair on AW2 using the following command:

   ```sh
nen-keygen -t rsa -b 4096
```

   When prompted, store the keypair in the default location.


14. Boot AW1, unlock its persistent volume, and set an admin password on the welcome screen.

15. Open the file manager (Applications ▶ Accessories ▶ Files).

16. Insert AW2 and unlock it.

17. In a terminal, type the following commands to authorize the newly created SSH keypair on your servers:

   ```sh
   ssh-copy-id -i /media/amnesia/TailsData/openssh-client/id_rsa.pub app
   ssh-copy-id -i /media/amnesia/TailsData/openssh-client/id_rsa.pub mon
   ```

18. Log into the Journalist Interface using your admin credentials, and create a new user account with admin rights.

   Record its passphrase securely; you will add it to the password manager on AW2.

   (You will need to on-board the new admin’s 2FA device to complete this step. If this is not possible yet, you can defer it until later.)


20. Boot AW2, unlock its persistent volume, and set an admin password on the welcome screen.

21. Boot into AW2 and run the command `./securedrop-admin tailsconfig` in `~/Persistent/securedrop`.

   This will set up desktop shortcuts and SSH access.

22. Confirm that you are able to access mon and app via SSH (`ssh app` and `ssh mon`).

23. Confirm that you are able to access the Source Interface and the Journalist Interface using the desktop shortcuts.

24. Initialize a passphrase database on AW2. Store the admin account details using KeePassXC, and other account information this admin will need in the course of administering this system.


You can now provide AW2 to the new administrator. Ensure that they store the disk encryption passphrase in a secure manner: in most configurations, it is the only passphrase that is required to SSH into your servers for anyone who obtains access to the USB drive.

The SSH keypair on AW2 is unique to that workstation. When offboarding the administrator, you can manually remove the SSH public key from your admin user’s `~/.ssh/authorized_keys` on app and mon. Alternatively, if only a single Admin Workstation is in active use, you can use the `./securedrop-admin reset_admin_access` command in `~/Persistent/securedrop` to revoke access to all other SSH keys. See our offboarding guide for more information.
SecureDrop is only as secure as the environment that surrounds it. To keep sources safe, the news organization’s website, physical space, and dedicated SecureDrop hardware must employ a set of basic security best practices or risk losing any source protection provided by SecureDrop.

Freedom of the Press Foundation eventually plans to list all of those SecureDrop onion URLs that meet the minimum requirements for deployment best practices as “verified” on its website. If your organization cannot follow the minimum guidelines, we cannot recommend your SecureDrop instance as safe to use.

In addition to implementing the following best practices, we strongly recommend that you have a reputable security firm perform a review of your organization’s public website prior to launching an instance of SecureDrop. Upon request, we can help put you in touch with a few security firms if you need more assistance.
SecureDrop itself runs as a Tor Onion Service. Organizations also need to create a SecureDrop Landing Page that will explain how SecureDrop works, give sources instructions on how to access the Tor Onion Service, and disclose the risks. We also recommend including a privacy policy (see our Sample SecureDrop Privacy Policy) describing what data is collected and how it will be used by your organization.

Note: SecureDrop will bring more attention to your organization from security researchers and others. A Landing Page that fails to implement minimum security requirements is sure to be noticed, and could undermine trust, discouraging possible sources.

26.1 URL and Location

Ideally you would not use a separate subdomain, but would use a path at your top-level domain, e.g. organization.com/securedrop. This is because TLS does not encrypt the hostname, so a SecureDrop user whose connection is being monitored would be trivially discovered.

If the Landing Page is deployed on the same domain as another site, you might consider having some specific configuration (such as the security headers below) apply only to the /securedrop request URI. This can be done in Apache by encapsulating these settings within a <Location> block, which can be defined similarly in nginx by using the location {} directive.

26.2 HTTPS Only (No Mixed Content)

HTTPS encryption is the number-one security requirement for your site’s SecureDrop Landing Page. Without HTTPS, a source can easily be exposed as a visitor to your site.

This may be difficult if your website serves advertisements or utilizes a legacy content delivery network. You should make sure the SecureDrop Landing Page does not serve ads of any kind, even if the rest of your site does.

If you do not serve ads on any of your site, you should also consider switching your whole site over to HTTPS by default immediately. If you do serve ads, consider pressuring your ad networks to enable you to switch to HTTPS for your entire website in the future.

If your website needs to operate in both HTTPS and HTTP mode, use protocol-relative URLs for resources such as images, CSS and JavaScript in common templates to ensure your page does not end up in a mixed HTTPS/HTTP state.

Consider submitting your domain to be included in the Chrome HSTS preload list if you can meet all of the requirements. This will tell web browsers that the site is only ever to be reached over HTTPS.
26.3 Perfect Forward Secrecy

Perfect Forward Secrecy (PFS) is a property of encryption protocols that ensures each SSL session has a unique key, meaning that if the key is compromised in the future it can’t be used to decrypt previously recorded SSL sessions. You may need to talk to your CA (certificate authority) and CDN (content delivery network) for this, although our recommended configuration below provides forward secrecy.

26.4 SSL Certificate Recommendations

Regardless of where you choose to purchase your SSL cert and which CA issues it, you’ll often be asked to generate the private key and a CSR (certificate signing request).

When you do this, it’s imperative that you use SHA-2 as the hashing algorithm instead of SHA-1, which is being phased out. You should also choose a key size of at least 2048 bits. These parameters will help ensure that the encryption used on your Landing Page is sufficiently strong. The following example OpenSSL command will create a private key and CSR with a 4096-bit key length and a SHA-256 signature:

```bash
openssl req -new -newkey rsa:4096 -nodes -sha256 -keyout domain.com.key -out domain.com.csr
```

Don’t load any resources (scripts, web fonts, etc.) from third parties (e.g. Google Web Fonts)

This will potentially leak information about sources to third parties, which can more easily be accessed by law enforcement agencies. Simply copy them to your server and serve them yourself to avoid this problem.

26.5 Do Not Use Third-Party Analytics, Tracking, or Advertising

Most news websites, even those that are non-profits, use third-party analytics tools or tracking bugs on their websites. It is vital that these are disabled for the SecureDrop Landing Page.

In the past, some news organizations were heavily criticized when launching their SecureDrop instances because their Landing Page contained trackers. They claimed they were going to great lengths to protect sources’ anonymity, but by having trackers on their Landing Page, this also opened up multiple avenues for third parties to collect information on those sources. This information can potentially be accessed by law enforcement or intelligence agencies and could unduly expose a source.

Similarly, consider avoiding Cloudflare (and other CDNs like Akamai, StackPath, Incapsula, Amazon CloudFront, etc.) for the SecureDrop Landing Page. These services intercept requests between a potential source and the SecureDrop Landing Page and can be used to track or collect information on sources.

26.6 Do Not Hyperlink .onion Addresses

Because a visitor to your Landing Page may not be using Tor Browser yet, clicking a link to your SecureDrop instance or to any other .onion address may result in an error message. Worse, depending on the browser and network configuration, it may cause lookups that an adversary can use to identify SecureDrop-related behavior.

Instead, we recommend including .onion addresses in plain text, without a hyperlink.
26.7 Avoid Direct Links to SecureDrop.org

We appreciate that you may want to link to the SecureDrop website to give Landing Page visitors more information about the system. Unfortunately, if a visitor visits these links without using Tor Browser, this generates traffic that an adversary may be able to use to identify SecureDrop-related behavior, regardless of the use of HTTPS.

We suggest offering a reference to the SecureDrop Onion Service in plain text, without a hyperlink (as per the preceding section):

sdolvtfhatvsyose6134d65ymdwxcuajasv7k5jk4cy5ttzhjoi6dfzvyd.onion

26.8 Apply Security Headers

Security headers give instructions to the web browser on how to handle requests from the web application. These headers set strict rules for the browser and help mitigate against potential attacks. Given the browser is a main avenue for attack, it is important these headers are as strict as possible.

You can use the site securityheaders.com to easily test your website’s security headers.

If you use Apache, you can use these:

```
Header set Cache-Control "max-age=0, no-cache, no-store, must-revalidate"
Header edit Set-Cookie ^(.*)$ ;HttpOnly
Header set Pragma "no-cache"
Header set Expires "-1"
Header always append X-Frame-Options: DENY
Header set X-XSS-Protection: "1; mode=block"
Header set X-Content-Type-Options: nosniff
Header set X-Download-Options: noopen
Header set X-Permitted-Cross-Domain-Policies: master-only
Header set Content-Security-Policy: "default-src 'none'; script-src 'self'; style-src 'self'; img-src 'self'; font-src 'self';"
Header set Referrer-Policy "no-referrer"
```

If you intend to run nginx as your webserver instead, this will work:

```
add_header Cache-Control "max-age=0, no-cache, no-store, must-revalidate";
add_header Pragma no-cache;
add_header Expires -1;
add_header X-Frame-Options DENY;
add_header X-XSS-Protection "1; mode=block";
add_header X-Content-Type-Options nosniff;
add_header X-Download-Options noopen;
add_header X-Permitted-Cross-Domain-Policies master-only;
add_header Content-Security-Policy "default-src 'none'; script-src 'self'; style-src 'self'; img-src 'self'; font-src 'self';"
add_header Referrer-Policy "no-referrer";
```
26.9 Additional Apache Configuration

To enforce HTTPS/SSL always, you need to set up redirection within the HTTP (port 80) virtual host:

```
RewriteEngine On
RewriteCond %{HTTPS} off
RewriteRule (.*) https://%{HTTP_HOST}%{REQUEST_URI}
```

The same thing can be achieved in nginx with a single line:

```
return 301 https://$server_name$request_uri;
```

In your SSL (port 443) virtual host, set up HSTS and use these settings to give preference to the most secure cipher suites:

```
Header set Strict-Transport-Security "max-age=16070400;"
SSLProtocol all -SSLv2 -SSLv3
SSLHonorCipherOrder on
SSLCompression off
SSLCipherSuite ECDH+AESGCM:EDH+AESGCM:AES256+EECDH:AES256+EDH
```

Here's a similar example for nginx:

```
add_header Strict-Transport-Security max-age=16070400;
ssl_protocols TLSv1 TLSv1.1 TLSv1.2;
ssl_prefer_server_ciphers on;
ssl_ciphers "EECDH+AESGCM:EDH+AESGCM:AES256+EECDH:AES256+EDH";
```

Here's a similar example for nginx if the system supports TLS 1.3:

```
add_header Strict-Transport-Security max-age=16070400;
ssl_protocols TLSv1.2 TLSv1.3;
ssl_prefer_server_ciphers on;
```

**Note:** We have prioritized security in selecting these cipher suites, so if you choose to use them then your site might not be compatible with legacy or outdated browsers and operating systems. For a good reference check out Mozilla's recommendations.

You'll need to run `a2enmod headers ssl rewrite` for all these to work. You should also set `ServerSignature Off` and `ServerTokens Prod`, typically in `/etc/apache2/conf.d/security`. For nginx, use `server_tokens off`; so that the webserver doesn’t leak extra information.

If you use nginx, you can follow this link and use the configuration example provided by ProPublica.
26.9.1 Change detection monitoring for the web application configuration and Landing Page content

OSSEC is a free and open source host-based intrusion detection suite that includes a file integrity monitor. More information can be found here.

26.9.2 Don't log access to the Landing Page in the webserver

Here’s an Apache example that would exclude the Landing Page from logging. However you still need to make sure no other assets get logged!

```bash
SetEnvIf Request_URI "^/securedrop($|/(.*))" dontlog
CustomLog logs/access_log common env=!dontlog
```

In nginx, logging can be disabled by adding the following directives within the Landing Page location {} block:

```bash
access_log off;
error_log /dev/null;
```

26.10 Further Security Considerations

To guard your Landing Page against being modified by an attacker and directing sources to a rogue SecureDrop instance, you will need good security practices applying to the machine where it is hosted. Whether it’s a VPS in the cloud or dedicated server in your office, you should consider the following:

- Brute force login protection (see fail2ban or sshguard)
- Disable root SSH login
- Use SSH keys instead of passwords
- Use long, random and complex passwords
- Firewall rules to restrict accessible ports (see iptables or ufw)
- AppArmor, grsecurity, SELINUX, modsecurity
- Intrusion and/or integrity monitoring (see Logwatch, OSSEC, Snort, rkhunter, chkrootkit)
- Downtime alerts (Nagios or Pingdom)
- Two-factor authentication (see libpam-google-authenticator, libpam-yubico)

It's preferable for the Landing Page to have its own segmented environment instead of hosting it alongside other sites running potentially vulnerable software or content management systems. Check that user and group file permissions are locked down and that modules or gateway interfaces for dynamic scripting languages are not enabled. You don't want any unnecessary code or services running as this increases the attack surface.
26.11 How to test your Landing Page using Tor Browser

Sources may visit your Landing Page using Tor.

Many websites are configured with security measures that only apply when Tor is in use. For example, Tor visitors may be requested to solve a CAPTCHA, may trigger warnings that are specific to some Tor exit nodes, or may be unable to load the page altogether because of Tor-specific DDoS protections.

The effect of such measures cannot be tested without using Tor, and it is a very bad experience for a source if visiting a Landing Page doesn’t work as expected. Because of that, we recommended strongly that you test your organization’s Landing Page using Tor before you start advertising it.

You can do so using Tor Browser:

1. Download Tor Browser from the Tor Project website.
3. Ensure the Tor Browser security level is set to “Safest” by clicking on the shield icon. Click on “Advanced Security Settings” and select “Safest” if necessary.
4. Verify that everything works as expected.
5. Reload the page using a different Tor circuit by clicking on “New Tor Circuit for this Site” in the site information menu (padlock icon in the URL bar) or in the hamburger menu.
6. Verify that everything still works as expected.
7. Repeat the previous two steps several times to test with exit nodes in different countries and regions.

26.12 Landing Page Content Suggestions

The content below presents sample text for the SecureDrop component of a news organization’s tips page. It does not account for any specific legal or organizational needs, but should provide guidance for any outlet getting started on crafting Landing Page language. Any tweaks to the sample content should be left to the legal and editorial discretion of the individual outlet, and should be viewed as essential to upholding source protection and transparency.

What is SecureDrop?

SecureDrop is an anonymity tool for journalists and whistleblowers. As a source, you can use our SecureDrop installation to anonymously submit documents to our organization. Our journalists use SecureDrop to receive source materials and securely communicate with anonymous contacts.

What should I know before submitting material through SecureDrop?

To protect your anonymity when using SecureDrop, it is essential that you do not use a network or device that can easily be traced back to your real identity. Instead, use public wifi networks and devices you control.

- Do NOT access SecureDrop on your employer’s network.
- Do NOT access SecureDrop using your employer’s hardware.
- Do NOT access SecureDrop on your home network.
- DO access SecureDrop on a network not associated with you, like the wifi at a library or cafe.

Got it. How can I submit files and messages through SecureDrop?

Once you are connected to a public network at a cafe or library, download and install the desktop version of Tor Browser.
Launch Tor Browser. Visit our organization’s unique SecureDrop URL at http://our-unique-URL.onion/. Follow the instructions you find on our source page to send us materials and messages.

When you make your first submission, you will receive a unique codename. Memorize it. If you write it down, be sure to destroy the copy as soon as you’ve committed it to memory. Use your codename to sign back in to our source page, check for responses from our journalists, and upload additional materials.

**As a source, what else should I know?**

No tool can absolutely guarantee your security or anonymity. The best way to protect your privacy and anonymity as a source is to adhere to best practices.

You can use a separate computer you’ve designated specifically to handle the submission process. Or, you can use an alternate operating system like Tails, which boots from a USB stick and erases your activity at the end of every session.

A file contains valuable metadata about its source — when it was created and downloaded, what machine was involved, the machine’s owner, etc. You can scrub metadata from some files prior to submission using the Metadata Anonymization Toolkit featured in Tails.

Your online behavior can be extremely revealing. Regularly monitoring our publication’s social media or website can potentially flag you as a source. Take great care to think about what your online behavior might reveal, and consider using Tor Browser to mitigate such monitoring.

Our organization retains strict access control over our SecureDrop project. A select few journalists within our organization will have access to SecureDrop submissions. We control the servers that store your submissions, so no third party has direct access to the metadata or content of what you send us.

Do not discuss leaking or whistleblowing, even with trusted contacts.
MINIMUM REQUIREMENTS FOR THE SECUREDROP ENVIRONMENT

- The Application and Monitor Servers should be dedicated physical machines, not virtual machines.
- A trusted location to host the servers. The servers should be hosted in a location that is owned or occupied by the organization to ensure that their legal department cannot be bypassed with gag orders.
- The SecureDrop servers should be on a separate internet connection or completely segmented from the corporate network, such as a dedicated subnet with DENY rules for all traffic to and from the corporate LAN.
- All traffic from the corporate network should be blocked at the SecureDrop’s point of demarcation.
- Video monitoring should be recorded of the server area and the organization’s safe.
- Journalists should ensure that while using the air-gapped viewing station they are in an area without video cameras.
- An established monitoring plan and incident response plan. Who will receive the OSSEC alerts and what will their response plan be? These should cover technical outages and a compromised environment plan.
Ideally, some or all of the following changes are made to improve the overall security of the path to the Landing Page and obfuscate traffic analysis.

1. Make your entire site available through HTTPS.
   - That way, visits to your Landing Page won’t stand out as the only encrypted traffic to your site.
2. Include an iframe for all (or a random subset of) visitors, loading this particular URL (hidden).
   - By artificially generating traffic to the endpoint it will be harder to distinguish these from other, ‘real’ requests.
   - Use a random delay for adding the iframe (otherwise the ‘pairing’ with the initial HTTP request may distinguish this traffic).
3. Print the link, URL and info block on the dead trees (the paper), as others have suggested.
4. Add HSTS headers.

### 28.1 Suggested

- For publicly advertised SecureDrop instances display the Source Interface’s Onion Service onion address on all of the organization public pages.
- Mirror Tor Browser and Tails so sources do not have to visit torproject.org to download it.
SAMPLE SECUREDROP PRIVACY POLICY

[DATE]

SecureDrop strives to create a more secure environment for whistleblowers to give information to journalists. It was installed at [MEDIA ORG] with the help of Freedom of the Press Foundation.

Please read this privacy policy carefully. It explains what information what type of information SecureDrop does and does not collect, and why.

29.1 Collection of Information From Sources

- We don’t ask or require you to provide any personally identifying information when you submit materials through SecureDrop.
- The system does not record your IP address, information about your browser, computer, or operating system. Furthermore, the SecureDrop pages do not embed third-party content or deliver persistent cookies to your browser.
- The server will only store the date and time of the newest message sent from each source. Once you send a new message, the time and date of your previous message is automatically deleted.
- Journalists decrypt and read each message offline. They are encouraged to delete messages from the server on a regular basis.
- Please keep in mind that the actual messages you send and receive through SecureDrop may include personally identifying information. For this reason, once you read a journalist’s message, we recommend you delete it.

Also please note that when you submit certain types of files through SecureDrop, you may be sending us metadata associated with that file.

For example, if you submit a photo through SecureDrop in JPEG format, the file may include information about the date, time, and the GPS location of where it was taken, and the type of device used to take the photo. Similarly, if you submit a Word file (.doc or .docx) through SecureDrop, it may include the identity of the document’s author, the author’s operating system, GPS data about the author’s location, and the date and time when the document was created.

Our policy is to scrub metadata from the files we receive through SecureDrop before publication. If you don’t want to send us metadata, please use the Metadata Anonymization Toolkit to scrub the file before you submit it.
29.2 Collection of Information About Journalists’ Use of SecureDrop

[MEDIA ORG] collects information about journalists’ use of SecureDrop for security monitoring and to make sure the system works properly.

This information we collect about journalists includes details about the device, browser, and operating system journalists use when accessing the system, and the date and time of each session.

We retain these access logs for [___] days, and then delete them.

29.3 Data Security

[MEDIA ORG] works diligently to protect the identities of our sources and keep the information they give us confidential.

SecureDrop servers are under the physical control of [MEDIA ORG] and do not share common elements of the [MEDIA ORG’S] other infrastructure.

However, no one can truly guarantee 100% security of any system. Like all software, SecureDrop may contain bugs. Ultimately, you use the SecureDrop service at your own risk.

29.4 Children Under 13

The Children’s Online Privacy Protection Act restricts our ability to collect personal information from children under 13. This site is not directed to children 12 or younger.

29.5 Changes to This Policy

We may revise this Privacy Policy from time to time. The most current version of the policy will govern our collection and use of personal information and will always be at [LINK]. If we make changes that we believe are material, we will prominently display a notice on our site [___] days before we make those changes.

29.6 Contact

[MEDIA ORG] welcomes questions, concerns, and feedback about this policy. If you have suggestions for us, feel free to let us know at [EMAIL ADDRESS].
PROMOTING YOUR SECUREDROP INSTANCE

At Freedom of the Press Foundation, we’ve found news organizations that get the most out of SecureDrop are those who promote it regularly and effectively. SecureDrop will only be used by sources if they know it exists, so it’s best to promote its use in a variety of ways so that a wide swath of people will see it.

So here are a few tips used by some of the news outlets that have seen the most success with SecureDrop.

30.1 Make a High Profile Announcement

Anytime you launch a SecureDrop, you’ll want to write an accompanying news story along with it to alert your readers and potential sources where to submit information. Almost every news organization already does this, but some good recent examples come from USA Today, The Guardian, and Wired. You can also write a companion Q & A like the Washington Post did.

However, a launch announcement is really just a small piece of the puzzle. It’s important to regularly remind readers and potential sources that your SecureDrop exists, because only a tiny fraction will likely see the launch announcement and it will quickly be buried in other news after a couple of days.

30.2 Provide a Clear Link on Your Homepage

Making your SecureDrop or secure tips page easy to find is one of the most important things you can do to ensure that potential sources use it. The best way you can do this is providing a clear link on your home page, so that every time a user goes to your website, they can quickly see where they need to go.

For example, the Intercept has a “become a source” link in its main menu:
The Washington Post has a link on their front page for “how to share a tip securely”:

Other news organizations put a little link in their footer, however, we’ve found that this is not as effective as putting it in a more prominent on your front page.
30.3 Provide Links at the Bottom of Your Articles

Another great way to remind potential sources know that they can use SecureDrop is to put a link at the bottom of each article. For example, Gizmodo Media Group, uses a message like this:

Have something you think we should know? Email us at tips@deadspin.com, call our confidential tips hotline at (347) 746-8471, or contact our writers directly, or use our SecureDrop system. You can also follow us on Twitter, like us on Facebook, and sign up for our newsletter!

30.4 Create an Instructional Video on How to Access and Use Your SecureDrop

To better help potential sources visualize how SecureDrop works, several organizations have made short instructional videos walking through all the steps. Some good examples include the Toronto Globe and Mail, The Intercept, and Lucy Parsons Labs.

30.5 Regularly Share Your SecureDrop Landing Page on Social Media

The majority of adults in the United States now get their news from Facebook or other social media sites like Twitter, so it’s important to regularly remind people via social media posts that SecureDrop is the safest way they can contact your journalists if they have a sensitive tip to share. If there’s specific stories you are looking for tips on that may already be in the news, this is a great way of getting added attention to your SecureDrop.
30.6 Target Potential Whistleblowers with Advertising

Facebook and Twitter also allow for targeted advertising to users in specific locations, attributes, and sometimes even specific users. For example, Gizmodo Media Group targeted online advertisements for their secure tips page at DC residents imploring them to tell on trump. At Freedom of the Press Foundation, we ran a proof of concept Twitter advertisement aimed at EPA and NOAA employees to show how it can be done. You can read about how you can do the same thing here.
30.7 Put an Advertisement in Your Physical Paper

Obviously this tip only applies to news outlets that also print a physical newspaper, but putting an ad or in the paper to tell readers where to go to access SecureDrop can be extremely effective.

The New York Times took out a full page ad in their own paper when they launched SecureDrop and other secure communications tools for their tips line:
So excited and proud to see @nytimes run a full page ad letting readers know how to securely send tips.

Got a confidential tip? Get in touch.

Every news story starts somewhere. So if you think you have a credible tip, our newsroom is waiting to hear from you. Just keep in mind what we always keep in mind — is it a story of consequence? Will it impact society? And of course, is there documentation or evidence that can fuel the fact-based, original journalism that is a hallmark of The Times?

For secure, encrypted ways to share messages and materials with our journalists, visit nytimes.com/tips
And the Toronto Globe and Mail regularly puts a note in their physical paper reminding potential sources where they can go:

Canadian news organization @globeandmail includes the URL to its @SecureDrop landing page in the printed paper:
WHAT MAKES SECUREDROP UNIQUE

SecureDrop attempts to solve or mitigate several problems journalists and sources have faced in recent legal investigations, attacks from state actors, and other threats to the confidentiality of communications.

31.1 No Third Parties that Can Secretly be Subpoenaed

For decades, there were very few leak prosecutions in the United States in large part because the government would have to subpoena reporters to testify against a source to get a conviction. That proved incredibly difficult, if not impossible, when reporters regularly refused to testify and threatened to go to jail rather than betray a source.

More recently, there have been a record number of leak prosecutions largely because the government has learned they don’t need reporters to testify against their sources anymore. Instead, they can just secretly subpoena third-party services like Google or AT&T or Verizon or Facebook and get a treasure trove of digital information on reporters and sources’ communications. For example, the Associated Press had twenty of their phone lines subpoenaed without their knowledge in order to identify a source. The government also got a warrant for Fox News reporter James Rosen’s Gmail account without him knowing. In both cases, their alleged sources were prosecuted, even though journalists never directly divulged their sources.

SecureDrop completely eliminates third parties from the equation and puts the power to challenge such cases back in the hands of reporters. The journalist and source communicate exclusively through one server that the news organization owns and sits on their property, so any legal order for information must go directly to the news organization rather than Google or AT&T. The news organization again has the power to contest the order or refuse to comply if they so wish.

31.2 Limits the Metadata Trail as Much as Possible

In many leak cases, the metadata of a journalist’s communications—where you’re located, who you’re talking to, when you’re talking to them, and how often—can lead to trouble just as much as the actual content of your conversations.

Even if a government serves a court order directly to a news organization to compel the disclosure of information, SecureDrop logs much less information than email providers or phone companies do.

The source can only log into SecureDrop through Tor Browser, which masks the source’s IP address to begin with, so there is no indication who the source is (unless they disclose it) and where they are sending information from. The Tor IP address, the computer, and the browser type that the source is using is not logged either.

For each source, only the time and date of each submission is logged on the server. When a source sends a new message, the time and date of the last message is overwritten. This means that there won’t be a trail of metadata showing exactly when the source and journalist were talking.

In addition, sources cannot create a custom username that could reveal information about them. Instead, SecureDrop automatically generates two random codenames, one to show to the source and another to the journalists using the system.
31.3 Encrypted and Air-Gapped

Communications through SecureDrop are both encrypted in transit, so messages cannot be easily intercepted and read while they are traversing the Internet and are also encrypted on the server so if any attacker manages to break into the server, they would not be able to read past messages.

In addition, the decryption key for SecureDrop submissions sits on an air-gapped computer (not connected to the Internet). This air-gapped computer is the only place SecureDrop submissions are decrypted and read so that they are much harder for an attacker to access.

31.4 Protects Against Hackers

A 2014 study showed that 21 of the top 25 news organization had, at one time or another, been targeted by state sponsored hackers.

Because of this threat, SecureDrop completely segments its traffic from a news organization’s normal network. Submissions are accessed and downloaded using the Tails operating system, which boots off of a USB, does not touch your computer’s hard drive, and routes all its Internet traffic through Tor.

Submissions are decrypted on an air-gapped computer also using Tails. This mitigates against the risk that an attacker could send malware through SecureDrop in an attempt to infect the news organization’s normal network as well.

The SecureDrop servers also undergo significant system hardening in order to make it as difficult as possible for hackers to break in. By doing so, SecureDrop protects sources against networks that are already compromised, as well as a news organization’s normal network from attacks that could potentially come through SecureDrop.

31.5 Free and Open Source Software

100% of SecureDrop’s code is free and open source. Not only does this mean anyone can install SecureDrop themselves, but the code is available online for security experts to test for vulnerabilities.

SecureDrop has gone through four audits by third-party penetration testing firms and will continue to go through audits when major changes are made to the code base in the future. We always publish these audits publicly so everyone can be assured that SecureDrop is as safe to use as possible.
CHAPTER
THIRTYTWO

INVESTIGATING LOGS

When troubleshooting issues with your SecureDrop instance, be sure to examine all relevant log files on both servers. To work with logs, it is helpful to be familiar with commands like `less`, `tail` and `grep`; to inspect older, archived logs (names end with `.gz`) you can use commands like `zless` and `zgrep` to avoid manually decompressing each file.

Note: You can use the `securedrop-admin` tool to extract logs to send to Freedom of the Press Foundation for analysis. Run the following command on your `Admin Workstation`:

```
cd ~/Persistent/securedrop
./securedrop-admin logs
```

This command will produce encrypted tarballs containing logs from each server. See the command output for more information.

32.1 Logs to examine on both servers

- `/var/log/kern.log`: Use this file to investigate kernel-related issues, including warnings or errors specific to AppArmor or grsecurity (a set of patches applied to the kernels for additional security hardening)
- `/var/log/syslog`: Use this file to investigate most other system issues, including iptables configuration problems or Tor network issues. Use search patterns, e.g., search for “app Tor” to find log entries specific to Tor.

32.2 Application Server Logs

See the directory `/var/log/apache2/*` for web server access and error logs. In production systems, logging is only enabled for the `Journalist Interface` to the files `journalist-access.log` and `journalist-error.log`, and the logs do not contain IP address information.

When investigating an application error on the `Source Interface` (e.g., if you see an “Internal Server Error” when submitting a document), it can make sense to temporarily enable error logging. To do so:

1. Log into your `Application Server` from your `Admin Workstation` via `ssh app`
2. Edit the file `/etc/apache2/sites-enabled/source.conf` (requires `sudo`)
3. Comment out the old `ErrorLog` and `LogLevel` directives, e.g., like so:
4. Add the desired new logging configuration in the same location (inside the `<VirtualHost>` block), e.g.:

```
ErrorLog /var/log/apache2/source-error.log
LogLevel debug
```

5. Save the file and reload the configuration with `sudo service apache2 reload`

6. Visit the Source Interface and reproduce the error

7. Inspect the log file `/var/log/apache2/source-error.log` for any details

8. Remember to set the configuration back to the default values once your investigation is complete.

Note that the `debug` logging level is highly verbose; if you want to adjust it, see the Apache documentation for more information about the different logging levels.

If you encounter an application error, and you have not modified the application code, please be sure to file an issue or contact us via `securedrop@freedom.press` (GPG encrypted).

### 32.3 Monitor Server Logs

- `/var/ossec/logs/ossec.log`: Examine this file to investigate problems with OSSEC itself not functioning as expected (e.g., you are not seeing alerts when you would expect them to).

- `/var/ossec/logs/alerts/alerts.log`: This file contains the most recent alerts generated by OSSEC. If you have correctly configured OSSEC emails, the text of these alerts should correspond to the text of the emails.

- `/var/log/mail.log` and `/var/log/procmail.log`: These files contain information about email delivery and email processing (for encrypting the alerts). Investigate these files if you believe OSSEC is correctly configured, but you are not receiving emails.
33.1 Setting up OSSEC alerts

OSSEC is an open source host-based intrusion detection system (IDS) that we use to perform log analysis, file integrity checking, policy monitoring, rootkit detection and real-time alerting. It is installed on the Monitor Server and constitutes that machine’s main function. OSSEC works in a server-agent scheme, that is, the OSSEC server extends its existing functions to the Application Server through an agent installed on that server, covering monitoring for both machines.

In order to receive email alerts from OSSEC, you need to supply several settings to Ansible in the playbook for your environment. If you don’t already have a working mail server or don’t know what to do, then see the section below about using Gmail as a fallback option. We assume that you’re working out of the ‘securedrop’ directory you cloned the code into, and editing install_files/ansible-base/group_vars/all/site-specific prior to installing SecureDrop.

What you need:

- The OSSEC Alert Public Key
- The email address that will receive alerts from OSSEC
- Information for your SMTP server or relay (hostname, port)
- Credentials for the email address that OSSEC will send alerts from

Receiving email alerts from OSSEC requires that you have an SMTP relay to route the emails. You can use an SMTP relay hosted internally, if one is available to you, or you can use a third-party SMTP relay such as Gmail. The SMTP relay does not have to be on the same domain as the destination email address, i.e. smtp.gmail.com can be the SMTP relay and the destination address can be securedrop@freedom.press.

While there are risks involved with receiving these alerts, such as information leakage through metadata, we feel the benefit of knowing how the SecureDrop servers are functioning is worth it. If a third-party SMTP relay is used, that relay will be able to learn information such as the IP address the alerts were sent from, the subject of the alerts, and the destination email address the alerts were sent to. Only the body of an alert email is encrypted with the recipient’s GPG key. A third-party SMTP relay could also prevent you from receiving any or specific alerts.

The SMTP relay that you use should support SASL authentication and SMTP TLS protocols TLSv1.2, TLSv1.1, and TLSv1. Most enterprise email solutions should be able to meet those requirements.

Below are the values you must specify in to configure OSSEC correctly. For first-time installs, you can use the configuration playbook, or edit install_files/ansible-base/group_vars/all/site-specific manually.

- **OSSEC Alert Public Key**: ossec_alert_gpg_public_key
- **Fingerprint of key used when encrypting OSSEC alerts**: ossec_gpg_fpr
- **The email address that will receive alerts from OSSEC**: ossec_alert_email
- The reachable hostname of your SMTP relay: `smtp_relay`
- The secure SMTP port of your SMTP relay: `smtp_relay_port` (typically 25, 587, or 465. must support TLS encryption)
- Email username to authenticate to the SMTP relay: `sasl_username`
- Domain name of the email used to send OSSEC alerts: `sasl_domain`
- Password of the email used to send OSSEC alerts: `sasl_password`

If you don’t know what value to enter for one of these, please ask your organization’s email admin for the full configuration before proceeding. It is better to get these right the first time rather than changing them after SecureDrop is installed. If you’re not sure of the correct `smtp_relay_port` number, you can use a simple mail client such as Thunderbird to test different settings or a port scanning tool such as nmap to see what’s open. You could also use telnet to make sure you can connect to an SMTP server, which will always transmit a reply code of 220 meaning “Service ready” upon a successful connection.

The `smtp_relay` mail server hostname is often, but not always, different from the `sasl_domain`, e.g. `smtp.gmail.com` and `gmail.com`.

In some cases, authentication or transport encryption mechanisms will vary and you may require later edits to the Postfix configuration (mainly `/etc/postfix/main.cf`) on the **Monitor Server** in order to get alerts to work. You can consult Postfix’s official documentation for help, although we’ve described some common scenarios in the **troubleshooting section**.

If you have your **OSSEC Alert Public Key** public key handy, copy it to `install_files/ansible-base` and then specify the filename, e.g. `ossec.pub`, in the `ossec_alert_gpg_public_key` line of `group_vars/all/site-specific`.

If you don’t have your GPG key ready, you can run GnuPG on the command line in order to find, import, and export your public key. It’s best to copy the key from a trusted and verified source, but you can also request it from keyservers using the known fingerprint. Looking it up by email address or a shorter key ID format could cause you to obtain a wrong, malicious, or expired key. Instead, we recommend you type out your fingerprint in groups of four (just like GPG prints it) enclosed by double quotes. The reason we suggest this formatting for the fingerprint is simply because it’s easiest to type and verify correctly. In the code below simply replace `<fingerprint>` with your full, space-separated fingerprint:

Download your key and import it into the local keyring:

```
gpg --recv-key "<fingerprint>"
```

**Note:** It is important you type this out correctly. If you are not copy-pasting this command, we recommend you double-check you have entered it correctly before pressing enter.

Again, when passing the full public key fingerprint to the `--recv-key` command, GPG will implicitly verify that the fingerprint of the key received matches the argument passed.

**Caution:** If GPG warns you that the fingerprint of the key received does not match the one requested do not proceed with the installation. If this happens, please email us at securedrop@freedom.press.

Next we export the key to a local file.

```
gpg --export -a "<fingerprint>" > ossec.pub
```

Copy the key to a directory where it’s accessible by the SecureDrop installation:
The fingerprint is a unique identifier for an encryption (public) key. The short and long key ids correspond to the last 8 and 16 hexadecimal digits of the fingerprint, respectively, and are thus a subset of the fingerprint. The value for ossec_gpg_fpr must be the full 40 hexadecimal digit GPG fingerprint for this same key, with all capital letters and no spaces. The following command will retrieve and format the fingerprint per our requirements:

```
gpg --with-colons --fingerprint "<fingerprint>" | grep "^fpr" | cut -d: -f10
```

Next you specify the e-mail that you’ll be sending alerts to, as ossec_alert_email. This could be your work email, or an alias for a group of IT admins at your organization. It helps for your mail client to have the ability to filter the numerous messages from OSSEC into a separate folder.

Now you can move on to the SMTP and SASL settings, which are straightforward. These correspond to the outgoing e-mail address used to send the alerts instead of where you’re receiving them. If that e-mail is ossec@news-org.com, the sasl_username would be OSSEC and sasl_domain would be news-org.com.

The Postfix configuration enforces certificate verification, and requires both a valid certificate and STARTTLS support on the SMTP relay. By default the system CAs will be used for validating the relay certificate. If you need to provide a custom CA to perform the validation, copy the cert file to install_files/ansible-base add a new variable to group_vars/all/site-specific:

```yaml
smtp_relay_cert_override_file: MyOrg.crt
```

where MyOrg.crt is the filename. The file will be copied to the server in /etc/ssl/certs_local and the system CAs will be ignored when validating the SMTP relay TLS certificate.

Save group_vars/all/site-specific, exit the editor and proceed with the installation by running the playbooks.

### 33.1.1 Using Gmail for OSSEC alerts

It’s easy to get SecureDrop to use Google’s servers to deliver the alerts, but it’s not ideal from a security perspective. This option should be regarded as a backup plan. Keep in mind that you’re leaking metadata about the timing of alerts to a third party — the alerts are encrypted and only readable to you, however that timing may prove useful to an attacker.

First you should sign up for a new account. While it’s technically possible to use an existing Gmail account, it’s best to compartmentalize these alerts from any of your other activities. Choose a strong and random passphrase for the new account. Skip the creation of a Google+ profile and continue straight to Gmail. Next, enable Google’s 2-Step Verification. With 2-Step Verification enabled, you won’t use the normal account password in this configuration — it will not work; instead you must navigate (using the settings in the top right) to Account > Signing in > App passwords, and generate a new App password which you will use as the sasl_passwd.

Once the account is created you can log out and provide the values for sasl_username as your new Gmail username (without the domain), sasl_domain, which is typically gmail.com (or your custom Google Apps domain), and sasl_passwd. Remember to use the App password generated from the 2-step config for sasl_passwd, as the primary account password won’t work. The smtp_relay is smtp.gmail.com and the smtp_relay_port is 587.
33.1.2 Configuring fingerprint verification

If you run your own mail server, you may wish to increase the security level used by Postfix for sending mail to fingerprint, rather than secure. Doing so will require an exact match for the fingerprint of TLS certificate on the SMTP relay. The advantage to fingerprint verification is additional security, but the disadvantage is potential maintenance cost if the fingerprint changes often. If you manage the mail server and handle the certificate rotation, you should update the SecureDrop configuration whenever the certificate changes, so that OSSEC alerts continue to send. Using fingerprint verification does not work well for popular mail relays such as smtp.gmail.com, as those fingerprints can change frequently, due to load balancing or other factors.

You can retrieve the fingerprint of your SMTP relay by running the command below (all on one line). Please note that you will need to replace smtp.gmail.com and 587 with the correct domain and port for your SMTP relay.

```
openssl s_client -connect smtp.gmail.com:587 -starttls smtp < /dev/null 2>/dev/null |
    openssl x509 -fingerprint -noout -in /dev/stdin | cut -d'|'= -f2
```

If you are using Tails, you will not be able to connect directly with `openssl s_client` due to the default firewall rules. To get around this, proxy the requests over Tor by adding `torify` at the beginning of the command. The output of the command above should look like the following:

```
```

Finally, add a new variable to `group_vars/all/site-specific` as `smtp_relay_fingerprint`, like so:

```
```

Specifying the fingerprint will configure Postfix to use it for verification on the next playbook run. (To disable fingerprint verification, simply delete the variable line you added, and rerun the playbooks.) Save `group_vars/all/site-specific`, exit the editor and proceed with the installation by running the playbooks.

33.2 Troubleshooting

Some OSSEC alerts should begin to arrive as soon as the installation has finished.

The easiest way to test that OSSEC is working is to SSH to the Monitor Server and run `service ossec restart`. This will trigger an Alert level 3 saying: “Ossec server started.”

So you’ve finished installing SecureDrop, but you haven’t received any OSSEC alerts. First, check your spam/junk folder. If they’re not in there, then most likely there is a problem with the email configuration. In order to find out what’s wrong, you’ll have to SSH to the Monitor Server and take a look at the logs. To examine the mail log created by Postfix, run the following command:

```
tail /var/log/mail.log
```

The output will show you attempts to send the alerts and provide hints as to what went wrong. Here’s a few possibilities and how to fix them:
<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection timed out</td>
<td>Check that the hostname and port is correct in the relayhost line of /etc/postfix/main.cf</td>
</tr>
<tr>
<td>Server certificate not verified</td>
<td>Check that the relay certificate is valid (for more detailed help, see Troubleshooting SMTP TLS). Consider adding smtp_relay_cert_override_file to prod_specific.yml as described above.</td>
</tr>
<tr>
<td>Authentication failure</td>
<td>Edit /etc/postfix/sasl_passwd and make sure the username, domain and password are correct. Run postmap /etc/postfix/sasl_passwd to update when finished.</td>
</tr>
</tbody>
</table>

After making changes to the Postfix configuration, you should run `service postfix reload` and test the new settings by restarting the OSSEC service.

**Tip:** If you change the SMTP relay port after installation for any reason, you must update the `smtp_relay_port` variable in the `group_vars/all/site-specific` file, then rerun the Ansible playbook. As a general best practice, we recommend modifying and rerunning the Ansible playbook instead of manually editing the files live on the servers, since values like `smtp_relay_port` are used in several locations throughout the config.

### 33.2.1 Useful log files for OSSEC

Other log files that may contain useful information:

/\var/log/procmail.log
   Includes lines for sending mail containing OSSEC alerts.

/\var/log/syslog
   Messages related to grsecurity, AppArmor and iptables.

/\var/ossec/logs/ossec.log
   OSSEC's general operation is covered here.

/\var/ossec/logs/alerts/alerts.log
   Contains details of every recent OSSEC alert.

**Tip:** Remember to encrypt any log files before sending via email, for example to `securedrop@freedom.press`, in order to protect security-related information about your organization’s SecureDrop instance.
33.2.2 Not receiving emails

Some mail servers require that the sending email address match the account that authenticated to send mail. By default the Monitor Server will use ossec@ossec.server for the from line, but your mail provider may not support the mismatch between the domain of that value and your real mail host. If the Admin email address (configured as ossec_alert_email in group_vars/all/site-specific) does not start receiving OSSEC alerts updates shortly after the first playbook run, try setting ossec_from_address in group_vars/all/site-specific to the full email address used for sending the alerts, then run the playbook again.

33.2.3 Message failed to encrypt

If OSSEC cannot encrypt the alert to the OSSEC Alert Public Key for the Admin email address (configured as ossec_alert_email in group_vars/all/site-specific), the system will send a static message instead of the scheduled alert:

Failed to encrypt OSSEC alert. Investigate the mailing configuration on the Monitor Server.

Check the GPG configuration vars in group_vars/all/site-specific. In particular, make sure the GPG fingerprint matches that of the public key file you exported.

33.2.4 Troubleshooting SMTP TLS

Your choice of SMTP relay server must support STARTTLS and have a valid server certificate. By default, the Monitor Server’s Postfix configuration will try to validate the server certificate using the default root store (in Ubuntu, this is maintained in the ca-certificates package). You can override this by setting smtp_relay_cert_override_file as described earlier in this document.

In either situation, it can be helpful to use the openssl command line tool to verify that you can successfully connect to your chosen SMTP relay securely. We recommend doing this before running the playbook, but it can also be useful as part of troubleshooting OSSEC email send failures.

In either case, start by attempting to make a STARTTLS connection to your chosen smtp_relay:smtp_relay_port (get the values from your group_vars/all/site-specific file). On a machine running Ubuntu, run the following openssl command, replacing smtp_relay and smtp_relay_port with your specific values:

```
openssl s_client -showcerts -starttls smtp -connect smtp_relay:smtp_relay_port < /dev/null 2> /dev/null
```

Note that you will not be able to run this command on the Application Server because of the firewall rules. You can run it on the Monitor Server, but you will need to run it as the Postfix user (again, due to the firewall rules):

```
sudo -u postfix openssl s_client -showcerts -starttls smtp -connect smtp.gmail.com:587 < /dev/null 2> /dev/null
```

If the command fails with “Could not connect” or a similar message, then this mail server does not support STARTTLS. Verify that the values you are using for smtp_relay and smtp_relay_port are correct. If they are, you should contact the admin of that relay and talk to them about supporting STARTTLS, or consider using another relay that already has support.

If the command succeeds, the first line of the output should be “CONNECTED” followed by a lot of diagnostic information about the connection. You should look for the line that starts with “Verify return code”, which is usually one of the last lines of the output. Since we did not give openssl any information about how to verify certificates in the previous command, it should be a non-zero value (indicating verification failed). In my case, it is Verify return code: 20 (unable to get local issuer certificate), which indicates that openssl does not know how to build the certificate chain to a trusted root.
If you are using the default verification setup, you can check whether your cert is verifiable by the default root store with `-CApath`:

```
openssl s_client -CApath /etc/ssl/certs -showcerts -starttls smtp -connect smtp_relay:smtp_relay_port < /dev/null 2> /dev/null
```

For example, if I’m testing Gmail as my SMTP relay (smtp.gmail.com:587), running the `openssl` with the default root store results in `Verify return code: 0 (ok)` because their certificate is valid and signed by one of the roots in the default store. This indicates that can be successfully used to securely relay email in the default configuration of the Monitor Server.

If your SMTP relay server does not successfully verify, you should use the return code and its text description to help you diagnose the cause. Your cert may be expired, in which case you should renew it. It may not be signed by a trusted CA, in which case you should obtain a signature from a trusted CA and install it on the mail server. It may not have the right hostnames in the Common Name or Subject Alternative Names, in which case you will need to generate a new CSR with the correct hostnames and then obtain a new certificate and install it. Etc., etc.

If you are not using the the default verification setup, and intentionally do not want to use a certificate signed by one of the default CA’s in Ubuntu, you can still use `openssl` to test whether you can successfully negotiate a secure connection. Begin by copying your certificate file (`smtp_relay_cert_override_file` from `group_vars/all/site-specific`) to the computer you are using for testing. You can use `-CAfile` to test if your connection will succeed using your custom root certificate:

```
openssl s_client -CAfile /path/to/smtp_relay_cert_override_file -showcerts -starttls smtp -connect smtp_relay:smtp_relay_port < /dev/null 2> /dev/null
```

Finally, if you have a specific server in mind but are not sure what certificate you need to verify the connection, you can use the output of `openssl s_client` to figure it out. Since we have `-showcerts` turned on, `openssl` prints the entire certificate chain it receives from the server. A properly configured server will provide all of the certificates in the chain up to the root cert, which needs to be identified as “trusted” for the verification to succeed. To see the chain, find the part of the output that start with `Certificate chain`. It will look something like this (example from smtp.gmail.com, with certificate contents snipped for brevity):

```
---
Certificate chain
  0 s:/C=US/ST=California/L=Mountain View/O=Google Inc/CN=smtp.gmail.com
  i:/C=US/O=Google Inc/CN=Google Internet Authority G2
------BEGIN CERTIFICATE------
    <snip>
------END CERTIFICATE------
  1 s:/C=US/O=Google Inc/CN=Google Internet Authority G2
  i:/C=US/O=GeoTrust Inc./CN=GeoTrust Global CA
------BEGIN CERTIFICATE------
    <snip>
------END CERTIFICATE------
  2 s:/C=US/O=GeoTrust Inc./CN=GeoTrust Global CA
  i:/C=US/O=Equifax/OU=Equifax Secure Certificate Authority
------BEGIN CERTIFICATE------
    <snip>
------END CERTIFICATE------
---
```

The certificates are in reverse order from leaf to root. `openssl` handily prints the Subject (s:) and Issuer (i:) information for each cert. In order to find the root certificate, look at the Issuer of the last certificate. In this case, that’s Equifax Secure Certificate Authority. This is the root certificate that issued the first certificate in the chain, and it is what you need to tell Postfix to use in order to trust the whole connection.

---

33.2. Troubleshooting 231
Actually obtaining this certificate and establishing trust in it is beyond the scope of this document. Typically, if you are using your own SMTP relay with a custom CA, you will be able to obtain this certificate from an intranet portal or someone on your IT staff. For a well-known global CA, you can obtain it from the CA’s website. For example, a quick search for “Equifax Secure Certificate Authority” finds the web page of GeoTrust’s Root Certificates, which have accompanying background information and are available for download.

Once you have the root certificate file, you can use `-CAfile` to test that it will successfully verify the connection.

### 33.3 Analyzing the alerts

Understanding the contents of the OSSEC alerts requires a background and knowledge in Linux systems administration. They may be confusing, and at first it will be hard to tell between a genuine problem and a fluke. You should examine these alerts regularly to ensure that the SecureDrop environment has not been compromised in any way, and follow up on any particularly concerning messages with direct investigation.

An initial SecureDrop install will generate quite a few alerts as OSSEC is installed early in the install process. As part of the administration of a SecureDrop instance, regularly looking through the generated alerts provides administrators with information on the overall health of the SecureDrop instance.

OSSEC alerts will range from a severity level of 1 (lowest) to 14 (highest), and as a baseline, you should expect to see the following alerts:

#### 33.3.1 Common OSSEC alerts

**Package updates**

The SecureDrop Application and Monitor Servers check for package updates every day. As updates are automatically installed, OSSEC will notice and send out alerts. You may see any number of these alerts in the email, as several alerts can be batched in a single email. You should also see them in an email named Daily Report: File Changes. To verify this activity matches the package history, you can review the logs in `/var/log/apt/history.log`.

```
Received From: (app)
Rule: 2902 fired (level 7) -> "New (Debian Package) installed."
Portion of the log(s):
status installed <package name> <version>
```

In addition to letting you know what packages were updated, OSSEC will send alerts about the specific changes to the files in these packages.

```
Received From: (app)
Rule: 550 fired (level 7) -> "Integrity checksum changed."
Portion of the log(s):

Integrity checksum changed for: '/usr/sbin/<binary name>'
Old md5sum was: '<old md5sum>'
New md5sum is: '<new md5sum>'
Old sha1sum was: '<old sha1sum>'
New sha1sum is: '<new sha1sum>'
```

These are normal alerts, and tell you that your SecureDrop servers are properly up-to-date and patched. Changes to configuration files, or files files unrelated to an expected package may warrant further investigation.
Occasionally your SecureDrop Servers will send an alert for failing to connect to Tor relays. Since SecureDrop runs as a Tor Onion Service, it is possible for Tor connections to timeout or become overloaded.

<table>
<thead>
<tr>
<th>Received From: (app)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule: 1002 fired (level 2) -&gt; &quot;Unknown problem somewhere in the system.&quot;</td>
</tr>
<tr>
<td>Portion of the log(s):</td>
</tr>
<tr>
<td>[warn] Your Guard &lt;name&gt; ($fingerprint) is failing a very large amount of circuits. Most likely this means the Tor network is overloaded, but it could also mean an attack against you or potentially the guard itself.</td>
</tr>
</tbody>
</table>

This alert is common but if you see them for sustained periods of time (several times a day), please contact us at the SecureDrop Support Portal or at securedrop@freedom.press for help.

**Daily reports**

On days where file integrity checksums have changed or users have logged into app or mon servers, you will receive emails entitled Daily report: File changes or Daily report: Successful logins. These emails may be a more convenient format should you not have continuous access to the inbox or GPG key.

**Action**: periodically review these daily reports to ensure file changes correspond to platform updates and logins correspond to authorized admin activity on the SecureDrop servers.

If you have any suggestions on how to further tune or improve the alerting, you can open an issue on GitHub.

### 33.3.2 Uncommon OSSEC alerts

#### Data integrity

SecureDrop runs automatic checks for submission data integrity problems. For example, secure deletion of large submissions could potentially be interrupted:

| Received From: (app) 10.20.2.2->/opt/venvs/securedrop-app-code/bin/python3 /var/www/...securedrop/manage.py check-disconnected-fs-submissions |
| Rule: 400801 fired (level 1) -> "Indicates that there are files in the submission area...without corresponding submissions in the database." |
| Portion of the log(s): |
| ossec: output: '/opt/venvs/securedrop-app-code/bin/python3 /var/www/securedrop/manage.py...check-disconnected-fs-submissions': There are files in the submission area with no...corresponding records in the database. Run "manage.py list-disconnected-fs-submissions..." for details. |

To resolve the issue, you can *clean them up.*
**Instance misconfigurations**

In addition, SecureDrop performs a small set of daily configuration checks to ensure that the iptables rules configured on the Application and Monitor Server match the expected configuration. If they do not, you may receive a level 12 alert like the following:

```
Received From: (app) 10.20.2.2->/var/ossec/checksdconfig.py
Rule: 400900 fired (level 12) ->
"Indicates a problem with the configuration of the SecureDrop servers."
Portion of the log(s):
  ossec: output: '/var/ossec/checksdconfig.py': System configuration error:
The iptables default drop rules are incorrect.
```

Alternatively, the error text may say: The iptables rules have not been configured. To resolve the issue, you can reinstate the standard iptables rules by updating the system configuration.

**securedrop-admin commands**

OSSEC will send an alert when the securedrop-admin tool is used to backup, restore, or change the system configuration:

```
Rule: 400001 fired (level 13) -> "Ansible playbook run on server (securedrop-admin, --install, backup, or restore)."
```

**Action**: You should ensure that this action was performed by you or a fellow administrator.

If you believe that the system is behaving abnormally, you should contact us at the SecureDrop Support Portal or securedrop@freedom.press for help.
Because Tails is supposed to be as amnesiac as possible, you want to shield your Tails stick from any extra inputs from, and outputs to, a potentially untrusted network. This is why we strongly recommend using a printer that does not have WiFi or Bluetooth, and connecting to it using a regular USB cable to print.

Finding a printer that works with Tails can be challenging because Tails is based on the Linux operating system, which often has second-class hardware support in comparison to operating systems such as Windows or macOS.

We maintain a list of printers that we have personally tested and gotten to work with Tails, in the Hardware guide; if possible, we recommend using one of those printers. The Linux Foundation also maintains the OpenPrinting database, which documents the compatibility, or lack thereof, of numerous printers from almost every manufacturer.

Note: The latest generations of printers might or might not be represented by the OpenPrinting database; also, the database does not document whether or not a printer is wireless, so this will involve manually checking models of interest, if you wish to use this resource as a guide for purchasing a non-wireless printer suitable for use with SecureDrop.

With that in mind, this database is arguably the best resource for researching the compatibility of printers with Linux. As a tip for narrowing down your search, look for printers that are compatible with Debian, or Debian-based distributions like Ubuntu, since Tails itself is also Debian-based. This might increase the chances for a seamless installation experience in Tails.

In any case, this document outlines the usual set of steps that we follow when attempting to use a new printer with Tails.

### 34.1 Installing and Printing via the Tails GUI

Let’s look at the flow in Tails 4 for installing a USB-connected printer. On the Tails welcome screen, unlock your persistent volume, and set an admin password. This ensures that you won’t have to reinstall the printer each time you start Tails.

Connect the printer to your Tails-booted computer via USB, then turn the printer on.

Now, you’ll want to single-click your way through Applications ▶ System Tools ▶ Settings, then select Printers.

If this is the first time you’ve tried to install a printer, the “Printers” section will look like this:
Click **Add a Printer**. After a brief period during which Tails searches for printers, you should see a list of printers that Tails has auto-detected:

In this example we’ve connected a virtual printer, but the process for adding a real printer is identical. Clicking on the name of your printer in the list will select it for installation. The installation can take a few seconds, during which it looks like nothing is happening.

Assuming you receive no errors in this process, you will then see a screen like the following one, which indicates that the printer is ready for printing.
34.2 Printing from the Command Line

After you have configured your printer, you can also easily print from the command line using the `lp` command. If you haven’t already set your installed printer as default in the GUI, you can quickly do so by adding this line to your `~/.bashrc` file, or entering this directly into the terminal:

```
export PRINTER=Printer-Name-Here
```

If you need to find the name of the printer, you can use `lpstat` to get a list of installed printers, as such:

```
lpstat -a
```

Once you’ve set your default printer, you can easily print from the terminal by using the following syntax:

```
lp filename.extension
```

While printing from the GUI is much easier, once you’ve got everything set up, it’s equally straightforward from the command line, if you prefer that environment.
HTTPS ON THE SOURCE INTERFACE

The SecureDrop Source Interface is served as an onion service with an .onion URL, requiring Tor Browser to access it. While onion services provide end-to-end encryption by default, as well as strong anonymity, there are several reasons why you might want to consider deploying an additional layer of encryption and authentication via HTTPS:

- Extended Validation (EV) certificates, which are currently the only type of certificates that may be issued for *.onion addresses, are intended to attest to the identity of the organization running a service. This provides an additional measure of authenticity (in addition to the organization’s Landing Page and the SecureDrop Directory) to help assure sources that they are communicating with the intended organization when they access a given Source Interface.

- SecureDrop supports v3 onion services, which use updated cryptographic primitives that provide better transport-layer encryption than those used by v2 onion services. Using HTTPS on the source interface will provide an extra layer of encryption for data in transit.

35.1 Obtaining an HTTPS certificate for Onion URLs

35.1.1 Digicert

Digicert is one of only two Certificate Authorities (CA) that issue HTTPS certificates for .onion sites. Digicert requires organizations to follow the Extended Validation (EV) process in order to obtain a certificate for an Onion URL, so you should start by reviewing Digicert’s documentation for obtaining a .onion certificate.

The EV certificates display information about an organization under the certificate icon beside the URL bar:

Additional information about the organization, such as name and geographic location, are checked by the CA during the EV process. A Source can use this information to confirm the authenticity of a SecureDrop instance, beyond the verification already available in the SecureDrop Directory.

In order to obtain an HTTPS certificate for your SecureDrop instance, contact Digicert directly. As part of the Extended Validation, you will be required both to confirm your affiliation with the organization, and to demonstrate control over the Onion URL for your Source Interface.

In order for you to demonstrate control over the Onion URL for your Source Interface, you will need to perform a signing operation leveraging the private key of the Onion service used on the Source Interface. Digicert will provide you with some text and request that you use that text in a signing operation. At a high level, obtaining a certificate from Digicert involves:

1. Generating an HTTPS keypair and CSR via openssl.
2. Submitting the CSR to DigiCert. (This CSR demonstrates control over the private key used for HTTPS.)

3. Scheduling a phone call and verifying your relationship to the organization.

4. Generating another CSR, using a custom tool, leveraging the Onion service private key.

5. Submitting the second CSR to DigiCert. (This CSR demonstrates control over the private key for the onion service.)

6. Downloading the certificate from the DigiCert panel.

7. Installing the cert on the SecureDrop Application Server, via securedrop-admin.

For SecureDrop, you should perform these steps on the Admin Workstation. Below are detailed steps for use on Tails:

```
# On the Admin Workstation, generate the first CSR
$ mkdir ~/Persistent/sd-https-key-generation
$ cd ~/Persistent/sd-https-key-generation
$ openssl req -new -newkey rsa:4096 -nodes -keyout sd.key -out sd.csr
```

That command will generate two files: sd.key, the private key that will be used by the SecureDrop Application Server; and sd.csr, the certificate signing request (CSR), that will be sent to certificate authority in order to receive a certificate. Upload that CSR to the DigiCert website, to begin the request. After passing the EV organization verification, you’ll receive an email with a nonce. Use that value to generate the second CSR:

```
# On the Admin Workstation, generate the second CSR
$ source ~/Persistent/securedrop/admin/.venv3/bin/activate
$ torify pip install onionmaker
# Copy the Onion service key material to the Admin Workstation:
$ mkdir hsdir
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hostname > hsdir/hostname
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hs_ed25519_public_key > hsdir/hs_ed25519_public_key
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hs_ed25519_secret_key > hsdir/hs_ed25519_secret_key
# Generate (second) CSR
$ onionmaker <nonce> hsdir
```

The CSR will be printed to stdout, starting with BEGIN CERTIFICATE REQUEST. Save that CSR, and send it via email reply to DigiCert. After you receive your final certificate, see instructions below for installing the certificate on the SecureDrop Application Server.

### 35.1.2 Harica

The Greek CA Harica is now providing Domain Validation (DV) certificates for .onion addresses. DV certificates are less useful for authentication purposes, but may still be used to provide another layer of encryption for source traffic. The commands provide detail on how to obtain a DV certificate from Harica on the Admin Workstation:

```
# On the Admin Workstation
$ cd ~/
$ git clone --recurse-submodules https://github.com/HARICA-official/onion-csr.git
$ cd onion-csr
$ sudo apt-get update && sudo apt-get install -y ruby-dev rubygems build-essential
# If prompted, choose to install the packages "Only once"
$ torify gem install --user-install ffi
$ gcc -shared -o libed25519.so -fPIC ed25519/src/*.c
```

(continues on next page)
# Confirm the binary works by checking that "help" info is displayed:
$ ./onion-csr.rb -h

# Copy the Onion service key material to the Admin Workstation:
$ mkdir hsdir
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hostname > hsdir/hostname
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hs_ed25519_public_key > hsdir/hs_...ed25519_public_key
$ ssh app sudo cat /var/lib/tor/services/sourcev3/hs_ed25519_secret_key > hsdir/hs_...ed25519_secret_key

# Generate CSR
$ ./onion-csr.rb -n <nonce> -d ./hsdir

35.2 Activating HTTPS in SecureDrop

Make sure you have *installed SecureDrop already*.

First, on the *Admin Workstation*:

```sh
cd ~/Persistent/securedrop
```

Make note of the Source Interface Onion URL. Now from `~/Persistent/securedrop` on your admin workstation:

```sh
./securedrop-admin sdconfig
```

This command will prompt you for the following information:

<table>
<thead>
<tr>
<th>Whether HTTPS should be enabled on Source Interface (requires EV cert): yes</th>
<th>Local filepath to HTTPS certificate (optional, only if using HTTPS on source interface): sd.crt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local filepath to HTTPS certificate key (optional, only if using HTTPS on source...interface): sd.key</td>
<td></td>
</tr>
<tr>
<td>Local filepath to HTTPS certificate chain file (optional, only if using HTTPS on source...interface): ca.crt</td>
<td></td>
</tr>
</tbody>
</table>

The filenames should match the names of the files provided to you by DigiCert, and should be saved inside the `install_files/ansible-base/` directory. You’ll rerun the configuration scripts:

```sh
./securedrop-admin install
```

The webserver configuration will be updated to apply the HTTPS settings. Confirm that you can access the Source Interface at `https://<onion_url>`, and also that the HTTP URL `http://<onion_url>` redirects automatically to HTTPS.

**Note:** By default, Tor Browser will send an OCSP request to a Certificate Authority (CA) to check if the Source Interface certificate has been revoked. Fortunately, this occurs through Tor. However, this means that a CA or anyone along the path can learn the time that a Tor user visited the SecureDrop Source Interface. Future versions of SecureDrop will add OCSP stapling support to remove this request. See [OCSP discussion](#) for the full discussion.
Under a production installation post-install, the default way to gain SSH administrative access is over the Tor network. This provides a number of benefits:

- Allows remote administration outside of the local network.
- Provides anonymity to an administrator while logging into the SecureDrop servers.
- Can mitigate against an attacker on your local network attempting to exploit vulnerabilities against the SSH daemon.

Most administrators will need SSH access during the course of running a SecureDrop instance and a few times a year for maintenance. So the potential shortfalls of having SSH over Tor are not usually a major issue. The cons of having SSH over Tor can include:

- Slow and delayed remote terminal performance
- Allowing SSH access from outside of your local network can be seen as a potential larger security hole for some organizations, particularly those with tight network security controls.

That being said, the default setting of only allowing SSH over Tor is a good fit for most organizations. If you happen to require SSH restricted to the local network instead please continue to read.

### 36.1 Configuring SSH for Local Access

**Warning:** It is important that your firewall is configured adequately if you decide you need SSH over the local network. The install process locks down access as much as possible with net restrictions, SSH keys, and two-factor authentication. However, you could still leave the interface exposed to unintended users if you did not properly follow our network firewall guide.

**Warning:** This setting will lock you out of SSH access to your instance if your Admin Workstation passes through a NAT in order to get to the SecureDrop servers. If you are unsure whether this is the case, please consult your firewall configuration or network administrator.

**Note:** Whichever network you install from will be the one that SSH is restricted to post-install. This will come into play particularly if you have multiple network interfaces.

First, make sure your local SecureDrop environment is up-to-date and on the latest production release.
$ cd ~/Persistent/securedrop
$ ./securedrop-admin update
$ ./securedrop-admin setup

The setting that controls SSH over LAN access is set during the sdconfig step of the install. Below is an example of what the prompt will look like. You can answer either ‘no’ or ‘false’ when you are prompted for Enable SSH over Tor:

$ ./securedrop-admin sdconfig

Username for SSH access to the servers: vagrant
Local IPv4 address for the Application Server: 10.0.1.4
Local IPv4 address for the Monitor Server: 10.0.1.5
Hostname for Application Server: app
Hostname for Monitor Server: mon

[...]
Enable SSH over Tor (recommended, disables SSH over LAN). If you respond no, SSH will be available over LAN only: no

Then you’ll have to run the installation script:

$ ./securedrop-admin install

Note: If you are migrating from a production install previously configured with SSH over Tor, you will be prompted to re-run the install portion twice. This is due to the behind the scenes configuration changes being done to switch between Tor and the local network.

Finally, re-configure your Admin Workstation as follows:

$ ./securedrop-admin tailsconfig

Assuming everything is working you should be able to gain SSH access as follows:

$ ssh app
$ ssh mon
37.1 Day 1: Install

37.1.1 Installing SecureDrop

Installation may be started by admins ahead of schedule to save on-site time.

Time: 6+ hours

Participants: SecureDrop Admins

Format: For assisted installs, in-person or hybrid-remote (FPF remote, admins in-person)

- Follow *Installing SecureDrop*

37.2 Day 2: Admin and Digital Security Training

37.2.1 Admin Training

Time: 4+ hours

Participants: SecureDrop Admins

Format: In-person or hybrid-remote (FPF remote, admins in-person)

- Check access to previously created Tails USB
- Updating Tails
- Setup KeePassXC manager (one for *Secure Viewing Station*, one for *Admin Workstation*)
- Setting up SSH aliases for the *Admin Workstation* if needed
- Go over common OSSEC alerts for security updates and daily reports
- Adding/removing SecureDrop users
- Backups
- Disk space monitoring
- Changing passphrases (for FDE, persistent volumes, 2FA, KeePassXC managers…)
- Enabling logging for troubleshooting
- Sending logs to FPF support team
- Preparing *Journalist Workstation* drives
• Updating SecureDrop
  – Unattended upgrades
  – Upgrades that require admin intervention
• Distribute important info:
  – https://docs.securedrop.org
  – Admin Best Practice Guide
  – Hardware for SecureDrop
  – Overview guidelines

37.2.2 Digital Security 101

Time: 2 hours
Participants: Journalists to be onboarded to SecureDrop, admins, OSSEC alert recipients and anyone else interested
Format: In-person or remote
  • Risk assessment and threat modeling
  • Account security fundamentals
    – Passphrases and Password Managers
    – Two-factor authentication (2FA)
  • Phishing prevention
  • Web browser security
  • IP address privacy, VPNs and Tor
  • Secure communication tools for colleagues and sources
  • Q & A

37.3 Day 3: Journalist Training and Onboarding

37.3.1 Journalist Training, Part 1

Time: 2.5 hours
Participants: Journalists to be onboarded to SecureDrop, admins, OSSEC alert recipients and anyone else interested
Format: In-person or remote
  • Introduction to Tails and its features
  • Importance of the Landing Page security
  • Demo of source submission process
  • Demo of journalist’s processes for checking the Journalist Interface
  • Demo of journalist’s processes for replies
  • Demo working with submissions on the Secure Viewing Station
  • Secure-deleting and difference between wipe and erase free space on Tails, and when to use each
• Discuss scrubbing submitted documents prior to publication
  – Using MAT (Metadata Anonymisation Toolkit)
  – Converting files to more benign formats
  – What to do for unsupported formats
• Options for distributing with other news organizations
• Show example of an OSSEC alert, briefly cover what it does
• Overview of onion names
• Physical security of servers and Secure Viewing Station
• How to securely publicize the organization’s Source Interface Tor URL
• Distribute important info:
  – https://securedrop.org
  – Source Best Practice Guide
  – Journalist Best Practice Guide
• Link to security audits
• Q & A

37.3.2 Journalist Training, Part 2

**Time:** 1+ hours, depending on the number of journalists being onboarded

**Participants:** Journalists to be onboarded to SecureDrop, admins

**Format:** In-person or hybrid-remote (FPF remote, journalists and admins in-person)

• Check access to previously created Tails USB drives
• Create SecureDrop accounts for individual journalists
• Setup KeePassXC for Journalist Workstation drive
• Disaster recovery for 2FA and password manager
• Updating Tails
• If needed, process for distributing the Submission Private Key to a remote journalist’s air-gapped Secure Viewing Station
• Do complete journalist process walk through once, and repeat for each individual journalist being onboarded
This guide describes in detail how to set up a YubiKey for two-factor authentication on the Journalist Interface. This setup is performed once per journalist to create a secure log-in method. The process requires some configuration steps using a separate software tool.

Note: You will do all of these steps from within the Tails operating system.

38.1 What is a YubiKey?

A YubiKey is a physical token used for two-factor authentication. They are made by a company called Yubico and are commercially available. Note that not all physical tokens are compatible with the YubiKey Personalization Tool; for this, you require a key that can support OATH-HOTP.

38.2 Download and Launch the YubiKey Personalization Tool

1. Start Tails. At the log in-screen, choose the option to allow an administrator passphrase.

2. Open a terminal and enter

```
sudo apt-get update;
sudo apt-get install yubikey-personalization-gui
```

1. Once you have downloaded and installed the personalization program, open a Root Terminal by choosing Applications ▶ System Tools ▶ Root Terminal.

2. Open the YubiKey personalization tool by entering

```
yubikey-personalization-gui
```
38.3 Setting Up Hardware-Based Codes

After opening the personalization tool, click the heading OATH-HOTP. This will bring you to a window called Program in OATH-HOTP mode.

Click on the Quick button.

Under Configuration Slot, click Configuration Slot 1.

Note: If you are already using this YubiKey for something else, you should choose Configuration Slot 2. You will have to press and hold for several seconds to use the token from Slot 2 instead of the one in Slot 1. See the YubiKey manual for more information.

In the section titled OATH-HOTP parameters, uncheck the box for OATH Token Identifier (6 bytes). Leave the HOTP length at 6 digits. Next, uncheck the box for Hide secret. This will display the Secret Key (20 bytes Hex) field.

Important: Make a note somewhere safe of the Secret Key (20 bytes Hex) value.
When ready, click the **Write Configuration** button.

Click through the warning about overwriting the configuration slot and choose a location to save the log file. When the configuration is done, you should see green text saying **YubiKey configured** at the top of the window.
38.4 Adding Users

When adding new users, a SecureDrop admin will need the Secret Key value described above. She will enter it after selecting the I’m Using a YubiKey option while adding users. The new user will then have to verify their YubiKey before being added to the system. This means that the new user and the admin should be physically present for this process.
38.5 Using Your YubiKey

When using a Yubikey to log-in to the Journalist Interface, insert the Yubikey into the USB port and enter your username and passphrase. Then click the Two-factor Code field to focus the cursor there. Quickly press the lighted button on your YubiKey. This will insert the 6-digit code that you will need to log in.

Note: When using Configuration Slot 2, be sure to press and hold the YubiKey button for approximately 3 seconds. This can be somewhat finicky.
Maintaining regular backups helps guard against data loss and hardware failure. Having a recent backup will allow you to redeploy SecureDrop without changing onion URLs, recreating journalist accounts, or losing previous submissions from sources.

**Note:** Only the *Application Server* is backed up and restored, including historical submissions and both *Source Interface* and *Journalist Interface* URLs. The *Monitor Server* needs to be configured from scratch in the event of a hardware migration.

### 39.1 Minimizing Disk Use

Since the backup and restore operations both involve transferring *all* of your SecureDrop’s stored submissions over Tor, the process can take a long time.

Encouraging journalists to regularly delete older, unneeded submissions from the *Journalist Interface* will save time and improve reliability when doing backups.

**Tip:** Although it varies, the average throughput of an onion service is about 3 Mbps, or roughly 90 minutes for 2GB. Plan your backup and restore accordingly.

On the *Application Server*, open a Terminal on the Admin Workstation and run

```
ssh app sudo du -sh /var/lib/securedrop/store
```

Compare the output of this command (which approximates the size of a backup archive) to the amount of free space on your Tails persistent volume via Tails’ *Disks* utility to ensure you have sufficient space to perform a backup.

If you find you cannot perform a backup or restore due to this constraint, and have already deleted old submissions from the *Journalist Interface*, contact us through the SecureDrop Support Portal.

**Note:** Submissions are deleted asynchronously and one at a time, so if you delete a lot of submissions through the *Journalist Interface*, it may take a while for all of the submissions to actually be deleted. SecureDrop uses `shred` to securely erase files, which takes significantly more time than normal file deletion. You can monitor the progress of queued deletion jobs by logging in to the *Application Server* over SSH and running:

```
sudo journalctl -u securedrop_rqworker
```
39.2 Backing Up

Open a **Terminal** on the *Admin Workstation* and cd to ~/Persistent/securedrop.

Run `git describe --exact-match` to verify that your workstation is running the latest version of SecureDrop, 2.4.2. If not, you should update it before proceeding.

### 39.2.1 Check Connectivity

Verify that your *Admin Workstation* is able to run Ansible and connect to the SecureDrop servers.

```bash
ssh app uptime
```

If this command fails, see *Troubleshooting*.

### 39.2.2 Create the Backup

When you are ready to begin the backup, run

```bash
./securedrop-admin backup
```

The backup command will display updates on its progress as the backup is created. Run time will vary depending on connectivity and the number of submissions saved on the *Application Server*.

When the backup action is complete, the backup will be stored as a compressed archive in ~/Persistent/securedrop/install_files/ansible-base. The filename will begin `sd-backup`, followed by a timestamp of when the backup was initiated, and ending with `.tar.gz`. You can find the full path to the backup archive in the output of the backup command.

**Warning:** The backup file contains sensitive information! It should only be stored on the *Admin Workstation*, or on a dedicated encrypted backup USB.

**Note:** When dealing with larger backups, the `securedrop-admin backup` command may fail with a `MemoryError` at this stage of the operation: “Fetch the backup tarball back to the Admin Workstation”.

If this happens, a backup was successfully generated, but it is still on the server. Run this command from your ~/Persistent/securedrop directory to copy the backup your *Admin Workstation*:

```bash
rsync -av --progress --partial app:$($ssh app ls -lrt /tmp/sd-backup* | tail -1) install_files/ansible-base/
```

If the transfer fails or is interrupted, you can simply run this command again to resume it.

Note that this method will only work if you have first run the `securedrop-admin backup` command, and the backup has successfully progressed at least until the “Fetch the backup tarball” stage.
39.3 Restoring from a Backup

39.3.1 Prerequisites

To perform a restore, boot into the Admin Workstation and ensure that your .tar.gz backup archive has been copied to ~/Persistent/securedrop/install_files/ansible-base. (If you are using the same Admin Workstation as you did when you took the backup, the archive will already be in place).

If you are restoring data onto an existing instance (for example, for data recovery purposes), see Restoring a Backup on an Existing Instance.

If you are reinstalling SecureDrop and then restoring from a backup (for example, for hardware migration, operating system upgrade, or disaster recovery purposes), see Migrating Using a Backup.

For other data recovery scenarios, see Additional Information or contact Support.

39.3.2 Restoring a Backup on an Existing Instance

To restore an existing instance to a previous state, run the command:

```bash
./securedrop-admin restore sd-backup-2020-07-22--01-06-25.tar.gz
```

Make sure to replace `sd-backup-2020-07-22--01-06-25.tar.gz` with the filename for your backup archive.

This command attempts to restore submissions, source and journalist accounts, and configuration details for the onion services used by the web interfaces and SSH (if configured).

**Note:** You cannot restore v2 onion service configurations to a v3-only server (this includes any SecureDrop installation based on Ubuntu 20.04). If a restore operation would leave you without a valid onion service configuration, the restore script will fail with an error. In this case, you can still perform a data-only restore. See Data-only Restores for more information.

39.4 Migrating Using a Backup

Moving a SecureDrop instance to new hardware involves:

- Backing up the old instance and preserving configuration and credentials from the Admin Workstation;
- Installing SecureDrop on new hardware;
- Restoring the backup to the new instance and repairing credentials.

SecureDrop now supports only v3 onion services, so the final configuration will only include v3 onion services regardless of the backup state.

**Note:** If you need to restore from a backup from an instance configured to use SSH-over-LAN onto an SSH-over-Tor instance, you must either first update the target instance to use SSH-over-LAN or perform a data-only backup. See Data-only Restores for more information.

The restore process differs based on the onion services that were configured on the old instance and preserved in the backup:

- **Migrating using a v2+v3 or v3-only backup**
Migrating Using a V2+V3 or V3-Only Backup

Note: The instructions below assume that you are using the same Admin Workstation that was used to manage your old instance. If you are using a new Admin Workstation you will need to copy the directory ~amnesia/Persistent/securedrop from the old workstation to the new workstation (using a Transfer Device) before proceeding.

1. If you have not already done so, back up the existing installation. The instructions below assume that the backup has been created and renamed sd-backup-old.tar.gz.

2. Move the existing Admin Workstation SecureDrop code out of the way, by opening a Terminal via Applications ▶ System Tools ▶ Terminal and running the command:

```bash
mv ~/Persistent/securedrop ~/Persistent/sd.bak
```

3. Move the existing Admin Workstation SSH configuration out of the way via the Terminal, using the commands:

```bash
ssh-add -D
find ~/.ssh/ -type f -exec mv {} {} .bak \;
```

Note: You will be generating fresh SSH credentials for the servers, and any other Admin Workstation USBs will have to be provisioned with updated credentials.

4. Re-clone the SecureDrop repository to the Admin Workstation using the following Terminal commands:

```bash
cd ~/Persistent
git clone https://github.com/freedomofpress/securedrop
```

5. Verify that the current release tag was signed with the release signing key:

```bash
cd ~/Persistent/securedrop/
git fetch --tags
git tag -v 2.4.2
```

The output should include the following two lines:

```bash
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B222E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-→2021@freedom.press>" [unknown]
```

Important: If you do not see the message above, signature verification has failed and you should not proceed with the installation. If this happens, please contact us at securedrop@freedom.press.

Verify that each character of the fingerprint matches what is on the screen of your workstation. If it does, you can check out the new release:

```bash
git checkout 2.4.2
```
6. Copy the old instance’s configuration files and backup from `~/Persistent/sd.bak` into `~/Persistent/securedrop` using the following Terminal commands:

```
cd ~/Persistent/securedrop
export SD_OLD=~/Persistent/sd.bak/install_files/ansible-base
export SD_NEW=~/Persistent/securedrop/install_files/ansible-base
cp $SD_OLD/group_vars/all/site-specific $SD_NEW/group_vars/all/
cp $SD_OLD/tor_v3_keys.json $SD_NEW/
cp $SD_OLD/sd-backup-old.tar.gz $SD_NEW/
```

You will also need to copy the old instance’s Submission Public Key, OSSEC Alert Public Key, and, if configured, the Journalist Alert Public Key. Assuming that these are named `SecureDrop.asc`, `ossec.asc`, and `journalist.asc` respectively, run the following commands:

```
cp $SD_OLD/SecureDrop.asc $SD_NEW/
cp $SD_OLD/ossec.asc $SD_NEW/
cp $SD_OLD/journalist.asc $SD_NEW/
```

7. *(Optional):* If your old instance was configured to provide the Source Interface via HTTPS, you should also copy across the certificate, certificate key, and chain file. Assuming that these are named `sd.crt`, `sd.key`, and `ca.crt` respectively, run the following commands:

```
cp $SD_OLD/sd.{crt,key} $SD_NEW/
cp $SD_OLD/ca.crt $SD_NEW/
```

8. Ensure your Admin Workstation is connected to a LAN port on your network firewall, and configure the Admin Workstation’s IP address.

9. Install Ubuntu 20.04 on the Application and Monitor Servers, following the server setup instructions to install with the correct settings, test connectivity, and set up SSH keys to allow for Admin Workstation access.

   **Note:** You may need to wait approximately 10-15 minutes after installing Ubuntu 20.04 for the servers to become reachable via SSH.

10. Reinstall SecureDrop on the servers, following the installation instructions. During the configuration stage `.securedrop-admin sdconfig`, the values will be prepopulated based on the old instance’s configuration. Press Enter to accept each value.

   Proceed through the installation by running `.securedrop-admin install` then `.securedrop-admin tailsconfig`. If SSH-over-Tor is configured, run `ssh app uptime` and `ssh mon uptime` in the Terminal to verify SSH connectivity.

11. Restore from the old instance’s backup (e.g. `sd-backup-old.tar.gz`) using the Terminal command:

```
./securedrop-admin restore sd-backup-old.tar.gz
```

   The restore task will proceed for some time, removing v2 services if a v2+v3 backup was used.

12. Synchronize the server and Admin Workstation’s web interface config and authentication keys using the Terminal commands:

```
... (Terminal commands for synchronization) ...
```
13. Test the new instance to verify that the web interfaces are available and the servers can be reached via SSH.

14. If you have migrated to new hardware, ensure your old servers have been decommissioned and/or destroyed by following the relevant sections of our decommissioning documentation.

**Repair Additional Admin Workstations**

If you have additional Admin Workstation USBs, they will no longer have valid SSH credentials and will need to be repaired. In these steps, the “primary Admin Workstation” is the one which you used to complete the above migration process.

1. Prepare a fresh **LUKS-encrypted USB**. You may record the passphrase in your primary Admin Workstation KeePassXC password manager.

2. Copy the following files from your primary Admin Workstation onto the LUKS-encrypted USB:
   - `~/.ssh/id_rsa.pub`
   - `~/.ssh/id_rsa`
   - `~/Persistent/securedrop/install_files/ansible-base/tor_v3_keys.json`
   - `~/Persistent/securedrop/install_files/ansible-base/mon-ssh.auth_private`

   **Note:** Alternatively, if you wish to use different SSH credentials for each Admin Workstation, you may do so. In this case, copy only the first two files above to your additional Admin Workstations.

   Generate per-machine SSH keys and use a clean LUKS-encrypted USB drive to transfer the public portions of those keys to your primary Admin Workstation, where you will then add them to the servers’ `authorized_keys` files, as described here. You may also contact Support for assistance.

3. Boot into each additional Admin Workstation. Set an administration password and unlock the persistent volume on the Tails welcome screen. Once logged in, attach the LUKS-encrypted USB and unlock it.

4. Ensure that this Admin Workstation is using an up-to-date version of Tails and is running the latest SecureDrop application code, 2.4.2.

5. As you did with the primary Admin Workstation, archive the existing SSH configuration:

   ```bash
   ssh-add -D
   find ~/.ssh/ -type f -exec mv {} {}\.bak \;
   ```

6. From the LUKS-encrypted USB, copy `~/.ssh/id_rsa` and `~/.ssh/id_rsa.pub` to the `~/.ssh/` directory.

7. From the LUKS-encrypted USB, copy `tor_v3_keys.json` and `mon-ssh.auth_private` to the `~/Persistent/securedrop/install_files/ansible-base` directory.

8. In the Terminal, type the following commands:

   ```bash
   cd ~/Persistent/securedrop
   ./securedrop-admin tailsconfig
   ```

9. Test connectivity to each server by running `ssh app uptime` and `ssh mon uptime`.

10. Once all Admin Workstations have been updated, securely wipe the files on the LUKS-encrypted USB, by right-clicking them in the file manager and selecting Wipe. Then, reformat the device using the **Disks** utility.
39.4.2 Migrating Using a V2-Only Backup

V2 onion services are no longer supported by SecureDrop, so v2 Source and Journalist Interface addresses will be replaced by v3 addresses when you perform a migration using a v2-only backup. However, it is possible to migrate submissions, source accounts, and journalist accounts. To do so, follow the steps below:

**Note:** The instructions below assume that you are using the same Admin Workstation that was used to manage your old instance. If you are using a new Admin Workstation you will need to copy the directory ~amnesia/Persistent/securedrop from the old workstation to the new workstation (using a Transfer Device) before proceeding.

1. If you have not already done so, **back up the existing installation**. The instructions below assume that the backup has been created and renamed sd-backup-old.tar.gz.

2. Move the existing Admin Workstation SecureDrop code out of the way, by opening a Terminal via Applications ▶ System Tools ▶ Terminal and running the command:

   ```bash
   mv ~/Persistent/securedrop ~/Persistent/sd.bak
   ```

3. Move the existing Admin Workstation SSH configuration out of the way via the Terminal, using the commands:

   ```bash
   ssh-add -D
   find ~/.ssh/ -type f -exec mv {} {}.bak \;
   ```

4. Reinstall SecureDrop on the Admin Workstation using the following Terminal commands:

   ```bash
   cd ~/Persistent
   git clone https://github.com/freedomofpress/securedrop
   ```

5. Verify that the current release tag was signed with the release signing key:

   ```bash
   cd ~/Persistent/securedrop/
   git fetch --tags
   git tag -v 2.4.2
   ```

   The output should include the following two lines:

   ```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-→2021@freedom.press>" [unknown]
```

**Important:** If you do not see the message above, signature verification has failed and you should **not** proceed with the installation. If this happens, please contact us at securedrop@freedom.press.

Verify that each character of the fingerprint matches what is on the screen of your workstation. If it does, you can check out the new release:

```bash
git checkout 2.4.2
```

**Important:** If you see the warning **refname ‘2.4.2’ is ambiguous** in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).
6. Copy the old instance's configuration files and backup from `~/Persistent/sd.bak` into `~/Persistent/securedrop` using the following Terminal commands:

```
cd ~/Persistent/securedrop
export SD_OLD=~/Persistent/sd.bak/install_files/ansible-base
export SD_NEW=~/Persistent/securedrop/install_files/ansible-base
cp $SD_OLD/group_vars/all/site-specific $SD_NEW/group_vars/all/
cp $SD_OLD/sd-backup-old.tar.gz $SD_NEW/
```

You will also need to copy the old instance's Submission Public Key, OSSEC Alert Public Key, and, if configured, the Journalist Alert Public Key. Assuming that these are named `SecureDrop.asc`, `ossec.asc`, and `journalist.asc` respectively, run the following commands:

```
cp $SD_OLD/SecureDrop.asc $SD_NEW/
cp $SD_OLD/ossec.asc $SD_NEW/
```

7. Ensure your Admin Workstation is connected to a LAN port on your network firewall, and configure the Admin Workstation's IP address.

8. Install Ubuntu 20.04 on the Application and Monitor Servers, following the server setup instructions to install with the correct settings, test connectivity, and set up SSH keys to allow for Admin Workstation access.

**Note:** You may need to wait approximately 10-15 minutes after installing Ubuntu 20.04 for the servers to become reachable via SSH.

9. Reinstall SecureDrop on the servers, following the installation instructions. During the configuration stage (`./securedrop-admin sdconfig`), the values will be prepopulated based on the old instance’s configuration. Press Enter to accept each value.

**Note:** If your old instance served the Source Interface over HTTPS, you will need to set up your new instance using HTTP instead, and update it to use HTTPS after the initial migration. The web interface addresses change as part of the process, and so your certificate is no longer valid.

Proceed through the installation by running `./securedrop-admin install` then `./securedrop-admin tailsconfig`. If SSH-over-Tor is configured, run `ssh app uptime` and `ssh mon uptime` in the Terminal to verify SSH connectivity and add the new onion URLs to your `known_hosts` file.

10. Restore from the old instance's backup (e.g. `sd-backup-old.tar.gz`) using the Terminal command:

```
./securedrop-admin restore --preserve-tor-config sd-backup-old.tar.gz
```

The new instance’s onion service addresses will be unchanged, but the old instance’s data and accounts will now be available.

11. As part of this process, your .onion URLs have changed, and any old Journalist and Admin Workstations will no longer work. To create additional Journalist Workstations, see our onboarding documentation.

12. If you have migrated to new hardware, ensure your old servers have been decommissioned and/or destroyed by following the relevant sections of our decommissioning documentation.
39.5 Additional Information

39.5.1 Data-Only Restores

The `restore` command normally restores both the data and the Tor configuration of an instance, including the .onion URLs for your instance.

You may, however, restore data, such as submissions and journalist and source accounts, without altering an instance’s Tor configuration, with the following command:

```
./securedrop-admin restore --preserve-tor-config sd-backup-2020-07-22--01-06-25.tar.gz
```

This is a suitable option if you have a backup archive taken from an instance with v2 onion services, and wish to restore it to an instance that is now using v3 onion services.

If you require any assistance with migration or data recovery, please contact Support.
BACKING UP AND RESTORING WORKSTATIONS

40.1 Backup the Workstations

Note: This workflow will create a single USB drive with the data backed up from all Tails drives. If instead you’d like to create a single duplicate Tails drive, you should follow the official documentation maintained by the Tails project.

Now that you have set up the Secure Viewing Station, the Admin Workstation, and your Journalist Workstations, it is important you make a backup. Your USB drive may wear out, a journalist might lose their drive, or something completely unexpected may happen.

In all these cases, it is useful to have a backup of your data for each device.

40.1.1 What You Need

1. You will need your existing SecureDrop Tails USB sticks (Admin Workstation, Journalist Workstation, and Secure Viewing Station).

2. You will also need an airgapped machine to perform the backups. The Secure Viewing Station may be used for this task.

3. You will also need a “primary” Tails USB, which we will use to perform the backups.

4. You also need at least one USB drive to backup the data from your current SecureDrop Tails USB sticks.

Warning: An airgapped machine (such as the Secure Viewing Station) is required in order to perform these backups safely. By isolating the machine from all network access, you reduce the exposure of sensitive data to networked computers, thereby reducing the threat of compromise by adversaries who wish to gain access to your SecureDrop instance.

The airgapped machine should have 3 USB ports, so you can plug in the primary Tails USB drive, the Tails drive you want to backup, and the backup drive at the same time. If you don’t have 3 USB ports available you can use a USB hub which may reduce transfer speeds.

Note: The steps in this section should be performed for each Secure Viewing Station, Journalist Workstation, and Admin Workstation USB drive in your organization.
40.1.2 Preparing the Backup Device

First you must boot the primary Tails USB drive. Ensure you set an administrator password set at the login screen. Then navigate to Applications ▶ Utilities ▶ Disks.

Insert the USB drive you wish to use as a backup drive.

Select the drive from the list of drives in the left column.
Click the button with the two cogs and click **Format Partition.**
Fill out the form as follows:
• **Erase**: Don’t overwrite existing data (Quick)

• **Type**: Internal disk for use with other Linux systems only (Ext4), and make sure Password protect volume (LUKS) is checked

• **Name**: Backup
Data stored in the volume will only be accessible with the correct password. Be careful not to forget it.

Password

Strong

Mix uppercase and lowercase and try to use a number or two.

Confirm

[ ] Show Password

Warning: Since this will serve as a long-term backup, make sure to use a strong passphrase.

Click Format.

A dialog box will appear asking you Are you sure you want to format the volume? appears, click Format.

Once completed, you will see two partitions appear:
Now that you made the backup device, plug in the device you want to backup. Then, browse to Places ▶ Computer:
Click on the disk on the left side column. Fill in the passphrase you set up when you created your Tails devices.
You should now have both the Backup and TailsData partition to be backed up mounted and ready to access.
40.1.3 Create the backup using Rsync

Open a terminal by going to Applications ▶ System Tools ▶ Terminal.

Next, create a directory on the Backup USB for the device to be backed up - the command below creates a directory named admin-backup:

```
mkdir /media/amnesia/Backup/admin-backup
```

Then, copy the contents of the device’s persistent volume to the directory using rsync:

```
sudo bash -c "rsync -a --info=progress2 --no-specials --no-devices \ /media/amnesia/TailsData/ /media/amnesia/Backup/admin-backup/ && sync"
```

**Note:** Please make sure to include the trailing / in the directory paths in the command above, otherwise the files will not be backed up correctly.

Once complete, unmount the TailsData partition by clicking the Eject button beside its entry in the lefthand column of the file manager. When its entry is no longer shown in the lefthand column, it is safe to remove the Admin Workstation USB.

Repeat these steps for every device, making a new folder on the backup device for each device you back up.

Finally, once you have completed the steps described in this section for each USB drive, unmount the Backup partition by clicking its Eject button. Wait until the Backup USB can be safely removed, and store it somewhere safely.
40.2 Restoring a Workstation from a Backup

To recreate a backed-up Admin Workstation, Journalist Workstation, or Secure Viewing Station Tails USB, you will need

- your Backup USB containing the persistent volume to be restored,
- a blank USB stick to be set up as the new workstation USB,
- an airgapped machine and a USB with Tails already installed, referred to as the host Tails USB in this document. The host Tails USB is only used to transfer files between the Backup USB and the new workstation USB.

The process will require 3 USB ports - if necessary, you can use a USB hub. We recommend labeling USB devices before use, as it can be easy to confuse them.

40.2.1 Prepare the new Tails USB

Follow the guide to creating a Tails USB to install Tails and create a persistent volume on the blank USB stick to create the new workstation USB.

40.2.2 Open the Backup USB and new Tails Persistent Volume

First, boot up the host Tails USB on the airgapped machine, making sure to set an administration password on the Tails Welcome Screen dialog.

Then, navigate to Places ▶ Computer to open the file manager, and insert the Backup USB. Click its entry in the lefthand column and enter its decryption passphrase when prompted. Its volume name (Backup in the instructions above) will appear in place of the generic N.M GB Encrypted name.

Next, insert the new workstation USB, and click its entry in the lefthand column. When prompted, enter its persistent volume’s passphrase. The volume name TailsData will appear in the lefthand column.

40.2.3 Copy the Backup to the New Workstation USB’s Persistent Volume

Open a terminal by navigating to Applications ▶ System Tools ▶ Terminal. Next, use the rsync command to copy the appropriate backup folder to the new workstation USB’s persistent volume. For example, if the backup folder to be copied is named admin-backup, run the following command:

```
sudo bash -c "rsync -a --info=progress2 --no-specials --no-devices \n/media/amnesia/Backup/admin-backup/ /media/amnesia/TailsData/ && sync"
```

Note: Please make sure to include the trailing / in the directory paths in the command above, otherwise the backup files will not be restored correctly.

Once the command is complete, click the Eject button for the TailsData volume in the lefthand column of the file manager, wait for the TailsData entry to disappear from the column, and remove the new workstation USB.
You may now repeat the restore process for any other USBs that you wish to restore, or shut down the host Tails USB and test your new workstation USB by booting it with persistence unlocked and verifying its functionality.
You are responsible for keeping your Tails USBs updated.

There are two ways to perform updates: via the Tails graphical installer and manually. The manual update process will work on any Tails USB. The graphical installer requires an Internet connection to notify you when updates are available, so it is only suitable for internet-connected Tails workstations (such as the Admin Workstation and the Journalist Workstation).

Because the Secure Viewing Station (SVS) is airgapped, it cannot receive update notifications, so it will need to be updated manually.

**Important:** The SVS stores some of SecureDrop’s most sensitive data (decrypted submissions, the Submission Private Key), so we strongly encourage you to manually update the SVS whenever a new version of Tails is released.

The Tails project releases updates every 6 to 8 weeks. Occasionally they release a new version ahead of the normal cycle in order to address a security issue. For regular Tails OS and security information, check out the Tails Security page and subscribe to the Tails RSS/Atom feed.

### 41.1 Update via Graphical Installer

For Internet-connected Tails workstations, you’ll see a notification when a new version of Tails is available.
We recommend that you **back up your existing configuration** and update as soon as possible. It usually takes some time for updates to download, so keep that in mind when choosing when to update.

### 41.2 Update Manually

The process for manually updating a Tails USB is:

1. **Recommended**: *Make a backup of the USB you want to update.*
2. Install the *latest version of Tails* on your *primary Tails USB* or a blank USB stick.
3. Use the *primary Tails USB* to *perform a manual update of your desired Tails USB* on a fully offline (airgapped) computer, such as the computer used for the *Secure Viewing Station*.

#### 41.2.1 What you need

1. Your *Admin Workstation* computer
2. A *primary Tails USB* stick (you may still have one; it was used to create the *Admin Workstation*, *Secure Viewing Station*, and *Journalist Workstation* Tails USBs during the initial SecureDrop install process)
3. The Tails USB that you want to update
4. A Backup USB to back up the data on your existing Tails USBs
5. An airgapped computer, such as the computer used for the *Secure Viewing Station*. 
41.2.2 1. Back up your Tails USB

Follow the instructions to back up your existing Tails USB.

41.2.3 2. Get the latest version of Tails

If you have an existing primary Tails USB and the version of Tails you are updating to supports automatic updates, boot into it on your Admin Workstation computer and follow the graphical updater prompts that guide you through the update process.

Alternatively, you can also download and install the newest version of Tails from scratch (as you did when you first installed SecureDrop). This may be faster if your primary Tails USB has not been updated in a while.

41.2.4 3. Perform airgapped update

In this step, use the up-to-date primary Tails USB to update your desired Tails USB.

**Warning:** The entire Secure Viewing Station is designed to be airgapped, so the SVS Tails USB must never be plugged into a computer with a network connection.

Use an airgapped computer, such as the Secure Viewing Station computer, to perform the steps in this section.

Plug your primary Tails USB into the airgapped computer and boot into Tails.

You can then perform the manual update steps.

41.2.5 If you encounter issues

If you run into issues, you can always restore your data from the backup device following the instructions here.

If you continue to have problems, you can contact us through the SecureDrop Support Portal.
REBUILDING AN ADMIN WORKSTATION USB

In cases where an Admin Workstation USB stick has been lost or destroyed, and no backup exists, it is possible to rebuild one. In order to do so, you’ll need

- physical access to the SecureDrop servers
- 2 USB sticks:
  - Tails Master USB
  - 1 replacement Admin Workstation USB (USB3 and 16GB or better recommended)

The process requires experience with the Linux command line and Tails, and can take up to 3 hours. If a backup of the SecureDrop application server is available, reinstalling the instance and restoring the backup may be simpler. An outline of the steps involved in rebuilding an Admin Workstation is as follows:

1. Prepare the USB sticks.
2. (Optional) Boot the Application and Monitor Server in single user mode and reset the shell admin account password.
3. Set up SSH access for the new Admin Workstation.
4. Retrieve SecureDrop configuration settings from the Application and Monitor Server.
5. Back up and configure the SecureDrop application.
6. Run ./securedrop-admin install and ./securedrop-admin tailsconfig from the new Admin Workstation.
7. Configure SSH-over-TOR.

Important: The rebuild process involves temporarily removing iptables rules on the Application and Monitor Servers, weakening their security. Because of this, it’s important to complete the rebuild process promptly, to avoid leaving the servers in an insecure state.
42.1 Step 1: Prepare the USB sticks

First, create a new Admin Workstation USB and set up a persistent volume with a strong passphrase.

Once persistence has been set up, start up the Admin Workstation with persistence enabled, install the SecureDrop application code, and set up the KeePassXC database.

The Admin Workstation uses SSH with key authentication to connect to the servers, so you’ll need to create a new SSH keypair for your SecureDrop instance. To do so, open a terminal by navigating to Applications ▶ System Tools ▶ Terminal, and run the following command:

```
ssh-keygen -t rsa -b 4096
```

When prompted to Enter file in which to save the key, Press Enter to use the default location. When prompted for a passphrase, it’s safe to leave it blank.

42.2 Step 2: (Optional) Boot the servers in single-user mode

If you do not have the original password for the shell admin account on the Application and Monitor Servers, you’ll need to reset the password on each server by booting in single user mode. In order to do so, you’ll need physical access to the server, a keyboard, and a monitor.

First, connect a monitor and keyboard to the Monitor Server. Then reboot the server. Enter the GRUB menu (instructions vary by hardware), ensure the Ubuntu entry is highlighted, and press e to edit boot options.

In the boot options for Ubuntu, find the line that starts with `linux` and ends with

```
noefi ipv6.disable=1 quiet
```

Add single after quiet, separated by a space, and press F10 to boot in single user mode.

42.2.1 Reset the SecureDrop admin user’s password

Once the root prompt appears, you’ll need to reset the password for the SecureDrop admin user. By default this user is named `sdadmin` and has UID 1000. However it may have been named differently during the installation of your instance. You can use the command `getent passwd 1000` to check the username corresponding to UID 1000. Once you have the correct username, reset its password using the `passwd` command, for example:

```
pwd sdadmin
```

**Important:** Make sure to select a strong password, and record it in the Admin Workstation’s KeePassXC database.

Finally, reboot the Monitor Server and verify that you can log in at the console using the new password.

Repeat the process for the Application Server. Use the same username and password as for the Monitor Server - this is required in order for the .securedrop-admin install command to work correctly.
42.3 Step 3: Set up Admin Workstation access

Next, you’ll configure the servers to allow temporary SSH access from the new Admin Workstation.

First, start the new Admin Workstation with persistence enabled and an administration password set.

Next, connect the new Admin Workstation to the Hardware Firewall via the appropriate Ethernet port, and set up its static IP address. For more information on how to do so, see this section in the firewall setup documentation. If you do not know the correct static IP address for the Admin Workstation, and you are using a recommended pfSense-based Hardware Firewall, you can retrieve the address by logging into its admin interface and checking the settings under Firewall ▶ Aliases.

| Note: | If you do not have login credentials for your pfSense firewall, check its user manual for instructions on resetting the administration password. |

Next, determine whether your instance was set up to allow administrative access via SSH over Tor, or via SSH over LAN. If you don’t know which option was originally chosen, you can check as follows:

1. Log in to the Application Server via the console using the administration username and password.
2. Check to see if an SSH hidden proxy service exists, using the command `sudo cat /var/lib/tor/services/sshv3/hostname`. If this file exists and includes an Onion URL, your instance is set up to use SSH over Tor and you should configure temporary SSH access using these instructions. If not, your instance is set up to use SSH over LAN, and you should follow these instructions instead.

42.3.1 Configuring access for an SSH-over-Tor instance

Direct SSH access is disabled when the SSH-over-Tor option is selected during installation. To temporarily re-enable it, you’ll need to update iptables rules and change the sshd daemon’s configuration.

First, log on to the Application Server via the console, and run the following commands, substituting the Admin Workstation’s static IP for `<admin_static_ip>`:

```
sudo iptables -I INPUT -p tcp --dport 22 -s <admin_static_ip> \  
-m state --state NEW,ESTABLISHED -j ACCEPT
sudo iptables -I OUTPUT -p tcp --sport 22 --dport 22 -m state --state ESTABLISHED -j ACCEPT
```

Next, edit the file `/etc/ssh/sshd_config`, changing the line:

```
ListenAddress 127.0.0.1:22
```

To:

```
ListenAddress 0.0.0.0:22
```

and deleting the line:

```
PasswordAuthentication no
```

Restart sshd using the command `sudo service sshd restart`.

Then, use the command `ip a` to note the local IP address of the default Ethernet interface. You’ll need it in the next step.

Repeat the process above for the Monitor Server, making sure to note its local IP address as well.
Once the *Monitor Server* has been configured, proceed to *enable access from the new Admin Workstation*.

### 42.3.2 Configuring access for an SSH-over-LAN instance

First, log on to the *Application Server* via the console and edit the file `/etc/ssh/sshd_config`, deleting the line:

```plaintext
PasswordAuthentication no
```

Restart `sshd` using the command `sudo service sshd restart`.

Then, use the command `ip a` to note the local IP address for the default Ethernet interface. You’ll need it in the next step.

Repeat the process above for the *Monitor Server*, making sure to note its local IP address as well.

### 42.3.3 Enabling access from the new Admin Workstation

From the *Admin Workstation*, open a terminal and copy the *Admin Workstation’s* SSH public key to the servers, substituting the values for the server administration username and server IP addresses in the commands below and entering the admin account’s password when prompted:

```plaintext
ssh-copy-id <admin-username>@<application-server-ip>
ssh-copy-id <admin-username>@<monitor-server-ip>
```

Next, create a file `~/.ssh/config` with contents as below, again substituting the appropriate values for your servers:

```plaintext
Host app
  User <admin-username>
  Hostname <application-server-ip>
  ProxyCommand none

Host mon
  User <admin-username>
  Hostname <monitor-server-ip>
  ProxyCommand none
```

Finally, test direct SSH access from the terminal, using the commands `ssh app` and `ssh mon`. It should be possible to connect without entering a password.

### 42.4 Step 4: Retrieve SecureDrop configuration info from the servers

In addition to the account and networking information retrieved from the servers so far, you’ll need to retrieve the following files and info:

- GPG *Submission Public Key*, *OSSEC Alert Public Key*, and (optional) *Journalist Alert Public Key*
- OSSEC alert configuration details
- (Optional) HTTPS configuration details
42.4.1 Retrieve GPG Public Keys

Copy the Submission Public Key with the following commands:

```bash
echo "$(ssh app sudo cat /var/lib/tor/services/sourcev3/hostname)" > /tmp/sourcev3
cd ~/Persistent/securedrop/install_files/ansible-base
curl http://$(cat /tmp/sourcev3)/public-key > SecureDrop.asc
gpg --import SecureDrop.asc
```

Validate that the imported key’s fingerprint matches the one on your SecureDrop install. You can do this by running the command:

```bash
gpg --with-fingerprint --import-options import-show --dry-run --import SecureDrop.asc
```

Then, compare the returned fingerprint value with that advertised by your Source Interface, using the command:

```bash
curl http://$(cat /tmp/sourcev3)/metadata
```

Next, note the OSSEC Alerts email address (OSSEC_EMAIL) and, if applicable, the Journalist Alerts email address (JOURNALIST_EMAIL):

```bash
ssh mon sudo cat /var/ossec/send_encrypted_alarm.sh | grep _EMAIL= | cut -f7 -d' '
```

Import the OSSEC Alert Public Key using the following commands (substituting the appropriate email address for alerts@example.com):

```bash
ssh mon sudo gpg --homedir=/var/ossec/.gnupg --export --armor alerts@example.com > ossec._pub
gpg --import ossec.pub
```

If a Journalist Alerts address has been configured, repeat this step for the Journalist Alert Public Key, naming it journalist.pub or similar.

You will require the fingerprints for these keys during the next step, which you can obtain via the command:

```bash
gpg -k --fingerprint
```

42.4.2 Retrieve OSSEC alert configuration details

You’ll also need to retrieve the following configuration information:

- SMTP server
- SMTP port
- SASL username
- SASL domain
- SASL password

To retrieve these values, use the following command in the terminal:

```bash
ssh mon sudo cat /etc/postfix/sasl_passwd
```

This will return a line like:
In this example, smtp.gmail.com is the SMTP server, 587 is the SMTP port, testossec is the SASL username, gmail.com is the SASL domain, and AwfulPassword is the SASL password.

42.4.3 (Optional) Retrieve HTTPS certificate files

If your Source Interface was configured to use HTTPS, you will need to copy three related files from the Application Server to the Admin Workstation.

To retrieve these files, use the commands:

```
cd ~/Persistent/securedrop/install_files/ansible-base
ssh app sudo tar -c -C /var/lib ssl/ | tar xvf -
```

These commands will create a directory named ~/Persistent/securedrop/install_files/ansible-base/ssl on the Admin Workstation, containing your instance’s SSL certificate, certificate key, and chain file. When prompted for the names of these files during the next step, you should specify them relative to the install_files/ansible-base directory, i.e. as ssl/mydomain.crt.

42.5 Step 5: Configure and back up the Application Server

Next, configure the application using the files and info retrieved in the previous steps. To do so, connect to the Tor network on the Admin Workstation, open a Terminal and run the following commands:

```
cd ~/Persistent/securedrop
./securedrop-admin setup
./securedrop-admin sdconfig
```

Note: The ./securedrop-admin setup command may take several minutes to complete, and may fail due to network issues. If it fails, it’s safe to run again.

The sdconfig command will prompt you to fill in configuration details about your instance. Use the information retrieved in the previous steps. When prompted whether or not to enable SSH-over-Tor, type no.

Next, back up the Application server by running the following command in the terminal:

```
./securedrop-admin backup
```

Ensure the backup command completes successfully.
42.6 Step 6: Use the installer to complete the configuration

Run:

```bash
./securedrop-admin install
```

Once the command completes successfully, run

```bash
./securedrop-admin tailsconfig
```

Once this command is complete:

- verify that the desktop shortcuts for the Source and Journalist Interfaces work correctly, opening their respective homepages in Tor Browser.

To revert the changes made to enable temporary local SSH access, you should reboot the servers, by issuing the following commands in a terminal:

```bash
ssh app sudo reboot
ssh mon sudo reboot
```

42.7 Step 7: Set up SSH-over Tor

**Note:** Without performing this step, you will not be able to access your SecureDrop servers from outside the local network. See *SSH Over Local Network* for more information.

Rerun the command:

```bash
./securedrop-admin sdconfig
```

Press “Enter” to use the pre-populated values, but when asked whether to configure SSH-over-Tor, type *yes* (recommended).

Then, re-run

```bash
./securedrop-admin install
```

When the installation completes, run:

```bash
./securedrop-admin tailsconfig
```

Once this command completes:

- verify that the Hostname references in `~/.ssh/config` have been updated to refer to Onion URLs instead of direct IP addresses
- verify that you can connect to the servers using `ssh app` and `ssh mon`
- verify that the desktop shortcuts for the Source and Journalist Interfaces work correctly, opening their respective homepages in Tor Browser.
42.8 Step 8: Post-rebuild tasks

**Important:** Rebuilding an Admin Workstation makes changes that will prevent your other Tails workstations from connecting to your SecureDrop servers. If you rebuild your Admin Workstation, you must also provision all other existing Tails Workstation USBs with updated Tor credentials (see below).

We recommend completing the following tasks after the rebuild:

- Set up a new administration account on the **Journalist Interface**, by following [these instructions](https://example.com).
- Verify that submissions can be decrypted, by going through the decryption workflow with a new submission.
- Back up your **Admin Workstation** using the process documented here.
- Delete invalid admin accounts in the **Journalist Interface**.
- Restrict SSH access to the **Application** and **Monitor Servers** to valid **Admin Workstations**. If your new **Admin Workstation** USB stick is the only one that should have SSH access to the servers, you can remove access for any previous **Admin Workstations** from the terminal, using the commands:

```
cd ~/Persistent/securedrop
./securedrop-admin reset_admin_access
```

You can also selectively remove invalid keys by logging on to the **Application** and **Monitor Servers** and editing the file `~/.ssh/authorized_keys`, making sure not to remove the public key belonging to your new **Admin Workstation**.

- **Back up the Application server** once SSH-over-Tor has been restored. Ensure that server and workstation backups happen regularly.
- Provision all other Tails Workstation USBs (**Journalist** and/or **Admin Workstations**) with updated Tor credentials, so that they can access SecureDrop after this rebuild.

You will need to copy the following file(s) to all other **Admin** and **Journalist Workstations**, replacing the existing files of the same name:

```
~/Persistent/securedrop/install_files/ansible-base/app-journalist.auth_private
~/Persistent/securedrop/install_files/ansible-base/tor-v3-keys.json # for Admin Workstations only
```

You may copy these files using a **Transfer Device** (which must be wiped afterwards), or boot into each of your additional Tails workstations, plug in and unlock your **Admin Workstation**’s encrypted partition via the **Places** app, and manually copy the file(s) from the Admin Workstation to the same directory on the target Tails workstation.
TROUBLESHOOTING KERNEL UPDATES

Kernel updates address known bugs and security vulnerabilities in the Linux kernel. They may be installed automatically on your Application and Monitor Servers as part of a SecureDrop release. All kernel updates are tested extensively against recommended hardware. If things do go wrong (e.g., the server does not boot after a kernel update), the following instructions will help you to roll back to the previous, working kernel. You can then report compatibility issues to us so we can work together to resolve them as quickly as possible.

First, you need to physically access each server. Power down the server (safely if possible), attach required peripherals (keyboard, monitor), and power the server back up.

If you have access to the password for your admin user, you can use it to log into each server without the use of two-factor authentication, which was disabled for keyboard logins in SecureDrop 0.8.0. You may have saved the password in the KeePassXC database on your Admin Workstation. If you do not have the password, you can boot into single user mode instead.

43.1 Boot into Single User Mode

To access single user mode, you will have to edit the boot options for the new kernel. You can do so using the GRUB bootloader, pictured below:
Press any key quickly just once. You will only have about 2 to 3 seconds before Ubuntu starts booting. If you miss that window, just log in normally and reboot safely, provided you can log in. Do not unplug or forcibly shut down the server.

Once you hit a key, you will be able to interact with the menu with the up (↑) and down (↓) keys. Select “Ubuntu” as shown above, and press “e” to edit the boot options. In the line that begins with “linux”, add the word “single” at the end. When you are done, the output on your console should look similar to the screenshot below.
43.2 Test the New Kernel

Observe the boot process. It is possible that the system will fail to boot completely; if so, the log information will help us to understand what is happening.

Provided that you can log in, check if you have network access. Try a command such as `sudo host freedom.press`. If you don’t have network access, it is most likely due to the upgraded kernel missing a network driver for your hardware.

If everything appears to be operating normally, the outage may not be kernel-related. In that case, you may still wish to follow the steps at the end of this document to send us log information along with an issue report, and we will help you investigate.

If you are experiencing network issues or other kernel problems, we recommend that you roll back to an older kernel, and that you report the issue to us immediately.
43.3 Compare the Behavior of the Old Kernel

Reboot the server in a safe way with `sudo reboot`. After the BIOS screen, you can select a different kernel from the GRUB boot menu by selecting **Advanced options for Ubuntu**, pictured below.

The next menu should give you a list of kernels, similar to the one pictured below:
Choose the option with the previous kernel version. If unsure, please consult the release notes for the most recent release of SecureDrop, which will include details about kernel version changes.

As before, you may need to edit the kernel options to enter single user mode. The boot process should proceed normally. Wait until you get a login prompt and log in.

Once you are logged in, check to see if you have network access. If you do, then your instance is having an issue with the newer kernel. In that case, we need to temporarily set an older kernel as the default.

### 43.4 Roll Back to the Old Kernel

**Important:** It is of critical importance for the security of your instance that we work together to resolve any compatibility issues. Rolling back to an older version is only a stopgap measure to avoid a prolonged outage of your SecureDrop instance.

Inspect the file `/boot/grub/grub.cfg`. You should find a `menuentry` line with the same text that you selected during boot, e.g.:

```markdown
submenu 'Advanced options for Ubuntu'...

   menuentry 'Ubuntu, with Linux 4.xxx.xx-grsec...
```

Take note of its position among the other submenu entries (it will most likely be third). Then edit the GRUB configuration:
sudo nano /etc/default/grub

Make a backup of the file or take a note of the current value of \texttt{GRUB\_DEFAULT} somewhere, so you can restore the previous behavior easily at a later point.

Once you have done so, set the \texttt{GRUB\_DEFAULT} variable to point to the index of the menu and submenu. Note that the index starts at 0, so for a typical setup, the line in \texttt{/etc/default/grub} would look like this:

\begin{verbatim}
GRUB_DEFAULT="1>2"
\end{verbatim}

The “1” means the second entry of the main menu (“Advanced options”), the “2” means the third entry of the submenu. Again, update these numbers consistent with your configuration.

\begin{center}
\textbf{Caution:} Ensure that you have chosen the right index for the main menu and the submenu, and double-check that you are beginning the count at 0, not 1; otherwise, you may boot into the wrong kernel.
\end{center}

This change still has to be applied to take effect on the next boot:

\begin{verbatim}
sudo update-grub
\end{verbatim}

Now you can reboot into the old, working kernel.

\begin{verbatim}
sudo reboot
\end{verbatim}

The server should come up automatically. From here on, you should be able to perform all administrative tasks via SSH as usual. If you want additional confirmation of the kernel version, the command \texttt{uname -r} should display the expected kernel version number.

Please notify us of the compatibility issue so we can help you resolve it ASAP.

### 43.5 Report Compatibility Issues

If you have encountered issues with a kernel update, it is important that you report them to us so that we may incorporate any necessary changes to our updated kernel, and so that we can work with you to switch back to the new kernel as soon as possible.

Run the following commands via SSH from the \textit{Admin Workstation}:

\begin{verbatim}
cd ~/Persistent/securedrop/
source admin/.venv3/bin/activate
cd install_files/ansible-base
ansible all -b -m setup > server-facts.log
\end{verbatim}

Please also send us a copy of \texttt{/var/log/syslog} and \texttt{/var/log/dmesg} for analysis.

You can share \texttt{server-facts.log}, \texttt{syslog} and \texttt{dmesg} with us as follows:

- If you are a member of our Support Portal, please create a new issue and attach the files to it.
- Alternatively, email us at securedrop@freedom.press (GPG encrypted) with the subject “SecureDrop kernel facts” and the files attached.

Once we get your information, we can try to provide assistance to resolve compatibility issues.
If you are not a member of our Support Portal, we also encourage you to request help in the SecureDrop Community Forums. Choose carefully what information to disclose publicly. For example, raw logs may contain sensitive information useful to potential attackers.

43.6 Test and Enable an Updated Kernel

If you have changed your default kernel, we urge you to test an updated kernel as soon as it becomes available in a future SecureDrop release. Note that an update may be enforced as part of a release to protect the security of your instance. Please consult the release notes for details about kernel updates.

You can test a kernel update without downtime for your instance by booting your Monitor Server with the new kernel. Log into your Monitor Server using the Admin Workstation. Shut down the server safely using the command sudo poweroff. Ensure that the server is fully powered off.

Attach required peripherals and power the server back up. After the GRUB bootloader appears, select Advanced options for Ubuntu, pictured below.

![GRUB menu](image)

Use the ↑ and ↓ keys to select which entry is highlighted. Press enter to boot the selected OS, `e` to edit the commands before booting or `c` for a command-line.

If a SecureDrop release with a kernel update has been installed on your system, the updated kernel version will be available in the list of options:
Select the new kernel (you do not need to use the version with recovery mode). If you do not know your admin account password, you can boot into single user mode by editing the boot options. Otherwise, press enter to boot.

Verify that you can boot successfully, and that you have network access (sudo host freedom.press). If you still encounter problems with the new kernel, please report compatibility issues at your earliest convenience, and reboot the server into the old kernel for now.

If the update resolved compatibility issues with an earlier kernel version, you can make the new kernel the default. Edit the file /etc/default/grub, e.g., by issuing the following command:

```
sudo nano /etc/default/grub
```

Make a backup of the file or take a note of the current value of GRUB_DEFAULT somewhere, so you can restore the previous behavior if needed. Change the line to GRUB_DEFAULT=0. This configures the bootloader to default to loading the most recent kernel version installed on your server.

This change still has to be applied to take effect on the next boot:

```
sudo update-grub
```

Safely shut down the Monitor Server, remove attached peripherals, and reboot it. Verify that it is working correctly by logging in using your Admin Workstation. If everything is working as expected, you can make the same change to /etc/default/grub on your Application Server as well. Remember to again run the command sudo update-grub when you are done.

You can make the change on the Application Server from your Admin Workstation and reboot the server using the command sudo reboot.

Subsequent kernel updates will again be applied automatically.
There are several support options available if you need help installing SecureDrop, or are looking for help with your existing SecureDrop instance.

**Note:** If your installation is up and running, we recommend that you submit your SecureDrop to the SecureDrop directory. This also serves as a first introduction to the SecureDrop team.

### 44.1 Support Portal

Because of the sensitive nature of SecureDrop-related communications, we recommend that you request an account on the support portal at https://support.freedom.press/ and review our documentation for using it.

As a member of the support portal, you will receive notifications regarding SecureDrop releases and security advisories, and you will be able to open tickets to request technical support.

Membership in the support portal is free of charge and granted at Freedom of the Press Foundation’s sole discretion. To reach out regarding a membership request, please use the contact form.

While we will provide technical assistance within reason and at our discretion, we encourage you to consider a paid support agreement to receive priority support, staff training, or installation help. Visit the Priority Support and Training pages on the SecureDrop website for more information.

### 44.2 Community Based Support

The SecureDrop forum is a good place to discuss SecureDrop and to get help from the international community of SecureDrop users and developers.

You can also connect directly with the SecureDrop development team and the larger SecureDrop community using the SecureDrop Gitter channel.

**Warning:** Remember that both the SecureDrop forum and the Gitter channel are public. Do not post any sensitive information through public channels.
Below are the steps for updating the BIOS on the Application and Monitor Servers. We provide instructions for Intel NUC devices, in accordance with our hardware recommendations. You should also update the BIOS on other computers such as the Admin Workstation, but those instructions will vary depending on the manufacturer and model of your device.

### 45.1 What you need

1. A clean USB device to download the BIOS file
2. An Internet-connected workstation, such as the Admin Workstation
3. A UPS (uninterrupted power supply), such as a surge-protecting power supply with a backup battery (This is not required, but strongly recommended)
4. A keyboard and monitor

### 45.2 Perform Backups

If you are updating the BIOS on an existing SecureDrop system, we recommend you back up the Application Server before proceeding.

### 45.3 Prepare the USB Stick

Using the Disks application, delete existing partitions on the USB device, if applicable, and reformat the entire device with one FAT32 partition. Note that you will lose access to all existing data on this USB stick.

### 45.4 Download and Verify Appropriate BIOS Files

#### 45.4.1 For Intel NUC Devices

Check the make and model of your servers, and follow the F7 BIOS update method in the documentation. The exact instructions vary by model:

- BIOS update instructions for Intel NUC with Intel Visual BIOS
- BIOS update instructions for Intel NUC with Aptio V UEFI Firmware Core
Each make and model of Intel NUC will offer different file types; proceed to the Intel Download Center and download the file indicated in the documentation for the F7 method (e.g., .bio or .cap).

**Warning:** Do not download BIOS updates from anywhere other than the manufacturer’s website. Be sure that you are on the correct website and that it has a valid SSL Certificate. Intel’s SSL Certificate is issued to *.intel.com and signed by DigiCert. Be sure you download the files specific to the model of your servers.

Intel provides an SHA1 checksum on the download page. Once you have downloaded the file, using the **Files** application, browse to the file, right click and select **Properties ▶ Digests**, select SHA1, and click Hash. Compare the result in the Digest column to the SHA1 sum listed on Intel’s website. If these two values do not match, do not proceed, and contact support@freedom.press. Tails provides a detailed explanation of this process. (Note that the hash in the screenshot below is an example only, and will not match your specific file.)

![FN0056.cap Properties](image)

Once you have verified the hash, copy the file to your USB device.
45.5 Update the BIOS

Power off the Monitor Server. We recommend plugging it into an uninterrupted power supply (UPS). Plug in the keyboard, monitor, and USB key, and power on the server, then press F7 when prompted to enter the BIOS Update tool.

Select the USB device and navigate to the file you have downloaded, then hit Enter. The update will take several minutes—do not interrupt the update or unplug the server during this time.

Repeat these steps on the Application Server. These steps are also available on Intel’s website (PDF).
OFF-BOARD ADMINISTRATORS AND JOURNALISTS

When journalists and SecureDrop administrators leave your organization, it is important to off-board them from SecureDrop.

What you need:
- An Admin Workstation. Contact SecureDrop Support or follow our guide to rebuilding an Admin Workstation if you do not have one.
- An admin account on the Journalist Interface

Important: Additional measures may need to be taken if the user’s departure is on unfriendly terms. These measures will vary depending on the circumstances and your own internal incident response procedures, and may include doing a full reinstall of SecureDrop. If you are in such a situation, feel free to contact us for further assistance.

46.1 Off-boarding checklist

- Inform the SecureDrop Support team that the user’s support portal account should be deactivated, and indicate if any new staff members should be added.
- Delete the user’s account on the Journalist Interface.
- Retrieve Admin Workstation or Journalist Workstation USB drive(s), Transfer, Export, and Backup drive(s), and any other SecureDrop hardware or materials.
- If the user receives email alerts (OSSEC alerts or daily submission notifications), either directly or as a member of an email alias, remove them from those alerts and set up someone new to receive those alerts.
- (Circumstance-dependent) If you have specific concerns that the Submission Key has been compromised, you should consider a full reinstall of SecureDrop. At minimum, you should rotate the Submission Key.

46.2 Additional steps for off-boarding administrators

- If the departing user was your primary SecureDrop admin, designate the next person who will take over their function. Ideally, your outgoing administrator will be able to provide as much training as possible on the use and maintenance of the system, as well as on your organizational policies (such as backup strategies, and so on) before they leave; if this is not the case, contact the SecureDrop Support team.
- We do not recommend enabling remote management for SecureDrop’s network firewall. However, if your SecureDrop firewall can be accessed remotely, even if only from within your organization’s network, you may want to rotate its login credentials.
• Back up and rotate the Admin Workstation SSH key to prevent unauthorized SSH access to the Application and Monitor Servers in the event that this user has retained their Admin SSH credentials.

46.2.1 Rotate SSH keys on the SecureDrop Servers

If you are concerned that the user may have a copy of the Admin Workstation USB or that they may have kept a copy of the Admin Workstation SSH key, you should rotate the key in the following manner.

1. Create a new SSH keypair. From an Admin Workstation, run

   ```bash
   ssh-keygen -t rsa -b 4096
   ```

   and make sure to change the key name. This is the only parameter you need to change. For example, instead of `/home/amnesia/.ssh/id_rsa`, call the key `/home/amnesia/.ssh/newkey`. You don't need a passphrase for the key.

2. Copy new public key to the SecureDrop Servers. Copy the public portion of the key to the Application and Monitor Servers by running

   ```bash
   scp /home/amnesia/.ssh/newkey.pub scp://app
   ```

   and

   ```bash
   scp /home/amnesia/.ssh/newkey.pub scp://mon
   ```

3. Add this key to the list of authorized keys. SSH to the Application Server and append this new key to the list of authorized keys by using

   ```bash
   cat newkey.pub >> ~/.ssh/authorized_keys
   ```

   Be sure to use the command as above so that you append the key, instead of replacing the file. While you are still on the Application Server, you can then delete the file newkey.pub from wherever you scp'd it to (i.e. your home directory). Repeat this process with the Monitor Server.

4. Rename SSH keys. Exit all SSH sessions and, on your Admin Workstation, rename id_rsa and id_rsa.pub (the old SSH keys) to something else. For example,

   ```bash
   mv /home/amnesia/.ssh/id_rsa /home/amnesia/.ssh/id_rsa_old
   mv /home/amnesia/.ssh/id_rsa.pub /home/amnesia/.ssh/id_rsa_old.pub
   ```

   Then, rename your newkey and newkey.pub to id_rsa and id_rsa.pub.

5. Test SSH connection. Test that you can still ssh into the Application and Monitor Servers (you can test with ssh app host and ssh mon host).

6. Restrict SSH access to the new key.

   **Important:** If you have other users who also have SSH access to the Application and Monitor Servers, the next step will revoke their access. Their public keys will have to be re-appended to the authorized_keys file on each server, as in step 3.

From an Admin Workstation, run

```bash
~/Persistent/securedrop/securedrop-admin reset_admin_access
```
This removes all other SSH keys, except for the new key that you are currently using, from the list of authorized keys on the Application and Monitor Servers.

46.3 Rotate the Submission Key

The Submission Private Key is held on the airgapped Secure Viewing Station, and is not normally accessed by SecureDrop users anywhere but on the SVS. Therefore, we recommend rotating the Submission Key under the following circumstances:

- If the user’s departure was not amicable
- If the user is still holding on to any Secure Viewing Station USB drive or backup
- If you have any other reason to believe the Submission Private Key or the entire Secure Viewing Station USB may have been copied or compromised.

You should still keep the old key on the Secure Viewing Station, or else you will not be able to decrypt submissions that were sent to you while that key was in effect.

You will need:

- The Admin Workstation
- The Secure Viewing Station
- A Transfer Device (LUKS-encrypted USB drive)

46.3.1 On the Secure Viewing Station

1. From the Secure Viewing Station Applications Menu, choose Accessories ▶ Kleopatra, and select the Submission Key from the list of available keys.

2. From the details view that appears, click the Add email address button.
3. In the dialog window that appears, choose Advanced.

4. Set the name field to “OLD SecureDrop Submission Key - Do Not Delete”, and set the comment field to “Retired <Date of Retirement>”. Click OK to add this information to the key.
5. Return to the Terminal, then run:

```
gpg --list-keys
```

In the output, locate the Retired SecureDrop Submission Key. It should look similar to this:

```
pub   rsa4096/0x1CB396626CA370AB 2022-08-16 [SC]
     Key fingerprint = 6A7F 116B 3C22 4F36 7275 236A 1CB3 9662 6CA3 70AB
uid    [ultimate] OLD SecureDrop Submission Key (Retired 2022-08-16)
uid    [ultimate] SecureDrop (SecureDrop Submission Key)
sub    rsa4096/0x228C92459E3D16DE 2022-08-16 [E]
```

Make note of the ID of the key, which is the portion of the key after the slash in the first line. In this example, the key ID would be: 0x1CB396626CA370AB

6. Generate a revocation certificate, by running the command below (replacing `<KEY_ID>` with the ID you noted in the step above):

```
gpg --output revoke.asc --gen-revoke <KEY_ID>
```

This will launch an interactive prompt, where you can supply the following values:

Create a revocation certificate for this key? (y/N) y
Please select the reason for the revocation:
  0 = No reason specified
  1 = Key has been compromised
  2 = Key is superseded
  3 = Key is no longer used
  Q = Cancel
(Probably you want to select 1 here)
Your decision? 2
Enter an optional description; end it with an empty line:
> <Just Press Enter>
Reason for revocation: Key is superseded
(No description given)
Is this okay? (y/N) y
ASCII armored output forced.
Revocation certificate created.

7. Import the revocation certificate:

```bash
$ gpg --import revoke.asc
```

8. Return to Kleopatra, and make sure the key is now marked as **Revoked**.

9. Now **follow the instructions** to create a PGP key on the Secure Viewing Station. This will be your new **Submission Key**. Copy the fingerprint and new **Submission Public Key** to your **Transfer Device**.

### 46.3.2 On the Admin Workstation

**Important**: Ensure that your **Admin Workstation** is **up-to-date** before performing these steps.

1. Take the **Transfer Device** with the new **Submission Public Key** and fingerprint to your **Admin Workstation**. As you did during the initial install, copy the public key, SecureDrop.asc, to the install_files/ansible-base/ directory, replacing the existing public key file that is there.

2. From the `~/Persistent/securedrop` directory, run

```bash
./securedrop-admin sdconfig
```
If the new public key that you placed in `install_files/ansible-base` has the same name as the old public key, `SecureDrop.asc`, the only part of the configuration you will change is the SecureDrop Submission Key fingerprint, which you will update with the fingerprint of your new key.

3. Once you have completed the above, run

```bash
./securedrop-admin install
```

to push the changes to the server.

You may want to immediately create a test submission, then use a Journalist account to log into the Journalist Interface, download your submission, and take it to the Secure Viewing Station.

### 46.3.3 Return to the Secure Viewing Station

1. On the Secure Viewing Station, decrypt the test submission you made to ensure that your new key is working properly.

2. **Do not delete your old submission key!** You’ll want to maintain it on the SVS so that you can still decrypt old submissions that were made before you changed keys.

3. If you have any other Admin Workstations, make sure that you have copied the new Submission Public Key into the `install_files/ansible-base` directory, replacing the old public key file, and updated the Submission Public Key fingerprint by running

```bash
./securedrop-admin sdconfig
```

and updating the fingerprint when prompted. You do not have to run `./securedrop-admin install` again, since you have already pushed the changes to the server.

### 46.4 Getting Support

If you have any questions about the steps in this guide, we’re here to help:

- Community support is available at [https://forum.securedrop.org](https://forum.securedrop.org)

- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.

The following steps will guide you through the decommissioning of your SecureDrop instance.

1. **Put a notice in advance on your landing page to inform sources that your instance will soon be retired.**
   
   You may want to direct them to other secure methods of contacting you.

2. **Locate and create an inventory of all your hardware.**
   
   - Journalist Workstation USBs
   - Admin Workstation USBs
   - Secure Viewing Station USB
   - Secure Viewing Station computer
   - Transfer and Export Devices (USBs, optical drives, or external drives)
   - Backup USBs/other storage media
   - Servers
   - Firewall

   You may also want to inventory credentials, such as the email address or alias and PGP key used for receiving OSSEC alerts, in order to retire them.

   **Note:** The recommended SecureDrop setup includes only one Secure Viewing Station USB. However, if you have been working remotely or have a non-standard setup, you may have more than one SVS USB. It is important that you locate all of these USBs, since they hold the most sensitive data.

3. **Optional: Save a backup.** If you want to save a backup of the Application Server (for example, to reinstall SecureDrop in the future using the same .onion address), follow our backup guidelines. Once the backup has been created, you can move it off of the Admin Workstation USB and onto an encrypted device, such as a LUKS-encrypted drive. You will also require a backup of the Submission Key found on the SVS.

   If you do not require a server backup, you may choose to download specific submissions, and store them in a secure manner (such as on an encrypted drive). If you export and store these submissions without first decrypting them on the SVS, be sure you maintain access to the Submission Private Key found on the SVS so that you can decrypt them at a later time.

4. **Optional: Delete submissions on the server.** Log into the Journalist Interface and delete all sources to take advantage of SecureDrop’s secure deletion properties. Note that depending on the number of sources on your server, it may take anywhere from several minutes to an hour or more for the submissions to be completely deleted from the server.

   You can either leave the server ample time to complete this operation, or monitor the progress by SSHing to the Application server and running
You will see repeated log lines that contain the following:

```
[Timestamp] app python [...] INFO Clearing shredder
[Timestamp] app python [...] INFO Files to delete: <number>
```

When the number of files to delete reaches 0, the process is complete.

5. **Disconnect the firewall and the servers from the internet.** Be sure to inform your network administrator of any changes to devices on your network.

6. **Wipe and destroy the USB drives.** Because the USB drives used for SecureDrop are all LUKS-encrypted, reformatting the USB drives (in particular, overwriting a portion of internal storage called the **LUKS header**) should be sufficient to make any existing data on those drives unrecoverable.

For example, you could use your primary Tails USB to launch Gnome Disks, insert and identify the USB drive you are trying to erase, and reformat this drive with a new, LUKS-encrypted partition, erasing the existing partition data.

**Caution:** Be very sure you are reformatting the right drive. You may want to use the Secure Viewing Station laptop for this procedure to reduce the risk of accidentally erasing a drive on your regular-use machine.

You may also choose to destroy the drives by physical means, such as using a hammer or purpose-built shredder to pulverize or destroy the drive.

7. **Wipe and destroy the storage drives on the servers.** SecureDrop submissions are stored GPG-encrypted on the **Application Server**. Unless your SecureDrop Submission Key is compromised (or a significant vulnerability in GPG is discovered), access to the servers does not guarantee access to the submissions and messages you have received.

That said, there may still be some sensitive information on the servers, including system logs and the SecureDrop database, which would yield information on the number of submissions and replies stored on the server. This risk is partially mitigated by securely deleting submissions from the server, as described in a previous step; however, physically destroying or encrypting the storage drives on the servers are the best ways to ensure that data on the drives cannot be recovered.

Physically destroying SSD drives is not as straightforward as destroying older hard drives, but drives can be pulverized, shredded, or incinerated, as long as the flash chips are destroyed.

If those options are not available, you may choose instead to write over the information on the existing drives. Most SSDs support ATA Secure Erase, although the implementation of this feature varies by manufacturer.

Another option is to re-install a clean version of Ubuntu server with full- disk encryption enabled. During the disk-partitioning portion of the installation wizard, select *Guided - use entire disk and set up encrypted LVM*. You will need to reclaim the space that was taken up by your previous installation, so whenever prompted to unmount and reclaim unused partitions, select “yes.”

8. **Destroy other Transfer or Export media, if applicable.**

9. **Optional:** Factory-reset the firewall.

10. **Update your Landing Page (tips page) to reflect the fact that your organization no longer has SecureDrop.**

11. **Notify the SecureDrop Support team that your instance is no longer active.** If you have any questions about the decommissioning process, or about other secure communications options, please feel free to contact us at securedrop@freedom.press (GPG encrypted) or via the support portal.
CHAPTER FORTYEIGHT

UPGRADE FROM 2.4.1 TO 2.4.2

48.1 Update Servers to SecureDrop 2.4.2

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

48.2 Update Workstations to SecureDrop 2.4.2

48.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.4.2 by clicking “Update Now”: 
SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.

Update Later  Update Now
48.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
```

```
gpg --keyserver hkps://keys.openpgp.org --recv-key \
"2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.4.2
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-˓
˓→2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.4.2
```

**Important:** If you do see the warning “refname ‘2.4.2’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

48.3 Troubleshooting Kernel Issues

SecureDrop 2.4.2 includes a kernel update on the Application and Monitor Servers, from version 5.15.26 to version 5.15.57. As with all kernel updates, we have extensively tested this update against recommended hardware.

If you are running SecureDrop on hardware that is not officially supported, you may encounter compatibility issues with the new kernel. For example, the servers may not boot, or you may lose network connectivity. If this happens, you can temporarily downgrade to the previous kernel version.

**Important:** To ensure continued secure operation of your SecureDrop instance, it is of critical importance to resolve any compatibility issues with the new kernel as quickly as possible. If you encounter problems with this update, please get in touch with us urgently, so we can help you run the latest supported kernel version.

For information on how to downgrade to the previous kernel, and for additional troubleshooting information, please see our Kernel Troubleshooting Guide.
48.4 Upgrade from Tails 4 to Tails 5

If you have not already done so, you must manually upgrade from the Tails 4 release series to the Tails 5 series.

**Important:** You must upgrade your workstations to the latest version of SecureDrop by following the steps above *before* upgrading to the Tails 5 series. You can verify the version of SecureDrop by running `git status` in your `~/.Persistent/securedrop` directory. The output should include “HEAD detached at 2.4.2”.

The Tails 5 series is based on Debian 11 (“Bullseye”). Among the most noticeable changes is the switch to a new frontend for GnuPG called Kleopatra. Once you upgrade your Secure Viewing Station, you will need to use Kleopatra to open `.gpg` files. Please see our Journalist Guide for more information.

You must perform the upgrade to Tails 5 manually. You need a blank USB drive that you can install the latest release in the Tails 5 series on from scratch. You will use this drive to upgrade your Journalist Workstation(s), your Admin Workstation(s), and your Secure Viewing Station(s).

The persistent storage volumes of your USB drives will be migrated as part of this upgrade, but we still highly recommend backing them up first. Follow the steps for updating Tails manually.

For each Journalist and Admin Workstation, perform the following additional steps to complete the upgrade:

1. Boot the USB drive
2. On the Tails welcome screen, unlock the persistent volume and configure an administrator password
3. Open a terminal (Applications ► Utilities ► Terminal)
4. Run the following commands:

   ```sh
   cd ~/.Persistent/securedrop/admin
   rm -rf .venv3
   cd ..
   ./securedrop-admin setup
   ```

   When prompted by Tails to “Install Only Once” or “Install Every Time”, click **Install Every Time** (this is a change from previous versions of Tails).

48.5 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at [https://forum.securedrop.org](https://forum.securedrop.org)
- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.
49.1 Update Servers to SecureDrop 2.4.1

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

49.2 Update Workstations to SecureDrop 2.4.1

49.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.4.1 by clicking “Update Now”: 
SecureDrop Workstation Updater

SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.

Update Later          Update Now

0%
49.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
gpg --keyserver hkps://keys.openpgp.org --recv-key "2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.4.1
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-→2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.4.1
```

**Important:** If you do see the warning “refname ‘2.4.1’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```
49.3 Re-enabling codename filtering (if you previously disabled it)

This release fixes a bug in the feature to prevent initial messages containing the source’s seven word secret codename. If you have previously disabled this feature, you can safely re-enable it in the submission preferences section of the Admin Interface.

49.4 Upgrade from Tails 4 to Tails 5

If you have not already done so, you must manually upgrade from the Tails 4 release series to the Tails 5 series.

**Important:** You must upgrade your workstations to the latest version of SecureDrop by following the steps above before upgrading to the Tails 5 series. You can verify the version of SecureDrop by running `git status` in your `~/Persistent/securedrop` directory. The output should include “HEAD detached at 2.4.1”.

The Tails 5 series is based on Debian 11 (“Bullseye”). Among the most noticeable changes is the switch to a new frontend for GnuPG called Kleopatra. Once you upgrade your Secure Viewing Station, you will need to use Kleopatra to open `.gpg` files. Please see our Journalist Guide for more information.

You must perform the upgrade to Tails 5 manually. You need a blank USB drive that you can install the latest release in the Tails 5 series on from scratch. You will use this drive to upgrade your Journalist Workstation(s), your Admin Workstation(s), and your Secure Viewing Station(s).

The persistent storage volumes of your USB drives will be migrated as part of this upgrade, but we still highly recommend backing them up first. Follow the steps for updating Tails manually.

For each Journalist and Admin Workstation, perform the following additional steps to complete the upgrade:

1. Boot the USB drive
2. On the Tails welcome screen, unlock the persistent volume and configure an administrator password
3. Open a terminal (Applications ➤ Utilities ➤ Terminal)
4. Run the following commands:

   ```bash
   cd ~/Persistent/securedrop/admin
   rm -rf .venv3
   cd ..
   ./securedrop-admin setup
   ```

   When prompted by Tails to “Install Only Once” or “Install Every Time”, click **Install Every Time** (this is a change from previous versions of Tails).

49.5 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at [https://forum.securedrop.org](https://forum.securedrop.org)
- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.
• The Freedom of the Press Foundation offers training and priority support services. See https://securedrop.org(priority-support/) for more information.
UPGRADE FROM 2.3.2 TO 2.4.0

50.1 Update Servers to SecureDrop 2.4.0

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

50.2 Update Workstations to SecureDrop 2.4.0

Note: If you encounter errors with the graphical updater, perform a manual update. This will ensure that you have imported the new SecureDrop release signing key.

50.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.4.0 by clicking “Update Now”: 
SecureDrop WorkstationUpdater

Updates Available
Detailed Update Progress

SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.
50.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
```

```
gpg --keyserver hkps://keys.openpgp.org --recv-key "2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.4.0
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188ED3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-˓
→2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.4.0
```

**Important:** If you do see the warning “refname ‘2.4.0’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

50.3 Tor Browser security issue

Tails has published an advisory for a serious security issue in Tor Browser affecting all versions of Tails. Administrators and journalists should disable JavaScript by setting Tor Browser’s security level to “Safest” until a fix is available (expected on May 31, 2022). If you are using Tor Browser in Tails for non-SecureDrop browsing, we recommend restarting Tor Browser before and after using it for SecureDrop.
50.4 Upgrade from Tails 4 to Tails 5

If you have not already done so, you must manually upgrade from the Tails 4 release series to the Tails 5 series.

**Important:** You must upgrade your workstations to the latest version of SecureDrop by following the steps above before upgrading to the Tails 5 series. You can verify the version of SecureDrop by running `git status` in your `~/Persistent/securedrop` directory. The output should include “HEAD detached at 2.4.0”.

The Tails 5 series is based on Debian 11 (“Bullseye”). Among the most noticeable changes is the switch to a new frontend for GnuPG called Kleopatra. Once you upgrade your Secure Viewing Station, you will need to use Kleopatra to open .gpg files. Please see our Journalist Guide for more information.

You must perform the upgrade to Tails 5 manually. You need a blank USB drive that you can install the latest release in the Tails 5 series on from scratch. You will use this drive to upgrade your Journalist Workstation(s), your Admin Workstation(s), and your Secure Viewing Station(s).

The persistent storage volumes of your USB drives will be migrated as part of this upgrade, but we still highly recommend backing them up first. Follow the steps for updating Tails manually.

For each Journalist and Admin Workstation, perform the following additional steps to complete the upgrade:

1. Boot the USB drive
2. On the Tails welcome screen, unlock the persistent volume and configure an administrator password
3. Open a terminal (Applications ➤ Utilities ➤ Terminal)
4. Run the following commands:

```bash
cd ~/Persistent/securedrop/admin
rm -rf .venv3
cd ..
./securedrop-admin setup
```

When prompted by Tails to “Install Only Once” or “Install Every Time”, click Install Every Time (this is a change from previous versions of Tails).

50.5 Language support changes

We are pleased to announce support for Portuguese (Portugal). To enable this language, on the Admin Workstation run:

```
./securedrop-admin sdconfig
```

When prompted, add pt_PT to the list of locales. Then run:

```
./securedrop-admin install
```

We are currently lacking translators for Hindi and Romanian, which are both at risk of being removed in the next SecureDrop release. If you speak either language or know someone who does, please see our instructions on contributing translations.
50.6 Back Up the Tails Workstations

USB flash drives degrade over time and vary in quality. To ensure continued access to SecureDrop by administrators and journalists, we recommend backing up the Tails Workstations on the occasion of a new SecureDrop release, after you have completed the upgrade process for each drive.

You can use a single storage device for backups of multiple workstations. See our Workstation Backup Guide for more information.

50.7 Apply Any Available Firewall Updates

As part of SecureDrop maintenance, we recommend checking for software updates for the hardware firewall, which may need to be applied manually. If you are using one of the recommended firewalls, see Keeping pfSense up to Date or see Keeping OPNSense up to Date.

50.8 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at https://forum.securedrop.org

- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.

- The Freedom of the Press Foundation offers training and priority support services. See https://securedrop.org/priority-support/ for more information.
51.1 Update Servers to SecureDrop 2.3.2

Your servers will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

51.2 Update Workstations to SecureDrop 2.3.2

Note: If you encounter errors with the graphical updater, perform a manual update. This will ensure that you have imported the new SecureDrop release signing key.

51.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.3.2 by clicking “Update Now”: 
SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.
51.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater's temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
gpg --keyserver hkps://keys.openpgp.org --recv-key "2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.3.2
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.3.2
```

**Important:** If you do see the warning “refname ‘2.3.2’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

51.3 Upgrade to Tails 5.0

**Important:** You must upgrade your workstations to SecureDrop 2.3.2 by following the steps above before upgrading to Tails 5.0. You can verify the version of SecureDrop by running `git status` in your ~/Persistent/securedrop directory. The output should include “HEAD detached at 2.3.2”.

Tails 5.0 is the first version of Tails to be based on Debian 11 (“Bullseye”). Among the most noticeable changes is the switch to a new frontend for GnuPG called Kleopatra. Once you upgrade your *Secure Viewing Station*, you will need to use Kleopatra to open `.gpg` files. Please see our *Journalist Guide* for more information.

You must perform the upgrade to Tails 5.0 manually. You need a blank USB drive that you can install Tails 5.0 USB on from scratch. You will use this drive to upgrade your *Journalist Workstation(s)*, your *Admin Workstation(s)*, and your *Secure Viewing Station(s)*.
The persistent storage volumes of your USB drives will be migrated as part of this upgrade, but we still highly recommend backing them up first. Follow the steps for updating Tails manually.

For each Journalist and Admin Workstation, perform the following additional steps to complete the upgrade:

1. Boot the USB drive
2. On the Tails welcome screen, unlock the persistent volume and configure an administrator password
3. Open a terminal (Applications ▶ Utilities ▶ Terminal)
4. Run the following commands:

```
cd ~/Persistent/securedrop/admin
rm -rf .venv3
cd ..
./securedrop-admin setup
```

When prompted by Tails to “Install Only Once” or “Install Every Time”, click Install Every Time (this is a change from previous versions of Tails).

### 51.4 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at [https://forum.securedrop.org](https://forum.securedrop.org)
- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.
CHAPTER FIFTYTWO

UPGRADE FROM 2.3.0 TO 2.3.1

52.1 Update Servers to SecureDrop 2.3.1

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

52.2 Update Workstations to SecureDrop 2.3.1

Note: If you encounter errors with the graphical updater, perform a manual update. This will ensure that you have imported the new SecureDrop release signing key.

52.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.3.1 by clicking “Update Now”: 
SecureDrop Workstation Updater

SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.

0%

Update Later  Update Now
52.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/.Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/.Persistent/securedrop
git fetch --tags
gpg --keyserver hkps://keys.openpgp.org --recv-key \\
"2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.3.1
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-˓→2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.3.1
```

**Important:** If you do see the warning “refname ‘2.3.1’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

52.3 Update Tails

Follow the graphical prompts to update to the latest version of the Tails operating system on your Admin and Journalist Workstations.

**Important:** Older versions of Tails had problems with automatic updates, which SecureDrop tries to correct automatically. Check the version of Tails on your Admin and Journalist Workstations (Applications ➤ Tails ➤ About Tails). If you are running a version older than Tails 4.23, and did not receive an automatic upgrade prompt after connecting to the Internet, perform a manual update. If this also fails, please don’t hesitate to contact us.
52.4 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at https://forum.securedrop.org

- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.

- The Freedom of the Press Foundation offers training and priority support services. See https://securedrop.org/priority-support/ for more information.
53.1 Update Servers to SecureDrop 2.3.0

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

53.2 Update Workstations to SecureDrop 2.3.0

Note: If you encounter errors with the graphical updater, perform a manual update. This will ensure that you have imported the new SecureDrop release signing key.

53.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.3.0 by clicking “Update Now”: 
SecureDrop workstation updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.
## 53.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
gpg --keyserver hkps://keys.openpgp.org --recv-key "2359E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.3.0
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
gpg: Good signature from "SecureDrop Release Signing Key <securedrop-release-key-→2021@freedom.press>" [unknown]
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. A warning that the key is not certified is normal and expected. If the output includes the lines above, you can check out the new release:

```
git checkout 2.3.0
```

**Important:** If you do see the warning “refname ‘2.3.0’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

## 53.3 Update Tails

Follow the graphical prompts to update to the latest version of the Tails operating system on your *Admin* and *Journalist Workstations*.

**Important:** Older versions of Tails had problems with automatic updates, which SecureDrop tries to correct automatically. Check the version of Tails on your *Admin* and *Journalist Workstations* ([Applications ➤ Tails ➤ About Tails](#)). If you are running a version older than Tails 4.23, and did not receive an automatic upgrade prompt after connecting to the Internet, perform a *manual update*. If this also fails, please don’t hesitate to contact us.
53.4 Ensure You Are on Supported Hardware

SecureDrop 2.2.x was the last release series with support for Mac Mini or Intel NUC5 hardware. If you are still using Mac Mini or Intel 5th-gen NUC servers, you must move to a supported hardware platform as soon as possible to continue using SecureDrop. Newer Intel NUC models will continue to be supported.

53.5 Back Up the Tails Workstations

USB flash drives degrade over time and vary in quality. To ensure continued access to SecureDrop by administrators and journalists, we recommend backing up the Tails Workstations on the occasion of a new SecureDrop release, after you have completed the upgrade process for each drive.

You can use a single storage device for backups of multiple workstations. See our Workstation Backup Guide for more information.

53.6 Apply Any Available Firewall Updates

As part of SecureDrop maintenance, we recommend checking for software updates for the hardware firewall, which may need to be applied manually. If you are using one of the recommended firewalls, see Keeping pfSense up to Date or see Keeping OPNSense up to Date.

53.7 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at https://forum.securedrop.org
- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.
- The Freedom of the Press Foundation offers training and priority support services. See https://securedrop.org/priority-support/ for more information.
CHAPTER FIFTYFOUR

UPGRADE FROM 2.2.0 TO 2.2.1

54.1 Updating Servers to SecureDrop 2.2.1

Servers running Ubuntu 20.04 will be updated to the latest version of SecureDrop automatically within 24 hours of the release.

54.2 Updating Workstations to SecureDrop 2.2.1

Note: If you encounter errors with the graphical updater, perform a manual update. This will ensure that you have imported the new SecureDrop release signing key.

54.2.1 Using the graphical updater

On the next boot of your SecureDrop Journalist and Admin Workstations, the SecureDrop Workstation Updater will alert you to workstation updates. You must have configured an administrator password on the Tails welcome screen in order to use the graphical updater.

Perform the update to 2.2.1 by clicking “Update Now”: 
SecureDrop workstations updates are available! It is recommended to install them now.

If you don't want to install them now, you can install them the next time you reboot.

You will need to have set a Tails Administration password in the Tails Greeter on boot to complete the update.

When you start your workstation, this window will automatically appear if you have not completed any required updates.
54.2.2 Performing a manual update

If the graphical updater fails and you want to perform a manual update instead, first delete the graphical updater’s temporary flag file, if it exists (the . before securedrop is not a typo):

```
rm ~/Persistent/.securedrop/securedrop_update.flag
```

This will prevent the graphical updater from attempting to re-apply the failed update and has no bearing on future updates. You can now perform a manual update by running the following commands:

```
cd ~/Persistent/securedrop
git fetch --tags
gpg --keyserver hkps://keys.openpgp.org --recv-key "2359 E653 8C06 13E6 5295 5E6C 188E DD3B 7B22 E6A3"
git tag -v 2.2.1
```

The output should include the following two lines:

```
gpg: using RSA key 2359E6538C0613E652955E6C188EDD3B7B22E6A3
```

Please verify that each character of the fingerprint above matches what is on the screen of your workstation. If it does, you can check out the new release:

```
git checkout 2.2.1
```

**Important:** If you do see the warning “refname ‘2.2.1’ is ambiguous” in the output, we recommend that you contact us immediately at securedrop@freedom.press (GPG encrypted).

Finally, run the following commands:

```
./securedrop-admin setup
./securedrop-admin tailsconfig
```

54.3 Updating Tails

Follow the graphical prompts to update to the latest version of the Tails operating system on your Admin and Journalist Workstations.

**Important:** Older versions of Tails had problems with automatic updates, which SecureDrop tries to correct automatically. Check the version of Tails on your Admin and Journalist Workstations (Applications ▶ Tails ▶ About Tails). If you are running a version older than Tails 4.23, and did not receive an automatic upgrade prompt after connecting to the Internet, perform a manual update. If this also fails, please don’t hesitate to contact us.
54.4 Mac Mini and Intel 5th-gen NUC Deprecation

SecureDrop 2.2.x will be the last release series with support for Mac Mini or Intel NUC5 hardware. If you are still using Mac Mini or Intel 5th-gen NUC servers, you must move to a supported hardware platform as soon as possible to continue using SecureDrop. Newer Intel NUC models will continue to be supported.

54.5 Troubleshooting Kernel Issues

SecureDrop 2.2.1 includes a kernel update on the Application and Monitor Servers, from version 5.15.18 to version 5.15.26. As with all kernel updates, we have extensively tested this update against recommended hardware.

If you are running SecureDrop on hardware that is not officially supported, you may encounter compatibility issues with the new kernel. For example, the servers may not boot, or you may lose network connectivity. If this happens, you can temporarily downgrade to the previous kernel version.

**Important:** To ensure continued secure operation of your SecureDrop instance, it is of critical importance to resolve any compatibility issues with the new kernel as quickly as possible. If you encounter problems with this update, please get in touch with us urgently, so we can help you run the latest supported kernel version.

For information on how to downgrade to the previous kernel, and for additional troubleshooting information, please see our Kernel Troubleshooting Guide.

54.6 Getting Support

Should you require further support with your SecureDrop installation, we are happy to help!

- Community support is available at https://forum.securedrop.org
- If you are already a member of our support portal, please don’t hesitate to open a ticket there. If you would like to request access, please contact us at securedrop@freedom.press (GPG encrypted). Note that your ticket will be visible to all support portal users at your organization; if this is a concern, reach out by email to the above address or to a staff member directly.
- The Freedom of the Press Foundation offers training and priority support services. See https://securedrop.org/priority-support/ for more information.
This document outlines the threat model for SecureDrop 0.3 and is inspired by a document Adam Langley wrote for Pond. The threat model is defined in terms of what each possible adversary can achieve. This document is always a work in progress. If you have questions or comments, please open an issue on GitHub or send an email to secure-drop@freedom.press.

The threat model for the SecureDrop Workstation based on Qubes OS is summarized in a separate document.

### 55.1 Actors

The SecureDrop ecosystem comprises a host of actors, organized by the following high-level categories: *Users, Adversaries, and Systems.*

#### 55.1.1 Users

The following table of the users who interact with the SecureDrop web application. Note that the airgapped SVS with the GPG *Submission Key* is required to decrypt submissions or messages.

<table>
<thead>
<tr>
<th>User Type</th>
<th>Trust Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>• Submit a document or message</td>
</tr>
<tr>
<td>Recurring source</td>
<td>• Submit another document or message</td>
</tr>
<tr>
<td></td>
<td>• Read replies</td>
</tr>
<tr>
<td>Journalist</td>
<td>• Download all GPG-encrypted documents from all sources</td>
</tr>
<tr>
<td></td>
<td>• Download all GPG-encrypted messages from all sources</td>
</tr>
<tr>
<td></td>
<td>• Reply to all sources</td>
</tr>
<tr>
<td>Admin</td>
<td>• Download all GPG-encrypted documents from all sources</td>
</tr>
<tr>
<td></td>
<td>• Download all GPG-encrypted messages from all sources</td>
</tr>
<tr>
<td></td>
<td>• Reply to all sources</td>
</tr>
<tr>
<td></td>
<td>• Change the SecureDrop instance logo</td>
</tr>
<tr>
<td></td>
<td>• SSH and root privileges on <em>app</em> and <em>mon</em> servers</td>
</tr>
</tbody>
</table>
55.1.2 Adversaries

We consider the following classes of attackers for the design and assessment of SecureDrop:

<table>
<thead>
<tr>
<th>Adversary</th>
<th>Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation State / Law Enforcement / Global Adversary</td>
<td>• Large scale, full-packet network capture</td>
</tr>
<tr>
<td></td>
<td>• Active network attacks</td>
</tr>
<tr>
<td></td>
<td>• Advanced attacks on infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Hardware and software implants for persistence</td>
</tr>
<tr>
<td></td>
<td>• Cryptanalysis</td>
</tr>
<tr>
<td></td>
<td>• Exploitation of unknown vulnerabilities</td>
</tr>
<tr>
<td>Large Corporation</td>
<td>• Limited network capture</td>
</tr>
<tr>
<td></td>
<td>• Some targeted attacks on infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Use of known vulnerabilities</td>
</tr>
<tr>
<td></td>
<td>• Mostly limited to software-based attacks</td>
</tr>
<tr>
<td>Internet Service Provider</td>
<td>• Full network capture</td>
</tr>
<tr>
<td></td>
<td>• Mostly limited to network-based attacks</td>
</tr>
<tr>
<td>User Error</td>
<td>• Source, Journalist, Administrator or Developer error</td>
</tr>
<tr>
<td>Dedicated Individual</td>
<td>• Use of known vulnerabilities</td>
</tr>
<tr>
<td></td>
<td>• Mostly limited to software-based attacks</td>
</tr>
</tbody>
</table>

55.1.3 Systems

For more information about the various systems involved in a SecureDrop deployment, please visit the hardware section.

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Firewall</td>
<td>• Dedicated Hardware Firewall</td>
</tr>
<tr>
<td></td>
<td>• pfSense-based</td>
</tr>
<tr>
<td></td>
<td>• 3 Interfaces: app, mon and admin</td>
</tr>
<tr>
<td>Application Server</td>
<td>• SecureDrop Source Interface</td>
</tr>
<tr>
<td></td>
<td>• SecureDrop Journalist Interface</td>
</tr>
<tr>
<td></td>
<td>• SSH Server</td>
</tr>
<tr>
<td></td>
<td>• Ossec Client</td>
</tr>
<tr>
<td>Monitor Server</td>
<td>• Ossec Server</td>
</tr>
<tr>
<td></td>
<td>• SSH Server</td>
</tr>
<tr>
<td>Journalist/Admin Workstation</td>
<td>• Internet-connected laptop</td>
</tr>
<tr>
<td></td>
<td>• Tails USB with persistence volume</td>
</tr>
<tr>
<td>Secure Viewing Station (SVS)</td>
<td>• Airgapped and stripped-down laptop</td>
</tr>
<tr>
<td></td>
<td>• Tails USB with persistence volume</td>
</tr>
</tbody>
</table>

55.2 Assumptions

The following assumptions are accepted in the threat model of every SecureDrop project:
55.2.1 Assumptions About the Source

- The source acts reasonably and in good faith, e.g. if the source were to give their credentials or private key material to the attacker that would be unreasonable.
- The source would like to remain anonymous, even against a forensic attacker.
- The source obtains an authentic copy of Tails and Tor Browser.
- The source follows our guidelines for using SecureDrop.
- The source is accessing an authentic SecureDrop site.

55.2.2 Assumptions About the Admin and the Journalist

- The admin and the journalist act reasonably and in good faith, e.g. if either of them were to give their credentials or private key material to the attacker that would be unreasonable.
- The admin and the journalist obtain authentic copies of Tails.
- The journalist follows our guidelines for using SecureDrop and working with submitted documents.

55.2.3 Assumptions About the Person Installing SecureDrop

- This person (usually the admin) acts reasonably and in good faith, e.g. if they were to give the attacker system-level access that would be unreasonable.
- The person obtains an authentic copy of SecureDrop and its dependencies.
- The person follows our guidelines for deploying the system, setting up the landing page for the organization, and for installing SecureDrop.

55.2.4 Assumptions About the Source’s Computer

- The computer correctly executes Tails or Tor Browser.
- The computer is not compromised by malware.

55.2.5 Assumptions About the Admin Workstation and the Journalist Workstation

- The computer correctly executes Tails.
- The computer and the Tails device are not compromised by malware.
- The two-factor authentication device used with the workstation are not compromised by malware.
55.2.6 Assumptions About the Secure Viewing Station

- The computer is airgapped.
- The computer correctly executes Tails.
- The computer and the Tails device are not compromised by malware.

55.2.7 Assumptions About the SecureDrop Hardware

- The servers correctly execute Ubuntu, SecureDrop and its dependencies.
- The servers, network firewall, and physical media are not compromised by malware.

55.2.8 Assumptions About the Organization Hosting SecureDrop

- The organization wants to preserve the anonymity of its sources.
- The organization acts in the interest of allowing sources to submit documents, regardless of the contents of these documents.
- The users of the system, and those with physical access to the servers, can be trusted to uphold the previous assumptions unless the entire organization has been compromised.
- The organization is prepared to push back on any and all requests to compromise the integrity of the system and its users, including requests to deanonymize sources, block document submissions, or hand over encrypted or decrypted submissions.

55.2.9 Assumptions About the World

- The security assumptions of RSA (4096-bit GPG and SSH keys) are valid.
- The security assumptions of scrypt with randomly-generated salts are valid.
- The security/anonymity assumptions of Tor and the onion service protocol are valid.
- The security assumptions of the Tails operating system are valid.
- The security assumptions of SecureDrop dependencies, specifically Ubuntu, the Linux kernel, application packages, application dependencies are valid.

55.2.10 Other Assumptions or Factors

- The level of press freedom may vary in both geography and time.
- The number of daily Tor users in a country can greatly vary.
55.3 Assets

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets relating to SecureDrop users</td>
<td>• Login details</td>
</tr>
<tr>
<td></td>
<td>• Encryption key(s)</td>
</tr>
<tr>
<td></td>
<td>• SSH details</td>
</tr>
<tr>
<td>Assets relating to the publicly accessed system</td>
<td>• Access to documents via server</td>
</tr>
<tr>
<td></td>
<td>• Access to documents via Journalist Interface</td>
</tr>
<tr>
<td></td>
<td>• Access to admin privileges via Journalist Interface</td>
</tr>
<tr>
<td></td>
<td>• Access to user alerts, support tickets</td>
</tr>
<tr>
<td>Assets relating to the underlying system</td>
<td>• SecureDrop code manipulation</td>
</tr>
<tr>
<td></td>
<td>• Dependency code manipulation</td>
</tr>
</tbody>
</table>

55.4 Implications of SecureDrop Area Compromise

55.4.1 What a Compromise of the Application Server Can Surrender

- The server sees the plaintext codename, used as the login identifier, of every source.
- The server sees all HTTP requests made by the source, the admin, and the journalist.
- The server sees the plaintext submissions of every source.
- The server sees the plaintext communication between journalists and their sources.
- The server stores the onion service private key for the source interface.
- The server stores the onion service private key and authentication token for the Journalist interface.
- The server stores (optional) TLS private key and certificate (if HTTPS is enabled on the source interface)
- The server stores hashes of codenames, created with scrypt and randomly-generated salts.
- The server stores journalist password hashes, created with scrypt and randomly-generated salts, as well as TOTP seeds.
- The server stores only encrypted submissions and communication on disk.
- The server stores a GPG key for each source, with the source’s codename as the passphrase.
- The server may store plaintext submissions in memory for at most 24 hours.
- The server stores sanitized Tor logs, created using the SafeLogging option, for the Source Interface, the Journalist Interface, and SSH.
- The server stores both access and error logs for the Journalist Interface.
- The server stores connection history and audit logs for the admin.
- The server can connect to the Monitor Server using an SSH key and a passphrase.
55.4.2 What a Compromise of the Monitor Server Can Surrender

- The server stores the plaintext alerts on disk, data may also reside in RAM.
- The server stores the OSSEC Alert Public Key the OSSEC alerts are encrypted to.
- The server stores plaintext credentials for the SMTP relay used to send OSSEC alerts.
- The server stores the email address the encrypted OSSEC alerts are sent to.
- The server stores sanitized Tor logs, created using the SafeLogging option, for SSH.
- The server stores connection history and audit logs for the admin.
- The server stores OSSEC and Procmail logs on disk.
- The server can connect to the Application Server using an SSH key and a passphrase.

55.4.3 What a Compromise of the Workstations Can Surrender

- The Admin Workstation requires Tails with a persistent volume, which stores information such as GPG and SSH keys, as well as a database with passphrases for the Application Server, the Monitor Server, and the GPG key the Monitor Server will encrypt OSSEC alerts to.
- The Journalist Workstation requires Tails with a persistent volume, which stores information such as the onion service value required to connect to the Journalist Interface, as well as a database with passphrases for the Journalist Interface.
- The Secure Viewing Station requires Tails with a persistent volume, which stores information such as the SecureDrop application’s GPG key, as well as a database with the passphrase for that key.

55.4.4 What a Compromise of the Source’s Property Can Surrender

- Use of Tor Browser will leave traces that can be discovered through a forensic analysis of the source’s property following either a compromise or physical seizure. Unless the compromise or seizure happens while the source is submitting documents to SecureDrop, the traces will not include information about sites visited or actions performed in the browser.
- Use of Tails with a persistent volume will leave traces on the device the operating system was installed on. Unless the compromise or seizure happens while the source is submitting documents to SecureDrop, or using the persistent volume, the traces will not include information about sites visited or actions performed in the browser or on the system.
- SecureDrop 0.3 encourages sources to protect their codenames by memorizing them. If a source cannot memorize the codename right away, we recommend writing it down and keeping it in a safe place at first, and gradually working to memorize it over time. Once the source has memorized it, they should destroy the written copy. If the source does write down the codename, a compromise or physical seizure of the source’s property may result in the attacker obtaining the source’s codename.
- An attacker with access to the source’s codename can:
  - Show that the source has visited the SecureDrop site, but not necessarily submitted anything.
  - Upload new documents or submit messages.
  - Communicate with the journalist as that source.
  - See any replies from journalists that the source has not yet deleted.
55.4.5 What a Physical Seizure of the Source’s Property Can Surrender

- Document use of Tor or Tails, but not necessarily research into SecureDrop
- Prevent the source from submitting documents by taking the device the documents are stored on.
- If the property is seized while powered on, the attacker can also analyze any plaintext information that resides in RAM.
- Tamper with the hardware.
- A physical seizure of, and access to, the source’s codename will allow the attacker to access the Source Interface as that source.
- A physical seizure of the admin’s property will allow the attacker to:
  - Prevent the admin from working on SecureDrop for some period of time.
  - Access any stored, decrypted documents taken off the Secure Viewing Station.
  - If the property is seized while powered on, the attacker can also analyze any plaintext information that resides in RAM.
- A physical seizure of, and access to, the admin’s Tails persistent volume, password database, and two-factor authentication device will allow the attacker to access both servers and the Journalist Interface.

55.4.6 What Compromise of the Admin’s Property Can Surrender

- To access the Journalist Interface, the Application Server, or the Monitor Server, the attacker needs to obtain the admin’s login credentials and the admin’s two-factor authentication device. Unless the attacker has physical access to the servers, the attacker will also need to obtain the onion service values for the Interface and the servers. This information is stored in a password-protected database in a persistent volume on the admin’s Tails device. The volume is protected by a passphrase. If the admin’s two-factor authentication device is a mobile phone, this will also be protected by a passphrase.
- An attacker with access to the admin’s computer can:
  - Access any stored, decrypted documents taken off the Secure Viewing Station.
- An attacker with access to the persistent volume on the admin’s Tails device can:
  - Add, modify, and delete files on the volume.
  - Access the onion service values used by the Interfaces and the servers.
  - Access SSH keys and passphrases for the Application Server and the Monitor Server.
  - Access the GPG key and passphrase for the encrypted OSSEC email alerts.
  - Access the credentials for the account the encrypt alerts are sent to.
  - Access the admin’s personal GPG public key, if stored there.
- An attacker with admin access to the Journalist Interface can:
  - Add, modify, and delete journalist users.
  - Change the codenames associated with sources within the Interface.
  - Download, but not decrypt, submissions.
  - Communicate with sources.
  - Delete one or more submissions.
– Delete one or more sources, which destroys all communication with that source and prevents the source from ever logging back in with that codename.

• An attacker with admin access to the Application Server can:
  – Add, modify, and delete software, configurations, and other files.
  – See all HTTP requests made by the source, the admin, and the journalist.
  – See the plaintext codename of a source as they are logging in.
  – See the plaintext communication between a source and a journalist as it happens.
  – See the stored list of hashed codenames.
  – Access the GPG public key used to encrypt communications between a journalist and a source.
  – Download stored, encrypted submissions and replies from the journalists.
  – Decrypt replies from the journalists if the source’s codename, and thus the passphrase, is known.
  – Analyze any plaintext information that resides in RAM, which may include plaintext of submissions made within the past 24 hours.
  – Review logs stored on the system.
  – Access the Monitor Server.

• An attacker with admin access to the Monitor Server can:
  – Add, modify, and delete software, configurations, and other files.
  – Change the SMTP relay, email address, and GPG key used for OSSEC alerts.
  – Analyze any plaintext information that resides in RAM.
  – Review logs stored on the system.
  – Trigger arbitrary commands to be executed by the OSSEC agent user, which, assuming the attacker is able to escalate privileges, may affect the Application Server.

55.4.7 What a Physical Seizure of the Admin’s Property Can Achieve

• Tamper with the hardware.

• Prevent the admin from working on SecureDrop for some period of time.

• Access any stored, decrypted documents taken off the Secure Viewing Station.

• If the property is seized while powered on, the attacker can also analyze any plaintext information that resides in RAM.

• A physical seizure of, and access to, the admin’s Tails persistent volume, password database, and two-factor authentication device will allow the attacker to access both servers and the Journalist Interface.
55.4.8 What a Compromise of the Journalist’s Property Can Achieve

- To access the Journalist Interface, the attacker needs to obtain the journalist’s login credentials and the journalist’s two-factor authentication device or seed. Unless the attacker has physical access to the server, the attacker will also need to obtain the onion service value for the Interface. This information is stored in a password-protected database in a persistent volume on the journalist’s Tails device. The volume is protected by a passphrase. If the journalist’s two-factor authentication device is a mobile phone, this will also be protected by a passphrase.

- An attacker with access to the journalist’s computer can:
  - Access any stored, decrypted documents taken off the Secure Viewing Station.

- An attacker with access to the persistent volume on the journalist’s Tails device can:
  - Add, modify, and delete files on the volume.
  - Access the onion service values used by the Journalist Interface.
  - Access SSH keys and passphrases for the Application Server and the Monitor Server.

- An attacker with journalist access to the Journalist Interface can:
  - Change the codenames associated with sources within the interface.
  - Download, but not decrypt, submissions.
  - Delete one or more submissions.
  - Communicate with sources.
  - If the journalist has admin privileges on SecureDrop, they can create new journalist accounts.

55.4.9 What a Physical Seizure of the Journalist’s Property Can Achieve

- Tamper with the hardware.

- Prevent the journalist from working on SecureDrop for some period of time.

- Access any stored, decrypted documents taken off the Secure Viewing Station.

- If the property is seized while powered on, the attacker can also analyze any plaintext information that resides in RAM.

- A physical seizure of, and access to, the journalist’s Tails persistent volume, password database, and two-factor authentication device will allow the attacker to access the Journalist Interface.

55.4.10 What a Compromise of the Application Server Can Achieve

- If the Application Server is compromised, the system user the attacker has control over defines what kind of information the attacker will be able to view and what kind of actions the attacker can perform.

- An attacker with access to the debian-tor user can:
  - View, modify, and delete all files owned by this user. This includes sanitized Tor logs, created using the SafeLogging option, for SSH, the Source Interface and the Journalist Interface.
  - View, modify, and delete the Tor configuration file, root is required to reload the config.

- An attacker with access to the ossec user can:
  - Add, view, modify, and delete the log files, and in doing so send inaccurate information to the Monitor Server and the admin.

55.4. Implications of SecureDrop Area Compromise
• An attacker with access to the **www-data** user can:
  
  – View, modify, and delete all files owned by this user. This includes all files in use by the SecureDrop application, such as text, code, the database containing encrypted submissions and communications. The attacker needs root access to reload configuration files.
  
  – View, modify, and delete both access and error logs for the *Journalist Interface*.
  
  – View any HTTP requests made by the source, the admin, and the journalist in that moment. This includes seeing plaintext codenames, submissions, and communications.
  
  – Add and delete communications between a journalist and a source by writing to the database.

• An attacker with access to the **root** user can:
  
  – Do anything the **www-data** user can do in terms of the SecureDrop application, this user is in full control of the server and can view, modify, and delete anything at will. This user is not able to decrypt submissions or communications, unless the attacker has access to the encryption key required to do so.

### 55.4.11 What a Physical Seizure of the Application Server Can Achieve

• If the *Application Server* is seized, the attacker will be able to view any and all unencrypted files on the server. An attacker will be able to modify any and all files on the server. This includes all files in use by the SecureDrop Application. If the server is seized while it is powered on, the attacker can also analyze any plaintext information that resides in RAM. The attacker can also tamper with the hardware.

### 55.4.12 What a Compromise of the Monitor Server Can Achieve

• If the *Monitor Server* is compromised, the system user the attacker has control over defines what kind of information the attacker will be able to view and what kind of actions the attacker can perform.

• An attacker with access to the **debian-tor** user can:
  
  – View, modify, and delete all files owned by this user. This includes sanitized Tor logs, created using the `SafeLogging` option, for SSH.
  
  – View, modify, and delete the Tor configuration file, root is required to reload the config.

• An attacker with access to the **ossec** user can:
  
  – View all ossec logs and alerts on disk.
  
  – Modify the ossec configuration.
  
  – Send (or suppress) emails to administrators and journalists.

• An attacker with access to the **root** user can:
  
  – Do anything the **ossec** user can do in terms of the SecureDrop application, this user is in full control of the server and can view, modify, and delete anything at will. This user is not able to decrypt encrypted email alerts, unless the attacker has access to the encryption key required to do so.
55.4.13 What a Physical Seizure of the *Monitor Server* Can Achieve

- If the *Monitor Server* is seized, the attacker will be able to view any and all unencrypted files on the server. This includes all files in use by OSSEC. If the server is seized while it is powered on, the attacker can also analyze any plaintext information that resides in RAM. The attacker can also tamper with the hardware.
- If the *Monitor Server* is no longer online or tampered with, this will have an effect on the quantity and accuracy of notifications sent to admins or journalists.

55.4.14 What a Compromise of the *Secure Viewing Station* Can Achieve

- The *Secure Viewing Station* is only useful to an attacker while powered on and with the Tails persistent volume mounted. The attacker may learn more if the *Transfer Device* or the *Export Device* are in use at the time of compromise or seizure. A physical seizure of this machine, its Tails device, the *Transfer Device* or the *Export Device* will also achieve nothing, assuming that the Tails and VeraCrypt implementations of full-disk encryption work as expected.
- A compromise of the *Secure Viewing Station* allows the attacker to:
  - Run commands as the *amnesia* user.
  - View, modify, and delete files owned by the *amnesia* user. This includes the *Submission Private Key* used to encrypt and decrypt submitted documents.
  - View, modify, and delete submissions in encrypted form
  - View, modify, and delete decrypted submissions, if they are stored in decrypted form on the *Secure Viewing Station*, or if the *Export Device* is in use.
  - Export the *Submission Private Key* key (unless there is a passphrase set).

55.4.15 What a Physical Seizure of the *Secure Viewing Station* Can Achieve

- The *Secure Viewing Station* is only useful to an attacker while powered on and with the Tails persistent volume mounted. The attacker may learn more if the *Transfer Device* or the *Export Device* are in use at the time of compromise or seizure. A physical seizure of this machine, its Tails device, the *Transfer Device* or the *Export Device* will also achieve nothing, assuming that the Tails and VeraCrypt implementations of full-disk encryption work as expected.
- A physical seizure of the *Secure Viewing Station*, while on and with the persistent volume decrypted and mounted, allows the attacker to:
  - Tamper with the hardware.
  - Run commands as the *amnesia* user.
  - View, modify, and delete the *Submission Private Key* used to encrypt and decrypt submitted documents.
  - View, modify, and delete decrypted submissions, if they are stored in decrypted form on the *Secure Viewing Station*, or if the *Export Device* is in use.
55.4.16 What a Local Network Attacker Can Achieve Against the Source, Admin, or Journalist:

- A local network can observe when they are using Tor.
- A local network can block Tor and prevent them from accessing SecureDrop.
- A local network may be able to deduce use of SecureDrop by looking at request sizes, plaintext uploads and encrypted downloads, although research suggests this is very difficult.

55.4.17 What a Global Adversary Can Achieve Against the Source, Admin, or Journalist:

- A global adversary capable of observing all Internet traffic may have more luck than the local network attacker in deducing use of SecureDrop by looking at request sizes, plaintext uploads and encrypted downloads.
- A global adversary may be able to link a source to a specific SecureDrop server.
- A global adversary may be able to link a source to a specific journalist.
- A global adversary may be able to correlate data points during a leak investigation, including looking at who has read up on SecureDrop and who has used Tor.
- A global adversary may be able to forge an SSL certificate and use it to spoof an organization’s HTTPS Landing Page, thereby tricking the source into visiting a fake SecureDrop site.

55.4.18 What a Random Person on the Internet Can Achieve

- A random person can attempt to DoS the SecureDrop server and overwhelm the journalists by generating a high number of codenames and uploading many large documents.
- A random person can submit empty, forged, or inaccurate documents.
- A random person can submit malicious documents, e.g. malware that will attempt to compromise the Secure Viewing Station.
- A random person can attempt to get sensitive information from a SecureDrop user’s browser session, such as the source’s codename.
- A random person can attempt to compromise the SecureDrop server by attacking the exposed attack surface, including the kernel network stack, Tor, Apache, the SecureDrop web interfaces, Python, OpenSSH, and the TLS implementation.
The following diagram captures all data flows to and from a SecureDrop deployment.
ATTACKS AND COUNTERMEASURES ON THE SECUREDROP ENVIRONMENT

SecureDrop is a complex ecosystem comprised of various pieces of hardware, a diverse codebase, multiple user roles, and varied software dependencies. As such, an adversary can compromise any one of these components through a variety of attacks, as detailed below. We’ve categorized attacks and countermeasures by SecureDrop architecture area for clarity.

There are certain attacks that cannot be mitigated by any of the technical or operational countermeasures built into SecureDrop. Attacks of a political nature — for example, if a source, journalist, or organization is threatened with legal action — are context-dependent, and determined by an ever-shifting climate around press freedoms. While these attack vectors are out of the scope of this document, they should be factored in to any organization’s threat model with regional and political specificity.

57.1 Application Code — SecureDrop Repository/Release

57.1.1 Attacks to the Application Code — SecureDrop Repository/Release

- Malicious code introduced in SecureDrop repository
- Malicious code introduced in SecureDrop release
- Failure to encrypt submissions as they are written to disk

57.1.2 Countermeasures on the Application Code — SecureDrop Repository/Release

- Code (git tags) and releases (packages uploaded to apt) are signed with the aircapped signing key
- Protection is placed on main and develop branch on GitHub
- For SecureDrop Developers, two-factor authentication is mandated on GitHub
- Community trust is built through 3 trusted code owners and code reviews
57.2 Application Code — Source Interface and Journalist Interface

57.2.1 Attacks to the Application Code — Source Interface and Journalist Interface

- Configuration vulnerability in Source or Journalist Interface
- Lack of segmentation between Source and Journalist Interface
- Session management vulnerability in Source or Journalist Interface
- Malicious input vulnerability in Source or Journalist Interface
- Configuration vulnerability in Source or Journalist Interface
- Authentication vulnerability in Source or Journalist Interface
- Access control vulnerability in Source or Journalist Interface
- Data protection vulnerability in Source or Journalist Interface
- Communications vulnerability in Source or Journalist Interface
- Error handling and logging vulnerability in Source or Journalist Interface
- HTTP security configuration vulnerability in Source or Journalist Interface
- File and resource vulnerability in Source or Journalist Interface
- Business logic vulnerability in Source or Journalist Interface
- Web services vulnerability in Source or Journalist Interface

57.2.2 Countermeasures on both Source and Journalist Interfaces

- Interfaces run on an end-to-end encrypted Tor Onion Service
- Sensitive source and submission data is sent through HTTP POST
- All source submissions are encrypted with GPG at rest using the airgapped Submission Key
- Interface sessions are invalidated after a user logs out or inactivity over 120 minutes
- Session control on Interface includes CSRF token in Flask Framework
- All Interface session data (except language and locale selection) is discarded at logout, and fully deleted upon exiting Tor Browser
- A number of mitigations are in place as protection against malicious input vulnerabilities on the Source and Journalist Interfaces:
  - X-XSS-PROTECTION is enabled
  - SQLAlchemy is used as ORM for all database queries
  - Application does not execute uploaded submission data
- A number of mitigations are in place as protection against the risk of an HTTP misconfiguration on the Source and Journalist Interfaces:
  - Cache control header is set to “no store;”
  - HTTP headers do not expose version information of system components
– X-Content-Type is set to “nosniff;”
– X-XSS-Protection is set to “1”

57.2.3 Countermeasures unique to Source Interface

• TLS on Source Interface is opt-in with an EV cert
• Only HTTP GET, POST and HEAD methods are allowed
• A number of mitigations are in place as protection against access control vulnerabilities on the Source Interface:
  – Source codenames are long and automatically generated
  – Hashed codenames are stored in a database hashed with a unique salt
  – Source codename reset functionality is not available
  – Source login does not display information about prior submissions
  – Source login requires 7-word codename to check Source Interface for replies

57.2.4 Countermeasures unique to Journalist Interface

• Journalist Interface is located behind an authenticated Onion Service and only privileged users have required authorization token
• Only HTTP GET, POST, HEAD and DELETE methods are allowed
• A number of mitigations are in place as protection against access control vulnerabilities on the Journalist Interface:
  – Apache autoindex module is disabled
  – Journalist/Admin passphrases are long and automatically generated
  – Passphrases are stored in a database hashed with a unique salt
  – Account generation/revocation/reset is restricted to Admin role
  – Two-factor authentication is required (via a TOTP app, or an HOTP device like a YubiKey)

57.3 Application Server and Monitor Server

57.3.1 Attacks on the Application Server and Monitor Server

• Application or Monitor Server configuration error
• Source or Journalist Interface is framed
• Application or Monitor Server is compromised
• Attacker exploits postfix
• Known vulnerabilities in the Linux kernel or packages used by app/mon servers
57.3.2 Countermeasures on Both Application and Monitor Servers

- Grsecurity/PaX linux patches prevent the exploitation of certain memory-corruption attacks
- AppArmor profiles further reduce process capabilities through Mandatory Access Control
- All SecureDrop infrastructure is provisioned via infrastructure-as-code (Ansible scripts)
- A cron job ensures that automatic nightly security updates are applied for OS packages
- *Journalist Interface* uses ATHS cookie
- *Monitor Server* should only expose SSH via Tor Onion Service. All other traffic should be blocked by firewall

57.3.3 Countermeasures Unique to Application Server

- SecureDrop *Source* and *Journalist Interfaces* uses X-Frame-Options: DENY header
- Browser Same Origin Policy should prevent the SecureDrop page from trivial modifications, but more complex attacks are mitigated via the X-Frame-Options: DENY HTTP header

57.3.4 Countermeasures Unique to Monitor Server

- OSSEC is used for intrusion detection/file integrity monitoring, and are sent to Admins via end-to-end encrypted email

57.4 SecureDrop Dependencies — Python, Tor, Linux Kernel, apt, Tails, Ubuntu, or Hardware Firewall Vulnerabilities

57.4.1 Attacks on SecureDrop Dependencies

- Known vulnerabilities in Python or libraries used by SecureDrop
- Known vulnerabilities in Tor (incl. Onion Service cryptography, authentication)
- Malicious apt package installed at install-time or during updates
- Known weakness in Onion Service cryptography
- Github is compromised
- Firewall is not up-to-date
- Tails ISO malicious
- Ubuntu ISO malicious
- Tor apt repo compromised
- Ubuntu apt repo compromised
- Tor Browser exploit
- Vulnerabilities/Compromise of Hardware Firewall
57.4.2 Countermeasures Against Vulnerabilities in Python or Libraries

• FPF performs vulnerability management for all Python packages used by SecureDrop
• CI will run safety check to ensure dependencies do not have a CVE associated with the version

57.4.3 Countermeasures Against Vulnerabilities in Tor

• A cron job ensures that automatic nightly security updates are applied for OS packages, including Tor
• Grsecurity/PaX linux patches prevent the exploitation of certain memory-corruption attacks
• AppArmor profiles further reduce process capabilities through Mandatory Access Control
• Onion service authentication is used as a complementary authentication and only used for defense-in-depth/attack surface reduction

57.4.4 Countermeasures Against Malicious apt Installs

• apt does GPG signature verification of all packages as long as it’s not explicitly disabled

57.4.5 Countermeasures Against Malicious Tails or Ubuntu ISOs

• SecureDrop Admin Guide instructs Users/Admins to validate checksum/signatures of downloaded images

57.4.6 Countermeasures Against Vulnerabilities in the Hardware Firewall

• SecureDrop Admin Guide informs administrators to update the hardware firewall and provides a very restrictive policy for accessing the administrative interface (blocked on app and mon ports of the firewall).
• Alert emails are sent out to admins when there are critical pfSense vulnerabilities.
• Application and Monitor Servers use IPTables as host-based firewall for defense-in-depth
• All application traffic is over Tor onion services (end-to-end encrypted) and all software packages are signed. Only DNS and NTP are transmitted over HTTP (unauthenticated and in cleartext)

57.5 Network Infrastructure — FPF Infrastructure or Organization Corporate Network

57.5.1 Attacks on Network Infrastructure

• Landing Page source control is compromised
• Landing Page host is compromised
• Landing Page is framed or unavailable
• Landing Page DNS leaks from SecureDrop/leaks-related subdomain
• Communications vulnerability in Source or Journalist Interface
• DNS requests to news organization’s subdomain for SecureDrop Landing Page, Freedom.press, torproject.org Tor activity, SD submissions may be correlated
• SecureDrop.org is compromised
• User web traffic to SecureDrop Landing Page uses CDN and may be logged
• Tor network exploit
• apt server man-in-the-middle used to serve old or malicious packages
• SecureDrop apt servers are compromised, or apt server man-in-the-middle attack injects malicious packages
• News Organization network is compromised
• OSSEC and/or Journalist alert SMTP account credentials compromised
• OSSEC and/or Journalist alert private key compromised
• SMTP relay compromised
• Admin’s network is monitored

57.5.2 Countermeasures in FPF Infrastructure

• Builds are independently validated by multiple developers
• Release files containing hashes (MD5, SHA1, SHA256, SHA512) of package file and package hashes are signed with an airgapped GPG key
• Developer key list is published and GPG-signed with the directory key
• SecureDrop updates are packaged in a .deb file and served through FPF’s apt repo
• Source code is validated/verified before packaging and signing the .deb

57.5.3 Countermeasures in News Organization Corporate Network

• SecureDrop environment should be strictly segregated from corporate environment
• Most SecureDrop application traffic goes over Tor and as such is encrypted end-to-end
• Alert emails to Journalists and Admins are GPG-encrypted (but not signed) to provide confidentiality
• OSSEC alerts are scrubbed for sensitive contents (application data, server IPs)
• Documented deployment best practices provide instructions to strengthen Landing Page security and privacy

57.6 User Behavior and Hardware — SecureDrop Hardware Tampering or Failure in Operational Security

57.6.1 Attacks on User Behavior or Hardware

• Journalist corporate workstation seized/tampered/compromised
• Transfer device seized/stolen/lost
• Admin workstation backup stick is compromised
• Admin two-factor authentication device is lost or compromised
• Admin SSH Key is compromised
• SecureDrop installer misconfigures server/firewall hardware
SecureDrop Documentation, Release stable

- Source uses tor2web or employer/corporate device
- Source shares that they are using SecureDrop/leaking documents
- Journalist/Admin gets phished from a submission or otherwise breaks the SVS airgap with malware

57.6.2 Countermeasures in User Behavior Recommendations

- **Source Guide** gives instructions on best practices for the entire submission workflow
- Source interface banner suggests that user disables JS (high security settings in Tor Browser)
- **Journalist Guide** informs users of malware risks, the importance of strict compartmentalization of SecureDrop-related activities
- **SecureDrop Deployment Guide** gives best practices for proper administration of the SecureDrop system, and its public-facing properties like the Landing Page
- **Admin Guide** gives instructions for long-term maintenance of the technical properties of the SecureDrop system, as well as operations to support Journalists
- All Admin tasks are completed over Tor/Tor authenticated onion services after installation
- Any Journalist/Admin password/2FA credentials resets can only be done by an Admin with password-protected SSH capability or authenticated Onion Service credentials.
- Persistent storage on the Admin Workstation is protected with LUKS/dm-crypt encryption

Two versions of this documentation are available:

- **latest** - built from the develop branch of the SecureDrop repository, containing updates that have been tested but not yet released.
- **stable** - built from the stable branch of the SecureDrop repository, and up to date with the most recent release, 2.4.2.