

FEX-LAB

# User Guide

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## 1. FEX-LAB OVERVIEW

**FEX-LAB™** (FEX-LAB) manages the processing of computer forensic cases across multiple devices. FEX-LAB is a scalable solution that can expand from the desktop to enterprise.

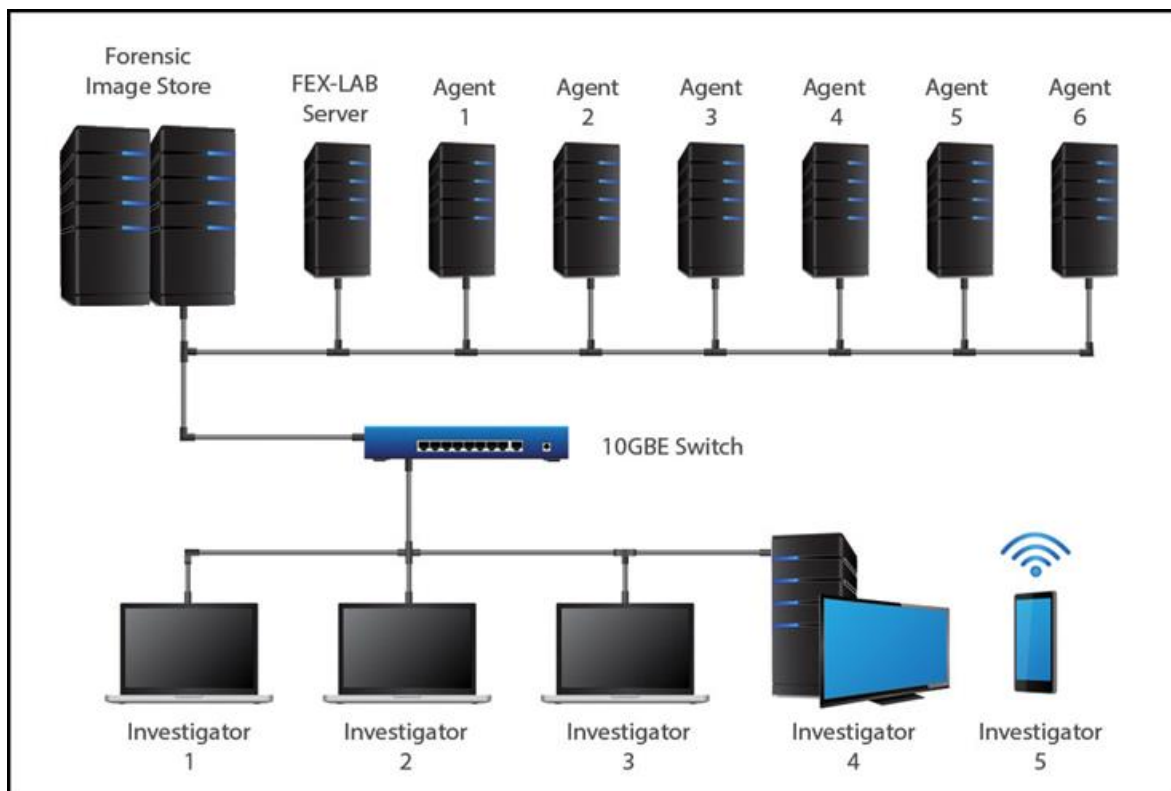
FEX-LAB uses GetData's Command Line Processing tool (**FEX-CLI**) as its processing engine. Custom processing profiles are created for all common forensic processing tasks, including:

- Artifact extraction
- Email search and analysis
- Export folders and files
- Export to L01
- Hash match
- Image verification
- Indexing
- Keyword search
- Random sampling
- Report generation
- Running scripts and filters
- Triage

A typical deployment environment will consist of an **image store** and a group of **processing agents** connected via a high-speed network (e.g., a 10GbE network switch).

FEX-LAB can be run in a closed network without internet access.

Figure 1: FEX-Lab overview



## 2. TERMINOLOGY

The following common terms are used in this user-guide:

Agent	A processing instance that connects to FEX-LAB Server to execute and control jobs. Agents can be: <ul style="list-style-type: none"> <li>• A physical computer (connected via a network).</li> <li>• A CPU core on FEX-Server (a local agent), or a remote computer.</li> <li>• A Virtual Machine (VMWare, VirtualBox, Docker).</li> </ul>
FEX-CLI	The Forensic Explorer CLI ( <b>FEX CLI</b> ) is a command line program (FEX_CommandLine.exe) that is the processing engine used by FEX-LAB. Type FEX_CommandLine.exe /? at the command line for available options.
FEX-GUI	Refers to the GUI version of Forensic Explorer.
FEX-LAB	FEX-LAB is software used to control and monitor Agents and Jobs.
FEX-LAB-D	An Electron GUI software to control FEX-LAB functions.
FEX-LAB Server	The FEX-LAB Server is the machine on which FEX-LAB is installed (Note that the FEX-LAB Server can also run local FEX-LAB Agents).
FEXQ (Queue)	Main processing instance that executes and controls jobs that are assigned by FEX-LAB.
Report Template	A report template referenced by the TXML.
TXML (Processing Template)	A TXML processing template contains the instructions that are passed to the FEX-CLI to process data. TXML includes forensic tasks such as Signature Analysis and File Carving.

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## 3. INSTALLATION - OVERVIEW

### 3.1 RECOMMENDED HARDWARE CONFIGURATION

FEX-LAB runs on a wide variety of configurations, including desktops, servers, and cloud platforms (e.g., AWS). Processing agents can be run as:

- Local agents (one agent per core of on the FEX-LAB Server).
- Remote agents (one agent per core on a remote computer).
- VMWare agents (local or remote).
- Docker agents (local or remote).
- Any combination of the above.

A process agent runs on a computer core. As a general rule, the **maximum number of processing agents** is the machine **core count minus four** (reserved for use by the Operating System).

**Network Access:** 10GBE or above network.

**RAM:** 64 GB or above.

**Data Drive:** Fast read access (e.g., SSD, RAID).

**Output Drive:** Fast write access (e.g., SSD, RAID). For large output jobs (e.g., creating L01s, exporting files) a separate output drive is recommended.

**Operating System:** Windows 10/11, or Server 2019/2022 for high volume processing.

### 3.2 SOFTWARE

The following software is required:

- **FEX-LAB Server** setup: Contact support@getdata.com

#### 3.2.1 POST INSTALLATION CODEC SOFTWARE

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Once FEX-LAB is installed, Microsoft Server Operating Systems may require the addition of specific codecs to display files using the FEX-GUI. This can include:

- **WebP Codec:**
  - <https://dev.mysql.com/downloads/mysqlhttps://codecpack.co/download/WebP-Codec-for-Windows.html>
- **HEIC/HEIF Codec:**
  - <https://apps.microsoft.com/store/detail/heif-image-extensions/9PMMSR1CGPWG?hl=en-au&gl=au&rtc=1>

## 4. INSTALLATION - BASIC SERVER (LOCAL AGENTS)

A **basic server** installation runs processing agents on the same server as the installation.

For **advanced server** installation, where processing is distributed over multiple machines, contact [support@getdata.com](mailto:support@getdata.com) for instructions.

### 4.1 FEX-LAB SERVER (+ FEX-LAB DESKTOP)

Launch the **FEX-LAB Server** installation file and follow the installation steps as shown in the screenshots below:

Figure 2: FEX-LAB Server Setup.

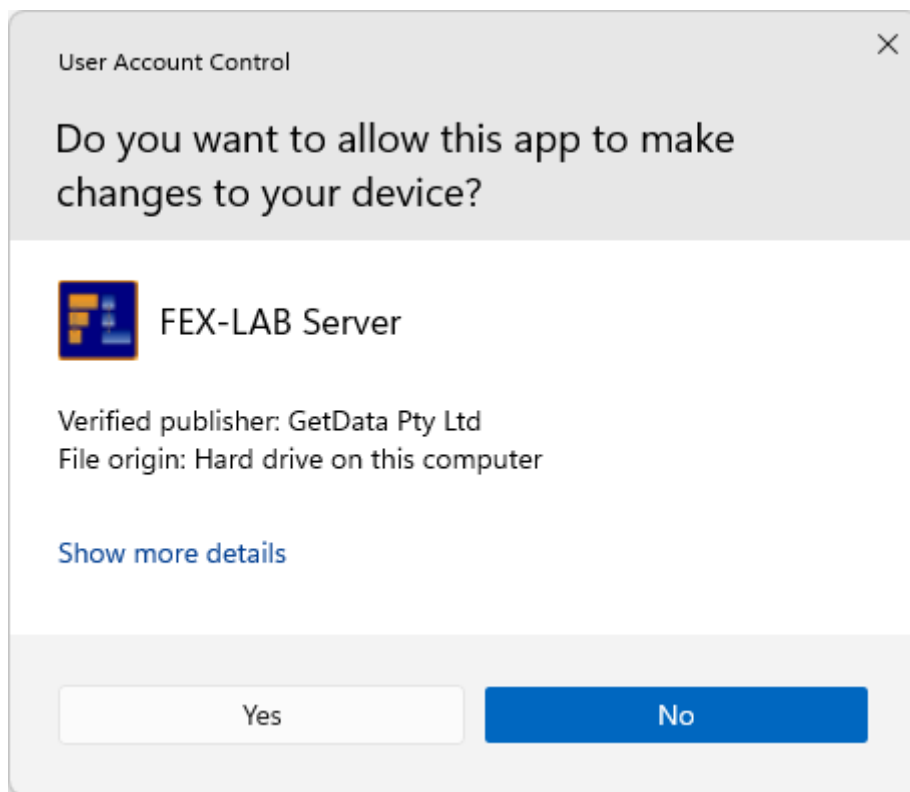


Figure 3: FEX-LAB Server Installation – Select language.

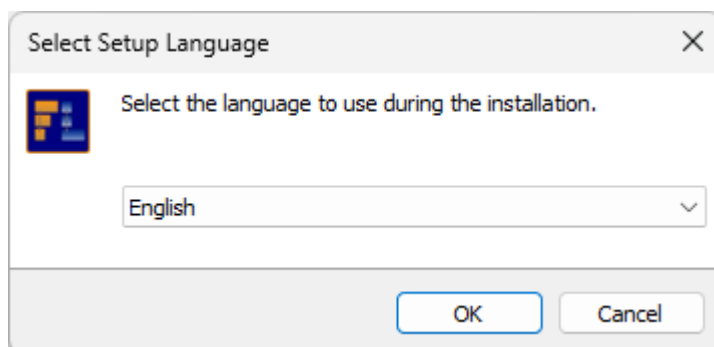


Figure 4: FEX-LAB Server Installation – License Agreement.

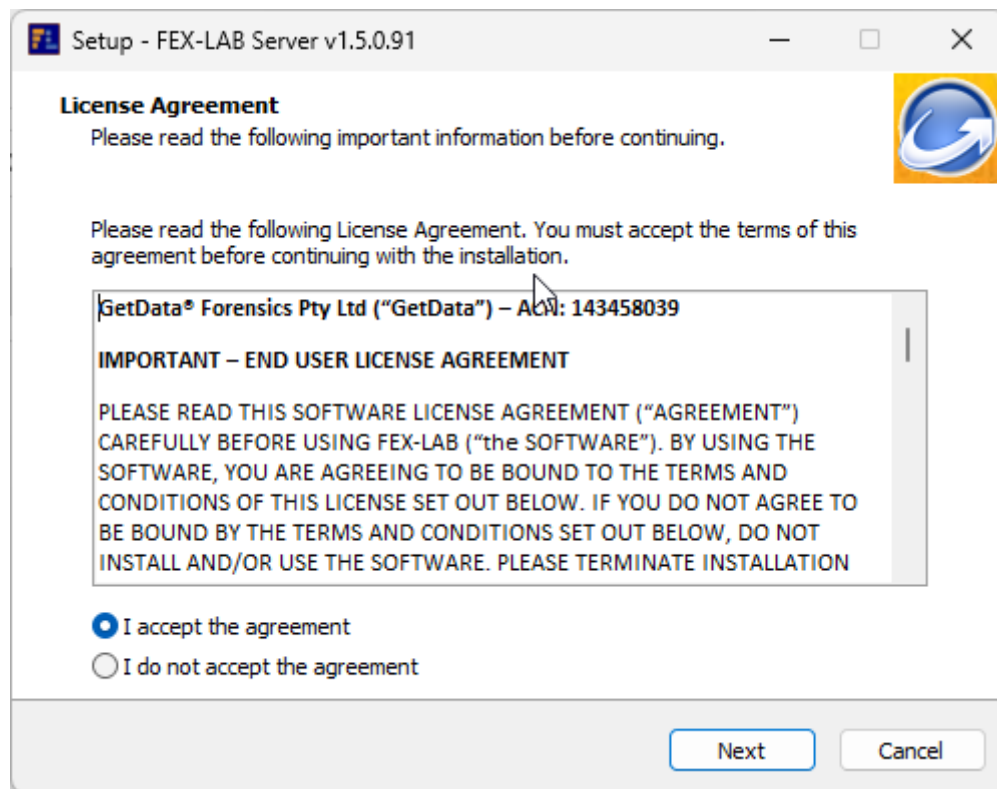


Figure 5: FEX-LAB Server Installation – Default Administrator password.

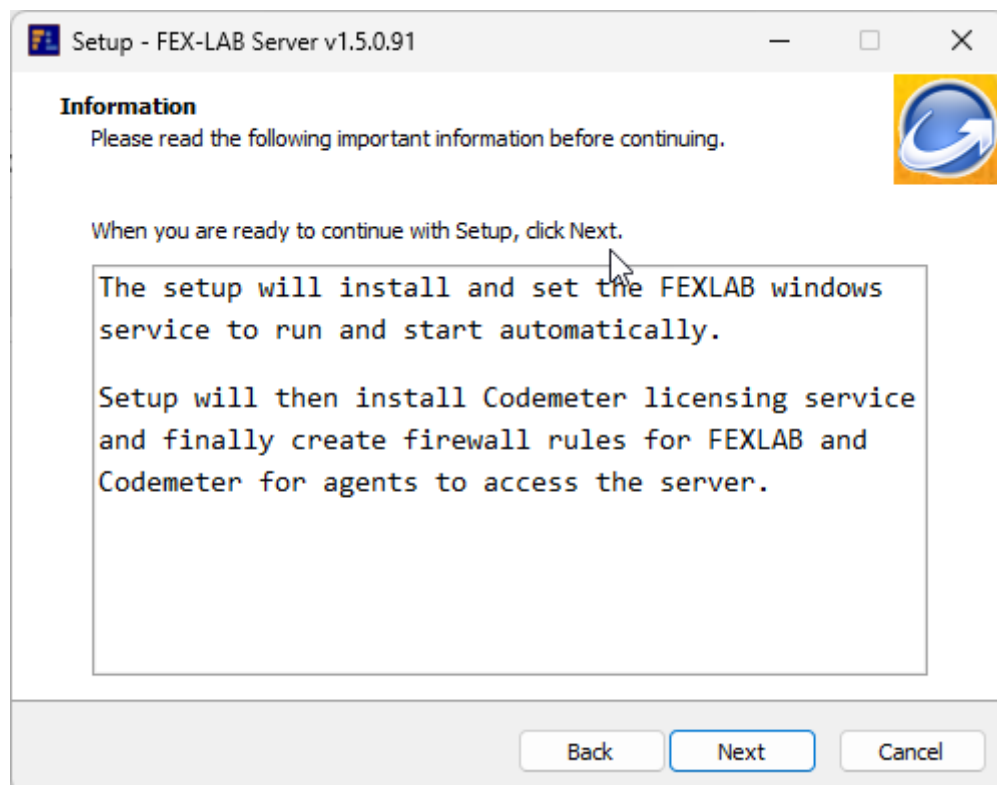




Figure 6: FEX-LAB Server Installation. Embedded MySQL Database and FEX-LAB Desktop options.

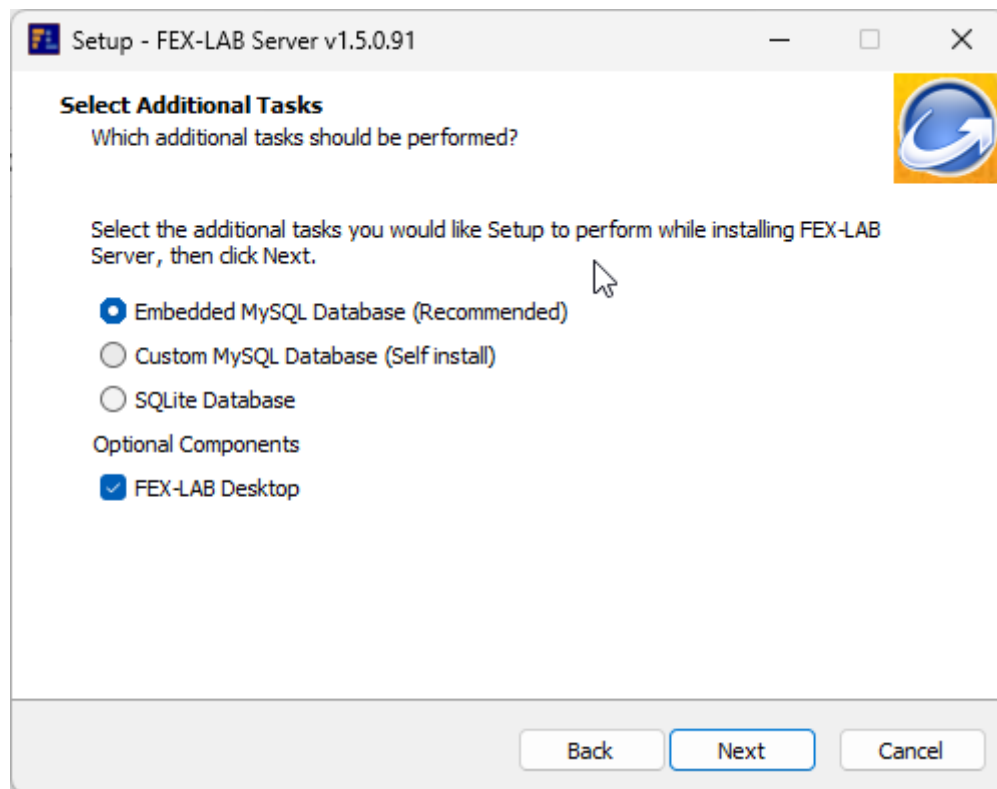


Figure 7: FEX-LAB Server Installation. Ready to Install.

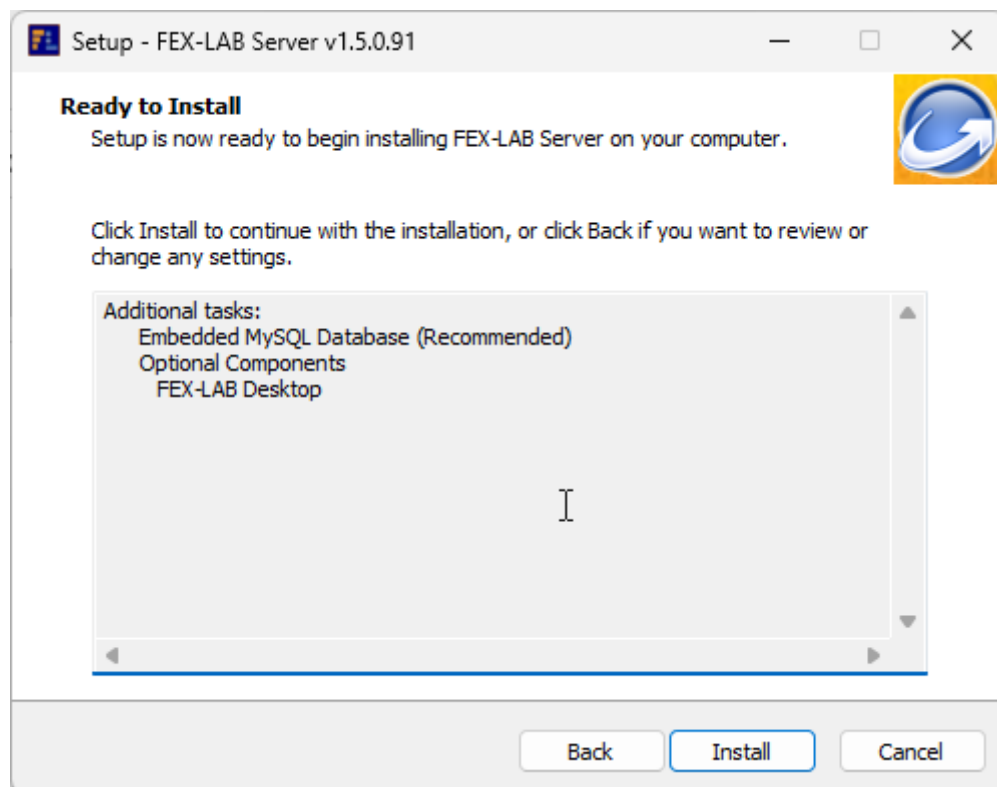


Figure 8: FEX-LAB Server Installation – Installation process.

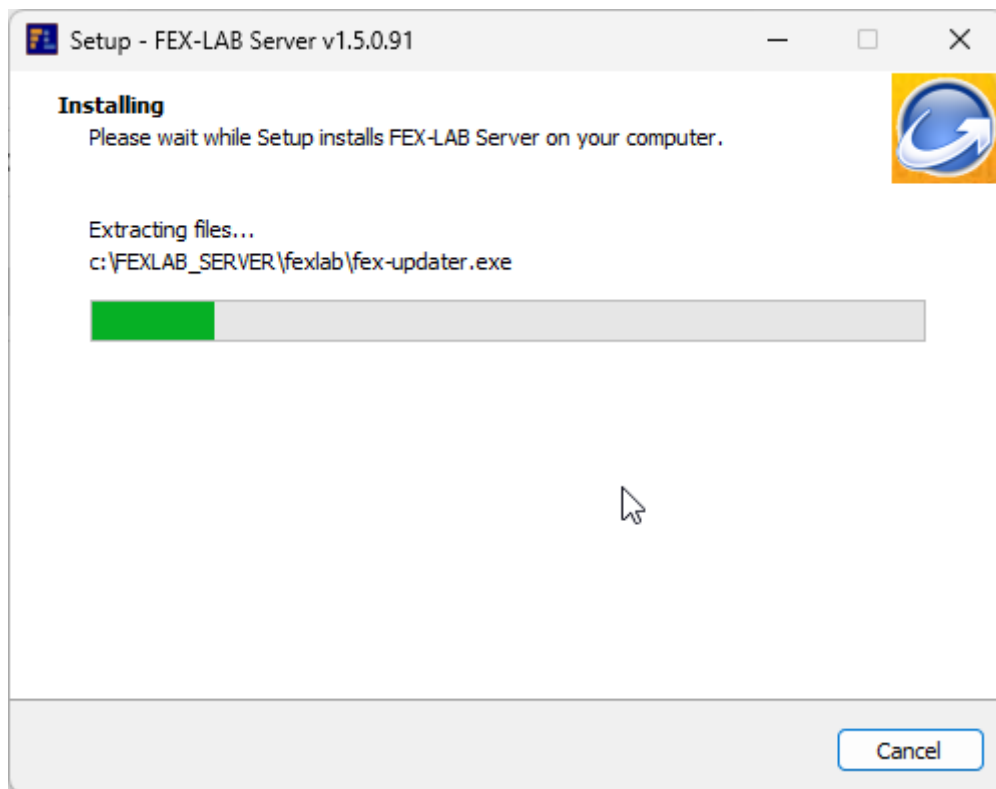


Figure 9: FEX-LAB Server Installation. Installation of CLI.

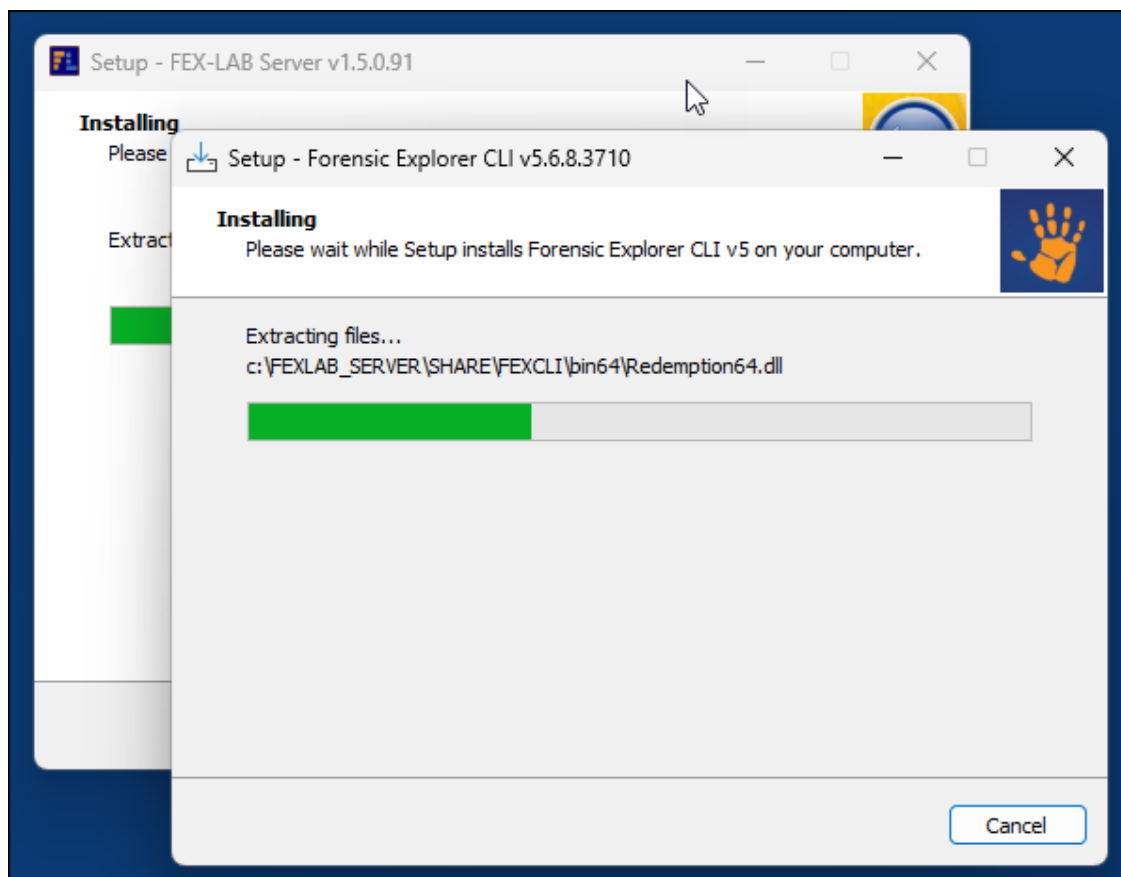


Figure 10: FEX-LAB Server login credentials.

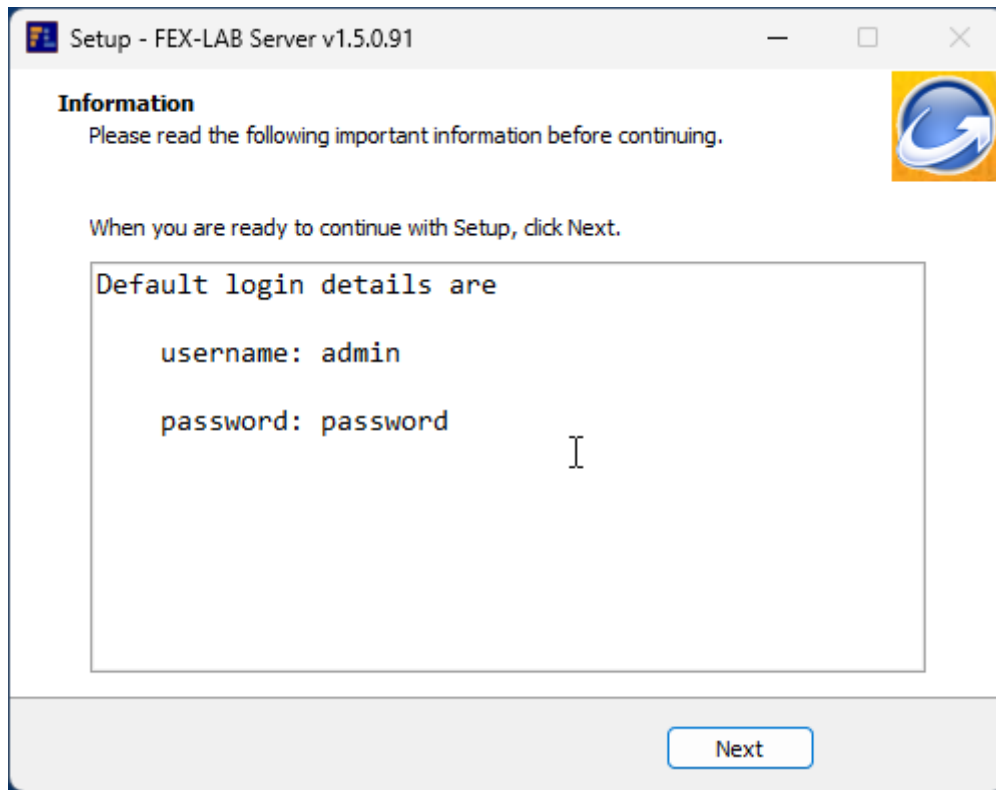
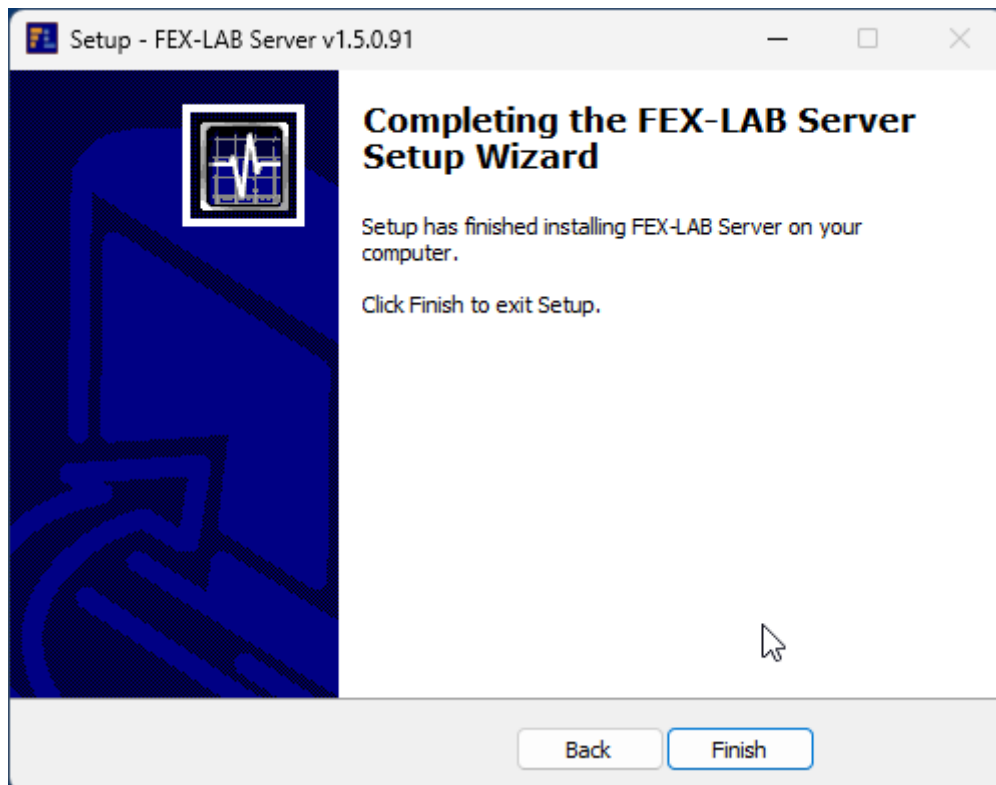


Figure 11: FEX-LAB Server Installation. Completion.



### 4.1.1 POST FEX-LAB SERVER INSTALLATION – CHECK WINDOWS SERVICES

When **FEX-LAB Server** installation is complete:

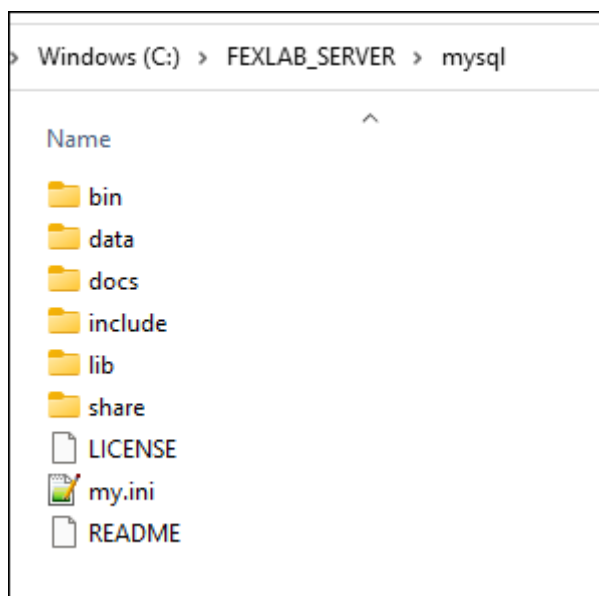
1. Open Windows Services and search for the **FEXLAB** service.
2. The **FEX-LAB** service should be configured with a **Startup Type** of **Automatic (Delayed Start)**.
3. Both **FEXLAB** and **FEXLAB-MySQL80** services should be running.

Figure 12: Installed Windows Services.

Name	Description	Status	Startup Type	Log On As
FEXLAB		Running	Automatic (Delayed Start)	Local System
FEXLAB-MySQL80		Running	Automatic	Local System

MYSQL is installed into the following folder:

Figure 13: FEXLAB-MySQL80 installation folder.



## 4.2 INSTALLATION - FEX-LAB DESKTOP

**FEX-LAB-Desktop** is the application that connects to **FEX-LAB Server**. If **FEX-LAB Desktop** was installed with FEX-LAB Server in the previous step, **then this step may not be required**.

**FEX-LAB Desktop** is typically installed on remote forensic workstations to enable users to submit and process jobs. The following files are required:

- **FEX-LAB Desktop:** Contact [support@getdata.com](mailto:support@getdata.com) for download link.

Launch the FEX-LAB Desktop setup file and following the on-screen instructions:

Figure 14: FEX-LAB Desktop

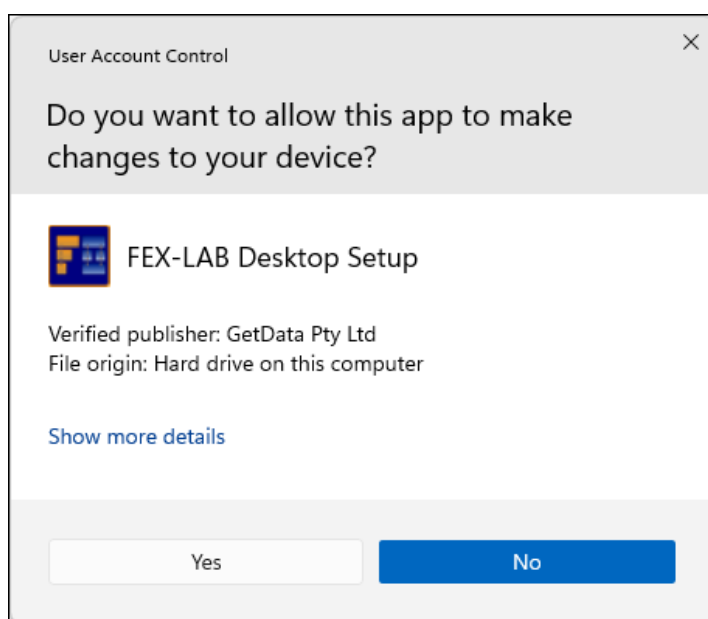


Figure 15: FEX-LAB Desktop Installation – Select language.

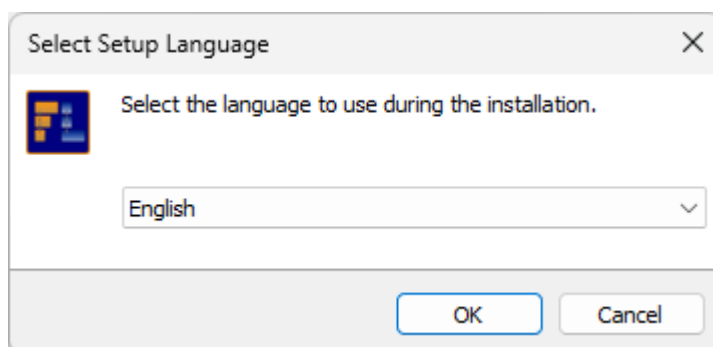


Figure 16: FEX-LAB Desktop Installation.

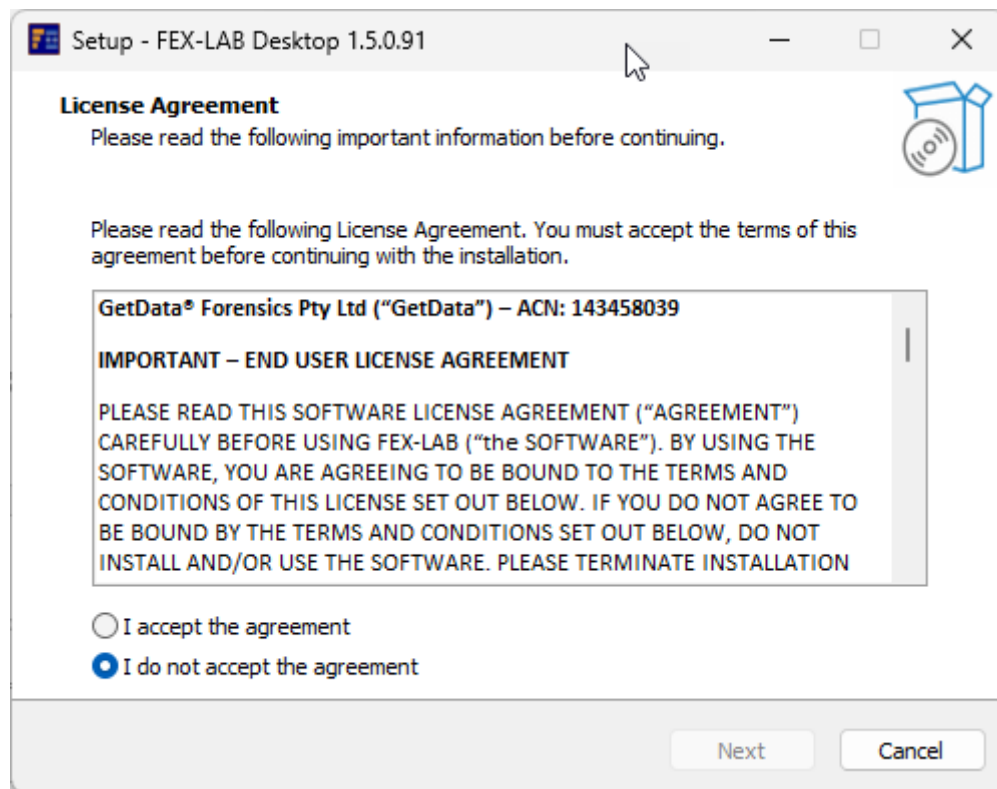


Figure 17: FEX-LAB Desktop Installation.

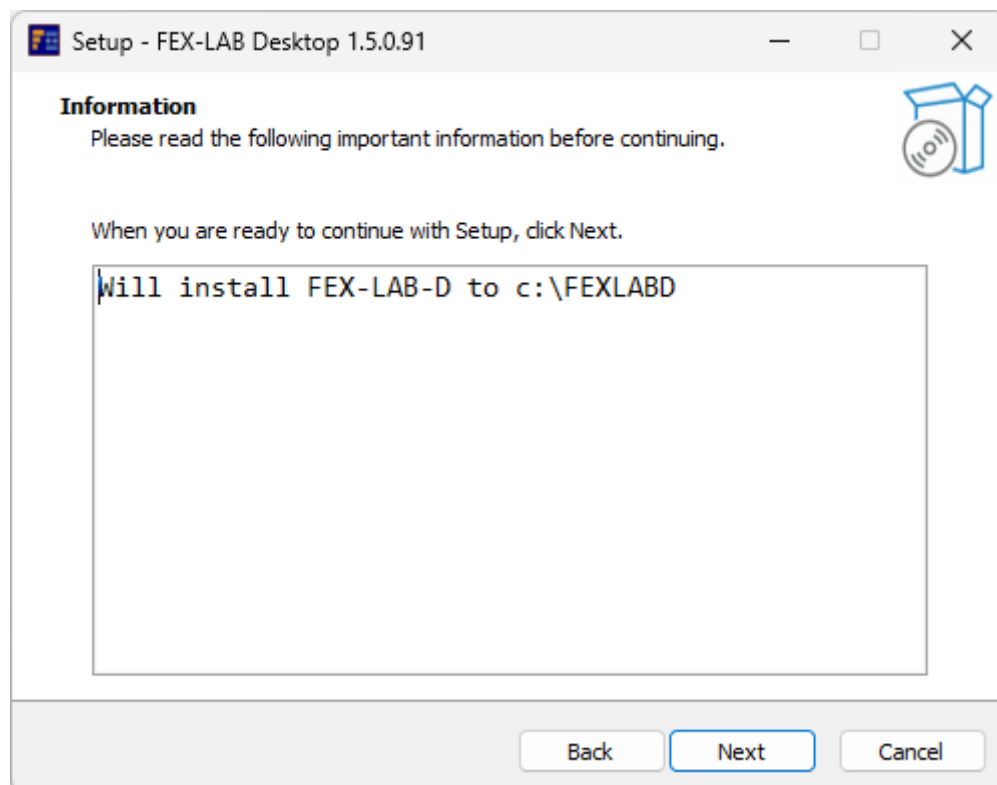


Figure 18: FEX-LAB Desktop Installation.

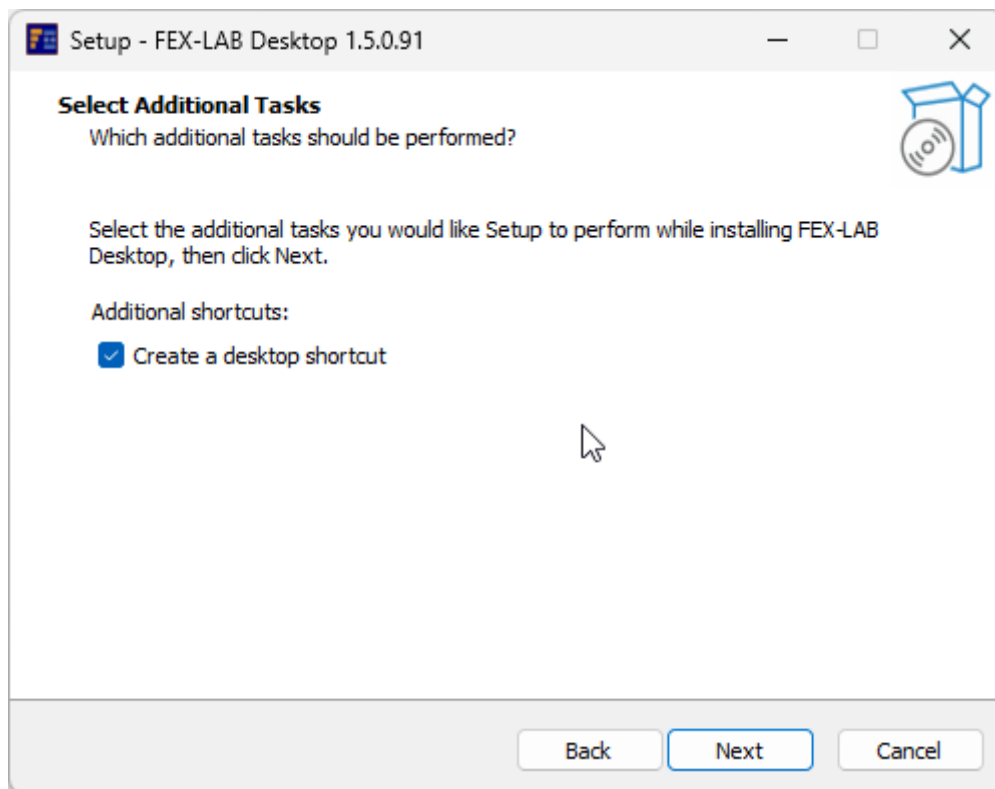


Figure 19: FEX-LAB Desktop Installation.

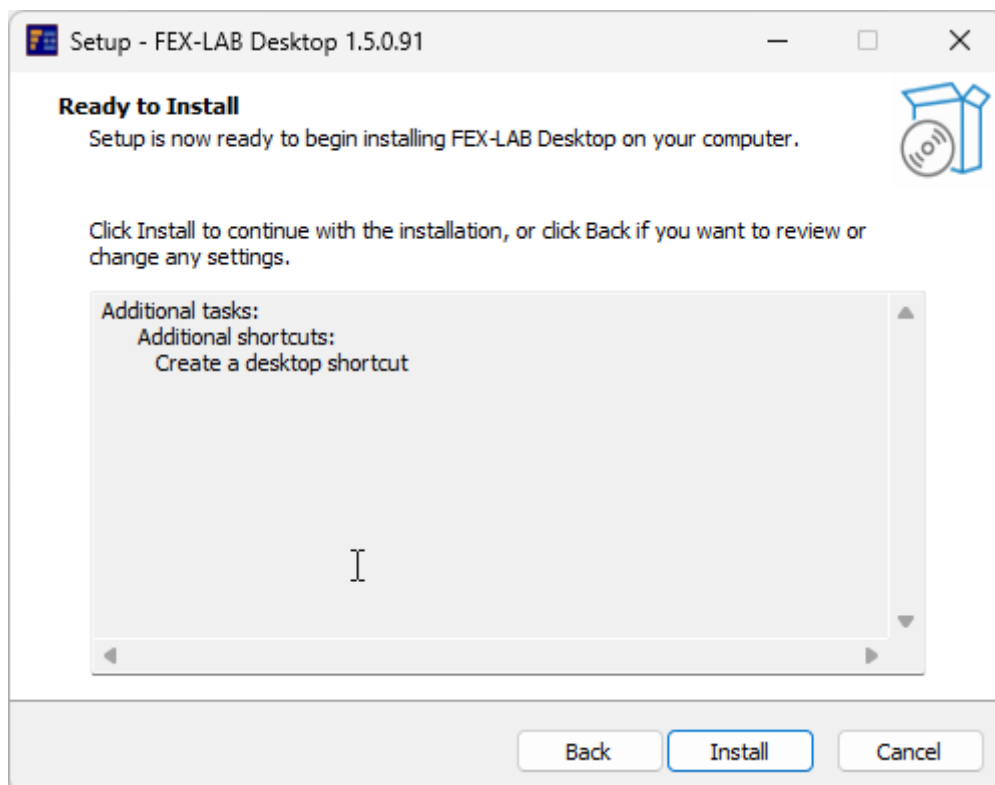


Figure 20: FEX-LAB Desktop Installation.

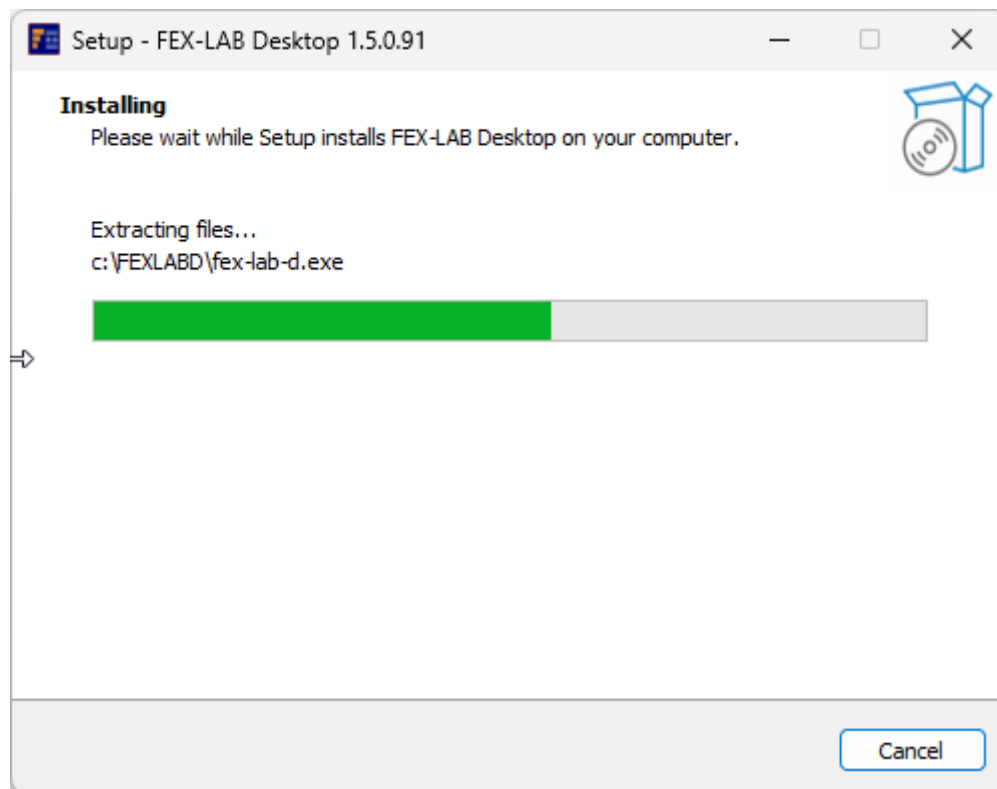


Figure 21: FEX-LAB Desktop Installation.

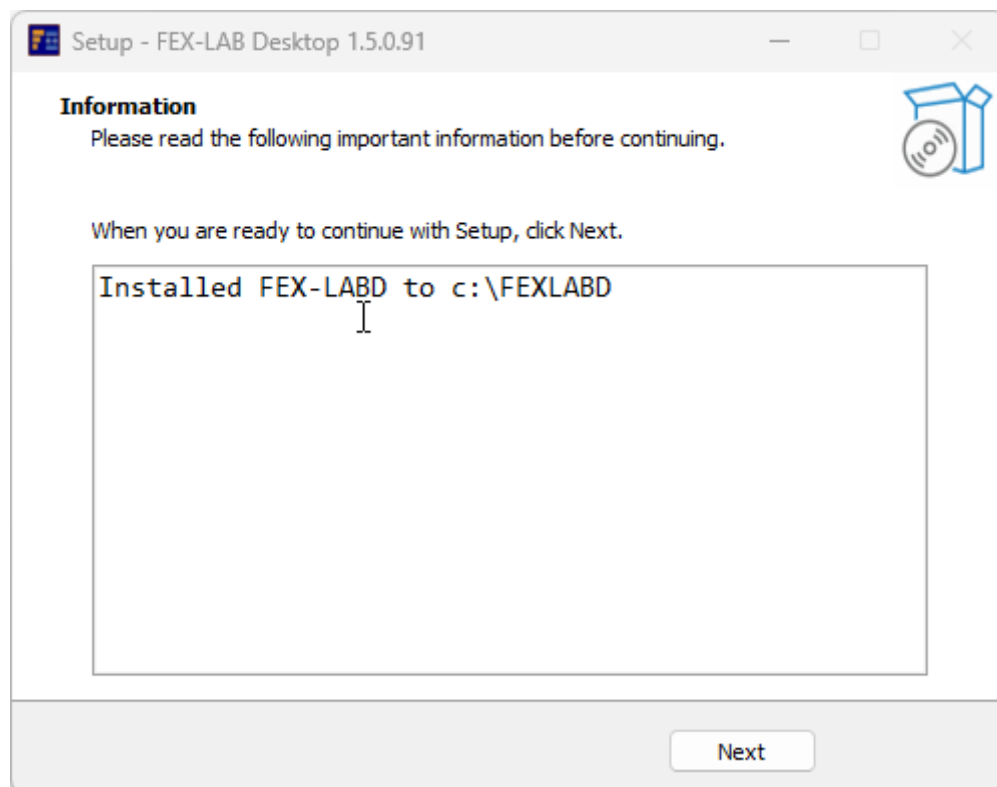
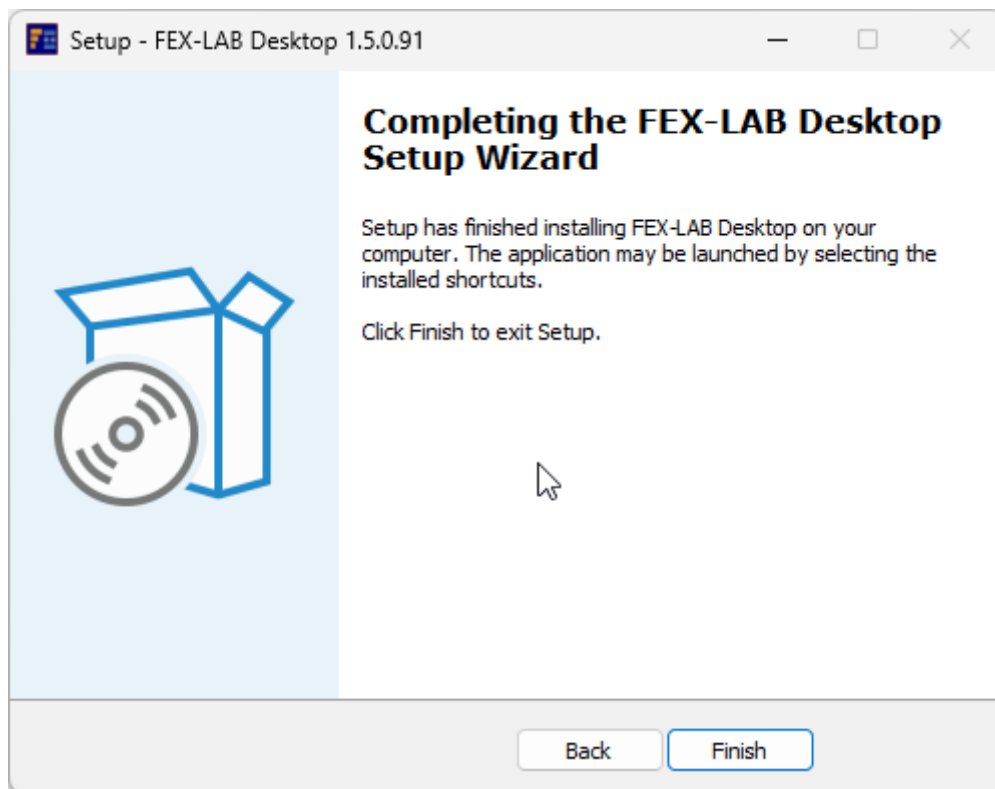




Figure 22: FEX-LAB Desktop Installation.



Launch FEX-LAB-D using the following icon:

Figure 23: FEX-LAB Desktop icon.



## 5. INSTALLATION – ADDING ADDITIONAL REMOTE PROCESSING COMPUTERS

When FEX-LAB Server is installed, the setup file is created:

**C:\FEXLAB\_SERVER\SHARE\Setup\FEX-LAB Processing Agent (vx.x.x.xxx).exe**

The **FEX-LAB Processing Agent (FEX Agent)** is used to setup additional remote computers to process FEX-LAB jobs.

**Important:** When adding remote computers, consideration should be given to **network speed**. It is recommended that remote computers and the **forensic image datastore** be connected via minimum **10Gbe**.

To install FEX-Agent:

1. Launch **FEX-LAB Processing Agent (vx.x.x.xxx).exe** and follow the on-screen instructions:

Figure 24: FEX-LAB Processing Agent (vx.x.x.xxx).exe

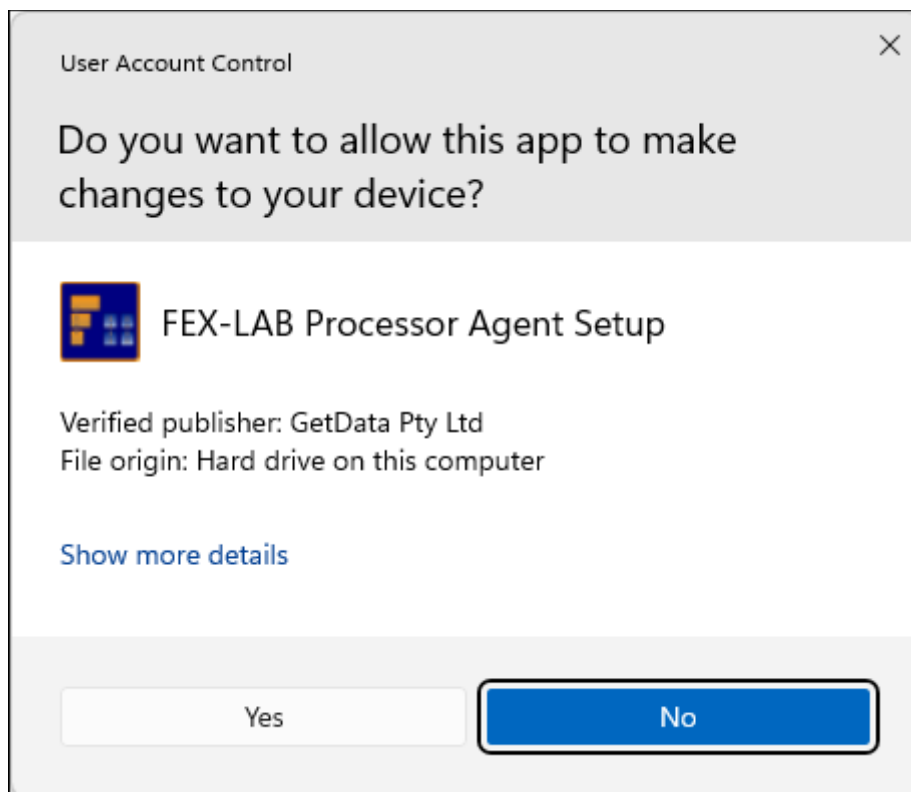


Figure 25: FEX-LAB Processor Agent install.

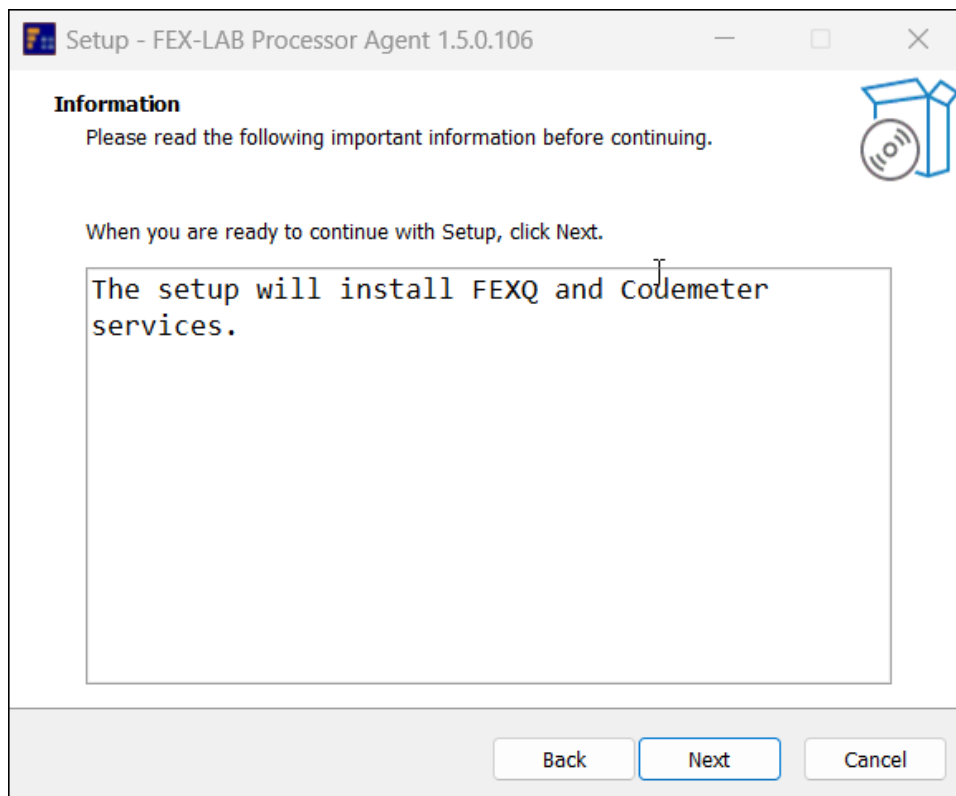
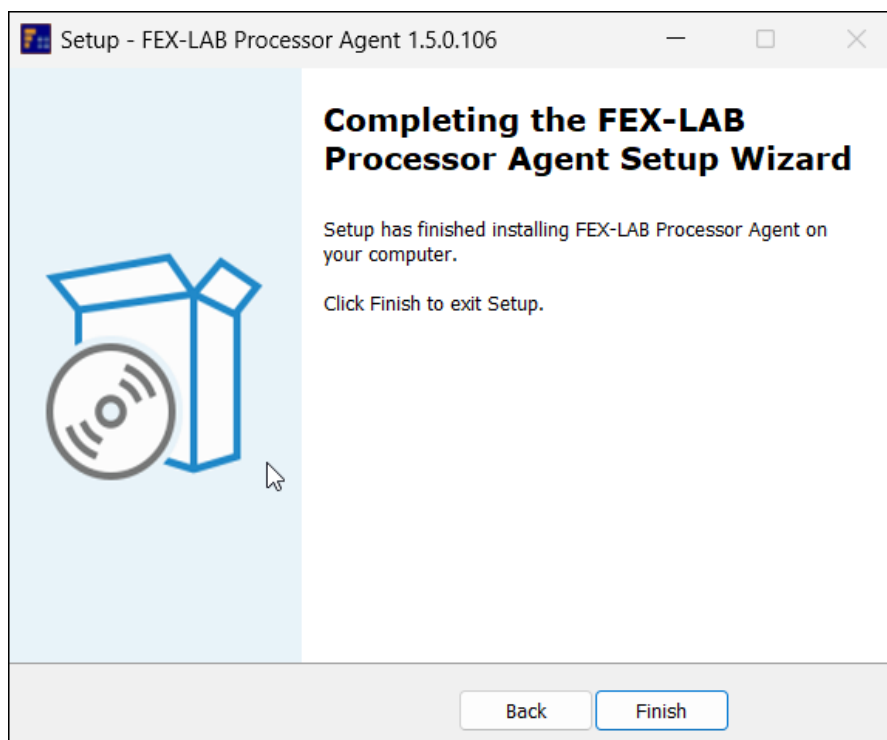


Figure 26: FEX-LAB Processor Agent install.



FEX Agent is started as a service during OS boot. It starts `fexq.exe` with command line arguments. For example: `fexq.exe -s http://192.168.1.3 -p 8080` (-s: server -p: port).

## 6. CONNECT TO FEX-LAB SERVER

There are two methods to connect to the FEX-LAB Server:

- Web browser
- FEX-LAB Desktop Client (Recommended).

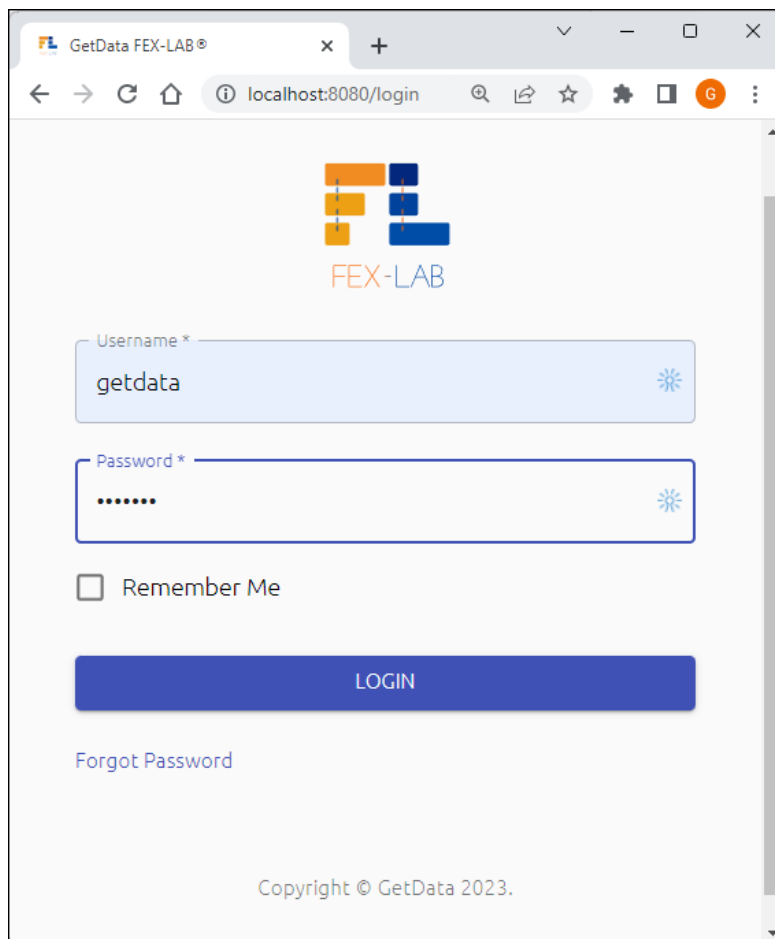
### 6.1 ACCESS FEX-LAB BY WEB BROWSER

To access FEX-LAB via a web browser:

1. Open a browser (ensure that the browser software is up to date).
2. Browse to **localhost:8080**. The FEX-LAB login window should appear. Login to FEX-LAB (username: **admin**, password: **password**).

**Note:** The recommended method to connect to FEX-LAB server is not by http but by using FEX-LAB Desktop described in the following section.

Figure 27: Testing FEX-LAB installation using localhost:8080

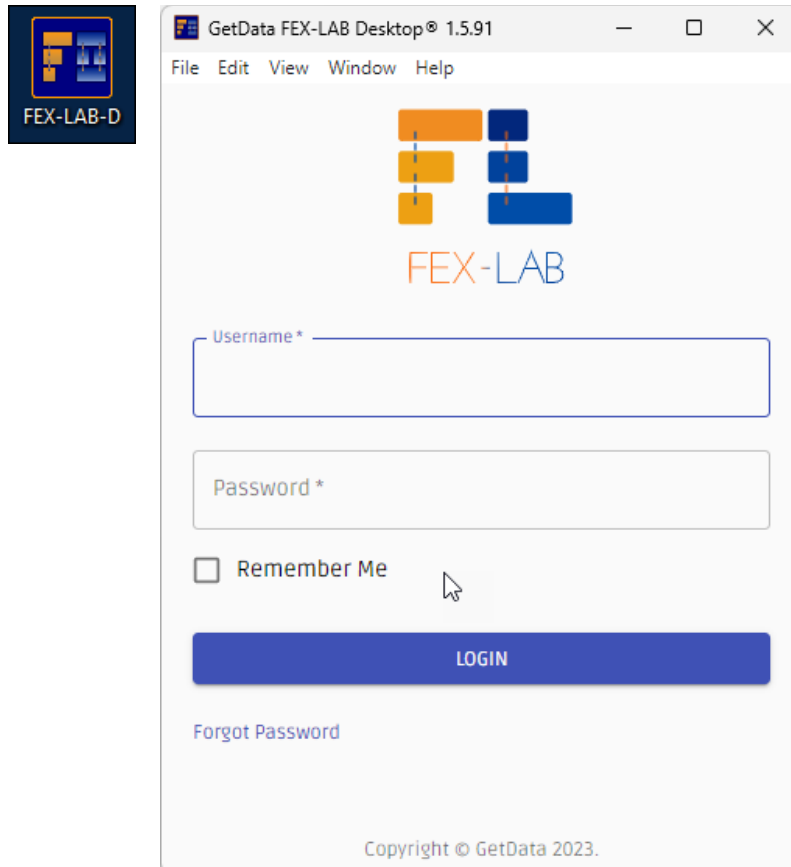


## 6.2 ACCESS FEX-LAB BY FEX-LAB DESKTOP (RECOMMENDED)

Once FEX-LAB Server and FEX-LAB Desktop are installed:

1. Launch FEX-LAB Desktop from its icon:

Figure 28: FEX-LAB desktop icon.



2. Login with default administrator credentials, user: **admin**, password: **password**.

## 6.3 QUICK START CONFIGURATION

When connecting to FEX-LAB for the first time:

1. Navigate to the **Settings** window (see section 12 below):
  - a. Set the **Evidence Folder** path to your **forensic image store**.
2. Navigate to the **Agents** window (see section 10 below):
  - a. Configure the number of **On Demand Agents** and/or **Launch Local Agents**.
3. Go to the **Jobs** window and submit your first job.

## 7. NAVIGATION MENUS

FEX-LAB is primarily driven from the left-hand navigation menu. To access this menu, click the **☰ options button** in the top left global toolbar.

### 7.1 NAVIGATION MENU - ADVANCED MODE

Additional menu options show when **Advanced Mode** is enabled. To enable Advanced Mode:

1. Select **Settings** from the options menu.
2. Select **Advanced Mode > Enabled** and **Save Settings**.

Menu navigation options are summarized as follows:

<b>Home:</b>	An overview of the current FEX-LAB properties.
<b>Jobs:</b>	Create and manage processing jobs.
<b>CLI Editor:</b>	Create a 3rd party tool cli launcher (e.g., Exif Tool).
<b>Template Editor:</b>	An interface to create and edit TXML processing templates.
<b>Task Editor:</b>	An interface to edit FEX-CLI tasks.
<b>Workload:</b>	Display CPU and RAM usage.
<b>Agents:</b>	List processing agents and their status.
<b>Statistics:</b>	Collects and manages processing statistics.
<b>Users:</b>	Manager FEX-LAB user accounts (See section 11.2 below).
<b>Settings:</b>	Configure FEX-LAB file locations and other settings.
<b>User IP:</b>	The I.P. address of the current user.
<b>FEX-LAB Server IP:</b>	The I.P. address of FEX-LAB Server.
<b>Logout:</b>	Log out of FEX-LAB.

**Agent Licenses** are the number of licenses read from the USB activation dongle. Licenses determine the maximum number of concurrent processing agents. For example, 5 license can process 5 concurrent jobs. License information can also be obtained using the GetData License Manager, available for download from: <https://getdataforensics.com/activation/>

Figure 29: Normal mode.

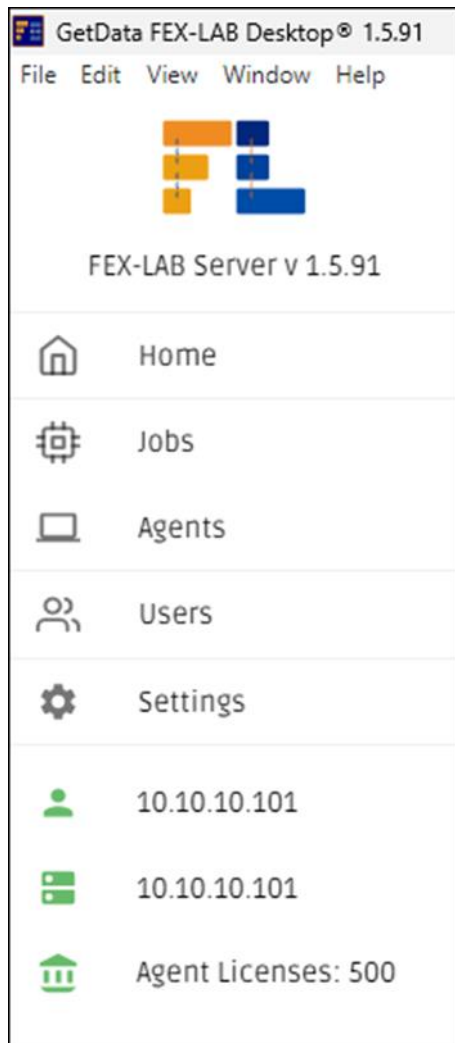
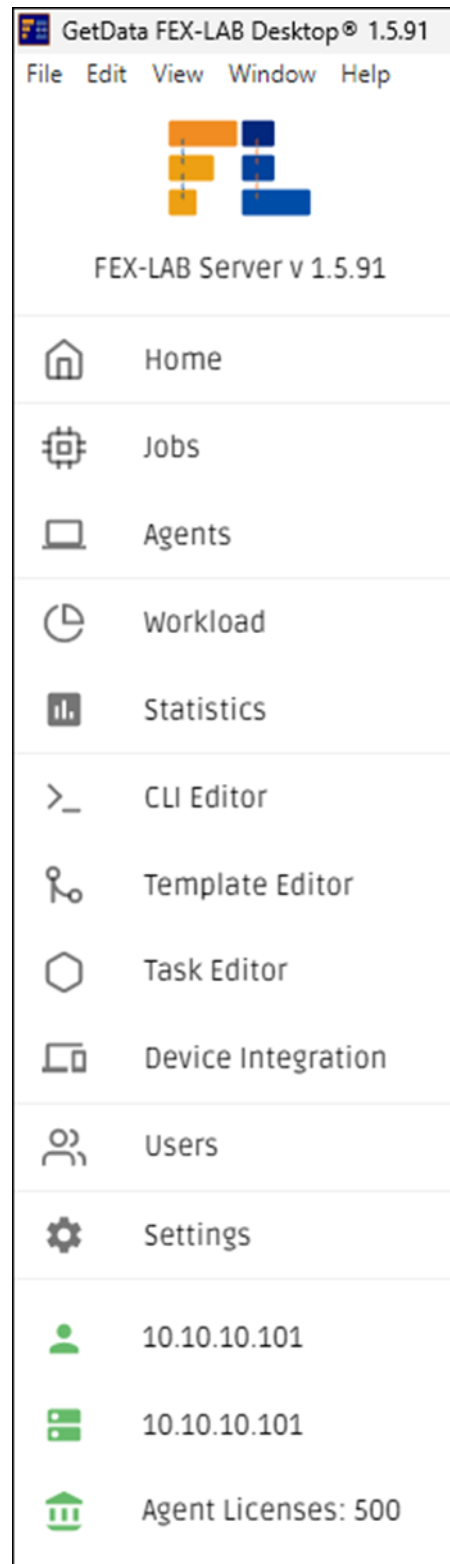


Figure 30: Advanced mode.



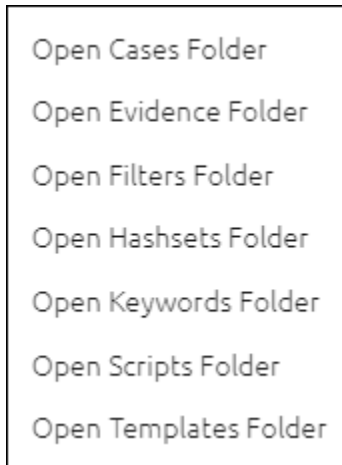
## 7.2 NAVIGATION MENU - GLOBAL TOOLBAR

At the top of FEX-LAB is the global menu bar. The icons are linked to the following actions:

Figure 31: FEX-LAB global menu bar.



1. **Light/dark** mode.
2. **Agents**. Links to the Agents window.
3. **Total jobs**. Displays the count of all jobs.
4. **On hold jobs**. Displays the **Jobs** window with on hold jobs filtered.
5. **Queued jobs**. Displays the Jobs window with queued jobs filtered.
6. **Running jobs**. Displays the **Jobs** window with running jobs filtered.
7. **Completed jobs**. Displays the **Jobs** window with completed jobs filtered.
8. **Errored jobs**. Displays the **Jobs** window with errored jobs filtered.
9. **Folder shortcuts:**



10. **Current user account**. Provides **user account details** and **login/logout** options.

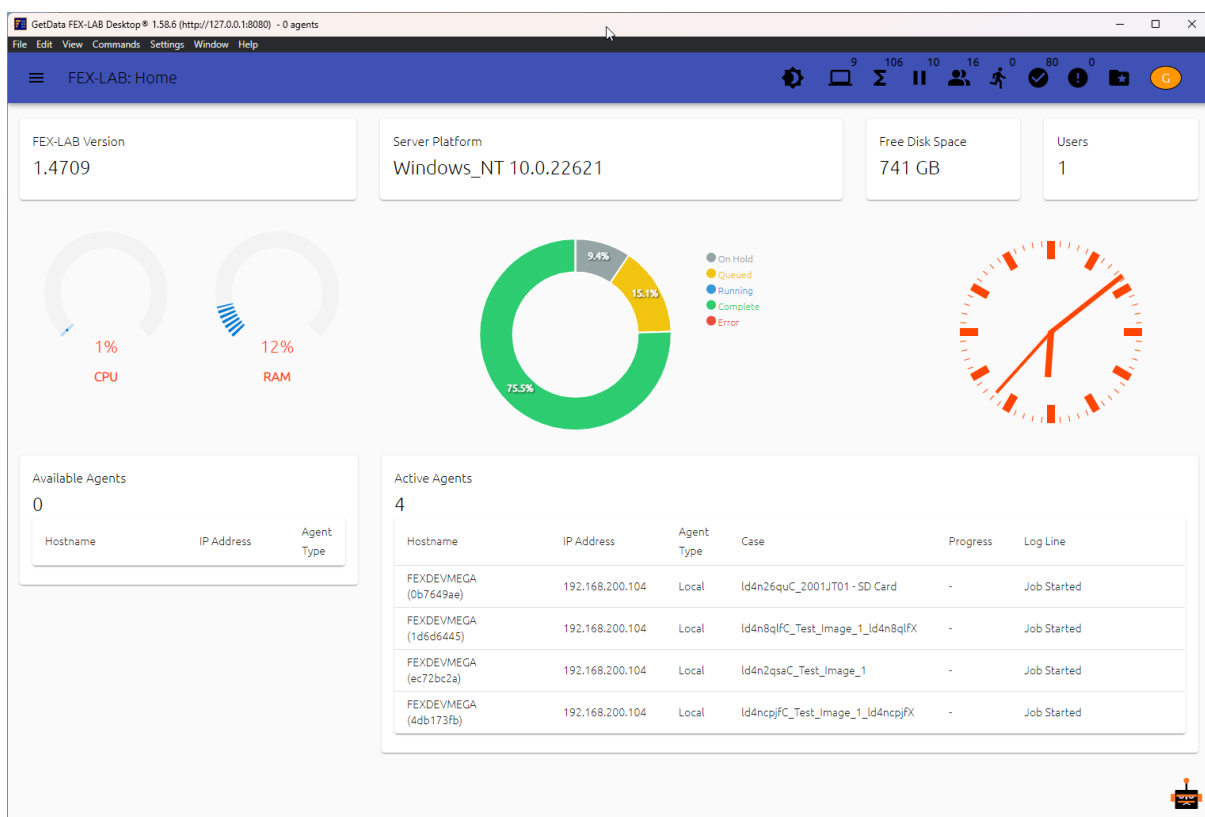


## 8. HOME

The **Home** window provides an overview of:

- Server software, platform, and resource information.
- Available and active agents.
- Job status.
- Users.

Figure 32: FEX-LAB Home.












## 9. JOBS




The Jobs window is where processing jobs are created and managed.

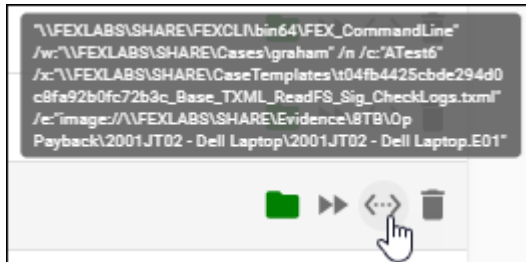
Figure 33: Jobs window (administrator shown)

Case	Template	Priority	User	Queued	Elapsed (minutes)	Agent	Progress	Status	Edit
id4956C_2001J701 - SWI Laptop	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	00:00:01	192.168.200.104 (23931847)	-	Job Started...	⏏ ⏪ ⏩ ⏹
id4956C_ea7f1	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	00:00:01	192.168.200.104 (23931847)	-	Job Started...	⏏ ⏪ ⏩ ⏹
id4956C_Artmas	02_multiple_tasks	3	getdata	1/09/2023 3:23:21 PM	00:00:16	192.168.200.104 (23931847)	43%	Just Task...	⏏ ⏪ ⏩ ⏹
id4956C_Test_image_1_id4956C	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	Queue Position 1	-	Queued	⏏ ⏪ ⏩ ⏹
id4956C_Artmas	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	Queue Position 2	-	Queued	⏏ ⏪ ⏩ ⏹
id4956C_ea7f1	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	Queue Position 3	-	Queued	⏏ ⏪ ⏩ ⏹
id4956C_Artmas	02_multiple_tasks	1	getdata	1/09/2023 4:23:20 PM	00:01:03	192.168.200.104 (23931847)	100%	Complete	⏏ ⏪ ⏩ ⏹
id4956C_Test_image_1_id4956C	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	-	-	On Hold	⏏ ⏪ ⏩ ⏹
id4956C_Test_image_1	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	-	-	On Hold	⏏ ⏪ ⏩ ⏹
id4956C_2001J701 - SD Card	02_image_and_report	3	getdata	1/09/2023 6:16:15 PM	-	-	-	On Hold	⏏ ⏪ ⏩ ⏹

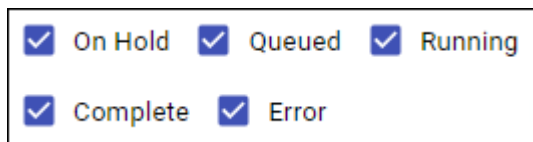
The following icons are used in the **Jobs** window:

-  Tree Job. Each folder containing evidence is processed as a job.
-  Shortcut to open case, templates, hashsets, filters and scripts folders.
-  Force terminates (administrator only).
-  Add new job.
-  Start selected job.
-  Restart selected job.
-  Stop selected job.
-  Delete selected job.
-  Import or export jobs to .CSV.

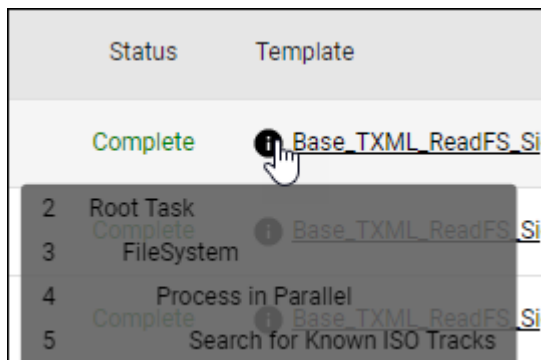
-  Successfully completed job. Links to the case folder.
-  100% Progress. Mouse over for tasks completed / total tasks.
-  Duplicate job. This will add a new job with an auto-generated case name.



Mouse over displays the command line argument passed to the FEX-CLI. From this text it is possible to identify the case name, the processing profile (.xml), the forensic image files.



Quick filter the jobs window using the checkboxes.

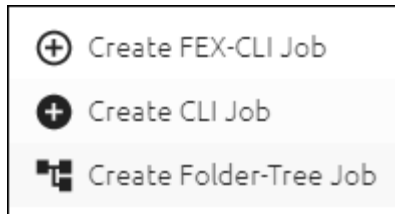


Administrator only: Mouse over displays a summary of processing tasks. Click on the template link to open the processing template (.XML file).

## 9.1 CREATING JOBS

To **Create a Job**, In the **Jobs** window, click the **plus icon** **+** to open **Create Jobs**:

Figure 34: Job types.



Three types of job can be submitted:

1. **FEX-CLI Job:** A FEX-CLI job is the standard method to add job/s. See 9.2 below.
2. **Folder-Tree Job:** Process a folder structure. See 9.4 below.
3. **CLI Job:** Launch third-party CLI tools. See 9.3 below (advanced mode).

## 9.2 CREATE FEX-CLI JOBS

This is the standard way to add a job in FEX-LAB.

Figure 35: Create FEX-CLI jobs.

1. **Evidence Type** is selected from the radio buttons. This can be a forensic image, e.g., E01, or files, folders, or a Remote physical disk.
2. **Select Image File(s)** using the drop menu. This can be:
  - **A single forensic image:** Click the required image in the drop-down list.
  - **All images:** Click **Select All Images** at the top of the drop-down list.
  - **A selection of images:** Use **CTRL mouse click** to select/unselect required images.
3. The **Separate Cases** checkbox will determine if multiple images are processed as a single case, or individually as separate cases.
4. Enter a unique **Case Name**. It will be used to create the **Case Folder** and as such Windows reserved characters (<, >, :, ;, ", /, \, |, ?, \*) cannot be used.
5. Select the **Evidence Processor Template** (See section 13 below for more information).

---

**CREATE JOBS > ADVANCED.**

The **Create Jobs > Advanced** button provides additional job configuration options.

**Figure 36: Create FEX-CLI Jobs.**

The screenshot shows a web interface for creating FEX-CLI jobs. At the top left is a 'BACK' button with a left arrow, and at the top right is an 'ADVANCED' button. The main heading is 'Create FEX-CLI Jobs'. Below this, there are several configuration sections:

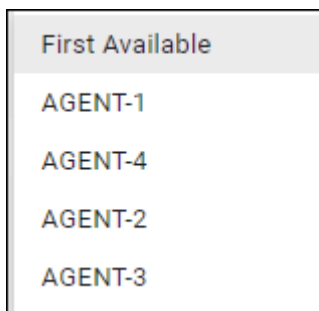
- Evidence Type:** Radio buttons for 'Image' (selected), 'Files', 'Folder', and 'Remote'.
- Select Image File:** A dropdown menu showing 'Test\_Image\_1.E01'.
- Selected:** A label indicating '1' item is selected.
- Case Name Prefix:** A text input field containing 'Operation Hawk'.
- Action:** A blue button labeled 'COPY FORENSIC IMAGE TO FEX-LAB SERVER'.
- Case Name:** A text input field containing 'Dell Laptop'.
- Evidence-Processor-Templates:** A dropdown menu showing 'txml\_examples\02\_triage\_and\_report', with an information icon (i) and a settings icon (gear) to its right.
- Evidence Password:** A text input field.
- Select Processing Agent:** A dropdown menu showing 'First Available'.
- Queue Options:** A dropdown menu showing 'On Hold'.
- Notify me via e-mail:** An unchecked checkbox.
- Submit:** A large blue button at the bottom labeled 'ADD TO QUEUE'.

**Select Processing Agent:**

When set to **First Available**, the first free agent with more resources will process the job.

If agents are connected, the agent name can be selected from the drop-down menu:

Figure 37: Select a processing agent.



### Queue Options

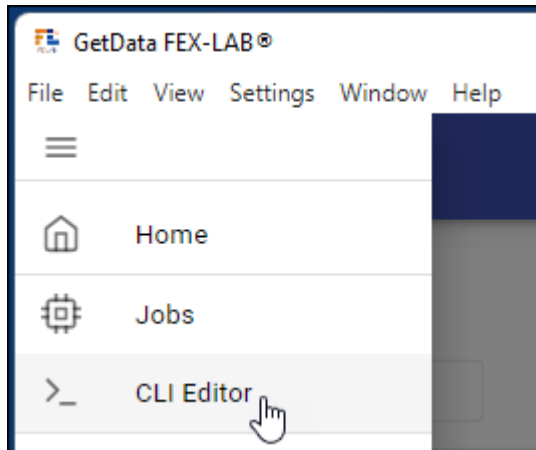
**Queued** means that the selected the job will be picked up by the next available an agent.

**On Hold** means that the job is placed on-hold in the Jobs window. It must be manually queued in the Jobs window for processing.

### 9.3 CLI JOBS (RUN OTHER CLI TOOLS)

FEX-LAB can be used to launch other command line tools. To configure another CLI tool, select **CLI Editor** from the left-hand menu:

Figure 38: CLI Editor



#### CONFIGURING A CLI TOOL

A CLI Job is configured when it is added or edited. CLI arguments specific for the tool are added in the CLI editor window.



Figure 39: CLI Editor.

The image shows a web-based form titled "CLI Editor". It contains several input fields and sections:

- Name \***: A text input field.
- Program**: A dropdown menu.
- Custom Program Path**: A toggle switch, currently turned off.
- Version**: A text input field.
- Description**: A text input field.
- Statuses**: A section header with a "+ ADD NEW STATUS" button below it.
- Pre-Commands**: A section header with a "+ ADD NEW PRE-COMMAND" button below it.
- Arguments**: A section header with a "+ ADD NEW ARGUMENT" button below it.
- A large black redaction bar is present below the "Arguments" section.
- A blue "CREATE" button is at the bottom of the form.

#### LAUNCH A CLI JOB


In **Jobs Window**:

1. Select **Create CLI Job**.
2. Choose from the **Select CLI Program** menu.
3. Add a **Case Name**.

Figure 40: Create CLI Jobs.

The screenshot shows a web form titled "Create CLI Jobs". At the top, the title "Create CLI Jobs" is centered. Below the title, there are three main input areas. The first is a dropdown menu labeled "Select CLI Program" with "Exif Tool" selected and a downward arrow on the right. The second is a text input field labeled "Case Name" containing the text "Extract Exif Data". Below these is a checkbox labeled "Notify me via e-mail" which is currently unchecked. At the bottom of the form is a wide, blue button with the text "ADD TO QUEUE" in white capital letters.

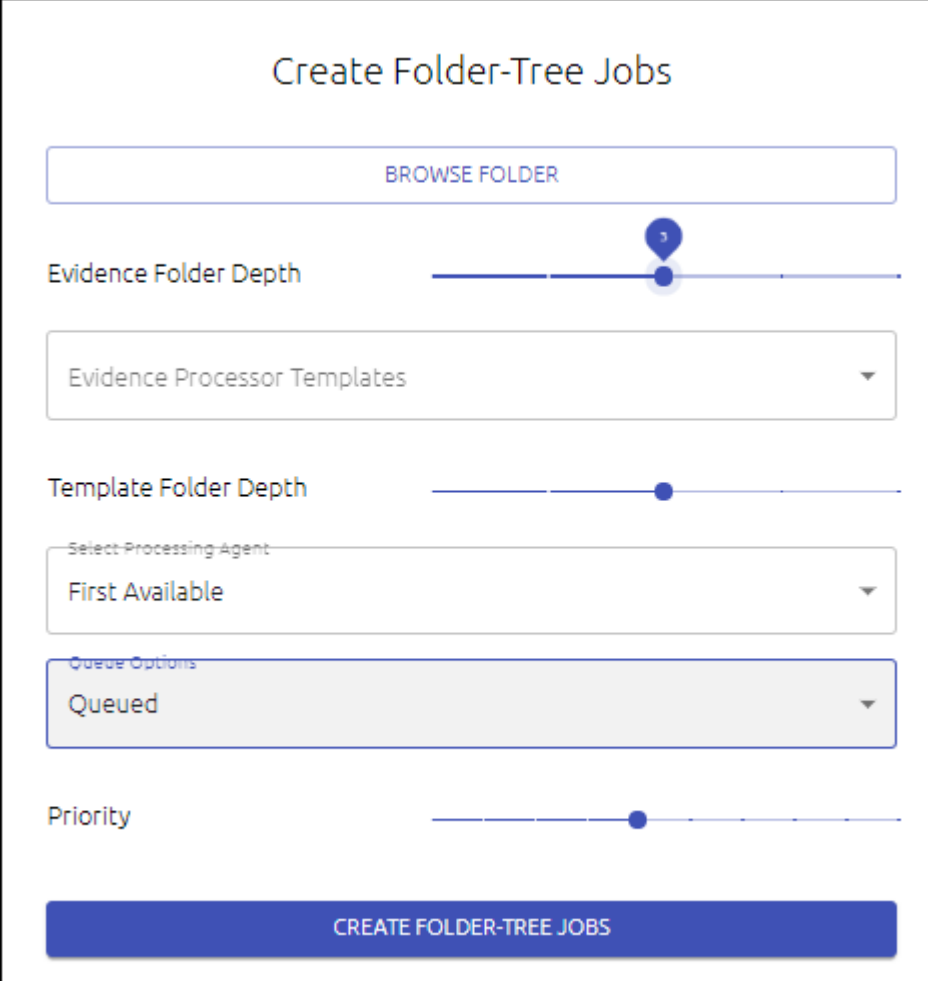
## 9.4 CREATE FOLDER-TREE JOBS

A **Tree job** is created from the **Jobs** window by clicking the tree icon: .

A **Tree Job** enables the investigator to process forensic images that have been organized in a folder structure. The containing folder becomes the case name.

**IMPORTANT:** The selected folder must be part of the network share, e.g., `\\Fexlabs\share\Evidence\8TB`, so that the processing agents have access.

Figure 41: Create Tree Job.



The screenshot shows the 'Create Folder-Tree Jobs' dialog box. It features a 'BROWSE FOLDER' button at the top. Below it is a slider for 'Evidence Folder Depth' set to 3. A dropdown menu for 'Evidence Processor Templates' is visible. Further down is a slider for 'Template Folder Depth'. Below that is a dropdown menu for 'Select Processing Agent' set to 'First Available'. A dropdown menu for 'Queue Options' is set to 'Queued'. At the bottom is a slider for 'Priority'. A large blue button labeled 'CREATE FOLDER-TREE JOBS' is at the very bottom.

Note that when a tree job has been run once, the existing **case folders must be moved or renamed before a second run**, so that FEX-LAB does not conflict with existing case folders of the same name.

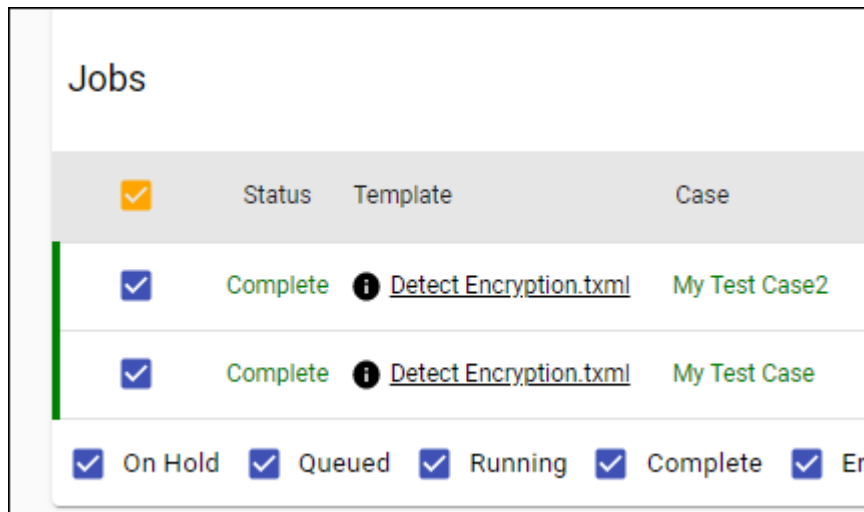
## 9.5 CSV JOBS


Frequently used jobs can be saved to a CSV file and imported when needed.

To **create a CSV job**:


1. In the **Jobs** window, place a checkbox next to the required jobs.

Figure 42: Jobs window



2. Select the **Import/Export** button .
3. Name the CSV and save to the desired location.

To **import jobs** from a CSV:

1. Select the **Import/Export** button .
2. Locate the required CSV file.
3. Each row in the CSV will create a new job.

## 9.6 REPEAT JOB

A job that appears in the **Jobs** window can be duplicated by pressing the **Duplicate Job** button:

Figure 43: Jobs window, Duplicate Job button



The duplicate job will get a unique case name based on the current date time and the original job name.

## 9.7 FOLDER WATCHER

### Settings > Folder Watcher:

The configured folder is monitored for new forensic image files that are processed according to the specified template.

Note that the watcher folder will use **CASE NAME** setting (see 12.2 below). Duplicate case names will be automatically renamed.

### NON-SEGMENTED IMAGE FILES:

#### Important:

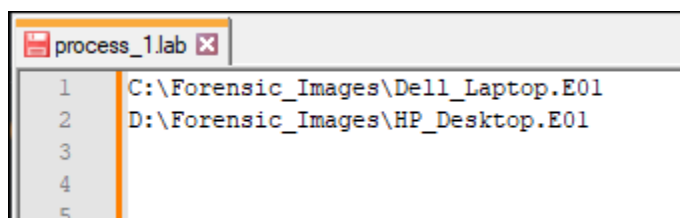
- Images added to this folder **must not be** segmented (i.e., a single .E01 file is required).

### .LAB (TEXT FILE) – SEGMENTED IMAGES – CREATE MULTIPLE CASES

To process segmented images and create multiple cases:

- Add a **.lab** text file containing the full path to the **first image segment**. For example:

Figure 44: .lab text file (for segmented image files) to create separate cases.



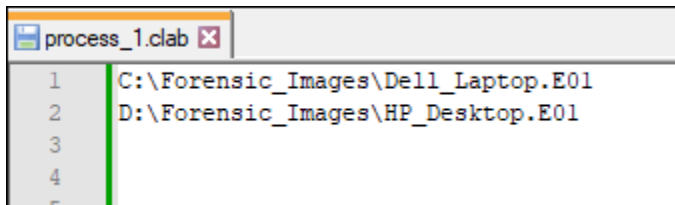
The output of processing the above .lab file will be **two separate cases**.

### .CLAB (TEXT FILE) – CREATES A SINGLE CASE (SEGMENTED IMAGES)

To process segmented images and create a single case:

- Add a **.clab** text file to the folder containing the full path to the **first image segment**.

Figure 45: .clab text file (for segmented image files) to create one case with two images.

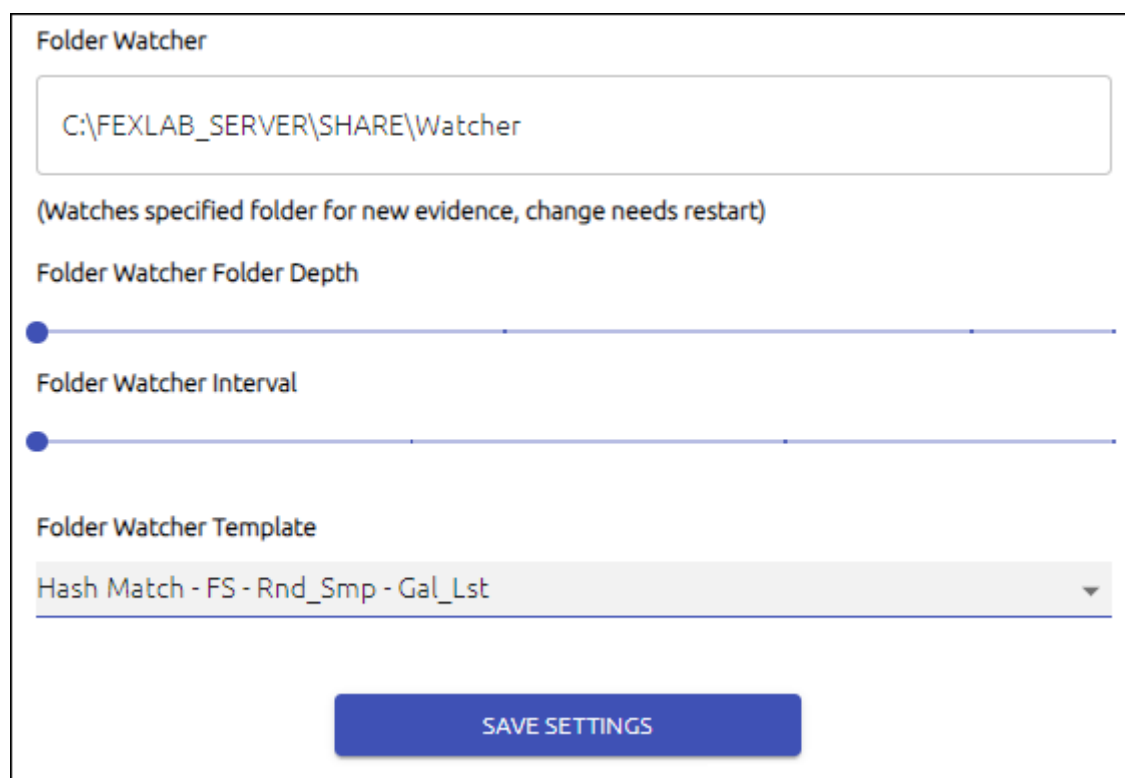


```
1 C:\Forensic_Images\Dell_Laptop.E01
2 D:\Forensic_Images\HP_Desktop.E01
3
4
5
```

The output of processing the above .lab file will be **a single case containing the two images**.

### FOLDER WATCHER SETTINGS

Figure 46: Settings > Folder Watcher.



**Folder Watcher**

C:\FEXLAB\_SERVER\SHARE\Watcher

(Watches specified folder for new evidence, change needs restart)

Folder Watcher Folder Depth

Folder Watcher Interval

Folder Watcher Template

Hash Match - FS - Rnd\_Smp - Gal\_Lst

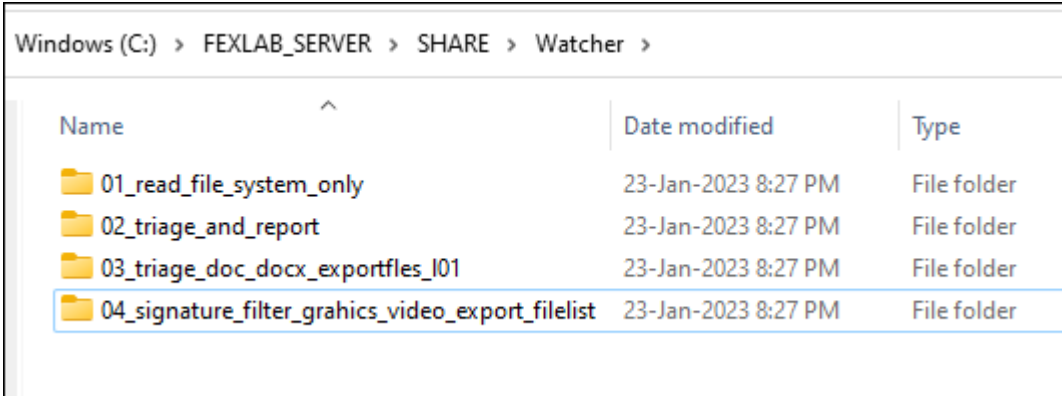
**SAVE SETTINGS**

### WATCHER SUB-FOLDERS

Watcher sub-folders can be created using the names of processing templates:

- If the folder name matches a TXML name, it will process using that template, else,
- It will process using the default template.

Figure 47: Watcher sub-folders created with template.xml names.



The image shows a screenshot of a Windows File Explorer window. The address bar indicates the path: Windows (C:) > FEXLAB\_SERVER > SHARE > Watcher >. The main area displays a table of folders. The table has three columns: Name, Date modified, and Type. There are four folders listed, all with a date modified of 23-Jan-2023 8:27 PM. The folder '04\_signature\_filter\_grahics\_video\_export\_filelist' is selected and highlighted with a blue border.

Name	Date modified	Type
01_read_file_system_only	23-Jan-2023 8:27 PM	File folder
02_triage_and_report	23-Jan-2023 8:27 PM	File folder
03_triage_doc_docx_exportfles_l01	23-Jan-2023 8:27 PM	File folder
04_signature_filter_grahics_video_export_filelist	23-Jan-2023 8:27 PM	File folder

---

---

## 10. AGENTS

**FEX-LAB Agents** are the computers that connect to **FEX-LAB Server** and process jobs. To access this window, select **Agents** from the left-hand menu.

### 10.1 AGENT TYPES

The different types of Agents are (shown in the **Agent Type** column):

1. **Local:** An agent running on the same computer as FEX-LAB.
2. **Process:** An agent running on a remote computer.
3. **Remote:** A remote agent that is used to access remote machine drives for processing.



## 10.2 STARTING LOCAL AGENTS

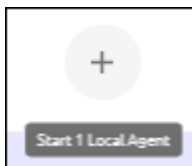
Local Agents are stated in the **Options > Agents** window.

### ADD A SINGLE LOCAL AGENT

Launch a **single Local Agent**:

1. Add a single Local Agent by clicking the plus icon:

Figure 48: Launch a single local agent.

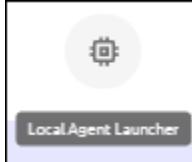


### ADD MULTIPLE LOCAL AGENTS

Launch multiple **Local Agents**:

1. Click the **Local Agent Launcher** button:

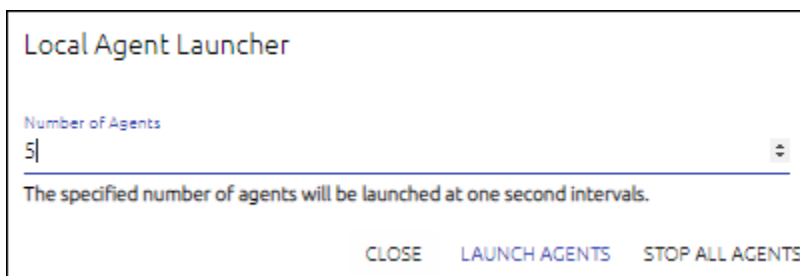
Figure 49: Launch multiple Local Agents.



2. In the Local Agent Launcher window, set the number of local agents.

**Important:** As a general rule, the maximum number of agents should be the total machine core count – 4 (reserved for use by the Operating System). Test to determine the most efficient operation on your hardware.

Figure 50: Create local agents.



3. Close the window and Local Agents will launch at one second intervals.

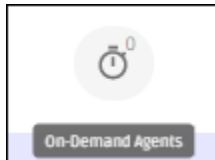
---

## LAUNCH LOCAL AGENTS ON DEMAND

To spin up/down Local Agents on demand:

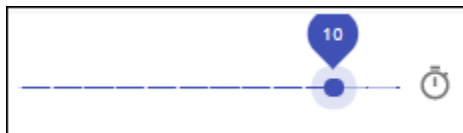
1. Click the **On Demand Agents** icon:

Figure 51: Launch Local Agents on demand.



2. A slide bar will display. Set the maximum number of concurrent agents in the slide bar:

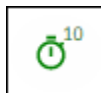
Figure 52: Set maximum Local Agents on demand.



The length of the slide-bar is determined by the number of computer cores available (each agent is assigned a core). Four cores are reserved by use for the Windows Operating System.

When active, the On Demand Agents icon will turn green and display the maximum number of concurrent agents available.

Figure 53: On demand agents.



When a job is added, an agent will spin up on demand to process the job. On job completion, the agent will spin down.

FEX-LAB will pause spinning up new agents if the host CPU usage is greater than 90%.

## 10.3 AGENT ICONS

There are two sets of icons in the **Agents** window:

- Operations using the icons at the **top of the Agents window** are applied to **all Agents**.
- Operations using the icon in **each row of the Agents table** apply to **that Agent only**.

Figure 54: FEX-LAB Agents table

Agent Name	Agent IP	Agent Type	Agent Status	Update Time	CPU	RAM	Total Ram	Version	Platform	CLI	Edit
HP-I9-LAPTOP-02D61813 (e443c353)	10.10.10.101	Local	Idle	1/21/2023, 7:51:21 PM	2%	13.18 GB	63.88 GB	1.415	Windows_NT 10.0.22621		
HP-I9-LAPTOP-02D61813 (e3db1c05)	10.10.10.101	Local	Idle	1/21/2023, 7:51:21 PM	2%	13.18 GB	63.88 GB	1.415	Windows_NT 10.0.22621		
HP-I9-LAPTOP-02D61813 (961cc63a)	10.10.10.101	Local	Idle	1/21/2023, 7:51:21 PM	2%	13.18 GB	63.88 GB	1.415	Windows_NT 10.0.22621		
HP-I9-LAPTOP-02D61813 (71e66642)	10.10.10.101	Local	Idle	1/21/2023, 7:51:21 PM	2%	13.18 GB	63.88 GB	1.415	Windows_NT 10.0.22621		
HP-I9-LAPTOP-02D61813 (305eb407)	10.10.10.101	Local	Idle	1/21/2023, 7:51:21 PM	2%	13.18 GB	63.88 GB	1.415	Windows_NT 10.0.22621		

The icons perform the following functions:

- Green = The agent PC is online.
- Green = Connected to the network share (e.g., cases, FEXCLI, templates).
- Run Command issued in the CLI edit box.
- Restart FEXQ service.
- Reboot.
- Update Agent software (the agent must be online).
- Shutdown all (top menu only).
- Chart resource and processing information.

## 11. USERS

### 11.1 LOGIN

There are two methods to log into FEX-LAB:

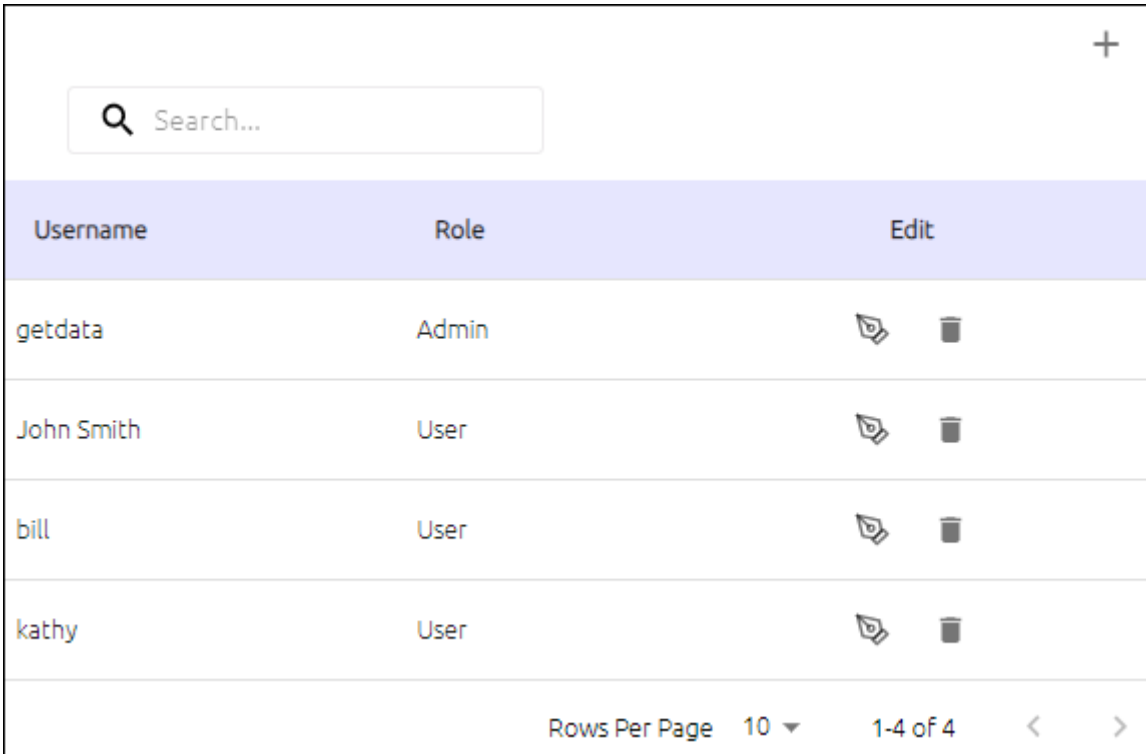
1. **Web browser**, using <http://localhost:8080>, or [http://\[SERVERIPADDRESS\]:8080](http://[SERVERIPADDRESS]:8080).
2. **FEX-LAB-D** (recommended).

Login requires a valid user account and password. FEX-LAB is installed with a default admin account, username: getdata, password: getdata.









### 11.2 USER ACCOUNTS

User accounts are added and managed from the left-hand menu Users link (admin only). Existing user accounts are listed:

Figure 55: Role information.



The screenshot shows a user management interface. At the top right is a plus sign (+). Below it is a search bar with a magnifying glass icon and the text "Search...". The main content is a table with the following data:

Username	Role	Edit
getdata	Admin	 
John Smith	User	 
bill	User	 
kathy	User	 

At the bottom of the table, there is a pagination control showing "Rows Per Page 10" with a dropdown arrow, "1-4 of 4", and left and right navigation arrows.

FEX-LAB has two use roles:

1. **Admin:**
  - Create processing agents.
  - Create, launch, and administer jobs.

- Create and manage users.
- Update settings.
- Edit processing templates.

## 2. User:

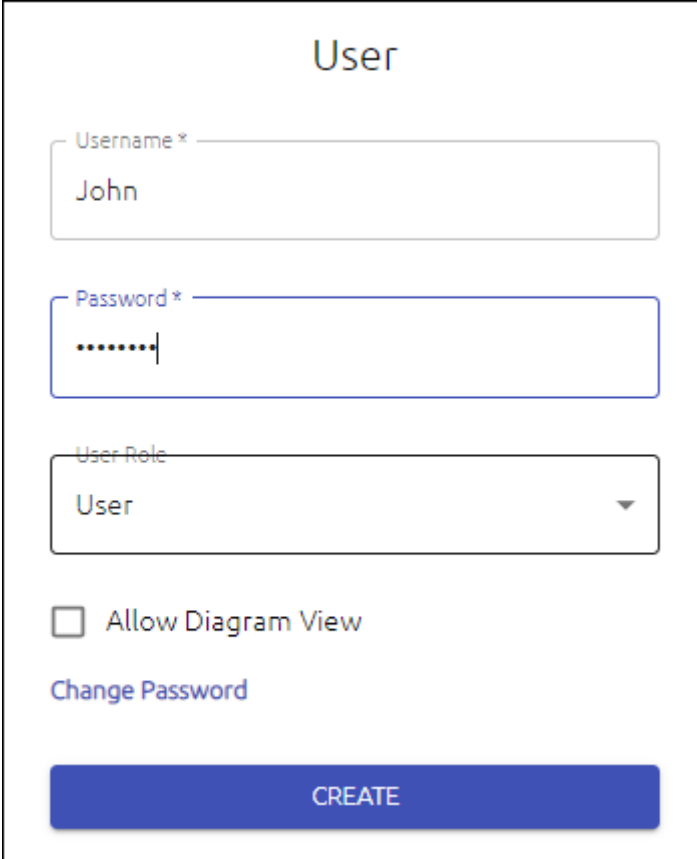
- Launch jobs.

---

### ADD A USER ACCOUNT:

1. Log in as an **admin** user.
2. Click the + symbol (shown in Figure 55 above).
3. Complete the form and click **CREATE**.

Figure 56: Adding a user to FEX-LAB.



The screenshot shows a web form titled "User" for creating a new account. It contains the following elements:

- A text input field for "Username \*" containing the text "John".
- A password input field for "Password \*" with masked characters ".....".
- A dropdown menu for "User Role" with "User" selected.
- An unchecked checkbox labeled "Allow Diagram View".
- A blue link labeled "Change Password".
- A prominent blue button labeled "CREATE" at the bottom.

## 12. SETTINGS (ADMIN ONLY)

The **Settings** button is accessed from the options icon ☰ when logged in as a FEX-LAB administrator user.

Figure 57: Settings menu button.

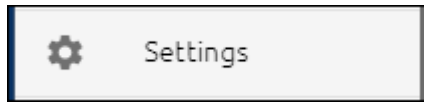
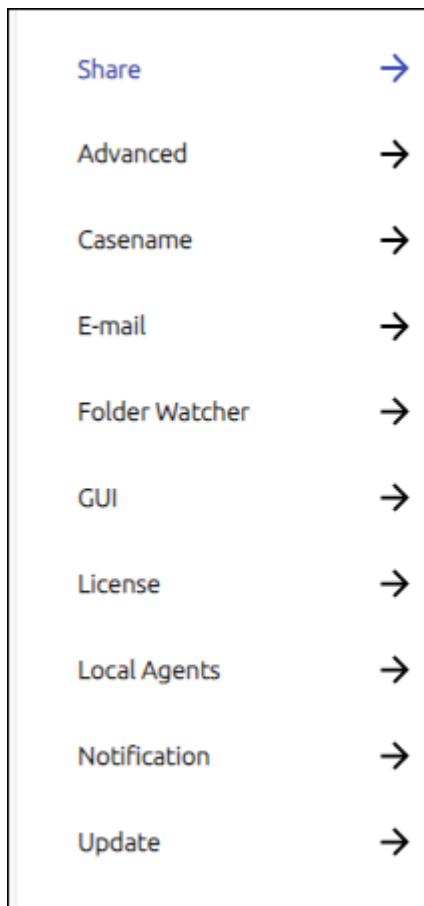
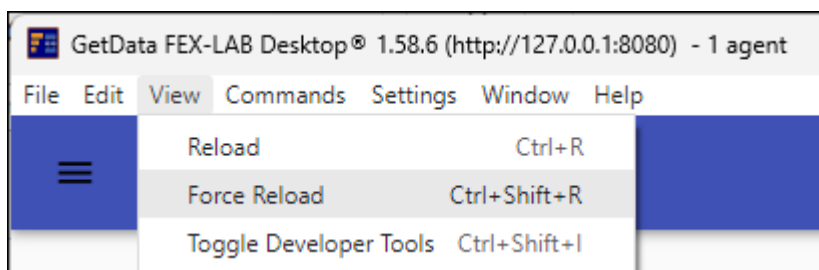


Figure 58: Settings sub-menu button.



Note: Some settings changes require a page reload to refresh and display changes:

Figure 59: Reload page.



## 12.1 SETTINGS > SHARE

**Share** sets paths to required folders. If remote agents are used, UNC paths are required.

Figure 60: FEX-LAB Settings (settings shown are for local agents).

Cases Folder \*

C:\SHARE\Cases

FEX-CLI Path \*

C:\SHARE\FEXCLI

Evidence Folder \*

C:\SHARE\Evidence

Watcher Folder

C:\SHARE\Watcher

Templates Folder \*

C:\SHARE\FEXCLI\{xml}

Evidence Folder Depth

Template Folder Depth

SET PATHS

If using remote agents, use an accessible network share

SAVE SETTINGS

### Evidence Folder Depth:

- Controls how many sub-folders are included when the **Select Image File** field is populated in the **Create FEX-CLI Jobs** window.

### Template Folder Depth:

- Controls how many sub-folders are included when then **Evidence Processor Templates** field is populated the **Create FEX-CLI Jobs** window.

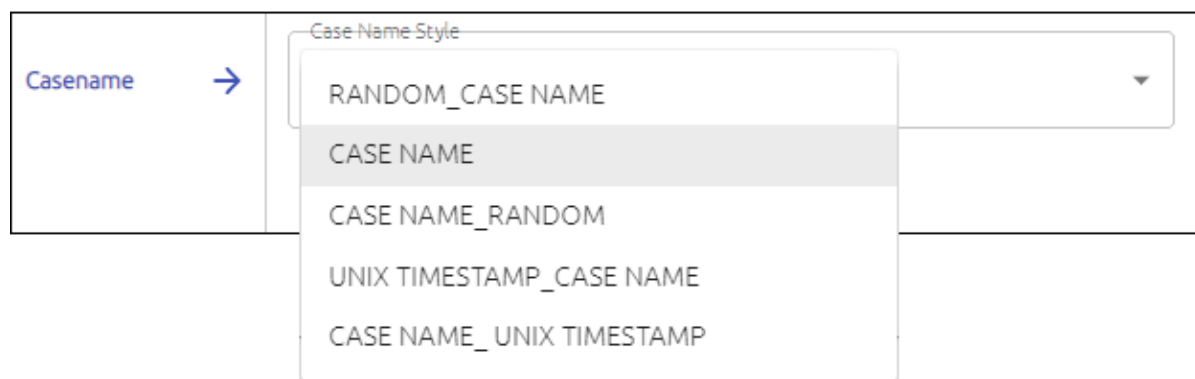
## 12.2 SETTINGS > CASE NAME

When a job is created and processed by Forensic Explorer (FEX-GUI, FEX-CLI, FEX-Triage, FEX-LAB) a Forensic Explorer case is created and stored in a folder with a **unique case name**.

In FEX-LAB, where multiple users submit jobs that are processed simultaneously, unique case names are tightly controlled to avoid conflict with an already existing case name. This is primarily achieved by **appending a timestamp** to the **case folder name**, and the **.fex** case file.

The following case name options exist:

Figure 61: Case name settings.



In Figure 62 below, the following examples are provided:

Figure 62: Case name examples.

Casename Setting	Created Case Folder Name / Case File Name (.fex)
RANDOM_CASE NAME	Op Sky_ <b>ld0n2tqjC</b> _Dell Laptop
CASE NAME	Op Sky_ <b>Dell Laptop</b>
CASE NAME_RANDOM	Op Sky_ <b>Dell Laptop_ld0n2tqjC</b>
UNIX_TIMESTAMP_CASE NAME	Op Sky_ <b>1673986536018C</b> _FOUR
CASE NAME_UNIX_TIMESTAMP	Op Sky_ <b>Dell Laptop_1673986536018C</b>

The components of the name are:

- **Op Sky\_** Case Name Prefix (Create FEX-CLI Jobs window [optional]).
- **Dell Laptop** Case Name (Create FEX-CLI Jobs window).
- **ld0n2tqj** 8-digit randomized date/time (cannot be reversed).
- **1673986536018** 13-digit Unix date/time to milliseconds.



- **C** Job type (Created, Duplicated, Restarted, Imported, Process Tree).

Note that when **CASE NAME** is used, no additional naming components are added. The operator must ensure that this casename does not already exist. If the casename is not unique, FEX-LAB will not process the job and display an error message in the jobs window, as shown in Figure 63 below.

Figure 63: Error (Case path not empty).

Status
<i>Error (Case path not empty)</i>
<i>Error (Case path not empty)</i>

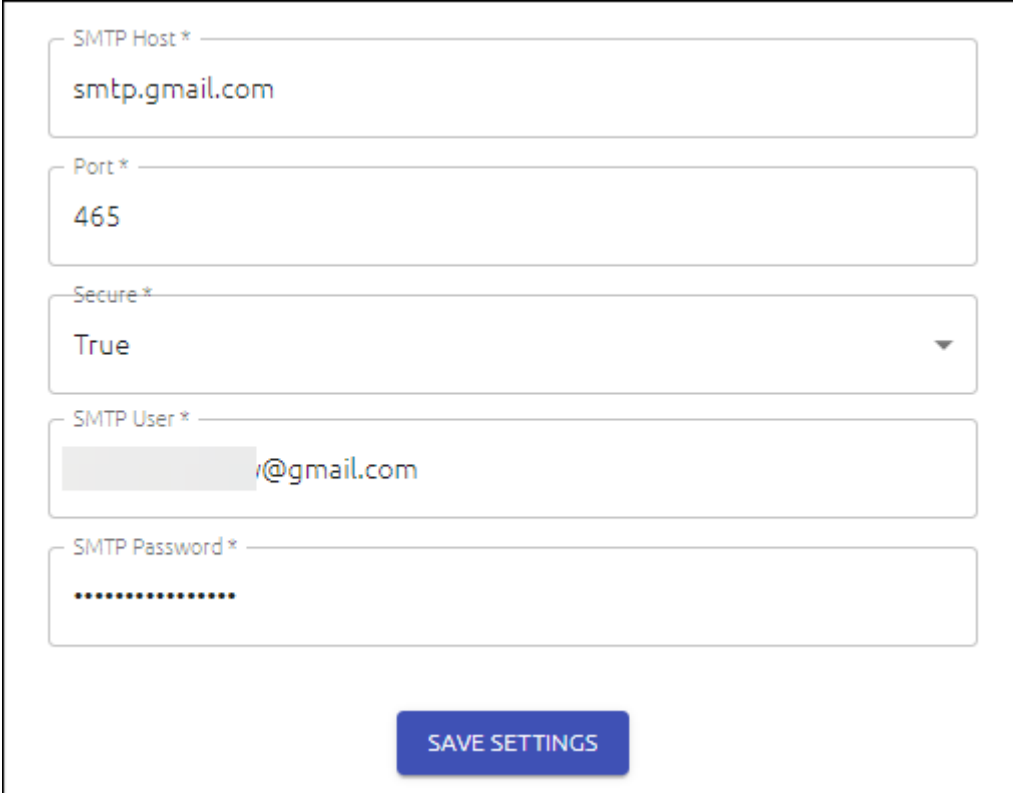
## 12.3 SETTINGS > E-MAIL

### 12.3.1 SETUP SMTP SERVER

To receive FEX-LAB job notification by email:

1. Configure an SMTP server (Gmail is a frequently used free SMTP service).

Figure 64: Configure Gmail SMTP Server.



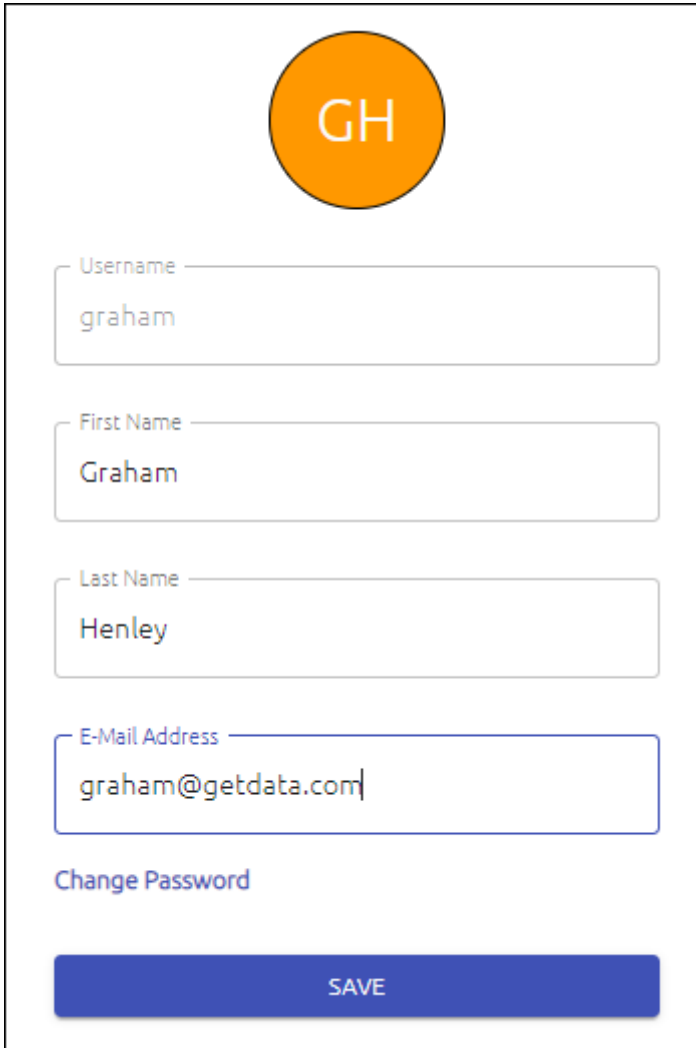
The screenshot shows a configuration form for an SMTP server. It contains five input fields and a save button. The fields are: SMTP Host \* (smtp.gmail.com), Port \* (465), Secure \* (True), SMTP User \* (redacted@gmail.com), and SMTP Password \* (masked with dots). A blue button labeled 'SAVE SETTINGS' is located at the bottom center of the form.

SMTP Host *	smtp.gmail.com
Port *	465
Secure *	True
SMTP User *	[redacted]@gmail.com
SMTP Password *	.....

SAVE SETTINGS

2. Ensure there is a valid email address associated with FEX-LAB user profile submitting the job:

Figure 65: User account profile.



The screenshot shows a user account profile form. At the top center is a circular orange profile picture containing the letters 'GH'. Below this are four input fields: 'Username' with the value 'graham', 'First Name' with the value 'Graham', 'Last Name' with the value 'Henley', and 'E-Mail Address' with the value 'graham@getdata.com'. Below the email field is a link labeled 'Change Password'. At the bottom of the form is a large blue button labeled 'SAVE'.

3. When the job is submitted, check **Notify me via e-mail**:

Figure 66: Email notification.



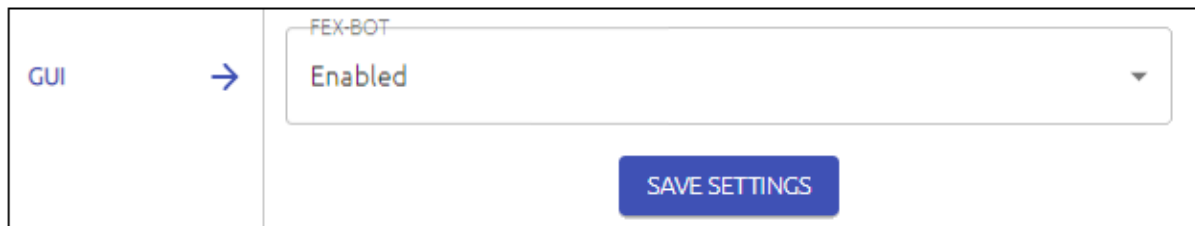
The screenshot shows a checkbox labeled 'Notify me via e-mail' which is checked. Below the checkbox is a large blue button labeled 'ADD TO QUEUE'.

## 12.4 SETTINGS > GUI

### 12.4.1 GUI > FEX-BOT

FEX-BOT is an alternate method to issue processing commands to FEX-LAB. Enable FEX-BOT in the Settings > GUI > FEX-BOT > Enabled/Disabled.

Figure 67: Enable/Disable FEX-BOT.



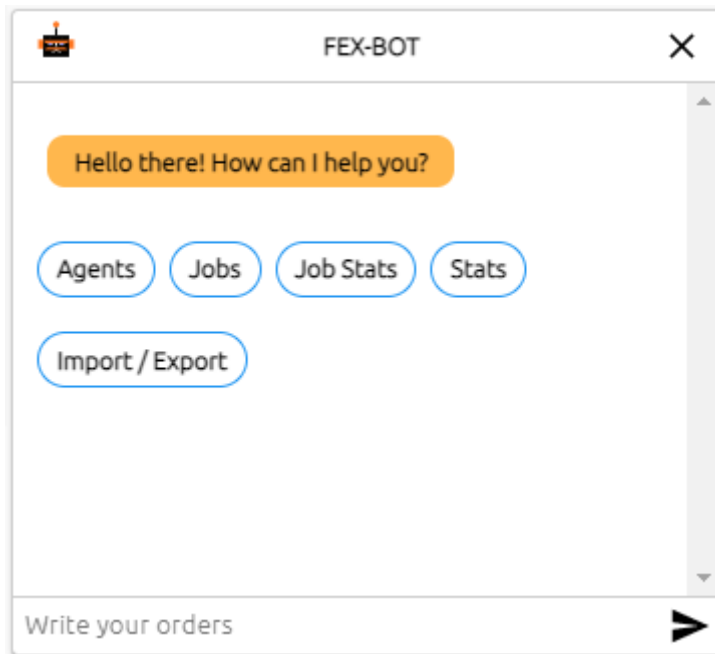
When enabled, FEX-BOT will appear in the bottom right-hand corner.

Figure 68: FEX-BOT.



Click FEX-Bot to open the command window.

Figure 69: FEX-BOT Command window.

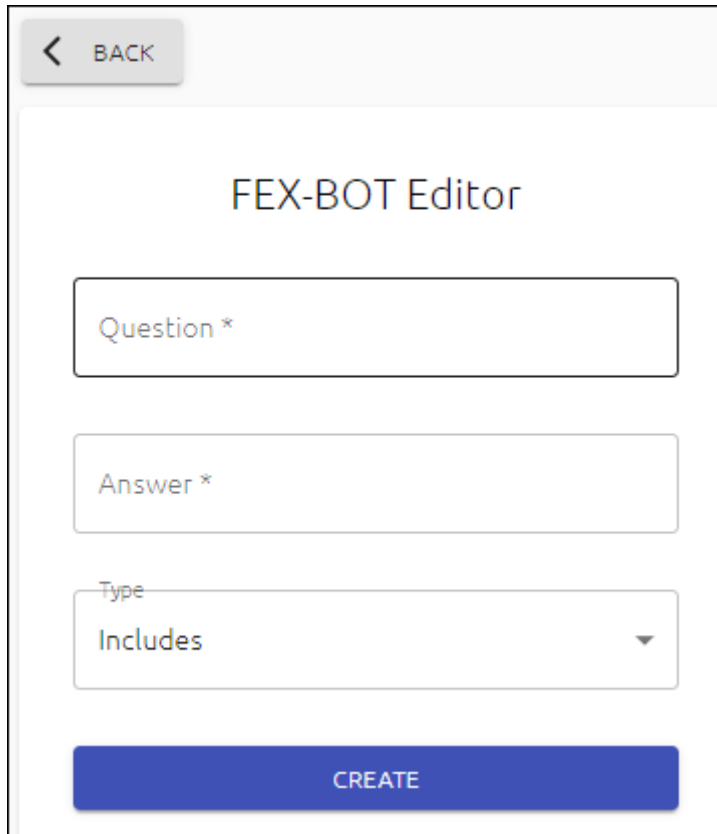


When FEX-BOT is enabled, **Admin** users have the ability to program custom response text in the FEX-BOT editor:

Figure 70: Settings > FEX-BOT Editor (Admin).



Figure 71: FEX-Bot Editor.

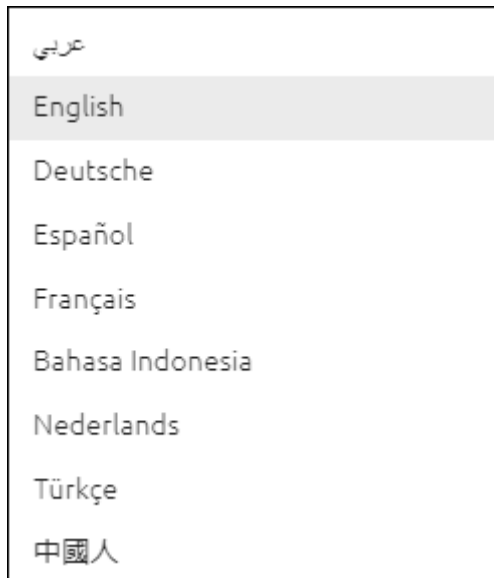
A mobile-style form titled "FEX-BOT Editor". At the top left is a "BACK" button with a left arrow. Below the title are three input fields: "Question \*" (text), "Answer \*" (text), and "Type" (dropdown menu with "Includes" selected). At the bottom is a blue "CREATE" button.

## 12.4.2 GUI > LANGUAGE

---

Used to change the interface language:

Figure 72: FEX-LAB Settings > GUI > Language.

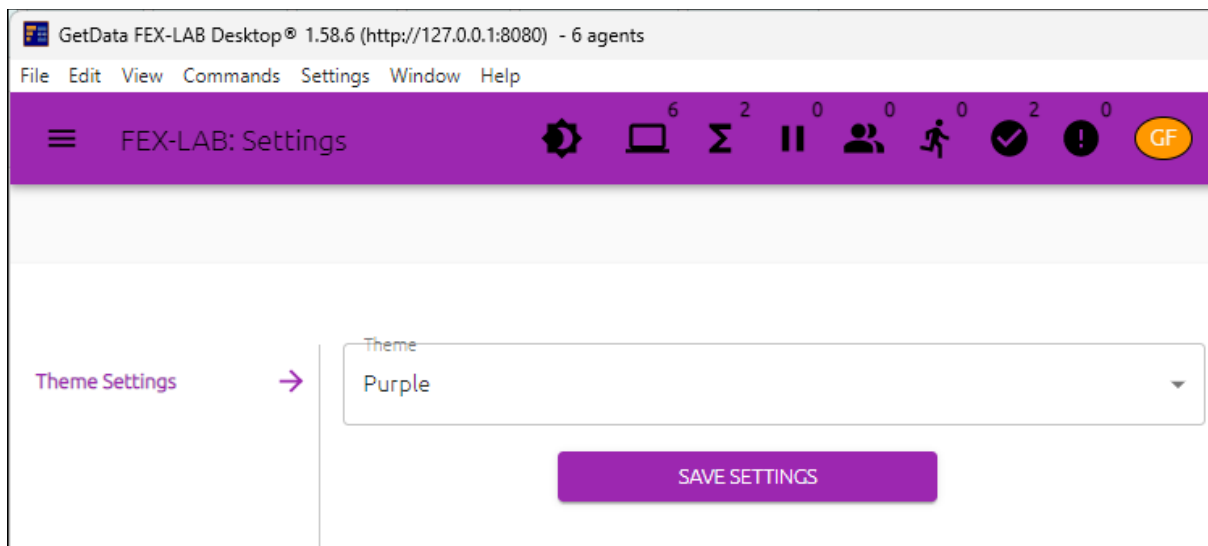


## 12.4.3 THEME

---

Used to change the GUI theme (blue, green, red, yellow, orange, purple, brown):

Figure 73: Change theme.



#### 12.4.4 GUI > DESKTOP NOTIFICATION

Enables or disables Windows desktop notifications.

Figure 74: Windows Desktop Notifications.

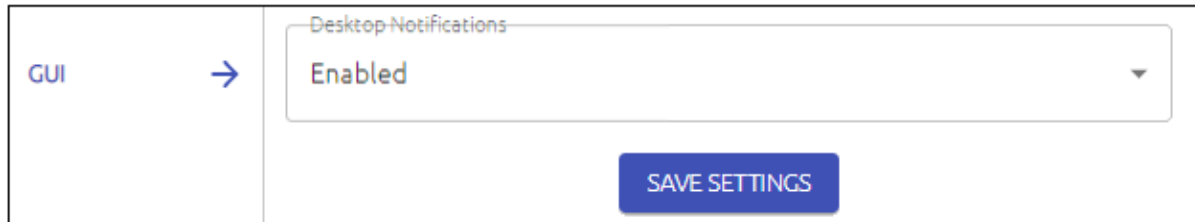


Figure 75: Windows > System > Notifications.

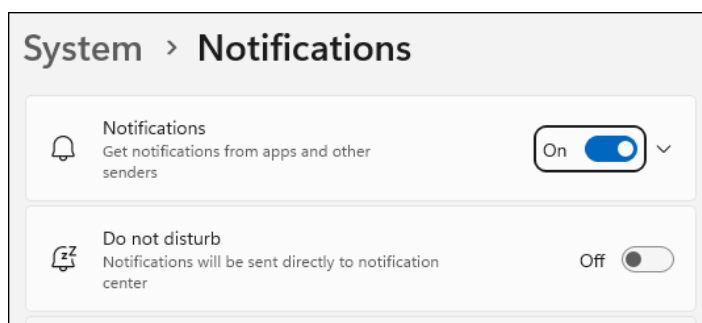
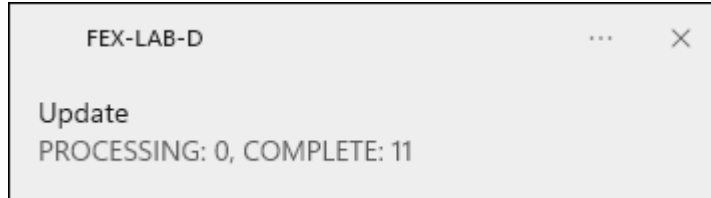


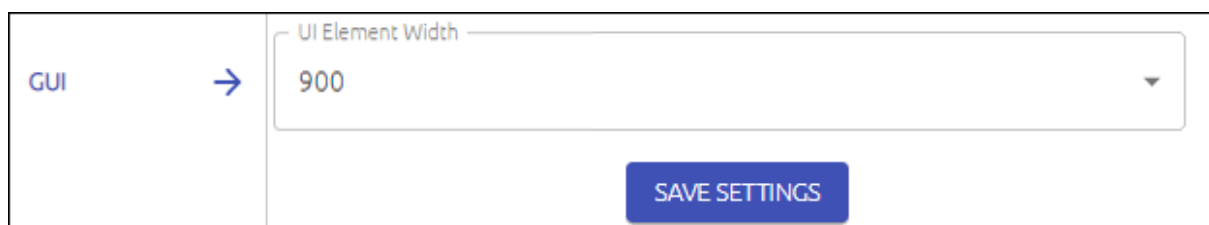
Figure 76: Windows Desktop Notifications.



#### 12.4.5 GUI > UI ELEMENT WIDTH

**UI Element Width** controls the width of FEX-LAB-D input windows. It can be adjusted to suit different monitor sizes:

Figure 77: GUI Element Width.

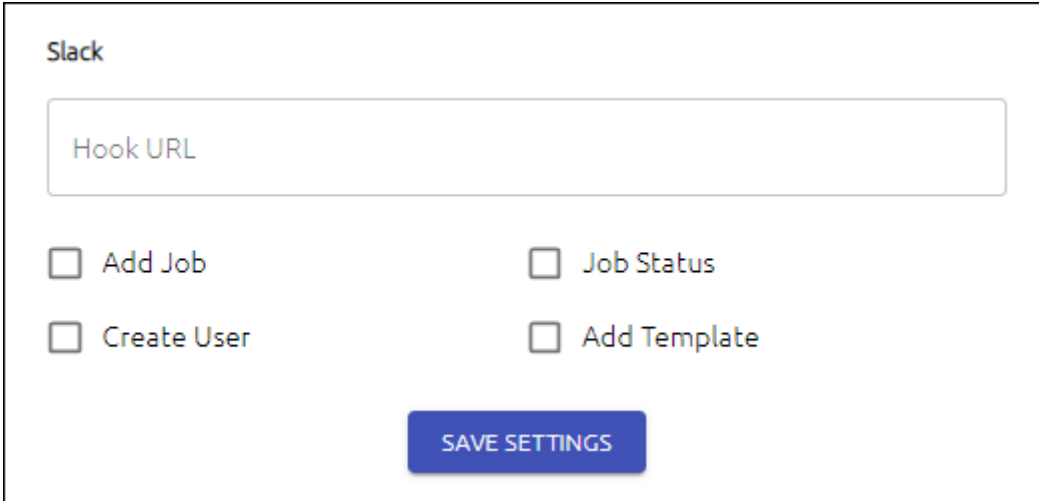


## 12.5 SETTINGS > NOTIFICATION

Slack is an instant messaging program designed by Slack Technologies and owned by Salesforce. FEX-LAB can send job processing notification by Slack.

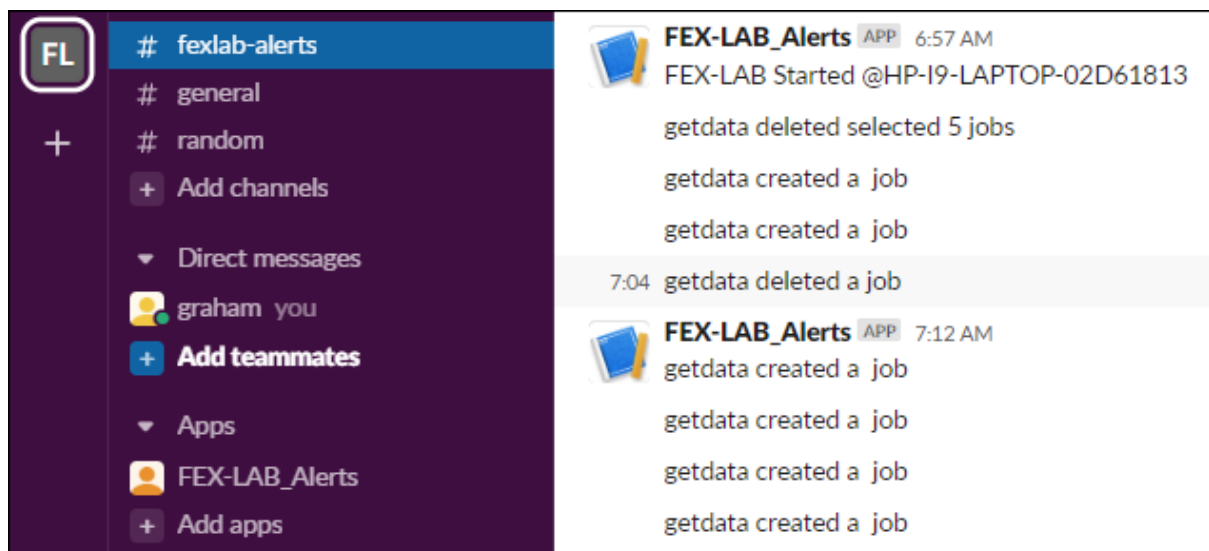
- Learn about Slack webhooks here: <https://api.slack.com/messaging/webhooks>
- Learn how to configure Slack notifications here: <https://www.youtube.com/watch?v=sxtC40gUS2A>

Figure 78: Slack notification settings.



The screenshot shows the 'Slack' notification settings interface. It features a text input field labeled 'Hook URL'. Below the input field are four checkboxes: 'Add Job', 'Job Status', 'Create User', and 'Add Template'. At the bottom center is a blue button labeled 'SAVE SETTINGS'.

Figure 79: Slack notifications.





## 13. EVIDENCE PROCESSOR TEMPLATES (TXML)

An **Evidence Processor Template** is a defined set of instructions in XML format that sets out the processing steps for a job.

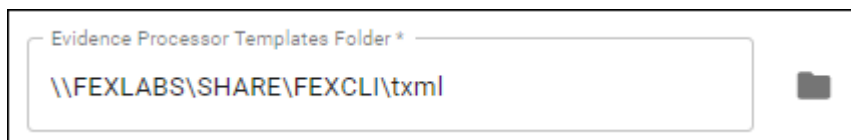
A template is selected from the **Create Jobs > Evidence Processor Templates** drop-down menu.

Figure 80: Create Jobs window, Evidence Processor Template



The templates that are populated in this drop-down menu read from the folder path defined in **Settings > Evidence Processor Templates Folder**:

Figure 81: Settings templates folder location



Evidence Processor Template Files (TXML) contain the instructions (processing steps) that are passed to the FEX-CLI to process data.

### 13.1 TCOMMANDTASKS

A TXML can contain **TCommandTask** statements that initiate the processing directly. These include common forensics tasks such as:

- TCommandTask\_Acquirememory
- TCommandTask\_AppleBackup
- TCommandTask\_Bookmark
- TCommandTask\_CacheThumbnails
- TCommandTask\_CacheVideoThumbnails
- TCommandTask\_ClamAV
- TCommandTask\_CreateHash
- TCommandTask\_DataStore
- TCommandTask\_DtSearch
- TCommandTask\_ExpandCompoundFiles
- TCommandTask\_ExportEntryList
- TCommandTask\_ExportFiles
- TCommandTask\_ExportFilesL01
- TCommandTask\_ExportVIC
- TCommandTask\_ExportZIP
- TCommandTask\_FileTypeAnalysis
- TCommandTask\_Filter
- TCommandTask\_FolderCarve

---

---

- TCommandTask\_KeywordSearchExternal
- TCommandTask\_LiveBoot
- TCommandTask\_MatchHash
- TCommandTask\_Parallel
- TCommandTask\_ReportGenerator
- TCommandTask\_Root
- TCommandTask\_Script
- TCommandTask\_SearchforEmails
- TCommandTask\_SearchforKnownFS
- TCommandTask\_SearchforKnownISOTracks
- TCommandTask\_SearchforKnownMBR
- TCommandTask\_SearchforLostFiles
- TCommandTask\_SearchRegistryHive
- TCommandTask\_SendTo
- TCommandTask\_VerifyDevice

## 13.2 CUSTOMIZING WITH SCRIPTS AND FILTERS

**TCommandTask\_Script**, **TCommandTask\_Filter** and **TCommandTask\_ReportGenerator** enable the TXML to call scripts, filters, and reports. This gives a TXML extended processing customization ability.

## 13.3 TXML STRUCTURE

A TXML follows the XML specification where each task has an opening and closing task. When a task appears within another task (identified by an indent), it is said that the inner element is "nested".

TXML processing templates follow a logical sequence in forensic processing. For example, a file system must be read before a filter can be applied to process only graphics.

Typically, an organization will have a common **base.xml** from which other custom TXMLs are developed for specific processing tasks. An example of a base TXML is shown below, where:

Figure 82: TXML Structure

*The filesystem is read.*

*A signature analysis is performed.*

*A search for Apple backups is conducted.*

*A filter is applied for encrypted files.*

*A list of encrypted files is written to a CSV.*

*The filter is closed.*

*The file system is closed.*

*A script is run to check processing log files for any errors.*

Figure 83: Typical base TXML template

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <TXML version="2">
3      <task classname="TCommandTask_Root" caption="Root Task">
4
5          <!-- READ FILESYSTEM -->
6          <task classname="TCommandTask_DataStore" caption="FileSystem" module="F
7              <task classname="TCommandTask_Parallel" caption="Process in Paralle
8                  <task classname="TCommandTask_SearchforKnownISOTracks" caption=
9                      <task classname="TCommandTask_SearchforKnownMBR" caption="Searc
10                         <task classname="TCommandTask_SearchforKnownFS" caption="Se
11
12                  </task>
13              </task>
14
15          <!-- SIGNATURE -->
16          <task classname="TCommandTask_FileTypeAnalysis" caption="Signature
17
18          <!-- APPLE BACKUP -->
19          <task classname="TCommandTask_AppleBackup" caption="Apple Backup Id
20
21          <!-- FILTER -->
22          <task classname="TCommandTask_Filter" caption="Filter isEncrypted"
23              <task classname="TCommandTask_ExportEntryList" caption="Encrypt
24          </task>
25
26          <!-- ADDITIONAL TASKS START HERE -->
27
28          <!-- ADDITIONAL TASKS END HERE -->
29      </task>
30
31      <!-- SCRIPT -->
32      <task classname="TCommandTask_Script" caption="SCRIPT - Check Log Files
33
34  </task>
35  </TXML>

```

## 13.4 TASK COMPONENTS

An individual TXML task will typically have values that can be accessed for processing control. For example, tasks, such as Signature Analysis shown below, have a default enabled state (True or False) that will determine if the task is used:

Figure 84: Signature Analysis

```
<!-- SIGNATURE -->  
<task classname="TCommandTask_FileTypeAnalysis"  
caption="Signature Analysis"  
enabled="True"/>
```

### MODIFYING TASKS WHEN SUBMITTING A JOB

When a job is added in the **Create Jobs** window, the user has the option to modify processing options on-the-fly, by clicking the cog icon. This opens the **Options** window which gives the user choices based on the content of the TXML:

Figure 85: Modifying TXML processing options when adding a job.

The screenshot shows a dialog box titled "Options" with a scrollable list of settings. The settings are:

- FileSystem**: A text box containing "FileSystem".
- Process in Parallel**: A checked checkbox labeled "Enabled".
- Search for Known ISO Tracks**: A checked checkbox labeled "Enabled".
- Signature Analysis**: A checked checkbox labeled "Enabled".
- Apple Backup Identify**: A checked checkbox labeled "Enabled".
- Filter isEncrypted**: A checked checkbox labeled "Enabled" and a text box containing "%APP\_PATH%..\filters\by\_is\filter\_isencr".

At the bottom right of the dialog are "SAVE" and "CANCEL" buttons.

When options are changed, the original TXML is not altered. Changes are made to a temporary copy of the TXML which is saved to the case. In this way anyone opening the case in the future can refer to the TXML to see the exact processing steps used.

---

---

## 14. UPDATING FEX-LAB

To **update FEX-LAB** on an online or **off-line computer**:

1. From an internet connected visit: <https://getdataforensics.com/product/fex-lab/download/> and download the latest **FEX-LAB Server Update** executable.
2. **Copy the executable** to the offline system.

**Important:** Ensure **no active jobs** are running on **FEX-LAB**. Fexlab\_update.exe will stop the FEX-LAB service and any running jobs will be terminated.

3. **Launch fexlab\_updater.exe** with **administrator rights** and follow the on-screen instructions.
4. It is recommended to close down and restart FEX-LAB once the update is complete. Check the home screen for the updated version number. It may be necessary to use **View > Reload** in the topmost menu to refresh the view.

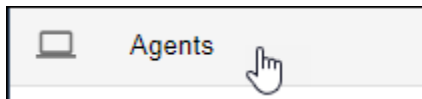
A local update path can also be used for air-gapped setups. The path needs to include fexlab.json and the updated executables. Changing the update URL in FEX-LAB settings is necessary.

## 15. SHUTTING DOWN FEX-LAB

### 15.1 SHUT DOWN ALL AGENTS (REMOTE AGENTS ONLY)

To shut-down (power off) **remote** FEX-LAB agents:

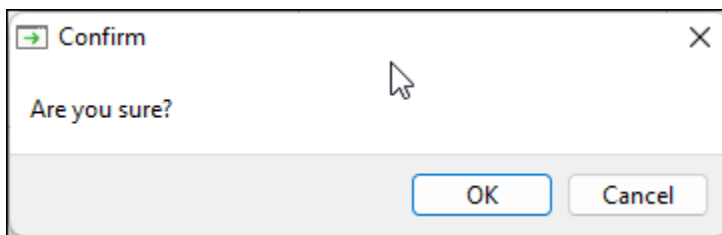
1. Select Agents from the left-hand menu.



2. Click the power button.



3. You will be prompted to confirm.



4. On confirmation, all agents will power down.

### 15.2 STOP FEX-LAB SERVER

To stop the FEX-LAB server:

- Log-out of FEX-LAB.
- Stop the FEX-LAB Windows service.

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