7.0.4.4

Provides a complete breakdown of leveraging F-Response to perform expert remote e-discovery, computer forensics, and incident response.
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Terminology

The following terminology will be used throughout this manual.

**EXAMINER**

F-Response Examiner refers to the applications used to connect to remote Subjects and Providers to attach devices and shares.

**SUBJECT**

F-Response Subject refers to the applications used to present remote devices, drives, memory and shares to Examiners as defined above.

**PROVIDER**

Provider refers to the supported 3rd party Cloud Services providers that F-Response is able to connect to and present data from.

**TARGET**

Targets refer to individual devices, shares, and data sources presented by Subjects or Providers to Examiners as defined above.

**PHYSICAL DEVICE**

Physical Device refers to the F-Response connected subject’s remote physical disks and logical volumes presented as locally attached physical disks.

**VIRTUAL DEVICE**

Virtual devices refer to F-Response virtual connected resources including Provider Targets.

**PHYSICAL IMAGE**

Physical Image refers to an Expert Witness (EWF) formatted full device acquisition. Physical Images will include the allocated and unallocated content of the physical device. Physical images can only be performed against Physical Devices.

**LOGICAL IMAGE**

Logical Image refers to an Expert Witness (EWF) or Virtual Hard Disk (VHD) formatted file and folder acquisition of a virtual device.

**CONTAINER**

Container refers to a list of references of user identified files and folders from either physical or virtual devices added to a user created container. A container must be converted to a Expert Witness (EWF) or Virtual Hard Disk (VHD) formatted Image to actually acquire the files and folders added.

**LIVE FILE DEVICE**

Live File Device refers to the F-Response connected subject’s remote physical disks and logical volumes presented as locally attached live raw files (Linux and OSX Examiner Platforms Only).
Overview
F-Response is a software product which leverages our patented and patent pending technology to provide access to remote drives, memory, volumes, and 3rd party cloud storage.

Supported Platforms

Subject
The F-Response Subject executables are designed to provide all or a subset of the available target types on the following operating systems:

- Linux (Most modern distributions)
- Apple OSX (10.6+)

Examiner
The F-Response Examiner executables and management tools provide access to F-Response Subjects and Targets on the following operating systems:

- Microsoft Windows (7,8,10) both 32 and 64 bit
- Linux (Most modern distributions)
- Apple OSX (10.8+)

Provider
The F-Response Management Console supports the following 3rd party Cloud Storage and Local Storage Providers:

- Amazon Simple Storage Service (S3)
- Box.com
- Dropbox
- Google Drive for Business
- Google Drive for Consumers
- Google Mail (OAuthv2)
- Imap Email (Limited)
- Microsoft Azure Blob Storage
- Office 365 Email
- Office 365 OneDrive for Business
- Office 365 Sharepoint
- OneDrive for Consumers
- Rackspace CloudFiles

1 IMAP Email is provided on a “best effort basis”. Restrictions and constraints enforced by individual providers make IMAP based email collection difficult at best.
Technical Architecture

The following overview summarizes the F-Response technical architecture sufficient to implement F-Response in your environment.

Network Ports and Overview

![Diagram of network ports and overview]

- **Examiner Laptop or Workstation**
- **Example Subject Computers**

### Deployment to remote non-Windows machines
- Available in the console and runs over SSH/TCP 22.
- Connections are inbound to remote Subject(s) for deployment.

### Deployment to remote Windows machines
- Available in the console and runs over Netbios/TCP 445.
- Connections are inbound to remote Subject(s) for deployment.

### License Manager
- TCP Port 5682
- Encrypted license verification between Subject and Examiner License Manager.
- Connections are outbound from the remote subjects to the Examiner License Manager.

Internal Windows Software Architecture

The Windows F-Response Examiner uses a series of Component Object Model (COM) servers and worker processes to provide connections to remote devices, shares, and provide imaging services. The following COM servers are considered critical infrastructure and must be installed and running to use the F-Response Management Console or F-Response Control Panel Applet:

- F-Response License Server
- F-Response Connector Server
- F-Response Imager Server
- F-Response Subject Server

Please make sure all services are started prior to contacting support.

Internal Unix Software Architecture

The Unix F-Response Examiner uses a set of command line tools and worker processes to provide connections to remove devices. The following command line tools are considered critical infrastructure and must be installed on the examiner’s machine.

- fr_lm
- fr_exa
- fr_ace
- fr_ssh (Optional, necessary for deploying to Unix machines.)
- fr_win (Optional, necessary for deploying to Windows machines.)

While functional on their own, the command line tools are also used by a provided graphical interface.
Licensing

F-Response software uses one or more hardware dongles to enforce the licensing model depending on the version selected. The following list indicates the version and how licensing is managed.

**Enterprise, Consultant + Covert, Consultant**
These versions of F-Response use a single hardware dongle that functions as a USB human interface device (HID). This device is inserted in the examiner machine, or in another machine on the network functioning as the License Manager. This dongle must remain inserted always.

**TACTICAL**
This version of F-Response provides two license dongles that function as a pair. Each dongle is a USB Storage device. The dongle marked “TACTICAL Subject” is to be inserted in the Subject computer, the dongle marked “TACTICAL Examiner” is to be inserted in the Examiner computer. These dongles must remain inserted in both computers throughout the operation to maintain a consistent connection. For Cloud Service access, only the “TACTICAL Examiner” dongle is required and must be in the Examiner machine throughout the connection.

**Field Kit**
This version of F-Response uses a single hardware dongle that functions as a USB human interface device (HID). This device must reside in the Subject computer in order to execute the F-Response software on the Subject machine.
Windows

License Manager
Using the F-Response License Manager Software (Enterprise, Consultant + Covert, Consultant)

To validate your license (F-Response Dongle) from remote computers running F-Response Enterprise, Consultant + Covert, or Consultant Edition, you must have your dongle physically connected to your analysis machine and the F-Response License Manager must be started.

The first time the F-Response License Manager Monitor (F-Response LM) software is executed it will display a System Tray icon indicating the License Manager server is not started.

*System Tray Icon indicating the F-Response License Manager is not running*

![F-Response License Manager Monitor, Main Window](image)

The representation above shows a running F-Response License Manager Monitor. Details of the information in the Network tab fields are as follows:

**TCP PORT**
Local machine TCP port currently listening for incoming F-Response Enterprise/Consultant Edition License Validation requests.

**USERNAME**
The F-Response specific username\textsuperscript{3} used to control access to F-Response Subjects.

\textbf{PASSWORD}

The F-Response specific password used to control access to F-Response Subjects.

\textbf{Operation}

\textbf{START}

Starts the License Manager Server.

\textbf{STOP}

Stops the License Manager Server.

\textbf{RESET KEY}

Since the License Manager Server is responsible for priming the unique encryption parameters for the subjects it is possible some organizations will want to reset this key information from time to time. Stop the License Manager Server and use this button to reset the key parameters.

\textbf{ENABLE AUTO START}

Checking this box sets the License Manager Server to automatically start when the local computer boots.

\textsuperscript{3} The versions of F-Response prior to version 7 had the username and password for F-Response in the Management Console.
Starting the F-Response License Manager

Before you can begin using F-Response Enterprise, Consultant + Covert, and/or Consultant Edition you must Start the F-Response License Manager service. Double click on the F-Response License Manager Monitor icon in the System Tray to bring up the License Manager console.

![F-Response License Manager Monitor console, Main Window](image1)

Start the F-Response License Manager service by pressing the Start button. Your F-Response dongle must be inserted prior to starting the License Manager server.

![F-Response License Manager running and waiting for licensing requests.](image2)

The F-Response License Manager is now running and waiting for licensing requests. The License Manager automatically creates Windows Firewall exceptions for the service application, however if you are using other firewall products you may need to add exceptions as necessary.
F-Response Management Console

Starting with F-Response version 7 each separate F-Response application has now been merged into a single F-Response Management Console. This console gives TACTICAL and above F-Response users the ability to access remote subjects, providers, and imaging from a single location and through a consistent interface.

The F-Response Management Console
Providers
Using the Management Console to connect to 3rd party Data Providers

Disclaimer: F-Response provides access to 3rd party data sources via Application Programming Interfaces (APIs) and internal structures presented by the provider. 3rd party provided data sources are by their very nature volatile. The afore mentioned F-Response products provide “best effort” for accessing and interacting with those 3rd party data sources however service disruptions, API changes, provider errors, network errors, as well as other communications issues may result in errors or incomplete data access. F-Response always recommends secondary validation of any 3rd party data collection.

The F-Response Management Console provides functionality sufficient to access remote data sources from various providers. Configuring access to these providers varies greatly by provider, therefore for the most accurate information see the appropriate Mission Guide⁴ on the F-Response Website.

---

⁴ Mission Guides are specific training documents available for a wide array of topics on the F-Response Website at https://www.f-response.com/support/missionguides
Configuring Provider Settings

The Providers menu gives us the ability to access Provider Settings and Credentials. Using the Provider Settings we can configure both provider specific and application wide settings for communicating with cloud and 3rd party data providers.

![Provider Menu](image)

There are many options that can be configured for communicating with Providers, these options include:

![Provider Settings](image)

**Record Log**

Setting a directory location here will instruct the software to create a secondary CSV log file with the drive contents for each attached provider device.

**Number of retries to attempt before timing out**

Setting this number instructs the software to attempt this many web operations before giving up on the request.

**Include provider specific metadata as .FRES.Metadata* files**
Enabling this option instructs the software to retain the provider specific metadata as “.FRES_METADATA” files. Any provider specific metadata will be in the same format it was in when delivered by the provider.

**Dropbox Options**

**FOR MODIFIED TIME USE:**

Dropbox provides two different times that can be used as Modified Time for a given file. By default, the software uses the Modified time as provided by the Dropbox Servers. Alternatively, it is possible to use the Client MTime, a non-verified time that is assigned to the files when they are modified by a Dropbox Client tool. The Client MTime is not verified by Dropbox.

**DO NOT SHOW FILE REVISIONS (DEFAULT IS TO SHOW ALL FILE REVISIONS)**

By default, the software will show all revisions for Dropbox items, checking this box will instruct the software to not request multiple versions of items.
Configuring Provider Credentials

Before you can connect to Provider services you must first input valid credentials. While the credentials necessary vary by Provider, all credentials must be input using one of the Configure Credentials dialog boxes.

As the credential location and process for acquiring those credentials changes frequently for almost all providers, including each one in this manual would quickly become obsolete. Please refer to the specific Mission Guide on the F-Response Website for details on provider you are attempting to access. F-Response Mission Guides are available at https://www.f-response.com/support/missionguides
Enumerating Provider Accounts and Targets
After successfully adding one or more provider accounts you will find them visible in the Providers Window tree view under the specific provider.

Use the [+] to expand individual providers and locate the accounts

Double clicking on an individual account will trigger a scan or enumeration of that account. Once results are available they will be shown in the Targets window.

Provider Account enumeration results
Connecting to Provider Targets
You can connect to one or more targets by simply double clicking on the target. The newly attached volume will be assigned a drive letter and is accessible via Windows Explorer. Selecting the newly attached device and right clicking on the drive letter opens the device menu which provides multiple ways to work with the newly attached share.

Logged in Provider Account target assigned the G:\ drive letter

Disconnecting from Provider Targets
You can disconnect from one or more provider targets by simply double clicking on target.
Subjects - Exporting and Deploying

Using the Management Console to deploy and/or connect to remote Subjects
The F-Response Management Console provides options for connecting to remote subjects for all versions of F-Response (TACTICAL, Consultant, Consultant + Covert, Enterprise). Field Kit customers will want to use the F-Response Control Panel Applet for connecting to remote machines.

Customers using F-Response Consultant edition and above have the option to export unique preconfigured subject executables for different platforms. These exported subjects reduce some of the configuration complexity and allow for easier operation.

Customers using F-Response Consultant + Covert and Enterprise have the option to only export unique preconfigured subject executables for different platforms as well as the option to deploy those customized subject executables to remote machines with the proper credentials.
Export GUI Subject executable (Consultant, Consultant + Covert, and Enterprise)

F-Response Consultant edition and above users also have the option of exporting individual subject executables pre-configured for usage. Using the Export GUI Subject executable window, you’ll be able to select both the License Manager URI, where the subject should go to check its license, and the Platform of the executable you wish to export.
Deployment Settings

Prior to beginning any deployment operations, you should review the Deployment Settings. Please refer to the guidelines below for configuring the deployment settings.

![Deployment Settings Dialog]

**Service Name**

This is the name the F-Response Subject service will be installed as on the remote computer(s). This name is completely user selectable. Please do NOT use the name of an existing service as they may conflict.

**Service Description**

Description value that will be assigned to the F-Response Subject service when installed on the remote computer(s). This description is completely optional.

**Service Executable**

This is the executable name that will be assigned when the Subject software is deployed.

**Service Port**

This is the TCP port the F-Response Subject service will listen on.

**Auto Start Windows Service**

If this option is enabled the service will be set to start on install.

**License Manager URI**

This is the IP and Port of the F-Response License Manager that the Subject will be configured to communicate with.
Deploy covert Subject via the Network
Select Deployment->Deploy covert Subject via the Network from the menu to view the dialog for pushing F-Response Subject software over the network. There are 3 sections here: Deployment Credentials, Scan for Machines, and Scan Results.

Deployment Dialog

The first step to deploy over the network is to click the Configure Credentials button in the top right corner and the Configure Credentials window will open.
Configure Credentials
Here credentials can be set up for both Windows (the top section of the window) and Non-Windows platforms (the lower portion).

Windows
Under **Windows Credentials**, enter the **User name** (with administrator level privileges), **Domain** (if local account leave this value blank), and **Password**. Click **Add Credential** to add it to the stack.

![Deployment Credentials Dialog](image)

Apple/Linux
Under **Unix Credentials**, Credentials can be added for supported Non-Windows Platforms.

Under **User Account** check **User** and enter the User name. The user account must have elevated privileges to install and run the subject software so select **su** or **sudo** from the drop down list under **Assume Root**. Next check **User Password** and enter the password for the account. Alternatively, if using the root account, simple select root under **User Account**, check **Root Password** and enter the password. Click **Add Credential** for each account entered to add them to the stack.

Multiple accounts can be added if needed. Click **Ok** in the lower right corner once all the necessary credentials have been entered.
Scanning for and deploying to Subject Machines

The **Scan for Machines** field allows for the input of a comma separated list of hostnames or IP addresses. Enter the list of subject machines to be deployed to and press **Start Scan** to the right of the text box.

<table>
<thead>
<tr>
<th>Scan for Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input a comma separated list of IP addresses and or machine names to be scanned (ex. MACHINE1, MACHINE2, 192.168.1.1)</td>
</tr>
<tr>
<td>192.168.1.146, x64-win7pro-sub, x64-win2k8-sub, x86-win2k8-sub,192.168.1.169</td>
</tr>
</tbody>
</table>

The results will appear in the **Scan Results** box below:

<table>
<thead>
<tr>
<th>Scan Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hostname</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>x64-win2k8-sub</td>
</tr>
<tr>
<td>x64-win7pro-sub</td>
</tr>
<tr>
<td>192.168.1.146</td>
</tr>
</tbody>
</table>

To install the F-Response software on the subject machine, click on the hostname of the machine to highlight it, then select **Install/Start F-Response** on the right. After a short moment, in the **F-Response Software Status** column, the status of the machine will change to **Installed** and then **Started** showing it is connected to the F-Response Universal Appliance.
Export covert Microsoft Software Installer

F-Response Consultant + Covert and Enterprise also offers the option to create a Microsoft Software Installer (MSI) which can then be distributed throughout the environment using an alternative software distribution method such as Group Policy in Active Directory, Microsoft System Center Configuration Manager (SCCM), or various other software deployment tools.

The process to create an MSI is straightforward, simply modify any of the settings specific to the environment as necessary (i.e. changing the Service Name, or Description, etc.). After which use the “…” button to select a location to save the exported MSI.
Stopping the remote software
When finished using F-Response on one or more subject machines, there are multiple ways to remove or stop the software on the remote machine. It can be removed directly by using the “Stop and Remove Subject Software” option, or through the Deployment process covered earlier.
Command Line Subject Options for Manual Deployment

The F-Response Main Console provides multiple deployment options, however in some instances the Enterprise or Consultant + Covert software must be deployed using another means. In this instance it is possible to configure and install the Enterprise or Consultant + Covert service natively on the local machine using the following command line arguments:

To Add the Service with all required arguments:
- `-a "SERVICE NAME"` - Sets the Service Name and adds the new service.
- `-k DONGLENUMBER` - Sets the dongle # for the license manager.
- `-s LICENSEMANAGERURI` - Sets the License Manager URI, IP:Port.
- `-l LOCALPORT` - Sets the local port F-Response should listen on.

There are two subject executables available:
- `subject_srv.exe` - for 32 bit systems
- `subject_srv-x64.exe` - for 64 bit systems

Example of adding the “Test Service” on a 64 bit local machine.

```
"subject_srv-x64.exe -a "Test Service" -k 155520212 -s 192.168.1.1:5682 -l 3262"
```

To Remove the Service:
- `-r "SERVICE NAME"` - Removes the service by name.
Subjects - Working with Subjects

Listing License Managed Subjects
After starting the F-Response software on one or more remote subjects any subjects configured to use your local license manager will appear in the F-Response Management Console as seen below.

<table>
<thead>
<tr>
<th>Subject Name</th>
<th>Source</th>
<th>Subject UUID</th>
</tr>
</thead>
<tbody>
<tr>
<td>x64-win81-sub</td>
<td>192.168.1.42:3262/sub</td>
<td>2358200f-b785-4ee5-9...</td>
</tr>
<tr>
<td>x64-win81-sub</td>
<td>192.168.1.140:3262/sub</td>
<td>f17bdf19-4c13-4e25-8...</td>
</tr>
</tbody>
</table>

Selecting and double-clicking on an individual subject will refresh the Targets window with available targets for that subject. Additional information on individual target types and authenticating to them is available in the “Connecting to Targets” section of this manual.

Adding Accelerator Subjects
When running the F-Response Management Console on a machine without a local license dongle, providing the location of a license dongle on the network opens the F-Response Accelerator version of the Management Console. In this mode you can add remote subjects directly using their URI.

Optional License Manager URI

We were unable to detect either a valid and/or unexpired F-Response Dongle. In order to continue we must have a valid F-Response License Manager URI. License Manager URI is in the format: <hostname or ip>:<port>.

Please input an F-Response License Manager URI to continue.

Continue  Quit

Dialog prompting the location of a valid license manager

5 In prior versions of F-Response this would be equivalent to the “Active Clients” panel.
The first step to using the F-Response Management Console in “Accelerator” mode to connect to remote deployed and running instances of F-Response is to make sure the F-Response Username and Password value has been set. You will find those settings under Subjects->Accelerator Settings.

Here the credentials entered should match those set up on the examiner machine with the license dongle attached, as entered in the License Manager Monitor.

F-Response “Accelerator” Console

Accelerator Settings Menu

Accelerator Settings Dialog
Next you can add one or more Accelerator Subjects by inputting their full URI on into the Add Accelerator Subjects dialog.

![Add Accelerator Subjects Dialog](image)

Provided the username and password configured earlier are correct and there was no issues communicating with the remote subjects you should see icons for them appear in the Accelerator Subjects panel.

![Accelerator Panel showing multiple subjects](image)
Consultant and Field Kit Subject
F-Response Field Kit and Consultant edition use the same graphical subject software on remote machines. The following outlines the steps necessary to configure and use the graphical subject software.

**License Manager URI**
This is the URI necessary for locating the license manager.

**Ignore License Manager and use Local Dongle**
This option will set the executable in Field Kit mode and will not attempt to contact a remote license manager.

**Username**
In Field Kit mode the selected Username must be input in this field.

**Password**
In Field Kit mode the selected Password must be input in this field.

**TCP Port**
This is the TCP port the F-Response Subject service will listen on.

**Messages**
Any errors or output will be presented here.
TACTICAL Subject
F-Response TACTICAL edition use a graphical subject software on remote machines. The following outlines the steps necessary to configure and use the graphical subject software.

TCP PORT
This is the TCP port the F-Response Subject service will listen on.

MESSAGES
Any errors or output will be presented here.
Non-Windows Subjects
All Non-Windows F-Response Subjects are command line based and can be found in your installation folder, or deployed/exported using the mechanisms defined earlier in this manual. The following command line options are the same regardless of Non-Windows Platform.

F-Response <PLATFORM> Subject <VERSION> Consultant Edition
Copyright F-Response, All Rights Reserved
-h ; print help message
-s <port=3262> ; subject tcp port
-m <host>;<port=5682> ; license manager server
Thank you for using F-Response.

F-Response <PLATFORM> Subject <VERSION> Field Kit Edition
Copyright F-Response, All Rights Reserved
-h ; print help message
-s <port=3262> ; subject tcp port
-u <username> ; username
-p <password> ; password
Thank you for using F-Response.
Connecting to Targets

Target Devices
Each Subject and Provider can display different targets. The following list identifies the available Target types, where they are available, and what they represent.

Physical Drives, Partitions, and Volumes
Double click on a physical device for the remote system. Once attached access to the full physical device is completely read-only. The attached drive is a full physical SCSI device in the context of the examiner machine.

Physical Memory
Double click on the Memory for a Windows system. Once attached, access to the complete physical memory of the remote machine is presented via a physical drive.

---

6 Physical Memory is supported in Microsoft Windows (32 and 64bit)
Provider Targets
Double click on the provider target. Once attached access to the provider target will be presented as a virtual device share on the local machine.

<table>
<thead>
<tr>
<th>Active Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Matthew Shannon</td>
</tr>
</tbody>
</table>

*F-Response Management Console showing an attached provider volume*
Imaging

Overview
The F-Response Management Console provides a simple and straightforward mechanism for creating physical, logical, and container based images of F-Response devices, shares, and targets. This imaging capability is completely optional however, since F-Response devices and shares are completely vendor neutral you are welcome to use whatever imaging or analysis tools you would like.

Physical Image
Creating a Physical Image from the Console
The F-Response Management Console provides the ability to make Physical Images of attached F-Response presented physical devices. Use the Images->New Image... menu option or simply right-click on an F-Response attached physical device (Local Device column) to open a dialog for creating a new Physical Image.
Creating a Physical Image requires the following dialog items be completed.

**Source Type**
You must select Physical as your source type.

**Image Source**
You must select a valid F-Response drive from the list of available drives and volumes to be imaged.

**Image Name**
You must input a valid file name for the Image you will be creating.

**Image Path**
You must use the “…” button to locate a suitable location to save your image files to, image files may NOT be saved to network shares.

**Hash**
You must select a valid Hash: MD5, SHA1, or both.

**Compression**
You have the option to enable compression of your image, where ‘Fast’ offers slight compression but fastest imaging speed, ‘Normal’ is the middle of the compression/speed scale, and ‘High’ offers the highest compression but slower imaging time. The default setting is ‘None’ if compression of the image is not needed.
All other fields are optional and will be saved for your user account and re-presented with each execution of the imager.

<table>
<thead>
<tr>
<th></th>
<th>Active Images</th>
<th>Completed Images</th>
<th>Errored Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Source Device</td>
<td>Last Status</td>
<td></td>
</tr>
<tr>
<td>BoxdotcomFiles</td>
<td>\X64-WIN10\Matthew-Shannon</td>
<td>Copying...88.1 MB</td>
<td></td>
</tr>
</tbody>
</table>

**Imaging Panel**

Active imaging operations will appear in the “Active Images” panel. The Last Status field will update as the image operation progresses.

If the image completes successfully it will be removed from the Active Images panel and will appear in the Completed Images panel. There are multiple options for a completed image, including:

**Completed Image Context Menu**

**REMOVE IMAGE**

Removes the Image from the F-Response Imager. This does not delete the image or resultant log files, it only removes the Imager from the F-Response Imager console.

**OPEN IMAGE PATH**

Use this option to open Windows Explorer directly to the location of the newly created Image file(s).

**OPEN IMAGE LOG**

Use this option to open the Image “.log” file directly.

**OPEN IMAGE FILE LIST**

Use this option to open a listing of the files copied during the image (Logical and Container Images only).
Creating a Physical Image from Windows Explorer

The F-Response provides the ability to make Physical Images of attached F-Response presented physical devices directly from Windows Explorer. This patent pending feature can be leveraged using the right click context menu from any F-Response presented fixed or removable disk in Windows Explorer.

*Windows Explorer Context Menu Options for the F-Response Imager*
Logical Image

Creating a Logical Image from the Console
The F-Response Imager provides the ability to make Logical Images of attached Virtual Devices (Provider Target Shares). Use the Images->New Image... menu option to open a dialog for creating a new Logical Image.

Creating a Logical Image requires the following dialog items be completed.

**SOURCE TYPE**
You must select Logical as your source type.

**FORMAT**
You can create your image in Expert Witness format (E01), a Virtual Hard Disk (VHD), or both.

**IMAGE SOURCE**
You must select a valid network drive or virtual device from the list of available devices to be imaged.

**IMAGE NAME**
You must input a valid file name for the Image you will be creating.

**IMAGE PATH**
You must use the “...” button to locate a suitable location to save your image files to, image files may NOT be saved to network shares.

**HASH**
You must select a valid Hash: MD5, SHA1, or both.

**Compression**

You have the option to enable compression of your image, where ‘Fast’ offers slight compression but fastest imaging speed, ‘Normal’ is the middle of the compression/speed scale, and ‘High’ offers the highest compression but slower imaging time. The default setting is ‘None’ if compression of the image is not needed.

All other fields are optional; they will be saved for your user account and will appear with each execution of the Imager.

<table>
<thead>
<tr>
<th>Images</th>
<th>Active Images</th>
<th>Completed Images</th>
<th>Errored Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Source Device</td>
<td>Last Status</td>
<td></td>
</tr>
<tr>
<td>AmzS3_JumboBucket \X64-WIN10\s3-jumbo</td>
<td>Copying...142 MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the image completes successfully it will be removed from the Active Images panel and will appear in the Completed Images panel. There are multiple options for a completed image, including:

**Remove Image**

Removes the Image from the F-Response Imager. This does not delete the image or resultant log files, it only removes the Imager from the F-Response Imager console.

**Open Image Path**

Use this option to open Windows Explorer directly to the location of the newly created Image file(s).

**Open Image Log**

Use this option to open the Image “.log” file directly.

**Open Image File List**

Use this option to open a listing of the files copied during the image (Logical and Container Images only).
Creating a Logical Image from Windows Explorer

F-Response provides the ability to make Logical Images of F-Response attached Virtual Devices directly from Windows Explorer. This patent pending feature can be leveraged using the right click context menu from any network share presented by Windows Explorer.

Windows Explorer Context Menu for the F-Response Imager
Container

Creating a Container
The F-Response Imager provides the ability to make a Container of Files and Folders from attached devices, both physical and virtual. Use the Containers->New Container... menu option to open a dialog for creating a new Container.

Containers contain only references to the files and folders added to them. A container must be converted to an image to acquire the files and folders added.

Once you have created the container you can find it under the Containers in the Console. Double click on the container to open it and manage or view the contents.
Adding Files and Folders to a Container via the Console

**Add File**
Adds a new File to the Container. This is a reference to the file only, no actual files are copied until the container has been converted to an Image.

**Add Directory**
Adds a new Directory to the Container. This is a reference to the directory only, no actual directories or their content are copied to until the container has been converted to an Image. Added Directories are considered recursive, therefore all child items will be added automatically during the conversion to an Image.

**Remove Entry**
Removes a File or Directory from the Container.

**Refresh**
Will refresh the list of files and folders currently in the Container.

**Convert to Image**
Will close the Container and open the Create Image dialog where the details of the image can be specified.
Adding Files and Folders to a Container via Windows Explorer

F-Response provides the ability to add files and directories to Containers via Windows Explorer. This patent pending feature can be leveraged using the right click context menu from any file or directory presented by Windows Explorer.

![Windows Explorer Context Menu for the F-Response Imager](image)

Closing and Imaging a Container via the Console

Once all files and directories have been added to the Container it must be converted to an Image to copy and preserve the content requested. Use the Containers->Convert to Image... menu item to begin this process.

![Container Panel Context Menu](image)
FORMAT
E01 (Expert Witness), VHD (Virtual Hard Disk), or Both. The choice of format determines what the Imager will provide at the end of the conversion process.

HASH
You must select a valid Hash, MD5 or SHA1.

COMPRESSION
You must select a compression method.

All other options are optional and will be saved for your user account and re-presented with each execution of the imager.
Messages

The Management Console retains a Messages Panel showing all the textual messages, errors or otherwise returned by running F-Response operations. These logs are displayed on the screen and stored in text files generated for each execution of the F-Response Management Console. By default these log files are stored in the Examiner’s profile directory under AppData\Local\F-Response\LogFiles.

Profile directory showing messages log files

The name of the log file is based on the process identifier of the console when it was opened and the date and time of that opening.
Managing F-Response TACTICAL
Back up your F-Response TACTICAL Licenses

We recommend using the F-Response TACTICAL Manager to backup your F-Response TACTICAL License files to your Analyst or Investigator's computer prior to using F-Response TACTICAL for the first time. Insert both F-Response TACTICAL Fobs into your computer and select the appropriate drive letter for the Examiner and Subject device. If the drive letter is not listed, press "Refresh Drives" to re-populate the drop down listing of available devices. Press Start to begin the backup operation. TACTICAL License files are stored in C:\Program Files\F-Responsev7\F-Response TACTICAL\Tactical License Backup
Restoring the F-Response TACTICAL Software

Should the F-Response TACTICAL software ever be accidentally deleted, or if you have downloaded and installed a new version of F-Response TACTICAL, it will be necessary to update and restore the software to your F-Response TACTICAL Fobs. Insert both F-Response TACTICAL Fobs into your computer and select the appropriate drive letter for the Examiner and Subject device. If the drive letter is not listed, press "Refresh Drives" to re-populate the drop down listing of available devices. Press Start to begin the Restore/Update operation.
Restoring your F-Response TACTICAL Licenses

![TACTICAL Manager](image)

Should the F-Response TACTICAL licenses ever be accidentally deleted, or if you have downloaded and copied new license files to your computer, it will be necessary to update and restore the licenses to your F-Response TACTICAL Fobs. Insert both F-Response TACTICAL Fobs into your computer and select the appropriate drive letter for the Examiner and Subject device. If the drive letter is not listed, press “Refresh Drives” to re-populate the drop down listing of available devices. Press Start to begin the Restore/Update operation.
F-Response Device Connector Applet

The F-Response Device Connector Applet is a secondary mechanism for interacting with F-Response Devices (Subject presented targets), listing and attaching/detaching them. The F-Response Device Connector is available via the Control Panel on your Examiner machine after installing F-Response.

**USERNAME**

F-Response Username designated for accessing remote F-Response Subjects.

**PASSWORD**

F-Response Password designated for accessing remote F-Response Subjects.

**ADD**

Add a new remote Subject by URI, Ex. HOSTNAME:PORT or IP:PORT.

**REMOVE**

Select and remove an existing F-Response Subject.

**REFRESH**

Refresh the list of Subject Targets for the selected Subject.

**ATTACH**

Select and attach a Subject Target.

**DETACH**

Select and detach a Subject Target.
# Unix

## Installation and Configuration

All Unix versions of F-Response require installation. The following commands outline the installation, post install configuration, and uninstall process.

### Installing RPM (.rpm)

```bash
# yum install fresponse7.x86_64.rpm
```

### Installing Debian (.deb)

```bash
# dpkg -i fresponse7.x86_64.deb
# apt-get install -f
```

### Installing Apple Disk Image (.dmg)

```bash
$ hdiutil attach fresponse7.x86_64.dmg
$ sudo installer -pkg /Volumes/FResponse7/fresponse7.x86_64.pkg -target /
$ sudo cp -R /Volumes/FResponse7/fresponse-console.app/ /Applications/fresponse-console.app/
$ sudo cp -R /Volumes/FResponse7/fresponse-accelerator.app/ /Applications/fresponse-accelerator.app/
$ hdiutil detach /Volumes/fresponse7
```

### Installing RPM (.rpm) for deployment tools (Linux Only)

```bash
# yum install fresponse7win.centos6.x86_64.rpm
```

### Installing Debian (.deb) for deployment tools (Linux Only)

```bash
# dpkg -i fresponse7win.ubuntu14.x86_64.deb
# apt-get install -f
```

## Uninstallation

### Uninstalling RPM (.rpm)

```bash
# yum remove fresponse7
```

### Uninstalling Debian (.deb)

```bash
# apt-get remove fresponse7
```

### Uninstalling Apple Disk Image (.dmg)

```bash
$ sudo fr_uninstall.sh
```

### Uninstalling RPM (.rpm) for deployment tools (Linux Only)

```bash
# yum remove fresponse7win
```

### Uninstalling Debian (.deb) for deployment tools (Linux Only)

```bash
# apt-get remove fresponse7win
```

---

For the sake of this document Unix encompasses the following F-Response Examiner platforms: Linux and Apple OSX.
Post Installation

Updating /var/lib/f-response
The F-Response directory is installed as /var/lib/f-response with permissions enabled for all users. However, for additional security we recommend changing the ownership and permissions to allow access to an individual user or group only.

```
$ sudo chown -R USERNAME:USERNAME /var/lib/f-response
$ sudo chmod -R og-rwx /var/lib/f-response
```

Updating fusermount - Linux Only
The examiner and accelerator use fusermount to mount and unmount F-Response Live File Devices. We recommend confirming the user account used in the preceding step has read and execute permissions on fusermount.

```
$ whereis fusermount
fusermount: /bin/fusermount /usr/bin/fusermount
$ sudo chmod o+rx /bin/fusermount /usr/bin/fusermount
```

Updating /etc/fuse.conf - Linux Only
The examiner and accelerator use fusermount which reads /etc/fuse.conf. We recommend confirming the user account used in the preceding steps has read permissions on the /etc/fuse.conf file. In addition, /etc/fuse.conf must have a single line with the value, user_allow_other, to enable non-root users to use fusermount.

```
$ sudo chmod o+r /etc/fuse.conf
```

Reloading udev rules - Linux Only
The /etc/udev/rules.d/99-fresponse.rules file is installed with the license manager to grant access to the license dongle for non-root users. However, the rules must be reloaded by running udevadm or restarting the system.

```
$ sudo udevadm control --reload-rules
$ sudo udevadm trigger
```

Updating $PATH
The license manager, examiner, and accelerator are installed on /usr/bin for Linux and /usr/local/bin for Mac OS X.

```
$ export PATH=$PATH:/usr/bin
$ export PATH=$PATH:/usr/local/bin
```
License Manager

Using the F-Response Management Console
To validate your license (F-Response Dongle) from remote computers running F-Response Enterprise, Consultant + Covert, or Consultant Edition, you must have your dongle physically connected to your analysis machine and the F-Response License Manager must be started.

The F-Response License Manager interface is part of the Management Console.

Use the Manager Menu to Start and Stop the License Manager

Configure the License Manager with an arbitrary Username and Password that you can remember. This credential will be used to access F-Response on remote machines.
Using the License Manager Command Line Interface
The license manager interface implements a set of functions for managing the license manager server, which provides license verification and examiner authentication services for subjects and subject directory services for examiners.

start
The start command starts the license manager server. By default, the license manager server runs in the foreground and listens on port 5682. The -d or --daemon option can be specified to run the license manager server in the background and the --port argument can be specified to listen on a different port.

```
$ fr_lm start --port 5682 --daemon
F-Response Linux License Manager x.x.x.x
Copyright F-Response, All Rights Reserved
License manager process pid ... 5809.
License manager pid file path ... /var/lib/f-response/manager/pid.
Unikey hardware identifier ... 155710303
Unikey license type ... enterprise
Unikey expiration date ... 2018-08-02T00:00:00Z
License manager is online and running in the background.
Exclude -d,--daemon on command line to run in foreground.
```

stop
The stop command stops the license manager server.

```
$ fr_lm stop
F-Response Linux License Manager x.x.x.x
Copyright F-Response, All Rights Reserved
Signal sigterm to license manager process -- 5809
Waiting for license manager .. success
```

status
The status command prints the status of the license manager server. If the -j or --json option is specified, then the output is encoded in JSON.

```
$ fr_lm status --json
{
   "date": "2018-08-02T00:00:00Z",
   "expire": "131776416000000000",
   "hid": "155710303",
   "license": "enterprise",
   "password": "U6kyPw3REZqjO2LEoAT9g==",
   "port": "5682",
   "username": "default"
}
```
set
The set command sets the username and password of the license manager server, which is stored in /var/lib/f-response/config.

```
$ fr_lm set -u default -p default
F-Response Linux License Manager x.x.x.x
Copyright F-Response, All Rights Reserved
Updated /var/lib/f-response/config.
```

dhparam
The dhparam command generates Diffie Hellman parameters, which is encoded and written to /var/lib/f-response/dh.der.

```
$ fr_lm dhparam
F-Response Linux License Manager x.x.x.x
Copyright F-Response, All Rights Reserved
Successfully generated a 1024-bit prime using 2-generator.
Generated 1024-bit prime and 2-generator is encoded in DER format.
Diffie Hellman parameters written to /var/lib/f-response/dh.der.
```
F-Response Management Console

Starting with F-Response version 7 each separate F-Response application has now been merged into a single F-Response Management Console. This console gives F-Response users the ability to access remote subjects from a single location and through a consistent interface.

The F-Response Management Console
Subjects - Deploying using the Management Console

Using the Management Console to deploy and/or connect to remote Subjects
Customers using F-Response Consultant + Covert and Enterprise have the option to deploy customized subject executables to remote machines with the proper credentials.

Deploy covert Subject via the Network
Select Deploy->Add User to begin the deployment process. When prompted add one or more user accounts to access remote machines.

Adding Windows Deployment User(s)
Use the “administrator” drop down to select either domain based credentials, or local machine credentials, then populate the username, password, and domain if selected. Press Add to add the user account to the console.

Adding Unix Deployment User(s)
Use the “administrator” drop down to select root, sudo, or su for administrative rights and populate the username and password fields as appropriate.
Adding Hosts
Select a User and use the Add Host menu to input a list of remote hosts to deploy to using that user’s account.

Deploying the Subject Software
Use the Deploy->Deploy Subject menu item to select one or more hosts to deploy the F-Response Subject software to.
Un-deploying Subject Software

Use the Deploy->Undeploy Subject menu item to select one or more hosts to remove the F-Response Subject software from.
Subjects - Deploying using the Command Line

Unix Deployment Interface
The Unix deployment interface implements a set of functions for installing and uninstalling the subject executable and starting and stopping the subject server on remote Unix machines. The remote computer must have a SSH server running and the user account must be either the root user or any user that can escalate privileges via su or sudo.

Authentication
The SSH deployment interface supports key and password authentication. To authenticate with a key, the -k argument with the private key path and -u argument with the username must be specified. And if the private key is password-protected, then the -w argument with the private key password must be specified. To authenticate with a password, the -u argument with the username and the -p argument with the password must be specified. If the password is not specified, then the controlling terminal will be prompted to enter a password.

$ fr_ssh -k ~/.ssh/id_rsa -u root -s <subject> <command>

$ fr_ssh -u root -p secret -s <subject> <command>

install
The install command uploads the subject executable to the remote computer. The install command selects a subject executable based on the remote computer’s architecture and platform, then searches for the temporary directory, e.g. /tmp and /usr/tmp. After selecting a subject executable and finding the temporary directory, the subject executable is secure copied to the temporary directory on the remote computer.

$ fr_ssh -s 192.168.1.110 -u root -p secret install
F-Response Linux SSH Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
Detected superuser 'root'.
Connected to 192.168.1.110 on port 22.
Completed session handshake and key exchange.
Authenticated as root via password.
Detected 'linux' kernel and 'x86_64' platform.
Set source path to /var/lib/f-response/deploy/sub-lin-x86_64-consultant.
Set remote path to /tmp/fr_sub.
Uploading 0.00% 0 7 1322736 | /var/lib/f-response/deploy/sub-lin-x86_64-consultant
...Uploading 50.80% 672000 / 1322736 | /var/lib/f-response/deploy/sub-lin-x86_64-consultant
Uploading 99.19% 1312000 / 1322736 | /var/lib/f-response/deploy/sub-lin-x86_64-consultant
Installed /tmp/fr_sub.

uninstall
The uninstall command removes the subject executable from the remote computer. If the subject executable exists in a temporary directory, then the subject is unlinked over SFTP.

$ fr_ssh -e 192.168.1.110 -u root -p secret uninstall
F-Response Linux SSH Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
Detected superuser 'root'.

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start
The start command starts the subject server on the remote computer. The --manager argument specifies the license manager server, the --port argument specifies the subject server's listening port, and the --infinite option runs the subject server in infinite mode. By default, the license manager server is determined automatically, the subject server listens on port 3262, and the subject server runs in normal mode.

```
$ fr_ssh -s 192.168.1.110 -u root -k ~/.ssh/id_rsa start
F-Response Linux Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Set license manager ipv4 address to 192.168.1.110
Detected '155710303' license dongle with 'enterprise' license.
Detected superuser 'root'.
Connected to 192.168.1.110 on port 22.
Completed session handshake and key exchange.
Authenticated as root via /home/jching/.ssh/id_rsa.
Set remote path to /tmp/fr_sub.
Uninstalled /tmp/fr_sub.
```

stop
The stop command stops the subject server on the remote computer. The --port argument specifies the listening port of the subject server. By default, the listening port is 3262.

```
$ fr_ssh -s 192.168.1.110 -u root -k ~/.ssh/id_rsa stop
F-Response Linux Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
F-Response Linux Examiner 7.0.4.1 Accelerator Edition
Copyright F-Response, All Rights Reserved
Cached subject file at /var/lib/f-response/cache/526911ba-6fee-4fa2-9007-bed26e50c24b/subject.
Subject 192.168.1.110:3262/sub received shutdown signal.
Stopped subject process on 192.168.1.110:22/ssh.
```

status
The status command checks that status of the subject executable and server.

```
$ fr_ssh -s 192.168.1.110 -u root -k ~/.ssh/id_rsa status
F-Response Linux Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
Detected superuser 'root'.
Connected to 192.168.1.110 on port 22.
Completed session handshake and key exchange.
Authenticated as root via /home/jching/.ssh/id_rsa.
Subject executable '/tmp/fr_sub' is installed.
Subject process '/tmp/fr_sub' is not running.
```
Windows Deployment Interface
The Windows deployment interface implements a set of functions for installing and uninstalling the subject executable and starting and stopping the subject service on remote Windows machines. For computers that are not in a domain, the UAC remote restriction on Windows Vista or later must be disable. And the firewall must be configured to allow in-bound connections over port 445. Finally, the domain or local user account must have administrative privileges on the remote computer.

Authentication
The Windows deployment interface supports password authentication. The -u argument specifies the domain and username separated by two backslashes, e.g. fresponse\frestest, or without the domain and only the username, e.g. frestest. And the -p argument specifies the password. If the -p argument is not specified, then the controlling terminal will be prompted to enter a password.

```
$ fr_win -u fresponse\jching -p secret -s <subject> <command>
$ fr_win -u jching -p secret -s <subject> <command>
```

install
The install command uploads the subject executable to the remote computer. The install command connects to the administrative share for the disk volume C or a temporary share on the C:\ path. After connecting to a share on the C:\, the subject executable is uploaded to C:\Windows over SMB.

```
$ fr_win -s 192.168.1.45 -u fresponse\frestest -p secret install
F-Response Linux Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
Detected windows 10.0.
Set share path to smb://192.168.1.45/C$/Windows.
Set remote path to smb://192.168.1.45/C$/Windows/sub-win-i386-service.exe.
Uploading 0.00% 0 / 1169328 | /var/lib/f-response/deploy/sub-win-i386-service.exe...
Uploading 50.44% 589824 / 1169328 | /var/lib/f-response/deploy/sub-win-i386-service.exe...
Uploading 98.08% 1146880 / 1169328 | /var/lib/f-response/deploy/sub-win-i386-service.exe...
```

uninstall
The uninstall command removes the subject executable from the remote computer. If the subject executable exists in the C:\Windows directory, then the subject executable is removed over SMB.

```
$ fr_win -s 192.168.1.45 -u fresponse\frestest -p secret uninstall
F-Response Linux Deployment 7.0.4.1
Copyright F-Response, All Rights Reserved
Detected '155710303' license dongle with 'enterprise' license.
Detected windows 10.0.
Set share path to smb://192.168.1.45/C$/Windows.
Set remote path to smb://192.168.1.45/C$/Windows/sub-win-i386-service.exe.
```

start
The start command creates and starts the subject service on the remote computer. The --manager argument specifies the license manager server, the --port argument specifies the subject server's
listening port, the --infinite option runs the subject server in infinite mode, the --autostart option starts the service on login after a reboot, and the --name argument specifies the service name of the subject service. By default, the license manager server is determined automatically, the subject server listens on port 3262, the subject server runs in normal mode, the subject service does not autostart, and the service name is “F-Response Subject”.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fr_win -a 192.168.1.45 -u freespns -p secret start</td>
<td>F-Response Linux Deployment 7.0.4.1</td>
</tr>
<tr>
<td></td>
<td>Copyright F-Response, All Rights Reserved</td>
</tr>
<tr>
<td></td>
<td>Set license manager ipv4 address to 192.168.1.110</td>
</tr>
<tr>
<td></td>
<td>Detected '155710303' license dongle with 'enterprise' license.</td>
</tr>
<tr>
<td></td>
<td>no talloc stackframe at ../source3/libamb/cliconnect.c:3200, leaking memory</td>
</tr>
<tr>
<td></td>
<td>C:\Windows\sub-win-i386-service.exe -a &quot;192.168.1.110:5682&quot; -l &quot;3262&quot; -v &quot;F-Response Subject&quot; - k &quot;155710303&quot;.</td>
</tr>
<tr>
<td></td>
<td>Created subject service 'F-Response Subject'.</td>
</tr>
<tr>
<td></td>
<td>Started subject service 'F-Response Subject'.</td>
</tr>
<tr>
<td></td>
<td>Checking subject service 'F-Response Subject' status -- start pending.</td>
</tr>
<tr>
<td></td>
<td>Checking subject service 'F-Response Subject' status -- running.</td>
</tr>
</tbody>
</table>
Subjects - Working with Subjects using the Management Console

Listing License Managed Subjects
After starting the F-Response software on one or more remote subjects any subjects configured to use your local license manager will appear in the F-Response Management Console.

Subjects currently connected to the local license manager
Selecting an individual subject from the Subjects tab will populate the targets list below.

Mounting Targets
Use the Subject -> Mount Target menu item to select and mount one or more F-Response Subject Targets on your examiner machine as Live Device Files. See the section on “Using F-Response Live Device Files” for more information.

Unmounting Targets
Use the Subject -> Unmount Target menu item to select and unmount one or more F-Response Subject Targets.
Adding Accelerator Subjects
When running the F-Response Accelerator on a machine without a local license dongle you can add remote subjects directly using their URI.

F-Response “Accelerator” Console
The first step to using the F-Response Accelerator Console to connect to remote deployed and running instances of F-Response is to make sure the F-Response Username and Password value has been set.

License Manager Authentication
Here the credentials entered should match those set up on the examiner machine with the license dongle attached, as entered in the License Manager. Next you can add one or more F-Response Subjects by inputting their full URI on into the text input at the bottom of the dialog.

Provided the username and password configured earlier are correct and there were no issues communicating with the remote subjects you should see icons for them appear in the Subjects panel.
Subjects - Working with Subjects using the Command Line

The F-Response Linux Examiner also includes a complete set of command line tools for enumerating and connecting to remote subjects and targets.

Examiner Interface

The examiner interface implements a set of functions for mounting and unmounting targets, stopping subjects, and printing the subject and target list.

cache

The cache command prints the subject list in CSV format. If the -s or --subject argument is specified, then the target list of the subject is printed in CSV format. And if the -j or --json option is specified, then the subject or target list is printed in JSON format.

```
$ fr_exa cache
name,platform,url,version"centos6-x64-dev","2.6.32-642.3.1.el6.x86_64:Linux-x86_64","192.168.1.110:3262/sub","7.0.4.1"
```

```
$ fr_exa cache -s centos6-x64-dev
name,block_size,block_count,pid,mount_path"vg_centos6x64dev-lv_root","512","33554432","0",""
"sda","512","1024000","0",""
"sda2","512","32528384","0",""
"sdb","512","4194304","0",""
"sdc","512","83886080","0",""
"sdc1","512","83875302","0",""
"sdd","512","15482880","0",""
"sdd1","512","15474816","0",""
"sde","512","15482880","0",""
"sde1","512","15474816","0",""
```

mount

The mount command creates a target file on the mount path. The target file represents a device on the subject, i.e. reading from the target file is equivalent to reading from the device on the subject.

The subject, target, and mount path argument must be specified. The -s or --subject argument specifies the IPv4 address, IPv6 address, or resolvable hostname and the listening port of the subject, e.g. 192.168.1.110:3262 or centos6-x64-dev:3262. The -t or --target argument specifies the name of the target. And the -m or --mount argument specifies the mount path.

By default, the mount command runs in the foreground. If the -d or --daemon option is specified, then the mount command runs in the background.

```
$ fr_exa mount --subject centos6-x64-dev --target sda --mount ~/mnt --daemon
F-Response Linux Examiner 7.0.4.1
Copyright F-Response, All Rights Reserved
Connected to subject 192.168.1.110:3262/sub.
Connected to target sda.
Exported target on /home/frestest/mnt/centos6-x64-dev/sda.
Examiner worker is online and running in the background.
Exclude -d, --daemon on command line to run in foreground.
```

active

The active command prints the active target list in CSV format. If the -j or --json option is specified, then the active target list is printed in JSON format.

```
$ fr_exa active --json
| "subjects": |
| |
```
umount
The umount command removes the target file.

```bash
$ fr_exa umount --subject centos6-x64-dev --target sda
Successfully unmouted /home/frestest/mnt/centos6-x64-dev/sda.
```

stop
The stop command stops the subject server or service.

```bash
$ fr_exa stop --subject centos6-x64-dev
Subject 192.168.1.110:3262/sub received shutdown signal.
```
Using F-Response Live Device Files

The examiner and accelerator export a live device file that represents a raw device on the subject. The following examples cover how to mount the live device file as a loopback device and process it with multiple open source tools.

Mounting the target file on a loopback device
You must have an attached device to make use of the SIFT workstation provided filesystem and partition table support. Since the target file is not an attached device it must be mounted as a loopback device.

```
$ fr_exa mount -s 192.168.1.45 -t vol-C -m . -d
F-Response Linux Examiner 7.0.4.1
Copyright F-Response, All Rights Reserved
Connected to subject 192.168.1.45:3262/sub.
Connected to target vol-C.
Exported target on /home/frestest/valkyrie/vol-C.
Examiner worker is online and running in the background.
Exclude -d, --daemon on command line to run in foreground.
```

```
$ sudo losetup /dev/loop0 /home/frestest/valkyrie/vol-C
$ sudo losetup -a
/dev/loop0: [0041]:2 (/home/frestest/valkyrie/vol-C/vol-C)
```

Mounting an NTFS filesystem from a loopback device

```
$ ls -l mnt
```

Running Sleuthkit utilities on the device file
The `fls` utility prints the list of inodes and the `icat` utility writes the file content to stdout. In this example, `fls` is used to list the inodes of the root of a NTFS filesystem and the `icat` is used to retrieve the `$MFT`.

```
$ fls /dev/loop0
...  
```

```
```

```
```

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Running Volatility commands on the target file
In this example, a Windows 10 host is running the subject service and the physical memory target, i.e. pmem, is mounted and analyzed by Volatility to obtain a list of running processes. Note that physical memory is only supported on Windows.

Mounting the target file as a raw disk image (OSX)
The target file can be attached as a raw disk image using hdiutil and mounted as a filesystem using diskutil. In the example below, a Windows 10 host with a VHD disk containing a FAT filesystem is mounted with the examiner.

---

8 http://www.volatilityfoundation.org/
<table>
<thead>
<tr>
<th>Command</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>`/dev/disk5s1</td>
<td>Windows_FAT_16</td>
</tr>
</tbody>
</table>
| ```
    $ sudo diskutil mount readOnly -mountPoint mnt /dev/disk5s1
    Volume TESTVHD2GB on /dev/disk5s1 mounted
    ```                                     |                                                                        |
| ```
    $ ls -l mnt
    total 64
    drwxrwxrwx 1 fretest staff 32768 Aug 24 11:15 System Volume Information
    ```                                     |                                                                        |
| ```
    $ sudo diskutil umount mnt
    Volume TESTVHD2GB on disk5s1 unmounted
    ```                                     |                                                                        |
| ```
    $ sudo hdiutil detach /dev/disk5
    "disk5" unmounted.
    "disk5" ejected.
    ```                                     |                                                                        |
| ```
    $ fr_exa umount -s valkyrie -t disk-2
    F-Response OSX Examiner x.x.x.x
    Copyright F-Response, All Rights Reserved
    Founded subject valkyrie.
    Founded target disk-2.
    Unmount successful for /Users/frestest/Desktop/valkyrie/disk-2
    ```                                     |                                                                        |
Flexdisk™ API

Getting Started
Access to the Flexdisk™ API is available from any platform capable of issuing HTTPS URL based web queries, including all mobile device platforms. Accessing the Flexdisk™ is very simple, it was designed to be straightforward and universally accessible from most web friendly programming environments.

API Overview
The F-Response Flexdisk™ API consists of two main parts, flexd and hscsi.

<table>
<thead>
<tr>
<th></th>
<th>flexd?</th>
<th>hscsi?</th>
</tr>
</thead>
<tbody>
<tr>
<td>/flexd?</td>
<td>Explore, Read, Extract</td>
<td>/hscsi?</td>
</tr>
<tr>
<td></td>
<td>Provides access to file system</td>
<td>Provides read access to physical</td>
</tr>
<tr>
<td></td>
<td>structures and meta data.</td>
<td>device (memory) raw data.</td>
</tr>
</tbody>
</table>

Authentication
Access to the Flexdisk™ is protected using standard HTTP Basic Authentication over SSL. All web queries are authenticated using this model.

Data Encoding
Unless otherwise indicated the Flexdisk™ API makes use of the Javascript Object Notation (JSON) data encoding format. JSON is well documented in the industry and there are numerous libraries capable of manipulating JSON encoded content. More details on JSON and consuming JSON in your applications is available at http://www.json.org/.
**Flexdisk™ Web Request and Response Values**

### Flexdisk™ Web Query Request Arguments

<table>
<thead>
<tr>
<th>Request</th>
<th>Meaning</th>
<th>Values</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>tgt</td>
<td>Target</td>
<td>vol-C, rdisk0</td>
<td>Indicates the target name as provided by the main Flexdisk™ handler.</td>
</tr>
<tr>
<td>enc</td>
<td>Encoding</td>
<td>json, csv, html</td>
<td>Instructs the Flexdisk™ handler to return the output in one of three potential encoding formats, JSON, CSV, or HTML. Default is HTML unless otherwise configured</td>
</tr>
<tr>
<td>node</td>
<td>File or Directory Node value</td>
<td>&lt;numeric&gt;</td>
<td>Indicates the desired node by numeric value.</td>
</tr>
<tr>
<td>type</td>
<td>Response value type</td>
<td>data, meta, read</td>
<td>Indicates the desired value type, data for accessing the entire file, meta for file metadata, or read for reading from a select location within a file.</td>
</tr>
<tr>
<td>name</td>
<td>File or Directory Name</td>
<td>&lt;text&gt;</td>
<td>Indicates the name of the file or directory requested.</td>
</tr>
<tr>
<td>offset</td>
<td>File Offset to start at</td>
<td>&lt;numeric&gt;</td>
<td>Valid only for Read Operations (type=read), value in bytes.</td>
</tr>
<tr>
<td>len</td>
<td>Length of file content to obtain</td>
<td>&lt;numeric&gt;</td>
<td>Valid only for Read Operations (type=read), value in bytes.</td>
</tr>
</tbody>
</table>

### Flexdisk™ Web Query Response Values (JSON Encoded Responses Only)

<table>
<thead>
<tr>
<th>Response</th>
<th>Meaning</th>
<th>Values</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Name of the object returned</td>
<td>&lt;text&gt;</td>
<td>Indicates the name of the returned object, depending on usage it may be a file, directory, or a disk/device.</td>
</tr>
<tr>
<td>type</td>
<td>Type of object returned</td>
<td>&lt;text&gt;</td>
<td>Indicates the type of the returned object. Examples include “ntfs” for file system type, or dir for directory node type.</td>
</tr>
<tr>
<td>uri</td>
<td>URL used to access the specific object</td>
<td>&lt;url&gt;</td>
<td>Provides a URL to access the object (data or explore) depending on the object.</td>
</tr>
<tr>
<td>node</td>
<td>Node value</td>
<td>&lt;numeric&gt;</td>
<td>Numeric identifier for a given object.</td>
</tr>
<tr>
<td>sectorsize</td>
<td>Size of a single sector</td>
<td>&lt;numeric&gt;</td>
<td>Indicates the Sector Size of a target device.</td>
</tr>
<tr>
<td>volsize</td>
<td>Size of the device</td>
<td>&lt;numeric&gt;</td>
<td>Indicates the size of the target device.</td>
</tr>
<tr>
<td>atime</td>
<td>Access Time</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the last access time in unix time.</td>
</tr>
<tr>
<td>atime_hires</td>
<td>Access Time</td>
<td>&lt;win32 time&gt;</td>
<td>Indicates the last access time in win32 time, where available.</td>
</tr>
<tr>
<td>ctime</td>
<td>Change Time</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the changed time on Ext2/3/4 and the Entry Modified Time on NTFS.</td>
</tr>
<tr>
<td>ctime_hires</td>
<td>Change Time</td>
<td>&lt;win32 time&gt;</td>
<td>Indicates the changed time on Ext2/3/4 and the Entry Modified Time on NTFS in win32 time.</td>
</tr>
<tr>
<td>cftime</td>
<td>Create Time</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the Created time on FAT and NTFS.</td>
</tr>
<tr>
<td>crtime_hires</td>
<td>Create Time</td>
<td>&lt;win32 time&gt;</td>
<td>Indicates the Created time on FAT and NTFS in win32 time.</td>
</tr>
<tr>
<td>mtime</td>
<td>Modified Time</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the Modified time on Ext2/3/4, the written time on FAT, and the File Modified Time on NTFS.</td>
</tr>
<tr>
<td>mtime_hires</td>
<td>Modified Time</td>
<td>&lt;win32 time&gt;</td>
<td>Indicates the Modified time on Ext2/3/4, the written time on FAT, and the File Modified Time on NTFS in Win32 time.</td>
</tr>
<tr>
<td>bkuptime</td>
<td>Backup Time (OSX)</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the Backup time on HFS.</td>
</tr>
</tbody>
</table>
Flexdisk™ Sample Queries

Obtain a listing of all Flexdisks™ on the target computer (JSON encoded)
Sample Request (Python): https://<host>:<port>/flexd?enc=json

```python
import json
import requests
requests.packages.urllib3.disable_warnings()

credential = requests.auth.HTTPBasicAuth('default', 'default')
request = requests.get(url, auth = credential, verify = False)
print(json.dumps(request.json(), sort_keys=True, indent=4, separators=(',', ': '))
```

Sample Response:

```json
{
  "response": {
    "contents": [
      {
        "name": "vg_centos6x64dev-lv_root",
        "sectorsize": "512",
        "type": "ext4",
        "volsize": "14935916544"
      },
      {
        "name": "sda1",
        "sectorsize": "512",
        "type": "ext4",
        "volsize": "524288000"
      }
    ],
    "date": "Thu, 10 Aug 2017 10:02:12 (EDT)",
    "host": "192.168.1.110:3262"
  }
}
```

Obtain a listing of the content for the root of a provided Flexdisk™ (JSON encoded)

```python
import json
import requests
requests.packages.urllib3.disable_warnings()

credential = requests.auth.HTTPBasicAuth('default', 'default')
request = requests.get(url, auth = credential, verify = False)
print(json.dumps(request.json(), sort_keys=True, indent=4, separators=(',', ': '))
```

Sample Response:

```json
{}
```
Extract a given allocated or unallocated file based on the node.
Sample Request (Python):

```python
import json
import requests
import Crypto.Hash.MD5
requests.packages.urllib3.disable_warnings()

# create https session (keepalive)
with requests.Session() as session:
    credential = requests.auth.HTTPBasicAuth('default', 'default')
    host = '192.168.1.110:3262'
    target = 'vg_centos6x64dev-lv_root'
    node = 393680
    file = 'sublin-x86_64-consultant'
    url = 'https://{0}/flexd?type=data&tgt={1}&node={2}&name={3}'.format(host, target, node, file)
    md5 = Crypto.Hash.MD5.new()
    # md5 the file using a
    # buffer size of 524288
    offset = 0
    length = 432140
    stream = session.get(url, auth = credential, verify = False, stream = True)
    for buffer in stream.iter_content(chunk_size = 524288):
        md5.update(buffer)
        offset = offset + len(buffer)
        length = length - len(buffer)
        print '{0:3.2f}%'.format(100 * (float(offset) / (offset + length))),
        print '{0}'.format(md5.hexdigest())
```

Sample Response:
A stream of file content (chunk encoding) from specified node.

Obtain a listing of the content for a given directory node of selected Flexdisk™ (JSON encoded)
Sample Request (Python): \url{https://<host>:<port>/flexd?enc=json&tgt=<target>&node=<node>}

```python
import json
import requests
requests.packages.urllib3.disable_warnings()

credential = requests.auth.HTTPBasicAuth('default', 'default')
target = 'vg_centos6x64dev-lv_root'
node = 260610
directory = 'root'
url = 'https://192.168.1.110:3262/flexd?enc=json&tgt={0}&node={1}&name={2}'.format(target, node, directory)
request = requests.get(url, auth = credential, verify = False)
print json.dumps(request.json(), sort_keys=True, indent=4, separators=(',', ': '))
```

Sample Response:

```
{
  "response": {
    "contents": [
      {
        "atime": "1502370970",
        "atime_hires": "131468446104637471",
        "bkuptime": "0",
        "crttime": "1471015743",
        "crttime_hires": "131154893760015088",
        "ctime": "1480707734",
        "ctime_hires": "131251814300892295",
        "mtime": "0",
        "ext": "sh",
        "mtime": "1480707633",
        "mtime_hires": "0",
        "name": "sync.sh",
        "node": "273085",
        "size": "380",
        "state": "alloc",
        "type": "file",
        "uri": "https://192.168.1.110:3262/flexd?enc=json&tgt=vg_centos6x64dev-lv_root&node=273085&type=data&name=sync.sh"
      }
    ],
    "date": "Fri, 11 Aug 2017 10:37:39 (EDT)"
  }
}
```

Read from a given location in a file node.
Sample Request (Python):

```python
import json
import requests
import Crypto.Hash.MD5
requests.packages.urllib3.disable_warnings()

# create https session (keepalive)
with requests.Session() as session:
    credential = requests.auth.HTTPBasicAuth('default', 'default')

    # node and file paramaters are
```
Sample Response:

A block of file content from specified node⁹.

---

⁹ We recommended streaming the file content versus issuing a separate HTTPS requests for each block of data.
hSCSI™ Web Request and Response Values

hSCSI™ Web Query Request Arguments

<table>
<thead>
<tr>
<th>Request</th>
<th>Meaning</th>
<th>Values</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>tgt</td>
<td>Target</td>
<td>fdisk-0</td>
<td>Indicates the target name as provided by the main hSCSI™ handler.</td>
</tr>
<tr>
<td>offset</td>
<td>File Offset to start at</td>
<td>&lt;numeric&gt;</td>
<td>Valid only for Read Operations (type=read), value in blocks.</td>
</tr>
<tr>
<td>len</td>
<td>Length of file content to obtain</td>
<td>&lt;numeric&gt;</td>
<td>Valid only for Read Operations (type=read), value is number of blocks. Total size may not be larger than 65535 bytes (Ex. 1 Block = 512 bytes, max read is 126 blocks)</td>
</tr>
</tbody>
</table>

hSCSI™ Web Query Response Values (JSON Encoded Responses Only)

<table>
<thead>
<tr>
<th>Response</th>
<th>Meaning</th>
<th>Values</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Name of the object returned</td>
<td>&lt;text&gt;</td>
<td>Indicates the name of the returned object, depending on usage it may be a file, directory, or a disk/device.</td>
</tr>
<tr>
<td>type</td>
<td>Type of object returned</td>
<td>&lt;text&gt;</td>
<td>Indicates the type of the returned object. Examples include disk, pmem, etc.</td>
</tr>
<tr>
<td>uri</td>
<td>URL used to access the specific object</td>
<td>&lt;url&gt;</td>
<td>Provides a URL to access the object (data or explore) depending on the object.</td>
</tr>
<tr>
<td>blocksz</td>
<td>Size of a single sector</td>
<td>&lt;numeric&gt;</td>
<td>Indicates the block size (sector size) of a target hSCSI™ device.</td>
</tr>
<tr>
<td>blockc</td>
<td>Count of sectors</td>
<td>&lt;numeric&gt;</td>
<td>Indicates the total block(sector) count.</td>
</tr>
<tr>
<td>disksize</td>
<td>Size of the disk in bytes</td>
<td>&lt;unix time&gt;</td>
<td>Indicates the total device size in bytes.</td>
</tr>
<tr>
<td>host</td>
<td>Hostname</td>
<td>&lt;text&gt;</td>
<td>Hostname of the target machine.</td>
</tr>
<tr>
<td>date</td>
<td>Date</td>
<td>&lt;datetime&gt;</td>
<td>Date/Time of the completed query response.</td>
</tr>
</tbody>
</table>

hSCSI™ Sample Queries

Obtain a listing of all hSCSI™ targets on the target computer (JSON encoded)
Sample Request (Python): https://<host>:<port>/hscsi?

```python
import json
import requests

requests.packages.urllib3.disable_warnings()

credential = requests.auth.HTTPBasicAuth('default', 'default')
url = 'https://192.168.1.110:3262/hscsi'?
request = requests.get(url, auth = credential, verify = False)
print json.dumps(request.json(), sort_keys=True, indent=4, separators=(', ', ': '))
```

Sample Response:

```json
{
  "response": {
    "contents": [
      {
        "blockc": "33554432",
        "blocksz": "512",
        "disksize": "17179869184",
        "name": "sda",
        "type": "physical",
      }
    ]
  }
}
```
Read from a given location in a hSCSI™ target

Sample Request (Python): `https://<host>:<port>/hscsi?tgt=<target>&offset=<offset>&len=<length>`

```python
import json
import requests
import Crypto.Hash.MD5
requests.packages.urllib3.disable_warnings()

# create https session (keepalive)
with requests.Session() as session:
    credential = requests.auth.HTTPBasicAuth('default', 'default')

    # node and file parameters are
    # obtain via directory request
    host = '192.168.1.110:3262'
nodel = 'sda1'

    md5 = Crypto.Hash.MD5.new()

    # md5 the file using a
    # buffer size of 524288
    offset = 0
    length = 524288000
    while 0 < length:
        url = 'https://{0}/hscsi?tgt={1}&offset={2}&len={3}'
            .format(host, target, offset / 512, min(524288 / 512, length / 512))
        buffer = session.get(url, auth = credential, verify = False, stream = False).content
        if len(buffer) <= 0:
            break
        md5.update(buffer)
        offset = offset + len(buffer)
        length = length - len(buffer)
    print '{0:3.2f}\r'.format(100 * (float(offset) / (offset + length))),
    print '{0}'.format(md5.hexdigest())
```

Sample Response:

A block of data from specified target.
Appendix A.

Legal Notices

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Disclaimer

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Patents

F-Response is covered by United States Patent Numbers: 8,171,108; 7,899,882; 9,037,630; 9,148,418, and other Patents Pending.
Appendix B.

Release History

F-Response 7.0.4.4 contains the following new features and enhancements:

Changes affecting Enterprise, Consultant + Covert, Consultant Edition, and TACTICAL

- Improved NTFS volume shrink during VHD/E01 virtual image creation.
- Improved handling of > 2TB devices.
- Generates a single e01 file for physical images.
- Corrected Accelerator menu and window title to better reflect usage.
- Moved comprehensive logs to the system32\LogFiles directory by process.
- Corrected issue with event logs for subject access and operation notification.
- Improved Linux Examiner graphical user interface and command line tools.
- Corrected Windows Export UI to account for all available interfaces.
- Fixed a menu issue with the F-Response Accelerator for Consultant + Covert.
- Corrected TACTICAL Subject for Windows to properly handle Windows XP.

F-Response 7.0.3.1 contains the following new features and enhancements:

Changes affecting Enterprise, Consultant + Covert, Consultant Edition, and TACTICAL

- Additional error messages for failed MSI exports and Provider drive attach operations.
- Corrected issue with IMAP not offering full drive attachment.
- Moved crashfiles and/or bad input error logs from the user’s profile to the system TEMP directory.
- Corrected TACTICAL license backup and restore process in cases where folder paths don’t exist.
- Improved handling of cloud accounts with filenames too large to be displayed.
- Updated manual with additional Linux and OSX examiner command line tool details.
- Implemented SSH and windows deployment interfaces for Linux.
- Modified F-Response Linux Examiner JSON output to improve key-value readability.
- Network settings to improve stability on busy and idle connections.
- Improved version requirements for F-Response Linux Examiner system dependencies.
- Updated man pages and manual for Linux and Mac OS X.
Appendix C.

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