



FastX Installation Guide

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Purpose

The purpose of this document is to give an in-depth understanding of how to install and configure FastX for use on your Linux system. This guide will cover basic installation as well as more advanced topics such as installation in non standard locations.

System Requirements

FastX Server

- [Download the FastX Server](#) Installation Package on your Linux server

Hardware Requirements

- Intel or AMD x86-64 processor
- The amount of RAM required is dependent on the number of sessions you are running. Please see [FastX Memory Usage](#) for more information

Operating Systems

- Red Hat Enterprise (including CentOS) 7, 8, or later, 64-bit only. FastX version 3.0 is the latest version available for Red Hat 6.
- Any Linux operating system equivalent to Red Hat 7 or later including Debian/Ubuntu style systems

Miscellaneous Requirements

These requirements can be modified by changing the default [startup options](#).

- Mounted \$HOME directory (when using clustering)
- /tmp directory with read/write access for all users

Default Ports

- Port 3300 for http and https (https://hostname:3300)
- Port 22 for SSH

Root Installations

Follow these instructions for administrators who have root privileges. Systems can be RPM or Deb based.

RPM Based Systems (Red Hat/SuSE etc)

The following instructions assume an installation in the default **/usr** directory.

Install the server (as root)

```
yum install -y FastX3.*rpm
```

Run the post install script (as root)

```
FASTX2=/your/fastx2/installdir/ /usr/lib/fastx/3/install.sh
```

**The FASTX2 environment variable lets the FastX installation script migrate over previous FastX 2 configurations. If you are installing on a new system you can simply run

```
/usr/lib/fastx/3/install.sh
```

Installing in an Alternate Location

The FastX server rpm supports installs in alternate locations. This is helpful when admins want to install the server in a shared directory, or a specific location for 3rd party applications. In the following example, the FastX server will be installed in **/your/base/dir**

Install the server (as root)

```
rpm -i --prefix=/your/base/dir FastX3-*.rpm
```

Run the post install script (as root)

```
FASTX2=/your/fastx2/installdir/ /your/base/dir/lib/fastx/3/install.sh
```

Upgrading FastX

To upgrade FastX simply follow the installation instructions again with the new RPM Package.

** If you have a prerelease version of FastX you will need to uninstall FastX before upgrading to the newer version.

Uninstalling FastX

To uninstall, run the command

```
yum erase -y FastX3
```

Debian/Ubuntu

FastX ships as an rpm based package. The first thing you need to do is convert the rpm to a .deb format using the *alien* utility.

Install alien package converter:

```
sudo apt-get install alien
```

Convert the FastX Server rpm file to a deb file:

```
sudo alien --scripts FastX3-*.rpm
```

Note: This will take a long time, due to the large number of font files in the package.

Install the deb file:

```
sudo dpkg -i FastX3*.deb
```

Run the post install script (as root)

```
sudo FASTX2=/your/fastx2/installdir/ /usr/lib/fastx/3/install.sh
```

Uninstalling FastX

To uninstall, run the command

```
sudo dpkg -r fastx3
```

Non Root Installations

Users who do not have root access can still install FastX using the following commands to extract the file from rpm. First, download the RPM file to your home directory.

Run the following commands to extract the files

```
cd $HOME
mkdir FastX
cd FastX
rpm2cpio ~/FastX3-version.build.rhel7.x86_64.rpm | cpio -id
mv usr/* .
rmdir usr
```

This will create a \$HOME/FastX directory where all the files are extracted.

Licensing

Activating a License

To install a license (necessary to launch a session), run:

```
$HOME/FastX/lib/fastx/3/install/activate
```

Running the License Server

After the license is installed, run the license server

```
$HOME/FastX/lib/fastx/3/r1m/r1m -c $HOME/FastX/lib/fastx/var/license
```

Suggestions

FastX can scan your system and preconfigure basic suggestions (GNOME, KDE, xterm etc) to simplify the connection process. If you want FastX to check for default suggestions ru

```
$HOME/FastX/lib/fastx/3/install/suggestions
```

Web Server

Running the Web Server

To run the web service with default settings, run:

```
nohup $HOME/FastX/lib/fastx/3/tools/run-web &
```

Silent and Automated Installs

The `install.sh` program is designed to help the installation by being user-interactive. Administrators wishing to automate their installs should run one or all of the install commands in their scripts. Below is a listing of the operations needed for installing FastX using an automated install.

Administrators can also call use the `-q` command to silently install with the default options:

```
/usr/lib/fastx/3/install.sh -q
```

Create a Fastx User

The `install.sh` script creates a user called **fastx** that will be used to run the `fastx3` service file. When rolling a custom install, make sure to have a `fastx` user account who owns the `FX_VAR_DIR`. The FastX web server will switch to the uid of the owner of the `FX_VAR_DIR` directory.

Add Licensing

Administrators typically use a centralized license server in a distributed system. Your installation should point to the central server.

1. Create the directory `/usr/lib/fastx/var/license`
2. Make sure the directory (from step 1) is world-readable (e.g. mode 755).
3. Put the name of your license server into a variable: `$LICENSE_SERVER`
4. Run this command: `echo "HOST $LICENSE_SERVER 00000000 5053" > /usr/lib/fastx/var/license/$LICENSE_SERVER.lic`
5. Make sure that file is world-readable (e.g. `chmod 644 /usr/lib/fastx/var/license/$LICENSE_SERVER.lic`)
6. If you have multiple (e.g. failover) license servers, repeat steps 3-5 for each license server on your network.

Install the Web Server

Run `/usr/lib/fastx/3/install/web -q` to install the web server.

Add the Initial Admin Group

Run `/usr/lib/fastx/3/tools/reset-admin group1 group2 group3 ...` to set your initial admin groups.

Create Global Bookmarks

Run `/usr/lib/fastx/3/install/suggestions -q` to create the initial set of bookmarks. This is an optional command. In a cluster, the bookmarks are synced with the cluster members. Run this command if you are making a standalone server.

Add Screenshot Support

The script `/usr/lib/fastx/3/install/screenshot` attempts to install the packages to support FastX screenshots (thumbnails). This may not be necessary if the packages are already installed or if you are on a closed network.

Create Clustering

Adding a server to a cluster is not done by the install script. Copy the file `/usr/lib/fastx/var/config/cluster.json` to other cluster members to start clustering. For more information [see our Clustering Guide](#).

Resetting the Admin Account

Admins are defined by Linux User Groups. If somehow you need to reset the admin account run the following command `/usr/lib/fastx/tools/reset-admin`

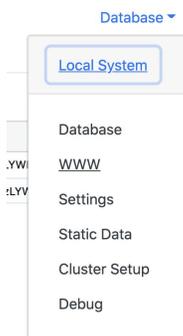
Note: The user who is running the FastX web service always has superadmin access.

Installing Third-Party Certificates

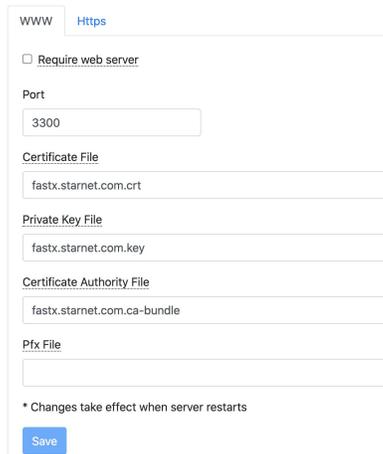
FastX ships with self-signed certificates to get the web server up and running with as little trouble as possible. Once the system has been configured and is ready to go into production, it is time to add your own certificates from a trusted third party (VeriSign, Thawte, Comodo etc). Acquiring the certificate is beyond the scope of this guide and typically the trusted third parties have instructions on how to do those.

1. Log in to the web interface as an administrator

2. Click on the gear  icon to bring up the System Section
3. Choose Local System > WWW



4. Add the paths to your cert, key and CA file

A screenshot of the 'WWW' configuration page in a web interface. The page has two tabs: 'WWW' and 'Https'. The 'WWW' tab is active. There is a checkbox labeled 'Require web server' which is unchecked. Below it is a 'Port' field with the value '3300'. There are three text input fields: 'Certificate File' with the value 'fastx.starnet.com.crt', 'Private Key File' with the value 'fastx.starnet.com.key', and 'Certificate Authority File' with the value 'fastx.starnet.com.ca-bundle'. There is also an empty 'Pfx File' field. At the bottom, there is a note: '* Changes take effect when server restarts' and a blue 'Save' button.

5. Save
6. Restart the FastX service

Granting Sudo Access to the FastX User

In order to avoid cases where double authentication is required in a cluster, or when using OpenID Connect administrators can set the fastx user account to try to sudo to the other user. This is an optional option. The method for allowing sudo access is documented in [Security Considerations](#)

Startup Options

FastX can be configured to set files and directories in locations other than the default location. This is useful for administrators who want to install FastX in a central location for multiple systems, and for users who wish to install FastX on a Docker image. Administrators should keep the following rules in mind

- Each system needs its own var, config, and local dir

- A TEMP directory must have read/write permissions for all users
- Users are defined by their username (not uid)
- In a cluster, users should have a mounted \$HOME directory

FastX.conf

The FastX.conf file is a special file that is located in \$FX_CONFIG_DIR. This file sets special variables for launching sessions. These are the default paths where the session will store session information.

```
# HOST is set to $(hostname) by default.
FastXPath=@HOME@/.fastx_server #base directory for FastX user storage
SessionPath=@HOME@/.fastx_server/@HOST@/sessions # location of session directories
```

Variable expansion is done by enclosing the variable name in “@” (@VAR@). To put a literal “@” in a variable, use “@@”. A “#” makes the rest of the line a comment. To put a literal “#” in a variable, use “@#@”. A variable can be either a FastX.conf variable or an environment variable. Available variables are *HOST*, which is set to the hostname of this server; *USER*, which is the username. *HOME* is a useful environment variable.

SessionPath is where session directories are stored. A session directory is named “FX3-” followed by the session id. The session directory contains log files, the X11 authorization file, session parameters, process ids, and other session-specific files.

FastXPath is where the history, bookmarks, and favorites file are kept, although the FastX database may have a more updated version of the information in these files. If this directory cannot be created, then the history is not saved.

HOST can be set if the system hostname command does not return a valid DNS hostname. It is used in the history file, to make an X11 authorization entry, and to set the DISPLAY name.

Environment Variables

FX_VAR_DIR

Default: `${fastx_installation (/usr/lib/fastx/3) }/..var`

Directory for Configuration, database, licenses, and local files. The var directory contains files that are specific to this installation of FastX. This includes configuration files (see FastX config Directory below), the local directory (see below), web (SSL) certificates, license files, and local web files (if used).

FX_CONFIG_DIR

Default: `$FX_VAR_DIR/config`

This is the directory of all configuration that is local to the system. You can mount this directory to be used by multiple systems, but that means changes that should be local to one system would propagate to others. A better idea is to clone a base configuration to the other systems' config dirs.

The config directory is read by the fastx-protocol and session start scripts, and the FastX web server.

FX_LOCAL_DIR

Default: `$FX_VAR_DIR/local`

The local directory contains the FastX database, the server ID, and the public-private key for this FastX server. This directory **must be unique** (not shared) for each FastX server (including FastX cluster members)

Setting Environment Variables

When FastX is installed as a service, you can set environment variables in `/etc/systemconfig/fastx3`. Variables are set using the syntax "NAME=value".

Hostname Substitution

Users may wish to create unique directory names by including the system host name. This can be done in the `/etc/sysconfig/fastx3` file with a substitution that depends on the type of system.

Systemd Systems

Systemd is installed on most modern linux systems (Red Hat 7 or later)

Use "%H" to substitute the host name.

Init.d Systems

Older systems use init.d

Use `$HOST`. To determine if your system is using systemd, run the command `systemctl`. If it shows many units loaded, then your system is a systemd system. If the `systemctl` command is not found, or shows nothing, then your system is the older init.d type.

Example

On a RedHat 7 system with systemd support suppose FastX is installed in `/opt/sw/fx`. You wish to configure your `FX_LOCAL_DIR` as `/opt/sw/fx/var/local/`hostname`/`

Edit `/etc/sysconfig/fastx3`

```
FX_LOCAL_DIR=/opt/sw/fx/var/local/%H
```

Configuring FastX for Multiple Systems

FastX uses a distributed database and local files to save configuration. The database allows for automatic synchronization for configuration across a cluster of servers. If you are configuring standalone servers you may want to automatically distribute configuration when setting up the server. The following steps will guide you through this process.

Set up a License Server

1. On a system central to all servers, Install the License Server
2. On each session server, run `/usr/lib/fastx/3/install.sh`
 - When asked if there is a license server on the network select `yes`
 - Add the hostname to point to the license server

Configure the First Server

1. Install FastX
2. Run the post installation script `/usr/lib/fastx/3/install.sh`
3. Log in to the Browser Client as a FastX Administrator
4. Configure the FastX Server According to your needs

Export the FastX Configuration

Local configuration is located in the `/usr/lib/fastx/var/config` directory. Any configuration that is local to this system only (not to the entire cluster) is located in this directory. It is Best Practice to make a backup copy of your default config directory. Copy the default configuration into each server so that the individual servers can change them later.

Clusters

Configuration global to your cluster is located in the database. If you are using clustering, this information is automatically synced across the cluster.

Standalone Servers

If you are not using clustering, or want to make a backup You can export the database configuration by doing the following

1. Log in to the Browser Client as a FastX Administrator

2. System > Tools > Exports
3. Export the configuration. Save the file as *override.json*

Configuring Other Servers

1. Install FastX
2. Run the post installation script in quiet mode: `/usr/lib/fastx/3/install.sh -q`
3. Copy the default local configuration from the first server into `/usr/lib/fastx/var/config`
4. Copy the *override.json* file into `/usr/lib/fastx/var/config`
5. Copy the *license.lic* file into `/usr/lib/fastx/var/license`
6. Restart the FastX service

`/usr/lib/fastx/var/config`

FastX stores shared configuration in the database. This allows configuration changes to be automatically propagated to other systems in a cluster.

Configuration that is private to the local system is stored in the config directory (default `/usr/lib/fastx/var/config`, set by `FX_CONFIG_DIR`)

`www.json`

This file holds the information needed to start the web server including port, certificate paths, and other options.

This file must be world readable as sessions use this file to attempt to reconnect with the web server

`cluster.json`

This file holds the information needed to connect to a cluster.

`settings.json`

Local settings of the web server

`override.json`

This file updates the database on startup and then renames itself. This is typically done to update database configuration during installs. This file does a hard update. There is no checking if the data is valid. Once the web server starts up, the `override.json` file is renamed, so it does not write it again.

Create an `override.json` file by logging in to the web server as an admin > System > Tools > Export.

suggestions.json

When the web server IS NOT running, this file is used to store the bookmarks.

When the web server IS running, this file will put any new bookmarks into the database. If the bookmark already exists, it will be skipped.

admin.json

This file is created by the install.sh script and sets the initial admins for the database. If there is already an admin record in the database this file does nothing. Use the override.json file or the admin-reset tool to reset your admins.

session.json

When the web server IS NOT running, this is the profile of the session.

When the web server IS running, this file is ignored.

debug.json

Turn on web server debugging options

FastX.conf

Sets special variables for launching sessions. These are the default paths where the session will store session information

CouchDB

FastX ships with the [CouchDB database](http://couchdb.apache.org/) (<http://couchdb.apache.org/>) to store information as well as cluster and load balancing across multiple systems. CouchDB is a stable, highly configurable, open source distributed database.

Accessing CouchDB

FastX configuration should exclusively be done from the FastX web interface, or from tools provided by FastX. Administrators who need lowest level access, typically for debugging, can gain access to the actual database instance that FastX is using.

Logging in to CouchDB

1. Shut down the FastX web service: `service fastx3 stop`
2. Run the command `/usr/lib/fastx/3/tools/run-db`

3. You will be asked to create an admin account (if you don't already have one)
4. From the linux machine that FastX is installed on, open a browser to ***http://localhost:5983/_utils***
5. Enter in the admin username and password from the previous step.

You now have access to the database. From here you can modify any of the records. CouchDB stores all records as json objects.

FastX uses an append-only database to keep configuration and data in sync between sessions and clusters. Over time, the database can grow to a level that is large and needs to be cleaned up. In a clustered environment, the database grows even faster due to the communication of multiple servers. Database cleanup should be part of your scheduled server maintenance and run periodically

Cleaning the Database

CouchDB is an append-only database. Over time, the database can grow to a level that is large and needs to be cleaned up. Database cleanup should be part of your scheduled server maintenance and run periodically.

Automatic Cleanup

FastX can automatically clean up the database at start. This will shrink the database, but also cause longer startup times.

1. System > Local System > Settings > Rebuild Database when server starts

Manual Cleanup

1. Shut down the fastx service: *service fastx3 stop*
2. Run: */usr/lib/fastx/3/tools/clean-db*
3. Restart the service: *service fastx3 start*

The database will be recreated. When the FastX Web Server goes down, running sessions will periodically attempt to contact the web server. Once the web server is back up, the sessions will write themselves into the database. It may take upwards of 10 minutes to restore the database.

Configuration

As to not conflict with other CouchDB installations, FastX uses the following configuration files to run the CouchDB instance

/usr/lib/fastx/var/local/db/vm.args

/usr/lib/fastx/3/www/server/db/http/couch/default.ini (DO NOT EDIT THIS FILE)

/usr/lib/fastx/var/local/db/couchdb.ini

You can edit the couchdb.ini file to configure the CouchDB instance as you wish.

See the [CouchDB configuration](#) for configuration options. Below is the default CouchDB configuration overrides for FastX.

Note: Do not edit the admin named fastxadmin. This file is overwritten each time fastx starts and the fastxadmin password dynamically changes. If you wish to set up your own admin user for CouchDB, see [Accessing CouchDB](#)

```
[couchdb]
database_dir=/usr/lib/fastx/var/local/db/data
view_index_dir=/usr/lib/fastx/var/local/db/views
[chttpd]
bind_address=127.0.0.1
port=5983
[httpd]
authentication_handlers={chttpd_auth, proxy_authentication_handler},
{chttpd_auth, default_authentication_handler}
[log]
writer=file
level=crit
file=/usr/lib/fastx/var/local/db/couchdb.log
[cluster]
n=1
[couch_httpd_auth]
proxy_use_secret=true
secret=__dynamically_generated__
[admins]
fastxadmin = __dynamically_generated_password__
```

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