



# Customizing FreeNAS 8.3 Using the Plugins Jail

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# Outline

- ◆ Brief Introduction to FreeNAS 8.3
- ◆ Introduction to Jails, PBIs, and Plugins
- ◆ Installing the Plugins Jail
- ◆ Installing and Configuring PBIs
- ◆ Installing non-PBI Software
- ◆ Creating Custom PBIs



# Intro to FreeNAS 8.3

Open source NAS (network attached storage) based on an embedded version of FreeBSD (nanoBSD) and released under 2-clause BSD license

Modular design: core NAS features can be extended using a plugins architecture

Designed to be installed on flash device and administered from a web browser



# Core NAS Features Include

- ◆ Ability to create AFP, CIFS, NFS shares
- ◆ Support for iSCSI, SSH, FTP/SFTP, TFTP
- ◆ Active Directory and OpenLDAP integration
- ◆ Automated, secure replication via rsync/ssh
- ◆ Automated ZFS snapshots and scrubs
- ◆ Link aggregation and failover



# Limitations of Core NAS

Due to its embedded nature, there is no room to install additional software

NAS does not include built-in UPnP, iTunes, or BitTorrent support

Users have all kinds of edge use cases for their NAS

It is possible, but inconvenient, to compile a custom version of FreeNAS



# Plugins Architecture

Provides the administrator the flexibility to install additional software from the FreeNAS GUI to meet the requirements of the NAS

Comprised of three components:

- FreeBSD Jail
- PBI (Push Button Installer) files
- Plugins



# What is a Jail?

A FreeBSD feature for providing light-weight, operating system-level virtualization

A jail has its own hostname, IP address, users, and is separated from the host operating system

FreeNAS implementation includes vimage which gives the jail its own networking stack and IP broadcasting



# What is a PBI/Plugin?

Originally created by the PC-BSD project (a desktop version of FreeBSD)

Provides a graphical installation wrapper for software ported to FreeBSD

FreeNAS implementation extends this functionality by incorporating the application's configuration file into the FreeNAS graphical administrative interface—the result is known as a Plugin





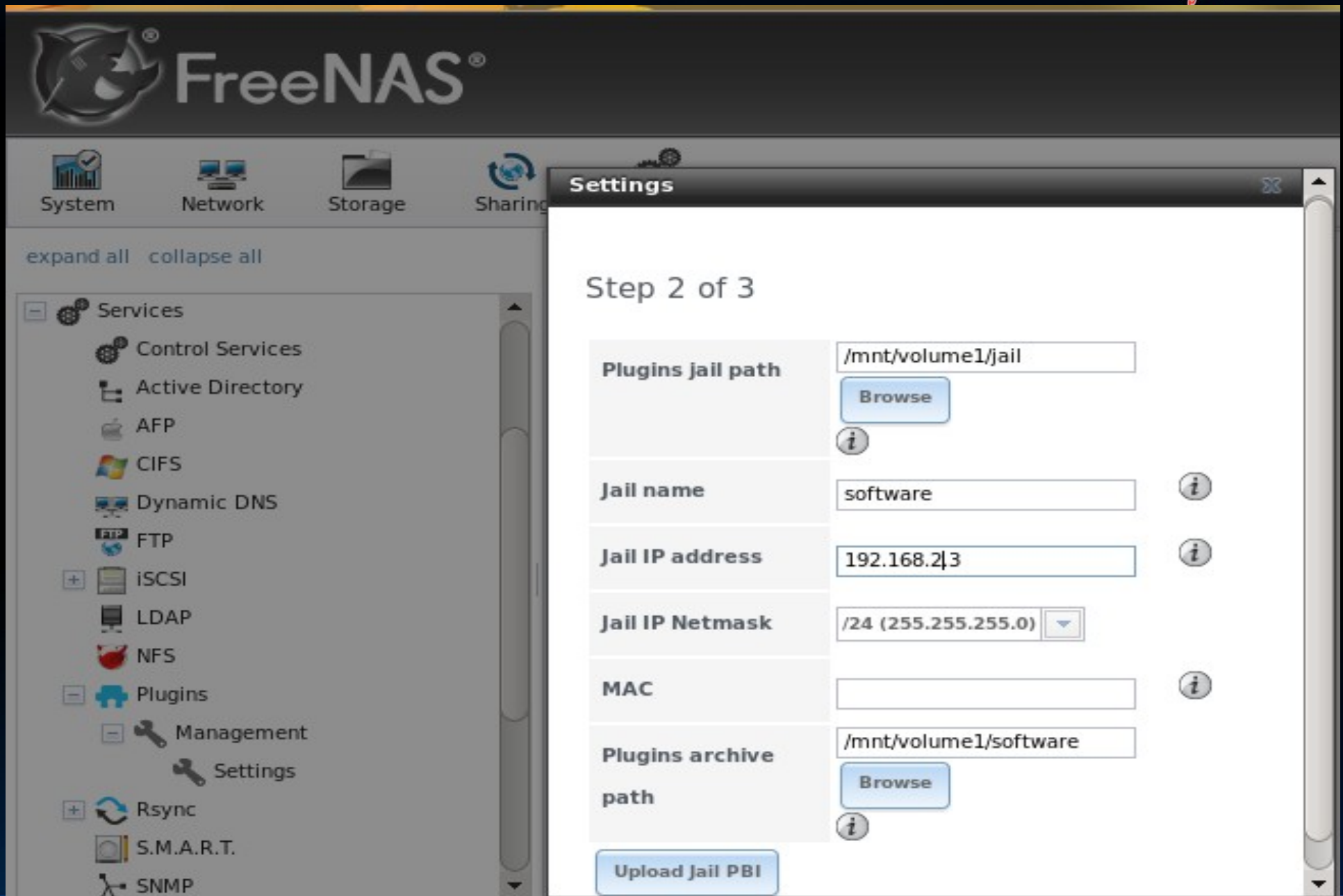
# Installing the Plugins Jail

Before any plugins can be installed, the Plugins Jail must be installed and started

Recommended that Plugins Jail is installed into its own ZFS dataset and that a second dataset is used to store the installed software

The Plugins Jail and supported Plugins can be downloaded from plugins folder for architecture <http://sourceforge.net/projects/freenas/files/> FreeNAS-8.3.0/

# Installing the Plugins Jail



The image shows the FreeNAS web interface with a "Settings" dialog box open. The dialog is titled "Step 2 of 3" and contains the following configuration fields:

| Field                | Value                 | Info Icon |
|----------------------|-----------------------|-----------|
| Plugins jail path    | /mnt/volume1/jail     | Yes       |
| Jail name            | software              | Yes       |
| Jail IP address      | 192.168.2.3           | Yes       |
| Jail IP Netmask      | /24 (255.255.255.0)   | No        |
| MAC                  |                       | Yes       |
| Plugins archive path | /mnt/volume1/software | Yes       |

Buttons: "Browse" (for Plugins jail path), "Browse" (for Plugins archive path), "Upload Jail PBI" (at the bottom).

Background interface elements: FreeNAS logo, navigation tabs (System, Network, Storage, Sharing), sidebar menu (Services, Control Services, Active Directory, AFP, CIFS, Dynamic DNS, FTP, iSCSI, LDAP, NFS, Plugins, Management, Settings, Rsync, S.M.A.R.T., SNMP).

# Starting the Plugins Jail



The screenshot shows the FreeNAS web interface. At the top, there are navigation tabs for System, Network, Storage, Sharing, and Services. The Services tab is active, and the 'Plugins' sub-tab is selected. A sidebar on the left shows a tree view of the system components, with 'Services' expanded. The main content area displays a list of services, each with a status indicator (OFF) and a wrench icon for configuration.

| Service          | Status | Configuration |
|------------------|--------|---------------|
| Active Directory | OFF    | Wrench        |
| AFP              | OFF    | Wrench        |
| CIFS             | OFF    | Wrench        |
| Dynamic DNS      | OFF    | Wrench        |
| FTP              | OFF    | Wrench        |
| iSCSI            | OFF    | Wrench        |
| LDAP             | OFF    | Wrench        |
| NFS              | OFF    | Wrench        |
| Plugins          | OFF    | Wrench        |
| Rsync            | OFF    | Wrench        |



# Installing a PBI

Once the Plugins Jail is installed and the Plugins service started, you can install FreeNAS PBIs (Plugins)

As each Plugin is installed, an icon will be added to the FreeNAS menu (used to configure the application) and its service will be added to the Plugins tab of the Control Services menu so it can be started



# Installing a PBI



- System
- Network
- Storage
- Sharing
- Services

expand all collapse all

- Services
  - Control Services
  - Active Directory
  - AFP
  - CIFS
  - Dynamic DNS
  - FTP
  - iSCSI
  - LDAP
  - NFS
  - Plugins
    - Management
      - Firefly
      - MiniDLNA
      - Transmission

Settings x Services x

Core Plugins

| Plugin name  | Version  | PBI                     | Service status               | Actions   |
|--------------|----------|-------------------------|------------------------------|---|
| Transmission | 2.51     | transmission-2.51-amd64 | <input type="checkbox"/> OFF | <button>Update</button> <button>Delete</button> |
| Firefly      | 1696_6   | firefly-1696_6-amd64    | <input type="checkbox"/> OFF | <button>Update</button> <button>Delete</button> |
| Minidlna     | 1.0.22_3 | minidlna-1.0.22_3-amd64 | <input type="checkbox"/> OFF | <button>Update</button> <button>Delete</button> |

# Configuring a PBI



### Transmission

|                                 |   |                                       |
|---------------------------------|---|---------------------------------------|
| <b>Watch Directory:</b>         | <input type="text" value="/usr/pbi/transmission-amd64/"/> | <input type="button" value="Browse"/> |
| <b>Configuration Directory:</b> | <input type="text" value="/usr/pbi/transmission-amd64/"/> | <input type="button" value="Browse"/> |
| <b>Download Directory:</b>      | <input type="text" value="/usr/pbi/transmission-amd64/"/> | <input type="button" value="Browse"/> |
| <b>Allowed:</b>                 | <input type="text"/>                                      |                                       |
| <b>Blocklist:</b>               | <input type="text"/>                                      |                                       |
| <b>Logfile:</b>                 | <input type="text"/>                                      | <input type="button" value="Browse"/> |
| <b>RPC/WebUI Enabled:</b>       | <input checked="" type="checkbox"/>                       |                                       |
| <b>RPC Port:</b>                | <input type="text" value="9091"/>                         |                                       |
| <b>RPC Auth. Required:</b>      | <input type="checkbox"/>                                  |                                       |

expand all collapse all

- Services
  - Control Services
  - Active Directory
  - AFP
  - CIFS
  - Dynamic DNS
  - FTP
  - iSCSI
  - LDAP
  - NFS
  - Plugins
    - Management
      - Firefly
      - MiniDLNA
      - Transmission
    - Rsync



# Installing Non-PBI Software

If a PBI is not available, you can still install packages or compile ports within the Plugins Jail

Software installed this way will not be integrated into the administrative interface but can be configured and started from the command line

Use [FreshPorts.org](http://FreshPorts.org) to search for software that has been ported to FreeBSD



# Installing Packages

A FreeBSD package is a pre-compiled binary that includes the dependencies required by the application

Installed using the **pkg\_add -r** command:  
FreshPorts.org will tell you the exact command to use

**pkg\_info -Lx** will tell you what gets installed

Typically, conf files are in */usr/local/etc/* and startup scripts are in */usr/local/etc/rc.d/*





# Compiling Ports

Packages are recommended unless a package is not available or you need to change a compile option as compiling takes time and system resources

FreshPorts.org will list the available compile options

Use the **make install** command to compile

Once compiled and installed, the software can be configured like any other package

# Creating Custom PBIs



FreeNAS PBIs are still new (only available since July 2012)

3 official PBIs: Firefly, MiniDLNA, Transmission

List of PBI requests:

[http://doc.freenas.org/index.php/PBI\\_Requests](http://doc.freenas.org/index.php/PBI_Requests)

List of user-created PBIs:

<http://forums.freenas.org/showthread.php?8470-INDEX-Available-Plugins>

# Creating Custom PBIs



A PBI is created from a PBI module: a set of files and directories containing the installation instructions for an application

These files are trivial to edit, except for the *control* file which contains the instructions for integrating the installed PBI into the FreeNAS GUI

The *control* file requires development experience with a programming language supported by the FastCGI API (typically Python or PHP)

# Creating Custom PBIs



In theory, the Plugins Jail has all of the tools needed to create a custom PBI; this needs to improve in practice

The documentation for creating PBIs is mostly complete but needs programmatic examples for the *control* file

For now, use packages, help test upcoming PBIs, and interact with other PBI creators on the forums or IRC



# Resources

Website: <http://www.freenas.org>

Forums: <http://forums.freenas.org>

Bug tracker: <http://support.freenas.org>

Documentation: <http://doc.freenas.org/Plugins>

IRC: #freenas on Freenode



# Questions?

Contact:

[dru@freebsd.org](mailto:dru@freebsd.org)

URL to Slides:

<http://slideshare.net/dlavigne/scale13>