



The Complete Single Source Imaging Solution

User Manual



FSI Server

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NeptuneLabs FSI Server

Next Generation Single Source Imaging

Introduction

FSI Viewer Server is a high performance Java Imaging Server, designed for outstanding scalability (multi core CPUs, multi server setups, load balancing) and excels in superior image quality compared to all imaging servers supported by FSI Viewer in the past.

While supporting Single Source Imaging (e.g. JPEG and PNG images for web sites) it also has full FSI Viewer support including FSI Showcase and FSI Pages.

The HTML/AJAX based web interface makes uploading, managing and publishing images as easy as handling local files. It also offers quick access to the more than 20 real-time image effects and all the FSI Viewer publishing options.

Key features

- internal storage containing image copies optimized for fast delivery
- support for transparent images
- fast, high quality image scaler
- support for large images (up to 536 megapixels)
- more than 20 combinable real time image effects
- support for read only source image pools
- input format independant performance

Thank you for using NeptuneLabs software!

www.fsi-viewer.com - Online Resources for FSI Viewer

Visit www.fsi-viewer.com for software updates, regularly updated samples, tutorials and downloads.

NeptuneLabs FSI Server

Part I • Administrator Documentation

1. System Requirements

FSI Server – Hardware Requirements

- 1 CPU Core (Quadcore or above recommended)
- 1 GB RAM (1GB per CPU core recommended)
- 5 GB HDD space + image data

FSI Server – Software Requirements

- Java SE 6
- Java Application server complying with servlet specification 2.5
- 32 bit Operating System (64 bit Operating System recommended)

FSI Server has been successfully tested with the following operating systems:

- Linux: Debian Etch 4.0
Lenny 5.0
Fedora 9 - 10
Ubuntu 6.06 LTS & 8.04 LTS & 8.10
SuSE 11
- Sun Solaris 10
- Windows Server 2003, 2008

FSI Server webinterface requires one of the following browsers

- Internet Explorer 6 or newer
- Firefox 3 or newer
- Safari 3 or newer
- Google Chrome

2. Installation

The current version of FSI Server is available as an installer for Microsoft Windows or as a Java WebArchive (war) for deployment in an existing application server.

2.1 Installation on Microsoft Windows

The installation for Windows is a packed executable for either 32 or 64 Bit Windows systems. The installer contains the current Sun Java Runtime Environment and the Apache Tomcat servlet container, therefore no further software is required prior to installation. To start the installation double click the downloaded installer. Choose the

installation directory and follow the instructions on the screen.

2.2 Platform independent installation

To install the FSI Server WebArchive a servlet container complying with the the Java Servlet Specification 2.5 and running von a Java 6 Runtime Environment is required.

FSI Server has been developed and tested on Apache Tomcat 6 and Sun Microsystems Java SE 6. FSI Server is installed by simply deploying the dowloaded war-file. Please also see Appendix C for required and recommended Tomcat and Java Virtual Machine Settings.

3. Configuration

FSI Server consists of two core components: the importer component that imports images into the internal storage and the actual server component that delivers images and metadata to the web.

The components can be configured separately. All configuration files are XML files and need to be edited manually. A graphical web-based configuration tool will be available in future versions of FSI Server.

3.1 Configuring the importer component

The configuration for the importer component is split into general settings and importer profiles. While the general settings apply componentwide there can be multiple profiles with different configurations.

Settings

The importer settings are placed in WEB-INF/config/importer.xml in the FSI Servers base application directory. The file is split into five main sections.

Application

The application section defines general settings for the importer component. By setting the enabled attribute the importer can be completely disabled.

```
<storage>directoryname</storage>
```

The storage option specifies where the internal storage should be placed. The given directory should exist and must be writable by the user running the application server. If a relative path is specified, it

will be relative to the web applications WEB-INF directory.

```
<searchdb_name>search</searchdb_name>
<searchdb_login>sa</searchdb_login>
<searchdb_password>sa</searchdb_password>
```

The search database parameters define how to access the search database.

```
<pause>15 seconds</pause>
```

The importer will scan the directories defined in the profiles in regular intervals to find new or modified files. This option allows setting the pause between the scans.

```
<imagethreads>auto</imagethreads>
```

The number of images that are converted simultaneously auto evaluates to the number of cpu cores on the machine running the importer. This is the best setting for most environments however it might be desirable to reduce the setting on machines running other applications at the same time.

Colormanagementsystem

The colormanagement section defines the settings for the colormanagement used when importing images. Disabling this section will disable the colormanagement systems and no color profiles will be used when importing images.

```
<DefaultCMYKProfile>auto</DefaultCMYKProfile>
<DefaultRGBProfile>auto</DefaultRGBProfile>
<DefaultGrayProfile>auto</DefaultGrayProfile>
<DefaultLabProfile>auto</DefaultLabProfile>
```

These settings define the default profiles to be used when importing images that do not contain color profiles. Auto will evaluate to an internal profile.

Other valid values would be complete paths to valid color profile files.

Formats

The formats section contains a list for <format> nodes containing file types that should be imported. Other files will be ignored.

Protected_dirs

The protected dirs section contains a list of <protected_dir> nodes containing names of directories that should be skipped while

scanning for new files. The directory names can contain a * as wildcard.

Protected_files

The protected files section contains a list of <protected_file> nodes containing names of files that should be skipped while scanning.

Profiles

The profiles are defined by files in the WEB-INF/importer_profiles directory of the FSI Server installation that end with the suffix .xml. A profile defines where to look for image files, how to import them and if they can be modified via the webinterface.

Enabled

The enabled node allows enabling and disabling a profile. A disabled profile is ignored and treated as nonexistent. Files that were imported via this profile will therefore be deleted from the internal storage when a profile is disabled.

Origin

The origin section defines where to look for images and how to access the found images.

```
<Accessor>filesystem</Accessor>
```

The accessor option defines how to access the profiles resources. Currently filesystem is the only supported accessor type.

```
<Location>directory</Location>
```

The location option defines where to look for images. A relative path is interpreted to be relative to the application WEB-INF directory.

```
<ReadOnly>>false</ReadOnly>
```

If the readonly option is enabled uploading or modifying the profile directories content via the webinterface is prohibited.

```
<Download>>true</Download>
```

Defines if the original image file is downloadable via the webinterface for authenticated users.

Conversion

The conversion section defines parameters applied when importing files.

```
<Format>JPEG</Format>
```

Specifies the compression format of the image data in the internal storage. Valid compression formats are JPEG and LOSSLESS which uses a Deflate compression algorithm. This setting has a large impact on the hard disk size used by the internal storage.

```
<Quality>92</Quality>
```

The JPEG compression quality used internally only applies if the format is set to JPEG.

3.2 Configuring the real-time image server component

Like for the importer the configuration of the real-time component is split into settings and profiles.

Settings

The settings are located in WEB-INF/config/settings.xml in the FSI Servers base application directory and has only one main section called application.

Application

The application section defines general settings for the real-time image server component. By setting the enabled attribute the component can be completely disabled.

```
<storage>directoryname</storage>
```

The storage option specifies where the internal storage can be found. If located on the same machine this should be identical to the storage setting in the importer settings. If a relative path is specified, it will be relative to the web applications WEB-INF directory.

```
<serverTokens>production</serverTokens>
```

Defines the response headers sent by FSI Server. Possible values are "full", "prod", "debug", "none".

```
<importer>http://localhost/fsi/importer</importer>
```

Tells the real-time component where to find the importer. This is used

to request the importer to prioritise a specific image that is currently in the conversion queue.

```
<searchdb_location>embedded</searchdb_location>  
<searchdb_login>sa</searchdb_login>  
<searchdb_password>sa</searchdb_password>
```

The search database parameters define where to find and how to access the search database.

Profiles

The profiles used by the real-time server component are defined in files located in WEB-INF/server_profiles that end with a .xml suffix. The profile configuration is split into two sections. The first defines the rendering options, the second the output file format and compression parameters.

Renderer

Defines parameters used while rendering image and metadata responses.

```
<keepAspectRatio>false</keepAspectRatio>
```

Denotes if the renderer should preverse the image aspect ratio.

```
<sort>filename</sort>  
<sortorder>asc</sortorder>
```

Defines the sorting options for responses to list requests.

```
<errorFallback>/path/to/img</errorFallback>
```

Specifies image to use as a fallback if the requested image could not be imported, if omitted the built in fallback image will be used

```
<importingFallback>/path/to/img</importingFallback>
```

Specifies image to use as a fallback if the requested image is currently being imported, if omitted, the built in fallback will be used.

Outputcompression

Defines the output format and options for responses to image requests.

```
<compressor>JPG</compressor>
```

Specifies the output file format, currently JPG, PNG and SWF are supported.

```
<quality>90</quality>
```

Defines the default jpeg compression quality. Please note that requests containing the quality parameter can override this setting.

4. User Management

The user management in the current release of FSI Server has deliberately been kept simple. All users have the same rights and the same access level. Consequently there are no means of hiding or protecting images uploaded by one authenticated user from another authenticated user.

Users are managed by a simple XML file in the WEB-INF/config/ directory of the FSI Server installation called users.xml.

Each user has an entry made up of the username and either a plaintext password or a password hash.

To add a user named "user" with the password "user" simply add the following line:

```
<user name="user" plain="user" />
```

or use a SHA-256 hash of the password and add the following:

```
<user name="user" hash="04f8996da763b7a969b1028ee3007569eaf3a635486ddab211d512c85b9df8fb" />
```

The new user will immediately be able to log in, a restart is not necessary

5. Licencing

An unlicenced copy of FSI Server is fully functional but all images delivered will contain watermarks.

To purchase a licence please contact your local reseller or NeptuneLabs directly.

A licence is installed by copying it into a file called licence.xml, placing this into the WEB-INF/config folder in your FSI Server installation directory and restarting your application server.

Depending on the licence obtained limitations apply, regarding the domainname used for accessing the server or the number of images hosted on the server. A licence can also contain an expiration date. If any of these limitations are exceeded, all images delivered by the server will again contain the watermark. In this case contact your

reseller or NeptuneLabs to upgrade or extend your licence.

Please note: The FSI Viewer and used Add-Ons or Plug-Ins must be licenced separately. Details on licencing FSI Viewer can be found in the FSI Viewer Manual.

6. Logging

FSI Server uses the Java Log4J Logging framework. The configuration file for the used loggers is called log4j.xml and can be found in the WEB-INF/config directory of the applications installation directory.

The server uses three loggers that can be configured independently. The first logs the activity of the importer component, the second logs the server component and the third logs activity of the webinterface.

By default all three loggers will write to rotating files in the application servers log directory.

For more information on Log4j and how to change to logging configuration please see the Log4j website at <http://logging.apache.org/log4j/>.

7. Templates

Responses to meta data requests for directories and images are rendered using templates. The response type and the content of the response can be modified by editing the templates or adding new templates. The templates are located in WEB-INF/templates in the FSI Server installation directory. A template must end with the suffix .ftl and is addressed by the tpl parameter in meta data requests (see part II, section 6.7). The templates are rendered using the freemarker template engine, documented at <http://www.freemarker.org/docs/>.

Modifying the default templates is not recommended as the webinterface and FSI Viewer rely on correctly formatted meta data responses.

NeptuneLabs FSI Server

Part II • User Documentation

1. Getting Started

FSI Server includes a webinterface allowing easy access to most of the servers features. Due to the intuitive and technically advanced interface, browsing and managing images is simplified. The interface provides the full functionality needed to assist in publishing images, showcases and catalogs and also allows configuring the real-time image effects. To get started, simply open up the interface by pointing your browser to `http://yourdomain/fsi`.

FSI Server is set up to provide real-time web access to images placed within a directory structure. Unlike any other imaging server, the server component merely requires read access to the directory. This guarantees the integrity of the original image files. This source directory is monitored and any new images are imported into FSI Servers internal storage retaining the directory structure. This internal storage consists of copies of the original files, optimized for fast access and real-time delivery to the web. This technique ensures high scalability and allows FSI Server to be used for high performance, heavy traffic websites.

Once configured the FSI Server does not require any further administration, the internal storage is set up automatically and will always be synchronized with the source directory. Modifications to the source directory via local file access, FTP Upload or the webinterface are immediately mapped to the internal storage.

2. Interface Overview

This section gives a brief overview of the web interface and its components. The interface is designed to provide a quick and intuitive access to the managed images and uses the modern AJAX technology. A list of compatible browsers can be found in part I - section 1.

2.1 Logging In

When accessing to interface URL at `http://yourdomain.com/fsi` a login screen and a language option will be displayed. Users need to authenticate themselves by using a combination of username and password. The default username and password combination is `admin/admin`, but it is strongly recommended to change the password prior to using FSI Server. For details on managing users please see Section 4 in part I - administrator documentation.



2.2 Search Bar

The "Search Bar" contains a textfield for entering search phrases and a submit button. A search phrase can be submitted by clicking on the submit button or simply by pressing enter. After submitting a search the results will be displayed in the thumbnail canvas and the search phrase is stored in the "Search Results" special folder in the folder tree. For details on search phrases and searching in general please see section 3.5.

2.3 View Bar

The "View Bar" contains buttons to customize the appearance of the thumbnail canvas. The left button group switches between standard and page view mode whereas the right slider changes the thumbnail size. The dropdown selector in the center allows to change the sorting order of the thumbnails. If the Cooliris browser plug-in is installed, an additional button allows to activate a Cooliris wall, showing the current active folder.

2.4 Log Out

The log out button closes the current session and takes the user back to the login screen.

2.5 Folder Tree Menu

The control buttons for the folder tree are located in the "Folder Tree Menu". There are buttons for adding and removing favorites as well as refreshing the current view. Most commands are also available in the folder trees context menu.

2.6 Location Bar

Similar to a browsers location bar it shows the currently viewed position and allows entering a different location (folder) to view. Manually typing a new location is supported by an auto complete function. Additional buttons to go back and forward to the previous/next folder as well a button to jump to the parent folder make navigating easier.

2.7 Folder Tree

The "Folder Tree" shows the directory structure of the data stored on the imaging server. Branches can be expanded or collapsed by clicking on the + or – buttons in front of the folder name.

Selecting a folder will show the folders contents in the thumbnail canvas. Two special folders contain shortcuts to favorites and the search history. Right-clicking on an entry will display a context menu providing access to available commands for the selected folder.

2.8 Thumbnail Canvas

The "Thumbnail Canvas" shows the contents of the currently selected folder or the search results. Depending on the view mode directories and images or only images are displayed. Hovering above an item in the canvas will show a tool tip containing a brief summary of the item. Double clicking a folder item will change the current directory to that folder and double clicking an image item will open the image details popup described in 2.11.

Items can be selected in order to perform operations with them. A single item is selected using a left click. Multiple items are selected by dragging open a box around them or by holding SHIFT and clicking another item. Items can be added to a selection by holding the CTRL key. As in the folder tree, right clicking will open a context menu containing the available operations.

2.9 Tool Bar

The "Tool Bar" mainly contains operations that can be performed with the selected items or in the current directory. Operations are enabled or disabled depending on the selection. The first tab contains the publishing options described in chapters 4 and 5.

The second tab contains a button to access the image details popup for a single selected image.

The next three tabs, "Upload", "Download" and "File and Folder Tools" provide access to the image managing options described in chapter 3.

The last tab shows the current server status for informational purposes.

2.10 Status Bar

The "Status Bar" displays additional information related to the current folder including the last modified date, the number of images, directories and the currently visible range of items.

2.11 Image Details Popup

The image details popup can be accessed by selecting the "Image Properties" entry from an image context menu, by clicking the "Show Details"-Button in the Tool Bar or by double clicking on an image in the Thumbnail Canvas. The image details popup contains two tabs. The first tab shows the image in an FSI Viewer instance and the second tab provides access to all the meta data available for the selected image.



3. Managing Images

The FSI Server interface does not only assist in publishing data stored on the server, it is also an easy and comfortable way to manage images in terms of uploading, deleting, moving or renaming. An extensive search function also helps to organizing large amounts of images.

3.1 Uploading

Images can be uploaded to the current directory by selecting one of the upload buttons from the Tool Bar. The first upload button enables a flash based upload function.

The system file chooser dialog used by this upload method, allows to select multiple files, which can be uploaded at the same time. Due to implementation issues in Flash Player the flash based upload does not work on browsers other than Internet Explorer if you are:

- a) connected to the internet via a proxy server
- b) accessing FSI Server interface via HTTPS

In these cases you should use the HTML/Javascript based upload instead which does not allow selecting multiple files to upload at a time though. Nevertheless you can add multiple images or ZIP archives to upload one after the other before uploading the selected files.

In addition to uploading single images, ZIP files can also be uploaded. These will then be unpacked to the upload directory and the images will be imported into the internal storage retaining the directory structure from the ZIP file, full automatically.

3.2 Downloading

Downloading images is limited to either downloading the original image file or using the real-time image delivery. A download other than the original is therefore a standard single source imaging request directed at FSI Server. The output formats are limited to jpg or png and the maximum size for such a download is 3000 x 3000 px.

3.3 Deleting

Folders and images can be deleted by selecting the appropriate item in the thumbnail canvas and opening "File and Folder Tools" in the toolbar, then by clicking delete or by opening the context menu of the item and then clicking delete. Please note that deleting is irreversible and deleted items cannot be restored.

3.4 Moving and Renaming

Folders and images can be renamed by selecting the item in the thumbnail canvas and choosing "Rename" from the toolbar or the context menu.

Moving objects from one folder to another is accomplished by selecting the item, choosing "Cut", changing to the new folder and selecting "Paste". Please note that moving or renaming a folder containing lots of files or subfolders, requires a restructure of the internal storage and therefore might take a while.

3.5 Searching

FSI Servers search provides an easy way to find specific images, especially when a large amount of images are on the server. The search function not only allows a full text search in the image meta data, but also allows image specific search such as looking for images with a certain width or height.

3.5.1 Full Text keyword search

By simply typing a keyword into the search field a full text search across the complete image meta data is performed. This includes all textural fields in the file specific meta data (the filename) as well as the IPTC and EXIF meta data of all currently imported images.

The full text search supports two wildcards: the question mark (?) stands for one single arbitrary character and the asterisk (*) stands for any number or arbitrary characters.

Search terms may not begin with wildcards. The search can be limited to a single textual field by preceding the keyword with the fieldname followed by a colon, for example 'iptc.caption:holiday' will show all images having the word 'holiday' in the IPTC Caption field. Appendix D.1 contains the full list of supported fields.

3.5.2 Comparative search

In addition to the full text search a comparative search is supported for a set of numerical meta data fields and fields containing dates. The comparative search always begins with a field name (see table below for a full list of supported field names). The value can be prepended with a smaller than (<) or larger than (>) prefix. If the prefix is missing, an exact match is required.

This for example allows searching for images with a minimum height (file.height:>3000) or images older than a specific date (iptc.date_created:<1.1.2009). Appendix D.2 contains the full list of supported fields.

Note on date searches: the given date can be provided in any standard format, independent of any country and/or regional settings. The date value may not include any spaces between the figures, as these would be treated as token separators.

3.5.3 Search modifiers

All entered keywords or phrases are optional by default. This means if two keywords are provided the result set will contain images having at least one the keywords in their meta data.

To perform searches with mandatory keywords precede the phrase with a plus (+). To exclude images from the results which match a certain condition precede the phrase with a minus (-).

4. Publishing Single Images

The publishing dialogs of FSI Servers interface provide assistance in generating image URLs or HTML code snippets, which can then be integrated into web pages.

A single image can be presented as a fixed size image in the end users browser or as an interactive zoomable image using FSI Viewer. The publishing dialogs can be accessed by selecting a single image in the thumbnail canvas and choosing a "Publish as HTML image" or "Publish as FSI Viewer" option from the toolbar.

4.1 HTML Image

The "Publish as HTML Image" helps assembling an URL, which can be used directly in a HTML img tag. The publishing dialog consists of four tabs allowing the selection of an image range, setting the resulting size and output effects and showing a preview of the resulting image. Image URLs can also be assembled manually. Appendix B contains a complete server URL command reference.

Publish Tab

The "Publish Tab" allows setting the resulting image size, the image format and in case of jpeg, the quality. It also contains a text field showing the HTML img tag, which can be integrated into webpage.

Effect Tab

The "Effect Tab" allows adding real-time image effects to the resulting image. Effects can be added by entering the effect parameters and then adding them in the effect list. Once in the effect list, effects can be dragged to change their position in the list, modifying the order they are applied.

Crop Tab

The "Crop Tab" consists of a preview image with the possibility of selecting the image range. If a range is selected, only the selection will be published.

Preview Tab

The "Preview Tab" shows a preview of the published image, with all effects and parameters applied. The preview size is limited to 700 px width.

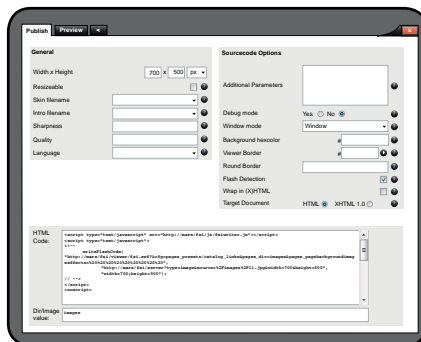
4.2 FSI Viewer

The "Publish as FSI Viewer" section allows choosing between four commonly used presets. Choosing a presets will open the FSI Viewer publishing dialog that provides access to all FSI Viewer parameters and plug-ins.

The publishing dialog contains five tabs grouping the FSI Viewer publishing options and parameters. By default only the two most commonly used tabs are directly accessible. The remaining tabs can be made visible using the expand tabs (>) button in the tab selection area.

Publish Tab

The "Publish Tab" provides access to the basic FSI Viewer and HTML Sourcecode options like viewer size and language. It also contains a text field containing the HTML code snip assembled from all the settings made in the various tabs.



Preview Tab

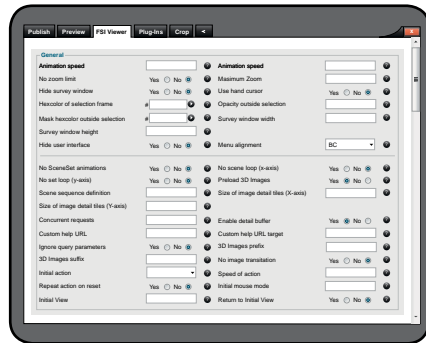
The "Preview Tab" shows an FSI Viewer instance using the assembled code snip from the Publish Tab.

The FSI Viewer looks exactly like it would, if it were integrated into a web page using the code snip, except for the preview size, which is limited to 700 px width. An "Open in Popup" button allows previewing the FSI Viewer in a separate window where the size limitation no longer applies.



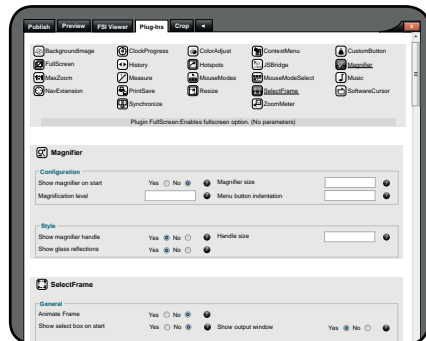
FSI Viewer Tab

The "FSI Viewer Tab" provides access to the main Viewer configuration parameters. The parameters mainly affect the behaviour and appearance of the viewer. Like in all the other tabs in the publishing section a short description is available for every parameter by clicking on the question button next to the parameter input field. For a more detailed help please see the FSI Viewer



Plug-Ins Tab

The "Plug-Ins Tab" not only allows to activate and deactivate the various FSI Viewer plug-ins, it also shows all configuration parameters of the activated plug-ins. Clearly arranged for quick access, the tab is split up in boxes. The first box contains a list of available plug-ins. Activating a plug-in by clicking on the plug-in icon will show a further box. For a detailed description see the FSI Viewer manual.



Crop Tab

As in the "Publish as HTML Image" section, the "Crop Tab" allows selecting an image range which will then be published in the FSI Viewer

5. Publishing Image Collections

Image collections can be published by placing the desired images into a folder and publishing the folder. Collections are used for 3D object presentation, FSI Pages and FSI Showcase. A folder can be published by navigating into the folder and selecting an FSI Viewer 3D, Pages or Showcase preset from the Tool Bar.

5.1 FSI Viewer 3D

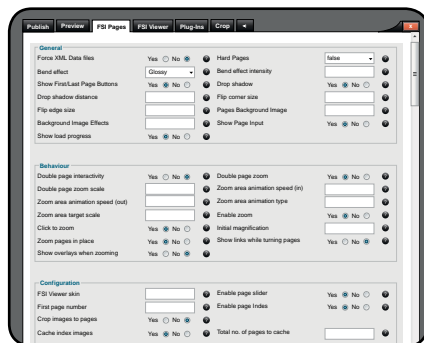
Publishing a collection as FSI Viewer 3D will create an FSI Viewer instance, displaying a rotatable view of an object composed by all images in the collection. The publishing dialog is identical to publishing a single image. Please refer to section 4.2. for details.

5.2 FSI Pages

Choosing an FSI Pages preset for a collection will activate the FSI Pages Add-on. The collection will be presetted as book or catalog. In the FSI Pages publishing dialog, the "Plug-Ins Tab" is extended by seven additional plug-ins and a new tab called "FSI Pages" is available after clicking on the expand tabs button.

FSI Pages Tab

The "Pages Tab" provides quick access to all FSI Pages specific parameters. For details on the various configuration options please see the FSI Pages section in the FSI Viewer manual.

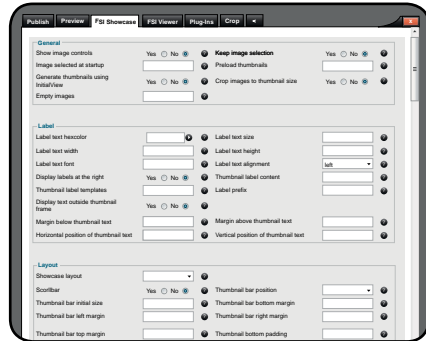


5.3 FSI Showcase

Choosing an FSI Showcase preset when publishing a collection will activate the FSI Showcase Add-on. A showcase allows to present multiple images in a single FSI Viewer instance as a kind of image gallery. The FSI Showcase publishing dialog adds a new tab to the common FSI Viewer publishing dialog.

FSI Showcase Tab

The "FSI Showcase Tab" provides quick access to all FSI Showcase specific parameters. For a detailed description of the configuration options please see the FSI Showcase section in the FSI Viewer manual.



6. Server Addressing

The FSI Server is addressed using standard HTTP and HTTP GET query parameter to specify the request.

The main server URL will always be in the form `http://www.example.org/fsi/server?` followed by the desired parameter. If the application is deployed under a name different to "fsi" the above URL needs to be adapted accordingly.

The following sections describe the available parameters in detail and give examples on their usage. Please note that not all parameter combinations are possible. In addition to the following descriptions, Appendix B contains a server addressing quick reference.

6.1 Source

The source parameter describes the accessed resource in form of a path. This can be either an image or a directory. The source parameter is mandatory.

6.2 Type

The mandatory type parameter defines the type of response expected. Available values are *image*, *info* and *list*. Image and info can be used if the source parameter defines an image file. Depending on the profile used (see 6.9) an image request will return a jpg, png or swf. Info and list requests provide access to image and directory metadata. The response type of these two depends on the used template (see 6.7).

6.3 Width and height

At least one of the parameters width or height must be provided for image requests. The value is interpreted as pixels and the result will be an image scaled to fit into the requested dimension. Depending on the profile used the aspect ratio is preserved, so if width and height are specified the resulting image may be smaller than the requested size.

6.4 Rect

The optional rect parameter can be used in image requests. It allows cropping images prior to scaling. The value is expected to consist of four comma-separated float values. The first two values define the top-left corner and the other two values define the bottom-right corner of the crop area. All values are expected to be normalized, this means the valid values range from 0 to 1 where 0 is left or top and 1 is right or bottom.

6.5 Left, top, right, bottom

The parameters left, top, right, bottom are a more human readable version of the rect parameter described above. The possible values are identical (0 to 1).

6.6 Quality

Used in image requests that return jpeg images this optional parameter defines the jpeg compression quality. The default value depends on the profile settings.

6.7 Tpl

The tpl parameter defines the template used to render into and list responses. For more on templates see section 7 in part I.

6.8 Effects

The effects parameter allows applying real-time image effects to an image. The effects parameter value is a comma-separated list containing the effect name followed by brackets containing effect-specific parameters. The effects will be applied in the order they are listed. For a detailed description of the available effects and the effects-specific parameters please see section 7.

6.9 Profile

Used in all request types this optional parameter defines the server profiles used to build the response. If omitted the default profile will be used. The default profile is defined by the server settings. For more information on profiles see section 3 in part I.

7. Real-time Image Effects

The FSI Server provides various effects, which are available in real time and can be applied to the images before delivery.

This section describes and visualises the included effects using an example image. The left image corresponds to the original and the right image shows the applied effect(s).

Blur	
Radius	(Float) $\geq 0.0 \leq 100.0$
Example	blur(50)
Version	1.0

Applies a gaussian blur effect to the image, therefore reduces image noise and detail levels.



Sharpen	
Amount	(Float) $\geq 0.0 \leq 100.0$
Example	sharpen(50)
Version	1.0

Sharpen the image using a gaussian unsharpen algorithm. Especially Details and contours will be highlighted.



Glow	
Amount	(Float) $\geq 0.0 \leq 100.0$
Example	glow(25)
Version	1.0

Adds a glow effect to the image by enlarging and summarizing all bright areas, so you have the impression the image shines.



Pixelize	
Size	(Int) ≥ 0
Example	pixelize(30)
Version	1.0

Creates a pixel effect by reducing the image details. The pixel colors adapt to the most common used color around each pixel, results in a tile effect.



Flip	
Value	(Enum) Horizontal, Vertical
Example	flip(vertical)
Version	1.0

Flips the image horizontal or vertical.



Distort	
Value	4 normalized xy coordinate pairs describing the new corner positions.
Example	<code>distort(0.1,0.1,0.9,0.2,1,1,0,1)</code>
Version	1.0

Performs a perspective distortion by moving the image corners to the new specified coordinates. The first two values are the upper left corner, based on a value of 0-1 on the X-and Y-axis. The following corners are to be entered clockwise.



Brightness	
Value	(Int) $\geq -100 \leq 100$
Example	<code>brightness(20)</code>
Version	1.0

Increases or reduces the images brightness.



Contrast	
Value	(Int) $\geq -100 \leq 100$
Example	contrast(20)
Version	1.0

Increases or reduces the contrast images.



ChannelExchange	
Mode	(Enum) RGB, RBG, BGR, BRG, GRB, GBR
Example	channelexchange(grb)
Version	1.0

Swaps color channels.



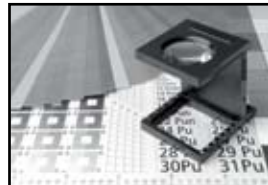
Colorize	
Hue	(Float) $\geq 0.0 \leq 360.0$
Saturation	(Float) $\geq 0.0 \leq 100.0$
Lightness	(Float) $\geq 0.0 \leq 100.0$
Example	colorize(170,80,10)
Version	1.0

Applies a colorize effect to the image. This makes it possible to give a general color impression to the image.



Desaturate	
Mode	(Enum) Average, Lightness, Luminosity, Saturation
Example	desaturate(lightness)
Version	1.0

Desaturates the specified image property.



Gamma	
Value	(Float) $\geq 0.1 \leq 9.99$
Example	gamma(6.0)
Version	1.0

Reduces or increases the image gamma.



HSL	
Hue	(Float) $\geq -180 \leq 180$
Saturation	(Float) $\geq -100 \leq 100$
Lightness	(Float) $\geq -100 \leq 100$
PrimaryColor	(Enum) All, Red, Yellow, Green, Cyan, Blue, Magenta
Example	hsl(90,80,30,All)
Version	1.0

Allows increasing or decreasing hue, saturation and lightness of a specified image channel.



Invert	
Mode	(Enum) Brightness, All, Red, Green, Blue, Alpha
Example	invert(red)
Version	1.0

Inverts one channel, all channels or the brightness of the image.



ColorOverlay	
Blendmode	Enum Blendmodes (Normal, Dissolve, Exclusion, Difference, Hardmix, PinLight, LinearLight, VividLight, HardLight, SoftLight, Overlay, LighterColor, LinearDodgeAdd, ColorDodge, Screen, Lighten, DarkenColor, LinearBurn, ColorBurn, Multiply, Darken, Divide, GrainExtract, GrainMerge, Subtract, LuminosityHSL, ColorHSL, SaturationHSL, HueHSL, LuminosityHSB, ColorHSB, SaturationHSB, HueHSB.)
RGB	(RGB INT) $\geq 0x000000 \leq 0xffffffff$
Opacity	(float) $\geq 0.0 \leq 100.0$
Example	coloroverlay(VividLight,0x300000,20)
Version	1.0

Applies a color overlay to the image using the specified color and blend mode.

By using one or perhaps several different effects, many changes in coloration can be achieved.



Posterize	
Level	(Int) $\geq 0 \leq 255$
Example	posterize(11)
Version	1.0

Applies a posterize effect, reducing the image to a limited number of color levels. Posterize is a separation of the tonal values with a simultaneous tonal value reduction.



Threshold	
LevelLow	(Int) >= 0 <= 255
LevelHigh	(Int) >= 0 <= 255
Color1	(RGB INT) >= 0x00000000 <= 0xffffffff
Color2	(RGB INT) >= 0x00000000 <= 0xffffffff
Example	threshold(10,200,0x00471698,0x00fbdb07)
Version	1.0

Reduces the color range of the images by applying a threshold filter.



Transparency	
Value	(Int) >0 <= 100
Example	transparency(30)
Version	1.0

Adds transparency to the image. If the image contains an alpha channel it will be strengthened. If there is no alpha channel in the image, then one will be created.



Matte	
Value	(Hex RGB)
Example	matte(2cb4ac)
Version	1.0

Removes transparency and renders all translucent pixel against the matte color.



Noise	
Amount	(Int) >0 <= 100
Strength	(Int) >0 <= 100
Monochrome	(Boolean)
Example	noise(60,80,true)
Version	1.0

Adds noise to the image.



Sepia	
Example	sepia()
Version	1.0

Makes the image look like a sepia toned photo.



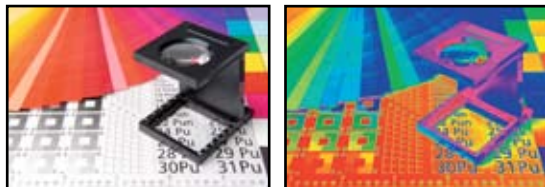
Solarize	
Example	<code>solarize()</code>
Version	1.0

Applies a solarize effect that negates all pixels above a certain value. Solarization allows the alienation of images.



GradientMap	
Mode	(Enum) Average, Lightness, Luminosity
Value	(HexColor) ARGB, [ARGB], ...
Example	<code>gradientmap (luminosity,ff0000,ff00ff,0000ff,00ffff,00ff00,ffffff00,ff0000)</code>
Version	1.0

Maps a defined gradient over a grayed image.



Appendix

Image Formats

Supported Image Formats are:

PNG, TIFF, JPEG, BMP, GIF, FPX, PBM, PFM, PGM, PNM, PDF*

* special features like layer effects are currently not supported

A Supported Input/Output Formats

1 Input Formats

Format	Description
PNG	Portable Network Graphics files are fully supported, including alpha channels. The maximum image size depends on the amount of memory available.
JPEG	Joint Photographic Experts Group files are fully supported. The maximum image size depends on the amount of memory available.
TIFF	Tagged Image File Format files are fully supported, including pyramid tiffs. The maximum image size is limited to 536 Megapixels assuming the necessary hard disk capacity is provided.
BMP	Bitmap file format is fully supported. The maximum image size depends on the amount of memory available.
FPX	FlashPix file format is fully supported. The maximum image size depends on the amount of memory available.
GIF	Graphics Interchange Format is fully supported. The maximum image size depends on the amount of memory available.

2 Output Formats

Format	Description
PNG	The default output format providing the additional quality parameter to specify image compression quality
JPEG	The jpg output supports alpha channels by default.
SWF	A special format wrapping image data into an swf for image presentation within flash movies.

B Server Addressing Quick Reference

1 Image Requests

?type=image&source=path/to/image

Parameter	Description	Mandatory	Default
Width/height	Width/height of the resulting image	yes (one)	—
Rect	Crop to a given range	no	0,0,1,1
Left/right/top/bottom	Crop to a given range	no	left/top=0 bottom/right=1
Quality	Jpeg compression quality	no	depends on profile
Effects	Real-time image effects	no	none
Profile	Used profile	no	depends on settings

2 Info Requests

?type=info&source=path/to/image

Parameter	Description	Mandatory	Default
Tpl	Defines the template used to render the response	no	depends on profile
Profile	Used profile	no	depends on settings

3 List Request

?type=list&source=path/to/directory

Parameter	Description	Mandatory	Default
Tpl	Defines the template used to render the response	no	depends on profile
Limit	Limits the amount of entries in the result set	no	all results
Profile	Used profile	no	depends on settings

C Tomcat and JVM Settings

1. Tomcat settings

In order to use the webinterface the application server must allow encoded slashes in URLs this can be achieved. In all application servers based on the catalina servlet container, by adding the following parameter to the CATALINA_OPTS:

`-Dorg.apache.tomcat.util.buf.UDecoder.ALLOW_ENCODED_SLASH=true`

2. Java Virtual Machine Settings

The optimal settings for the Java virtual machine depend on the hardware running FSI Server and any other applications sharing the hardware resources. Generally speaking, increasing the memory available in the virtual machine will increase FSI Servers performance as larger images can be converted in memory and more objects can be cached.

3. AJP & JK

If FSI Server is set up in an application server, reachable via AJP only, please ensure the Proxy Pass Reverse Settings are included in the AJP configuration, as the webinterface will not be usable with incorrect or missing AJP settings.

```

<IfModule mod_proxy_ajp.c>
    <Location /server>
        ProxyPass ajp://localhost:8009/fsi
        ProxyPassReverse ajp://localhost:8009/fsi
        ProxyPassReverseCookiePath /fsi /server
    </Location>
</IfModule>

```

D Search field reference

1 Textual search field

Fieldname	Description
file.name	the images filename
iptc.caption	The contents of the IPTC 'Caption' field
iptc.writer	The contents of the IPTC Writer/Editor field
iptc.headline	The contents of the IPTC Headline field
iptc.special_instructions	The contents of the IPTC Special Instructions field
iptc.by_line	The contents of the IPTC By-line field
iptc.by_line_title	The contents of the IPTC By-line Title field
iptc.credit	The contents of the IPTC Credit field
iptc.source	The contents of the IPTC Source field
iptc.object_name	The contents of the IPTC Object Name field
iptc.city	The contents of the IPTC City field
iptc.province_or_state	The contents of the IPTC Province/State field
iptc.country_or_primary_location	The contents of the IPTC Country/Primary Location field
iptc.original_transmission_reference	The contents of the IPTC Original Transmission Reference field
iptc.category	The contents of the IPTC Category field
iptc.supplemental_categories	The contents of the IPTC Supplemental Category(s) field
iptc.keywords	The contents of the IPTC Keywords field
iptc.copyright_notice	The contents of the IPTC Copyright Notice field

Fieldname	Description
iptc.Originating_program	The contents of the IPTC Originating Program field
iptc.fsi_search_data	The contents of the IPTC FSI Search Data field
exif.exposuretime	The contents of the EXIF Exposure Time field
exif.fnumber	The contents of the EXIF Fnumber field
exif.exposureprogram	The contents of the EXIF Exposure Programm field
exif.isospeedratings	The contents of the EXIF ISO Speed Ratings field
exif.subjectdistance	The contents of the EXIF Subject Distance field

2 Comparative search fields

Fieldname	Description	Type
file.size	The file size in bytes	Number
file.width	The image width in pixels	Number
file.height	The image height in pixels	Number
file.lastmodified	The last modified date of the original image file	Date
iptc.release_date	The contents of the IPTC 'Release Date' field	Date
iptc.date_created	The contents of the IPTC 'Date Created' field	Date

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