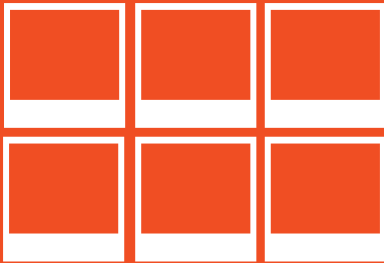


FSI SERVER

The complete Single Source Imaging Solution

User Manual



Version 3.0

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) and several JavaScript Viewers, 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 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 real-time image scaler
- support for large images
- support for digital assets
- more than 20 combinable real time image effects
- support for read only source image pools
- input format independent performance

Thank you for using NeptuneLabs software!

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

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

- Dual Core CPU or better recommended
- 2 GB RAM per CPU core recommended

FSI Server – Software Requirements

- JSun Java SE 6, Oracle Java SE 7, OpenJDK 1.7.0u41 or higher
- Apache Tomcat 6.0.18 - 7.0.X

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

- Linux (x86_64) Kernel 2.6 - 3.11
- Windows Server 2003, 2008, 2010
- Mac OS X 10.5 - 10.9

FSI Server webinterface requires one of the following browsers

- Internet Explorer 9 or newer
- Firefox 3.5 or newer
- Safari 5.1 or newer
- Google Chrome 10 or newer
- Opera 11 or newer

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 file. The installer contains the current Oracle 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 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 7 as well as Oracle Java SE 6 and 7. FSI Server is installed by simply deploying the downloaded war-file. Please also see Appendix C for required and recommended Tomcat and Java Virtual Machine Settings.

2.3 Indexing Services

The internal storage will contains files and directories not relevant for any other application. It should not be scanned by any indexing services. Allowing such a service to scan the internal storage will lead to a noticeable load and therefore to a reduced server performance whenever the indexing service runs.

2.3.1 Windows

If the FSI Server was installed using the Windows installer version, the storage folder will be set up so that it is not indexed. If the FSI Server was installed using the platform independent version or the storage was chosen to be in an other folder by changing the configuration, then the storage folder should be excluded from indexing by right clicking the folder in the Windows explorer, choosing the advanced properties and clearing the checkbox from the indexing option.

2.3.2 Mac OS X

On Mac OS X the storage folder can be excluded from the spotlight index by opening the spotlight preferences from the spotlight dropdown menu and

selecting the 'privacy' tab. The "+" button will allow adding a location that will then no longer be indexed.

2.3.3 Linux

Most Linux distributions come with support for the locate command as part of the find-utils. The updatedb process can be configured to exclude paths. Depending on the distribution the configuration is most likely to be found in /etc/updatedb.conf or /etc/sysconfig/locate.

2.3.4 Other common indexing services

There are some other commonly used indexing services, often referred to as desktop searches. Amongst others, these are the Google Desktop, Beagle or the Copernic Desktop Search. These should also all be deactivated or be configured to exclude FSI Servers internal storage.

3. Benchmarking

After installing FSI Server you should verify that the hardware you are using is capable of handling the amount of traffic and requests you are expecting to see. As these numbers are not always predictable and as the actual performance highly depends on your use case, FSI Server comes with a built-in benchmark, allowing you to compare your servers performance to a reference system.

The reference system is designed to satisfy the requirements of an average medium sized business. The benchmark consists of six different tests, measuring the performance of different hardware components. At the end of each test an index is calculated, allowing the comparison with the reference system.

The benchmark will summarize the results of these tests to two overall values, one being system performance (CPU and memory bandwidth) and the other being I/O performance (disk read and write operations). This allows to locate performance bottlenecks before integrating the server into the production environment.

3.1 Running the benchmark

After installing FSI Server as described in the previous chapter, you will find scripts to run the benchmark on Windows or Linux systems in *webapps/fsi/WEB-INF/benchmark*. Alternatively the benchmark can be run directly by executing the main FSI Server Jar-file located in *wepabbs/fsi/WEB-INF/lib/fsi.jar*. When executing the benchmark directly you can modify the benchmarks runtime behaviour as well as the settings of the Java Virtual Machine. For example, this allows running only a subset of the tests or limiting the number of threads used in the benchmark. A more detailed description of the benchmark parameters. can be found in the readme-file in the same directory as the benchmark scripts.

As the benchmark tests also tests the I/O performance, the benchmark working directory should be set to the filesystem that will host FSI Servers internal storage. This can be achieved by setting the "workdir" parameter.

As with all benchmark, there should be no other processes running on the system that use a significant amount of resources in order to obtain conclusive results. The output of the benchmark, by default in plain text format, will contain general system information, detailed results of all tests, as well as the to main performance rating indices mentioned above.

3.2 Interpreting the results

As mentioned in the introductory section, the benchmark will result in a number of indices. The two main resulting indices "system performance" and "I/O performance" allow comparing your servers performance to the reference system. The test is calibrated so that the reference system achieves a result value of 1000 for each test and index. If your system achieve values higher than 1000, then it performs better than the reference system. If the values are lower, the performance is not as good as the reference system. As stated above, this will give you an estimation if your system is fast enough to serve images for a medium sized website. If the results show that one of the performance indices is not satisfying, a detailed look into the systems hardware configuration might be necessary. Here the detailed results of the single tests might turn out to be helpful in finding bottlenecks. In general, if you are unsure if your system can handle the expected load, then please contact your local reseller or NeptuneLabs directly before putting the system into production.

3.3 A note on virtualization

FSI Server is an image processing application and therefore usually has higher resource requirements as an ordinary webserver. The benchmark can help estimating the hardware's performance. On virtualized systems where the host system is not under your control this is a problem as there is no way of knowing what other processes are running or might be running on the hardware in parallel in the future. Running the benchmark in such an environment will not produce results of any significance. Running FSI Server on shared hardware is therefore not recommended.

If virtualization is for administrative purposes only and you have full control over the host system and the resources assigned to the guest system, then the benchmark can be used as stated and the results can be interpreted accordingly.

4. Configuration

FSI Server consists of two core components: the **source manager** that imports images into the internal storage and the **request processor** that delivers images and metadata to the web. The two components have separate configurations. FSI Server

can be configured by manually editing the XML configuration files or through a web-based graphical interface using FSI Administrator.

4.1 Configuration Tasks and Preconsiderations

Basically FSI Server is delivered with a configuration suitable for most use cases. The default configuration was carefully chosen to minimize the necessary adaptations. To start using FSI Server, all that needs to be done is install the licence key, create a user account and define a source connector, which includes the path to your images.

As mentioned above, FSI Server imports the provided images into its internal storage. This import process converts and scales the source images which uses a considerable amount of the system resources and, depending on the amount and size of the source images, may take quite a long time. Due to the internal storage architecture the images in a source connector will be re-imported if the source connector is renamed. Choosing the correct name right from the beginning is therefore advisable.

4.2 Users, Groups, Permission Sets and Source Connectors

FSI Server uses group based rules to define the access permissions to certain files and directories. Every user belongs to one or more groups and every group has certain permissions restricting its members access to a source connector. The permissions are summarized in a "permission set" and every group source connector assignment references a permission set. Depending on the licence obtained, the number of groups may be limited.

Furthermore, FSI Server has two predefined access levels to further distinguish the users role in the system.

Normal Users: Normal users can access image data according to the group based permissions described above.

Administrators: Administrators have full access to all source connectors.

To clarify the relationship between users, groups and permission sets, here is an example configuration. The source connector "Samples" has two group relations:

group "users" with permission set "rw":

Every user in the group "users" has full access to the content and can view, list, upload and delete contents.

group "public" with permissionset "public":

Every anonymous user can access image data, image metadata and list the images in a folder.

By default the users and groups, just like all other settings are defined in XML files. FSI Server 3 also allows providing group and user information using an external LDAP Server as well as using a Kerberos Server for authentication. If configured to do so, then all local user and group declarations will be ignored and editing user and group information via FSI Administrator is disabled.

4.2.1 Permission Sets

A permission set is a named set of authorizations. In detail these authorizations are:

imageread:	access images
inforead:	access image metadata
imagelist:	list images in a folder
dirlist:	list subfolders in a folder
protectedtemplates:	access metadata using protected templates
protectedrenderers:	access images using protected renderers
upload:	upload files and create folders
delete:	delete files and folders

Please note: replacing or renaming an image requires upload as well as delete permission. There are three default permission sets called "public", "r" (read) and "rw" (read/write) which should cover most use cases:

	public	r	rw
access images	•	•	•
access metadata	•	•	•
list files	•	•	•
list folders	-	•	•
protected templates	-	•	•
protected renderers	-	•	•
upload	-	-	•
delete	-	-	•

4.2.2 Groups

There are two default groups called "users" and "public". These are considered special groups and like the default permission sets they cannot be modified or deleted. All users are by default member of the "users" group, this for example is useful to share a sample image folder. The

"public" group is used to specify the access permissions for anonymous users (normal website visitors).

4.2.3 Connectors

A source connector defines a directory and a set of rules on how to import this directory into FSI Servers internal storage. All images in this directory and its subfolders will be imported and (depending on the access permission) are then available via FSI Server under the source connectors name. The source connector declaration defines which group or groups have access to the directory contents by assigning a permission set.

As of version 3 of FSI Server there are two new source connectors types that allow access to assets and images without the need to import them.

The source connectors type "multiresolution" provides the ability to upload multiresolution tiff or fpx files and accessing these directly using the same URL-syntax as you would for imported images. This feature is primarily aimed at customers with a large stock of multiresolution images. More on multiresolution compared to storage source connectors can be found in *section 4.5.3*.

The other new source connector type "static" allows managing and serving arbitrary assets, which can be addressed via a simple URL. More on addressing static content can be found in part II section 8.2 of this manual.

4.3 User Preferences

Preferences are environment variables that influence the behavior of the FSI Server web interface. Preferences can be set to apply to all users or to a single user account. Preferences can be set for all users or for a single user. If a preference is set for all users and also set for a single user, the value set for the single user will override the value set for all users. Once set the preferences will apply as soon as the user logs in to the webinterface.

In the current version of the webinterface delivered with FSI Server 3 the following preferences can be set to modify the code snip generation in the "Publish to web" interface:

viewerPath: Defines an alternate path to the FSI Viewer installation used. If this is set the FSI Viewer in this location will be used instead of the default viewer.

proxyURL: Defines the proxy or FSI Cache used to publish images.

proxyServerPattern: Redefines the path prefix in the proxy (FSI Cache profile name) used to access images and metadata.

proxyViewerPath: Redefines the subdirectory where the default FSI Viewer

can be found on the proxy.

proxyJSPath: Redefines the subdirectory where the JavaScript helper files like fsiwriter can be found.

proxyUserViewerBase: Redefines the first part of the path to the user based FSI Viewer used to retrieve the viewer via the proxy.

If a preference is set for all users and also set for a single user, the value set for the single user will override the value set for all users. Once set the preferences will apply as soon as the user logs in to the webinterface.

4.4 Configuration using FSI Administrator

To use FSI Servers graphical configuration interface, you need a connected FSI Administrator. For details on installing FSI Administrator and connecting to an FSI application please refer to the FSI Administrator manual.

Once connected, you can enter the FSI Server configuration interface by clicking on the FSI Server logo in the "My Software" tab in FSI Administrator.

The every-day tasks are grouped in the "Common Tasks" menu. More complex tasks will be handled by wizards, which will lead through the task step by step. The more advanced and not so often used settings are accessible by choosing an entry from the "Advanced" menu.

4.4.1 Common Tasks

Often performed administration tasks have been grouped in the common tasks menu for quick access. Most of the interfaces for these tasks are self explaining but reading *Chapters 4.1 - 4.3* before starting is recommended.

New Account

The New Account Wizard will lead through the process of creating a new user account. It will also allow creating a new group and a source connector. The first step is to choose the account type. The following screens allow choosing a username and password and, if appropriate, a group, source connector name and an input directory.

If the FSI Server is configured to use Kerberos for authentication, then the request for a password will automatically be skipped in when creating a new account. An appropriate principle on the Kerberos server needs to be configured in order for the new user to be able to log in. If the FSI Server is configured to retrieve the user and group declaration from an LDAP server, then creating new accounts using this wizard is not possible.

Preferences

The preferences management is split into default preferences that apply to all users and preferences that apply to a single user only. When editing the preferences for a single user the default preferences are shown as well. For details on preferences in general *see section 4.3*.

FSI Viewer

Managing the FSI Viewer installations is a common task. It involves setting up an extra FSI Viewer for a specific user or managing FSI Viewer skins. Installing and FSI Viewer for a single user will copy the default viewer to a user specific directory and set a user preference so that the new FSI Viewer location will be used in the publishing dialogs. Removing a user FSI Viewer will delete the users copy of FSI Viewer. This will break all already published codesnips and should therefore only be done by experienced users. Skins can be uploaded or deleted for all copies of the FSI Viewer, the default as well as the user viewers. In very rare occasions, when a custom skin is used that involves more files than normal skins, manual deletion of files may be necessary. For backup purposes the FSI Viewer management interface allows downloading a zip of a complete FSI Viewer installation directory.

Licences

All licences, the FSI Servers own licence as well as the client application licences can be managed in one interface. The interface will show a list of all installed licences and allows uploading new licences as well as replacing or deleting licences. As of version 3 of FSI Server the licences can also be managed directly in the FSI Server webinterface by users with administrator permissions. More on managing licences using the webinterface can be found in *chapter 5*.

4.4.2 Advanced Configuration

Administration tasks that need to be performed only once for the initial configuration and settings that are necessary for special use cases only are grouped in the "Advanced" menu.

Request Processor Settings

The request processor settings interface allows editing the configuration of the server component and provides access to the renderers. A detailed description of the parameter values can be found in the interface help texts accessible by pressing the right mouse button or in *Chapters 4.5.7. and 4.5.8*.

Source Manager Settings

The source manager settings interface allows editing the configuration of the source manager and provides access to the source connectors. For a detailed description of the available settings please refer to the

interface help texts accessible by pressing the right mouse button or *see chapters 4.5.2. and 4.5.3.*

Users

This section allows managing user accounts. Creating accounts is possible but using the new account wizard mentioned above should be preferred. If FSI Server is configured to retrieve the user and group declarations from an LDAP Server, then this section will only allow to list the users.

Groups

The groups interface allows creating and deleting groups. It also allows assigning users to groups or removing them from a group. For a description of groups in general please *see chapter 4.2.2.* If FSI Server is configured to retrieve the user and group declarations from an LDAP Server, then this section will only allow to list the groups.

Permission Sets

As described in *Chapter 4.2.1* permission sets are used to define the operations a group member is allowed to perform on a certain source connector. This interface allows creating new permission sets from scratch, creating copies of existing permission sets as well as deleting permission sets. Permission sets currently in use can not be deleted.

Server Cache

FSI Server uses an internal memory cache to increase performance. The memory cache is not persistent and will be cleared on every FSI Server restart. This interface shows the current cache usage and allows deleting the cache without restarting the server.

Search Database

FSI Server 3 no longer uses an embedded database for searches. Instead it can be configured to use an external Apache Solr server to index the asset metadata and provide search functionality. By default the search is correctly configured to use the packaged Solr instance in the Windows installer version. In the platform independent version the search is disabled. In order to enable the search you will need to specify the location of the Solr server. More on setting up a Solr server for use with FSI Server, please refer to the extra documentation on this subject provided by NeptuneLabs.

4.5 Manual Configuration

As mentioned in the introduction to this chapter FSI Server can be configured manually by editing the XML configuration files.

4.5.1 Location of the configuration files

The location of FSI Servers configuration files depends on the type of setup you choose. This directory is referred to as [CONFIG DIRECTORY] in the following chapters.

- a) Platform independent installer

Using the platform independent installer the location is:

```
[webapps]/fsi/WEB-INF/config
```

- b) Windows installer

Using the Window installer the location is:

```
[SETUP DIR]\FSI Server\configuration\fsi-server\config\
```

FSI Server also supports using a custom configuration directory which allows easier updating when placed outside of the applications context. If the system property *com.neptunelabs.fsiserver3.config.home* is set, its value is interpreted as an absolute path and will be used as the configuration directory. The system property can usually be set by using the -D option in the application servers startup parameters. e.g. *-Dcom.neptunelabs.fsiserver3.config.home=/etc/fsi/fsi-server*.

4.5.2 Source Manager settings

The source manager settings define the general behavior of the source manager which synchronizes the original source images with the internal storage. The source manager settings are located in [CONFIG DIRECTORY]/sourcemanager.xml. This file is split into six main sections:

Application

The application section defines general settings for the source manager. By setting the enabled attribute to false the source manager can be disabled completely.

Storage

Specifies the location of the internal storage. The given directory should exist and should be writeable by the user running the application server. If a relative path is given it will be interpreted as being relative to the web applications WEB-INF folder. This setting should be identical to the storage setting in the server settings (see 4.5.7)

Maxcpu

The maximum number of threads running in parallel to use for CPU heavy internal tasks like scaling and encoding. "Auto" will determine the number of CPU threads available on the system.

MaxIO

The maximum number of threads running in parallel to use for IO heavy tasks like reading image tiles from the disk.

MaxThreadsPerJob

Defines the maximum number of threads that will be used for a single job.

Importstrategy

The import process can consume a lot of system resources. This parameter allows you to select the normal server use case, which influences how many threads will be used to import images and with which priority these threads will run. The actual number of used threads will depend on the amount of memory, the number of CPU cores and the "maxcpu" setting. Possible values are:

BACKGROUND: All import tasks will be performed with minimum priority trying to have as less impact on other processes as possible. Use this when there are additional time critical applications other than FSI Server installed.

SHARED: This is the optimal value for most FSI Server setup and tries to share to the system resources between the source manager and the renderer.

STANDALONE: The standalone setting tries to optimize the source manager behavior for servers that are dedicated to importing. This setting might cause a lot of i/o operations that might slow down other processes delivering content.

Parallelread, parallelwrite, parallelreadwrite

These parameters allows controlling the servers internal file io controller mechanisms and should only be changed if you are absolutely sure what you are doing. The default settings are the optimal for most situations. Parallelread enables parallel file reading operations, multiple files can be read in parallel, the default is true. Parallelwrite allows writing multiple files at the same time. This results in higher load on the io subsystem as, in theory, the hard discs head needs to perform more positioning operations compared to serialized file writing. The default settings for parallelwrite is false. Parallelreadwrite enables reading options to take place even if there are writing operations taking place. The default setting for this parameter is false.

Standalone

Allows or disallows an FSI Administrator instance to connect to this FSI Server. Note that setting standalone to false and not connecting an FSI Administrator may be a security risk. Please refer to the FSI Administrator manual for a detailed description.

Tempdirectory

Specifies the directory used to store temporary files. This will default to "WEB-INF/internal/temp" if nothing is specified.

Userdb

Defines whether to use user and groups configurations from local XML files or from a (remote) LDAP Server. Possible values are "xmlfile" (default) and "ldap".

LDAP Settings

If the above configuration parameter "userdb" is set to LDAP, then the access to the LDAP server needs to be specified. The parameters "LDAPUri", "LDAPUser", "LDAPPassword" and "LDAPBaseDN" define where to find the LDAP Server, how to log in and which Base DN to use. Details on the required directory structure beneath the given base DN can be found in Appendix G.

useKRB

Defines whether to use an external Kerberos server for authentication instead of using the password hashes from local files or LDAP servers. When using Kerberos, then the operating systems Kerberos client configuration needs to define the correct realm and KDC Location. Please see Appendix H for details on configuring your system as a Kerberos client.

Scanner

The scanner section controls the behavior of the scanning process, which monitors the input directories defined in the source connectors. Setting the scanner sections enabled attribute to false, will disable the scanning process. New images placed in the filesystem will not be found and must therefore be uploaded using the webinterface or the OpenAPI.

Sorting

This specifies if the contents of a directory should be sorted before it is processed. Enabling sorting will help that new images in a folder will be imported in the correct order. Sorting the directory contents on every scan might have an impact on the servers performance, especially with large directories.

Convertbefore1stscan

If set to true the FSI Server will start importing images immediately. If not, then newly found images will be enqueued but not imported before the first full scan after a restart of the server has been completed.

Search

The search section defines where to find the external Solr server. These should match the settings of the request processor component as described in 4.5.7.

SolrServerURI

Defines the URI specifying where to find the Solr server. The default is "http://localhost/solr".

Core

Specifies the Solr core to use. Defaults to "fsi-server-3".

Authentication

Specifies whether the Solr server requires authentication. The default is "false".

AuthenticationType, AuthenticationUsername, AuthenticationPassword

Define the authentication type and login credentials. Only applied if authentication is enabled. The default type is "basic", username and password have no defaults and must be specified.

Proxy

Specifies whether or not to use a proxy to connect to the Solr server. The default is "false".

ProxyHostname, ProxyPort, ProxySSL, ProxyAuthentication, ProxyUsername, ProxyPassword

Specify the parameters to connect to the proxy.

ConnectionPoolMax

Defines the maximum number of connections to the Solr server. The default is "500".

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>
```

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 `<file>` nodes containing names of files that should be skipped while scanning.

Ping Service

This section contains a list of `<address>` nodes defining the remote ip addresses or hostnames allowed to access the Ping service.

4.5.3 Source Connectors

The source connectors are defined by files in the `%[CONFIG_DIRECTORY]/connectors` directory of the FSI Server installation that end with the suffix `.xml`.

Enabled

The enabled node allows enabling and disabling a source connector. A disabled source connector 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 deleted.

Type

This setting defines the type of the source connector. The three supported types are:

"storage": Images found in the source directory will be imported into the internal storage. All other filetypes will be ignored and will not be accessible via FSI Server.

"multiresolution": Tiff and FPX files in the source directory are treated as multiresolution images, allowing image requests without the need of importing the images into the internal storage.

"static": Any file stored in the source directory is accessible via FSI Server. The files will not be imported and will all be treated equally regardless of their type. This means image-requests are not possible even though it might be an image file.

If the type-setting is omitted the source connector will be of type "storage". For more information, especially on when to use multiresolution instead of storage, please see appendix F

Origin

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

Accessor

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

Location

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

ReadOnly

If the readonly option is enabled uploading or modifying the source connector directory content via the webinterface is prohibited.

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. This section is only relevant for source connectors of the type "storage".

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

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

LevelQuality

Different prescaled zoom levels are stored, within FSI Servers internal storage. This parameters allows finetuning these zoomlevels. Possible values are:

- NORMAL: each level is half the size of the previous level.
- HIGH: each level is 2/3 the size of the previous level.
- ULTRA: each level 2/3 the size of the previous and every levels image data is always calculated from the originating image.

The normal setting uses less disk space than high or ultra and ultra will significantly increase image import time.

Access

This sections assigns groups and permissionsets to the source connectors (*see section 4.2* for details). Every entry in this section must be a `<group>` node with the attributes name and permissionset, e.g. `<group name="users" permissionset="rw" />`

4.5.4 Permission Sets

Permission sets are defined in `[CONFIG DIRECTORY]/permissionsets.xml`. Each permission set is defined by a `<permissionset>` node.

The name of the permission set is set using an attribute called "name". Every permission set node must have six childnodes named "imageread", "inforead", "imagelist", "dirlist", "upload" and "delete", referring to the permissions described in 4.2.1 Each of these nodes can have a value of "true" or "false". If the `permissionsets.xml` is not present on the system, then only the three default permission sets will be used.

4.5.5 Groups and Users configured locally

If FSI Server is configured to used local user and group declarations, the groups are defined in `[CONFIG DIRECTORY]/groups.xml` and the users are defined in `[CONFIG DIRECTORY]/users.xml`. Each group is represented by a node called `<group>`. The group name is specified by an attribute called "name". For every user belonging to a group, the group node needs a child node called `<user>` with the users loginname as text value.

In the users configuration file, every user is represented by a `<user>`-node. The username (login) is defined in the attribute "name". The password can be provided as plain text in an attribute called "plain" or as a SHA-256 hash in an attribute called "hash". If the FSI Server is configured to use a Kerberos Server for authentication, then the password declarations here will be ignored. A third attribute called "accesslevel" defines the users role in the system. The access level can be set to one of the two possible values according to the levels described in 3.2.:

"normal": for standard users.

"admin": for administrators.

4.5.6 Groups and Users configured using LDAP

The user and group declarations can be moved to an LDAP server instead of storing them in local files. Together with the Kerberos authentication

this allows a tighter intergration into existing system environments and provides the possibility of using external third party tools for user management. The basic access to the LDAP Server needs to be configured in the Source Manager settings (see 3.5.2 for details). The required structure of the data within the LDAP Server is described in Appendix G. As with locally configured user, the actual authentication can be handled by the FSI Server, if the password hash is stored within the LDAP tree or by specified Kerberos Server.

4.5.7 Request processor settings

The request processor settings are defined in [CONFIG DIRECTORY/settings.xml]. This file has four main sections called application, search, limits and cache. These sections define general settings for the request processor component and allow disabling the component completely.

Application

The parameters in the application section contain basic configuration options of the server component. The server component can be completely deactivated by setting the enabled attribute of the application tag to false.

Storage

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

ServerTokens

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

Source Manager

This setting tells the real-time component where to find the source manager. This is used to request the source manager to prioritize a specific image that is currently in the import queue.

Copyrightnotice

This allows defining a customized string that will be embedded into the headers of the images delivered by the server. This allows identifying the images generated by FSI Server.

Search

The search section describes how to access the database containing the search data gathered by the source manager. The settings in this section should match the settings in the search section of the source manager configuration.

Limits

The limits section allows defining global default and max values that will be applied to incoming requests.

MaxWidth, MaxHeight

Define the maximum allowed values for width and height. These values can be overridden for specific server profiles by defining other values in the server profile configuration.

DefaultWidth, DefaultHeight

Define the default image dimensions that will be applied if there are no dimensions provided in the request parameters. These values can also be overridden on a per profile basis.

DefaultProfile

Defines the profile to be used if no profile parameter is given in the request.

Cache

By default the request processor will use the same cache configured for the source manager component. The settings here only apply if the cache for the source manager of the source manager itself is disabled.

"MaxMemory"

The maximum amount of memory to be used by for the memory cache. The value is assumed to be given in bytes unless followed by one of the common abbreviations (KB, MB, GB etc)

"MaxThreads"

Specifies how many threads usually access the cache simultaneously. This helps optimizing the caches internal organization and therefore can improve performance. Set to "auto" if uncertain.

"DirectMemory"

Specified wheter to use direct memory or heap space to store the cache. The default is "false".

4.5.8 Renderers

Renderers allow defining default values or restrictions that apply to every incoming request. Every request is processed using the rules in a renderer. If no renderer name is given in the HTTP parameters, the default renderer will be used. A renderer defines how to render an image or a meta data response, which default values the image renderer will use and which file format is returned. The renderer name is given by the filename. Each `renderdefinition` may include up to six sections:

Image Renderer (`<imagerenderer>`)

Defines the renderer to use when an image request is directed at this profile and which default values and limits apply when rendering the image. The renderer to use is selected by specifying an "implementation" node which contains the class name of the renderer. If the "implementation" node is omitted then the default renderer will be used.

Depending on the chosen renderer implementation further nodes may define parameters for the renderer.

Info Renderer (`<inforenderer>`)

Currently only the default info renderer is delivered with FSI Server, therefore this node can be omitted. List Renderer (`<listrenderer>`). Currently only the default list renderer is delivered with FSI Server, therefore this node can be omitted.

OutputEffects (`<outputeffects>`)

This optional section provides the ability to define output effects that will be applied to every image accessed via this profile. Effects are defined by a list of `<effects>` tags containing effect commands using the same syntax as in image URLs. ✂ See chapter 9.

OutputCompression (`<outputcompression>`)

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

Compressor

Specifies the output file format, one of JPG, PNG, GIF and SWF.

Quality

Defines the default jpeg compression quality. Please note that requests containing the quality parameter can override this setting. The setting applies to JPG and SWF only.

Chroma Subsampling

Defines the chroma subsampling parameter used to encode JPG images. Possible values are: "4:4:4", "4:2:2" and "4:2:0". This setting applies to JPG and SWF only.

Compression Level

Defines the compression level used when encoding an image as PNG. Possible values range from 0 to 9.

Compression Filter

Defines the pre-compression filtering method used when encoding an image as PNG. Possible values are "none" and "sub". This setting only applies to PNG output.

Colorspace

Defines the colorspace of a PNG output image. Values: "rgb" or "gray".

Embed ICC

Defines whether to embed the used ICC profile into the output image. This setting applies to PNG and JPG output only.

Encoding

Defines whether to send the output image to the client as base 64 encoded data or not. Possible values are "image" and "base64".

5. Licensing

An unlicensed copy of FSI Server is nearly fully functional but all images delivered will contain watermarks. To purchase a licence please contact your local reseller or NeptuneLabs directly. A trial licence can be requested in the Licence-Tab when logged in to the webinterface as administrator. When you have acquired a licence, then this can be installed by either copying it into a file called `licence.xml` and placing this into the `[CONFIG-DIRECTORY]` of your FSI Server installation or by simply using the "Check for new licence" button in the webinterface.

Depending on the licence obtained, limitations apply regarding the number of assets hosted on the server as well as the number of groups and source connectors. A licence can also contain an expiration date. If any of these limitations are exceeded, all images delivered by the server will again contain watermarks. In this case please contact your reseller or NeptuneLabs to upgrade or extend your licence.

Furthermore, the JMX support and the batch rendering capability are enabled or disabled depending on the licence.

Every licence key is bound to the hardware it was created for. Changing essential parts of the server hardware will invalidate the licence key. In that case please request a new key from NeptuneLabs or via the licence tab in the FSI Server web interface.

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 `[CONFIG DIRECTORY]/`

directory of the applications installation directory. The server uses three loggers that can be configured independently. The first logs the activity of the source manager, the second logs the request processor 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 the logging configuration please see the log4j website at <http://logging.apache.org/log4j/>.

7. Templates

Responses to metadata requests for directories and files are rendered using templates. The response type and the content of the response can be modified by overriding the default templates or providing own custom templates. The templates delivered with FSI Server are located in WEB-INF/internal/templates. These should not be modified or overridden as they are required by the Webinterface and NeptuneLabs client applications like FSI Viewer. Own custom templates can be placed in [CONFIG DIRECTORY]/templates/ in the subdirectories list or info. A template must end with the suffix.ftl and is addressed by the tpl parameter in the metadata requests (see part II, section 7.7). The templates are rendered using the freemarker template engine, documented at <http://www.freemarker.org/docs/>.

NeptuneLabs FSI Server

Part II • User Documentation

1. Getting Started

FSI Server includes a web interface allowing easy access to most of the servers features. Due to the intuitive 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://your.fsi-server.com/fsi>

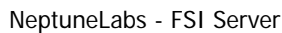
FSI Server is set up to provide real-time web access to images placed within a directory structure. It is also possible to store and manage digital assets on the FSI Server. Unlike any other imaging server, the server component merely requires read access to the directory. This guarantees the integrity 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 web interface 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 consists of 3 main sections: tree view, file view and working area. The size of these sections can be changed by dragging the splitter bars between the sections. 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*.



3. Logging In

When accessing the interface URL at <http://your.fsi-server.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 username: admin / password: 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*.

3.1 Tree View

The tree view contains tabs for browsing the folder structure and for searching. On the bottom of the tree view the type of the selected folder is visible (Root Directory, Source Connector Types: Storage, Static or Multi Resolution) as well as the public access permissions and total amount of files contained in the selected source connector.

The following source connector types are possible within the root directory:

Static: (for static files only, i.e. digital assets such as videos, zips, pdf and all other document formats)

Storage: (images will be imported to the storage for high performance Single Source Imaging)

Multi Resolution: (profile contains multi resolution TIFF files only)

New source connectors can be set up via FSI Administrator interface, as well as the administrative privileges (read only, write, etc) and user profiles. It is also possible to determine different **public access permissions** for each folder, which are visible at the bottom of the tree view.

Public File Access: When this option is enabled, all files can be accessed without authentication.

Public Metadata Access: With this option, the metadata can be accessed without authentication.

Public File List Access: If this is enabled, public users can access the file list of the selected folder.

Public Directory List Access: With this option, the sub directories list of the selected folder is visible without authentication.

Depending on the publishing option, the different public access permissions are required for publishing.

It is also possible for the administrator to define custom comments (e.g. what kind of files are recommended to put into a certain folder) for each source connector type, which will show up at the bottom of the tree view. These comments can be defined via FSI Administrator or an XML file.

3.1.1 Folder Tab

The "Folder Tree" shows the directory structure of the data stored on the imaging server.

At the top, the root directory name (server FQDN) is visible. The root directory contains all available Source Connectors on this specific FSI Server, listed below the root directory. Branches can be expanded or collapsed by clicking on the + or – buttons in front of the folder name. Selecting a connector will show the folders contents in the file view. Three special folders contain shortcuts to favorite folders, the recycle bin and the download files.

The root directory also contains the following fixed connectors:

FSI Viewer: Here all data which is needed for the FSI Viewer software is stored. Connector type: Static (you can upload XML and skin files for your FSI Viewer here)

Service Files: contains documentations related to FSI Server and FSI Viewer. Connector Type: Static

Service: Contains images required for FSI Software, like the instructions on FSI Pages mobile and fallback pictures. Connector type: Storage

Samples: Contains sample pictures. Connector type: Storage

Right-clicking on an entry will display a context menu providing access to available commands for the selected source connector.

3.1.2 Search Bar

FSI Servers search tab provides an easy way to find specific files, especially with a large amount of files 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. If the Search Tab is not displayed in the webinterface then the search is disabled in the request processor settings. At the top of the search bar, a simple text input can be found. With typing keywords into the text input it is possible to search for items that have matching keywords in any data field. Alternatively search criteria using the search conditions below the input can be set up:

- Use the check box located directly under the input to limit the search to the current selected directory
- Use the check box to include or exclude a search condition
- Choose the desired data field of the condition
- Choose whether a condition should be equal or unequal. Some fields additionally offer the option to comparatively search items (less than, greater than).
- Enter the value for the search condition

To add another condition click the "Add Condition" button at the bottom right. To remove conditions, click the "x" button at the top right of each condition. Note that with using multiple conditions it is possible to define each condition as "mandatory" or "alternatively". "alternatively" means that the condition extends the range of possibly matched items. "mandatory" usually reduces the range of possibly matched items.

Example:

Condition 1	Condition 2
<i>mandatory</i> field: "File Suffix" "equal" value: ".jpg"	<i>alternatively</i> field: "File Size" "less than" value: "550kb"

These conditions will return all files with a ".jpg" file suffix and additionally all files less than 550 kb in size. Switching Condition 2 to "mandatory" would return all files with a ".jpg" file suffix that are additionally less than 550 kb in size.

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.

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 metadata.

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 (-).

3.2 File View

The "File View" shows the contents of the currently selected folder or the search results. 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 in the "View" tab, which is described in 3.4. 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 tree view, right clicking will open a context menu containing the available operations.

With the toolbar at the top several actions for managing files and directories are selectable via icons: Create Folder, Rename, Copy, Cut, Paste, Delete.

The sorting drop down menu allows sorting items by certain criteria. With the arrow button aside, the order of the chosen sorting feature can be changed. On the right of the sorting menu the appearance of folders and items within the file view can be changed. In order to change the sizing of thumbnails, either click on the smaller/larger thumbnail button to change the view or slide the thumbnail controller in the desired direction. The buttons group on the right switches between Page View, Thumbnail View and List View.

Similar to a browsers location bar, the toolbar 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 as a button to jump to the parent folder make navigating easier.

3.3 Log Out

Clicking the log out button closes the current session and takes the user back to the log-in screen. By clicking the arrow right beside the Log Out button, it is possible to either change the current password or to switch the user if currently logged in with administrator privileges, this enables administrators to view the interface from a users perspective.

3.4 Status Bar

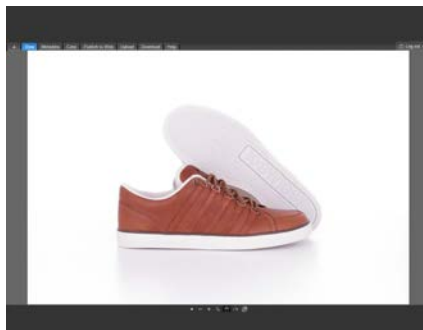
The "Status Bar" displays additional information related to the current folder including the last modified date, the number of images or directories. It also displays the currently logged in user in the bottom right corner.

3.5 Working Area

The "Working Area" mainly contains operations that can be performed with the selected items or items contained in the current directory as well as information relevant to the items. Operations are enabled or disabled depending on the selection.

View

The first tab View shows the selected image in an FSI Viewer instance in which you can use all standard features including a full screen option.



Metadata

The second tab "Metadata" provides access to all meta data available for the selected image. The metadata information is divided into General, IPTC, EXIF, and Custom data.

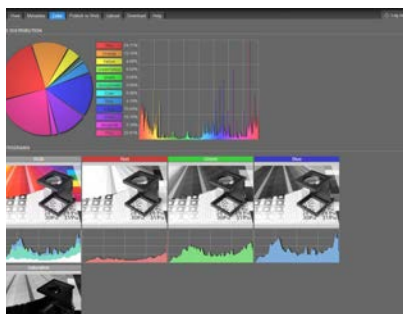
All metadata fields - except for those in the "General" group - can be edited, deleted or added. In order to change existing data, click on the corresponding field value and type in the desired value. By clicking the "Add data fields" button you can add IPTC, EXIF or custom data fields.

With all editable meta data (which are characterized by the check boxes in front of the data name), the options in the drop down menu located below the meta data can be applied. It is possible to choose whether to check or uncheck all editable meta data, to empty the values which are currently displayed in the data fields, to re-import meta data from the source file or to delete all selected fields. In order to do so, simply choose the desired action from the drop down menu and press the OK button. The changes will be saved automatically.

Color

The tab "Color" provides information on the dye distribution, color histograms, and the ICC Profile if applicable.

Dye Distribution: Both pie chart and histogram show the hue of each color in the image in percentage.

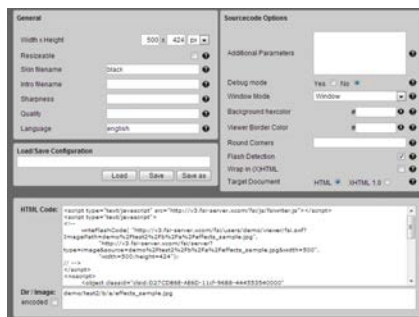


Histograms: Here the RGB, Red, Green, Blue and Saturation histograms are provided.

ICC Profile: The ICC profile is a color reference profile, which describes the characteristics of the device it corresponds to. They are used to enable the best possible color rendering and to provide color consistency independent of the device used. In this tab the media points (the color space which is used for the picture) as well as the profile data such as Description, CMM (color management module), manufacturer, creator and the creation date are visible. It is also the possible to download the profile in order to use it in further workflow.

Publish To Web

The "Publish To Web" tab is used to publish the image or directories as HTML Image, FSI TouchZoom, FSI Viewer, FSI Spin 360, FSI Pages or FSI Showcase. For a further explanation of this tab, please see chapter 5 – 7.



Upload

For a further explanation of this tab, please see 4.1.

Download

For a further explanation of this tab, please see 4.2.

Batch

For a further explanation of this tab, please see "4.3 Batch" on page 39

Licence

For a further explanation of this tab, please see 8.

Help

This tab provides an overview on how to use the web interface to manage and publish images.

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.

4. 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 organize large amounts of images.

4.1 Uploading

Depending on the type of the selected source connector, it is possible to upload different types of files. There are several possibilities to upload images into the interface:

- Choose the Upload tab, click the "Choose files" button to add files to upload to the list. The files will be uploaded to the current folder.
- Drag & Drop files from your explorer to the file view or the tree view. Please note that it is not possible to drop folders into the upload area. In this case it is necessary to zip the folder beforehand.

The upload starts immediately once files are added. It is possible to pause or continue the upload by using the pause upload button and to remove all files in the upload list.

4.2 Downloading

There are several possibilities to download images from the interface:

- Drag & Drop files or folders from the file view onto the "Download" tab or
- Select items in the file view and choose "Add to download archive" from the context menu.

Once all files are collected, it is possible to choose the Download Configuration using the "Download as:" drop down menu.

You can optionally schedule the download start to a specific time and choose a file name. Clicking the "OK" button starts the creation process and adds the download to My Downloads folder of the root directory.

4.3 Batch

There are several possibilities to download batch processed images from the interface:

- Drag & Drop files or folders from the file view onto the "Download" tab or
- Select items in the file view and choose "Add to download archive" from the context menu.

Once all files are collected, it is possible to choose the Download Configuration

using the "Download as:" drop down menu.

The Download Configuration determines how the files will be archived and whether a batch rendering for the images to download should be executed.

Click the "Options" button to modify or add a Download Configuration. Within the Download Configuration, the Configuration name and type of archive (ZIP, tar.gz, tar.bz2) can be chosen. When deciding to download processed images, it is possible to choose if the file extensions should be replaced or appended.

It is also possible to set the **Rendering Query Parameters** in the configuration box, which can be generated interactively in the Publish to Web Tab choosing the HTML Image section, where various effects can be added as well as cropping the image and seeing the preview of the processed image. (see: 5.1). After finishing the choosing of the operations which should apply to the images, the Rendering Query from the "Publish" tab can be copied.

The creation of the download can be optionally scheduled to a specific time and the file name of the archive can be defined. Clicking the "OK" button starts the creation process and adds the download to My Downloads folder of the root directory.

4.4 Deleting

Folders and images can be deleted by selecting the appropriate item in the file view and clicking the delete icon in the file view bar or by opening the context menu of the item and then clicking delete. The deleted items can be found in the Recycle Bin folder in the tree view, where it can be decided if you would like to delete the file permanently or if it should be restored.

4.5 Moving and Renaming

Folders and images can be renamed by selecting the item in the file view 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.

It is also possible to move the folders via drag&drop to the desired destination.

5. 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

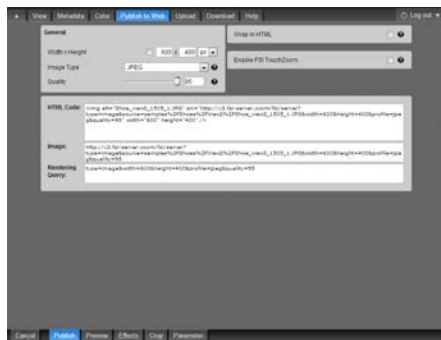
interactive zoomable image using FSI Viewer as well as using FSI TouchZoom for touch devices. The publishing dialogs can be accessed by selecting a single image in the file view and choosing a "Publish as HTML image" or "Publish as FSI Viewer" option from the "Publish To Web" tab.

5.1 HTML Image

The "Publish as HTML Image" helps assembling a URL, which can be used directly in an 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. 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. With this Publishing Option, it is also possible to publish zoomable images for mobile devices via FSI TouchZoom. In order to activate the zoom, check "Enable FSI TouchZoom" within the HTML Image Publish tab. **Publish Tab**

The "Publish" tab provides access to the basic image options like image size and image type.

Furthermore, it is possible to activate the FSI TouchZoom for touch devices with the corresponding check box. It also contains a text field containing the HTML code snippet assembled from all the settings made in the various tabs.



Preview Tab

The "Preview" tab shows a preview of the published image, with all effects and parameters applied. The preview size may be limited to the current size of the working area window.

Effect Tab

The "Effect" tab allows adding real-time image effects to the resulting image. Click on the desired effect in order to select it. Apply the effect on the picture by pressing the arrow button in the middle while the effect is selected (alternatively you can double click or drag the desired effect). You can adjust the options of the effect or delete it in the right column below the preview image. If more than one effect is applied, it is also possible to change the processing order of the effects by dragging the effect to achieve

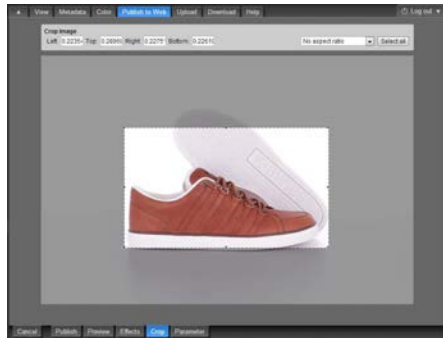
the desired sequence. Please note that overlays are always processed last and that the order of this effect cannot be changed.

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.

Parameter Tab

The "Parameter" tab shows parameters which can be used to configure the FSI TouchZoom.



5.2 HTML Zoom

The "HTML Zoom" section guarantees when pinch zooming into a website containing single source images provided by FSI Server, the images will be displayed in the resolution matching the current magnification.

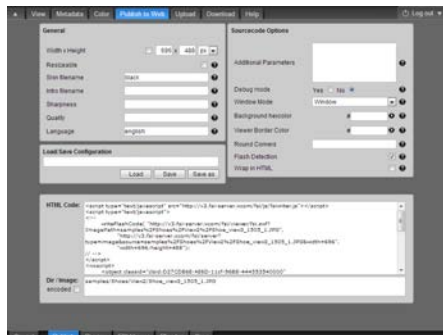
5.3 FSI Viewer

The "Publish as FSI Viewer" section allows choosing between four commonly used presets. By clicking on "more", more customized presets can be accessed. Choosing a preset will open the FSI Viewer publishing dialog that provides access to all FSI Viewer parameters and plug-ins.

The publishing dialog contains six tabs grouping the FSI Viewer publishing options and parameters as well as the Hot Spot Editor.

Publish Tab

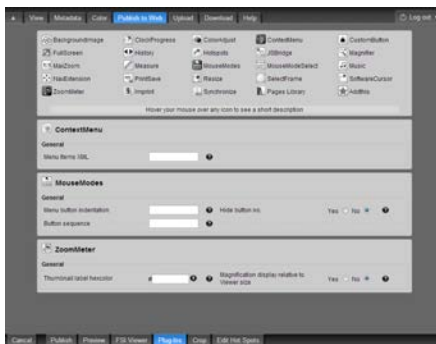
The "Publish" tab provides access to the basic FSI Viewer and HTML source code options like Viewer size and language. It also contains a text field containing the HTML code snippet assembled from all the settings made in the various tabs. It is also possible to load and save



Plug-Ins Tab

The "Plug-Ins" tab not only allows to activate and deactivate the various FSI Viewer plug-ins and 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 containing this plug-in parameters. For a detailed description of all available FSI Viewer plug-ins 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.

Edit Hot Spots

The "Edit Hot Spots" tab provides access to the hot spot editor. It is possible to choose between Default Options and the Hotspot tab, where e.g. the color, target and behavior of the tool tip can be determined. In order to draw a hotspot on the image, the shape library button or the freehand drawing tool on the bottom right can be used. Hotspot can also be saved, tested and deleted in this tab.



6. Publishing Image Collections

Image collections can be published by placing the desired images into a folder and publishing the folder. Collections are used for 360 object presentation, FSI Pages (as well as mobile) and FSI Showcase. A folder can be published by navigating into the folder and selecting an FSI Viewer 360°, FSI Spin360, FSI Pages, FSI Showcase or FSI ImageFlow preset from the "Publish To Web" tab.

6.1 FSI Viewer 360

Publishing a collection as FSI Viewer 360 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 with FSI Viewer. Please refer to section 5.2 for details.

6.2 FSI Spin360

FSI Spin360 is an HTML5 and JavaScript based tool to display 360° Object spins on touch devices.

Publish Tab

Within "Publish Tab" general options such as width x height and the possibility of zoom can be set. The display options provide access to options like changing the background color of the spin or the menu bar color. It also contains a text field containing the HTML code snip assembled from all the settings made in the various tabs. It is also possible to load and save customized presets within this tab. Please make sure not to overwrite configurations which are in use.

Parameter Tab

This tab shows parameters which can be used to configure the FSI Spin360. e.g. the Hotspot and Video parameters.

6.3 FSI Pages and FSI Pages mobile

Choosing an FSI Pages preset for a collection will activate the FSI Pages add-on. The collection will be presented as a 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" as well as the "Edit Hyperlinks" tab.

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.

The FSI Pages publishing interface is also used to publish image collections with FSI Pages mobile. The publish tab contains code snippets for both FSI Pages and FSI Pages mobile.

Edit Hyperlinks

The "Edit Hyperlinks" tab provides access to the hyperlink and overlay editor for FSI Pages. It is possible to choose between Standard mode (normal catalogue view), Link mode (edit links) or Overlay mode (edit or add overlays such as videos or icons).

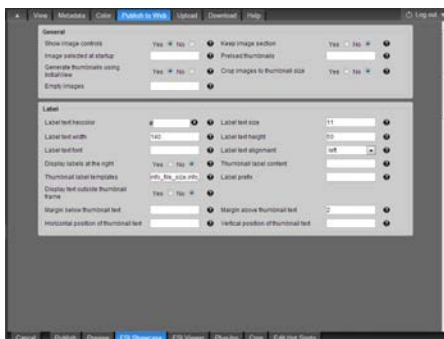


6.4 FSI Showcase

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.



6.5 FSI ImageFlow

FSI ImageFlow is a Javascript based image carousel with optional image zoom which can be used on touch devices.

The "Publish as FSI ImageFlow" section allows choosing between three presets. By clicking on "more", more customized presets can be accessed.

Publish Tab

Within "Publish Tab" general options such as width x height, the possibility of zoom and the image type can be set. The display options provide access to options like changing the background color of the carousel or the element

width. It also contains a text field containing the HTML code snippet assembled from all the settings made in the various tabs. It is also possible to load and save customized presets within this tab. Please make sure not to overwrite configurations which are in use.

Effects

The effects tab is identical to the effects tab for publishing a single image. For more information please refer to section 5.1.

Parameter Tab

This tab shows parameters which can be used to configure the FSI ImageFlow, e.g. color parameters and miscellaneous parameters such as mirror height and background darkness.

6.6 Animated GIFs

FSI Server can automatically create GIF animations from multiple still images. To do so, select the folder containing the source images in the File View and choose the "Publish as HTML image" from the Publishing Tab in the Working Area. The output format will be automatically set to "GIF". The publishing options are described in section 5.1. Please note that gif animations can only be created from equally sized images. The first image in the selected folder will be used as reference image for the size and the indexed color palette. All following images will only be added to the animation if the size matches the reference image.

7. Publishing Stereoscopic images

FSI Server supports real-time generation of stereoscopic 3D images, since version 2. The only things required are two source images of the same object, taken from slightly different angles. The two source images can be published as one plain stereoscopic image or as an FSI Viewer instance, allowing the user to zoom into the image. Two sets of source images can be published as an FSI Viewer 360° spin instance, if they are placed into separate directories.

7.1 Publishing a single stereoscopic image

Selecting two images with the same dimensions in the file view enables the "HTML Image 3D" option in the "Publish To Web" tab. Selecting this option brings up a publishing dialog similar to that used for publishing a standard HTML image (see 4.1). The dialog has three additional parameter fields in the publish tab, allowing to select the type of 3D glasses by specifying the lens colors for the left and right eye as well as choosing a desaturation effect to increase the 3D impression.

7.2 Publishing a stereoscopic image in FSI Viewer

Selecting two images with the same dimensions in the file view also enables the "FSI Viewer 3D" option in the "Publish To Web" tab. Here too, the resulting publishing dialog will be identical to the standard "Publish as FSI Viewer" dialog with the three additional fields described in the chapter above.

7.3 Publishing stereoscopic images as FSI Viewer 360

Selecting two directories containing the same number of images with the same dimensions in the file view will enable the "FSI Viewer 3D 360°" option in the "Publish To Web" tab. This option opens the FSI Viewer 360 publishing dialog with the additional parameter fields as described above

8. Licence

Licence Information

PID	FSI3.XXXX.XXXX.XXX.XXXX
Edition	FSI3-PMEE
Licencees	Neptunelabs
Issue Date	Thursday, September 26, 2013 5:22:36 PM
Images	unlimited (currently: 1,295,417)
User Groups	unlimited (currently: 6)
Source Connectors	unlimited (currently: 27)
Server Instances	currently 1, maximum is: 1

Enter Key Manually

Select a licence key file or enter the licence key data manually by clicking the corresponding button below:

Licence Request Data

Not for resale	<input checked="" type="checkbox"/>
JMX support	<input checked="" type="checkbox"/>
Image batch processing	<input checked="" type="checkbox"/>
FSI Viewer	<input checked="" type="checkbox"/>
FSI Pages mobile	<input checked="" type="checkbox"/>

This tab gives you an overview of your licence information and enables you to enter your key either by uploading the corresponding licence file or by typing in the licence data manually.

The Licence Request Data is crucial for updating your licence.

9. Server Addressing

Data on the FSI Server is addressed using standard HTTP requests and in case of image requests HTTP GET query parameters to specify the request.

9.1 Image and Metadata Addressing

The main server URL for image-, metadata- and list-requests will always be in the form `http://your.fsi-server.com/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 describes the available parameters in detail and gives examples on their usage. Please note that not all parameter combinations are possible or make sense.

ASCII Code needs to be converted to UTF8.

Alternatively the FSI Server webinterface provides an easy way to try out the parameters and assemble image URLs more interactively. This interface is described in detail in section 5 of this manual. In addition to the following descriptions, [Appendix B](#) contains a server addressing quick reference. The parameters described in this chapter apply to the default renderers. Other renderers might not support all the parameters listed here or rely on additional parameters. More on renderers can be found in the OpenAPI manual.

9.1.1 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.

9.1.2 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 [8.9](#)) 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 [8.7](#)).

9.1.3 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.

9.1.4 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.

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.

9.1.5 Quality

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

9.1.6 Template

The template parameter defines the template used to render info and list responses. For more on templates see [section 7 in part I](#).

9.1.7 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 9](#).

9.1.8 Renderer

Used in all request types this optional parameter defines the renderer used to build the response. If omitted the default renderer will be used. The default renderer is defined by the request processor settings. For more information on renderers see [section 4.5 in part I](#).

9.2 Addressing Static Content

All assets other than images are stored in directories configured in "static" source connectors.

These assets can be addressed as any other static file on a webserver by sending an HTTP GET request to *http://your.fsi-server.com/fsi/static/path/to/file.txt*.

As noted in [section 8.1](#), the "fsi" in the URL needs to be adapted if the application is deployed under a different name. The full URL for an asset lying on the server can also be seen in the metadata-tab when selecting the asset in the FSI Server webinterface.

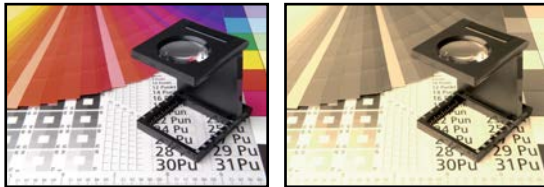
10. Real-time Image Effects

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

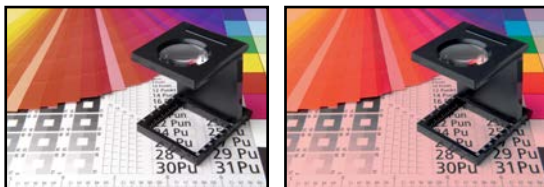
Sepia	
Example	sepia()
Version	1.0

Makes the image look like a sepia toned photo.



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) >= 0x000000 <= 0xffffffff
Opacity	(float) >= 0.0 <= 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.



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, resulting in a tile effect.



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

Flips the image horizontally or vertically.



Distort	
Value	4 normalized xy coordinate pairs describing the new corner positions.
Example	distort(0.1,0.1,0.9,0.2,1,1,0,1)
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.



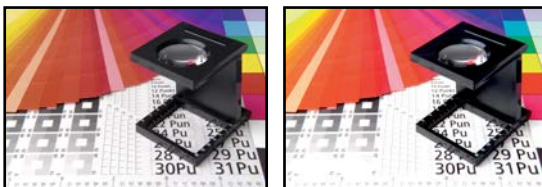
Brightness	
Value	(Int) $\geq -100 \leq 100$
Example	brightness(20)
Version	1.0

Increases or reduces the images brightness.



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

Increases or reduces the image contrast.



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.



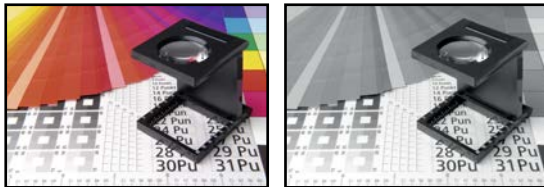
ChannelExchange	
Mode	(Enum) RGB, RBG, BGR, BRG, GRB, GBR
Example	channelexchange(grb)
Version	1.0

Swaps color channels.



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

Desaturates the specified image property.



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 increase or decrease of the hue, saturation and lightness of a specified image channel.



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

Sharpens the image using a Gaussian unsharpen algorithm. Especially details and contours will be highlighted.



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

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



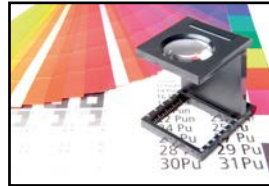
Gamma	
Value	(Float) $\geq 0.1 \leq 9.99$
Channel	(Enum) All, Red, Blue, Green
Example	gamma(6.0, Red)
Version	1.0

Reduces or increases the image gamma.



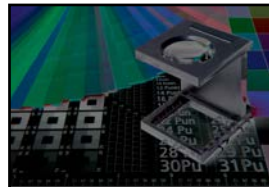
Glow	
Amount	(Float) $\geq 0.0 \leq 100.0$
Example	glow(25)
Version	1.0

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



Solarize	
Example	solarize()
Version	1.0

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



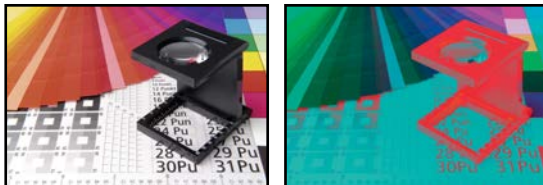
Threshold	
LevelLow	(Int) $\geq 0 \leq 255$
LevelHigh	(Int) $\geq 0 \leq 255$
Color1	(RGB INT) $\geq 0x00000000 \leq 0xffffffff$
Color2	(RGB INT) $\geq 0x00000000 \leq 0xffffffff$
Example	threshold(10,200,0x00471698,0x00fdb07)
Version	1.0

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



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.



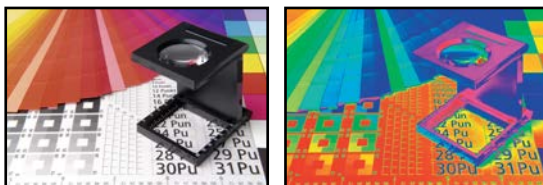
Posterize	
Level	(Int) $\geq 0 \leq 255$
Example	posterize(11)
Version	1.0

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.



GradientMap	
Mode	(Enum) Average, Lightness, Luminosity
Value	(HexColor) ARGB, [ARGB], ...
Example	gradientmap (luminosity,ff0000,ff00ff,0000ff,00ffff,00ff00,ffff00,ff0000)
Version	1.0

Maps a defined gradient over a grayed image.



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.



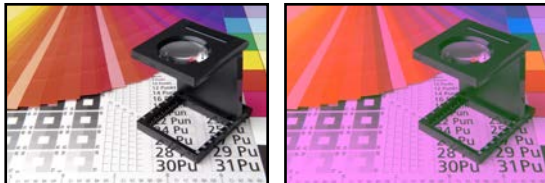
Matte	
Value	(Hex RGB)
Example	matte(2cb4ac)
Version	1.0

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



ChannelLevel	
Value	(Enum)red,green,blue,all
Min	(int) >= 0 <= 255
Max	(int) >= 0 <= 255
Example	channellevel(red,30,70)
Version	3.0

Increases or decreases all color values of the selected channel until they are in the specified range.



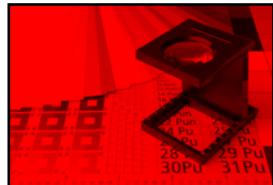
Fill	
Value	HexARGB
Example	fill(AA332255)
Version	3.0

Fills the image with the specified color considering the alpha channel if it exists in the image.



ChannelRGBfilter	
Value	(HexRGB)
Example	channelrgbfilter(FF0000)
Version	3.0

Applies the specified color filter to the image.



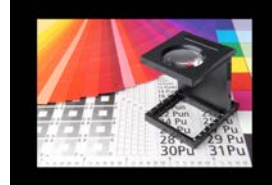
Noise	
Amount	(Int) >0 <= 100
Strength	(Int) >0 <= 100
Monochrome	(Boolean)
Example	noise(60,80,true)
Version	1.0

Adds noise to the image.



Pad	
Position	(Enum)TL,TC,TR,CL,CC,CR,BL,BC,BR
Color	(HexRGB)
Example	pad(CC,00FF00)
Version	3.0

Pads the image to fit the requested size exactly, placing the actual image on the colored canvas at the specified position.



Temperature	
Value	(int) $\geq -100 \leq 100$
Example	temperature(-50)
Version	3.0

Changes the image color temperature.



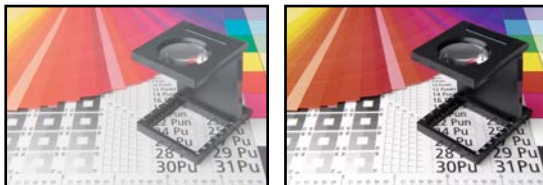
Saturation	
Mode	(Enum)HSL,YIQ
Strength	(int) $\geq -100 \leq 100$
Example	saturation(HSL,-50)
Version	3.0

Changes the image saturation.



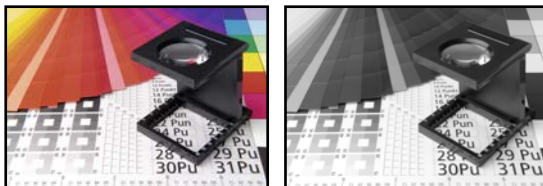
Opaque	
Example	opaque()
Version	3.0

Removes the Alpha Channel from an image if it exists.



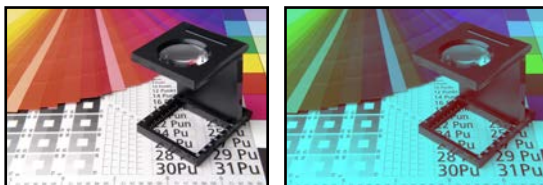
ChannelSelect	
Mode	(Enum)red,green,blue,hue,saturation,brightness
Example	channelselect(red)
Version	3.0

Displays only the information contained in the selected channel.



ChannelLevelTrunk	
Value	(Enum)red,green,blue,all
Min	(int) $\geq 0 \leq 255$
Max	(int) $\geq 0 \leq 255$
Pad	(int) $\geq 0 \leq 255$
Example	channelleveltrunk(red,20,255,10)
Version	3.0

Sets all color values of the selected channel outside the specified range to the pad value.



Select	
Action	Select(Command) Select(Command, Range, RangeParameters)
Examples	Select(New,Path,2) Select(Add,Alpha,3) Select(Sub,Rect,0.25,0.25,0.5,0.5) Select(Clear) Select(Invert)
Version	3.0

Limit subsequent effects to image regions using clipping paths and/or alpha channels.

Supported commands:

New: clears old and starts a new selection.

Add: adds region to existing selection.

Sub: subtracts region from existing selection.

Clear: clears the current selection.

Invert: inverts the current selection.



The New, Add and Sub commands require a range with appropriate range parameters. Possible range values are:

Path: Selects a path defined in the image. Requires the number of the path as range parameter.

Alpha: Selects one of the alpha channels defined in the image. Requires the number of the alpha channel as range parameter.

Rect: Selects a rectangular region within the image. Requires the rectangle coordinates as range parameters.

Appendix

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 2GB 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
JPEG	The default output format providing the additional quality parameter to specify image compression quality
PNG	The png output supports alpha channels by default.
SWF	A special format wrapping image data into an swf for image presentation within flash movies.
GIF	The gif output format also supports animations.

B Server Addressing Quick Reference

1. Image Requests

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

Parameter	Description	Mandatory	Default
width	Width/height of the resulting image	yes (one)	server defaults
height	Width/height of the resulting image	yes (one)	server defaults
rect	Crop to a given range	no	0,0,1,1
left	Crop to a given range	no	0
right	Crop to a given range	no	1
top	Crop to a given range	no	0
bottom	Crop to a given range	no	1
quality	Jpeg compression quality	no	depends on renderer
effects	Real-time image effects	no	none
renderer	Used renderer	no	depends on setting
encoding	Allows to specify if the response should be base64 encoded.	no	image
colospace	Allows to specify the colospace of the response image. Only applies to png output.	no	RGB
pixelrange pixelleft pixeltop pixelright pixelbottom	Crop to a given range (pixel based).	no	-
referencewidth referenceheight	Define the reference dimensions for pixelbased cropping.	no	-
disposition	Defines whether to send a content disposition header in the response.	no	false
save	Alias for "disposition".	no	false
savename	The filename to send with the disposition header.	no	-

2. Info Requests

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

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

3. List Requests

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

Parameter	Description	Mandatory	Default
template	Defines the template used to render the response	no	depends on renderer
limit	Limits the amount of entries in the result set	no	all results
renderer	Used renderer	no	depends on settings
items	Allows specifying the assets to include in item list	no	-
range	Allows applying a range parameter, to get only parts of the list	no	-

4. Search Requests

?type=search or ?type=simplesearch

Parameter	Description	Mandatory	Default
source	Path in which to search	yes when not authenticated	empty
query	Search phrase	yes	-
context	Simplesearch only. Comma-separated list of fields to search (see Appendix D for field names)	yes	-

C Tomcat and JVM Settings

1. Java Virtual Machine Settings

The optimal settings for the Java virtual machine depend on the hardware running FSI Server and any other application 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. The recommended setting for Oracle Java SE 6 is:

```
-XX:+UseConcMarkSweepGC -XX:+UseParNewGC
-XX:+UseBiasedLocking -XX:+CMSParallelRemarkEnabled
```

In addition to the JVM settings mentioned above, the memory settings need to be specified. The amount of heap space to configure depends not only on the amount of physical memory present. The recommended minimum heap space is 2GB per CPU core. In addition to the heap space, FSI Server uses direct memory when performing image operations, so the maximum heap space should be set well below the amount of physical memory present.

The maximum number of connections specified in the Tomcat configuration also needs to be taken into consideration as under full load every connection requires a thread and every thread requires a fixed amount of memory for its execution stack. In order to be able to handle more connections the stack size should be reduced using the Xss parameter. The minimum allowed value for Oracle Java SE 6 is 128K and for Java SE 7 160k. Both should be sufficient for running FSI Server 3.

Furthermore the used memory can be reduced by configuring Javas Permanent Generation memory. If FSI Server is the only application running in the Tomcat. Then a value of 128M is sufficient.

To summarize the above, the following parameters should be used in addition to the settings mentioned further up:

```
-Xss160k
-XX:MaxPermSize=128m
-Xms:[Heap Size depending on physical memory and Tomcat configuration]
-Xmx:[Heap Size depending on physical memory and Tomcat configuration]
```

2. 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 /fsi-server>
    ProxyPass ajp://localhost:8009/fsi
    ProxyPassReverse ajp://localhost:8009/fsi
    ProxyPassReverseCookiePath /fsi /fsi-server
  </Location>
</IfModule>
```

D Search field reference

1. Textual search field

Fieldname	Description
file.name	the image filenames
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 Categories field
iptc.keywords	The contents of the IPTC Keywords field
iptc.copyright_notice	The contents of the IPTC Copyright Notice field
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

E When to use multiresolution source connectors

FSI Server 3 supports multiresolution tif and fpx images as image sources without the need of importing them into the internal storage.

This feature is primarily directed at customers who already have a large stock of images with multiple resolutions embedded. Those customers establishing an FSI Server solution starting with flat (single resolution) images will need to use storage connectors if they do not want to rely on an external service to provide the multi-resolution images.

Customers with a small to medium size stock of multi-resolution images should consider the advantages and disadvantages of both options. The following table will assist in the decision.

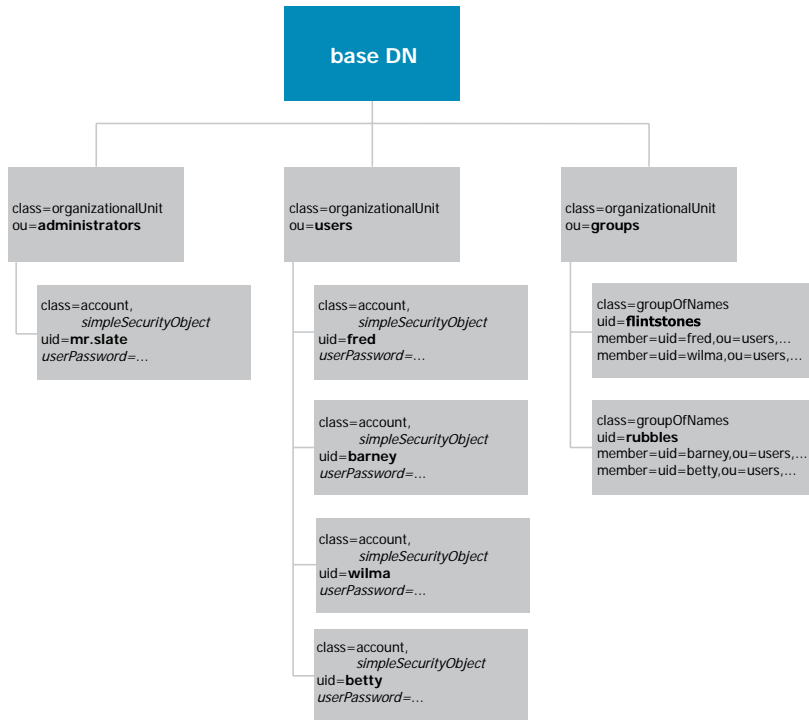
	storage	multi-resolution
supports jpg and png as source format	yes	no
response time (server performance) independent of source image size	yes	no
response time (server performance) independent of originating software	yes	no
requires import	yes	no
disk space required	usually more	usually less

F LDAP Directory Structure

When configuring your FSI Server to retrieve the user and group information from an LDAP Server, then this information must be stored in a predefined directory structure. FSI Server will presume to find three branches beneath the base DN provided in the configuration.

All three branches must be instances of the object class "organizationalUnit" (OID: 2.5.6.5) as defined in the LDAP Core schema (RFC 2256). Two of the units contain the users, divided into administrators and standard users, the other contains the groups. The user objects are instances of "account" and optionally also instances of "simpleSecurityObject" if the password are also stored on the LDAP Server. Both, account and simpleSecurityObject are defined by the COSINE schema (RFC 1274). The group unit contains instances of "groupOfNames", also defined in the Core schema.

The following diagram illustrates the layout of the DIT as required by FSI Server.



Example layout of the data information tree used for LDAP based user management. Includes the *optional* class definitions and attributes for storing the passwords on the LDAP Server.

G Systemwide Kerberos configuration

If FSI Server is configured to use a Kerberos server to validate the users passwords, then it will use the JVM wide Kerberos configuration by default.

This means that the Kerberos realm and the location of the KDC must be configured outside of the FSI Servers context. This configuration can therefore

not be done using FSI Administrator or by editing the FSI Server configuration files. The JVM will look for the configuration file in the following locations respecting the given order:

- a filename and path set by the JVM system property "java.security.krb5.conf",
- a file named `krb5.conf` in `<java-home>\lib\security` on Windows systems or

-
- `<javahome>/lib/security` on Linux
in `C:\winnt\krb5.ini` on Windows or `/etc/krb5.conf` on Linux.

H JMX MBean definitions

The MBeans provided by FSI Server are for monitoring purposes only and are logically grouped depending on the component providing them.

1. Request Processor Beans

Bean name	Description
Category: General	
Build	Build number the currently running FSI Server version
Major Version	Major version of the currently running FSI Server
Uptime	Number of seconds since the last start of the FSI Server
Vendor	The vendor of the software (NeptuneLabs)
Version	human-readable representation of the version number
VersionDecimal	Integer representation of the version number
Category: Licence	
BatchProcessing	States if batch processing is permitted by the licence
Edition	The purchased FSI Server Edition
Expired	States if the installed licence is expired
Licenced	States if a valid licence is installed
MaxGroups	Maximum number of user groups permitted by the licence key
MaxImages	Maximum number of assets permitted by the licence key
MaxConnectors	Maximum number of connectors permitted by the licence key
Staging	States if the installed licence is meant for staging pruposes only
Category: Performance	
ActiveCPUCount	Currently active CPU threads
ActiveCPUCountMax	Maximum number of simultaneously active CPU threads in the last 60 seconds
ActiveIOCount	Currently active IO threads

Bean name	Description
ActiveIOCountMax	Maximum number of simultaneously active IO threads in the last 60 seconds
CPULoadTotal	Current system CPU load
ConcurrentProcessing	Number of images currently being processed
ConcurrentProcessingMax	Maximum number of simultaneously processed images in the last 60 seconds
ConcurrentRequests	Number of requests currently being handled
ConcurrentRequestsMax	Maximum number of simultaneously handled requests in the last 60 seconds
GET	Number of GET requests handled by the server
HEAD	Number of HEAD requests handled by the server
POST	Number of POST requests handled by the server
HitsCached	Number of responses served from cache
HitsImage	Number of image-requests processed (excl. cached responses)
HitsInfo	Number of info-requests processed (excl. cached responses)
HitsList	Number of list-requests processed (excl. cached responses)
HitsSearch	Number of search-requests processed (excl. cached responses)
HitsTotal	Total number of requests handled
PixelsTotal	Total number of pixels sent out (excl. cached responses)
CPUQueueLength	Current number of CPU tasks waiting for execution
CPUQueueLengthMax	Maximum number of CPU tasks simultaneously waiting for execution in the last 60 seconds
IOQueueLength	Current number of IO tasks waiting for execution
IOQueueLengthMax	Maximum number of IO tasks simultaneously waiting for execution in the last 60 seconds
Status200	Number of requests answered with HTTP Status 200
Status302	Number of requests answered with HTTP Status 302
Status304	Number of requests answered with HTTP Status 304
Status400	Number of requests answered with HTTP Status 400
Status403	Number of requests answered with HTTP Status 403

Bean name	Description
Status404	Number of requests answered with HTTP Status 404
Status500	Number of requests answered with HTTP Status 500
Status503	Number of requests answered with HTTP Status 503
TTFB10 / TTLB10	Number of responses where the first/last byte was sent out in less than 10ms
TTFB25 / TTLB25	Number of responses where the first/last byte was sent out in less than 25ms
TTFB50 / TTLB50	Number of responses where the first/last byte was sent out in less than 50ms
TTFB100 / TTLB100	Number of responses where the first/last byte was sent out in less than 100ms
TTFB250 / TTLB250	Number of responses where the first/last byte was sent out in less than 250ms
TTFB500 / TTLB500	Number of responses where the first/last byte was sent out in less than 500ms
TTFB1000 / TTLB1000	Number of responses where the first/last byte was sent out in less than 1s
TTFB2500 / TTLB2500	Number of responses where the first/last byte was sent out in less than 2.5s
TTFB5000 / TTLB5000	Number of responses where the first/last byte was sent out in less than 5ms
TTFB5000plus / TTLB5000plus	Number of responses where the first/last byte was sent after more than less than 5s
TTFBAvg60 / TTLBAvg60	Average time to first/last byte for all requests handled in the last 60 seconds

2. Source Manager Beans

Bean name	Description
Category: Cache	
CachedObjects	Total Number of cached objects
TotalCacheSize	Total size of the level 2 cache
UsedCacheSize	Amount of level 2 cache used
*Requests	Number of requests directed at the cache
*L1Hits	Number of hits to the level 1 cache
*L2Hits	Number of hits to the level 2 cache
*SaveFailures	Number of failed attempts to save data in the cache
*Saves	Number of successful attempts to save data in the cache
* = Blob, Image, List, Metadata, Response, Tile	
Category: Scanner	
ScanTime	Number of milliseconds taken for the last scan
Category: Storage	
AssetCount	Total number of assets stored on the server
GroupCount	Total number of groups defined
ConnectorCount	Total number of connectors defined
AssetSize	Total size of the source files stored on the server (in bytes)
FreeSpace	Amount of free disk space on the partition containing the internal storage (in bytes)
ImagesProcessed	Images imported since last start
Pixels	Total number of pixel imported since last start
Processing	Number of images currently being imported
ProcessingSwap	Number of images currently being imported using swapfiles.
SwapImagesProcessed	Number of images imported using swapspace since last start
UsedSpace	Amount of disk space used on the partition containing the internal storage (in bytes)
TotalSpace	Total space on the partition containing the internal storage (in bytes)

I Updating from FSI Server 2 to 3

FSI Server 3 introduces some major changes to the internal storage as well as the configuration file layout. In most cases it will be easier to perform the configuration from scratch based on the predefined configuration files instead of migrating existing files.

When configured to use an FSI Server 2 storage directory, the internal storage will be migrated to the new layout in the background. This implies, that storage can no longer be used by an FSI Server version 2, which makes downgrading impossible. You will also notice a higher load on the system while the storage is migrated.

Detailed information on migrating from FSI Server 2 as well as a list on configuration changes can be found in the "FSI Server 2 to 3 migration guide" available on the FSI Server website at <http://www.fsi-server.com>.

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