

Integration with Siemens *syngo* Imaging

Release 8.0

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*HP Medical Archive
Solution*

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Integration

Integrating the Grid with Siemens *syngo* Imaging

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Preface

Purpose and Audience

This guide describes how to integrate the HP Medical Archive solution (HP MAS) system with a Siemens *syngo*[®] Imaging PACS system. This guide is intended for anyone responsible for installing or configuring an HP MAS deployment with a Siemens *syngo* system. If you are using this guide, it is assumed that you have a good understanding of HP MAS software and of the software installation procedures as described in the *Installation Guide* and integration procedures as described in the *Administrator Guide*. A fairly high level of computer literacy is assumed, including knowledge of Linux/Unix.

Currency

This edition of the *Integration with Siemens syngo Imaging Technical Guide* is **revision 2.0**.

Overview

Siemens *syngo* Imaging

The Siemens *syngo* Imaging PACS system periodically archives images for long term storage (LTS). The PACS also uses the LTS to store a daily backup of its database. Images and backups are stored by writing them into the archive and backup NFS mount points provided by the HP MAS system.

HP MAS System

The figure below illustrates the architecture of a HP MAS archive. This archive consists of:

- A Gateway Node, providing cached file system access to archived objects
- Two or more Storage Nodes, providing a disk based object store
- An optional Tape Node, providing long term storage on removable media (usually tape)

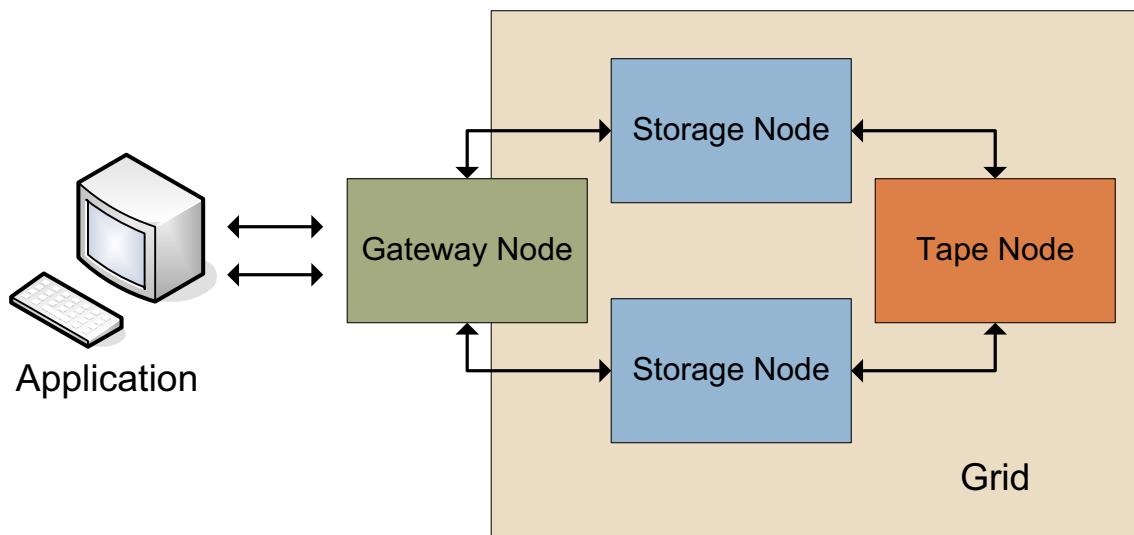


Figure 1: HP MAS Archive

The application stores files to be archived or backed up to the Gateway Node cache through an NFS mount. The Gateway Node creates a storage object containing the file, and submits the object to the Storage Nodes for long term storage. ILM (Information Lifecycle Management) rules ensure that copies of the object exist on at least two Storage Nodes.

When the Gateway Node cache reaches capacity, files are swapped out to make room for new ones. A swapped-out file retains its directory entry and file system metadata. From the point of view of an application, there is no distinction between a file that is resident in the Gateway Node cache and a swapped-out file.

When an application accesses a file through the NFS mount, the file content is served from the Gateway Node cache. If the file content was previously swapped out, the content is first retrieved from a Storage Node.

In a grid containing a Tape Node, ILM rules control the migration of stored objects to archive media. Typically, a copy of an object is placed on the Tape Node after a period of time has elapsed since the associated file was first ingested via the Gateway Node. At this time, one or both of the disk copies may be removed from the Storage Nodes.

When an application accesses a swapped-out file that has a copy of its content object on a Storage Node, the retrieval latency is negligible.

However, if the object only exists on a Tape Node, the latency may be significant, since the content object has to be retrieved from removable media first, and then streamed to the Gateway Node cache.

HP MAS Storage Adapter Implementation

The *syngo* Imaging application can archive images directly to an NFS mounted archive. In order to obtain detailed information about the archival status of files, it calls a vendor-specific storage adapter through a defined interface.

The HP MAS storage adapter responds to the *syngo* application's status queries, using the HP MAS HTTP API query interface and an ssh connection to the Gateway Node to obtain status information about archived files.

New for Release 8.0.

Release 8.0 includes changes to the integration with the *syngo* system. The *syngo* system no longer performs HTTP requests through a CLB and instead connects to a port on the FSG that proxies HTTP requests from the *syngo* system into the grid. A *syngo*-specific HTTP profile is no longer required. On grids that are integrated with the *syngo* system, you must configure the HTTP proxy on the FSG to accept requests from the *syngo* IP. See [“Integrating syngo Imaging” on page 9](#) for the procedure.

Physical Connection

To link the *syngo* SDM with HP MAS, connect the *syngo* internal ethernet switch to the HP MAS customer access ethernet switch.

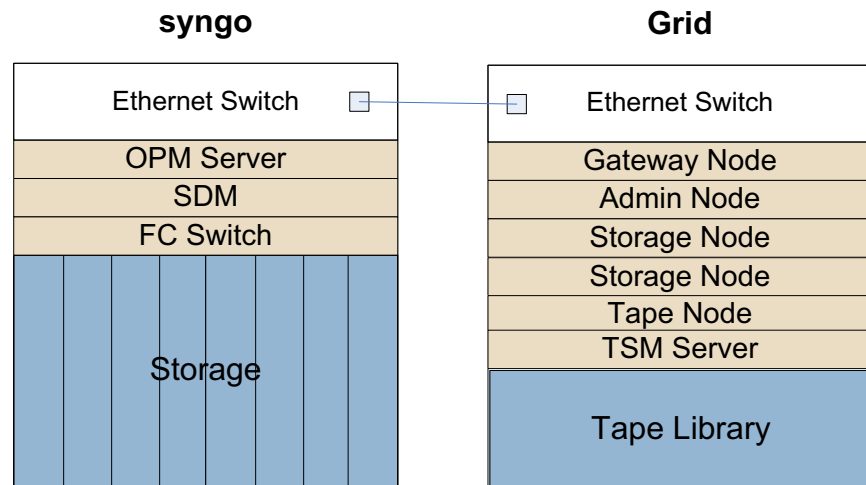


Figure 2: Physical Connection with Tape Node

Integrating *syngo* Imaging

To integrate a Siemens *syngo* Imaging PACS with the HP MAS system, you must complete the following procedures:

1. Install HP MAS software and start grid services. See [page 10](#).
2. Install the HP MAS storage adapter on the Siemens *syngo* SDM. See [page 10](#).
3. Add the FSG_HTTP profile to the /GRID namespace. See [page 11](#).
4. Configure the FSG HTTP proxy. See [page 12](#).
5. Restart the *syngo* SDM. See [page 13](#).
6. Configure email notifications. See [page 13](#).
7. Verify the integration. See [page 14](#).

Paths and File Names

Storage Adapter

The HP MAS storage adapter is installed at the following location on the *syngo* SDM:

```
/opt/sdm/grid
```

Log Files

Log files are saved to:

```
/opt/sdm/grid/logs
```

syngo SDM NFS Mount Points

The *syngo* SDM NFS mount points for the HP MAS system are:

```
/data/mnt/archive  
/data/mnt/backup
```

The following symlinks are available for NFS mount points:

```
/archive  
/backup
```

Install the HP MAS System

This section is for reference only. HP MAS installation is usually performed by the LTS vendor.

If you are integrating *syngo* Imaging with a new HP MAS deployment, follow the instructions in the HP MAS *Installation Guide* to install HP MAS software, start grid services, and perform the steps described in the chapter titled “Grid Integration Verification” before beginning the procedure described in this guide.

Alternatively, you may be integrating *syngo* Imaging with an existing HP MAS deployment. This procedure does not interfere with the operation of a running grid. If you are adding *syngo* integration to an existing grid, document the change in the Customer Questionnaire.

You must update the Free Space Watermark to be at least 128GB below cache capacity. For more information, see [Appendix A “Free Space Watermark”](#) on page 17.

Install HP MAS Adapter

To install the HP MAS storage adapter on the *syngo* SDM:

1. Create NFS shares on HP MAS.
2. Install HP MAS storage adapter on *syngo*.

Create NFS Shares on HP MAS

To create NFS Shares on HP MAS:

- Create two NFS shares on HP MAS’s Primary and Secondary Gateway Nodes. These two shares must be named archive and

backup. For more information on creating NFS file shares, see the *HP MAS Administrator Guide*.

Install HP MAS Storage Adapter on *syngo*

To install HP MAS Storage Adapter on *syngo*:

1. On the *syngo* SDM, log in as root.
2. At the *syngo* SDM command prompt or GUI, mount the HP MAS storage adapter software installation CD and note the mountpoint:
`<cd-mountpoint>`
3. Install the HP MAS storage adapter software. At the command prompt, enter:
`<cd-mountpoint>/install.sh`
The HP MAS storage adapter software installs on the *syngo* SDM.
4. Set up the software and follow prompts. At the command prompt, enter:
`/opt/sdm/grid/setup.rb`
5. Generate an ssh keypair for the sdm user. At the command prompt, enter (and then follow prompts):
`su - sdm`
`/opt/sdm/grid/configure-ssh.rb`
6. On the *syngo* SDM, activate the HP MAS adapter. At the command prompt, enter:
`/opt/sdm/grid/activate-adapter.sh`


NOTE It may take several seconds to complete the activation process. Ignore any warnings or errors that may occur during the activation process.

Add FSG_HTTP Profile to HTTP /GRID Namespace

The /GRID namespace supports queries to grid nodes and services by third-party client applications.

To add the FSG_HTTP Profile to the /GRID namespace:

1. Log in to the NMS using an account with Maintenance permissions such as the Vendor or Admin account.
2. Go to **Grid Management** ► **Grid Configuration** ► **HTTP Advanced** ► **Configuration**.

3. Add the FSG_HTTP Profile.
 - a. In the HTTP /GRID Namespace table, click **Edit** .
 - b. In the Profile Name box, type **FSG_HTTP**.
 - c. Select **Post**.

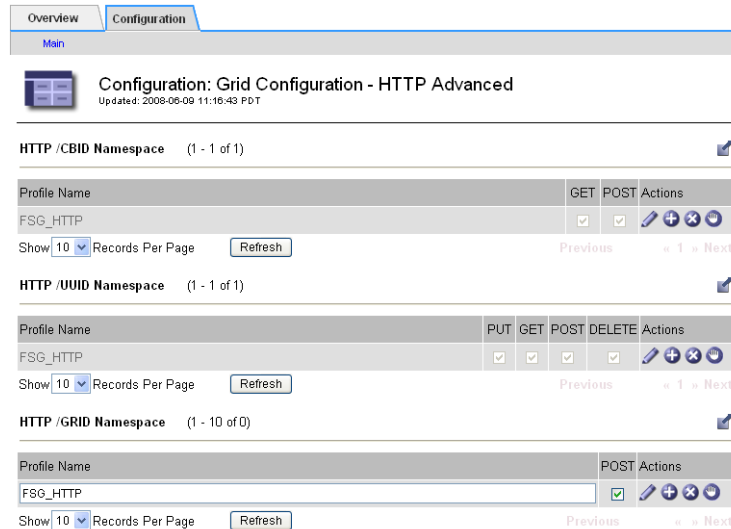


Figure 3: Adding the FSG_HTTP Profile to the HTTP /GRID Namespace

- d. Click **Apply Changes**.

Configure the HTTP Proxy

You must configure the HTTP proxy to accept requests from the *syngo* IP on every Gateway Node the *syngo* system connects to.

To configure the HTTP proxy:

1. Log in to a server hosting a Gateway Node to which the *syngo* system connects to.
 - a. At the server, press **<Alt>+<F1>** to access a command shell.
 - b. Log in as **root** using the password listed in the **Passwords.txt** file.
2. Access the ADE console of the FSG service. Enter:


```
telnet localhost 1410
```
3. Access the FSGS module. Enter


```
cd proc/FSGS
```

4. Enable the FSG HTTP proxy and configure it to listen for connections on any IP address assigned to the Gateway Node. The FSG HTTP proxy is disabled by default. Enter:

```
enable 0.0.0.0
```

5. Configure the FSG to allow connections from a *syngo* SDM with an IP address, 192.168.130.43 in the example below.

```
add-ip 192.168.130.43
```

— or —

Configure the FSG to allow connections from a range of IP addresses, for example:

```
add-ip 192.168.130.45-192.168.130.50
```

NOTE If the IP address of the *syngo* SDM has changed, first use the `remove-ip <old-ip>` command to remove the old IP address before using the `add-ip` command.

6. Apply the configuration changes and allow the FSG to start accepting connections. Enter:

```
reload
```

7. If updating an existing grid, edit the file `/opt/sdm/grid/conf/gridadapter.rc` on the *syngo* SDM to change the `httpport` setting from the default CLB port 8080 to the FSG HTTP proxy port:

```
httpport = 8008
```

8. Repeat steps step 1 to step 7 for all Gateway Nodes the *syngo* system connects to.

Restart *syngo* SDM

Restart the *syngo* SDM. Restarting activates the NFS shares and LTS configuration.

Configure Email Notifications

On HP MAS, configure email notifications for the Admin Node. Use the SDM administrator's email address as the destination for notifications. For more information, see the HP MAS *Administrator Guide*.

Verifying the Integration

Ensure that the integration of Siemens *syngo* Imaging PACS system with the HP MAS system has completed successfully.

Verify SSH Connection

To verify the ssh connection:

1. On the *syngo* SDM, log in as root.
2. At the command prompt, enter:

```
# su - sdm
```

3. At the command prompt, enter

```
$ cd /opt/sdm/grid
```

```
$ ./inittest.sh
```

```
$ ruby ./testssh.rb
```

The expected output is a UUID, for example:

```
<UUID> (like: 9243EAD9-9B9C-4210-A3A3-5D1D08C84189)
```

Verify HTTP Connection

To verify the http connection:

1. On the *syngo* SDM, log in as root.
2. At the command prompt, enter:

```
# su - sdm
```

3. At the command prompt, enter:

```
$ cd /opt/sdm/grid
```

```
$ ./inittest.sh
```

```
$ ruby ./testhttp.rb
```

The expected output is a list of Node IDs and Node Types, and a list of Adapter status messages, for example:

```
Nid= 13010115 Type= CMS
```

```
Nid= 20020133 Type= FSG
```

```
..
```

Verify the Storage Adapter

To verify the Storage Adapter:

1. On the *syngo* SDM, log in as root.

2. At the command prompt, enter:

```
# su - sdm
```

3. At the command prompt, enter:

```
$ cd /opt/sdm/grid
```

```
$ ./inittest.sh
```

```
$ ./testadapter.sh
```

The expected output is:

```
startArchive
SUCCESS
checkArchive
ARCHIVED
getFileStatus
ONLINE
dearchive
SUCCESS
```

Maintenance

Reconfigure Adapter on SDM

If in the course of operations the Gateway Node is reinstalled, remove all known hosts and run the `configure-ssh.rb` command.

To perform a reconfiguration:

1. On the *syngo* SDM, log in as root.

2. Remove known hosts. At the command prompt, enter:

```
# su - sdm
```

```
$ rm ~/.ssh/known_hosts
```

3. Run the `configure-ssh.rb` command. At the command prompt, enter:

```
# su - sdm
```

```
$ /opt/sdm/grid/configure-ssh.rb
```

Gateway Node Failovers

After a Gateway Node failover, run the `setup` and `configure-ssh` commands on the SDM.

After a Gateway Node failover:

1. On the *syngo* SDM, log in as root.

2. Set up the software and follow the prompts. At the command prompt, enter:

```
# /opt/sdm/grid/setup.rb
```
3. Run the configure-ssh.rb command. At the command prompt, enter:

```
# su - sdm  
$ /opt/sdm/grid/configure-ssh.rb
```


Free Space Watermark

Resetting the free space watermark on the
Gateway Node

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Resetting Free Space Watermark

The Swapout Free Space Watermark (FSWM) represents the remaining capacity of the Gateway Node cache under which the FSG swaps out files to keep the cache above this watermark.

The FSWM must be adjusted to allow the Gateway Node to manage *syngo* backup files.

To reset the Free Space Watermark on Gateway Nodes:

1. Log in the NMS using the Vendor account.
2. Determine the total cache capacity. Using the Grid Topology tree, go to Primary FSG ► **Storage** and look up the value for Total Cache. In this example, the total cache is 396GB.



Figure 4: Total Cache

3. Go to **Grid Management ► FSG Management** and locate the FSG replication group of the Gateway Node. In this example, the FSG Replication Group ID is 2.



Figure 5: FSG Management – Free Space Watermark

4. Check the current Swapout Free Space Watermark value. In this example, the value is 25GB.

- Go to the **Configuration** tab and edit the Swapout Free Space Watermark value so that it is 128GB below total cache capacity. In this example, the value is reset to 268GB.

The screenshot shows the 'Configuration (Settings): FSG Management - Group 2' page. The 'General' section contains a table of settings. The 'Swapout Free Space Watermark' field is highlighted with a blue arrow and labeled 'Swapout Free Space Watermark'.

Description	Settings
Maximum Active Swapsins	20
Maximum Active Ingests	20
Minimum Active Ingests	15
Ingest Idle Delay	10.0 seconds
Backup Window Start	8.0 hours
Backup Window Length	1.0 hours
Primary FSG	Site B/B-1/GN1-B-1/FSG
Backup FSG	Site B/B-1/GN1-B-1/FSG
Swapout Free Space Watermark	268000000000
Swapout No Create Watermark	10000000000

Apply Changes

Figure 6: Resetting Swapout Free Space Watermark

NOTE 268000000000 is only an example. You need to check total cache capacity and then set FSWM to be 128GB below that.

- Click **Apply Changes**.

