Contents

1 Introduction .................................................................................................................................................. 3

1.1 Purpose .................................................................................................................................................. 3

1.2 Hardware and Software Requirements ............................................................................................... 3

1.3 Data Flow ............................................................................................................................................... 4

2 Sending Files from Scanners / PACS ......................................................................................................... 5

3 Installation ................................................................................................................................................ 5

3.1 Installation Steps .................................................................................................................................. 6

4 Activation and Configuration of Site Server ............................................................................................. 11

4.1 Pre-conditions for configuring the TRIAD Site Server: ..................................................................... 11

4.2 Site Server Console Configuration .................................................................................................... 11

4.2.1 Domain Activation .......................................................................................................................... 12

4.2.2 Unmapped Submission .................................................................................................................... 17

4.2.3 Configuration of Port #, AE Title and Image Storage Folder ....................................................... 19

4.2.4 Setup Schedule for Image Forwarding ............................................................................................. 21

4.2.5 Advance Settings: .......................................................................................................................... 22

5 Un-installation .......................................................................................................................................... 24

6 SOP Classes Supported .......................................................................................................................... 24

7 Contact Information ............................................................................................................................... 24
1 Introduction

1.1 Purpose

The purpose of this document is to explain steps required for installation and configuration of TRIAD Site Server for the Dose Index Registry (DIR).

1.2 Hardware and Software Requirements

<table>
<thead>
<tr>
<th>#</th>
<th>Items</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>CPU</td>
<td>Intel Core2 Duo or above</td>
</tr>
<tr>
<td>3</td>
<td>Memory</td>
<td>Minimum 4 GB</td>
</tr>
<tr>
<td>4</td>
<td>Hard Disk</td>
<td>The hard disc size depends on the size of images received and stored in TRIAD Site Server. 50 GB minimum and 200 GB recommended.</td>
</tr>
<tr>
<td>6</td>
<td>Port 104 or other available port</td>
<td>TRIAD Site Server uses this port to listen to remote modalities or PACS to receive DICOM files. Users can change this port # as needed.</td>
</tr>
<tr>
<td>7</td>
<td>Port 443</td>
<td>This port is used for communication between TRIAD Central Server and Site Server. It must be accessible from the internet.</td>
</tr>
<tr>
<td>8</td>
<td>User Permissions on the Computer</td>
<td>An account with administrator rights to the computer will be needed for TRIAD Site Server installation. The account running TRIAD Site Server service should have sufficient privilege for executing service and be able to connect to Central Server through the internet (port 443).</td>
</tr>
<tr>
<td>9</td>
<td>Connectivity</td>
<td>PACS and scanners should have necessary connectivity permissions in place to allow the DICOM transfer of images to the computer running the SS service. The computer running the SS service should be allowed to transfer image files from your site via the internet. This ability is needed to submit files from the TRIAD Site Server to the Central Server.</td>
</tr>
</tbody>
</table>
10 | **Network Requirements** | The speed between TRIAD Site Server and the internet should be at least 256 kbps but we strongly suggest at least 1 Mbps
---|---|---
11 | **Central Server** | triad-dir-app.acr.org
| Sites that use proxy servers need to unblock this URL from their proxy settings.
12 | **National Radiology Data Registry (NRDR) user account** | A valid user account in NRDR is required for activation of TRIAD Site Server
13 | **Scanner information** | If there are multiple facilities, the following information is required for each of the scanners at each of the facilities: device serial number, station name, institution name and manufacturer model name.

### 1.3 Data Flow

Below is the data flow for the Dose Index Registry for receiving files from facilities and displaying the reports in the National Radiology Data Registry (NRDR). The data flow is as follows:

The standard required content for data transmission to TRIAD for DIR is the Radiation Dose Structured report and localizer. DIR accepts secondary capture as a backup option because, at the time the registry started, there were many old scanners that are not able to produce RDSRs and we wanted to accommodate those scanners. ACR uses OCR software to read the data that comes from secondary captures. But depending on the scanner manufacturers the process of parsing the dose screen using OCR might not produce consistent and correct data.

Manufacturers update their software from time to time that changes how the data in the dose screens/secondary capture looks. Keeping up the OCR software is extremely resource intensive and unreliable. Since the implementation of the XR-29 standards on most scanners, scanners are capable of generating RDSRs. Therefore, ACR has decided not to invest the resources to update our OCR software.

1. Three types of data will be sent from scanners or PACS to the TRIAD Site Server:
   a. Radiation Dose Structured Report (RDSR) received from scanners if scanners support the RDSR format. This is the preferred method for receiving dose information.
   b. Dose sheets / secondary captures received from either scanners or PACS if RDSR is not available. **(It is preferred that data should be received from scanners, however data can also be received from PACS if the facility has a high number of scanners.)**
   c. Localizers received from scanners. **(It’s preferred that data should be received from scanners, however data can also be received from PACS if the facility has a high number of scanners).**
2. Dose sheets / summary reports will be processed in Site Server and the RDSR will be created.
3. Site Server will anonymize the DICOM header of the RDSR’s and localizers based on a specified anonymization profile used by all DIR facilities.
4. Site Server will send the data to the TRIAD Central Server at ACR over Secure Sockets Layer (SSL) to ensure its security and reliability.
5. Data received at the TRIAD Central Server will be processed and displayed in NRDR reports available to any registered facility user from the NRDR web site.

2 Sending Files from Scanners / PACS

TRIAD for DIR supports the following scanner manufacturers:

1. Siemens
2. Philips
3. Toshiba
4. GE

Each scanner will need to be configured to send RDSR or dose sheets / summary reports along with localizers. Please contact your field engineer if you need help in configuring your scanner.

TRIAD Site Server supports RDSRs and localizers coming from many other scanner manufacturers.

3 Installation
3.1 Installation Steps

1. If an existing version of Site Server is on the machine, then Window Installer will prompt for the existing version to be removed. See section 5: Un-Installation

2. Verify that the machine meets the system requirements to run TRIAD Site Server. See System Requirements at https://triad4.acr.org/dirsiteserver/

3. Download the Site Server installation zip file from the specified URL (https://triad4.acr.org/dirsiteserver) to a local folder and unzip the file.

4. Start the installation by double clicking on the setup.exe file.

5. Clicking setup.exe will initially invoke installation of Java Runtime Engine 7.0 and Java Advanced Imaging I/O Tools for the JRE if they are not already installed on the computer. Click Accept and allow the default installation of both components.

6. The publisher should be “American College of Radiology”. Click “Run” to start installation.

7. Click the “Next” button in each screen to continue the installation steps.
8. Accept the license agreement and click “Next”
9. Change the Site Server application folder if needed. Then click “Next”.

10. Click “Next”.

![Image of Destination Folder window]
11. Specify the DICOM port # and leave Site Server DNS Name as the default value and then click “Next”.
i) **Site Server Client Service Port**: If this client service port is not used for the Dose Index Registry domain then do not modify. Leave the default value in the field.

ii) **Site Server SCP Port**: This is the port where the Site Server receives data from external devices such as scanners or PACS – This port can be any free port with a value ranging from 100 to 10000. Do not use 6567, 6568, or 7979. Use the command “`netstat -a`” to list all ports used in the system. The default port # is: 104.

iii) **Site Server DNS Name**: Do not modify the default value.

12. Click 'Install' to install the application.

![installation screen](image)

13. When the installation has been completed, the following screen is displayed. Click “Finish”.

![installation completion](image)
After successful installation, find the Site Server Console from Windows Start Menu – All Programs → American College of Radiology → Site Server Console 4.5.

The Site Server will need to be configured using the Site Server Console before the Site Server Service can be used.

### 4 Activation and Configuration of Site Server

#### 4.1 Pre-conditions for configuring the TRIAD Site Server:

Verify the items below before configuring Site Server:

- Site Server runs as a Windows service. Make sure Site Server Service (TriadSiteServerService) is up and running from the Windows Task Manager.
- Ensure that you have proper user accounts that are created in the National Radiology Data Registry (NRDR).
- You will need to run Site Server Console as local administrator. Make sure you have administrator access to the computer that runs Site Server.

#### 4.2 Site Server Console Configuration

The following are steps for configuring Site Server:
4. Domain activation
2. Configuring and mapping facilities
3. Configuration of AE title, port # and image storage folder
4. Setup the schedule for image forwarding

4.2.1 Domain Activation

Invoke the Site Server Console (Use Run as Administrator option) from Windows Start Menu –All Programs->American College of Radiology-> Site Server Console 4.5.

![Figure 8-Run SS Console](image)

The domain is activated from the main Site Server Console window. The domain activation screen can also be accessed by clicking on the “Site Info” tab.
To activate the Site Server for a domain (e.g. Dose Index Registry) perform the following steps.

1. Click the Add button. The following screen will be displayed:
2. In the pop-up screen, enter the following details.
   **Domain Name:** Select “Dose Index Registry” from the drop down list.
   **User name:** `<User Name in NRDR>` Enter the NRDR username.
   **Password:** `<Password in NRDR>` Enter the NRDR password.
   **Display Name:** `<Name used to identify your site server>`: Enter the NRDR facility ID. If the
   facility has multiple installations of SS, enter the ID using the format as 100001-1, 100001-2
   etc. (if the facility ID is 100001)
   **Location details:** `<address/ identification details of the physical location>`
   **Phone number:** `<Number we can use to contact regarding the SS>` e.g.: 120-453-8984
   **Email:** `<Email address of the user to be notified when the Site Server is down.>`
   Note: If you do not know your NRDR facility ID and/or password, contact
   [nrdrsupport@acr.org](mailto:nrdrsupport@acr.org) or call 800-227-5463 ext 3535.

3. If all the entries are in the proper format, then click ‘Activate Domain’. If successful, a new
   window will be displayed with your account and Facility ID association information. If
   activation failed, an error message will be shown regarding the status of activation. The most
   common error message will be related to entering a wrong NRDR user name and password.
4. Click on “No” since it is a single facility, a new entry will be added to the list as shown in the image below.

5. The pop-up below will appear if the domain activation is performed using an account associated with more than one facility ID. Click on “Yes” to add facilities. If you do not configure the facilities and try sending data, the data sent from the facilities will be cached.
(saved to temporary memory) for 14 days. An email will be sent to the e-mail address configured in the Site Server console asking to configure the facilities. Click on the Unmapped Submissions tab to see details of the unmapped scanners.
The email below is sent to the e-mail address configured in the Site Server console if a scanner is not mapped and the data is still being sent from that scanner to Site Server. This e-mail is sent for the first time when data is received from a scanner. The user has 14 days to configure the scanner mapping on the TRIAD Site Server console. After 14 days, files are deleted from the TRIAD Site Server.

Dear <Username>,

Site Server has detected the following unmapped submission:

- **Station Name**: <DICOM TAG VALUE>
- **Device Serial Number**: <DICOM TAG VALUE>
- **Institution Name**: <DICOM TAG VALUE>
- **Manufacturer Model**: <DICOM TAG VALUE>

You have the following unmapped submissions currently on site server:

<table>
<thead>
<tr>
<th>#</th>
<th>Station Name</th>
<th>Device Serial Number</th>
<th>Institution Name</th>
<th>Manufacturer Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>D</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

There is no association between this Device and an NRDR Facility ID. All submissions from this Device will be cached locally on the Site Server and submitted to ACR after corresponding association has been set up.

Please use Site Server Domain Settings -> 'Scanner-Facility Mapping' to map your devices.

Unrecognized data will be automatically removed from the Site Server in 14 days if they are not mapped during this time period.

Regards,
ACR TRIAD Support Team
703-390-9858 (Select option 1)

### 4.2.2 Unmapped Submission

Scanners can be mapped in two ways:

1. Select the “Unmapped submissions” tab in the Scanner-Facility Mapping window and add the unmapped scanners to its respective facility ID
Click on + to map the scanner → Select the respective facility ID → Add & Close

2. Select “Scanner Mapping” tab and click on the “Add new scanner” button. A new pop up window will appear. Select the “facility ID” and fill in the following fields. Click on “Add & Close” when done.

To add additional scanners click on “Add new scanner” and follow the same process.
- Facilities tab will display the count for mapped scanners of each facility
4.2.3 Configuration of Port #, AE Title and Image Storage Folder

1. The default port # is 104 and the default AE title for the TRIAD DIR domain is “ACR”. To change the port #, AE title and/or image storage folder, open the Site Server console and select the “Site Info” tab.
2. Select the Dose Index Registry domain row. Then click the button.

Note: Click “Save & Close” after all the scanners are mapped to its respective facility ID
3. In the pop-up screen, make any updates and then click the “Update” button.
4. Click “Exit” to return to the main screen.

4.2.4 Setup Schedule for Image Forwarding

Image forwarding interval can be set using the Manage Domains tab in the Site Server Console.

1. Select Dose Index Registry under Active Domains.

2. Under the File Transfer settings, there are three scheduling options available as shown in the figure below:

   a. Default Time Interval: The default time interval which allows the Site Server to forward processed files automatically every ten minutes. *This is the preferred method for the Dose Index Registry domain.*

   b. Every [blank] Minutes: Enter how often file transfers will occur.

   c. On HH MM daily (24 hour format): Enter the hour (HH) and minute (MM) the files should be transferred daily. This option is used to transfer files in daily batches.
Make sure to leave the other settings, such as “Localizer Forwarding” at their default values. If any changes are needed for configuration of those settings, then contact ACR using the contact information in section 6.

3. Click the “Save and Reload Settings” button to enable the schedule settings. The images stored locally in Site Server will be forwarded to Central Server as per the scheduled time.

The Site Server should now be up and running and ready to receive files from your scanner(s) or PACS.

4.2.5 **Advance Settings:**

This feature allows the user to manage the archive folder size and expiry date.
Archive Expiry is the duration of storing the log files within the archive in ‘days’. Maximum Archive Size is the log file storage size in MBs.
5 Un-installation

You can uninstall the Site Server by using Windows Control Panel (Programs and Features). The Site Server settings will be cleared during the un-installation.

6 SOP Classes Supported

```xml
<SOPClass UID="1.2.840.10008.5.1.4.1.1.2" Name="CT Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.2.1" Name="Enhanced CT Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.88.22" Name="Enhanced SR Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.1.7" Name="Secondary Capture Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.88.67" Name="X-Ray Radiation Dose SR Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.7.2" Name="Multi-frame Grayscale Byte Secondary Capture Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.7.3" Name="Multi-frame Grayscale Word Secondary Capture Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.7.1" Name="Multi-frame Single Bit Secondary Capture Image Storage" />
<SOPClass UID="1.2.840.10008.5.1.4.1.1.7.4" Name="Multi-frame True Color Secondary Capture Image Storage" />
<SOPClass UID="1.2.840.10008.1.1" Name="Verification SOP Class" />
```

7 Contact Information

Please contact ACR if you have questions with the installation and configuration of Site Server at:

E-mail address: Triad-support@acr.org
Phone: 703-390-9858 (Select IVR option 1)
Hours: 8AM-5PM EST Monday-Friday