SIEMENS

DICOM

TD

Troubleshooting Guide

DICOM

Troubleshooting Guide DICOM

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The goal of this document is to provide a **workflow oriented** guide for DICOM troubleshooting. The Service Tools within syngo, including the DICOM Service Tools, are currently functionally oriented (this will be changed to workflow oriented in future versions).

DICOM Troubleshooting can be performed using 2 methods:

1. The Online method by using the tools and log files provided by the syngo Service Tools. Online troubleshooting can be performed locally or remotely. For remote troubleshooting, in some cases it is necessary to have full access or even patient data access.
2. The Office method by using the Save mechanism provided by syngo (CT ALT S), and the network capture ability provided by the MergeCOM tool kit in syngo.

In this guide you will be asked on several places to decide which method you will use.

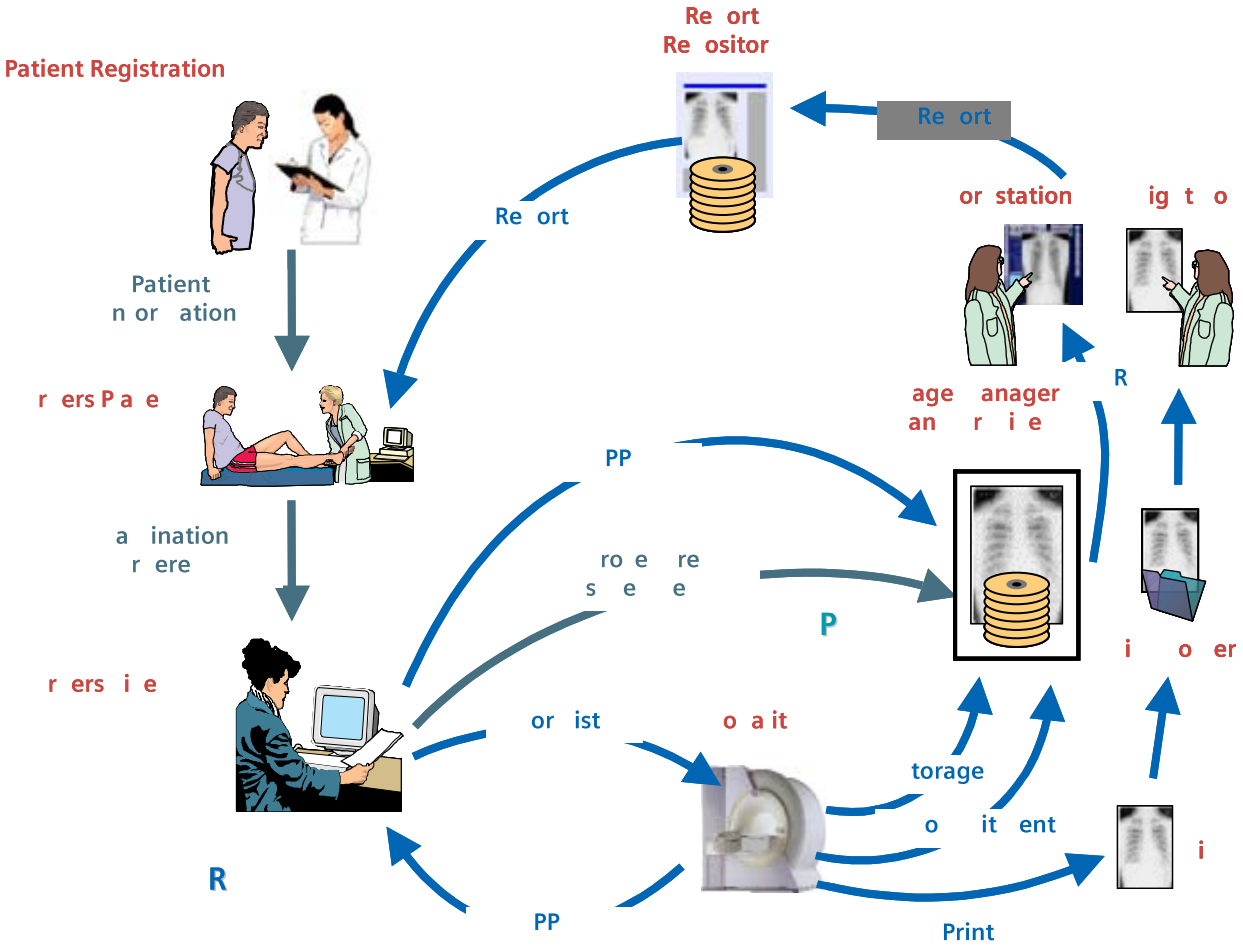


Fig. 1: DICOM Workflow

When to use which method

1. The **Online method** should be used,
   - For a quick check of the problem (check of event log, check of connectivity with TCP/IP ping and DICOM verification)
   - When a specialist is available (locally or remotely)

2. The **Office method** should be used,
   - When the problem cannot be analyzed with the Online method
   - When no specialist is available (just create a Save and perform a network capture that will be uploaded the the US).
   - When no remote access is possible (the Save and network capture can be transferred via e-mail).

Overview of the DICOM Troubleshooting Guide

The guide starts with a graphical overview of the troubleshooting procedures, which allows you to jump easily to the required procedure.

- Chapter 2 (No network Transfer) describes how to deal with problems caused on the network level. They are independent of the DICOM service.
- The next chapters are sorted by the DICOM services (Storage, Basic Print, Work,).

  Depending on the problem, you will have to go to the respective chapter and follow the instructions and hints. If the problem can not be fixed by means of these troubleshooting instructions, you will usually have to escalate the problem to your US.
- Appendix A provides information about the log files which the USC/HSC needs for further investigation.
- In Appendix B you will find examples of log files (including explanations) and several tables which are necessary to analyze the log files.
- Appendix “DICOM el-learning ” provides a Dicom self-learning tool.

Which skills are required for DICOM Troubleshooting?

This troubleshooting guide is organized in such a way that a modality specialist can perform troubleshooting up to a certain level. Only the DICOM service tools located on the local system are required.

Typical tasks for the modality specialist are:

- Check the Event Log
- Perform a TCP/IP ping and DICOM verification using the DICOM Service Tools
- Check configuration
- Create a SaveLog (CTRL ALT S) and perform a network capture (edit mergecom.pro file)

A DICOM specialist is required for detailed troubleshooting. CS TC provides a training class for DICOM Troubleshooting. In addition to DICOM basics, instruction for all required tools and log files is provided in this training class.

Typical tasks for the DICOM specialist are:

- Analyze network problems (TCP/IP, Ethernet, Router, Switch,)
- Analyze the DICOM log files
- Analyze Image header attributes
- Understand workflow and DICOM protocol

Which tools are required for DICOM Troubleshooting?

It is a general strategy of Siemens to have as many tools as possible on the local system, i.e., the Service Tools. However offline tools are required to analyze the network capture or to simulate remote systems such as Information Systems (Worklist, MPPS) or cameras (Print).

1. Syngo provides several local Service Tools (online), which are also remotely accessible with the following capabilities:

Fig. 2: DICOM Test Tools service menu

- Turn on trace levels for the appropriate log files and display these files
- Capture images and film prints using a test receiver and analyze them (display, image header dump, validation, comparison)
- TCP/IP ping and DICOM Verification (figure available)
- Send test images or captured images to any DICOM destination
- Create SaveLog file, including event log, configuration report and mergecom logs

2. Tools running on a PC to analyze a captured network transfer.

- The Merge DICOM Protocol Monitor (MergeDPM) is a very efficient tool to decode a captured network transfer. It allows you to save images within this network capture as an additional file.
- Network capturing can be done either using the MergeCOM tool kit on our syngo-based systems (beginning with syngo VD20), using the SUN snoop command provided by the MagicView1000 U or MagicStore or using a freeware tool for your laptop, called Ethereal.
- To display and edit DICOM image files it is recommended to use DICOMEdit, which is free for all Siemens employees.

- To validate DICOM images and DICOM Offline Media, in addition to DICOMEdit, it is recommended to use a tool from the University of Oldenburg (Offis institute) called DC-Mcheck, which is also freeware for all Siemens employees.

More details about the above mentioned tools can be found on the Siemens Intranet at `http://dicom.med.siemens.de` under DICOM Test Tools.

3. Tools running on a PC to simulate DICOM Services, e.g. a RIS or Camera

- Simulation of DICOM Service Class users and providers can be performed using freeware tools such as JDICOM (Java-based) and the AX DICOM Tools (which uses the Offis tools).

  More details about the above mentioned tools can be found on the Siemens Intranet at http://dicom.med.siemens.de under DICOM - Test Tools.

Which additional information is available for DICOM Troubleshooting?

- Together with the CS Training Center, a self-learn tool was developed -> DICOM e-Learning, which can be found in the appendix of this guide.(Dicom e-learning / p. 102)
- Known problems can be found in the CS Knowledge Base
- The Connectivity Competence Center (HS IM) provides an Intranet page

  http://dicom.med.siemens.de with DICOM-relevant topics such as

  - Links to Siemens and other vendor Conformance Statements
  - DICOM Interoperability Database where you can search for test results
  - Description of DICOM test tools
  - Frequently Asked Questions

NOTE

For DICOM troubleshooting on the specialist level, a Service PC with a network card and the ability of installing service tools is absolutely necessary!

DICOM troubleshooting may cover all systems in the clinical workflow. Movable and flexible tools are therefore necessary.

All DICOM services are based on the TCP/IP network protocol and use the same mechanism for the DICOM association negotiation and for the message transfer. This section deals with problems in this area, which are independent of the particular DICOM service.

Start troubleshooting with TCP/IP ping and DICOM verification provided by the DICOM service tools.

Probable Cause and Service Action	Service Tool
• Network problems; Configuration problem; Process not started ➪ Perform TCP/IP ping and DICOM verification ➪ To verify if other remote systems are also not reachable, perform DICOM verification for all configured DICOM nodes.	***syngo***: DICOM Service Tools - Verify Network (C_ECHO)

Probable Cause and Service Action

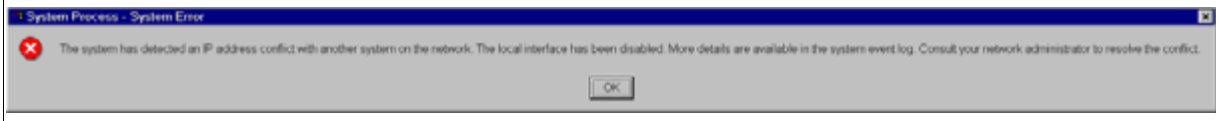


Fig. 3: IP address conflict

- Check the TCP/IP configuration of the node itself
- Check the TCP/IP configuration of the other nodes

TCP / IP Ping Fails

Error messages:

- **UI:** Connection failed because the remote node does not exist / no response from node name
- **Event log:** Could not open association with remote node / service is unacceptable
- **Merge log:** E: TCP init error / timeout in select () call

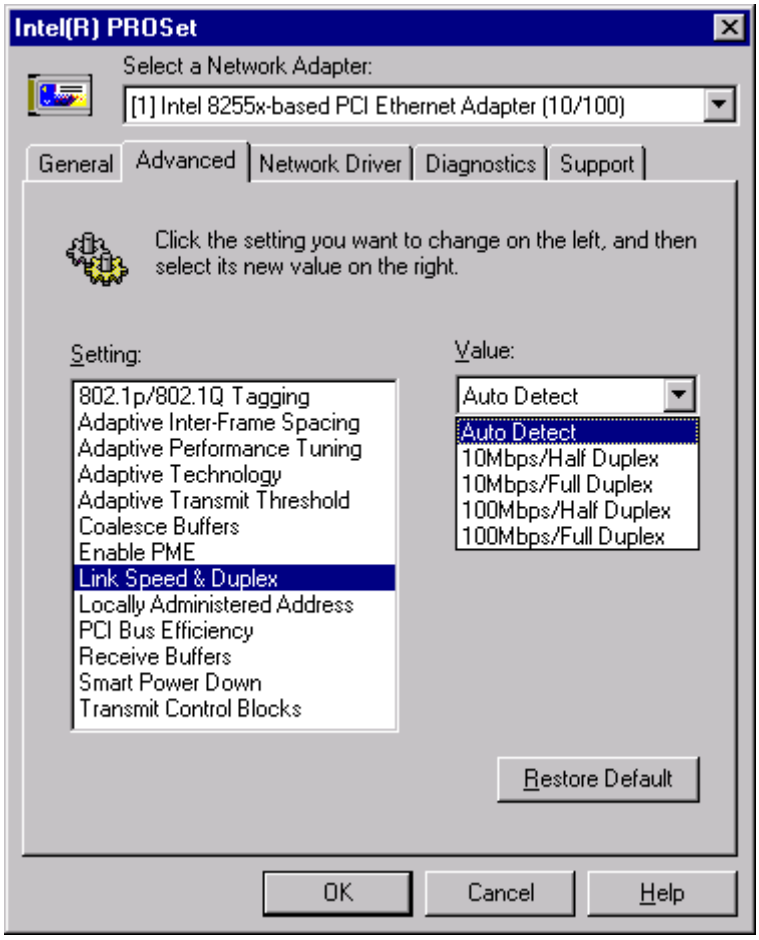
Probable Cause and Service Action	Service Tool
• Network problems; configuration problem; ➪ Check appropriate merge.log file for "TCP/IP init error" to verify that the problem is caused on the network level.	***syngo:*** DICOM Service Tools - Analysis Examine logs: merge_stu.log. merge_hc.log, merge_HRI.log
• Wrong configuration on local system ➪ Check IP address, subnet mask and gateway address in your configuration or with the operating system command " `ipconfig /all` "	***syngo:*** Configuration Tool - DICOM ***syngo:*** Utilities - Escape to OS -ipcponfig / all
• Link LED on network card is off: Cable not connected at HUB or switch, crossover port at HUB ➪ Many network cards do not provide this link LED. ➪ It might be necessary to remove PC housing to see link LED (if it exists at all) ➪ On AXIOM Artis system there are 2 network adapters. For troubleshooting purposes, it is possible to swap the connectors and the configuration.	Network administrator ***syngo:*** Configuration Tool -
• Problems with Domain Name Service (DNS) or wrong configuration ➪ Perform TCP/IP ping with IP address instead of node name	***syngo:*** Utilities - Escape to OS, ping IP address IP address can be found either in ***syngo:*** Configuration Tool or under C:\Winnt\system32 \drivers\etc\hosts (lmhosts)
• Gateway not accessible or down (only if remote node belongs to another subnet) ➪ Perform TCP/IP ping to the gateway	***syngo:*** Utilities, Escape to OS, ping gateway IP address

Tab. 1 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Gateway is incorrectly configured ➪ Perform TCP/IP ping to both sides of the gateway. ➪ Check gateway configuration	Network administrator
• Bad performance of the network because of many collisions. ➪ Check for collisions and errors on the network before and after a transfer. ➪ Check performance with ping command. ➪ On switched network, set "auto negotiation off" and manually set full duplex,100 Mbit/sec	***syngo:*** Utilities -Escape to OS - netstat -s (netstat -e) ***syngo:*** Utilities -Escape to OS - - ping -l 50000 -n 10 IP address Network administrator
• Problem in remote system ➪ Service engineer for the remote system should perform similar checks to localize the problem	Service engineer for remote system
• Problem in remote system ➪ Change IP address of your laptop to the one for the remote system and connect it instead of the remote system. ➪ Perform TCP/IP ping	Laptop with network card ***syngo:*** Utilities; Escape to OS, ping IP address

Data Transfer to Remote System is Too Slow

Tab. 2

Probable Cause and Service Action	Service Tool
• Check the configuration of the network card. Auto Detect could reduce the speed because sometimes the negotiation results in a transmission speed lower than usual. For ACOM.net environment, select 100MBps/Full Duplex.	 *Fig. 4: Network adapter, link speed setting* Association/Negotiation

DICOM Verification Fails (C-Echo)

but TCP/IP ping is O.K.

Error messages:

- **UI:** No response from node name
- **Event log:** Could not open association with remote node / service not acceptable
- **Merge log:** E: TCP init error

Probable Cause and Service Action	Service Tool
• AET or port number of remote system is wrong ➪ Verify configuration ➪ Find AET and port number of remote system in its Conformance Statement	Configuration Tool DICOM Conformance Statement of remote system
• Remote process is not running ➪ Perform command: telnet `IP address port number` of the remote provider to check if any process is listening under this port. If no process is listening on the port, after a time-out the message: "Connection to host lost" appears - If any process is listening on the port, you immediately get the message: "Connection failed / Host Name: host name"	***syngo:*** Utilities - Escape to OS telnet IP address port number (i.e. telnet syngo1 104)
• Remote system does not support DICOM verification (very seldom occurs) ➪ Check DICOM Conformance Statement if remote system supports DICOM verification as SCP	DICOM Conformance Statement of remote system
• Remote system is just a SCU; C_ECHO is usually not supported ➪ Check DICOM conformance statement if remote system is SCP. It is not possible to perform DICOM verification to an SCU!!	DICOM Conformance Statement of remote system

Tab. 3 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Any error on DICOM level ➪ Check appropriate merge.log file for error message (see appendix)	***syngo:*** DICOM Service Tools - Analysis Examine logs: merge_stu.log. merge_hc.log, merge_HRI.log
• Local SCU does not send any TCP/IP packets or network switch does not forward DICOM verification message ➪ Display the network traffic on TCP/IP level and check if packets are sent to the appropriate IP address and port number. Beside LAN analyzers, the tools on the right column provide the ability to display network traffic. Note that in a switched network the system which captures the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB	If a Unix (Solaris 2) system is available in the network -> command: snoop IP Unix (Sun OS) device available in the network -> command: etherfind IP ***syngo***: Utilities - Escape to OS - netstat -n ***syngo*** Operating system: Start - Programs - Administration - WindowsNT Diagnosis
• Network switch does not forward DICOM verification message ➪ Unplug SCP and simulate remote device by your laptop. Enter the IP address of the SCP at your laptop. ➪ Start the command shell and start a DICOM storage provider store scp (syntax: storescp -h) or JDICOM - Store SCP or any other storage device that supports DICOM verification.	- Offis Toolkit (Uni Oldenburg, available on the Intranet - DICOM - Tools): storescp -v -AET AET 104 - JDICOM: Store SCP

Error messages:

- **UI:** search platform: Logical name breaks down during searching
- **Event log:** Logical name breaks down during searching
- **Merge log: E:** Peer aborted association

Probable Cause and Service Action	Service Tool
• Remote system might check our local AET while receiving a message. Our AET is not or not correctly configured at the remote system. - Note: DICOM verification uses the AET for the appropriate service, e.g. AN_NODENAME for query destination and HRI_NODENAME for a worklist destination. - Contact service engineer for the remote system	Service engineer for remote system

If USC / HSC support is required:

If no remote access for troubleshooting is possible and a specialist needs to analyze the problem, he needs the output of the following files and commands:

%MEDHOME%\config\merge\mergecom.app

%MEDHOME%\log\merge_stu.log with trace level T2, T3 and T7 (for print merge_hc.log; for HIS/RIS merge_HRI.log) and output of the following commands:

Service tools: Utilities - Escape to OS - NT Command Inerpreter - Parameter: netstat -r > C:\Temp\netstat.txt

Service tools: Utilities - Escape to OS - NT Command Interpreter - Parameter: ipconfig / all > C:\Temp\ipconfig.txt

Image Transfer to Remote System Fails

Tab. 4 For DICOM Specialist level

Probable Cause and Service Action	Service Tool
• Verify that the problem is not caused on network level as described (No network connection) in these instructions (AXA4-100.840.01...). • Check how far the transfer succeeds and check for error messages at the end of the log file: • Turn on the Trace level T2, T3 and T7 for the merge_stu.log file and send one image again to the remote system. First T3 should show the Association Negotiation Request and Response. Afterwards the command set request should be displayed on T7. On T2, you will again see the command set and also the image header attributes should be displayed, and finally T7 should again display the response from the SCP.	***syngo:*** DICOM Service Tools - Storage - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs : merge_stu.log. See example of a merge.log file and the list of error messages in the appendix. (AXA4-100.840.01...)

Problem During the Association Negotiation (T3 level)

Error messages:

- **UI:** Session aborted by sender
- **Event log:** Session aborted by sender (40003) and service is unacceptable (30023)
- **Merge log:** E: T9: (Assoc_ABORT) send

Tab. 5 For DICOM specialist level

Probable Cause and Service Action	Service Tool /Person
• If the appropriate Presentation Context (image and transfer syntax) is rejected in the response of the Association Negotiation (on the T3 level), it will not be supported by the provider. The sender aborts the association. - Check configuration on both sides and the Conformance Statement of the remote system.	DICOM Conformance Statement of remote system. Service engineer for the remote system
• Wrong or missing command set request (T7 level) - Check if the correct command set is sent during the T7 request. If no T7 request is sent, the Association Negotiation (T3 level) might have failed. In the case of extended negotiation (SCU / SCP role others then "not sent"), this feature might not be supported by the SCU or SCP.	DICOM Conformance Statement of both systems. Service engineer for the remote system

Problem with the Transferred Image

Probable Cause and Service Action	Service Tool
• Status in the command set response (T7 level) is not "0". - Status "0" is successful transfer. Status "A7xx" is out of resources, which might be caused by an incorrect attribute in the data set (T2 level).	***syngo:*** DICOM Service Tools - Storage - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs : merge_stu.log. See list of status codes in the Appendix (AXA4-100.840.01...)
• Value representation of explicit VR transfer syntax causes problems or • JPEG Transfer Syntax cannot be decoded - Enable another transfer syntax (just one) at Service Configuration and send the image again. Only the selected transfer syntax will be used.	***syngo:*** <Configuration> <DICOM> <network nodes>

Probable Cause and Service Action	Service Tool
• Remote system reads the first image (or the whole study), but it fails to enter it in its local data base. - Send other images, if possible acquired from another modality or application. Do not send "Service images". - If possible, send image to another remote system (SCP) and check if the transfer is successful. - Send reference image via the DICOM Service Tools. This is a validated image that will be sent by the Test Send Process. There is no interaction of the local data base and other processes. - Start the test receiver and send image again. The sent image will be captured on the local system and can be analyzed using the analysis tools (verify, header dump, display) - Check error logs at the remote system	Another remote storage provider DICOM Service Tools - Storage - Send ***syngo:*** DICOM Service Tools - Storage - Simulate remote receiver DICOM Service Tools - Analysis Service engineer of the remote system

Timeout Problems

Tab. 6 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Timeout in the middle of the message stream - See merge_stu.log for error message: timeout in the middle of the stream. - Increase the inactivity timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine Logs: merge_stu.log ***syngo:*** Configuration Tool - DICOM - General
• Timeout when waiting for a response for successful transfer - See merge_stu.log for error message: timeout "Read PDU timeout" - Increase read PDU timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log ***syngo:*** Configuration Tool - DICOM - General

Problems Caused by the Remote System

Tab. 7 Problems caused by the remote system. For DICOM specialist level

Probable Cause and Service Action	Service Tool
• The remote system can not deal with the transferred image. - Connect your Service PC instead of the remote system. Simulate remote system by using the same IP address and start a storage provider with the same AET and port number. Check whether the test tools are able to receive the local images. Display the received image with a viewer (Osiris, ACRNview,...)	Service PC: - Offis storescp -AET AET 104 - JDICOM - Store SCP Be aware of the restrictions of the test tools

If USC / HSC support required:

If no remote access is possible and a specialist needs to analyze the problem, he needs the following data:

1. If possible, the DICOM transfer must be captured by means of the Solaris 2 snoop command or by the NetXray LAN analyzer.

   Please note that in a switched network, the system which is to capture the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB. The captured file can be analyzed using the Merge DPM tool.

2. If capturing of the DICOM transfer is not possible, it is necessary for storage to capture the transferred object (e.g. image) by means of the DICOM Service Tools. To do this, start the DICOM Service Tools <Storage><Simulate remote receiver> and transfer the object again.

3. In addition, the following log file is required: %MEDHOME%\log\merge_stu.log with trace level T2, T3 and T7

Image Transfer from Remote System to Local System Fails

Tab. 8 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Configuration problem - Check whether the remote system is correctly configured at local system (Network Nodes AXA4-100.843.01...) • Verify that the problem is not caused on the network level as described (No network connection) in these instructions (AXA4-100.840.01...).	Configuration - DICOM - Network nodes
• Check how far the transfer succeeds and look for error messages at the end of the log file: Turn on the Trace level T2, T3, T7 and T9 for the merge_stu..log file and send one image again from the remote system. First T3 must show the Association Negotiation Request and Response. Afterwards the Command set request must be displayed on T7. On T2 you will again see the command set and the image header attributes will also be displayed and finally the T7 will again display the response from the local system.	***syngo:*** DICOM Service Tools - Storage - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs : merge_stu.log. See list of status codes in the appendix (AXA4-100.840.01...)

Problem with the Association Negotiation (T3 level)

Error messages:

- **UI:** Session aborted by sender
- **Event log:** Session aborted by sender (40003) and service is unacceptable (30023)
- **Merge log:** E: T9: (Assoc_ABORT) received

Tab. 9 Association Negotiation for DICOM specialist level

Probable Cause and Service Action	Service Tool
• If the appropriate Presentation Context is rejected in the response of the Association Negotiation (on T3 level), it will not be supported by the provider. The sender aborts the association. - Check configuration on both sides and the Conformance Statement of the remote system.	DICOM Conformance Statement of remote system. Service engineer for the remote system
• Wrong or missing command set request (T7 level) - Check if the correct command set was sent during the T7 request. If no T7 request was sent, the Association Negotiation (T3 level) may have failed. In case of Extended negotiation (SCU / SCP role others then "not sent") this feature may not be supported by the SCU or SCP.	DICOM Conformance Statement of both systems. Service engineer for the remote system

Problem with Transfered Image

Probable Cause and Service Action	Service Tool
• Status in the command set response (T7 level) is not "0". - Status "0" is successful transfer. - Status "A7xx" is out of resources which might be caused by a wrong attribute in the data set (T2 level).	See list of status codes in the appendix (AXA4-100.840.01...)
• Value Representation of Explicit Transfer Syntax causes problems (if sent) or is required (if not sent). JPEG Transfer Syntax cannot be decoded. - Change to another transfer syntax and send the message again. Only the selected transfer syntax will be used.	***syngo:*** DICOM Service Tools - Storage - Extended Trace - Transfer Syntax

Probable Cause and Service Action	Service Tool
• Local system reads the first image (or the whole study) but it fails to enter it in its local data base ➪ Send other images, if possible acquired at another modality or application. ➪ If possible, send image from another remote system (SCP) and check if the transfer is successful. ➪ Start the test receiver and send image again. The sent image will be captured on local system and can be analyzed by the analysis tools (verify, header dump, display) ➪ Check error log of the study server (local system)	 Another remote Storage User ***syngo:*** DICOM Service Tools - Storage - Simulate local receiver ***syngo:*** DICOM Service Tools - Analysis ***syngo:*** DICOM Service Tools - Analysis - examine logs

Timeout Problems

Tab. 10 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Timeout in the middle of the message stream ➪ See merge_stu.log for error message: timeout in the middle of the stream. ➪ Increase Inactivity Timeout under Configuration.	***syngo:*** DICOM Service Tools - Analysis - Examine Logs ***syngo:*** Configuration Tool - DICOM
• Timeout while waiting for a response of successful transfer ➪ See merge_stu.log for error message: timeout "Read PDU timeout". ➪ Increase Read PDU timeout under Configuration.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log ***syngo:*** Configuration Tool - DICOM

If USC / HSC support is required:

If no remote access is possible and a specialist needs to analyze the problem, he needs the following data:

1. Preferably the DICOM transfer should be captured by means of the Solaris 2 snoop command, Ethereal or by the NetXray Lan Analyser. See introduction to these trouble-shooting instructions.

   Please note that in a switched network, the system which captures the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB. The captured file can be analyzed by the **Merge DPM tool**.

2. If capturing of the DICOM transfer is not possible, it is required for Storage to capture the transferred object (e.g. image) by means of the DICOM Service Tools. To do this, start the DICOM Service Tools <Storage><Simulate remote receiver> and transfer the object again.
3. In addition, the following log file is required: %MEDHOME%\log\merge_stu.log with trace level T2, T3 and T7

Patient / Study Browser Presentation at the Local System is not Correct

Tab. 11 For DICOM specialist level

Probable Cause and Service Action	Service Tool
Text in Patient Browser is not display in correct characters • Attribute 0008,0005 'Specific Character Set' is missing or wrong. If it is missing the system usually asumes that the ASCII character set is used. If the ASCII character set does also not fit, the system tries to interprete the image with the Latin1 (ISO IR100) character set. ➪ The modality or the sending system needs to enter the correct attribute 0008,0005. For more details see the Service Online Help - Configuration - Character Set.	***syngo:*** Configuration - DICOM - Character Set Configuration for character set of the sending system.
The same patient occurs several times in the patient browser • A patient will be uniquely identified by the "patient"s name, patient ID, patient sex and date of birth. If one of these attributes is different in an image, the local system assumes that the patient is different. If one or more of these 4 attributes is missing, the system assumes that the patient is not the same, even if all other attributes are filled in with the same value. ➪ Start the test receiver and send the study again, which is not correctly displayed in the patient/study browser. The sent images will be captured on the local system and the image header can be analyzed by the analysis tool "dump message" For further details on troubleshooting, see the following hints ➪ Check whether the difference in the attributes can be avoided at the RIS or modality. All 4 attributes must have a value!	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message

Probable Cause and Service Action	Service Tool
Images from the same study are not located in the same study in the patient browser • The matching criteria for a study is the attribute 0020,000d "Study Instance UID". This attribute is created by the HIS/RIS or by the modality and needs to be the same for all images that belong to the same study. The Requested Procedure ID (0040,1001), which is also created by the HIS/RIS, also needs to be the same. ➪ Start Test receiver and send the study again, which is not correctly displayed in the patient/study browser. The sent images will be captured on the local system and the image header can be analyzed using the Analysis tool "dump message" For further details on troubleshooting, see the following hints ➪ Check whether 0020,000d and 0040,1001 is different for the affected images. The 4th number in this UID defines the creator of the UID, whereby 1107 is Siemens.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
Series splitting is not o.k. • The DICOM standard does not define when a new series needs to be created. This task is always in charge of the local system. Series splitting of the same study can be different on different systems. ➪ Contact the USC to investigate this problem. See in the Intranet under `http://dicom.med.siemens.de` - Siemens products for the rules regarding the particular product.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
The same image appears several times in the browser • An image will be identified by the SOP Instance UID (0008,0018). If this attribute is different the image will be recognized by the system as a different image. ➪ Check the attribute 0008,0018. In this UID you can usually find out who created the image (4th value, 1107 is Siemens).	

Image Presentation and Manipulation at the Local / Remote System is not Correct

Tab. 12 For DICOM Specialist level

Probable Cause and Service Action	Service Tool
Image Text does not display correct characters • Attribute 0008,0005 "Specific Character Set" is missing. In this case, the system usually assumes that the ASCII character set is used. If the ASCII character set also does not fit, the system tries to interpret the image with the Latin1 (ISO IR100) character set. - Start the test receiver and the send image again. The sent image will be captured on local system and the image header can be analyzed using the Analysis tool "dump message". For further details on troubleshooting, see the following hints. - The modality or the sending system needs to enter the correct attribute 0008,0005. . For more details, see Service Online Help - Configuration - Character Set.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
Windowing not correct • The attributes 0028,1051 "Window Width" and 0028,1052 "Window Center" are just optional for most image objects in DICOM. If these attributes are missing, syngo enters the default value 100 into these attributes, which causes a dark image. ➪ Start Test receiver and the send image again. The sent images is captured on local system and the image header can be analyzed using the Analysis tool "dump message". For further details on troubleshooting, see the following hints. ➪ As a workaround, you can set the default window values under: Options - Configuration - Viewer. Under Image - Windowing you can select one of these configured default window values. • For CT images, the attribute 0028,1052 "Rescale Intercept" is sometimes ignored by non-Siemens viewers. This leads to a window center value that is skipped by 1024 Houndsfield values. ➪ Inform the service engineer for the remote system	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message

Probable Cause and Service Action	Service Tool
• The attribute 0028,1053 "Rescale Slope" needs to be an integer value for syngo based system. Otherwise it will not be correctly interpreted and leads to poor image quality and incorrect window value interpretation. ➪ Call USC • The image can have several Look Up Table sequences (LUTs) which need to be used for image display. Check if any LUT is included in the image header and if the system supports this LUT (Modality LUT sequence (0028,3000) and VOI LUT sequence (0028,3010)) ➪ Check DICOM Conformance Statements of the particular system. Syngo based systems shall use the LUTs correctly.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
Image is distorted (oval shape instead of circle) • Attribute 0028,0034 "Pixel Aspect Ratio" is not 1/1. If this attribute is missing, the system usually assumes that the pixel size is squared. ➪ Start Test receiver and send the image again. The sent images will be captured on local system and the image header can be analyzed using the Analysis tool "dump message". For further details on troubleshooting, see the following hints ➪ The system may not be able to display non-squared pixel sizes. Change the pixel aspect ratio in the modality to a squared pixel size.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message

Probable Cause and Service Action	Service Tool
Overlay missing • The overlay data are defined in the image header group 6000. If attributes in group 6000 are missing, the system cannot display overlays such as annotations, distance measurements and ROIs. ➪ Start Test receiver and the send image again. The sent images will be captured on local system and the image header can be analyzed using the Analysis tool "dump message" ➪ Inform the service engineer for the remote system • The system does not support overlays at all (such as 3D Virtuoso). ➪ Start Test receiver and send the image again. The sent images will be captured on local system and the image header can be analyzed using the Analysis tool "dump message" ➪ Check the Conformance Statement for the particular system. The local system must support overlays.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
• The overlay data in the group 6000 can be entered in 2 ways: 1. Overlay data are in the attribute 6000.3000. In this case the attributes 6000.0100 "Overlay Bits Allocated" and 6000.01002 "Overlay Bit Position" need to have the value "1". 2. Overlay data are part of the image pixel data. Group 6000 only points to the bit position where the overlay data are located. In this case, 6000.3000 does not exist and 6000.0100 needs to be equal to 0028,0100 "Bits Stored". 6000.0102 will show the bit position of the overlay data. ➪ Check if the attributes are filled in according to the left table column (Probable Cause).	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message

Probable Cause and Service Action	Service Tool
Instead of metric values the number of pixels is displayed • The system needs to know the size of a pixel. Therefore the following attributes are required (depending on the image type) - CT, MR, PET, NM: 0028,0030 "Pixel Spacing" is the physical distance between the center of each pixel. - CR, DX, : 0018,1164 "Image Pixel Spacing" is the physical distance measured on the front plane of the image receptor housing between the center of each pixel. This is not the physical distance in the body! - US: 0018,6024 to 0018,602E "Physical Units X/Y Direction" and "Physical Delta X/Y" are required. Some US devices use the attribute "Pixel Spacing" (0028,0030), although this attribute is not defined for US objects. Syngo based systems do not accept this value! - RT: 3002,0011 "Image Plane Pixel Spacing" is the physical distance between the center of each pixel. Although RT images are protection images (such as CR and DX), the value is the physical distance in the body. The attribute 3002,0026 "RT Image SID" is required to calculate the correct value for 3002.0011. RT Image SID is the distance from radiation machine source to image plane along the radiation beam axis. ➪ Start Test receiver and the send image again. The sent image will be captured on the local system and the image header can be analyzed using the analysis tool "dump message" ➪ Check if the appropriate attribute is available. For further investigation, call the USC / HSC.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message
Shutter is missing • Shutter information needs to be written into the attributes 0018,1600 - 0018,1620. Some systems write the shutter information into private header attributes (which are unknown to other systems). ➪ Start Test receiver and the send image again. The sent image will be captured on local system and the image header can be analyzed by the Analysis tool "dump message" ➪ Check whether the appropriate attributes are available. If yes, verify in the corresponding DICOM Conformance Statement whether "Display Shutter" is supported. The local system must support this functionality.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message

Probable Cause and Service Action	Service Tool
Zoomed image is displayed in the original size • Until "Presentation State Object", the DICOM standard did not define any attribute to set the zoom factor. Up to this time, either the zoomed image was saved as a new image at the image creator, or the zooming information was sent in a private attribute (which is unknown to other systems). ➪ Start Test receiver and send the image again. The sent image will be captured on local system and the image header can be analyzed using the analysis tool "dump message' ➪ The zoomed image needs to be saved with the new pixel data at the sending system (image creator).	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message DICOM Conformance Statement
Color images are not displayed correctly • Syngo based systems just support "RGB" and "Palette color" images.YBR images are not supported - image is black. RGB images with the value 1 for "Planar Configuration" (0028,0006) will not be supported - image appears several time with the wrong colors. ➪ Start Test receiver and send image again. The sent image will be captured on local system and the image header can be analyzed using the analysis tool "dump message" ➪ Check the attribute "Photometric Interpretation" (0028,0004) and "Planar Configuration" (0028,0006). • Color images transferred in JPEG compression mode may be displayed incorrectly. - Send images in non-compressed mode. This problem will be solved in one of the next releases.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message DICOM Conformance Statement
Multiframe images are not displayed correctly • Multiframe images sent in compressed (JPEG) mode may not be displayed correctly. ➪ Start Test receiver and send image again. The sent image will be captured on local system and the image header can be analyzed by the analysis tool "dump message" ➪ Multiframe images can be identified by the attribute "Number of Frames" (0028,0008), which should have a value higher than 1. The compression mode can be seen in the attribute "Derivation Description" (0008,2111). This problem will be solved in one of the next releases.	***syngo:*** DICOM Service Tools - Storage - Simulate local / remote receive ***syngo:*** DICOM Service Tools - Analysis - Dump message DICOM Conformance Statement

Image Transfer to Camera Fails

Tab. 13 For DICOM specialist level

Service Action	Service Tool
• Verify that the problem is not caused on the network level as described (No network connection) in these instructions (AXA4-100.840.01...). • Check how far the transfer succeeds and for error messages at the end of the log file: • Turn on the Trace level T2, T3, T7 and T9 for the appropriate merge.log file and send one image again from the customer User Interface • First T3 will show the Association Negotiation Request and Response. First T3 will show the Association Negotiation Request and Response. Afterwards several Meta Services (Film Session, Film Box, Image Box) will be performed one by one.	***syngo:*** DICOM Service Tools - Basic Print - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_hc.log. See example of a merge.log file and the list of error messages in the appendix.

Problem with the Association Negotiation (T3 level)

Probable Cause and Service Action	Service Tool
• The camera might have limited open DICOM associations. As some modalities always keep the session open, this limit can be reached when more than 3 modalities are connected to a camera. ➪ Check how many modalities are connected to the camera. Assistance from the camera vendor's service engineer may be necessary.	Service engineer of the camera

Probable Cause and Service Action	Service Tool
• The local system does not send any messages to the camera ➪ Simulate the camera using the DICOM Service Tools and send an image to the camera. Then go to Analyze, check the merge_hc.log file and display the transferred pixel data.	***syngo:*** DICOM Service Tools - Basic Print - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs : merge_hc.log.
• Camera can not deal with transferred messages ➪ Connect your Service PC instead of the camera. Simulate the camera by using the same IP address and start a camera server with the same AET and port number. Check whether the test tool is able to receive the images. ➪ Display the received image using a viewer (Osiris, ACRNview).	Service PC: - JDICOM - Print Server- Osiris, ACRNview, Be aware of the restrictions of the Test tools

Timeout Problems

Tab. 14 Timeout problems for DICOM specialist level

Probable Cause and Service Action	Service Tool
• Timeout in the middle of the message stream. ➪ See merge_hc.log for error message: timeout in the middle of the stream. ➪ Increase Inactivity Timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine Logs: merge_hc.log ***syngo:*** Configuration Tool - DICOM - General
• Timeout when waiting for a response of successful transfer. ➪ See merge_hc.log for error message: timeout "Read PDU timeout" ➪ Increase Read PDU Timeout under Configuration.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_hc.log ***syngo:*** Configuration Tool - DICOM - General

Image Quality Problems

Probable Cause and Service Action	Service Tool
• Wrong or no LUT configured at the local system for the appropriate image type. ➪ Check whether a LUT is configured for the appropriate image type (e.g. CR, MR,...)	***syngo:*** Configuration Tool - LUT
• Camera does or does not support the Presentation LUT (Gray scale Display Standard Function) ➪ Check whether the camera supports the DICOM Gray scale Display Standard Function and whether it is set this way. ➪ Check whether the presentation LUT needs to be configured at the local system. ➪ Check whether the correction LUT needs to be configured at the local system. For more details, see DICOM Service Online Help - LUT	***syngo:*** Configuration Tool - LUT
• The camera compares the AET of the transferred message (local AET of the sender) with the one configured for this sender at the camera. Depending on the AET, a Look Up Table LUT (usually linear LUT) is set. ➪ Check whether the local AET is correctly configured at the camera	Service engineer for the camera
• Any local configuration settings are not correct for the camera. ➪ Change the configuration settings such as image interpolation, min / max density to improve the image quality. Please note that these settings are validated for the released cameras and it is not necessary to modify them.	***syngo:*** Configuration Tool - LUT ***syngo:*** Configuration Tool - Print devices

If no remote access for troubleshooting is possible and a specialist needs to analyze the problem, he will need the following data:

1. Preferably, the DICOM transfer will be captured by means of the Solaris 2 snoop command, Ethereal or by the NetXray LAN Analyzer. See Introduction to these troubleshooting instructions.

   Please note that in a switched network the system which captures the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB. The captured file can be analyzed using the Merge DPM tool.

2. If capturing of the DICOM transfer is not possible, the following log file is required: %MEDHOME%\log\merge_hc.log with trace level T2, T3 and T7.

TBD

Query Matches are not Displayed Correctly

Tab. 15 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• Verify that the problem is not caused on the network level as described in chapter (No network connection) of these instructions (AXA4-100.840.01..). Check how far the transfer succeeds and for error messages at the end of the log file: Turn on the Trace level T2, T3 and T7 for the merge_stu.log file and perform a query request again from the customer User Interface - First T3 will show the Association Negotiation Request and Response. Then the Command set request will be displayed on T7. The requested attributes will be displayed on T2. A command set with status pending on T7 and the responded data on T2 will be displayed for each matching query response. Finally, T7 will display the status 0 = success.	***syngo:*** DICOM Service Tools - Query/Retrieve - Extend Trace Level ***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log. See example of a merge.log file (Storage) and the list of error messages in the appendix.

Association Negotiation Fails on the Patient Level or Study Level

Error messages:

- **UI search platform:** Could not establish connection to the node name
- **Event log:** Could not establish connection to the node name
- **Merge log:** E: Association rejected; permanent rejection

Tab. 16 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• If the remote system is configured with "Patient Root" model AND "Study Root" model but supports only one of these Q/R models, the Query Request fails.When both services are configured, syngo-based systems will start on the patient level with "Patient Root" and continue with a new Association Negotiation on the study level using "Study Root". - Configure only the query model that is supported by the remote system.	***syngo***: Configuration - DICOM - Network nodes

No Query Response Message is Received (no matches)

Probable Cause and Service Action	Service Tool
• There is no patient at the remote system that matches the query request - No response on T2 level. - Check the query request on T2 level. - Enter an exact patient name into the search platform and search again. - Enter an exact patient ID into the search platform and search again.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log..

Received Query Response Message is not Displayed at all

Probable Cause and Service Action	Service Tool
• Query matches are transferred (see responses on T2 level) but they are not displayed in the matching list of the customer UI. ➪ Check the query response on T2 level. If unknown (not requested) attributes are in the response message, the local system may not accept this message.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log.
• Status in the command set response (T7 level) is not pending or success. ➪ Status "0" is successful transfer.Status "HFF00" or "HFF01" / Decimal 65280 or 65281 is pending (further responses will follow). Status "A7xx" is out of resources which might be caused by an incorrect attribute in the data set (T2 level).	See list of status codes in the appendix.
• Value Representation of Explicit Transfer Syntax causes problems (if sent) or is required (if not sent). ➪ Change to another transfer syntax and send the message again. Only the selected transfer syntax will be used.	DICOM Service Tools - Query/Retrieve - Extended Trace - Transfer Syntax.
• Problem caused at the remote system. ➪ Check the error logs at the remote system	Service engineer of the remote system

Received Query Response Message not Displayed Correctly

Probable Cause and Service Action	Service Tool
• Incorrect character set ➪ Check the query response on T2 level. If no attribute 0008,0005 (Special Character Set) is included, the local system assumes that the default character set (ASCII) is used.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log.
• Not all matches are displayed ➪ The application accepts only a certain amount of matches in the response message	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log.

Timeout Problems

Probable Cause and Service Action	Service Tool
• Timeout in the middle of the message stream ➪ See merge_stu.log for error message: timeout in the middle of the stream. ➪ Increase Inactivity Timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_HRI.log ***syngo:*** Configuration Tool - DICOM - General
• Timeout when waiting for a response for successful transfer.The remote system is not able to find data according to the query request - performance problems ➪ See merge_stu.log for error message: timeout "Read PDU timeout" ➪ Increase Read PDU Timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_HRI.log. ***syngo:*** Configuration Tool - DICOM - General

Remote System cannot Handle Query Request

Probable Cause and Service Action	Service Tool
• The remote system (query SCP) can not handle the query request - Connect your Service PC instead of the remote system. Simulate the remote system by using the same IP address and start a Query Provider with the same AET and port number. Check whether the test tools are able to handle the query request.	Service PC: - JDICOM - Query Server GUI

Retrieve of Selected Data Fails

Probable Cause and Service Action	Service Tool
Verify that the problem is not caused on the network level as described in chapter 1 of these instructions. Check how far the transfer succeeds and for error messages at the end of the log file: Turn on the Trace level T2, T3, T7 and T9 for the appropriate merge.log file and perform a query / retrieve request again from the customer User Interface. Look for the C_MOVE request and check the log file from this point on. • C_MOVE request fails ➪ Check the AETs in the C_MOVE request. • C_STORE fails ➪ The C_MOVE request (retrieve) initiates a C_STORE request (send selected images on a separate association with DICOM Storage Service). Send the selected images from the remote system to the local system (not via query/retrieve). This transfer needs to be successful to get a successful C_MOVE request. If there are problems, see 2.2 Image transfer from remote system fails.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_stu.log.

If USC / HSC support required: If no remote access for troubleshooting is possible and a specialist needs to analyze the problem, he needs the following data:

1. Preferably, the DICOM transfer is captured by means of the Solaris 2 snoop command, Ethereal or by the NetXray Lan Analyzer. See Introduction to these troubleshooting instructions.

   Please note that in a switched network, the system which captures the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB. The captured file can be analyzed using the Merge DPM tool.

2. If capturing the DICOM transfer is not possible, the following log file is required: %MEDHOME%\log\merge_stu.log with trace level T2, T3 and T7.

No Worklist in Scheduler Database

Service Action	Service Tool
• Verify that the problem is not caused on the network level as described (No network connection) in these instructions (AXA4-100.840.01...). • Check how far the transfer succeeds and for error messages at the end of the log file: • Turn on the Trace level T2, T3, T7 and T9 for the appropriate merge.log file and send one image again from the customer User Interface. • First T3 will show the Association Negotiation Request and Response. Afterwards the Command set request will be displayed on T7. The requested attributes will be displayed on T2. A command set with status pending on T7 and the responded data on T2 for each matching worklist response will be displayed. Finally T7 will display the status 0 = success.	***syngo: DICOM*** Service Tools - Worklist - Extend Trace Level ***syngo: DICOM*** Service Tools - Analysis - Examine logs : merge_HRI.log. See example of a merge.log file (Storage) and the list of error messages in the appendix.

Problem with Received Worklist Message

Probable Cause and Service Action	Service Tool
• There is no scheduled patient at the information system that matches the worklist request - No response on T2 level. ➪ Check the worklist request on the T2 level. You will find values such as AET, modality and study date/time. Compare this data with the data scheduled in the Information System (assistance from Information System company might be necessary).	***syngo: DICOM*** Service Tools - Analysis - Examine logs: merge_HRI.log.
• Worklist matches will be transferred (see responses on T2 level) but no worklist will be displayed in the scheduler data base. ➪ Check the worklist response on the T2 level. If a mandatory attriubte is missing, the scheduler data base will not accept the received message. Test using JDICOM, Error messages, also application error messages	***syngo: DICOM*** Service Tools - Analysis - Examine logs: merge_HRI.log.

Probable Cause and Service Action	Service Tool
• Status in the command set response (T7 level) is not pending or successful. ➪ Status "0" is successful transfer. ➪ Status "HFF00" or "HFF01" / Decimal 65280 or 65281 is pending (further responses will follow) ➪ Status "A7xx" is out of resources which might be caused by an incorrect attribute in the data set (T2 level).	See list of status codes in the appendix
• Value Representation of Explicit Transfer Syntax causes problems (if sent) or is required (if not sent). ➪ Change to another transfer syntax and send the message again. Only the selected transfer syntax is used.	syngo: DICOM Service Tools - Worklist - Extended Trace - Transfer Syntax
➪ Check the error logs at the information system	Service engineer for the Information System

Missing Information in Worklist Response

Error messages:

- **UI:** Missing Information - mandatory study info missing
- **Event log:** operation failed, mapping failed

Probable Cause and Service Action	Service Tool
• Worklist matches will be transferred (see responses on T2 level) and are visible in the scheduler database. As soon as a scheduled patient is registered, a message appears that a mandatory attribute is missing. ➪ Open the registration platform (with continue) and check which attributes are not filled in. ➪ Check merge_HRI.log with trace level T2. Here you will find the requested and the responded worklist attributes.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_HRI.log.application: Scheduler - select patient -> Registration platform will be opened

DICOM Worklist Timeout Problems

Error messages:

- **UI:**
- **Event log:**
- **Merge log:** E:

Tab. 17 Timeout problems for DICOM specialist level

Probable Cause and Service Action	Service Tool
• Timeout in the middle of the message stream ➪ See merge_HRI.log for error message: time-out in the middle of the stream. Increase Inactivity Timeout under Configuration	***syngo:*** DICOM Service Tools - Analysis - Examine Logs: merge_HRI.log ***syngo:*** Configuration Tool - DICOM - General
• Timeout when waiting for a response for successful transfer. The information system is not able to find scheduled studies according to the worklist request - performance problems ➪ See merge_stu.log for error message: time-out "Read PDU timeout" ➪ Increase Read PDU Timeout under Configuration.	***syngo:*** DICOM Service Tools - Analysis - Examine logs: merge_HRI.log ***syngo:*** Configuration Tool - DICOM - General

Information System cannot Handle the Worklist Request

Tab. 18 For DICOM specialist level

Probable Cause and Service Action	Service Tool
• The information system can not handle the worklist request. ➪ Connect your Service PC instead of the remote system. Simulate remote system by using the same IP address and start a worklist provider with the same AET and port number. Check whether the test tools are able to deal with the worklist request.	Service PC: - JDICOM - RIS Server GUI

If USC / HSC support is required:

If no remote access for troubleshooting is possible and a specialist needs to analyze the problem, he will need the following data:

1. Preferably, the DICOM transfer will be captured by using the Solaris 2 snoop command, Ethereal or by the NetXray Lan Analyzer. See introduction to these troubleshooting instructions.

   Please note that in a switched network the system which captures the traffic needs to be one of the two involved systems or connected to one of the systems via a HUB. The captured file can be analyzed using the **Merge DPM** tool.

2. If capturing the DICOM transfer is not possible, the following log file is required: %MED-HOME%\log\merge_HRI.log with trace level T2, T3 and T7.

On the CS Intranet under: “***For Service - Planning - General***” you will find a Planning and Configuration Guide called "***DICOM Interface: syngo - IS***".

This document describes how to evaluate all required data for Modality Worklist and Modality Performed Procedure Steps and how to configure syngo. In addition, the syngo user interfaces for MPPS are described and a workflow table with all relevant attributes is provided.

JDICOM, which is available on the CS Intranet under “***For Service - DICOM -> DICOM - Test Tools***”, provides the ability to easily simulate a Worklist and MPPS provider (Information System) on your Service PC.

You can download a validation tool from the University of Oldenburg called ***DCMCheck*** on the CS Intranet under "***For Service - DICOM -> DICOM - Test Tools***". This tool allows you to validate an entire CD; the DICOMDIR and all images on the CD will be validated.

With JDICOM, which is available on the same Intranet Page, you can display and even edit DICOMDIR files.

You can perform the elementary checks to test network connectivity with the following commands.

Select **<Utilities> <Escape to OS>** in the service platform of the Host to enter the test commands.

Command	Note
ARP -A	Displays current ARP entries by interrogating the current protocol data. If inet-addr is specified, the IP and physical addresses are displayed (only nodes in the local network can be listed)
IPCONFIG/ALL	Display the local network configuration.
PING `otherhostname` (Kommando Ping AXA4-100.888.01...) **NBTSTAT -RN**	To check low-level connectivity. Try using the name first. If that fails, try the IP address. If it does not work even with the IP address, ascribe it to the NIC (Network Interface Card) drivers or routing. If ping works, but something on the high-level does not work, test with NBTSTAT -RN
NETSTAT -rn	To determine whether the local and remote hosts have a default gateway specified.
NSLOOKUP otherhostname	If DNS is used, find out the corresponding Internet address; reversed name lookup works as well (find the host name for an IP address).
TRACERT ip-address	Trace routing to a destination host (over a maximum of 30 hops).
Telnet	

PING

"PING" is used to check the ability to reach a component via the network. Two responses to the command are possible:

- Reply; the component answers the question ("is alive"), and
- Timeout; the component cannot be reached. A response was not sent within the time window. In this case, the configuration and the network connection for this component must be checked.

Ping Out of Configuration

While doing the network configuration, it is possible to check the entered IP address with the Test button. The system will then perform a ping to the IP address which is shown to the left of the Test button

Ping with DICOM Tests

After selection of the configured host, use the "GO" button to start the network test.

This ping uses the host name. The related IP number from the "hosts file" is used.

This file contains the mappings of IP addresses to host names.

Each entry is kept on an individual line. The IP address is placed in the first column, followed by the corresponding host name. The IP address and the host name are separated by at least one space.

After a successful "ping", the higher level test "DICOM ECHO" is started automatically.

Ping Out of Hardcopy Configuration

While doing the hardcopy configuration, it is possible to check the entered address with the Test button. The system will then perform a ping to the selected logical name.

The higher level test "DICOM ECHO" can be performed with the 'DICOM access' test button.

Ping with <Utilities><Escape to OS>

1. Call up the service software.
2. Call up "**Utilities**" on the service home page.
3. Under <**SOURCE**>, select "**Escape to OS**".
4. Under <**Commands**>, select the NT Command Interpreter.
5. In the <**Parameters**> input box, enter ping and the TCP/IP number of the component. (If the host name is entered, the name can also be entered instead of the IP address.)
6. Click on <**GO**>.

Example with "ping <ip-number>

Example with "ping <hostname>

Ping Parameters

The following parameters can be used together with the ping command.

ping [-t] [-a] [-n count] [-l length] [-f] [-i ttl] [-v tos] [-r count] [-s count] [[-j computer-list] | [-k computer-list]] [-w timeout] destination-list

Parameters		
-t		Pings the specified computer until interrupted.
-a		Resolve addresses to computer names.
-n	count	Sends the number of ECHO packets specified by count. The default is 4.
-l	length	Sends ECHO packets containing the amount of data specified by length. The default is 64 bytes; the maximum is 8192.
-f		Sends a ‘Do not Fragment’ flag in the packet. The packet will not be fragmented by gateways on the route.
-i	ttl	Sets the Time To Live field to the value specified by ttl.
-v	tos	Sets the Type Of Service field to the value specified by tos.
-r	count	Records the route of the outgoing packet and the returning packet in the Record Route field. A minimum of 1 and a maximum of 9 computers may be specified by count.
-s	count	Specifies the time stamp for the number of hops specified by count.
-j	computer list	Routes packets via the list of computers specified by computer list. Consecutive computers may be separated by intermediate gateways (loose source routed). The maximum number allowed by IP is 9.
-k	computer list	Routes packets via the list of computers specified by computer list. Consecutive computers may not be separated by intermediate gateways (strict source routed). The maximum number allowed by IP is 9.
-w	timeout	Specifies a timeout interval in milliseconds. Destination list specifies the remote computers to ping.

Netstat

This command is available only if the TCP/IP protocol has been installed.

Netstat Parameters

netstat [-a] [-e] [-n] [-s] [-p protocol] [-r] [interval]

Parameters		
-a		Displays all connections and listening ports; server connections are normally not shown.
-e		Displays Ethernet statistics. This may be combined with the -s option.
-n		Displays addresses and port numbers in numerical form (rather than attempting name look-ups).
-s		Displays per-protocol statistics. By default, statistics are shown for TCP, UDP, ICMP, and IP; the -p option may be used to specify a subset of the default.
-p	protocol	Shows connections for the protocol specified by proto; proto may be tcp or udp. If used with the -s option to display per-protocol statistics, proto may be tcp, udp, icmp, or ip.
-r		Displays the contents of the routing table.interval. Redisplays selected statistics, pausing interval seconds between each display. Press CTRL+C to stop redisplaying statistics. If this parameter is omitted, netstat prints the current configuration information once.

Telnet

To open a telnet window, proceed as follows

1. Call up the service software
2. Select “**Utilities**” at the Service Home page.
3. Under <**SOURCE**> select “**Escape to OS**”.
4. Under <**Commands**> select NT Command Interpreter.
5. In the input field <**Parameters**> enter **telnet**
6. Click on <**GO**>.

The telnet window will now appear.

Then connect the host with which you want to communicate. You can also connect to a port or service other than the standard Telnet port.

This is useful when the Telnet client is being used to access something other than a Telnet daemon.

Once you connect to the remote system, the title bar in the Telnet window will show the name of the remote system.

To connect to a remote computer

1. In the Connect menu, click on Remote System.
2. In the Host Name box, type the name of the remote system to which you want to connect.
3. In the Port box, specify a port or service to use.

The available choices are typical strings a host expects during TermType subnegotiation. Note: The string you specify in the TermType box does not control the terminal emulation that is used, only the string that is passed during TermType negotiation. The terminal emulation is still controlled by the settings in the Terminal Preferences dialog box.

Network Test Examples

ping -l 50000 -n 10 <IP address>

This is an example of the result with the "`ping -l 50000 -n 10 <IPaddress>`" command.

C:\>ping -l 50000 -n 10 157.163.196.88
Pinging 157.163.196.88 with 50000 bytes of data:
Request timed out.
Reply from 157.163.196.88: bytes=50000 time=90ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=80ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=81ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=90ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=90ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=90ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=80ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=80ms TTL=128
Reply from 157.163.196.88: bytes=50000 time=90ms TTL=128

netstat -rn

This is an example of the result with the "netstat -rn" command.

Tab. 19 netstat -rn

Active Routes: Network Destination	Netmask	**Gateway**	Interface	Metric
0.0.0.0	0.0.0.0	**157.163.196.1**	157.163.197.36	1
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
157.163.196.0	255.255.252.0	157.163.197.36	157.163.197.36	1

netstat -s

This is an example of the result with the "netstat -s" command.

IP Statistics		
Packets Received	=	57105
Received Header Errors	=	35953
Received Address Errors	=	284

IP Statistics		
Datagrams forwarded	=	0
Unknown protocols received	=	0
Received packets discarded	=	0
Received packets delivered	=	20677
Output requests	=	22996
Routing discards	=	0
Discarded output packets	=	0
Output packet no route	=	0
Reassembly required	=	307
Reassembly successful	=	9
Reassembly failures	=	1
Datagrams successfully fragmented	=	9
Datagrams failing fragmentation	=	0
Fragments created	=	306

ICMP Statistics	Received	sent
Messages	148	9
Errors	0	0
Destination unreachable	107	0
Time exceeded	0	0
Parameter problems	0	0
Source quench	0	0
Redirects	0	0
Echoes	9	0
Echo replies	0	9
Time stamps	0	0
Time stamp replies	0	0
Address masks	0	0
Address mask replies	0	0

TCP Statistics		
Active Opens	=	268
Passive Opens	=	252
Failed Connection Attempts	=	0
Reset Connections	=	32
Current Connections	=	316
Segments Received	=	15737
Segments Sent	=	15767
Segments Retransmitted	=	1

UDP Statistics		
Datagrams Received	=	3801
No Ports	=	1132
Receive Errors	=	0
Datagrams Sent	=	7219

ARP

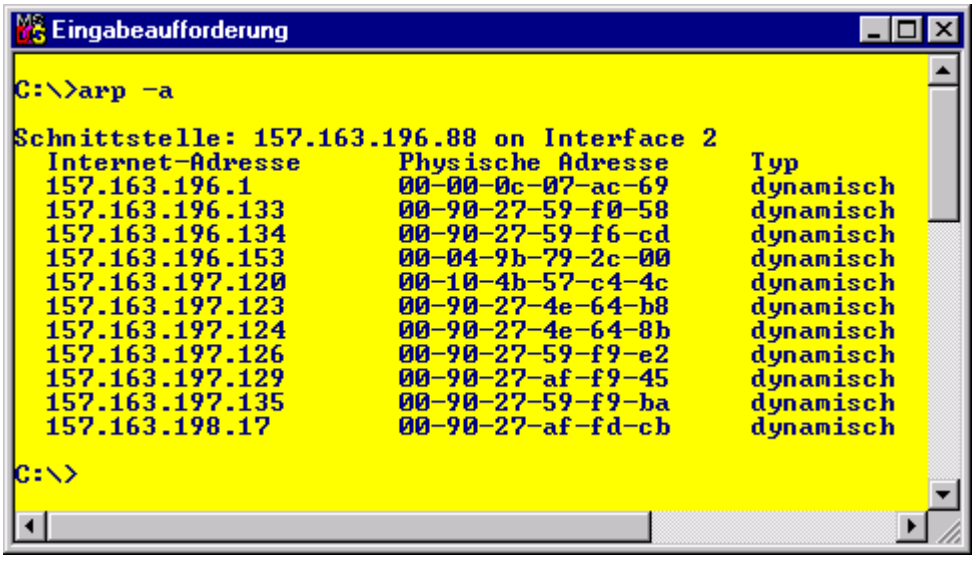
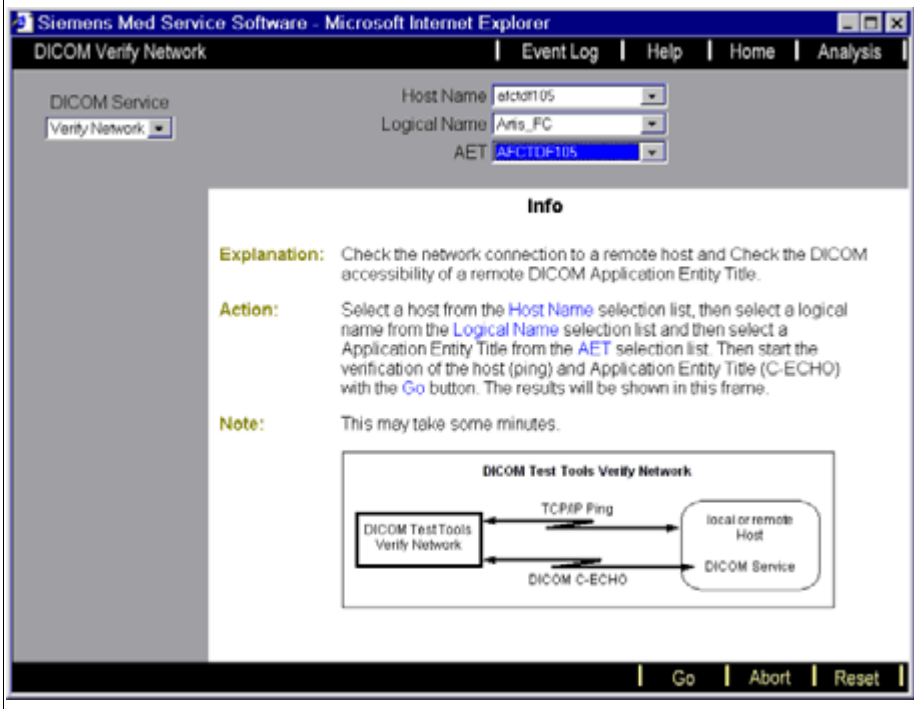
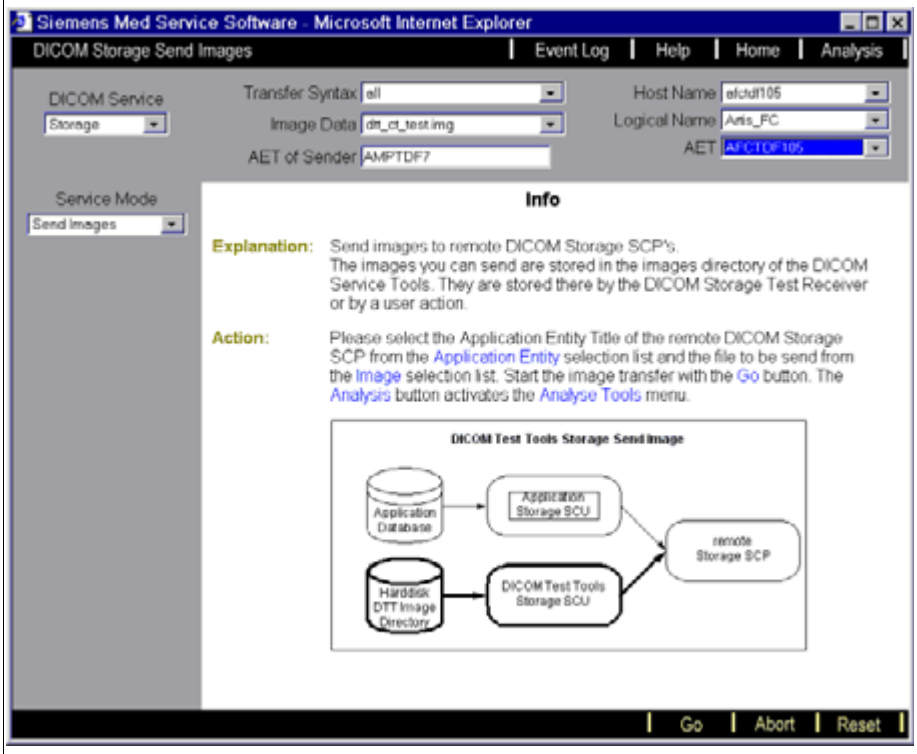
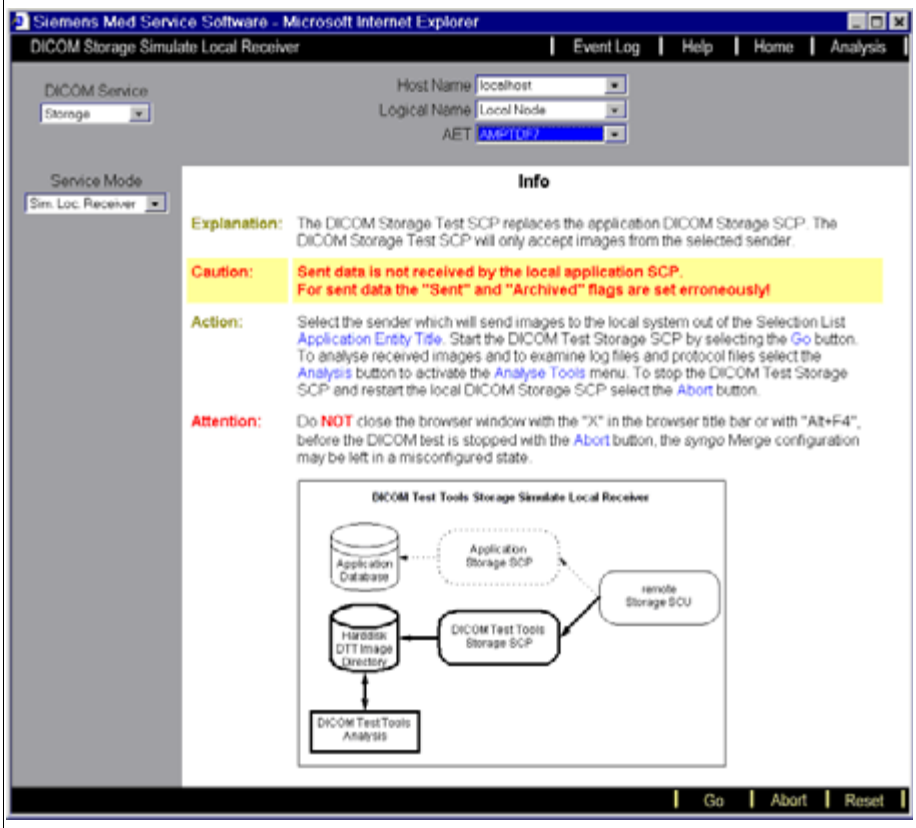
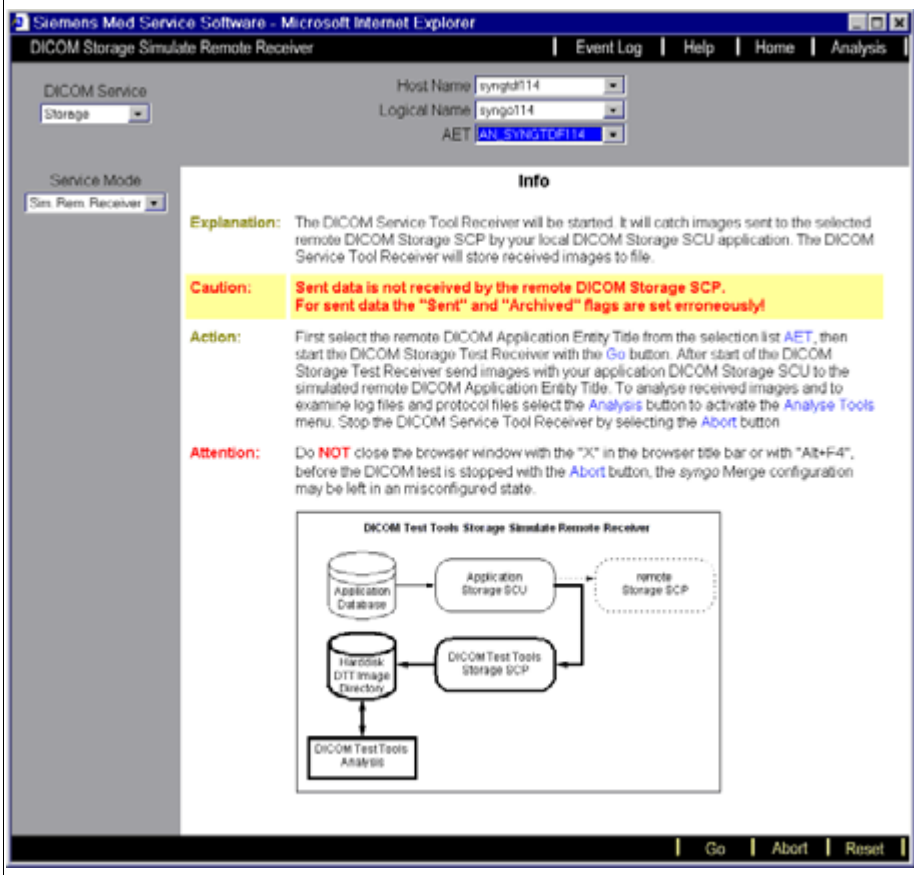


Fig. 5: ARP-A

Syngo DICOM Test Tools

DICOM Service	
Verify Network	 *Fig. 6: Verifying the network*
Storage Send Image	 *Fig. 7: Sending images*

DICOM Service	
Storage Simulate Local Receiver	 *Fig. 8: Simulating the local receiver*

DICOM Service	
Simulate Remote Receiver	 *Fig. 9: Simulating the remote receiver*
Analysis	

Merge Error Messages

[MC_ALREADY_REGISTERED]	Application was already registered
[MC_ASSOCIATION_ABORTED]	Association was aborted
[MC_ASSOCIATION_CLOSED]	Association was closed by peer
[MC_ASSOCIATION_REJECTED]	Association negotiation failed
[MC_ATTRIBUTE_HAS_VALUES]	Attribute has value[s] - VR cannot be changed to SQ
[MC_BUFFER_TOO_SMALL]	Value too large for buffer
[MC_CALLBACK_CANNOT_COMPLY]	Callback cannot comply
[MC_CALLBACK_DATA_SIZE_NEGATIVE]	Callback provided negative data size
[MC_CALLBACK_DATA_SIZE_UNEVEN]	Callback provided uneven data size
[MC_CALLBACK_PARM_ERROR]	Invalid parameter from callback
[MC_CALLBACK_REGISTERED]	Not allowed if callback is registered
[MC_CANNOT_COMPLY]	Callback cannot comply with request
[MC_CANT_ACCESS_PROFILE]	Cannot access MergeCOM services file
[MC_CONFIG_INFO_ERROR]	Invalid configuration parameter
[MC_CONFIG_INFO_MISSING]	Required configuration info missing
[MC_DDFILE_ERROR]	Problem with data dictionary file
[MC_DOES_NOT_VALIDATE]	Message contains validation errors
[MC_EMPTY_VALUE]	Attribute has no value yet
[MC_END_OF_DATA]	End of data
[MC_EXT_INFO_UNAVAILABLE]	Extended negotiation information unavailable
[MC_FOUND]	Private block found
[MC_FUNCTION_UNAVAILABLE]	Function not available on this machine
[MC_INCOMPATIBLE_VR]	Tag"s VR incompatible with function call
[MC_INCOMPATIBLE_VALUE]	Tag"s value incompatible with function call
[MC_INVALID_APPLICATION_ID]	Application ID parameter is invalid
[MC_INVALID_APPLICATION_TITLE]	Application Title parameter is invalid
[MC_INVALID_ASSOC_ID]	Association ID parameter is invalid
[MC_INVALID_CHARS_IN_VALUE]	Invalid characters in value for this VR
[MC_INVALID_COMMAND]	Invalid command parameter
[MC_INVALID_DATA_TYPE]	Invalid data type parameter

[MC_END_OF_LIST]	End of list has been reached
[MC_INVALID_GROUP]	Private group not an odd number
[MC_INVALID_HOST_NAME]	Host name parameter invalid
[MC_INVALID_ITEM_ID]	Item ID parameter invalid
[MC_INVALID_LENGTH_FOR_TITLE]	Application title not 1-16 bytes long
[MC_INVALID_LENGTH_FOR_VR]	Invalid VR length in stream data
[MC_INVALID_LICENSE]	Invalid license number specified in
[ASSOC_PARMS][MC_INVALID_MESSAGE_ID]	Message ID parameter invalid
[MC_INVALID_MESSAGE_RECEIVED]	Network partner sent an invalid message
[MC_INVALID_PARAMETER_NAME]	Invalid name parameter value
[MC_INVALID_PORT_NUMBER]	Port number parameter not positive
[MC_INVALID_PRIVATE_CODE]	Invalid private group code
[MC_INVALID_SERVICE_LIST_NAME]	Invalid service list name parameter
[MC_INVALID_TAG]	Tag parameter invalid
[MC_INVALID_TRANSFER_SYNTAX]	Invalid transfer syntax code
[MC_INVALID_VALUE_FOR_VR]	Invalid value for this tag"s VR
[MC_INVALID_VALUE_NUMBER]	Invalid value number for the attribute
[MC_INVALID_VR_CODE]	VR parameter is invalid
[MC_LOG_EMPTY]	No messages have been logged
[MC_MESSAGE_EMPTY]	The message object is empty
[MC_MESSAGE_VALIDATES]	Message validates
[MC_MISSING_CONFIG_PARM]	Required parameter missing in merge.ini
[MC_MSGFILE_ERROR]	Problem with message information file
[MC_MUST_BE_POSITIVE]	Value is not positive
[MC_NETWORK_SHUT_DOWN]	Network unexpectedly shutdown
[MC_NO_APPLICATIONS_REGISTERED]	No applications registered
[MC_NO_CALLBACK]	Attribute has no callback registered
[MC_NO_CONDITION_FUNCTION]	Warning: no function specified for Type 1C or Type 2C attribute
[MC_NO_FILE_SYSTEM]	No file system available to perform requested function
[MC_NO_INFO_REGISTERED]	No negotiation information registered for the service

[MC_NO_LICENSE]	License not found in [ASSOC_PARMS]
[MC_NO_MERGE_INI]	MERGE.INI file cannot be located
[MC_NO_MORE_ATTRIBUTES]	Message has no more attributes
[MC_NO_MORE_VALUES]	Attribute has no more values
[MC_NO_PROFILE]	Could not access MergeCOM Profile
[MC_NO_REQUEST_PENDING]	No association request to accept/reject
[MC_NON_SERVICE_ATTRIBUTE]	Invalid attribute for service
[MC_NOT_FOUND]	Private block not found
[MC_NOT_ONE_OF_ENUMERATED_VALUES]	Value not an enumerated value
[MC_NOT_ONE_OF_DEFINED_TERMS]	Value not one of defined terms
[MC_NULL_POINTER_PARM]	Null parameter
[MC_NULL_VALUE]	Attribute"s value is NULL
[MC_PROTOCOL_ERROR]	Protocol violation: Call made out of sequence
[MC_REQUIRED_ATTRIBUTE_MISSING]	Required attribute not in message
[MC_REQUIRED_DATASET_MISSING]	Missing required data set for this message command
[MC_REQUIRED_VALUE_MISSING]	Required attribute has no value
[MC_STATE_VIOLATION]	Function call invalid now
[MC_SYSTEM_CALL_INTERRUPTED]	System call was interrupted
[MC_SYSTEM_ERROR]	System error
[MC_TAG_ALREADY_EXISTS]	Tag already exists
[MC_TEMP_FILE_ERROR]	Temporary file I/O error
[MC_TIMEOUT]	Timed out waiting on network partner
[MC_TOO_FEW_VALUES]	Attribute must have more values
[MC_TOO_MANY_BLOCKS]	No room for more private blocks
[MC_TOO_MANY_VALUES]	Too many values for this attribute
[MC_UNABLE_TO_CHECK_CONDITION]	Unable to check condition
[MC_UNACCEPTABLE_SERVICE]	Message service unacceptable for this association
[MC_UNEXPECTED_EOD]	Unexpected end of stream data
[MC_UNKNOWN_ITEM]	Item is not configured
[MC_UNKNOWN_SERVICE]	Service is not configured
[MC_VALUE_MAY_NOT_BE_NULL]	Type 1[C] value may not be NULL

[MC_VALUE_NOT_ALLOWED]	Attribute must not be used under current condition
[MC_VALUE_OUT_OF_RANGE]	Out of range: Numeric precision would be lost.
[MC_VALUE_TOO_LARGE]	Stream value length too large
[MC_VR_ALREADY_VALID]	Value representation is already valid
[MC_LIBRARY_ALREADY_INITIALIZED]	MC_Library_Initialization has already been called
[MC_LIBRARY_NOT_INITIALIZED]	MC_Library_Initialization not called yet
[MC_INVALID_DIRECTORY_RECORD_OFFSET]	Directory record offset doesn"t match a directory record
[MC_INVALID_FILE_ID]	File ID parameter invalid
[MC_INVALID_DICOMDIR_ID]	DICOMDIR ID parameter invalid
[MC_INVALID_ENTITY_ID]	Entity ID parameter invalid
[MC_INVALID_MRDR_ID]	MRDR ID parameter invalid
[MC_UNABLE_TO_GET_ITEM_ID]	Function unable to get item ID from DICOMDIR object
[MC_INVALID_PAD]	Invalid number for padding, must be even
[MC_ENTITY_ALREADY_EXISTS]	Lower level directory entity already exists
[MC_INVALID_LOWER_DIR_RECORD]	Invalid lower-level directory record type
[MC_BAD_DIR_RECORD_TYPE]	Invalid directory record type
[MC_UNKNOWN_HOST_CONNECTED]	Unknown host attempted to connect
[MC_INACTIVITY_TIMEOUT]	Timed out waiting on network partner in middle of a transfer
[MC_INVALID_SOP_CLASS_UID]	SOP class UID parameter is invalid
[MC_INVALID_VERSION]	Invalid version of utilities used to generate configuration functions
[MC_OUT_OF_ORDER_TAG]	A tag was encoded in the stream not in ascending order
[MC_CONNECTION_FAILED]	Failed to connect to remote host
[MC_UNKNOWN_HOST_NAME]	Unable to resolve host name to ip address
[MC_INVALID_FILE]	Invalid DICOM file: did not contain DICM in prefix

Merge_stu.log - Storage Association T2, T3 and T7

This example shows the merge_stu.log with trace levels T2, T3, T7 and (only at the end) T9.

1.) Each DICOM communication starts with the Association Negotiation, which can be seen on trace level T3. The Service Class User (SCU) sends an Association Request message to the provider, where it presents all supported objects with a list of proposed transfer syntaxes (in this case, only one). Each object will be identified by a presentation context ID. In addition, the Application Entity Titles (AETs) and the maximum Protocol Data Unit size (PDU) will be transferred.

(312) 07-21 14:58:22.84 MC3 T3: REQUEST Association Parameters:

(312) 07-21 14:58:22.84 MC3 T3: Calling_presentation_address: cmv10001 (146.254.120.75)

(312) 07-21 14:58:22.85 MC3 T3: Called_presentation_address:

(312) 07-21 14:58:22.85 MC3 T3: Called_application_title: CSYNGO1

(312) 07-21 14:58:22.85 MC3 T3: Calling_application_title: 049SA1DCDADRSP

(312) 07-21 14:58:22.85 MC3 T3: Application_context_name: 1.2.840.10008.3.1.1.1

(312) 07-21 14:58:22.85 MC3 T3: PDU_maximum_length: 28672

(312) 07-21 14:58:22.85 MC3 T3: Implem_class_uid: 1.3.12.2.1107.5.8

(312) 07-21 14:58:22.85 MC3 T3: Version_name: SNKIT_1.10

(312) 07-21 14:58:22.85 MC3 T3: Max_operations_invoked: Not Sent

(312) 07-21 14:58:22.85 MC3 T3: Max_operations_performed: Not Sent

(312) 07-21 14:58:22.85 MC3 T3: PRESENTATION CONTEXTS:

(312) 07-21 14:58:22.86 MC3 T3: (1) Pres_context_id: 1

(312) 07-21 14:58:22.86 MC3 T3: (1) Abstract_syntax:
1.2.840.10008.5.1.4.1.1.4 (STANDARD_MR)

(312) 07-21 14:58:22.86 MC3 T3: (1) Proposed Transfer Syntaxes:

(312) 07-21 14:58:22.86 MC3 T3: 1.2.840.10008.1.2 (Implicit Little Indian)

(312) 07-21 14:58:22.86 MC3 T3: (1) SCU Role: Not sent (requestor supports SCU)

(312) 07-21 14:58:22.86 MC3 T3: (1) SCP Role: Not sent (requestor supports SCP)

(312) 07-21 14:58:22.86 MC3 T3: (1) No extended application info

(312) 07-21 14:58:22.86 MC3 T3: (2) Pres_context_id: 3

(312) 07-21 14:58:22.86 MC3 T3: (2) Abstract_syntax:
1.2.840.10008.5.1.4.1.1.1 (STANDARD_CR)

(312) 07-21 14:58:22.87 MC3 T3: (2) ProposedTransferSyntaxes:

(312) 07-21 14:58:22.87 MC3 T3: 1.2.840.10008.1.2 (Implicit Little Indian)

(312) 07-21 14:58:22.87 MC3 T3: (2) SCU Role: Not sent (requestor supports SCU)

(312) 07-21 14:58:22.87 MC3 T3: (2) SCP Role: Not sent (requestor supports SCP)

(312) 07-21 14:58:22.87 MC3 T3: (2) No extended application info

(312) 07-21 14:58:22.87 MC3 T3: (3) Pres_context_id: 5

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(312) 07-21 14:58:23.01 MC3 T3: (21) Pres_context_id: 41

(312) 07-21 14:58:23.02 MC3 T3: (21) Abstract_syntax:
1.2.840.10008.5.1.4.1.1.1.2.1
(STANDARD_MG_PROCESS)

(312) 07-21 14:58:23.02 MC3 T3: (21) Proposed Transfer Syntaxes:

(312) 07-21 14:58:23.02 MC3 T3: 1.2.840.10008.1.2 (Implicit Little Indian)

(312) 07-21 14:58:23.02 MC3 T3: (21) SCU Role: Not sent (requestor supports SCU)

(312) 07-21 14:58:23.02 MC3 T3: (21) SCP Role: Not sent (requestor supports SCP)

(312) 07-21 14:58:23.02 MC3 T3: (21) No extended application info

2.) The response of the Service Class Provider shows which objects are supported (accepted) and which one of the proposed Transfer Syntaxes will be used.

(312) 07-21 14:58:23.02 MC3 T3: RESPONSE Association Parameters:

(312) 07-21 14:58:23.02 MC3 T3: Calling_presentation_address: cmv10001 (146.254.120.75)

(312) 07-21 14:58:23.02 MC3 T3: Called_presentation_address:

(312) 07-21 14:58:23.02 MC3 T3: Called_application_title: CSYNGO1

(312) 07-21 14:58:23.03 MC3 T3: Application_context_name: 1.2.840.10008.3.1.1.1

(312) 07-21 14:58:23.03 MC3 T3: PDU_maximum_length: 28672

(312) 07-21 14:58:23.03 MC3 T3: Implem_class_uid: 1.3.12.2.1107.5.9.990801

(312) 07-21 14:58:23.03 MC3 T3: Version_name: SIEMENS_SWFVA47A

(312) 07-21 14:58:23.03 MC3 T3: Max_operations_invoked: Not Sent

(312) 07-21 14:58:23.03 MC3 T3: Max_operations_performed: Not Sent

(312) 07-21 14:58:23.03 MC3 T3: PRESENTATION CONTEXTS:

(312) 07-21 14:58:23.03 MC3 T3: (1) Pres_context_id: 1

(312) 07-21 14:58:23.03 MC3 T3: (1) Abstract_syntax: 1.2.840.10008.5.1.4.1.1.4 (STANDARD_MR)

(312) 07-21 14:58:23.03 MC3 T3: (1) Result_transfer_syntax: 1.2.840.10008.1.2 (Implicit Little Indian)

(312) 07-21 14:58:23.04 MC3 T3: (1) SCU Role: Not sent (remote accepts requestor SCU role)

(312) 07-21 14:58:23.04 MC3 T3: (1) SCP Role: Not sent (remote accepts requestor SCP role)

(312) 07-21 14:58:23.04 MC3 T3: (1) No extended application info

(312) 07-21 14:58:23.04 MC3 T3: (1) Negotiation Result: Accepted

(312) 07-21 14:58:23.04 MC3 T3: (2) Pres_context_id: 3

(312) 07-21 14:58:23.04 MC3 T3: (2) Abstract_syntax: 1.2.840.10008.5.1.4.1.1.1 (STANDARD_CR)

(312) 07-21 14:58:23.04 MC3 T3: (2) Result_transfer_syntax: 1.2.840.10008.1.2 (Implicit Little Indian)

(312) 07-21 14:58:23.04 MC3 T3: (2) SCU Role: Not sent (remote accepts requestor SCU role)

(312) 07-21 14:58:23.05 MC3 T3: (2) SCP Role: Not sent (remote accepts requestor SCP role)

(312) 07-21 14:58:23.05 MC3 T3: (2) No extended application info

(312) 07-21 14:58:23.05 MC3 T3: (2) Negotiation Result: Accepted

(312) 07-21 14:58:23.05 MC3 T3: (3) Pres_context_id: 5

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(312) 07-21 14:58:23.20 MC3 T3: (21) Pres_context_id: 41

(312) 07-21 14:58:23.20 MC3 T3: (21) Abstract_syntax: 1.2.840.10008.5.1.4.1.1.1.2.1 (STANDARD_MG_PROCESS)

(312) 07-21 14:58:23.20 MC3 T3: (21) Result_transfer_syntax: (Implicit Big Indian)

(312) 07-21 14:58:23.20 MC3 T3: (21) SCU Role: Not sent (remote accepts requestor SCU role)

(312) 07-21 14:58:23.20 MC3 T3: (21) SCP Role: Not sent (remote accepts requestor SCP role)

(312) 07-21 14:58:23.20 MC3 T3: (21) No extended application info

(312) 07-21 14:58:23.20 MC3 T3: (21) Negotiation Result: REJECTED: Abstract syntax

3.) After the Association Negotiation, the "Command Set" of the first object (e.g. image) will be sent and can be seen on trace level T7. All attributes within the command set belong to group 0000 and indicate which kind of object will be sent (context ID and affected SOP Class UID) and the unique object identification (affected SOP instance UID)

(409) 07-21 14:58:23.34 MC3 T7: Message received on context 5

(409) 07-21 14:58:23.34 MC3 T7: Group 0x0000 Elements:

(409) 07-21 14:58:23.34 MC3 T7: (0000,0000) Group 0000 length

(409) 07-21 14:58:23.34 MC3 T7: (1): 126

(409) 07-21 14:58:23.34 MC3 T7: (0000,0002) Affected SOP class UID

(409) 07-21 14:58:23.34 MC3 T7: (1): 1.2.840.10008.5.1.4.1.1.2

(409) 07-21 14:58:23.34 MC3 T7: (0000,0100) Command field

(409) 07-21 14:58:23.34 MC3 T7: (1): 1

(409) 07-21 14:58:23.35 MC3 T7: (0000,0110) Message ID

(409) 07-21 14:58:23.35 MC3 T7: (1): 0

(409) 07-21 14:58:23.35 MC3 T7: (0000,0700) Priority

(409) 07-21 14:58:23.35 MC3 T7: (1): 0

(409) 07-21 14:58:23.35 MC3 T7: (0000,0800) Data set Type

(409) 07-21 14:58:23.35 MC3 T7: (1): 0

(409) 07-21 14:58:23.35 MC3 T7: (0000,1000) Affected SOP instance UID

(409) 07-21 14:58:23.35 MC3 T7: (1): 1.3.12.2.1107.5.1.3.24013.4.0.2508718952428

4.) On trace level T2, you can again see the "Command Set" with the additional information.

Following the Command Set, the "Data Set" will be shown including all other attributes of the sent object. If there is an image transfer, these attributes are identical to the image header information. If there is a query or worklist request, you can see the attributes sent within these requests.

The value length will be shown inside of ( ) and the value itself inside of | |.

Command Set:

(409) 07-21 14:58:26.37 MC3 T2: Message (STANDARD_CT,C_STORE_RQ) received on context 5

(409) Message ID: 100

(409) Service supported: STANDARD_CT (0032)

(409) Command supported: C_STORE_RQ

(409) Message attributes:

(409) 0000,0000 Group 0000 length VR: UL VM: 1

(409) (0000004) |126|

(409) 0000,0002 Affected SOP Class UID VR: UI VM: 1

(409) (0000025) |1.2.840.10008.5.1.4.1.1.2|

(409) 0000,0100 Command Field VR: US VM: 1

(409) (0000002) |1|

(409) 0000,0110 Message ID VR: US VM: 1

(409) (0000002) |0|

(409) 0000,0700 Priority VR: US VM: 1

(409) (0000002) |0|

(409) 0000,0800 Data Set Type VR: US VM: 1

(409) (0000002) |0|

(409) 0000,1000 Affected SOP instance UID VR: UI VM: 1

(409) (0000043) |1.3.12.2.1107.5.1.3.24013.4.0.2508718952428|

Data Set

(0008,0005 Specific character set is missing -> ISO_IR6 = ASCII)

(409) 0008,0008 Image type VR: CS VM: 1-n

(409) (0000035) |ORIGINAL|
(409) |PRIMARY|
(409) |LOCALIZER|
(409) |CT_SOM5 TOP|
(409) 0008,0016 SOP class UID VR: UI VM: 1
(409) (0000025) |1.2.840.10008.5.1.4.1.1.2 |
(409) 0008,0018 SOP Instance UID VR: UI VM: 1
(409) (0000043) |1.3.12.2.1107.5.1.3.24013.4.0.2508718952428|
(409) 0008,0020 Study date VR: DA VM: 1
(409) (0000008) |20000711
(409) 0008,0021 Series date VR: DA VM: 1
(409) (0000008) |20000711|
(409) 0008,0022 Acquisition date VR: DA VM: 1
(409) (0000008) |20000711|
(409) 0008,0023 Image date VR: DA VM: 1
(409) (0000008) |20000711|
(409) 0008,0030 Study time VR: TM VM: 1
(409) (0000013) |143100.140000|
(409) 0008,0031 Series time VR: TM VM: 1
(409) (0000013) |143145.375000|
(409) 0008,0032 Acquisition time VR: TM VM: 1
(409) (0000013) |143203.890001|
(409) 0008,0033 Image time VR: TM VM: 1
(409) (0000013) |143203.890001|
(409) 0008,0050 Accession Number VR: SH VM: 1
(409) (0000010) |FONo200012 |
(409) 0008,0060 Modality VR: CS VM: 1
(409) (0000002) |CT|
(409) 0008,0070 Manufacturer VR: LO VM: 1
(409) (0000007) |SIEMENS|
(409) 0008,0080 Institution name VR: LO VM: 1
(409) (0000011) |Siemens CTE |
(409) 0008,0081 Institution address VR: ST VM: 1
(409) (0000032) |Street\x0A/27E5E2/\x0ADistrict\x0ACountry|
(409) 0008,0090 Referring physician"s name VR: PN VM: 1
(409) (0000061) |RefFamNam^RefGiveNam^RefMidNam^RefTitle^RefSuf^Ref|
(409) |Pre^RefDegr|
(409) 0008,1010 Station name VR: SH VM: 1

(409) (0000007) |F24013C|
(409) 0008,1030 Study description VR: LO VM: 1
(409) (0000020) |Abdomen^AbdThinSlice||
(409) 0008,103E Series description VR: LO VM: 1
(409) (0000008) |Topogram|
(409) 0008,1040 Institutional department name VR: LO VM: 1
(409) (0000000) <null>
(409) 0008,1050 Performing physician"s name VR: PN VM: 1-n
(409) (0000047) |SchedPerfPhNam1^SchedPerfPhNam2^SchedPerfPhNam3|
(409) 0008,1060 Name of physician(s) reading study VR: PN VM: 1-n
(409) (0000000) <null>
(409) 0008,1070 Operators" name VR: PN VM: 1-n
(409) (0000012) |Dr. Gruening|
(409) 0008,1080 Admitting diagnosis description VR: LO VM: 1-n
(409) (0000015) |LWS Fehlerbild1|
(409) 0008,1090 Manufacturer"s model name VR: LO VM: 1
(409) (0000011) |Volume Zoom|
(409) 0008,2111 Derivation description VR: ST VM: 1
(409) (0000000) <null>
(409) 0010,0010 Patient"s name VR: PN VM: 1
(409) (0000040) |CCTJul2000^VZVA20A^SpineSSD^Dr.^CCC_(\xFF\xFF)|
(409) 0010,0020 Patient ID VR: LO VM: 1
(409) (0000009) |PatID_VZ3|
(409) 0010,0030 Patient"s birth date VR: DA VM: 1
(409) (0000008) |19550824|
(409) 0010,0032 Patient"s birth time VR: TM VM: 1
(409) (0000000) <null>
(409) 0010,0040 Patient"s sex VR: CS VM: 1
(409) (0000001) |F|
(409) 0010,1000 Other patient IDs VR: LO VM: 1-n
(409) (0000000) <null>
(409) 0010,1001 Other patient names VR: PN VM: 1-n
(409) (0000000) <null>
.....
.....
(409) 0018,0010 Contrast/bolus agent VR: LO VM: 1
(409) (0000000) <null>
(409) 0018,0015 Body part examined VR: CS VM: 1

(409) (0000007) |ABDOMEN|

.....

(409) 0018,1000 Device serial number VR: LO VM: 1

(409) (0000000) <null>

(409) 0018,1020 Software version(s) VR: LO VM: 1-n

(409) (0000007) |VA20A.1|

.....

(409) 0018,5100 Patient position VR: CS VM: 1

(409) (0000003) |HFS|

(409) 0020,000D Study instance UID VR: UI VM: 1

(409) (0000043) |1.3.12.2.1107.5.1.3.24013.4.0.2883410072770|

(409) 0020,000E Series instance UID VR: UI VM: 1

(409) (0000043) |1.3.12.2.1107.5.1.3.24013.4.0.2882929363340|

(409) 0020,0010 Study D VR: SH VM: 1

(409) (0000001) |1|

(409) 0020,0011 Series number VR: IS VM: 1

(409) (0000001) |1|

(409) 0020,0012 Acquisition number VR: IS VM: 1

(409) (0000001) |1|

(409) 0020,0013 Image number VR: IS VM: 1

(409) (0000001) |1|

(409) 0020,0032 Image position (patient) VR: DS VM: 3

(409) (0000048) |0|

(409) |-398|

(409) |-1|

(409) 0020,0037 Image orientation (patient) VR: DS VM: 6

(409) (0000096) |0|

(409) |1|

(409) |0|

(409) |0|

(409) |0|

(409) |-1|

(409) 0020,0052 Frame of reference UID VR: UI VM: 1

(409) (0000043) |1.3.12.2.1107.5.1.3.24013.4.0.2507320363132|

(409) 0020,0060 Laterally VR: CS VM: 1

(409) (0000000) <null>

(409) 0020,1002 Images in acquisition VR: IS VM: 1

(409) (0000001) |0|

(409) 0020,1040 Position reference indicator VR: LO VM: 1
(409) (0000000) <null>
(409) 0020,1041 Slice location VR: DS VM: 1
(409) (0000016) |-1|
(409) 0020,4000 Image comments VR: LT VM: 1
(409) (0000000) <null>
(409) 0028,0002 Samples per pixel VR: US VM: 1
(409) (0000002) |1|
(409) 0028,0004 Photometric interpretation VR: CS VM: 1
(409) (0000011) |MONOCHROME2|
(409) 0028,0010 Rows VR: US VM: 1
(409) (0000002) |512|
(409) 0028,0011 Columns VR: US VM: 1
(409) (0000002) |512|
(409) 0028,0030 Pixel spacing VR: DS VM: 2
(409) (0000032) |1|
(409) |1|
(409) 0028,0100 Bits allocated VR: US VM: 1
(409) (0000002) |16|
(409) 0028,0101 Bits stored VR: US VM: 1
(409) (0000002) |12|
(409) 0028,0102 High Bit VR: US VM: 1
(409) (0000002) |11|
(409) 0028,0103 Pixel representation VR: US VM: 1
(409) (0000002) |0|
.....
(409) 0028,1050 Window center VR: DS VM: 1-n
(409) (0000016) |50 |
(409) 0028,1051 Window width VR: DS VM: 1-n
(409) (0000016) |350|
(409) 0028,1052 Rescale intercept VR: DS VM: 1
(409) (0000016) |-1024|
(409) 0028,1053 Rescale slope VR: DS VM: 1
(409) (0000016) |1.0002441|
.....
(409) 7FE0,0010 Pixel data VR: OW VM: 1
(409) <Callback routine>
(409) ===== End of Message ID: 100 =====

5.) After each object (image), a response will be sent from the provider in which you can see the status of the transfer (0 is success). A table of the status codes is available on the Intranet at http://dicom.med.siemens.de at DICOM - Glossary&Tables. This "Command Set" message can be seen on T7.

(409) 07-21 14:58:29.85 MC3 T7: Message (STANDARD_CT,C_STORE_RSP) sent on context 5

(409) 07-21 14:58:29.85 MC3 T7: Group 0x0000 elements:

(409) 07-21 14:58:29.86 MC3 T7: (0000,0000) Group 0000 length

(409) 07-21 14:58:29.86 MC3 T7: (1): 126

(409) 07-21 14:58:29.86 MC3 T7: (0000,0002) Affected SOP class UID

(409) 07-21 14:58:29.86 MC3 T7: (1): 1.2.840.10008.5.1.4.1.1.2

(409) 07-21 14:58:29.86 MC3 T7: (0000,0100) Command field

(409) 07-21 14:58:29.86 MC3 T7: (1): 32769

(409) 07-21 14:58:29.86 MC3 T7: (0000,0120) Message ID being responded to

(409) 07-21 14:58:29.87 MC3 T7: (1): 0

(409) 07-21 14:58:29.87 MC3 T7: (0000,0800) Data set type

(409) 07-21 14:58:29.87 MC3 T7: (1): 257

(409) 07-21 14:58:29.87 MC3 T7: (0000,0900) Status

(409) 07-21 14:58:29.87 MC3 T7: (1): 0

(409) 07-21 14:58:29.87 MC3 T7: (0000,1000) Affected SOP instance UID

(409) 07-21 14:58:29.87 MC3 T7: (1): 1.3.12.2.1107.5.1.3.24013.4.0.2508718952428

6.) When you turn on trace level T9, you will also see the entire association on the Packet Data Unit level (PDU). This will add a lot more information to the log file which is just helpful in some special cases. E.g., if the transfer is interrupted, you can see how many packets were successfully transferred.

The Association Release request and response can also be seen only on trace level T9.

(409) 07-21 14:58:29.96 MC3 T9: PDU Type: 05 (Assoc_Rel_RQ) received

(409) 07-21 14:58:29.96 MC3 T9: Reserved byte: 00

(409) 07-21 14:58:29.96 MC3 T9: PDU length: 0000 0004 (4 bytes)

(409) 07-21 14:58:29.96 MC3 T9: Reserved bytes (7-10): 0000 0000

(409) 07-21 14:58:29.96 MC3 T9: PDU Type: 06 (Assoc_Rel_RP) sent

(409) 07-21 14:58:29.96 MC3 T9: Reserved byte: 00

(409) 07-21 14:58:29.96 MC3 T9: PDU length: 0000 0004 (4 bytes)

Merge_hc.log - Print Association T2, T3 and T7

This example shows the merge_hc.log with trace levels T2, T3, T7 and (only at the end) T9.

Overview of the DICOM print services (which all belong to the Basic Gray Scale Print Management Meta SOP Class

1. Printer Service (which syngo sends frequently to the camera)
2. Printer Service (which will be sent also in the beginning of each print session)
3. Basic Film Session Service (N_Create to set the camera parameter)
4. Basic Film Box Service (N_Create to set the film parameter)
5. Basic Gray scale Image Box Service (N_Set to send the image data)
6. Basic Film Box Service (N_Action to print the film)
7. Basic Film Box Service (N_Delete to delete the film box)
8. Basic Film Session Service (N_Delete to delete the print session)

1. a) Printer Service (which syngo frequently sends to the camera)

Syngo frequently sends a PRINTER request to the camera to get the status of the camera. Because each is a DICOM communication, this request starts with the Association Negotiation, which can be seen on trace level T3. The modality or workstation (SCU) sends an Association Request message to the camera, where it presents all supported services with a list of proposed transfer syntaxes. Each service will be identified by a presentation context ID. In addition, the Application Entity Titles (AETs) and the maximum Protocol Data Unit size (PDU) will be transferred.

(579) 03-26 17:58:12.25 MC3 T3: REQUEST Association parameters:

(579) 03-26 17:58:12.34 MC3 T3: Calling_presentation_address: csyngo2

(579) 03-26 17:58:12.34 MC3 T3: Called_presentation_address: PL102625:1024

(579) 03-26 17:58:12.34 MC3 T3: Called_application_title: SYNGO_8700

(579) 03-26 17:58:12.34 MC3 T3: Application_context_name: 1.2.840.10008.3.1.1.1

(579) 03-26 17:58:12.34 MC3 T3: Calling_application_title: CSYNGO2

(579) 03-26 17:58:12.34 MC3 T3: PDU_maximum_length: 28672

(579) 03-26 17:58:12.34 MC3 T3: Implem_class_uid: 1.3.12.2.1107.5.9.20000101

(579) 03-26 17:58:12.34 MC3 T3: Version_name: SIEMENS_SWFVB10A

(579) 03-26 17:58:12.34 MC3 T3: Max_operations_invoked: Not sent

(579) 03-26 17:58:12.34 MC3 T3: Max_operations_performed: Not sent

(579) 03-26 17:58:12.34 MC3 T3: PRESENTATION CONTEXTS:

(579) 03-26 17:58:12.34 MC3 T3: (1)Pres_context_id: 1

(579) 03-26 17:58:12.34 MC3 T3: (1)Abstract_syntax: 1.2.840.10008.5.1.1.9

(BASIC_GRAYSCALE_PRINT_MANAGEMENT)

(579) 03-26 17:58:12.34 MC3 T3: (1) Proposed transfer syntaxes:

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.1 (explicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2 (implicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.2 (explicit big Indian)

(579) 03-26 17:58:12.34 MC3 T3: (1) SCU Role: Not sent (requester supports SCU)

(579) 03-26 17:58:12.34 MC3 T3: (1) SCP Role: Not sent (requester supports SCP)

(579) 03-26 17:58:12.34 MC3 T3: (1) No extended application info

(579) 03-26 17:58:12.34 MC3 T3: (2) Pres_context_id: 3

(579) 03-26 17:58:12.34 MC3 T3: (2) Abstract_syntax: 1.2.840.10008.5.1.1.14 (PRINT_JOB)

(579) 03-26 17:58:12.34 MC3 T3: (2) Proposed transfer syntaxes:

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.1 (explicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: | 1.2.840.10008.1.2 (implicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.2 (explicit big Indian)

(579) 03-26 17:58:12.34 MC3 T3: (2) SCU Role: Not sent (requester supports SCU)

(579) 03-26 17:58:12.34 MC3 T3: | (2) SCP Role: Not sent (requester supports SCP)

(579) 03-26 17:58:12.34 MC3 T3: (2) No extended application info

(579) 03-26 17:58:12.34 MC3 T3: (3) Pres_context_id: 5

(579) 03-26 17:58:12.34 MC3 T3: (3) Abstract_syntax: 1.2.840.10008.5.1.1.18 (BASIC_COLOR_PRINT_MANAGEMENT)

(579) 03-26 17:58:12.34 MC3 T3: (3) Proposed transfer syntaxes:

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.1 (explicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2 (implicit little Indian)

(579) 03-26 17:58:12.34 MC3 T3: 1.2.840.10008.1.2.2 (explicit big Indian)

(579) 03-26 17:58:12.35 MC3 T3: (3) SCU Role: Not sent (requester supports SCU)

(579) 03-26 17:58:12.35 MC3 T3: (3) SCP Role: Not sent (requester supports SCP)

(579) 03-26 17:58:12.35 MC3 T3: (3) No extended application info

(579) 03-26 17:58:12.35 MC3 T3: (4) Pres_context_id: 7

(579) 03-26 17:58:12.35 MC3 T3: (4) Abstract_syntax: 1.2.840.10008.5.1.1.23 (PRESENTATION_LUT)

(579) 03-26 17:58:12.35 MC3 T3: (4) Proposed transfer syntaxes:

(579) 03-26 17:58:12.35 MC3 T3: 1.2.840.10008.1.2.1 (explicit little Indian)

(579) 03-26 17:58:12.35 MC3 T3: 1.2.840.10008.1.2 (implicit little Indian)

(579) 03-26 17:58:12.35 MC3 T3: 1.2.840.10008.1.2.2 (explicit big Indian)

(579) 03-26 17:58:12.35 MC3 T3: (4) SCU Role: Not sent (requester supports SCU)

(579) 03-26 17:58:12.35 MC3 T3: (4) SCP Role: Not sent (requester supports SCP)

(579) 03-26 17:58:12.35 MC3 T3: (4) No extended application info

1. b) The response of the camera shows which services are supported (accepted) and which one of the proposed transfer syntaxes will be used.

(579) 03-26 17:58:12.46 MC3 T3: RESPONSE Association Parameters:

(579) 03-26 17:58:12.46 MC3 T3: Calling_presentation_address: csyngo2

(579) 03-26 17:58:12.46 MC3 T3: Called_presentation_address: PL102625:1024

(579) 03-26 17:58:12.46 MC3 T3: Called_application_title: SYNGO_8700

(579) 03-26 17:58:12.46 MC3 T3: Calling_application_title: CSYNGO2

(579) 03-26 17:58:12.46 MC3 T3: Application_context_name: 1.2.840.10008.3.1.1.1

(579) 03-26 17:58:12.46 MC3 T3: PDU_maximum_length: 1000000

(579) 03-26 17:58:12.46 MC3 T3: Implem_class_uid: 1.2.840.113720.1.9410.2

(579) 03-26 17:58:12.46 MC3 T3: Version_name: IMN_PrintServer

(579) 03-26 17:58:12.46 MC3 T3: Max_operations_invoked: Not sent

(579) 03-26 17:58:12.46 MC3 T3: Max_operations_performed: Not sent

(579) 03-26 17:58:12.46 MC3 T3: PRESENTATION CONTEXTS:

(579) 03-26 17:58:12.46 MC3 T3: (1) Pres_context_id: 1

(579) 03-26 17:58:12.46 MC3 T3: (1) Abstract_syntax: 1.2.840.10008.5.1.1.9
(BASIC_GRAYSCALE_PRINT_MANAGEMENT)

(579) 03-26 17:58:12.46 MC3 T3: (1) Result_transfer_syntax: 1.2.840.10008.1.2.1
(explicit little Indian)

(579) 03-26 17:58:12.46 MC3 T3: (1) SCU role: Not sent (remote accepts requestor SCU role)

(579) 03-26 17:58:12.46 MC3 T3: (1) SCP role: Not sent (remote accepts requestor SCP role)

(579) 03-26 17:58:12.46 MC3 T3: (1) No extended application info

(579) 03-26 17:58:12.46 MC3 T3: (1) Negotiation result: accepted

(579) 03-26 17:58:12.46 MC3 T3: (2) Pres_context_id: 3

(579) 03-26 17:58:12.46 MC3 T3: (2) Abstract_syntax: 1.2.840.10008.5.1.1.14
(PRINT_JOB)

(579) 03-26 17:58:12.46 MC3 T3: (2) Result_transfer_syntax: 1.2.840.10008.1.2.1
(explicit little Indian)

(579) 03-26 17:58:12.46 MC3 T3: (2) SCU Role: Not sent (remote accepts requester SCU role)

(579) 03-26 17:58:12.46 MC3 T3: (2) SCP Role: Not sent (remote accepts requester SCP role)

(579) 03-26 17:58:12.46 MC3 T3: (2) No extended application info

(579) 03-26 17:58:12.46 MC3 T3: (2) Negotiation result: accepted

(579) 03-26 17:58:12.46 MC3 T3: (3) Pres_context_id: 5

(579) 03-26 17:58:12.46 MC3 T3: (3) Abstract_syntax: 1.2.840.10008.5.1.1.18
(BASIC_COLOR_PRINT_MANAGEMENT)

(579) 03-26 17:58:12.46 MC3 T3: (3) Negotiation result: REJECTED: abstract syntax

(579) 03-26 17:58:12.46 MC3 T3: (4) Pres_context_id: 7

(579) 03-26 17:58:12.46 MC3 T3: (4) Abstract_syntax: 1.2.840.10008.5.1.1.23

(PRESENTATION_LUT)

(579) 03-26 17:58:12.46 MC3 T3: (4) Result_transfer_syntax: 1.2.840.10008.1.2.1 (explicit little Indian)

(579) 03-26 17:58:12.46 MC3 T3: (4) SCU role: Not sent (remote accepts requester SCU role)

(579) 03-26 17:58:12.46 MC3 T3: (4) SCP Role: Not sent (remote accepts requester SCP role)

(579) 03-26 17:58:12.46 MC3 T3: (4) No extended application info

(579) 03-26 17:58:12.46 MC3 T3: (4) Negotiation result: accepted

(579) 03-26 17:58:12.46 MC3 W: Presentation context 5 rejected, reason 0x03

(579) 03-26 17:58:12.46 MC3 W: Abstract syntax: 1.2.840.10008.5.1.1.18

(BASIC_COLOR_PRINT_MANAGEMENT

(579) 03-26 17:58:12.46 MC3 W: Abstract syntax rejected

1. c) After the Association Negotiation, the PRINTER service will be requested. This request can be seen on trace level T7. All attributes within the command set belong to group 0000 and indicate which kind of object will be sent (context ID and affected SOP class UID) and the unique object identification (affected SOP instance UID)

(617) 03-26 17:58:29.54 MC3 T7: Message (PRINTER,N_GET_RQ) sent on context 1

(617) 03-26 17:58:29.54 MC3 T7: Group 0x0000 elements:

(617) 03-26 17:58:29.54 MC3 T7: (0000,0000) Group 0000 length

(617) 03-26 17:58:29.54 MC3 T7: (1): 90

(617) 03-26 17:58:29.54 MC3 T7: (0000,0003) Requested SOP class UID

(617) 03-26 17:58:29.54 MC3 T7: (1): 1.2.840.10008.5.1.1.16

(617) 03-26 17:58:29.54 MC3 T7: (0000,0100) Command field

(617) 03-26 17:58:29.54 MC3 T7: (1): 272 (N_GET)

(617) 03-26 17:58:29.54 MC3 T7: (0000,0110) Message ID

(617) 03-26 17:58:29.54 MC3 T7: (1): 0

(617) 03-26 17:58:29.54 MC3 T7: (0000,0800) Data set type

(617) 03-26 17:58:29.54 MC3 T7: (1): 257

(617) 03-26 17:58:29.54 MC3 T7: (0000,1001) Requested SOP instance UID

(617) 03-26 17:58:29.54 MC3 T7: (1): 1.2.840.10008.5.1.1.17 (always the same instance UID)

1. d) On T7 you will see the "Command Set" of the response from the camera

(618) 03-26 17:58:29.84 MC3 T7: Message received on context 1

(618) 03-26 17:58:29.84 MC3 T7: Group 0x0000 elements:

(618) 03-26 17:58:29.84 MC3 T7: (0000,0000) Group 0000 length

(618) 03-26 17:58:29.84 MC3 T7: (1): 100

(618) 03-26 17:58:29.84 MC3 T7: (0000,0002) Affected SOP class UID

(618) 03-26 17:58:29.84 MC3 T7: (1): 1.2.840.10008.5.1.1.16

(618) 03-26 17:58:29.84 MC3 T7: (0000,0100) Command field

(618) 03-26 17:58:29.84 MC3 T7: (1): 33040 (N_GET response)

(618) 03-26 17:58:29.84 MC3 T7: (0000,0120) Message ID being responded to

(618) 03-26 17:58:29.84 MC3 T7: (1): 0

(618) 03-26 17:58:29.84 MC3 T7: (0000,0800) Data set type

(618) 03-26 17:58:29.84 MC3 T7: (1): 65278

(618) 03-26 17:58:29.84 MC3 T7: (0000,0900) Status

(618) 03-26 17:58:29.84 MC3 T7: (1): 0 (SUCCESS)

(618) 03-26 17:58:29.84 MC3 T7: (0000,1000) Affected SOP instance UID

(618) 03-26 17:58:29.84 MC3 T7: (1): 1.2.840.10008.5.1.1.17

1. e) On trace level T2 you can again see the "Command Set" (group 0000) and the "Data Set" (group 0008 and higher) of the response from the camera. Because the printer request has no data set, you will find no information on T2 trace level.

(618) 03-26 17:58:29.84 MC3 T2: Message (PRINTER,N_GET_RSP) received on context 1

(618) ==========

(618) Message ID: 118

(618) Service supported: PRINTER (0024)

(618) Command supported: N_GET_RSP

(618) Message attributes:

(618) 0000,0000 Group 0000 length VR: UL VM: 1

(618) (0000004) |100|

(618) 0000,0002 Affected SOP class UID VR: UI VM: 1

(618) (0000022) |1.2.840.10008.5.1.1.16|

(618) 0000,0100 Command field VR: US VM: 1

(618) (0000002) |33040|

(618) 0000,0120 Message ID being responded to VR: US VM: 1

(618) (0000002) |0|

(618) 0000,0800 Data Set Type VR: US VM: 1

(618) (0000002) |65278|

(618) 000,0900 Status VR: US VM: 1

(618) (0000002) |0|

(618) 0000,1000 Affected SOP instance UID VR: UI VM: 1

(618) (0000022) |1.2.840.10008.5.1.1.17|

(618) 0008,0070 Manufacturer VR: LO VM: 1

(618) (0000005) |Kodak|

(618) 0008,1090 Manufacturer"s model name VR: LO VM: 1

(618) (0000006) |M_8700|

(618) 0018,1020 Software version(s) VR: LO VM: 1-n

(618) (0000000) <null>

(618) 1001,0010 Private creator code VR: LO VM: 1

(618) (0000030) |IMATION1.2.840.113720.1.9410.2|

(618) 1001,1000 Non-standard attribute VR: IS VM: 1-n

(618) (0000001) |0|

(618) 2110,0010 Printer status VR: CS VM: 1

(618) (0000007) |WARNING|

(618) 2110,0020 Printer status Info VR: CS VM: 1

(618) (0000012) |SUPPLY EMPTY|

(618) 2110,0030 Printer name VR: LO VM: 1

(618) (0000011) |DryView8700|

(618) ===== End of Message ID: 118 =====

2.) Printer Service (which is also sent at the beginning of each print session)

If you print a film again, the association negotiation and a PRINTER request will be performed.

This is the same procedure as shown above. Therefore only part of this service is displayed.

(579) 03-26 18:00:03.67 MC3 T3: REQUEST association parameters:

(579) 03-26 18:00:03.67 MC3 T3: Calling_presentation_address: csyngo2

(579) 03-26 18:00:03.67 MC3 T3: Called_presentation_address: PL102625:1024

(579) 03-26 18:00:03.68 MC3 T3: Called_application_title: SYNGO_8700

(579) 03-26 18:00:03.68 MC3 T3: Calling_application_title: CSYNGO2

(579) 03-26 18:00:03.68 MC3 T3: Application_context_name: 1.2.840.10008.3.1.1.1

(579) 03-26 18:00:03.68 MC3 T3: PDU_maximum_length: 28672

(579) 03-26 18:00:03.68 MC3 T3: Implem_class_uid: 1.3.12.2.1107.5.9.20000101

(579) 03-26 18:00:03.68 MC3 T3: Version_name: SIEMENS_SWFVB10A

(579) 03-26 18:00:03.68 MC3 T3: Max_operations_invoked: Not Sent

(579) 03-26 18:00:03.68 MC3 T3: Max_operations_performed: Not Sent

(579) 03-26 18:00:03.68 MC3 T3: PRESENTATION CONTEXTS:

(579) 03-26 18:00:03.68 MC3 T3: (1) Pres_context_id: 1

(579) 03-26 18:00:03.68 MC3 T3: (1) Abstract_syntax: 1.2.840.10008.5.1.1.9
(BASIC_GRAYSCALE_PRINT_MANAGEMENT)

.....

.....

.....

(691) 2110,0010 Printer status VR: CS VM: 1

(691) (0000007) WARNING

(691) 2110,0020 Printer status info VR: CS VM:1

(691) (0000012) SUPPLY EMPTY

(691) 2110,0030 Printer name VR: LO VM: 1

(691) (0000011) DryView8700

(691) ===== End of Message ID: 182 =====

3. a) Basic Film Session Service (N_Create to set the camera parameter)

After the PRINTER service, the BASIC FILM SESSION service is performed. This is again a service of the Basic Gray scale Print Management Meta Service (context ID 1).

In this service, global camera parameters are set.

The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:13.10 MC3 T7: Message
(BASIC_FILM_SESSION,N_CREATE_RQ)sentoncontext1

(692) 03-26 18:00:13.12 MC3 T7: Group 0x0000 Elements:

(692) 03-26 18:00:13.12 MC3 T7: (0000,0000) Group 0000 length

(692) 03-26 18:00:13.12 MC3 T7: (1): 60

(692) 03-26 18:00:13.12 MC3 T7: (0000,0002) Affected SOP class UID

(692) 03-26 18:00:13.12 MC3 T7: (1): 1.2.840.10008.5.1.1.1

(692) 03-26 18:00:13.12 MC3 T7: (0000,0100) Command field

(692) 03-26 18:00:13.12 MC3 T7: (1): 320

(692) 03-26 18:00:13.12 MC3 T7: (0000,0110) Message ID

(692) 03-26 18:00:13.12 MC3 T7: (1): 2

(692) 03-26 18:00:13.12 MC3 T7: (0000,0800) Data set type

(692) 03-26 18:00:13.12 MC3 T7: (1): 0

3. b) Since this request includes also a "Data Set" (group 2000), you will also see the request on trace level T2.

(692) 03-26 18:00:13.12 MC3 T2: Message (BASIC_FILM_SESSION,N_CREATE_RQ) sent on context 1

(692) ==

(692) Message ID: 190

(692) Service supported: BASIC_FILM_SESSION (0003)

(692) Command supported: N_CREATE_RQ

(692) Message attributes:

(692) 0000,0000 Group 0000 length VR: UL VM: 1

(692) (0000004) I60I

(692) 0000,0002 Affected SOP class UID VR: UI VM: 1
(692) (0000021) |1.2.840.10008.5.1.1.1|
(692) 0000,0100 Command field VR: US VM: 1
(692) (0000002) |320|
(692) 0000,0110 Message ID VR: US VM: 1
(692) (0000002) |2|
(692) 000,0800 Data set type VR: US VM: 1
(692) (0000002) |0|
(692) 2000,0010 Number of copies VR: IS VM: 1
(692) (0000001) |1|
(692) 2000,0030 Medium type VR: CS VM: 1
(692) (0000009) |BLUE FILM|
(692) 2000,0040 Film destination VR: CS VM: 1
(692) (0000009) |PROCESSOR|
(692) ===== End of Message ID: 190 =====

3. c) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:13.40 MC3 T7: Message received on context 1
(691) 03-26 18:00:13.40 MC3 T7: Group 0x0000 elements:
(691) 03-26 18:00:13.40 MC3 T7: (0000,0000) Group 0000 length
(691) 03-26 18:00:13.40 MC3 T7: (1): 118
(691) 03-26 18:00:13.40 MC3 T7: (0000,0002) Affected SOP class UID
(691) 03-26 18:00:13.40 MC3 T7: (1): 1.2.840.10008.5.1.1.1
(691) 03-26 18:00:13.40 MC3 T7: (0000,0100) Command field
(691) 03-26 18:00:13.40 MC3 T7: (1): 33088
(691) 03-26 18:00:13.40 MC3 T7: (0000,0120) Message ID being responded to
(691) 03-26 18:00:13.40 MC3 T7: (1): 2
(691) 03-26 18:00:13.40 MC3 T7: (0000,0800) Data set type
(691) 03-26 18:00:13.40 MC3 T7: (1): 65278
(691) 03-26 18:00:13.40 MC3 T7: (0000,0900) Status
(691) 03-26 18:00:13.40 MC3 T7: (1): 0
(691) 03-26 18:00:13.40 MC3 T7: (0000,1000) Affected SOP instance UID
(691) 03-26 18:00:13.40 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173705.5

4. d) On T2 you will again see the "Command Set" as well as the "Data Set" of the response.

(691) 03-26 18:00:13.40 MC3 T2: Message
(BASIC_FILM_SESSION,N_CREATE_RSP)receivedoncontext1

(691) ==========

(691) Message ID: 191

(691) Service supported: BASIC_FILM_SESSION (0003)

(691) Command supported: N_CREATE_RSP

(691) Message attributes:

(691) 0000,0000 Group 0000 length VR: UL VM: 1

(691) (0000004) 118

(691) 0000,0002 Affected SOP class UID VR: UI VM: 1

(691) (0000021) 1.2.840.10008.5.1.1.1

(691) 0000,0100 Command field VR: US VM: 1

(691) (0000002) 33088

(691) 0000,0120 Message ID being responded to VR: US VM: 1

(691) (0000002) 2

(691) 0000,0800 Data set type VR: US VM: 1

(691) (0000002) 65278

(691) 0000,0900 Status VR: US VM: 1

(691) (0000002) 0

(691) 0000,1000 Affected SOP instance UID VR: UI VM: 1

(691) (0000040) 1.2.840.113720.1.9410.2.20010326173705.5

(691) 2000,0010 Number of copies VR: IS VM: 1

(691) (0000001) 1

(691) 2000,0020 Print priority VR: CS VM: 1

(691) (0000004) HIGH

(691) 000,0030 Medium type VR: CS VM: 1

(691) (0000009) BLUE FILM

(691) 2000,0040 Film destination VR: CS VM: 1

(691) (0000009) PROCESSOR

(691) ===== End of Message ID: 191 =====

4. a) Basic Film Box Service (N_Create to set the film parameter)

Following the Basic Film Session, the BASIC FILM BOX Service is performed, which is again a service of the Basic Gray scale Print Management Meta Service (context ID 1).

In this service, parameters for the film layout are set.

The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:14.42 MC3 T7: Message (BASIC_FILM_BOX,N_CREATE_RQ) sent on context 1

(692) 03-26 18:00:14.42 MC3 T7: Group 0x0000 Elements:

(692) 03-26 18:00:14.42 MC3 T7: (0000,0000) Group 0000 length

(692) 03-26 18:00:14.42 MC3 T7: (1): 60

(692) 03-26 18:00:14.42 MC3 T7: (0000,0002) Affected SOP class UID

(692) 03-26 18:00:14.42 MC3 T7: (1): 1.2.840.10008.5.1.1.2

(692) 03-26 18:00:14.42 MC3 T7: (0000,0100) Command field

(692) 03-26 18:00:14.42 MC3 T7: (1): 320

(692) 03-26 18:00:14.42 MC3 T7: (0000,0110) Message ID

(692) 03-26 18:00:14.42 MC3 T7: (1): 3

(692) 03-26 18:00:14.42 MC3 T7: (0000,0800) Data set type

(692) 03-26 18:00:14.42 MC3 T7: (1): 0

4. b) Since this request includes also a "Data Set" (group 2000), you will also see the request on trace level T2.

(692) 03-26 18:00:14.42 MC3 T2: Message (BASIC_FILM_BOX,N_CREATE_RQ) sent on context 1

(692) ==========

(692) Message ID: 193

(692) Service supported: BASIC_FILM_BOX (0002)

(692) Command supported: N_CREATE_RQ

(692) Message attributes:

(692) 0000,0000 Group 0000 length VR: UL VM: 1

(692) (0000004) |60|

(692) 0000,0002 Affected SOP class UID VR: UI VM: 1

(692) (0000021) |1.2.840.10008.5.1.1.2|

(692) 0000,0100 Command field VR: US VM: 1

(692) (0000002) |320|

(692) 0000,0110 Message ID VR: US VM: 1

(692) (0000002) |3|

(692) 0000,0800 Data set type VR: US VM: 1

(692) (0000002) |0|

(692) 2010,0010 Image display format VR: ST VM: 1

(692) (0000012) |STANDARD\1,1|

(692) 2010,0040 Film orientation VR: CS VM: 1

(692) (0000008) |PORTRAIT|

(692) 2010,0050 Film size ID VR: CS VM: 1

(692) (0000009) |14INX17IN|

(692) 2010,0060 Magnification type VR: CS VM: 1

(692) (0000004) |NONE|

(692) 2010,0120 Min density VR: US VM: 1

(692) (0000002) |20|
(692) 2010,0130 Max density VR: US VM: 1
(692) (0000002) |280|
(692) 2010,0500 Referenced film session sequence VR: SQ VM: 1
(692) ==
(692) <Sequence: Item 194 of message 193 (2010,0500)>
(692) ==
(692) Item ID: 194
(692) Item attributes:
(692) 0008,1150 Referenced SOP class UID VR: UI VM: 1
(692) (0000021) |1.2.840.10008.5.1.1.1|
(692) 0008,1155 Referenced SOP instance UID VR: UI VM: 1
(692) (0000040) |1.2.840.113720.1.9410.2.20010326173705.5|
(692) ===== End of Item ID: 194 =========
(692) Message ID: 193 (continued)
(692) ===== End of Message ID: 193 =====

4. c) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:14.71 MC3 T7: Message received on context 1
(691) 03-26 18:00:14.71 MC3 T7: Group 0x0000 elements:
(691) 03-26 18:00:14.71 MC3 T7: (0000,0000) Group 0000 length
(691) 03-26 18:00:14.71 MC3 T7: (1): 120
(691) 03-26 18:00:14.71 MC3 T7: (0000,0002) Affected SOP class UID
(691) 03-26 18:00:14.73 MC3 T7: (1): 1.2.840.10008.5.1.1.2
(691) 03-26 18:00:14.73 MC3 T7: (0000,0100) Command field
(691) 03-26 18:00:14.73 MC3 T7: (1): 33088
(691) 03-26 18:00:14.73 MC3 T7: (0000,0120) Message ID being responded to
(691) 03-26 18:00:14.73 MC3 T7: (1): 3
(691) 03-26 18:00:14.73 MC3 T7: (0000,0800) Data set type
(691) 03-26 18:00:14.73 MC3 T7: (1): 65278
(691) 03-26 18:00:14.73 MC3 T7: (0000,0900) Status
(691) 03-26 18:00:14.73 MC3 T7: (1): 0
(691) 03-26 18:00:14.73 MC3 T7: (0000,1000) Affected SOP instance UID
(691) 03-26 18:00:14.73 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173706.5.1

4. d) On T2 you will again see the "Command Set" as well as the "Data Set" of the response.

(691) 03-26 18:00:14.73 MC3 T2: Message (BASIC_FILM_BOX,N_CREATE_RSP) received on context 1

(691) ==========

(691) Message ID: 195

(691) Service supported: BASIC_FILM_BOX (0002)

(691) Command supported: N_CREATE_RSP

(691) Message attributes:

(691) 0000,0000 Group 0000 length VR: UL VM: 1

(691) (0000004) |120|

(691) 0000,0002 Affected SOP class UID VR: UI VM: 1

(691) (0000021) |1.2.840.10008.5.1.1.2

(691) 0000,0100 Command field VR: US VM: 1

(691) (0000002) |33088|

(691) 0000,0120 Message ID being responded to VR: US VM: 1

(691) (0000002) |3|

(691) 0000,0800 Data set type VR: US VM: 1

(691) (0000002) |65278|

(691) 0000,0900 Status VR: US VM: 1

(691) (0000002) |0|

(691) 0000,1000 Affected SOP instance UID VR: UI VM: 1

(691) (0000042) |1.2.840.113720.1.9410.2.20010326173706.5.1 |

(691) 2010,0010 Image display format VR: ST VM: 1

(691) (0000012) |STANDARD\1,1|

(691) 010,0030 Annotation display format ID VR: CS VM: 1

(691) (0000004) |NONE|

(691) 2010,0040 Film orientation VR: CS VM: 1

(691) (0000008) |PORTRAIT|

(691) 010,0050 Film size ID VR: CS VM: 1

(691) (0000009) |14INX17IN|

(691) 2010,0060 Magnification type VR: CS VM: 1

(691) (0000004) |NONE|

(691) 2010,0100 Border density VR: CS VM: 1

(691) (0000005) |BLACK|

(691) 2010,0110 Empty image density VR: CS VM: 1

(691) (0000005) |BLACK|

(691) 2010,0130 Max density VR: US VM: 1

(691) (0000002) |280|

(691) 2010,0140 Trim VR: CS VM: 1

(691) (0000002) |NO|
(691) 2010,0150 Configuration information VR: ST VM: 1
(691) (0000000) <null>
(691) 2010,0500 Referenced film session sequence VR: SQ VM: 1
(691) ==========
(691) <Sequence: Item 196 of message 195 (2010,0500)>
(691) ==========
(691) Item ID: 196
(691) Item attributes:
(691) 0008,1150 Referenced SOP class UID VR: UI VM: 1
(691) (0000021) |1.2.840.10008.5.1.1.1|
(691) 0008,1155 Referenced SOP instance UID VR: UI VM: 1
(691) (0000040) |1.2.840.113720.1.9410.2.20010326173705.5|
(691) ===== End of Item ID: 196 =====
(691) Message ID: 195 (continued)
(691) 2010,0510 Referenced image box sequence VR: SQ VM: 1
(691) ==========
(691) <Sequence: Item 197 of message 195 (2010,0510)>
(691) ==========
(691) Item ID: 197
(691) Item attributes:
(691) 0008,1150 Referenced SOP class UID VR: UI VM: 1
(691) (0000021) |1.2.840.10008.5.1.1.4|
(691) 0008,1155 Referenced SOP instance UID VR: UI VM: 1
(691) (0000044) |1.2.840.113720.1.9410.2.20010326173706.5.1.1|
(691) ===== End of Item ID: 197 =========
(691) Message ID: 195 (continued)
(691) ===== End of Message ID: 195 =====

5. a) Basic Gray scale Image Box Service (N_Set to send the image data)
Following the Basic Film Box, the BASIC IMAGE BOX Service is performed.
In this Service parameters for the image including the pixel data will be sent.
The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:17.04 MC3 T7: Message (BASIC_GRAYSCALE_IMAGE_BOX,N_SET_RQ) sent on context 1
(692) 03-26 18:00:17.04 MC3 T7: (0000,0000) Group 0000 length
(692) 03-26 18:00:17.04 MC3 T7: (1): 112

(692) 03-26 18:00:17.04 MC3 T7: (0000,0003) Requested SOP class UID

(692) 03-26 18:00:17.04 MC3 T7: (1): 1.2.840.10008.5.1.1.4

(692) 03-26 18:00:17.04 MC3 T7: (0000,0100) Command field

(692) 03-26 18:00:17.04 MC3 T7: (1): 288

(692) 03-26 18:00:17.04 MC3 T7: (0000,0110) Message ID

(692) 03-26 18:00:17.04 MC3 T7: (1): 4

(692) 03-26 18:00:17.04 MC3 T7: (0000,0800) Data set type

(692) 03-26 18:00:17.04 MC3 T7: (1): 0

(692) 03-26 18:00:17.04 MC3 T7: (0000,1001) Requested SOP instance UID

(692) 03-26 18:00:17.04 MC3 T7:(1):1.2.840.113720.1.9410.2.20010326173706.5.1.1

5. b) Since this request also includes a "Data Set" (group 2020, group 0028), you will also see the request on trace level T2.

(692) 03-26 18:00:17.04 MC3 T7: Group 0x0000 elements:

(692) 03-26 18:00:50.15 MC3 T2: Message (BASIC_GRAYSCALE_IMAGE_BOX,N_SET_RQ) sent on context 1 (692)

==========

(692) Message ID: 200

(692) Service supported: BASIC_GRAYSCALE_IMAGE_BOX (0004)

(692) Command supported: N_SET_RQ

(692) Message attributes:

(692) 0000,0000 Group 0000 length VR: UL VM: 1

(692) (0000004) |112|

(692) 0000,0003 Requested SOP class UID VR: UI VM: 1

(692) (0000021) |1.2.840.10008.5.1.1.4| (MR image)

(692) 0000,0100 Command field VR: US VM: 1

(692) (0000002) |288|

(692) 000,0110 Message ID VR: US VM: 1

(692) (0000002) |4|

(692) 0000,0800 Data set type VR: US VM: 1

(692) (0000002) |0|

(692) 000,1001 Requested SOP instance UID VR: UI VM: 1

(692) (0000044) |1.2.840.113720.1.9410.2.20010326173706.5.1.1|

(692) 020,0010 Image position VR: US VM: 1

(692) (0000002) |1|

(692) 2020,0110 Basic Gray scale Image Sequence VR: SQ VM: 1

(692) ==========

(692) <Sequence: Item 201 of message 200 (2020,0110)>

(692) ==
(692) Item ID: 201
(692) Item attributes:
(692) 0028,0002 Samples per pixel VR: US VM: 1
(692) (0000002) |1|
(692) 0028,0004 Photometric interpretation VR: CS VM: 1
(692) (0000011) |MONOCHROME2|
(692) 0028,0010 Rows VR: US VM: 1
(692) 0000002) |5220|
(692) 0028,0011 Columns VR: US VM: 1
(692) (0000002) |4096|
(692) 0028,0034 Pixel aspect ratio VR: IS VM: 2
(692) (0000002) |1| |1|
(692) 0028,0100 Bits allocated VR: US VM: 1
(692) (0000002) |8|
(692) 0028,0101 Bits stored VR: US VM: 1
(692) (0000002) |8|
(692) 0028,0102 High bit VR: US VM: 1
(692) (0000002) |7|
(692) 028,0103 Pixel representation VR: US VM: 1
(692) (0000002) |0|
(692) 7FE0,0010 Pixel data VR: OW VM: 1
(692) (21381120) <OB, OW, OL data>
(692) ===== End of Item ID: 201 =========
(692) Message ID: 200 (continued)
(692) ===== End of message ID: 200 =====

5. c) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:50.57 MC3 T7: Message received on context 1
(691) 03-26 18:00:50.57 MC3 T7: Group 0x0000 elements:
(691) 03-26 18:00:50.57 MC3 T7: (0000,0000) Group 0000 length
(691) 03-26 18:00:50.57 MC3 T7: (1): 122
(691) 03-26 18:00:50.57 MC3 T7: (0000,0002) Affected SOP class UID
(691) 03-26 18:00:50.57 MC3 T7: (1): 1.2.840.10008.5.1.1.4
(691) 03-26 18:00:50.57 MC3 T7: (0000,0100) Command field
(691) 03-26 18:00:50.57 MC3 T7: (1): 33056
(691) 03-26 18:00:50.57 MC3 T7: (0000,0120) Message ID being responded to
(691) 03-26 18:00:50.57 MC3 T7: (1): 4

(691) 03-26 18:00:50.57 MC3 T7: (0000,0800) Data set type

(691) 03-26 18:00:50.57 MC3 T7: (1): 65278

(691) 03-26 18:00:50.57 MC3 T7: (0000,0900) Status

(691) 03-26 18:00:50.57 MC3 T7: (1): 0

(691) 03-26 18:00:50.57 MC3 T7: (0000,1000) Affected SOP instance UID

(691) 03-26 18:00:50.57 MC3 T7:(1):1.2.840.113720.1.9410.2.20010326173706.5.1.1

5. d) On T2 you will again see the "Command Set" as well as the "Data Set" of the response.

(691) 03-26 18:00:50.57 MC3 T2: Message (BASIC_GRAYSCALE_IMAGE_BOX,N_SET_RSP) received on context 1

(691) ==========

(691) Message ID: 202

(691) Service supported: BASIC_GRAYSCALE_IMAGE_BOX (0004)

(691) Command supported: N_SET_RSP

(691) Message attributes:

(691) 0000,0000 Group 0000 length VR: UL VM: 1

(691) (0000004) 122

(691) 0000,0002 Affected SOP class UID VR: UI VM: 1

(691) (0000021) 1.2.840.10008.5.1.1.4

(691) 0000,0100 Command field VR: US VM: 1

(691) (0000002) |33056|

(691) 000,0120 Message ID Being responded to VR: US VM: 1

(691) (0000002) 4

(691) 0000,0800 Data set type VR: US VM: 1

(691) (0000002) 65278

(691) 0000,0900 Status VR: US VM: 1

(691) (0000002) 0

(691) 0000,1000 Affected SOP instance UID VR: UI VM: 1

(691) (0000044) 1.2.840.113720.1.9410.2.20010326173706.5.1.1

(691) 2010,0060 Magnification type VR: CS VM: 1

(691) (0000007) UNKNOWN

(691) 2020,0010 Image position VR: US VM: 1

(691) (0000002) 1

(691) 2020,0020 Polarity VR: CS VM: 1

(691) (0000006) NORMAL

(691) 2020,0030 Requested image size VR: DS VM: 1

(691) (0000002) -1

(691) 2020,0110 Basic Gray scale image sequence VR: SQ VM: 1

(691) ==

(691) <Sequence: Item 203 of message 202 (2020,0110)>

(691) ==

(691) Item ID: 203

(691) Item Attributes:

(691) 0028,0002 Samples per pixel VR: US VM: 1

(691) (0000002) 1

(691) 0028,0004 Photometric interpretation VR: CS VM: 1

(691) (0000011) MONOCHROME2

(691) 0028,0010 Rows VR: US VM: 1

(691) (0000002) 5220

(691) 0028,0011 Columns VR: US VM: 1

(691) (0000002) 4096|

(691) 0028,0034 Pixel aspect ratio VR: IS VM: 2

(691) 0000002) 1 1

(691) 0028,0100 Bits allocated VR: US VM: 1

(691) (0000002) 8

(691) 0028,0101 Bits stored VR: US VM: 1

(691) (0000002) 8

(691) 0028,0102 High bit VR: US VM: 1

(691) (0000002) 7

(691) 0028,0103 Pixel representation VR: US VM: 1

(691) (0000002) 1

(691) ===== End of Item ID: 203 ========

(691) Message ID: 202 (continued)

(691) ===== End of Message ID: 202 ====

6. a) Basic Film Box Service (N_Action to print the film)

Following the Basic Image Boxes (syngo always sends just one image for one film), the BASIC FILM BOX service is performed again (N_Action) to print out the film.

The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:51.60 MC3 T7: Message (BASIC_FILM_BOX,N_ACTION_RQ) sent on context 1

(692) 03-26 18:00:51.60 MC3 T7: Group 0x0000 elements:

(692) 03-26 18:00:51.60 MC3 T7: (0000,0000) Group 0000 length

(692) 03-26 18:00:51.60 MC3 T7: (1): 120

(692) 03-26 18:00:51.60 MC3 T7: (0000,0003) Requested SOP class UID

(692) 03-26 18:00:51.60 MC3 T7: (1): 1.2.840.10008.5.1.1.2

(692) 03-26 18:00:51.60 MC3 T7: (0000,0100) Command field

(692) 03-26 18:00:51.60 MC3 T7: (1): 304 (N_ACION)

(692) 03-26 18:00:51.60 MC3 T7: (0000,0110) Message ID

(692) 03-26 18:00:51.60 MC3 T7: (1): 5

(692) 03-26 18:00:51.60 MC3 T7: (0000,0800) Data set type

(692) 03-26 18:00:51.60 MC3 T7: (1): 257

(692) 03-26 18:00:51.60 MC3 T7: (0000,1001) Requested SOP instance UID

(692) 03-26 18:00:51.60 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173706.5.1

(692) 03-26 18:00:51.60 MC3 T7: (0000,1008) Action type ID

(692) 03-26 18:00:51.60 MC3 T7: (1): 1

6. b) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:52.40 MC3 T7: Message received on context 1

(691) 03-26 18:00:52.40 MC3 T7: Group 0x0000 elements:

(691) 03-26 18:00:52.40 MC3 T7: (0000,0000) Group 0000 length

(691) 03-26 18:00:52.40 MC3 T7: (1): 130

(691) 03-26 18:00:52.40 MC3 T7: (0000,0002) Affected SOP class UID

(691) 03-26 18:00:52.40 MC3 T7: (1): 1.2.840.10008.5.1.1.2

(691) 03-26 18:00:52.40 MC3 T7: (0000,0100) Command field

(691) 03-26 18:00:52.40 MC3 T7: (1): 33072

(691) 03-26 18:00:52.40 MC3 T7: (0000,0120) Message ID being responded to

(691) 03-26 18:00:52.40 MC3 T7: (1): 5

(691) 03-26 18:00:52.40 MC3 T7: (0000,0800) Data set type

(691) 03-26 18:00:52.40 MC3 T7: (1): 65278

(691) 03-26 18:00:52.40 MC3 T7: (0000,0900) Status

(691) 03-26 18:00:52.40 MC3 T7: (1): 0

(691) 03-26 18:00:52.40 MC3 T7: (0000,1000) Affected SOP instance UID

(691) 03-26 18:00:52.40 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173706.5.1

(691) 03-26 18:00:52.40 MC3 T7: (0000,1008) Action type ID

(691) 03-26 18:00:52.40 MC3 T7: (1): 1

6. c) On T2 you will again see the "Command Set" as well as the "Data Set" of the response.

(691) 03-26 18:00:52.40 MC3 T2: Message (BASIC_FILM_BOX,N_ACTION_RSP) received on context 1

(691) ==========

(691) Message ID: 206

(691) Service supported: BASIC_FILM_BOX (0002)
(691) Command supported: N_ACTION_RSP
(691) Message attributes:
(691) 000,0000 Group 0000 length VR: UL VM: 1
(691) (0000004) |130|
(691) 0000,0002 Affected SOP class UID VR: UI VM: 1
(691) (0000021) |1.2.840.10008.5.1.1.2|
(691) 0000,0100 Command field VR: US VM: 1
(691) (0000002) |33072|
(691) 0000,0120 Message ID being responded to VR: US VM: 1
(691) (0000002) |5|
(691) 0000,0800 Data Set Type VR: US VM: 1
(691) (0000002) |65278|
(691) 0000,0900 Status VR: US VM: 1
(691) (0000002) |0|
(691) 0000,1000 Affected SOP instance UID VR: UI VM: 1
(691) (0000042) |1.2.840.113720.1.9410.2.20010326173706.5.1|
(691) 0000,1008 Action type ID VR: US VM: 1
(691) (0000002) |1|
(691) 2100,0500 Referenced print job sequence VR: SQ VM: 1
(691) ==
(691) <Sequence: Item 207 of message 206 (2100,0500)>
(691) ==
(691) Item ID: 207
(691) Item attributes:
(691) 0008,1150 Referenced SOP class UID VR: UI VM: 1
(691) (0000022) |1.2.840.10008.5.1.1.14|
(691) 0008,1155 Referenced SOP instance UID VR: UI VM: 1
(691) (0000044) |1.2.840.113720.1.9410.2.20010326173744.5.0.6|
(691) ===== End of Item ID: 207 =========
(691) Message ID: 206 (continued)
(691) ===== End of message ID: 206 =====

7. a) Basic Film Box Service (N_Delete to delete the session)

After printing the film, syngo will delete the FILM BOX service.

The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:53.42 MC3 T7: Message (BASIC_FILM_BOX,N_DELETE_RQ) sent on context 1

(692) 03-26 18:00:53.42 MC3 T7: Group 0x0000 Elements:
(692) 03-26 18:00:53.42 MC3 T7: (0000,0000) Group 0000 length
(692) 03-26 18:00:53.42 MC3 T7: (1): 110
(692) 03-26 18:00:53.42 MC3 T7: (0000,0003) Requested SOP class UID
(692) 03-26 18:00:53.42 MC3 T7: (1): 1.2.840.10008.5.1.1.2
(692) 03-26 18:00:53.42 MC3 T7: (0000,0100) Command field
(692) 03-26 18:00:53.42 MC3 T7: (1): 336 (N_Delete)
(692) 03-26 18:00:53.42 MC3 T7: (0000,0110) Message ID
(692) 03-26 18:00:53.42 MC3 T7: (1): 6
(692) 03-26 18:00:53.42 MC3 T7: (0000,0800) Data set type
(692) 03-26 18:00:53.42 MC3 T7: (1): 257
(692) 03-26 18:00:53.42 MC3 T7: (0000,1001) Requested SOP instance UID
(692) 03-26 18:00:53.42 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173706.5.1

7. b) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:53.71 MC3 T7: Message received on context 1
(691) 03-26 18:00:53.71 MC3 T7: Group 0x0000 elements:
(691) 03-26 18:00:53.71 MC3 T7: (0000,0000) Group 0000 length
(691) 03-26 18:00:53.73 MC3 T7: (1): 120
(691) 03-26 18:00:53.73 MC3 T7: (0000,0002) Affected SOP class UID
(691) 03-26 18:00:53.73 MC3 T7: (1): 1.2.840.10008.5.1.1.2
(691) 03-26 18:00:53.73 MC3 T7: (0000,0100) Command field
(691) 03-26 18:00:53.73 MC3 T7: (1): 33104
(691) 03-26 18:00:53.73 MC3 T7: (0000,0120) Message ID being responded to
(691) 03-26 18:00:53.73 MC3 T7: (1): 6
(691) 03-26 18:00:53.73 MC3 T7: (0000,0800) Data set type
(691) 03-26 18:00:53.73 MC3 T7: (1): 257
(691) 03-26 18:00:53.73 MC3 T7: (0000,0900) Status
(691) 03-26 18:00:53.73 MC3 T7: (1): 0
(691) 03-26 18:00:53.73 MC3 T7: (0000,1000) Affected SOP instance UID
(691) 03-26 18:00:53.73 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173706.5.1

8. a) Basic Film Session Service (N_Delete to delete the print session)

After deleting the film boxes (in this case only one film was printed), the FILM SESSION service is deleted.

The request can be seen on trace level T7 (Command Set)

(692) 03-26 18:00:55.73 MC3 T7: Message (BASIC_FILM_SESSION,N_DELETE_RQ) sent on context 1

(692) 03-26 18:00:55.73 MC3 T7: Group 0x0000 elements:
(692) 03-26 18:00:55.73 MC3 T7: (0000,0000) Group 0000 length
(692) 03-26 18:00:55.73 MC3 T7: (1): 108
(692) 03-26 18:00:55.73 MC3 T7: (0000,0003) Requested SOP class UID
(692) 03-26 18:00:55.73 MC3 T7: (1): 1.2.840.10008.5.1.1.1
(692) 03-26 18:00:55.73 MC3 T7: (0000,0100) Command field
(692) 03-26 18:00:55.73 MC3 T7: (1): 336
(692) 03-26 18:00:55.73 MC3 T7: (0000,0110) Message ID
(692) 03-26 18:00:55.73 MC3 T7: (1): 7
(692) 03-26 18:00:55.73 MC3 T7: (0000,0800) Data set type
(692) 03-26 18:00:55.73 MC3 T7: (1): 257
(692) 03-26 18:00:55.73 MC3 T7: (0000,1001) Requested SOP instance UID
(692) 03-26 18:00:55.73 MC3 T7: (1): 1.2.840.113720.1.9410.2.20010326173705.5

8. b) On T7 you will see the "Command Set" of the response from the camera

(691) 03-26 18:00:56.06 MC3 T7: Message received on context 1
(691) 03-26 18:00:56.06 MC3 T7: Group 0x0000 elements:
(691) 03-26 18:00:56.06 MC3 T7: (0000,0000) Group 0000 length
(691) 03-26 18:00:56.06 MC3 T7: (1): 118
(691) 03-26 18:00:56.06 MC3 T7: (0000,0002) Affected SOP class UID
(691) 03-26 18:00:56.06 MC3 T7: (1): 1.2.840.10008.5.1.1.1
(691) 03-26 18:00:56.06 MC3 T7: (0000,0100) Command field
(691) 03-26 18:00:56.06 MC3 T7: (1): 33104
(691) 03-26 18:00:56.06 MC3 T7: (0000,0120) Message ID being responded to
(691) 03-26 18:00:56.06 MC3 T7: (1): 7
(691) 03-26 18:00:56.06 MC3 T7: (0000,0800) Data set type
(691) 03-26 18:00:56.06 MC3 T7: (1): 257
(691) 03-26 18:00:56.06 MC3 T7: (0000,0900) Status
(691) 03-26 18:00:56.06 MC3 T7: (1): 0
(691) 03-26 18:00:56.06 MC3 T7: (0000,1000) Affected SOP instance UID
(691) 03-26 18:00:56.06 MC3 T7: (1):

When you turn on trace level T9, you will also see the whole association on the Protocol Data Unit level (PDU). This will add a lot more information to the log file, which is just helpful in some special cases. E.g if the transfer is interrupted, you can see how many packets were successfully transferred. The Association Release request and response can also be seen only on trace level T9.

(409) 07-21 14:58:29.96 MC3 T9: PDU Type: 05 (Assoc_Rel_RQ) received
(409) 07-21 14:58:29.96 MC3 T9: Reserved byte: 00

(409) 07-21 14:58:29.96 MC3 T9: PDU length: 0000 0004 (4 bytes)
(409) 07-21 14:58:29.96 MC3 T9: Reserved bytes (7-10): 0000 0000
(409) 07-21 14:58:29.96 MC3 T9: PDU Type: 06 (Assoc_Rel_RP) sent
(409) 07-21 14:58:29.96 MC3 T9: Reserved byte: 00
(409) 07-21 14:58:29.96 MC3 T9: PDU length: 0000 0004 (4 bytes)

The Basic Print session was performed successfully. Check the image quality!

DICOM UIDs

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.1.1	Verification SOP class	SOP class	A.4	C
1.2.840.10008.1.2	Implicit VR little Indian: Default transfer syntax for DICOM	Transfer syntax	A.1	-
1.2.840.10008.1.2.1	Explicit VR little Indian	Transfer syntax	A.2	-
1.2.840.10008.1.2.2	Explicit VR big Indian	Transfer syntax	A.3	-
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1): default transfer syntax for lossy JPEG 8 Bit Image Compression	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.51	JPEG extended (Process 2 & 4): default transfer syntax for JPEG 12 Bit image compression (process only)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.52	JPEG Extended (Process 3 & 5)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.53	JPEG spectral selection, non-hierarchical (Process 6 & 8)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.54	JPEG spectral selection, non-hierarchical (Process 7 & 9)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.55	JPEG full progression, non-hierarchical (Process 10 & 12)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.56	JPEG full progression, non-hierarchical (Process 11 & 13)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.57	JPEG Lossless, non-hierarchical (Process 14)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.58	JPEG Lossless, non-hierarchical (Process 15)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.59	JPEG extended, Hierarchical (Process 16 &18)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.60	JPEG extended, hierarchical (Process 17 &19)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.61	JPEG spectral selection, hierarchical (Process 20 & 22)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.62	JPEG spectral selection, hierarchical (Process 21 & 23)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.63	JPEG full progression, hierarchical (Process 24 & 26)	Transfer syntax	A.4.1	-

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.1.2.4.64	JPEG full progression, hierarchical (Process 25 & 27)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.65	JPEG lossless, hierarchical (Process 28)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.66	JPEG lossless, hierarchical (Process 29)	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.4.70	JPEG lossless, non-hierarchical, first order prediction (Process 14 (selection value 1)): JPEG image compression	Transfer syntax	A.4.1	-
1.2.840.10008.1.2.5	RLE lossless	Transfer syntax	A.4.2	-
1.2.840.10008.1.20.1	Storage commitment push model SOP class	SOP class	J.3.4	N
1.2.840.10008.1.20.1.1	Storage commitment push model SOP instance	Well-known SOP instance	J.3.5.	-
1.2.840.10008.1.20.2	Storage commitment pull model SOP class	SOP class	J.4.4	N
1.2.840.10008.1.20.2.1	Storage commitment pull model SOP instance	Well-known SOP instance	J.4.5	-
1.2.840.10008.1.3.10	Media storage directory storage	SOP class	I.4	C
1.2.840.10008.1.9	Basic study content notification SOP class	SOP class	D.4.3	C
1.2.840.10008.3.1.1.1	DICOM application context name	Application context name	A.2.1	-
1.2.840.10008.3.1.2.1.1	Detached patient management storage) SOP Class	SOP class	E.3.4	N
1.2.840.10008.3.1.2.1.4	Detached patient management meta SOP class	SOP class	E.5.1	N
1.2.840.10008.3.1.2.2.1	Detached visit management (storage) SOP class	SOP class	E.4.4	N
1.2.840.10008.3.1.2.3.1	Detached study management (storage) SOP class	SOP class	F.3.4	N
1.2.840.10008.3.1.2.3.2	Study component management (storage) SOP class	SOP class	F.4.3	N
1.2.840.10008.3.1.2.3.3	Modality performed procedure step SOP class	SOP class	F.7.3	N

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.3.1.2.3.4	Modality performed procedure step retrieve SOP class	SOP class	F.8.3	N
1.2.840.10008.3.1.2.3.5	Modality performed procedure step notification SOP class	SOP class	F.9.3	N
1.2.840.10008.3.1.2.5.1	Detached results management (storage) SOP class	SOP class	G.3.4	N
1.2.840.10008.3.1.2.5.4	Detached results management meta SOP class	Meta SOP class	G.5.1	N
1.2.840.10008.3.1.2.5.5	Detached study management meta SOP class	Meta SOP class	F.5.1	N
1.2.840.10008.3.1.2.6.1	Detached interpretation management (storage) SOP class	SOP class	G.4.4	N
1.2.840.10008.5.1.1.1	Basic film session (storage) SOP class	SOP class	H.4.1.3	N
1.2.840.10008.5.1.1.14	Print job SOP class	SOP class	H.4.5.4	N
1.2.840.10008.5.1.1.15	Basic annotation box SOP class	SOP class	H.4.4.3	N
1.2.840.10008.5.1.1.16	Printer SOP class	SOP class	H.4.6.4	N
1.2.840.10008.5.1.1.16.376	Printer configuration retrieval SOP class	SOP class	H.4.11.3	N
1.2.840.10008.5.1.1.17	Printer SOP instance	Well-known printer SOP instance	H.4.6.5	-
1.2.840.10008.5.1.1.17.376	Well-known printer configuration retrieval SOP instance	Well-known printer SOP instance	H.4.11.4	-
1.2.840.10008.5.1.1.18	Basic color print management meta SOP class	Meta SOP class	H.3.2.2.2	N
1.2.840.10008.5.1.1.2	Basic film box (storage) SOP class	SOP class	H.4.2.3	N
1.2.840.10008.5.1.1.23	Presentation LUT SOP class	SOP class	H.4.9.2.4	N
1.2.840.10008.5.1.1.24.1	Basic print image overlay box SOP class	SOP class	H.4.12.3	N
1.2.840.10008.5.1.1.25	Print queue SOP instance	Well-known print queue SOP instance	L.4.4	-
1.2.840.10008.5.1.1.26	Print queue management SOP class	SOP class	L.4.3	N
1.2.840.10008.5.1.1.27	Stored print storage SOP class	SOP class	B.5	C

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.5.1.1.29	Hardcopy Gray scale image storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.1.30	Hardcopy color image storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.1.31	Pull print SOP class	SOP class	H.4.10.4	N
1.2.840.10008.5.1.1.32	Pull stored print management meta SOP class	SOP class	H.3.2.2.5	N
1.2.840.10008.5.1.1.4	Basic Gray scale image box (storage) SOP class	SOP class	H.4.3.1.3	N
1.2.840.10008.5.1.1.4.1	Basic color image box (storage) SOP class	SOP class	H.4.3.23.3	N
1.2.840.10008.5.1.1.9	Basic Gray scale print image management SOP class	Meta SOP class	H.3.2.2.1	N
1.2.840.10008.5.1.4.1.1.1	Computed radiography image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.1	Digital X-ray image storage - for presentation	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage - For processing	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.2	Digital mammography X-ray image storage - for presentation	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.2.1	Digital mammography X-ray image storage - for processing	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.3	Digital intra-oral X-ray image storage - for presentation	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.1.3.1	Digital intra-oral X-ray image storage - for processing	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.10	Stand-alone modality LUT storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.11	Stand-alone VOI LUT storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.11.1	Gray scale softcopy presentation state storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.12.1	X-ray angiography image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.12.2	X-ray radiofluoroscopic image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.12.3	X-ray angiographic biplane image storage	SOP class	B.5	C

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.5.1.4.1.1.128	Positron emission tomography image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.129	Stand-alone PET curve storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.2	CT image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.20	Nuclear medicine image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.3	Ultrasound multi-frame image storage (retired)	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.3.1	Ultrasound multi-frame image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.4	MR image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.1	RT image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.2	RT dose storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.3	RT structure set storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.4	RT bones treatment record storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.5	RT plan storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.6	RT brachy treatment record storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.481.7	RT treatment summary record storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.5	Nuclear medicine image storage (retired)	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.6	Ultrasound image storage (retired)	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.7	Secondary capture image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.77.1.1	Visible light endoscopic image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.77.1.2	Visible light microscopic image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.77.1.3	Visible light slide coordinates microscopic image storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.77.1.4	Visible light photographic image storage	SOP class	B.5	C

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.5.1.4.1.1.8	Stand-alone overlay storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.88.11	Structured report basic text SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.88.22	Structured report enhanced SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.88.33	Structured report comprehensive SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9	Stand-alone curve storage	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.1.3	Ambulatory ECG waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.2.1	Hemodynamic waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.3.1	Cardiac electrophysiology waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.1.9.4.1	Basic voice audio waveform storage SOP class	SOP class	B.5	C
1.2.840.10008.5.1.4.1.2.1.1	Patient root query/retrieve information model - FIND	SOP class	C.6.1.3	C
1.2.840.10008.5.1.4.1.2.1.2	Patient root query/retrieve information model - MOVE	SOP class	C.6.1.3	C
1.2.840.10008.5.1.4.1.2.1.3	Patient root query/retrieve information model - GET	SOP class	C.6.1.3	C
1.2.840.10008.5.1.4.1.2.2.1	Study root Query/Retrieve Information model - FIND	SOP class	C.6.2.3	C
1.2.840.10008.5.1.4.1.2.2.2	Study root query/retrieve information model - MOVE	SOP class	C.6.2.3	C
1.2.840.10008.5.1.4.1.2.2.3	Study root query/retrieve information model - GET	SOP class	C.6.2.3	C
1.2.840.10008.5.1.4.1.2.3.1	Patient/ study only query/retrieve Information model - FIND	SOP class	C.6.3.3	C
1.2.840.10008.5.1.4.1.2.3.2	Patient/ study only query/retrieve information model - MOVE	SOP class	C.6.3.3	C

UID Value	UID Name	UID Type	Part 4,5,7	C/N
1.2.840.10008.5.1.4.1.2.3.3	Patient/ study only query/retrieve information model - GET	SOP class	C.6.3.3	C
1.2.840.10008.5.1.4.31	Modality worklist information model - FIND	SOP class	K.6.1.4	C

Status Messages in merge.log File

Status Type	Service	Definition	Hex	Decimal
Success	all	Success	0000	0
Failure	all	No such attribute	0105	261
Failure	all	Invalid attribute value	0106	262
Warning	all	Attribute list error	0107	263
Failure	all	Processing Error	0110	272
Failure	all	Duplicate SOP instance	0111	273
Failure	all	No such object instance	0112	274
Failure	all	No such event type	0113	275
Failure	all	No such argument	0114	276
Failure	all	Invalid argument value	0115	277
Warning	all	Attribute value out of range	0116	278
Failure	all	Invalid object instance	0117	279
Failure	all	No such SOP class	0118	280
Failure	all	Class instance conflict	0119	281
Failure	all	Missing attribute	0120	288
Failure	all	Missing attribute value	0121	289
Refused	all	SOP class not supported	0122	290
Failure	all	Duplicate invocation	0210	528
Failure	all	Unrecognized operation	0211	529
Failure	all	Mistyped argument	0212	530
Failure	all	Resource limitation	0213	531
Refused	FIND	Out of resources	A700	42752
Refused	MOVE-GET	Out of resources: number of matches	A701	42753
Refused	MOVE-GET	Out of resources: no sub-operations	A702	42754
Refused	STORE	Out of resources	A7xx	42752-43007
Refused	MOVE	Move destination unknown	A801	43009
Failure	FIND-MOVE-GET	Identifier does not match SOP class	A900	43264
Failure	STORE	Data set does not match SOP class	A9xx	43264-43519

Status Type	Service	Definition	Hex	Decimal
Warning	MOVE-GET	Sub-operations complete: one or more failures	B000	45056
Warning	STORE	Coercion of data elements	B000	45056
Warning	STORE	Elements discarded	B006	45062
Warning	STORE	Data set does not match SOP class	B007	45063
Warning	PRINT	Memory allocation not supported	B600	46592
Warning	PRINT	Film session printing (collation) is not supported	B601	46593
Warning	PRINT	Film session SOP instance hierarchy does not contain image box SOP instances (empty page)	B602	46594
Warning	PRINT	Film box SOP instance hierarchy does not contain image box SOP instances (empty page)	B603	46595
Warning	PRINT	Image size is larger than image box size, the image has been demagnified	B604	46596
Warning	PRINT	Req. min or max density out of range. Printer will use its own values.	B605	46597
Warning	PRINT	Image size is larger than the image box size. The image has been cropped to fit.	B609	46601
Warning	PRINT	Image size or combined print image size is larger than the image box size. Image or combined print image has been cropped to fit.	B60A	46602
Failure	PRINT	Film session SOP instance hierarchy does not contain film box SOP instances.	C600	50688
Failure	PRINT	Unable to create print job SOP instance; print queue is full (film session)	C601	50689
Failure	PRINT	Unable to create print job SOP instance, print queue is full (film box)	C602	50690
Failure	PRINT	Image size is larger than image box size	C603	50691
Failure	PRINT	Insufficient memory printer to store the image	C605	50693
Failure	PRINT	More than one VOI LUT box contained in image	C606	50694
Failure	PRINT	Combined print image size is larger than the image box size	C613	50707

Status Type	Service	Definition	Hex	Decimal
Failure	PRINT	There is an existing film box that has not been printed and N-action at the film session level is not supported. A new film box will not be created when a previous film box has not been printed.	C616	50710
Failure	FIND_MOVE-GET	Unable to process	Cxxx	49152-53247
Failure	STORE	Cannot understand	Cxxx	49152-53247
Cancel	all	Cancel	FE00	65024
Pending	FIND	Matching continuing	FF00	65280
Pending	FIND-MOVE	Matching continuing: Warning	FF01	65281

DICOM Attributes in the Command Set (T7 in the merge.log File)

Message Field	Tag	VR	VM	Description of Field
Affected SOP class UID	(0000,0002)	UI	1	The affected SOP class UID
Requested SOP class UID	(0000,0003)	UI	1	The requested SOP class UID command
Command field	(0000,0100)	US	1	Requested/responded command
Message ID	(0000,0110)	US	1	Implementation-specific value
Message ID responded to	(0000,0120)	US	1	Should be same as (0000,0110)
Move destination	(0000,0600)	AE	1	DICOM AE title of the destination
Priority	(0000,0700)	US	1	LOW = 0002H MEDIUM = 000H HIGH = 0001H
Data set type	(0000,0800)	US	1	no data set = 0101H data set = any other
Status	(0000,0900)	US	1	OK = 0
Offending element	(0000,0910)	AT	1-n	If status is Cxxx, list of the elements in which the error was detected
Error comment	(0000,0902)	LO	1	Application-specific text
Error ID	(0000,0903)	US	1	Application-specific error code
Affected SOP instance ID	(0000,1000)	UI	1	SOP instance for this operation
Request SOP instance UID	(0000,1001)	UI	1	SOP instance for this operation
Event type ID	(0000,1002)	US	1	Application-specific
Attribute identifier list	(0000,1005)	AT	1-n	Attribute tag for attribute applicable
Action Type ID	(0000,1008)	US	1	Application-specific
Number of remaining Sub-operations	(0000,1020)	US	1	C-STORE sub-operations to be invoked for the operation
Number of completed sub-operations	(0000,1021)	US	1	C-STORE sub-operations which have completed successfully
Number of failed sub-operations	(0000,1022)	US	1	The number of the C-STORE sub-operations which have failed
Number of warning sub-operations	(0000,1023)	US	1	The number of C-STORE sub-operations which generated warning responses

Message Field	Tag	VR	VM	Description of Field
Move originator application entity title	(0000,1030)	AE	1	AE title which invoked C-MOVE, from which C-Store is being performed
Move originator message ID	(0000,1031)	US	1	Message ID (0000,0110) of the C-MOVE-RQ message from which C-STORE is being performed

Command Field Values (0000,0100)

Meaning	Request decimal	Request HEX	Response decimal	Response HEX
C-SEND	1	0001	32769	8001
C-GET	16	0010	32784	8010
C-FIND	32	0020	32800	8020
C-MOVE	33	0021	32801	8021
C-ECHO	48	0030	32816	8030
N-EVENT-REPORT	256	0100	33024	8100
N-GET	272	0110	33040	8110
N-SET	288	0120	33056	8120
N-ACTION	304	0130	33072	8130
N-CREATE	320	0140	33088	8140
N-DELETE	336	0150	33104	8150
C-CANCEL	4095	OFF		

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