

**Diagnostic Ultrasound System
DICOM Quick Guide FAQ Manual**

Intellectual Property Statement

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Note: Before using DICOM, please read the electronic file DICOM CONFORMANCE STATEMENT along with the device. At the same time, please verify that the SCU services provided by ultrasound machine can be supported by the SCP services provided by the systems such like PACS/RIS/HIS and so on.

The chapter is confined to the preset, connection verification and DICOM services of the DICOM-configured ultrasound machine, not including SCP configurations like PACS/RIS/HIS.

The DICOM package is optional, so the description here is only applicable for the system configured with the DICOM package.

This system supports the following DICOM functions:

- Verify Connectivity
- DICOM Storage
- DICOM Print
- DICOM Worklist
- MPPS Modality Performed Procedure Step
- Storage Commitment
- DICOM Medium Storage DICOMDIR Review
- DICOM Task Management

Workflows of DICOM Applications are briefly described as follows:

1. DICOM preset (Localhost DICOM Service Property, Server Setting, and Set DICOM Service).
2. Verify connectivity.
3. DICOM application (Image Storage, Print, MPPS, Worklist, Storage Commitment, DICOMDIR Review, Q/R and Task Management).

Abbreviation introduction:


The followings are the abbreviations in this chapter.

Abbreviation	Description
DICOM	Digital Imaging and Communications in Medicine
AE	Application Entity
MPPS	Modality Performed Procedure Step
PDU	Protocol Data Unit
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
SR	Structured Report
HL7	Health Level 7

1 Preset

1.1 DICOM Preset

To open the DICOM preset screen:

1. Click  icon in the upper right corner of the touch screen and click [Setup] key to show the Setup menu.
2. Move the cursor onto [DICOM/HL7 Preset] to open the screen, you can set up the Localhost DICOM Service Property, Server Setting and DICOM Services,

TLS Server Setting	Sever-side certificate management.
TLS Client Setting	<p>Verify Certificate: The precondition of the DICOM TLS services. The Dicom services checked TLS will Verify Certificate in term of</p> <p>Import the Type combox value have PEM and CER.</p> <p>Delete Delete the imported TLS certificates.</p>
Device	Name of the device supporting DICOM services.
IP Address	IP address of the server.
Ping	Check whether IP Address can connect normally or not.
Add	Click to add server (s) to the Device List.
Set DICOM Service	Set the attributes of DICOM Storage, Print, Worklist, MPPS, Storage Commitment and Q/R.
Delete	Click to delete the selected server (s) in the device list.
Set DICOM Strategy	Set DICOM strategy for doppler to be compatible with other
Log Level	Sets the log level.
Capture	Capture the dicom network packet.


In the above screen, please enter AE Title, Port, and PDU according to the actual situation, and then click [Save] to exit the screen.

Tip:

- AE Title should be the same with the SCU AE Title preset in the server (PACS/RIS/HIS), for example, if the AE Title of the server preset in the print server is Printer, and the AE Title of the accepted SCU is preset as Machine, then in the figure above, the AE Title of Local should be Machine, and the AE Title of print server should be Printer.
- The device name can be entered to your preference. If the currently entered name has another name.
- Port must not be set as 4001, 6000, 3001, 6555.
- IP address must be the actual IP address of the server.
- Set DICOM Strategy
 - a. The DICOM strategy must be configured by qualified personnel with good knowledge of DICOM standards.
 - b. The qualified personnel must ensure the validity of the DICOM strategy.
 - c. Dicom strategy supports export and import.
- Capture Mainly used for engineer positioning problem.

1.2 DICOM Service Preset

To open the DICOM Service screen:

1. Click  icon in the upper right corner of the touch scree and click [Setup]key to show the Setup menu. Move the cursor onto the [DICOM/HL7 Preset] item to open the screen.
2. Click the [Set DICOM Service] to set the attributes of services.

After DICOM is installed and DICOM Worklist, MPPS, and Query/Retrieve are optionally configured, there will be related screen for presetting.

1.2.1 DICOM Storage Preset

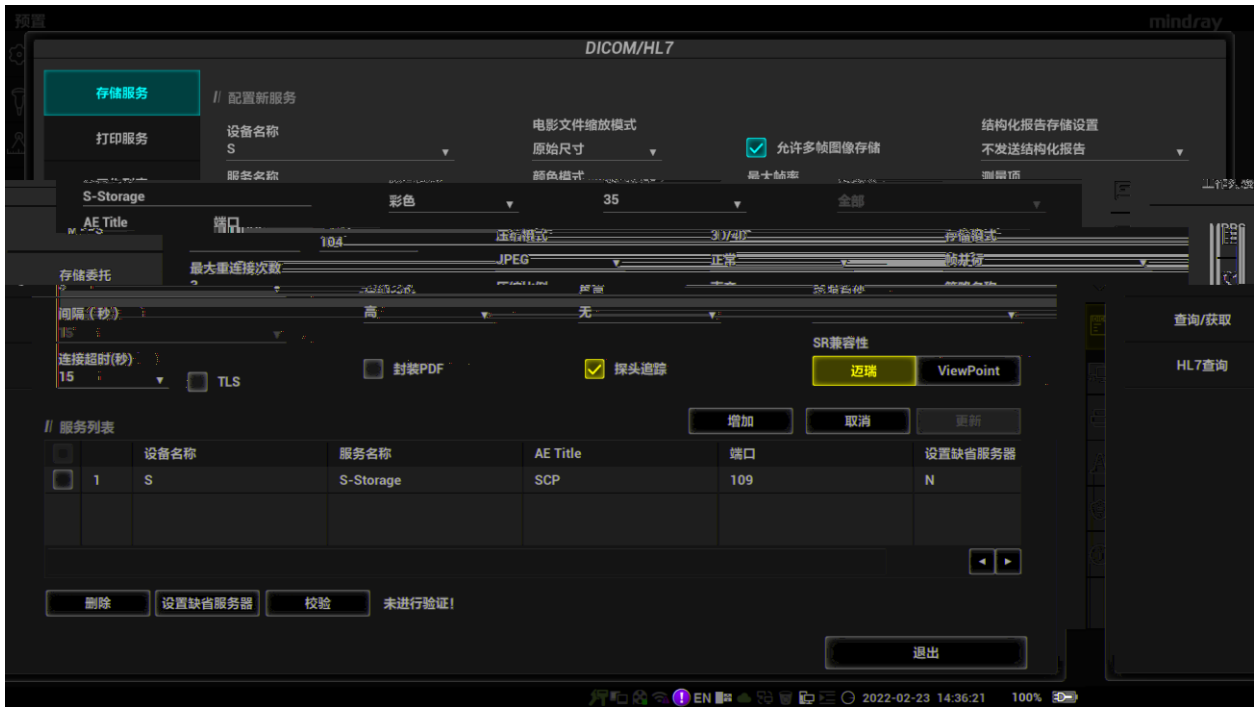


Figure 2 DICOM Storage Preset Screen

The main parameters of DICOM Storage are described as below:

Name	Description
------	-------------

Devices

Compression Mode	Uncompressed(The image is uncompressed) RLE(The image is lossless compressed) JPEG(Please refer to the information of provider to confirm whether SCP can support JPGE compression. If not, please do not select it) are optional, the default is JPEG.
Compression Ratio	LossLess, High, Middle and Low, three kinds of Compression Ratio are optional

1.2.2 DICOM Print Preset

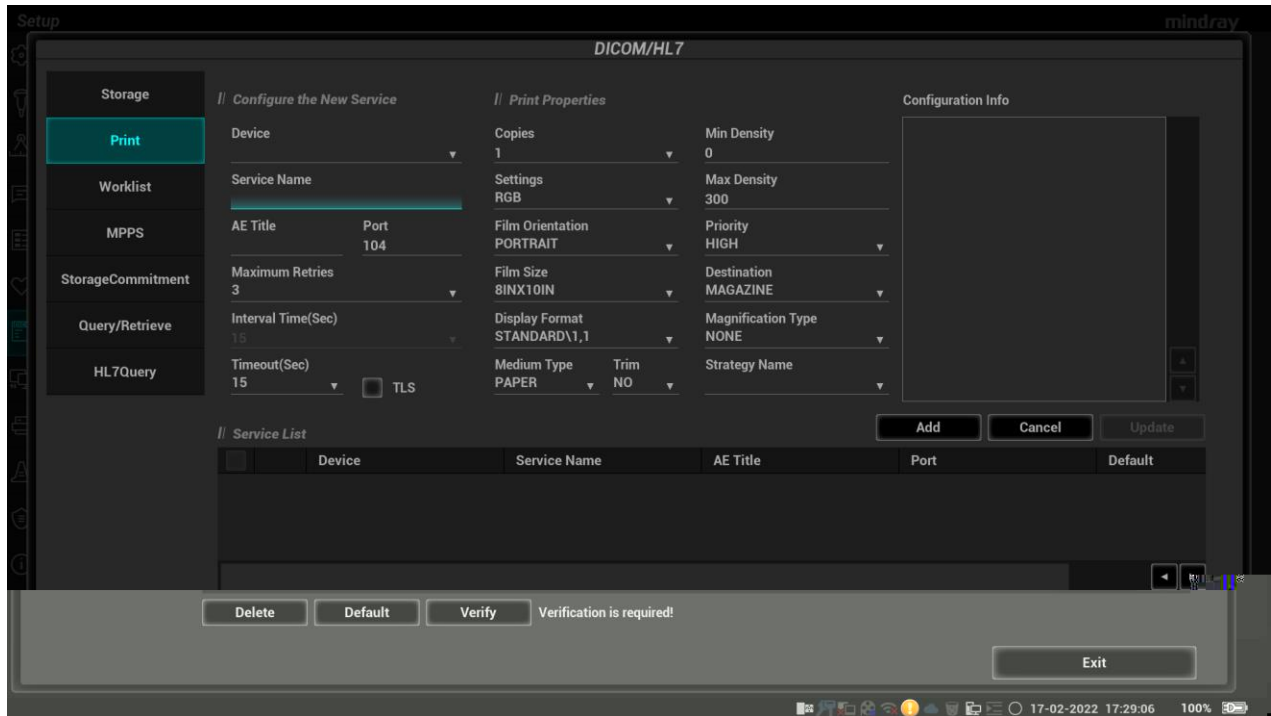


Figure 3 DICOM Print Preset Screen

The main parameters of DICOM Print are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the print server.
Service name	Default is xxx-Print, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the print server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the print server port.
Maximum Retries	0 9 times are optional, the default is 3. If the DICOM storage task that is sent to this server is failed, the task will be retried automatically, the retry times is set here.
Interval Time Sec	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout Sec	Refers to timeout during association establishment. Value: 5-60s, in increments of 5s, and 15 is default.
TLS	Transmission encryption when it is selected.
Copies	Refer to copies of printed files. You can select among 1 through 5, or directly enter the numeral.
Settings	The system supports RGB (color printing) and MONOCHROME2 (black and white printing). Please select the type the printer supports.
Film Orientation	Select between LANDSCAPE and PORTRAIT.
Priority	High Middle Low
Film Size	Select film size among the selections listed in the drop down list.
Display Format	Specify quantity of printed files, e.g. STANDARD\2, 3 indicates 6 images are

	printed for each page.
Media Type	Specify print medium: Paper, Clear Film, Blue Film; select Blue Film or Clear Film for black and white printing; select Paper for color printing.
Trim	Specify whether you want a trim box to be printed around each image on the film: Yes or No.
Min Density	Enter the minimum density of the film. The default is 0.
Max Density	Enter the maximum density of the film. The default is 300.
Priority	High Middle Low
Destination	Specify where the file is exposed: MAGAZINE (stored in the magazine), or, PROCESSOR (exposed in the processor).
Magnification Type	Select how the printer magnifies an image to fit the film. Replicate: interpolated pixels belong to duplicate of adjacent pixels); Bilinear: interpolated pixels are generated from bilinear interpolations between adjacent pixels; Cubic: interpolated pixels are generated from cubic interpolations between adjacent pixels; None: without interpolation.
Strategy Name	Set dicom Strategy for chosen dicom services.
Configuration Info	Enter configuration information in the field.
Add	Add the DICOM service to the service list.
Delete	Click to delete the selected service in the service list.

1.2.3 Worklist Preset

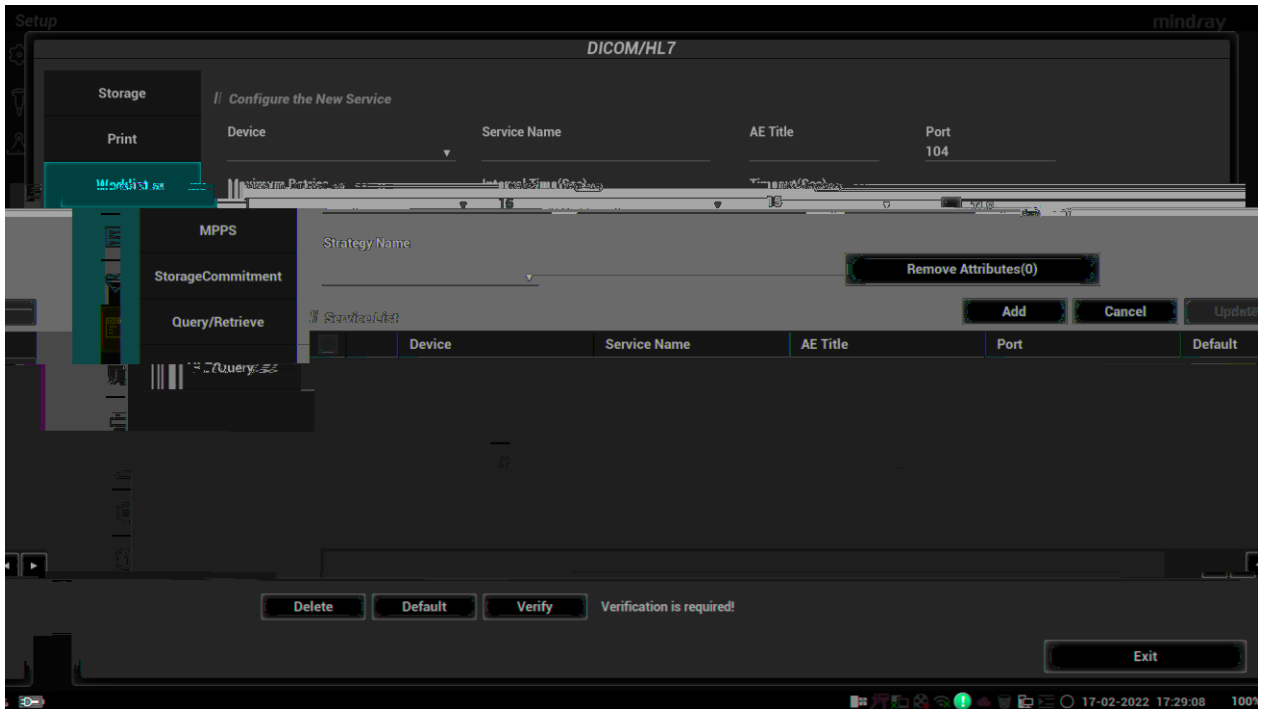


Figure 4 DICOM Worklist Preset Screen

The main parameters of DICOM Worklist are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the Worklist server.
Service name	Default is xxx-Worklist, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the Worklist server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the Worklist server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time Sec	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout Sec	5-60s, in increments of 5s, and 15 is default. Timeout is the overtime of connecting Association.
TLS	Transmission encryption when it is selected.
Strategy Name	Set dicom Strategy for chosen dicom services.
Remove Attributes(0)	Manage the data elements within the worklist message,unchecked elements in the list will not be sent.
Add	Click it to add the Worklist service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.

Verify	Click to verify if the two DICOM application entities are normally connected.
Default	Select an item in the service list, click [Default] and you can see
Exit	Click to exit the setup screen.

1.2.4 MPPS Preset

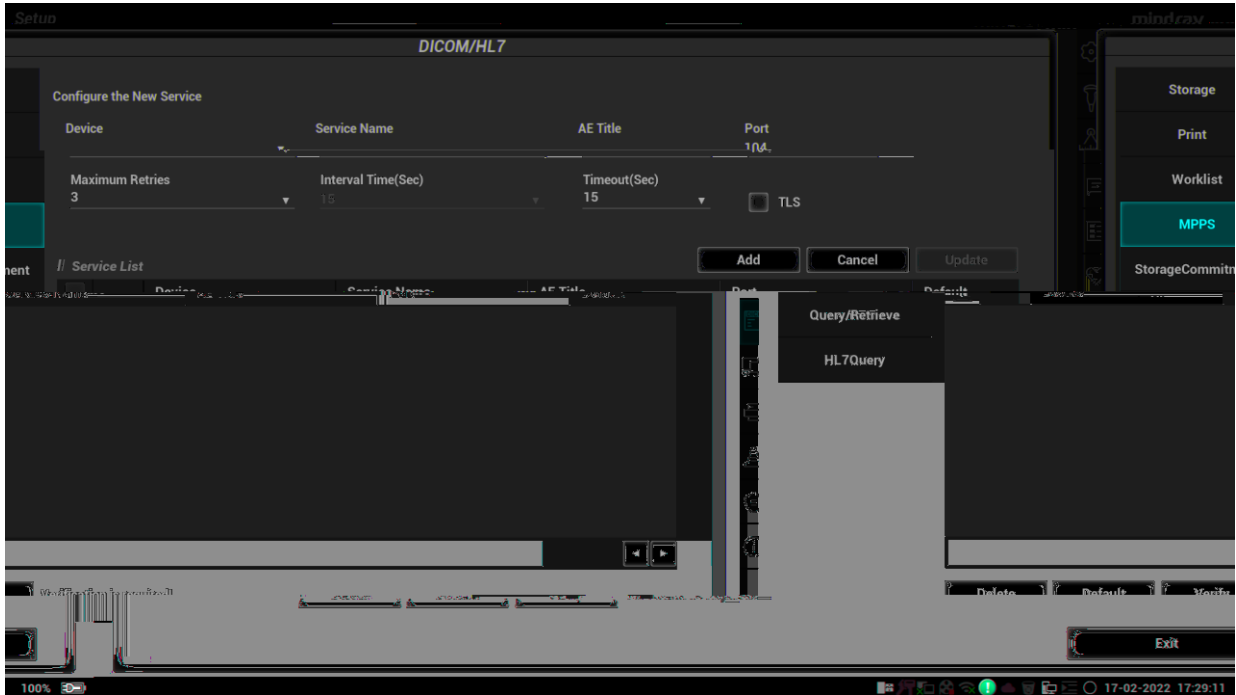


Figure 5 DICOM MPPS Preset Screen

The main parameters of DICOM MPPS are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the MPPS server.
Service name	Default is xxx-Worklist, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the MPPS server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the MPPS server port.
Maximum Retries	0 9 times are optional, the default is 3. if the DICOM storage task that is sent to this server is failed, the task will be retried automatically, the retry times is set here.
Interval Time Sec	5 1800 seconds, 15 seconds is default. (Reserved)
TLS	Transmission encryption when it is selected.
Timeout Sec	5-60s, in increments of 5s, and 15 is default. After user sending MPPS for 15 seconds, the connection will be closed.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.

Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	column.
Exit	Click to exit the preset screen.

Tip: You should set MPPS as default server when you use it.

1.2.5 Storage Commitment Preset

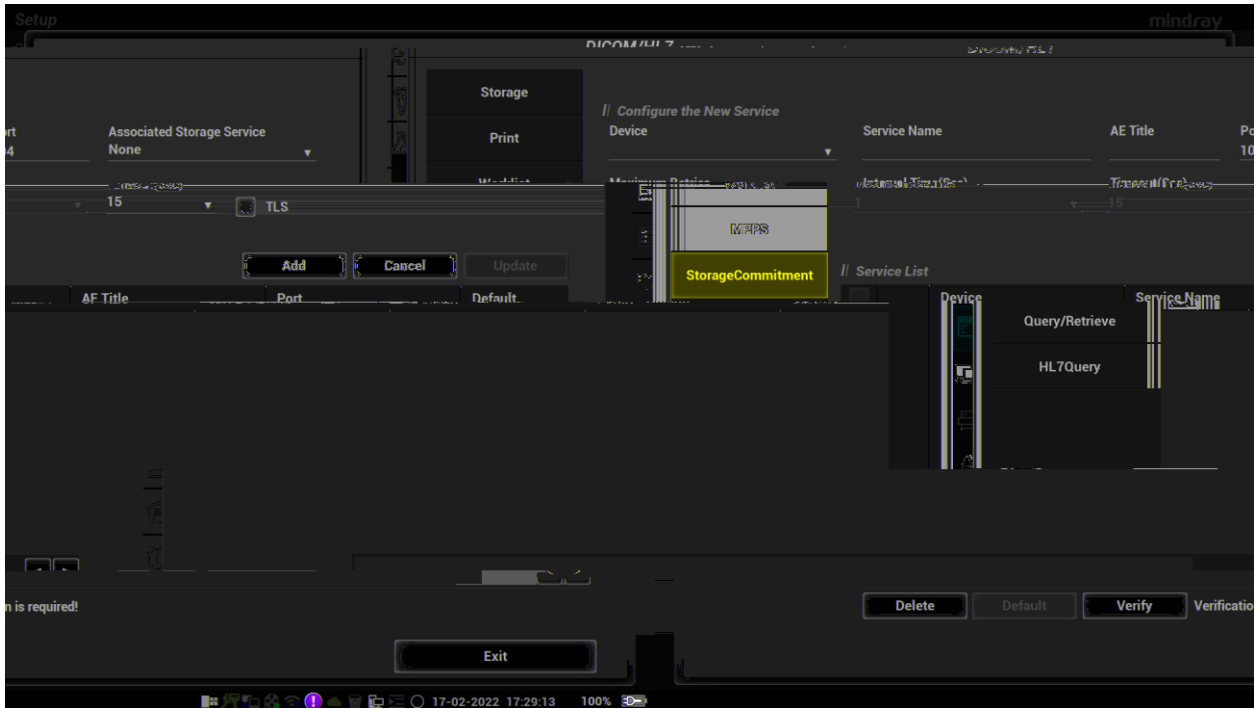


Figure 6 DICOM Commitment Preset Screen

The main parameters of storage commitment are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server Preset screen, the name (s) will appear in the drop-down list, select the name of the server.
Service name	Default is xxx-SC, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the storage commitment server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the storage commitment server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time	5 1800 seconds, 15 seconds is default. (Reserved)
TLS	Transmission encryption when it is selected.
Timeout	Value: 5-60s, in increments of 5s, and 15 is default. After user sending storage commitment for 15 seconds, the connection is closed.
Associated Storage	The associated storage server is preset before storage

Service	commitment, only after the exam is sent out, can storage commitment be created.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	Unavailable
Exit	Click to exit the setup screen.

1. Set storage server relating to storage commitment.
2. Set the port for message return and IP at server end, which are respectively corresponding to the port in DICOM Local and IP in TCP/IP preset.

1.2.6 Query/Retrieve Preset

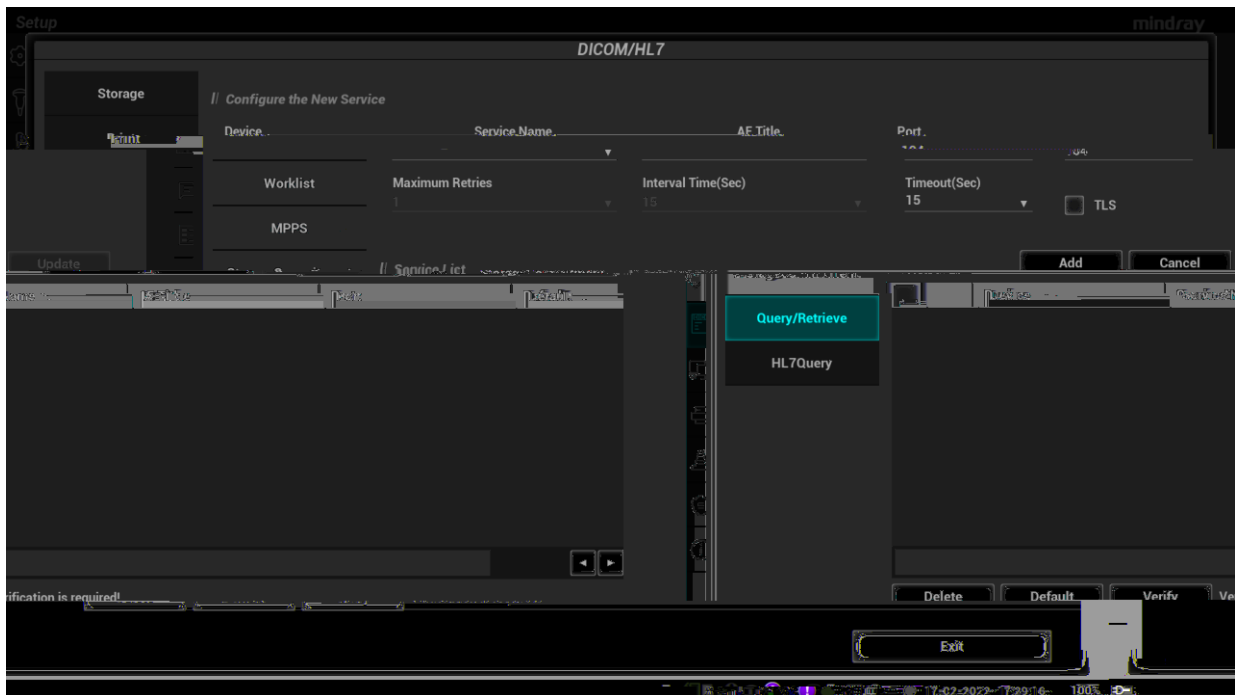


Figure 7 DICOM Query/Retrieve Preset Screen

The main parameters of Query/Retrieve are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server Preset screen, the name (s) will appear in the drop-down list, select the

	with that of the storage commitment server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout	Value: 5-60s, in increments of 5s, and 15 is default. After user sending storage commitment for 15 seconds, the connection is closed.
TLS	Transmission encryption when it is selected.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	column.
Exit	Click to exit the preset screen.

1.2.7 HL7Query Preset

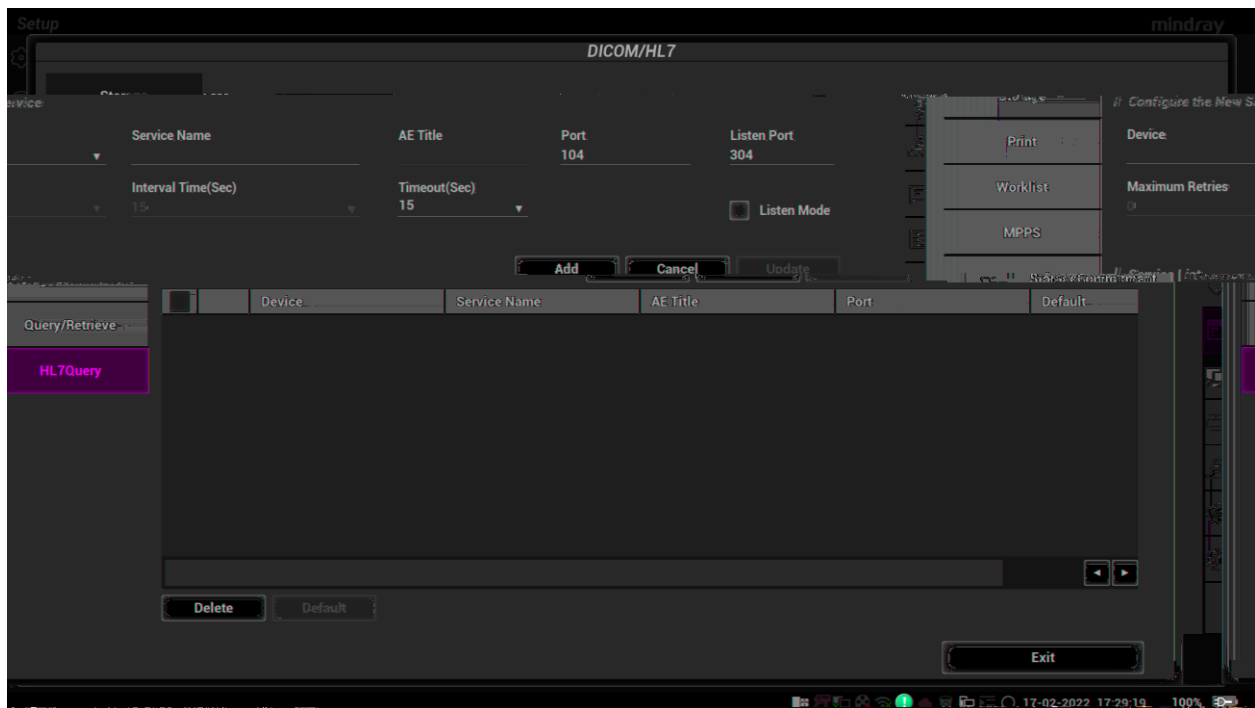


Figure 8 HL7Query Preset Screen

The main parameters of HL7Query are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the HL7 server.
Service name	Default is xxx-HL7Query, user-changeable.
AE Title	Unavailable

Port	HL7 communication port, 104 by default. The port should be consistent with that of the HL7 server port.
Maximum Retries	0 9 times, and the default is 3. (Reserved)
Interval Time Sec	5 1800 seconds, and 15 seconds is default. (Reserved)
Timeout Sec	5-60s, in increments of 5s, and 15 is default. Timeout is the overtime of connecting Association, after the set time, DC-60 will disconnect the TCP connection.
Lisen Port	HL7 Listen Port, the default is 304. This port is used to receive patient query result message.
Listen Mode	Under Listen Mode, Ultrasound Diagnostic System sends patient query message as client and receives query result from peer as server; Under non-Listen Mode, Ultrasound Diagnostic System sends and receives HL7 message in one TCP connection. The default is unselected.
Add	Click it to add the HL7 service to the service list.
Cancel	Click to cancel parameter preset changes.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Default	Unavailable
Exit	Click to exit the setup screen.

2 Services

2.1 Verify Connectivity

If you want to verify connectivity (it is not a must), you can click [Verify] button on Storage, Print or Worklist, MPPS, Storage Commitment and Query/Retrieve pages respectively. If the verification , which means the connection is wrong. Please reconfirm it.

Tip:

Not all the SCPs can support verification; please consult SCP belongings to confirm whether SCP

2.2 DICOM Storage

DICOM Storage is used to send images (and SR) to DICOM storage server for remote storage. The entrances of storage include:

- ◆ Patient information management (iStation)
- ◆ Review status (Review)
- ◆ Thumbnail area

DICOM storage supports:

- ◆ Single file transfer
- ◆ Exam transfer
- ◆ Batch transfer
- ◆ Static image and Cine file

Batch transfer means multiple exam records can be selected and sent for storage with one DICOM task for each exam. Multiple files in one exam will be sent in one DICOM connection.

The auto send function can be triggered by:

- ◆ Ending the exam (send to default storage service)
- ◆ Saving an image by pressing the user-defined save key (image is sent to the default DICOM storage server as well as saved).

2.2.1 Storage Operation

The system supports automatic and manual storage.

The operations for manual storage service are described below:

storage

1. Configure the storage server according to the above descriptions about service preset.
2. Press [iStation] on the touch screen atient information management page.
3. Select one or more exam records (that contain images. If not, the system will prompt) in exam list, or select one or more images in an exam, as shown in Figure 9 iStation Screen.

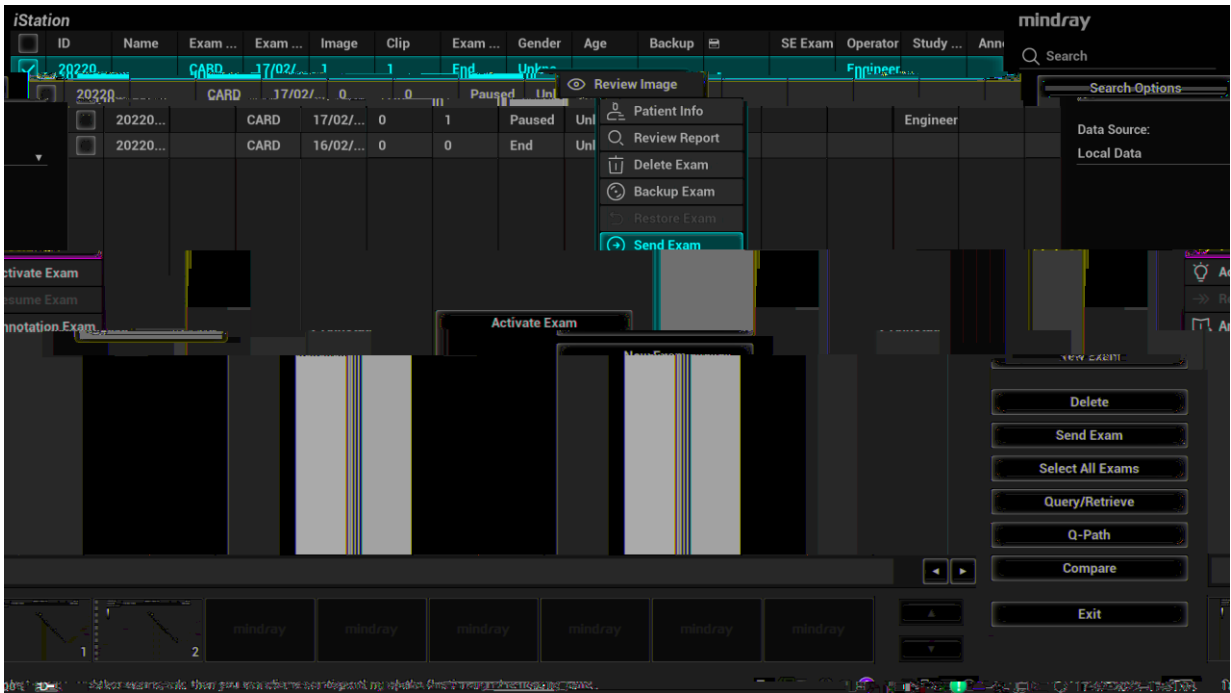


Figure 9 iStation Screen

- Click [Send Exam] to pop up the [Send To] dialog box.
- Select the remote DICOM Server; click [OK] to send, as shown in Figure 10 DICOM Send To Screen.

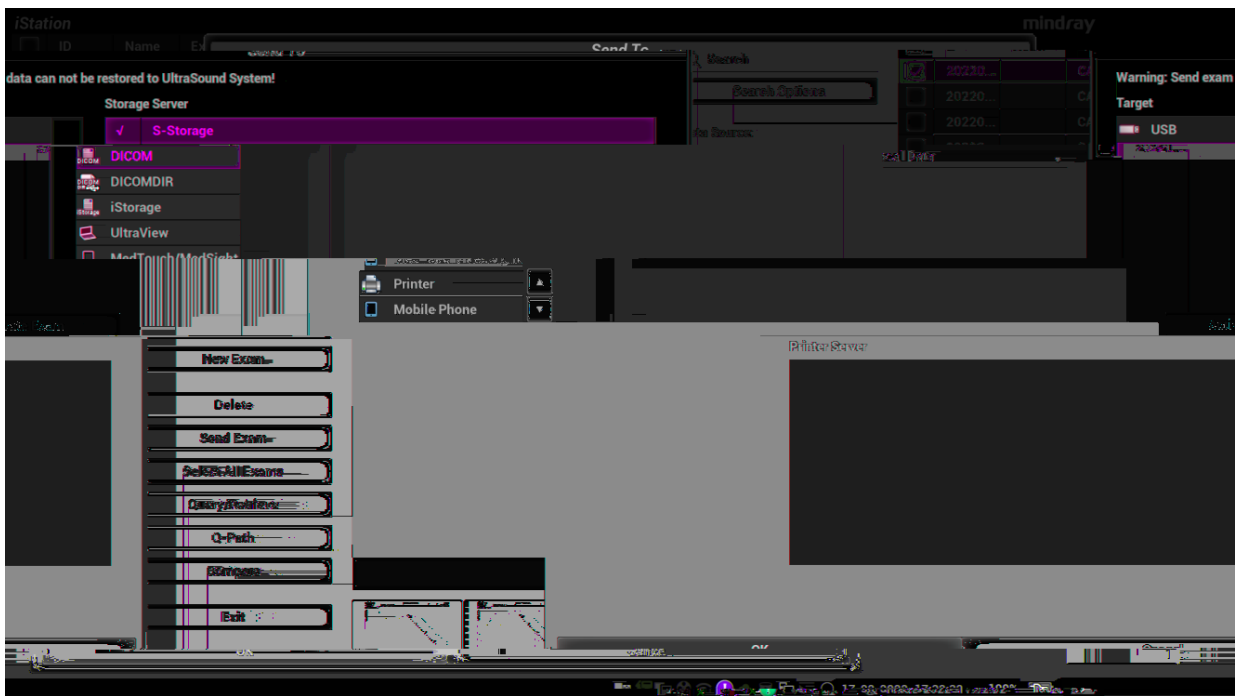


Figure 10 DICOM Send To Screen

- Click in the lower right corner of the screen to open Management, in which, you can review sending status. Select one record, and there is sending result in prompt dialog box, as shown in Figure 11 Task Management.

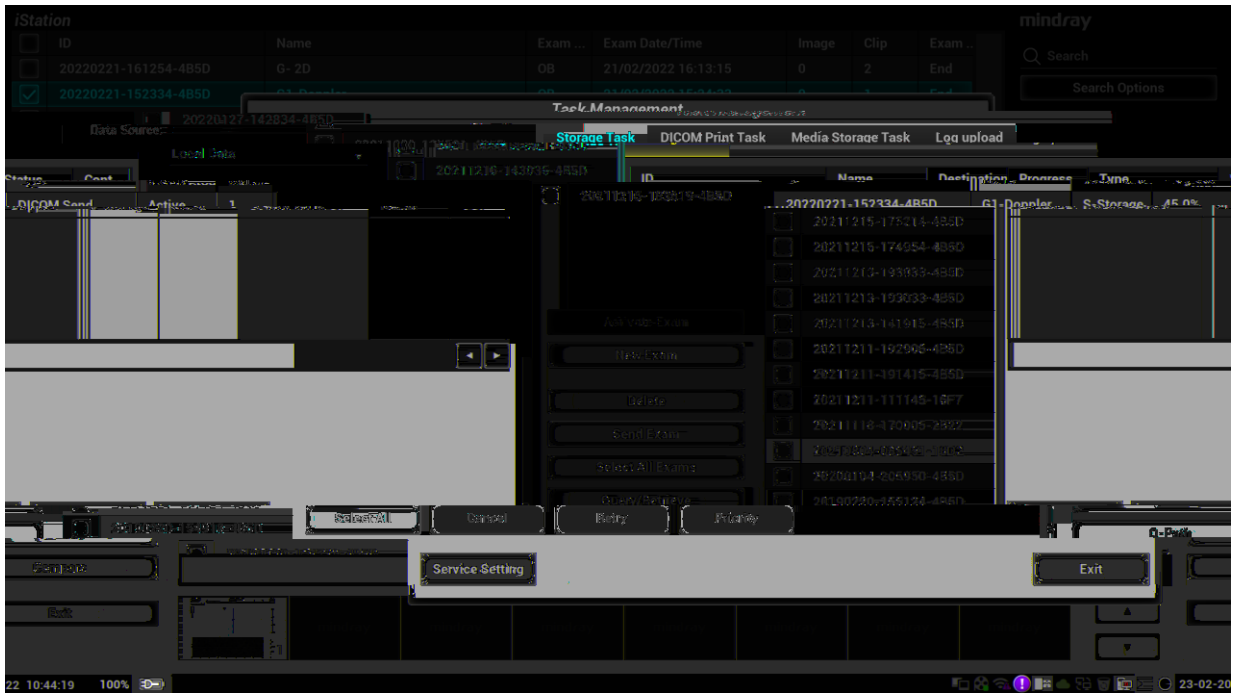


Figure 11 Task Management

Function paths of sending image to DICOM storage and sending images by user-defined key after ending exam automatically:

A. Send Image after end exam:

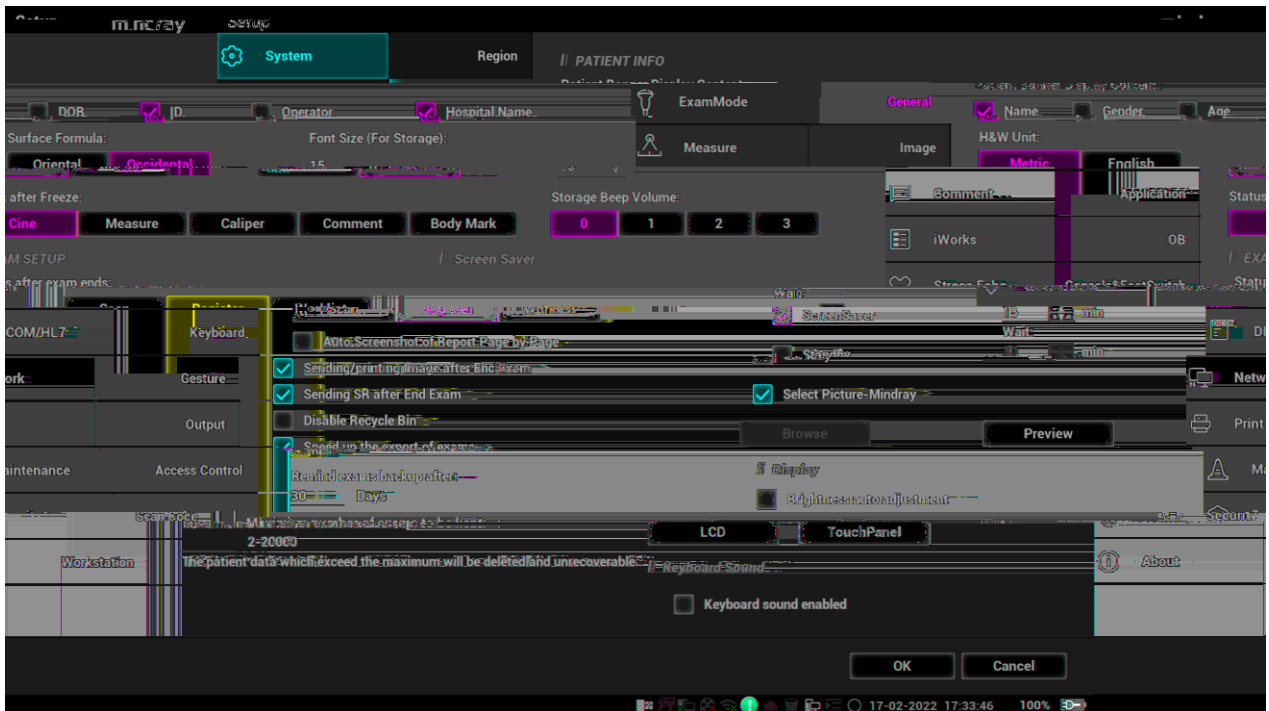


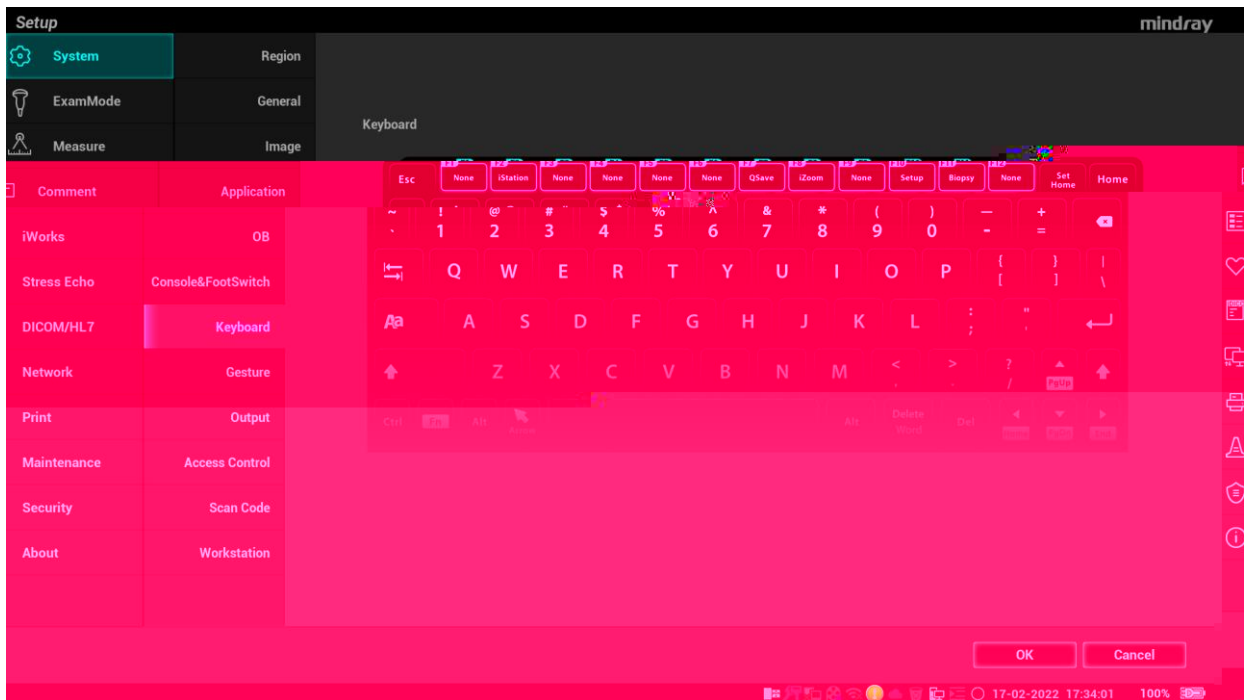
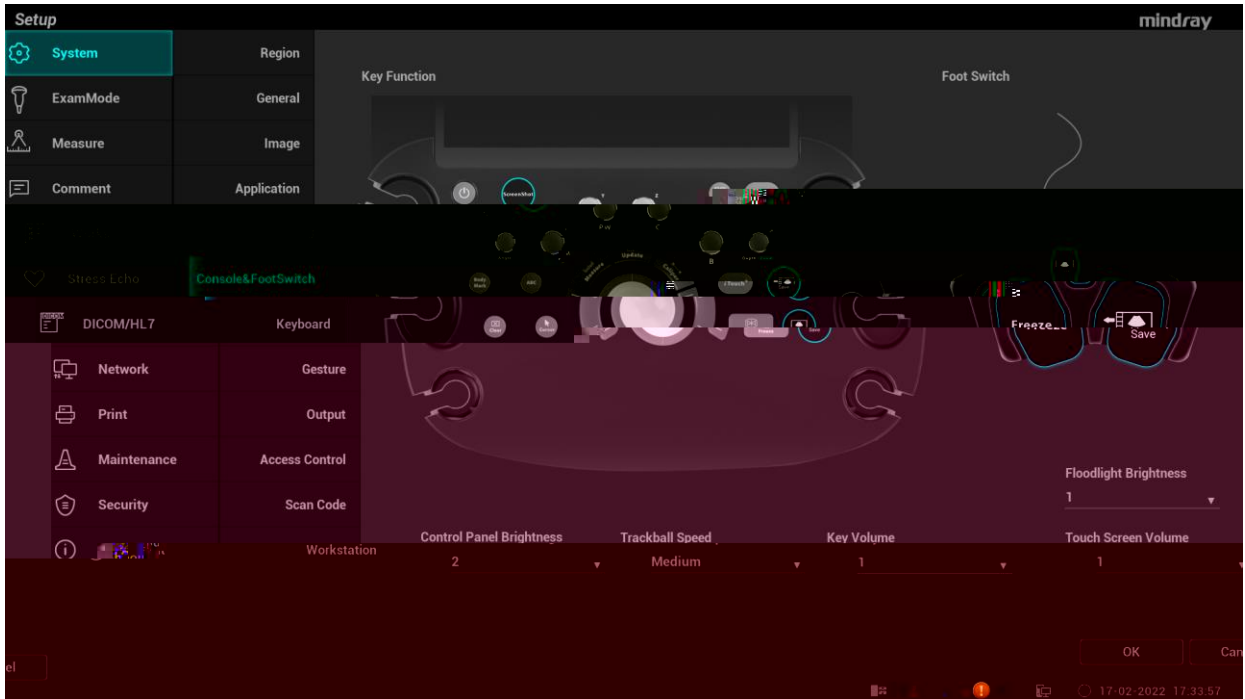
Figure 12 Send Image/SR after End Exam

Steps:

1. In Setup -> System -> General, select, as shown in Figure 12 Send Image/SR after End Exam.
2. In Setup -> DICOM/HL7 ->Set DICOM Service -> Storage, set the default storage server (one or more).
3. When pressing [End Exam] with the current exam being active, all images (and SR) of the current exam are sent to the default DICOM storage server.

B. Send to DICOM Storage by user-defined shortcut key

1. In Setup -> System ->Console&FootSwitch/ Keyboard, the NULL key can be set as Send Image to DICOM storage as shown in Figure 13 Send to DICOM Storage by User-defined Key.



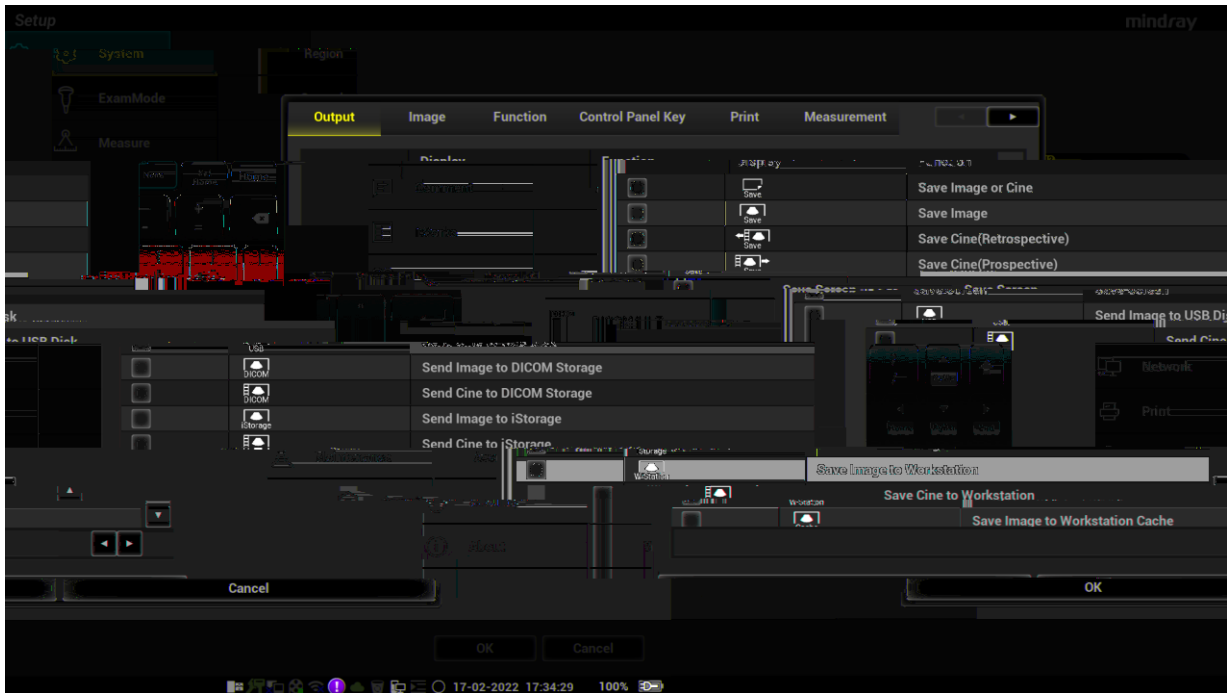


Figure 13 Send to DICOM Storage by User-defined Key

2. In Setup -> DICOM/HL7 ->Set DICOM Service -> Storage, set the default storage server (one or more).
3. In current exam, press <F4> (according to the user preset), the system will send a single-frame image to remote DICOM storage automatically. When pressing <F5>, the system will send a multi-frame image to remote DICOM storage

2.2.2 Structured Report (SR)

The system provides SRs in gynecology, obstetric, cardiac, vascular, and breast exams that specified in the DICOM standard. The SR can not only be sent alone to a DICOM server but also be sent along with an exam record that has image(s) saved. The type of SR to be sent is determined by the

1. Attach SR when Store Images DICOM Service -> Storage-> SR Storage Option(See 1.2.1)
2. Start a new patient:
 - Press [Info], enter the Patient ID, Patient Name etc, select [OB] (or GYN, CAR, VAS, BREAST, ABD,SMP) application region, click [OK]
 - Or, load a patient from the WorkList, click [Start Exam] (commonly used in hospital)
3. Perform obstetric (gynecology, cardiac, vascular, breast,abdmn,smp) measurements:
4. Save image(s)
 - Freeze the image, press <Save> (a user-defined key, maybe preset for other function) on the control panel to save single-frame file.
5. End the exam
6. Enter iStation screen; select the patient, click [Send Exam].A dialog box pops up, as shown in Figure 14 Send To.

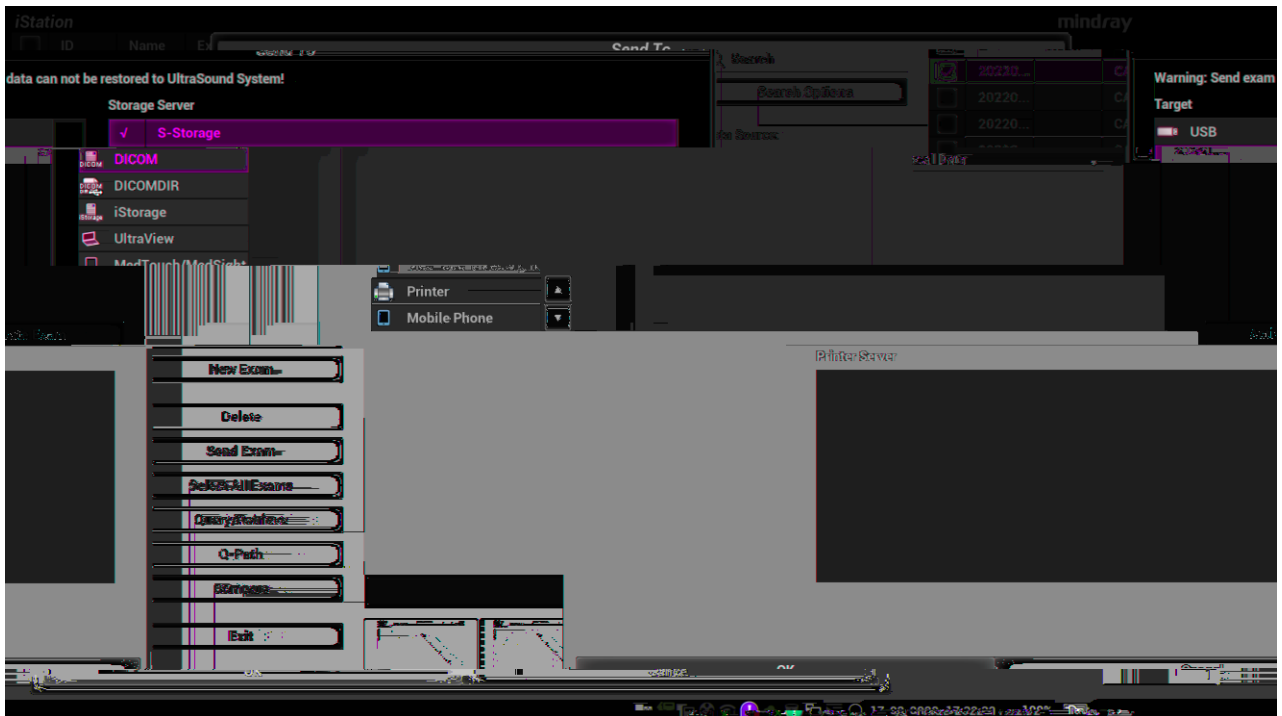


Figure 14 Send To

7. Select DICOM in the [Target] list; select a server in the [Storage Server] list.
8. Click [OK], the status of sending task can be viewed in DICOM task management.

NOTE: For sending SR automatically, the same procedures are followed as in 2.2.1 Storage Operation.

B. Only Storage SR

Only Store SR DICOM Storage Preset -> SR Store Option (See 1.2.1). The procedures are as the same as Attach SR when Store Images .

2.2.3 Encapsulated PDF

Encapsulated PDF is a PDF document that has been encapsulated within a DICOM information object, which is used to encapsulate the report document in this system.

The Encapsulated PDF only could be sent in the circumstance as below:

- Exam is the unit to send.
- The status of the exam is "End", "Paused" or "Cancelled". Encapsulated PDF would not be sent when an active exam is selected.
- The "Encapsulated PDF" should be enabled in DICOM storage service preset.

2. Select one or more exams (with image) in iStation, click [Send].
3. In the dialog box popped up, select the iStorage server.
4. Select

1. Configure the print server according to the upper descriptions of service preset.
2. Press [iStation] on the touch screen to enter the patient information management screen.
3. Select one or more exam records (that contain images) in exam list, or select one or more images in an exam.
4. Click [Send Exam] to pop up the [Send To] dialog box, select the Printer Server, click [OK] to print.

2.3.2 Send to DICOM Print Automatically

Function paths of sending to DICOM print automatically:

- Send to DICOM print when ending the exam
 - Steps:
 1. In Setup -> System -> General, set the default print server.
 2. In Setup -> DICOM/HL7 -> Set DICOM Service -> Print Service, set the default print server.
 3. When pressing [End Exam] with the current exam being active, all images (and SR) of the current exam are sent to the default DICOM print server.
- Send to DICOM print when pressing user-defined key
 1. In Setup -> System -> Console&FootSwitch/ Keyboard, set the default print server.

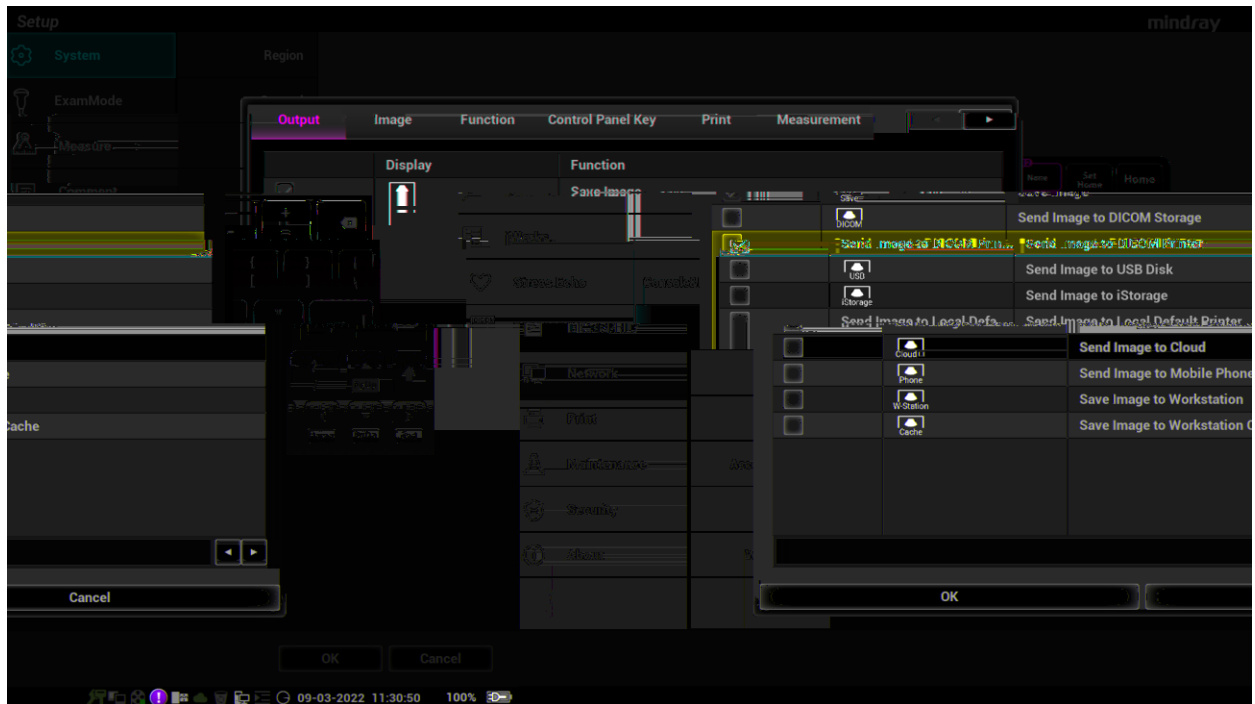
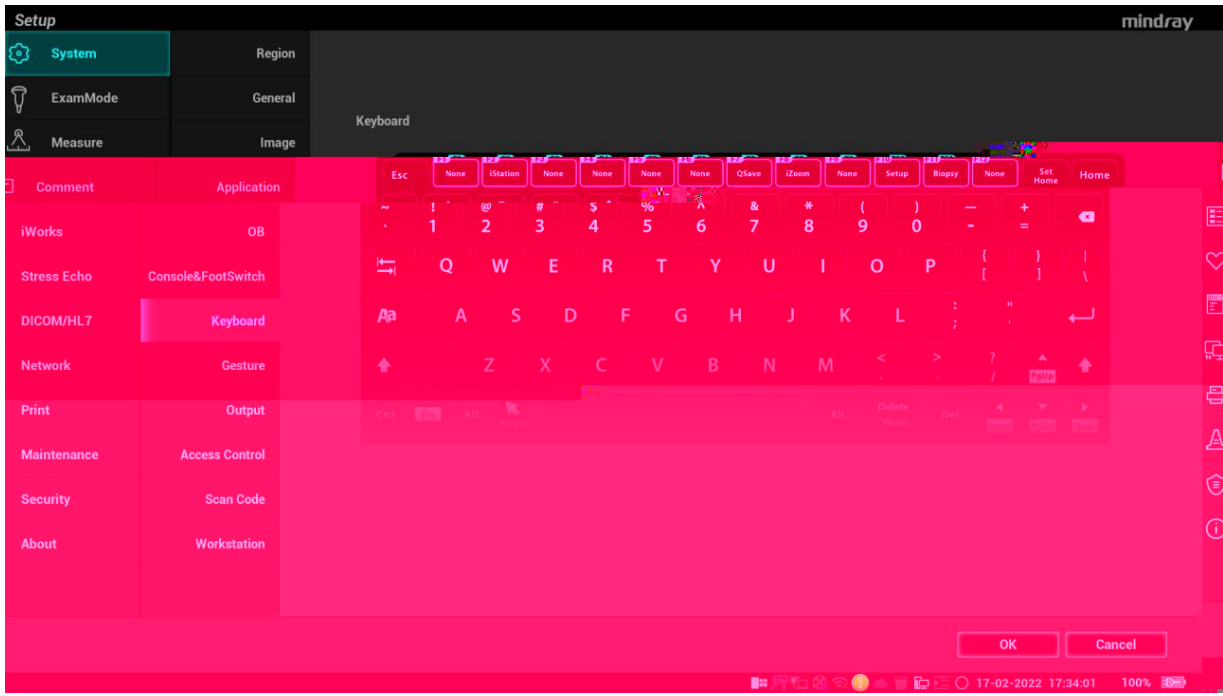


Figure 17 Send to DICOM print when pressing user-defined key

3. In DICOM Preset -> Print Service, set the default print server.
4. In current exam, press <F5> (according to the user preset) in the System -> DICOM [()] TJETQ EMC /Span

2. Click [WorkList] to enter the WorkList screen.
3. Query the patient information by setting conditions such as Patient ID, Name, and Key words, Exam Date, Modality, WorkList Server, and Scheduled Station AE Title. The default Exam Date is [Query].

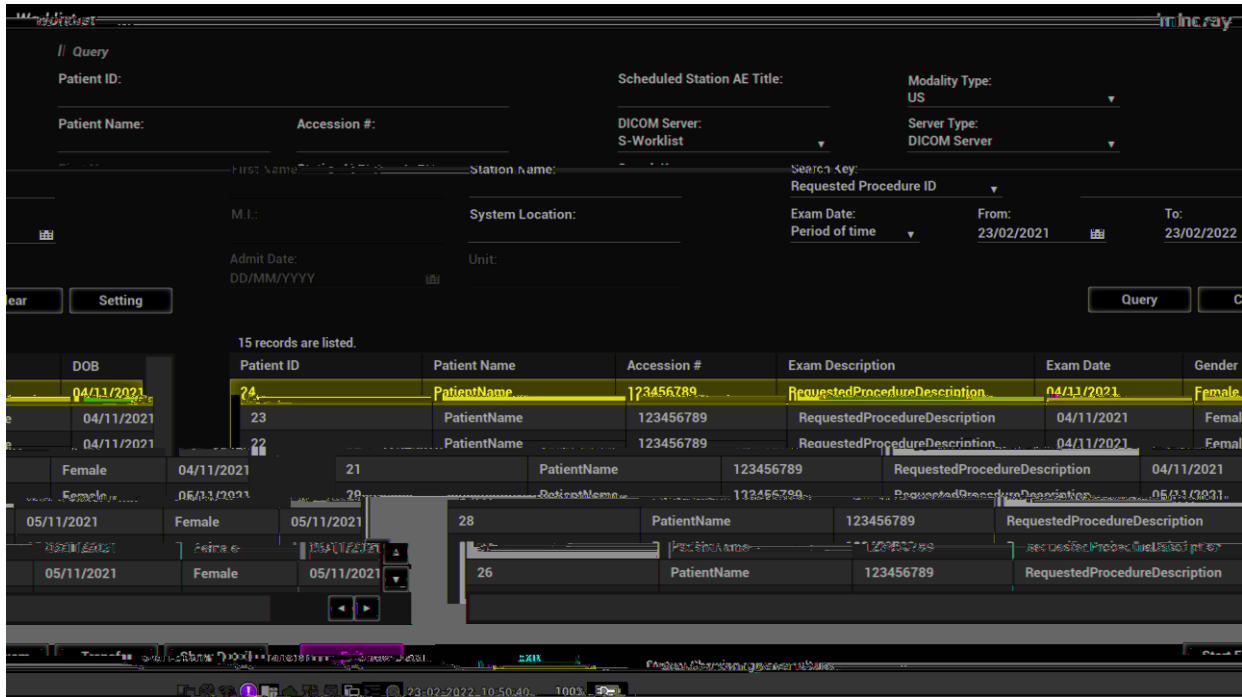


Figure 18 Query in WorkList

4. After the first query is finished, you can perform the second query within the range of the scheduled patients in the first time. The scheduled patients in the list will change in real time.
5. Select a patient record, click [Start Exam], the system import this patient and start the exam; Click [Transfer] will launch the patient record selected into the Patient Info screen to edit and restart the exam; Click [Show Detail] to view the detailed information of the patient.

NOTE:

- The modality type can be entered by the user.
- If you set the Scheduled Station AE Title in Worklist Query Screen, then this item configured should be consistent with the one set in the server.
- Second query and detail information are still available during off-

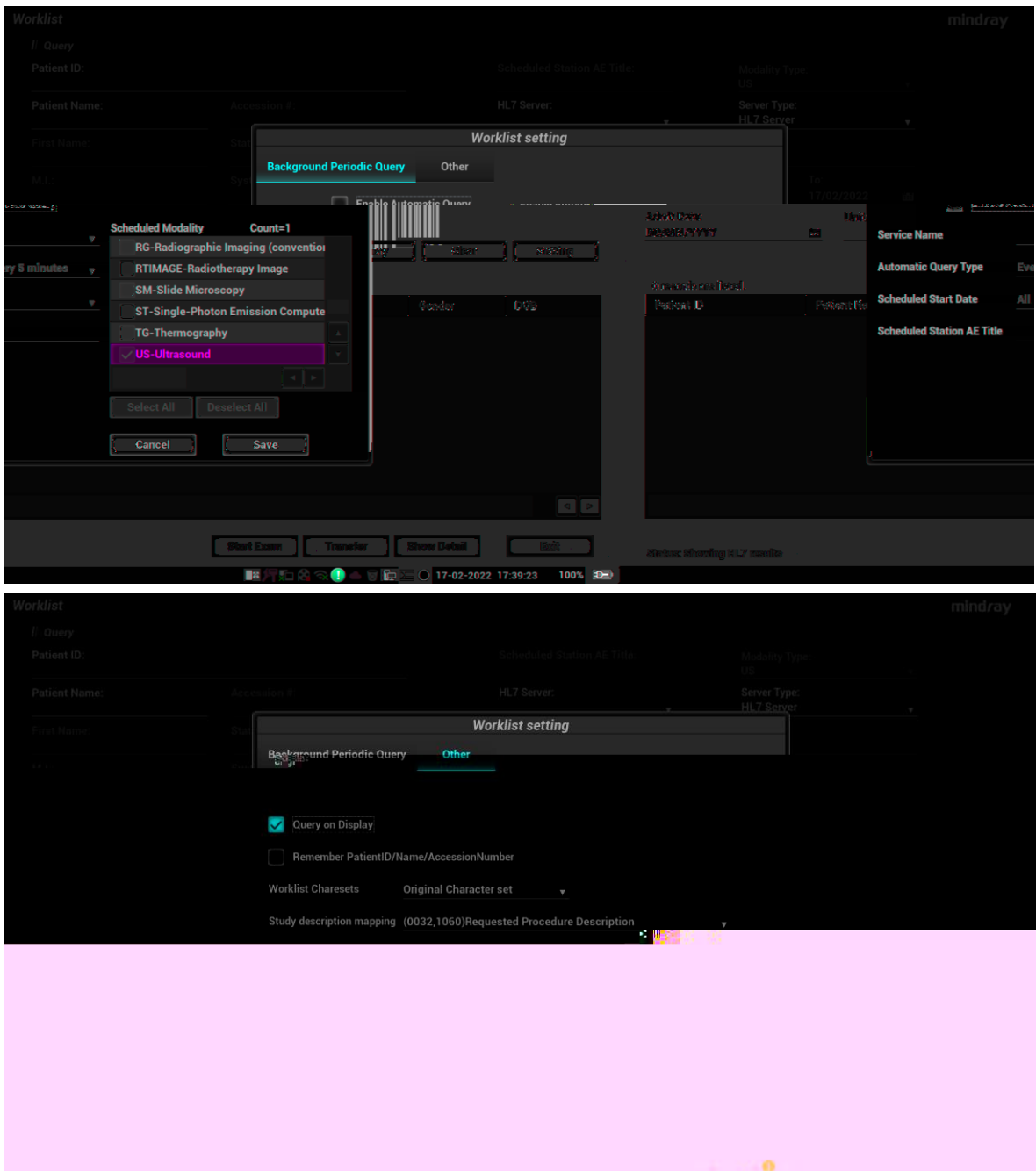


Figure 21 Worklist setting

2.5 HL7Query

The user can set query conditions when finding exam record(s) from the Patient Monitors or other HL7 server, and import the patient information selected in the query result.

Steps:

1. Press [Info] to open the Patient Info screen.
2. Click [WorkList] to enter the WorkList screen.
3. Select the Server Type to be Query the patient information by setting conditions such as Patient ID, Name or combination of them. Patient records will be listed after clicking [Query].

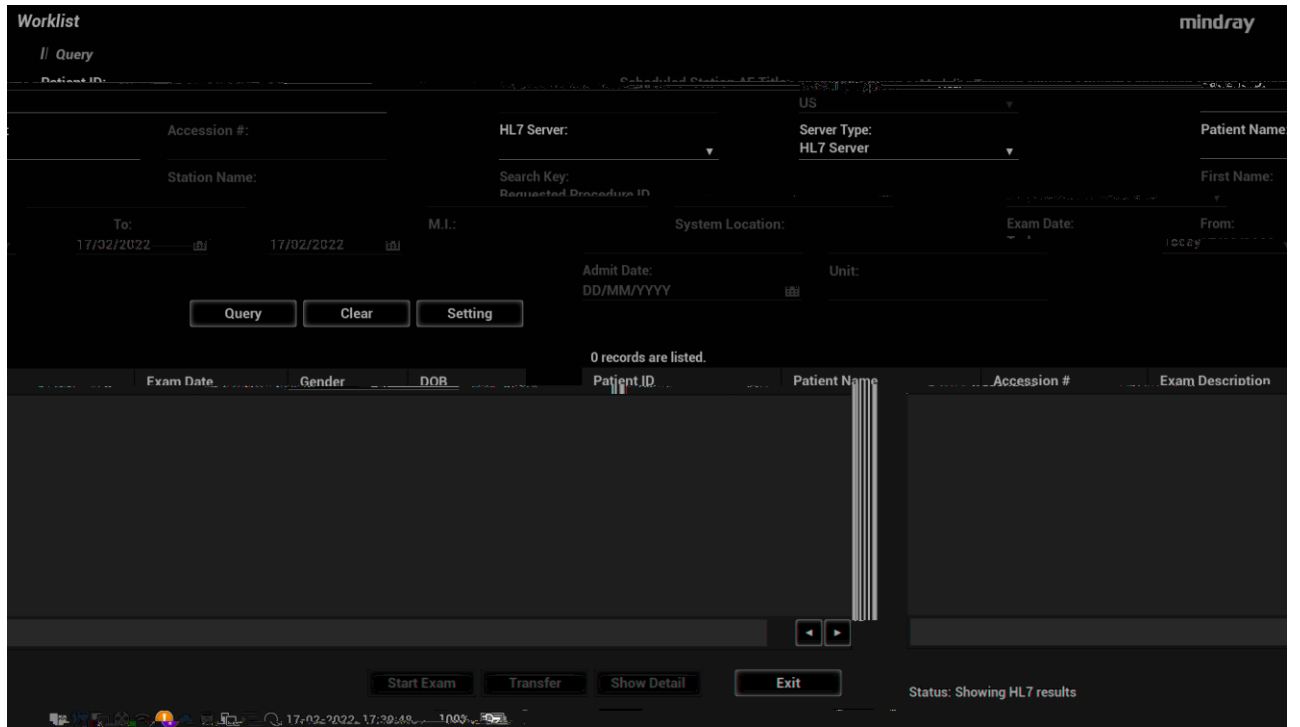



Figure 22 HL7 Query

2.7 Storage Commitment

Storage commitment is to ensure that the image data will be stored into the server correctly.

Prerequisite: a Storage Commitment server is needed, and a relative storage server must be set.

Steps:

1. A default storage commitment server is preset and a relative storage server is set.
2. Send image (and SR) to the storage server, the storage commitments are sent to the commitment server automatically.
3. The state of the committed service will be returned with the  column in iStation screen marked with PACS received, OK if the commitment is succeeded. Otherwise the column will be marked to .

2.8 Query/ Retrieve

The query/ retrieve function is to query and get the patient exam record from a specified server.

Steps:

1. A query/ retrieve server is preset.
2. Path1: press [iStation] -> [Query/ Retrieve].
3. Path2: press [Info] -> [iStation] -> [Query/ Retrieve].
4. Select the Source server, enter Search Key words chose the Level " Study" or" Series" and click [Query]. As shown in Figure 23 Query.

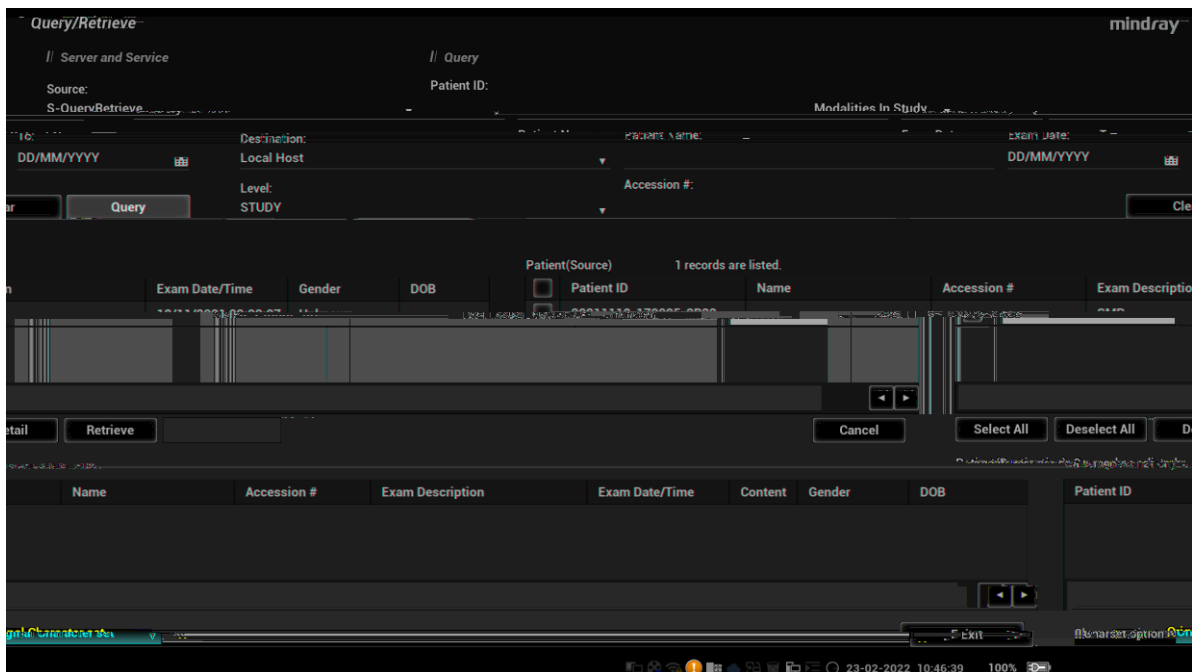


Figure 23 Query

5. Select one or more records and click [Retrieve] to get the records down to local system, as shown in Figure 24 Retrieve.



Consona N6 Series&Consona N7 Series&Consona N8 Series&Consona N9 Series Diagnostic

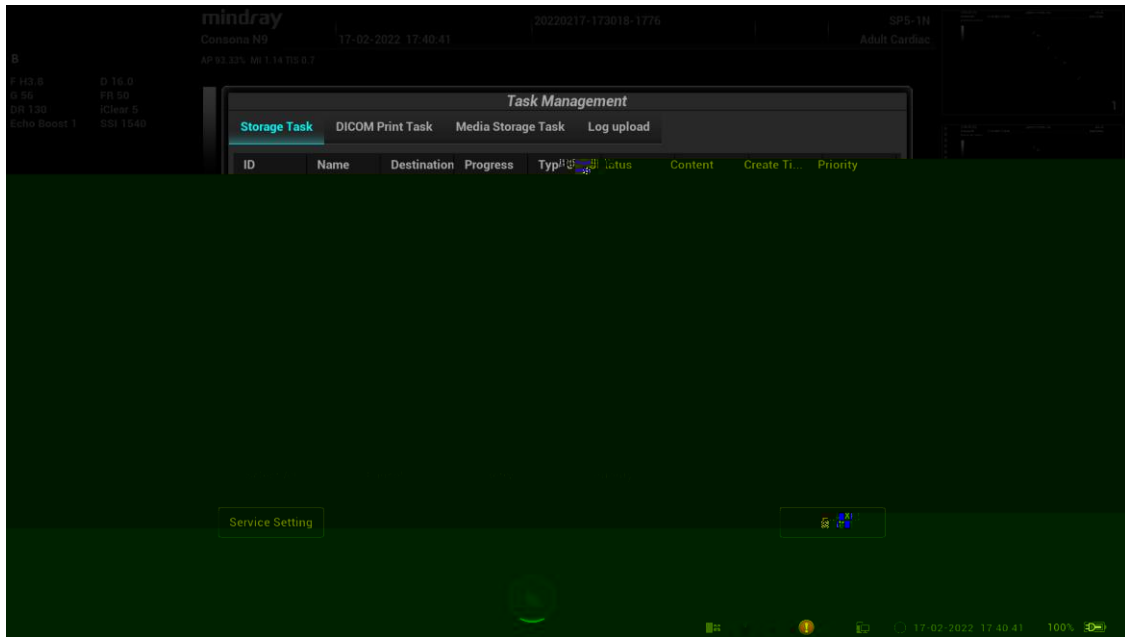


Figure 26 Task Manager

3 Common Failures and Troubleshooting

3.1 Common Failure: Service Verification Failed

Potential Reasons:

- Failed network connect, please check the network cable and connection;
- Verification service is not supported by the server;
- The verification is supported but not activated on the server; check the server setting if the verification service is activated.

Troubleshooting:

- Check the network cable and connection.
- Check the DICOM Conformance Statement if the SCP is supported;
- Enable the SCP service referring to the Server Manual or DICOM Conformance Statement.
- If the verification is still failed after all above steps and the operating system is Windows 7, Inbound Rules of Windows Firewall. Steps:
 - Control Panel->Windows Firewall->Advanced settings-> Inbound Rules;
 - Click New rules , select Port in the pop-up dialog and then click Next ;
 - Select TCP to which the rule applies and Input the server port in Specific local ports edit box, then click Next ;
 - Select Allow the connection and click Next ;
 - Specify the profiles for which the rule applies and click Next
 - Input the Name of the rule and click Finish .

3.2 Common Failure: Server disconnects the ultrasound system during implementing storage

Potential Reasons:

- The JPG compression is enabled on local device but is not supported on the server;
- Wrong AE TITLE settings on local device and the server.

Troubleshooting:

- -> Storage;
- Set the correct local AE TITLE and server AE TITLE on local device according to the DICOM Conformance Statement or settings of the server.

3.3 Common Failure: Multiframe transmission is failed, but single frame is succeeded.

Potential Reasons:

- "Allow Multiframe" is not selected in the dialog box of Storage preset.

Troubleshooting:

- Select " Allow Multiframe " in the dialog box of Storage preset.

3.4 Common Failure: Network disconnected (shown by network icon) during transmission

Potential Reasons:

- The network cable or wireless network is disconnected during transmission;
- The connected switch, router or hub is down or in failure.

Troubleshooting:

- Connect the network;
- Reset the switch, router or hub, or replace a network device with higher performance.

3.5 Common failure: Worklist query succeeded, but no patient is shown

Potential Reasons:

- Scheduled Station AE Title in the preset is not consistent with the setting on server;
- Records on the server database are not accordant with the query conditions on local ultrasound system

Troubleshooting:

- Preset the right Scheduled Station AE Title on Worklist screen according to the server settings.
- The ultrasound system is defaulted only to inquire the patient information that the Modality is US, and the patient needs the server to provide US attribute. Change the query conditions (e.g. date or patient name) to make the server find the record accordingly. Based on DICOM standard, Patient ID cannot support fuzzy inquiry, only can support the whole word match. Please confirm the entered Patient ID is right or not.

3.6 Common failure: Printing succeeded but the film is blank

Potential Reasons:

-
-

Troubleshooting:

inting which is performed by the ultrasound system;

- Check the printer conformance statement if the printer can support color printing; if not, modify the Print Preset Screen -> Print to B/W type (MONOCHROME2);
- color printing

3.7 Common Failure: Verification of connecting DICOM printer is succeed but printing is failed

Potential Reasons:


- Wrong AE_TITLE settings on local device and the server.
- The parameters set in DICOM Service -> Print are not supported.
- IP address of printer server is the same with the system IP.

1. The associated storage commitment server is incorrect;
2. The port and IP address settings on the commitment server are inconsistent with the local preset.

Troubleshooting:

1. Check if the associated storage commitment server is correct;
2. Check if the port and IP address settings on the commitment server are consistent with the local preset.

NOTE:

The storage commitment icon  in [iStation] screen is not refreshed in real time. Exit and enter the [iStation] screen will refresh the commitment icon if a storage commitment is succeeded.

3.11 Common Failure: Query is succeeded, but retrieve is failed, with the prompting that the remote server is wrong

Potential Reasons:

1. The client port, AE Title and IP address settings on the Q/R server are inconsistent with the local preset.
2. The setting of the local storage SCP port is wrong.

Troubleshooting:

1. Check if client port, AE Title and IP address settings on the Q/R server are consistent with the local preset.
2. Some servers only support the specified port as the storage SCP port. Please confirm whether the server has this restriction. If it has, please modify the serial number of local port. See the Figure 25 DICOM Local Preset.

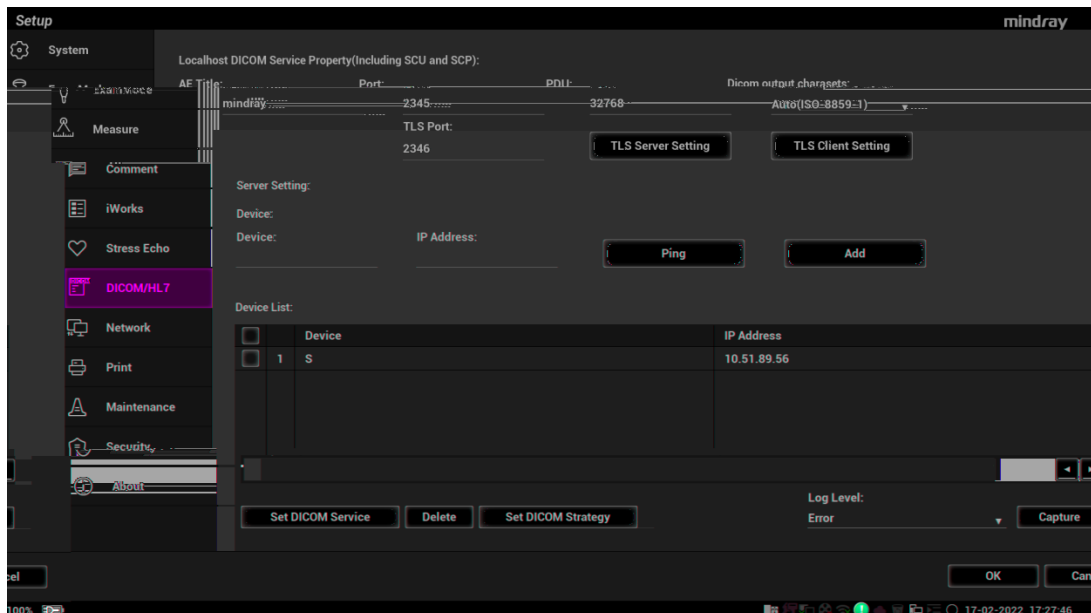


Figure 25 DICOM Local Preset

3.12 Common Failure: Error messages in DICOM Task Management

3.12.1 Association aborts

Potential Reasons: The association is denied by the SCP due to incorrect setting of AE TITLE on the SCU. See Figure 26 Association aborts.

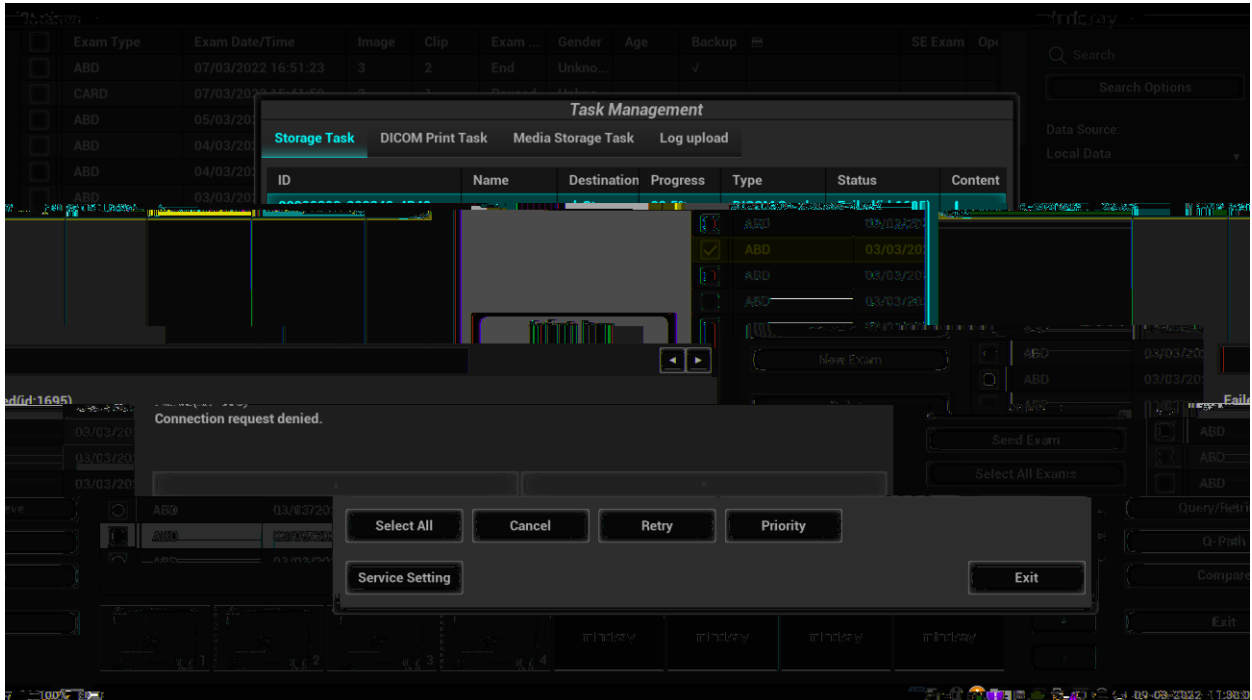
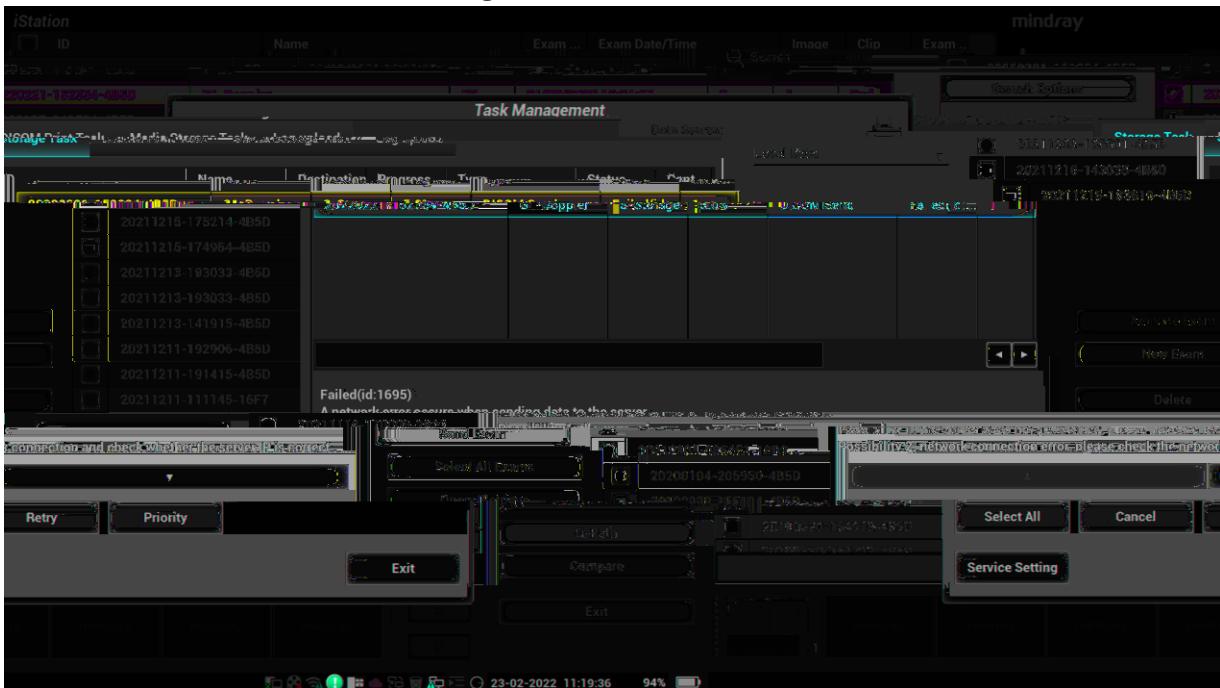


Figure 26 Association aborts



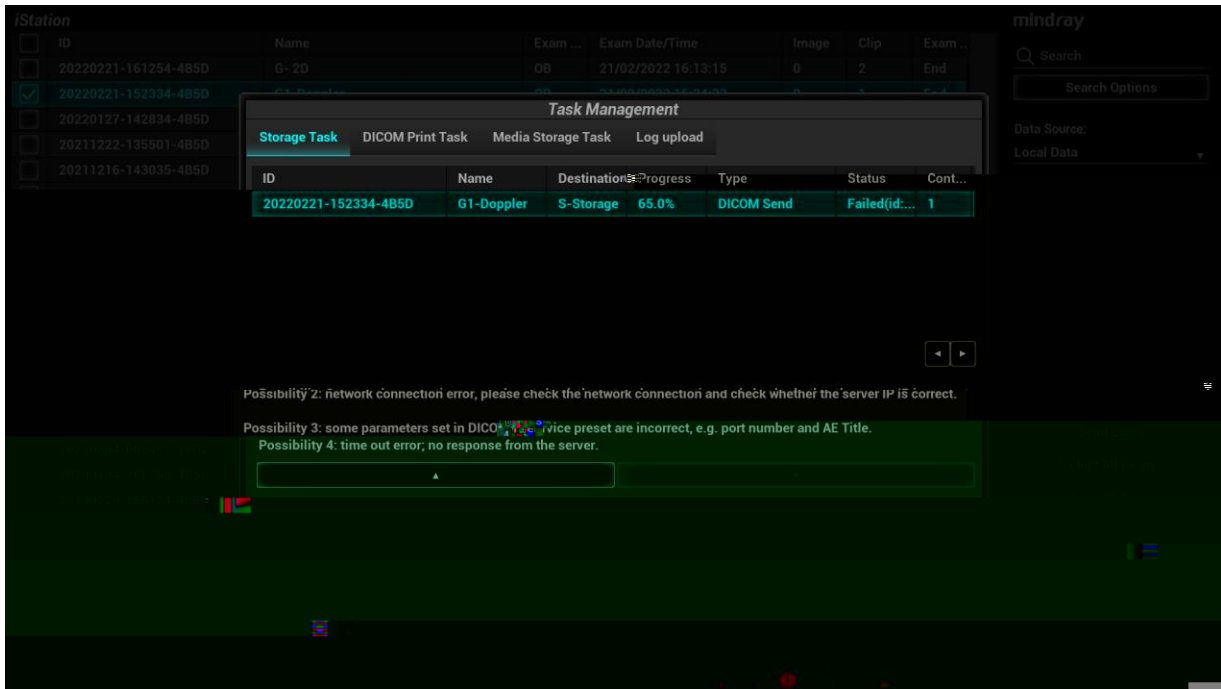


Figure 27 Network error

3.12.2 Network error: Socket sending error

Potential Reasons: Network cable unplugged or network equipment is failed during data transmission. See Figure 27 Network error.

3.13 Print Service Examples

Whether the printing will be succeeded is determined by:

1. Printer settings on local ultrasound system should consist with that specified on printer conformance statement;
2. The operations being performed are supported by the printer.

The following are two examples.

3.13.1 Example 1

The medium type supported by the Horizon CI DICOM printer in color and B/W printing is shown in table below:

Medium Type (standard values)	Grayscale PMM SOP negotiated	Color PMM SOP negotiated
PAPER	DV Paper	CV Paper
Blue Film	DV Blue Film	CV Film (clear)
CLEAR FILM	DV Clear Film	CV Film (clear)

The MAGNIFICATION Types supported by Horizon CI DICOM printer conformance statement are listed in table below:

MAGNIFICATION TYPE	NONE REPLICATE BILINEAR CUBIC BICUBIC
--------------------	---

	<p>MITCHELL LANCZOS SHARP1 SHARP2 SHARP3</p>
--	--

AE TITLE settings that specified in Horizon CI DICOM printer conformance statement are listed in table below:

System Job Settings File	Corresponding Use
Print_SCP	Used for DICOM. Does not contain any print parameter settings. If the media type or size is not included in the DICOM attributes sent to the imager, the imager detects the image type and selects the media type and size as follows: For grayscale images, uses the media set for Grayscale in the Default Media menu at the control panel. For color images, uses the media set for Color in the Default Media menu at the control panel.
Default Grayscale	Imager uses the media set for Grayscale in the Default Media menu at the control panel
Default Color	Imager uses the media set for Color in the Default Media menu at the control panel
8x10-dvf	8x10 DirectVista film (blue)
8x10-dvfb	8x10 DirectVista film (blue)
8x10-dvfc	8x10 DirectVista film (clear)
8x10-dvp	8x10 DirectVista paper
8x10-cvf	8x10 ChromaVista film
8x10-cvt	8x10 ChromaVista film
11x14-dvf	11x14 DirectVista film (blue)
11x14-dvfb	11x14 DirectVista film (blue)
11x14-dvfc	11x14 DirectVista film (clear)
11x14-dvp	11x14 DirectVista paper
11x14-dvp	11x14 DirectVista paper
14x17-dvf	14x17 DirectVista film (blue)
14x17-dvfb	14x17 DirectVista film (blue)
14x17-dvfc	14x17 DirectVista film (clear)
14x17-dvp	14x17 DirectVista paper
a-dvp	A-size DirectVista paper
a-cvf	A-size ChromaVista film
a-cvt	A-size ChromaVista film
a4-dvp	A4-size DirectVista paper
a4-cvp	A4-size ChromaVista paper

a4-cvf	A4-size ChromaVista film
a4-cvt	A4-size ChromaVista film
priority-high	Sets print job priority to high
priority-medium	Sets print job priority to medium
priority-low	Sets print job priority to low
receive-1	Forces sheet output to receive tray 1
receive-2	Forces sheet output to receive tray 2
receive-3	Forces sheet output to receive tray 3
syngofilm	Special OEM-specific job settings

The Horizon CI DICOM printer screen displays:

A4 CV PAPER

8X10 DV Blue

14X17 DV Blue

● **The following are the correct settings of the ultrasound system DICOM print preset:**

■ Color printing:

- (1) Settings: RGB
- (2) Medium Type: Paper
- (3) Film Size: A4
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print_Scp (Recommended)

■ B/W printing

1. Method 1

- (1) Settings: MONOCHROME2
- (2) Medium Type: Blue Film
- (3) Film Size: 8X10
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print_Scp (recommended)

2. Method 2

- (1) Settings: MONOCHROME2
- (2) Medium Type: Blue Film
- (3) Film Size: 14X17
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print_Scp (recommended)

● **The following are the incorrect settings of the ultrasound system DICOM print preset:**

■ Color printing:

Incorrect.

- 1) Settings:
MONOCHROME2

Medium Type: Blue Film	Incorrect. Paper and Clear file are supported by color printer according to the printer conformance statement; but only Paper is available as displayed in the printer screen.
Film Size: A3	Incorrect. Only three film size are available according to printer screen display: A4 14X17 8X10
MAGNIFICATION TYPE	Can be set as: NONE/ CUBIC/ REPLICATE/ BILINEAR
5) AE Title: 14x17-dvfb	Incorrect. Setting AE Title 14x17- 14x17 Direct Vista film (blue) printing.

3.13.2 Example 2

This example is FUJI Film drypix4000 printer connected with the ultrasound system.

■ DICOM print settings on ultrasound system:

- 1) Settings: MONOCHROME2
- 2) Medium Type: Blue Film
- 3) Film Size: 14X17
- 4) FORMAT: STANDARD\3, 5
- 5) Film Orientation: Landscape

Result: failed

■ Modify the DICOM print settings:

- 1) Settings: MONOCHROME2
- 2) Medium Type: Blue Film
- 3) Film Size: 14X17
- 4) FORMAT: STANDARD\3, 5
- 5) Film Orientation: Portrait

Result: succeeded.

■ Reasons:

Settings of Film orientation along with the FORMAT that supported by FUJI Film drypix4000 printer are specified in the conformance statement. The print setting of 14X17 Landscape STANDARD\3,5 is unavailable.

According to the printer conformance statement, Film orientation and FORMAT table supported by FUJI Film drypix4000 are listed in table below

Film Size and Orientation	FORMAT
---------------------------	--------

<p>14" 17" Portrait</p>	<p>STANDARD\1,1 STANDARD\1,2 STANDARD\1,3 STANDARD\2,1 STANDARD\2,2 STANDARD\2,3 STANDARD\2,4 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\3,6 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6 STANDARD\4,7 STANDARD\4,8 STANDARD\5,5 STANDARD\5,6 STANDARD\5,7 STANDARD\5,8 STANDARD\6,6 STANDARD\6,7 STANDARD\6,8 STANDARD\6,9 STANDARD\6,10 STANDARD\7,7 STANDARD\7,8 STANDARD\7,9 STANDARD\7,10 STANDARD\8,8 STANDARD\8,9 STANDARD\8,10</p>
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14" 17" Landscape	STANDARD\1,1 STANDARD\2,1 STANDARD\3,1 STANDARD\1,2 STANDARD\2,2 STANDARD\3,2 STANDARD\4,2 STANDARD\3,3 STANDARD\4,3 STANDARD\5,3 STANDARD\6,3 STANDARD\4,4 STANDARD\5,4 STANDARD\6,4 STANDARD\7,4 STANDARD\8,4 STANDARD\5,5 STANDARD\6,5 STANDARD\7,5 STANDARD\8,5 STANDARD\6,6 STANDARD\7,6 STANDARD\8,6 STANDARD\9,6 STANDARD\10,6 STANDARD\7,7 STANDARD\8,7 STANDARD\9,7 STANDARD\10,7 STANDARD\8,8 STANDARD\9,8 STANDARD\10,8
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