DICOM Correction Item

Correction Number	CP-602

Log Summary: Correct name of Number of Completed Sub-operations attribute	
Type of Modification	Name of Standard
Addition	PS 3.4 2006

Rationale for Correction

The name of the Number of Completed Sub-operations attribute used in C-MOVE and C-GET is inconsistent between PS 3.4 and 3.7. Correct it in PS 3.4.

Also, the naming of the statuses is inconsistent within PS 3.4 with respect to Failure and Success. Correct it.

Sections of documents affected

PS 3.4 C.4.2 and C.4.3

Correction Wording:

Amend PS 3.4 Section C.4.2 and C.4.3:

C.4.2   C-MOVE Operation

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C.4.2.1.4.2   Response Identifier Structure

The Failed SOP Instance UID List (0008,0058) specifies a list of UIDs of the C-STORE sub-operation SOP Instances for which this C-MOVE operation has failed. An Identifier in a C-MOVE response shall conditionally contain the Failed SOP Instance UID List (0008,0058) based on the C-MOVE response status value. If no C-STORE sub-operation failed, Failed SOP Instance UID List (0008,0058) is absent and therefore no Data Set shall be sent in the C-MOVE response.

Specific Character Set (0008,0005) shall not be present.

The Identifier in a C-MOVE response with a status of:

— Canceled, Fail~~edure~~, Refused, or Warning shall contain the Failed SOP Instance UID List Attribute

— Pending shall not contain the Failed SOP Instance UID List Attribute (no Data Set)

C.4.2.1.5   Status

Table C.4-2 defines the specific status code values which might be returned in a C-MOVE response. General status code values and fields related to status code values are defined in PS 3.7.

Table C.4-2
C-MOVE RESPONSE STATUS VALUES

Service Status	Further Meaning	Status Codes	Related Fields
Failure	Refused: Out of Resources – Unable to calculate number of matches	A701	(0000,0902)
	Refused: Out of Resources – Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
	Refused: Move Destination unknown	A801	(0000,0902)
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to Process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete – One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)
Success	Sub-operations Complete – No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

C.4.2.1.6   Number of Remaining Sub-Operations

Inclusion of the Number of Remaining Sub-operations is conditional based upon the status in the C-MOVE response. The Number of Remaining Sub-operations specifies the number of Remaining C-STORE sub-operations necessary to complete the C-MOVE operation.

A C-MOVE response with a status of:

— Pending shall contain the Number of Remaining Sub-operations Attribute
— Canceled may contain the Number of Remaining Sub-operations Attribute
— Warning, Fail~~edure~~, Refused, or Success~~ful~~ shall not contain the Number of Remaining Sub-operations Attribute

C.4.2.1.7   Number of ~~Successful~~Completed Sub-Operations

Inclusion of the Number of ~~Successful~~**Completed** Sub-operations is conditional based upon the status in the C-MOVE response. The Number of ~~Successful~~**Completed** Sub-operations specifies the number of C-STORE sub-operations generated by the requested transfer which have completed successfully.

A C-MOVE response with a status of:

— Pending shall contain the Number of ~~Successful~~**Completed** Sub-operations
Attribute

— Canceled, Warning, Fail**ed**~~ure~~, Refused, or Success~~ful~~ may contain the
Number of ~~Successful~~**Completed** Sub-operations Attribute

C.4.2.1.8   Number of Failed Sub-Operations

Inclusion of the Number of Failed Sub-operations is conditional based upon the status in the C-
MOVE response. The Number of Failed sub-operations specifies the number of C-STORE sub-
operations generated by the requested transfer which have Failed.

A C-MOVE response with a status of:

— Pending shall contain the Number of Failed Sub-operations Attribute

— Canceled, Warning, Fail**ed**~~ure~~, Refused, or Success~~ful~~ may contain the
Number of Failed Sub-operations Attribute

C.4.2.1.9   Number of Warning Sub-Operations

Inclusion of the Number of Warning Sub-operations is conditional based upon the status in the C-
MOVE response. The Number of Warning sub-operations specifies the number of C-STORE
sub-operations generated by the requested transfer which had a status of warning.

A C-MOVE response with a status of:

— Pending shall contain the Number of Warnings Sub-operations Attribute

— Canceled, Warning, Fail**ed**~~ure~~, Refused, or Success~~ful~~ may contain the
Number of Warning Sub-operations Attribute

C.4.2.2   C-MOVE SCU Behavior

This Section discusses both the baseline and extended behavior of the C-MOVE SCU.

C.4.2.2.1   Baseline Behavior of SCU

An SCU conveys the following semantics with a C-MOVE request:

— The SCU shall supply a single value in the Unique Key Attribute for each
level above the Query/Retrieve level. For the level of retrieve, the SCU shall
supply one unique key if the level of retrieve is above the STUDY level and
shall supply one UID, or a list of UIDs if a retrieval of several items is desired
and the retrieve level is STUDY, SERIES or IMAGE. The SCU shall also
supply a move destination. The move destination shall be the DICOM
Application Entity Title of a DICOM Application Entity capable of serving as
the SCP of the Storage Service Class.

— The SCU shall interpret responses to the C-MOVE with status equal to
Pending during the processing of the C-STORE sub-operations. These
responses shall indicate the number of Remaining, ~~Successful~~**Completed**,
Failed, and Warning C-STORE sub-operations.

— The SCU shall interpret responses with a status equal to Success, Warning,
Fail**ed**~~ure~~, or Refused as final responses. The final response shall indicate
the number of Successful C-STORE sub-operations and the number of

Failed C-STORE sub-operations resulting from the C-MOVE operation. The SCU shall interpret a status of:

- o Success to indicate that all sub-operations were successful**ly completed**
- o Warning to indicate one or more sub-operations were successful**ly completed** and one or more sub-operations were unsuccessful or had a status of warning, or all sub-operations had a status of warning
- o Fail**ed**~~ure~~ or Refused to indicate all sub-operations were unsuccessful.

— The SCU may cancel the C-MOVE service by issuing a C-MOVE-CANCEL request at any time during the processing of the C-MOVE. The SCU shall interpret a C-MOVE response with a status of Canceled to indicate the transfer was canceled. The C-MOVE response with a status of Canceled shall contain the number of ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations. If present, the Remaining sub-operations count shall contain the number of C-STORE sub-operations which were not initiated due to the C-MOVE-CANCEL request.

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C.4.2.3   C-MOVE SCP Behavior

This section discusses both the baseline and extended behavior of the C-MOVE SCP.

C.4.2.3.1   Baseline Behavior of SCP

An SCP conveys the following semantics with a C-MOVE response:

— The SCP shall identify a set of Entities at the level of the transfer based upon the values in the Unique Keys in the Identifier of the C-MOVE request. The SCP shall initiate C-STORE sub-operations for the corresponding storage SOP Instances. These C-STORE sub-operations shall occur on a different Association from the C-MOVE operation. The SCP of the Query/Retrieve Service Class shall serve as an SCU of the Storage Service Class.

— The SCP shall establish a new Association for the C-STORE sub-operations. A sub-operation is considered Failed if the SCP is unable to negotiate an appropriate presentation context for a given stored SOP Instance.

— The SCP shall initiate C-STORE sub-operations over the new Association for all stored SOP Instances related to the Patient ID, List of Study Instance UIDs, List of Series Instance UIDs, or List of SOP Instance UIDs depending on the Query/Retrieve level specified in the C-MOVE request.

— Optionally, the SCP may generate responses to the C-MOVE with status equal to Pending during the processing of the C-STORE sub-operations. These responses shall indicate the Remaining, ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations.

— When the number of Remaining sub-operations reaches zero, the SCP shall generate a final response with a status equal to Success, Warning, Fail**ed**~~ure~~, or Refused. This response shall indicate the number of ~~Successful~~**Completed** sub-operations, the number of Failed sub-operations, and the number of sub-operations with Warning Status. The status contained in the C-MOVE response shall contain:

- o Success~~ful~~ if all sub-operations were successful**ly completed**

- o Warning if one or more sub-operations were successful**ly completed** and one or more sub-operations were unsuccessful or had a warning status
- o Warning if all sub-operations had a warning status
- o Fail~~ed~~**ure** or Refused if all sub-operations were unsuccessful

— The SCP may receive a C-MOVE-CANCEL request at any time during the processing of the C-MOVE. The SCP shall interrupt all C-STORE sub-operation processing and return a status of Canceled in the C-MOVE response. The C-MOVE response with a status of Canceled shall contain the number of ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations. If present, the Remaining sub-operations count shall contain the number of C-STORE sub-operations which were not initiated due to the C-MOVE-CANCEL request.

— If the SCP manages images in multiple alternate encodings (see C.6.1.1.5.1), only one of the alternate encodings of an image shall be included in the set of object instances retrieved by a C-MOVE request at the Patient, Study, or Series level.

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C.4.3   C-GET Operation

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C.4.3.1.3.2   Response Identifier Structure

The Failed SOP Instance UID List (0008,0058) specifies a list of UIDs of the C-STORE sub-operation SOP Instances for which this C-GET operation has failed. An Identifier in a C-GET response shall conditionally contain the Failed SOP Instance UID List (0008,0058) based on the C-GET response. If no C-STORE sub-operation failed, Failed SOP Instance UID List (0008,0058) is absent and therefore no Data Set shall be sent in the C-GET response.

Specific Character Set (0008,0005) shall not be present.

The Identifier in a C-GET response with a status of:

— Canceled, Fail~~ed~~**ure**, Refused, or Warning shall contain the Failed SOP Instance UID List Attribute

— Pending shall not contain the Failed SOP Instance UID List Attribute (no Data Set)

C.4.3.1.4   Status

Table C.4-3 defines the specific status code values which might be returned in a C-GET response. General status code values and fields related to status code values are defined in PS 3.7.

Table C.4-3
C-GET RESPONSE STATUS VALUES

Service Status	Further Meaning	Status Codes	Related Fields
Failure	Refused: Out of Resources – Unable to calculate number of matches	A701	(0000,0902)
	Refused: Out of Resources – Unable to perform	A702	(0000,1020)

	sub-operations		(0000,1021) (0000,1022) (0000,1023)
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete – One or more Failures or Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete – No Failures or Warnings	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

C.4.3.1.5   Number of Remaining Sub-Operations

Inclusion of the Number of Remaining Sub-operations is conditional based upon the status in the C-GET response. The Number of Remaining Sub-operations specifies the number of Remaining C-STORE sub-operations necessary to complete the C-GET operation.

A C-GET response with a status of:

— Pending shall contain the Number of Remaining Sub-operations Attribute
— Canceled may contain the Number of Remaining Sub-operations Attribute
— Warning, Failedure, Refused, or Successful shall not contain the Number of Remaining Sub-operations Attribute.

C.4.3.1.6   Number of SuccessfulCompleted Sub-Operations

Inclusion of the Number of SuccessfulCompleted Sub-operations is conditional based upon the status in the C-GET response. The Number of SuccessfulCompleted Sub-operations specifies the number of C-STORE sub-operations generated by the requested transfer which have completed successfully.

A C-GET response with a status of:

— Pending shall contain the Number of SuccessfulCompleted Sub-operations Attribute
— Canceled, Warning, Failedure, Refused, or Successful may contain the Number of SuccessfulCompleted Sub-operations Attribute

C.4.3.1.7   Number of Failed Sub-Operations

Inclusion of the Number of Failed Sub-operations is conditional based upon the status in the C-GET response. The Number of Failed Sub-operations specifies the number of C-STORE sub-operations generated by the requested transfer which have Failed.

A C-GET response with a status of:

— Pending shall contain the Number of Failed Sub-operations Attribute

— Canceled, Warning, Fail~~ed~~ure, Refused, or Success~~ful~~ may contain the Number of Failed Sub-operations Attribute

C.4.3.1.8   Number of Warning Sub-Operations

Inclusion of the Number of Warning Sub-operations is conditional based upon the status in the C-GET response. The Number of Warning Sub-operations specifies the number of C-STORE sub-operations generated by the requested transfer which had a status of Warning.

A C-GET response with a status of:

— Pending shall contain the Number of Warning Sub-operations Attribute

— Canceled, Warning, Fail~~ed~~ure, Refused, or Success~~ful~~ may contain the Number of Warning Sub-operations Attribute

C.4.3.2   C-GET SCU Behavior

This Section discusses both the baseline and extended behavior of the C-GET SCU.

C.4.3.2.1   Baseline Behavior of SCU

An SCU conveys the following semantics with a C-GET request:

— The SCU shall have proposed sufficient presentation contexts at Association establishment time to accommodate expected C-STORE sub-operations which shall occur over the same Association. The SCU of the Query/Retrieve Service Class shall serve as the SCP of the Storage Service Class.

— The SCU shall supply a single value in the Unique Key Attribute for each level above the Query/Retrieve level. For the level of retrieve, the SCU shall supply one unique key if the level of the retrieve is above the STUDY level and shall supply one UID, or a list of UIDs if a retrieval of several items is desired and the retrieve level is STUDY, SERIES or IMAGE.

— The SCU shall interpret C-GET responses with status equal to Pending during the processing of the C-STORE sub-operations. These responses shall indicate the number of Remaining, ~~Successful~~**Completed**, Failed, Warning C-STORE sub-operations.

— The SCU shall interpret a C-GET response with a status equal to Success, Warning, Fail~~ed~~ure, or Refused as a final response. The final response shall indicate the number of ~~Successful~~**Completed** sub-operations and the number of Failed C-STORE sub-operations resulting from the C-GET operation. The SCU shall interpret a status of:

o Success to indicate that all sub-operations were successful**ly completed**

- o Warning to indicate one or more sub-operations were successful**ly completed** and one or more unsuccessful or all sub-operations had a status of warning
- o Fail~~edure~~ or Refused to indicate all sub-operations were unsuccessful

— The SCU may cancel the C-GET operation by issuing a C-GET-CANCEL request at any time during the processing of the C-GET request. A C-GET response with a status of Canceled shall indicate to the SCU that the retrieve was canceled. Optionally, the C-GET response with a status of Canceled shall indicate the number of ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations. If present, the Remaining sub-operations count shall contain the number of C-STORE sub-operations which were not initiated due to the C-GET-CANCEL request.

C.4.3.2.2   Extended Behavior of SCU

Extended SCU behavior shall be negotiated at Association establishment time. If an option within the extended behavior is not agreed upon in the negotiation, then only baseline SCU behavior shall be supported with respect to that option. Extended SCU behavior includes all baseline behavior with the following option:

— Relational-retrieve

C.4.3.2.2.1   Relational-Retrieve

The C-GET Service with relational-retrieve removes the restriction that the SCU supply Unique Key values for levels above the Query/Retrieve level to help identify an entity at the level of the retrieval. Hence, the Identifier of a C-GET request may retrieve:

— all composite object instances related to a study by providing a Study Instance UID (0020,000D)

— all composite object instances related to a series by providing a Series Instance UID (0020,000E)

— individual composite object instances by providing a list of SOP Instance UIDs (0008,0018)

C.4.3.3   C-GET SCP Behavior

This Section discusses both the baseline and extended behavior of the C-GET SCP.

C.4.3.3.1   Baseline Behavior of SCP

An SCP conveys the following semantics with a C-GET response:

— The SCP shall identify a set of Entities at the level of the retrieval based upon the values in the Unique Keys in the Identifier of the C-GET request. The SCP shall initiate C-STORE sub-operations for the corresponding storage SOP Instances. The SCP of the Query/Retrieve Service Class shall serve as an SCU of the Storage Service Class.

— The SCP shall initiate C-STORE sub-operations over the same Association for all stored SOP Instances related to the Patient ID, List of Study Instance UIDs, List of Series Instance UIDs, or List of SOP Instance UIDs depending on the Query/Retrieve level specified in the C-GET request

— A sub-operation is considered Failed if the SCP is unable to initiate a C-STORE sub-operation because the Query/Retrieve SCU did not offer an appropriate presentation context for a given stored SOP Instance.

— Optionally, the SCP may generate responses to the C-GET with status equal to Pending during the processing of the C-STORE sub-operations. These responses shall indicate the number of Remaining, ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations.

— When the number of Remaining sub-operations reaches zero, the SCP shall generate a final response with a status equal to Success, Warning, Fail~~edure~~, or Refused. The status contained in the C-GET response shall contain:

    o Success if all sub-operations were successful**ly completed**

    o Warning if one or more sub-operations were successful**ly completed** and one or more sub-operations were unsuccessful or had a status of warning

    o Warning if all sub-operations had a status of Warning

    o Fail~~ed~~**ure** or Refused if all sub-operations were unsuccessful

— The SCP may receive a C-GET-CANCEL request at any time during the processing of the C-GET request. The SCP shall interrupt all C-STORE sub-operation processing and return a status of Canceled in the C-GET response. The C-GET response with a status of Canceled shall contain the number of ~~Successful~~**Completed**, Failed, and Warning C-STORE sub-operations. If present, the Remaining sub-operations count shall contain the number of C-STORE sub-operations which were not initiated due to the C-GET-CANCEL request.

— If the SCP manages images in multiple alternate encodings (see C.6.1.1.5.1), only one of the alternate encodings of an image shall be included in the set of object instances retrieved by a C-GET request at the Patient, Study, or Series level.