Digital Imaging and Communications in Medicine (DICOM)

Supplement 234: DICOMweb Storage Commitment Service

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1 **Document History**

September 2022	Version 0.1	JM	Initial version, ready for First Read (FR) of WG06.
November 2022	Version 0.2	DK & JM	Updated with results from WG06's FR (September 2022): • Closed issues. • Synchronous and asynchronous behavior. Extended to be ready for discussion for Public Comment: • Closed a lot of issues. • Specified the entire subsection 10.x. • Added three examples (in Annex B). • Added Commit in Capabilities Description (Annex H). • Added changes to Conformance Statement template (pending the approval of supplement 209), including review comments of WG31's people. • Added changes to DICOM's data dictionary. • Added changes to de-identification profiles.
January 2023	Version 0.3	DK & JM	Updated with the results from WG06's November meeting: • Accepted all tracked textual changes made during the review of WG06. Copied these changes to applicable texts. • Made Storage Commitment a separate service, so moved it from the Studies Service and Resources (10.x) to a new top-level section (X). Added more textual changes.
March 2023	Version 0.4	DK & JM	Updated with the results from WG06's January meeting: • Accepted all tracked textual changes made during the review of WG06. Copied these changes to applicable texts. • Changed name of Supplement (added Service). • Changed the resource from `/commit` to `/commitment-requests`, to be in line with the other top-level resources. • Added {transactionUID} to the HTTP communication (and removed it from the payloads). Added a return code for handling the case of duplicate transaction UIDs. • Aligned the way of phrasing of this supplement with the existing parts of PS3.18. • Copied (and adapted, naming only) conformance requirements from the DIMSE section on the Storage Commitment Service (section J in PS3.4). Added more textual changes.
June 2023	Version 0.5	DK & JM	Updated with the results from WG06's March meeting: • Accepted all tracked textual changes, adapted text to selected tags, and removed resolved comments.

		• Moved request and response payloads as modules to Annex J.
		• Incorporated comments from WG31 (Sup209) on update of conformance statement template.
		Incorporated comments from WG06's June meeting.

2 Open Issues

18	Issue: Traditionally DICOMweb Service attribute optionality is defined in PS3.4 and referenced from PS3.18. Is it ok that we put it in Annex J in PS3.18 instead?
	Background: The available attributes are intentionally extended in DICOMweb beyond what is in DIMSE. This makes it 'awkward' to put in PS3.4.
19	Is the HTTP status code 404 Not Found the right number to convey that a transaction cannot be found at the origin server?

3 Closed Issues

1	**Issue**: In what section of Part 18 should the storage commit service be put? Is it part of the Studies Service and Resources, section 10, or should it be specified as a separate Service (so as section 13)?
	Proposal: make this service part of the Studies Service and Resources, as storage commitment (safekeeping of studies) fits the description of the Studies Web Service as given in section 7.1.2: "Enables a user agent to manage Studies stored on an origin server."
	Decision (2022-09-19 WG-06): Agree with proposal. (2022-11-17 WG-06): Changed to making it a separate service, as there are two transactions.
2	**Issue**: How to name the service that handles storage commitment? Is it the Storage Commitment Service? Is it the Commit Storage Service? Is it the Request for Storage Commitment Service? Or is it the …
	The first option mentioned resembles the SOP Class best but is not actively put as the other web services (Store, Retrieve, Search). The second one makes it active, with a verb, but suggests that the user agent is committing, while in fact the origin server is committing. The third option describes the service the best, and is active, but is quite long.
	Proposal: the name of the service will be Commit Storage Service (as the Store service is not called Request to Store service either).
	Decision (2022-09-19 WG06): name the service the Commit service. This is also one word, active, etc. Furthermore, nothing else needs to be committed, so there is no ambiguity.
3	**Issue**: How to deal with synchronicity? Do we allow for synchronous or asynchronous communication only, or for both? What will be the approach in either case?
	Proposal: We will allow for both kinds of communications. The starting point of communication will be the Asynchronous Request-Reply Pattern as for instance specified here: Asynchronous Request-Reply Pattern - Azure Architecture Center	Microsoft Docs. This means that *polling*[1] will be the basis of the architecture, which is apparently quite normal in RESTful

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[1] Using a call-back mechanism may be insecure, would require additional implementation effort for the both the user agent and the origin server, and would a handle to be passed to the origin server with which the user agent can be called back.

	architectures. This pattern will need to be adapted for this specific use case, e.g. it will be allowed that synchronous communication is possible; see issues 3a-3h for all adaptations. **Option**: The origin server can return the expected polling frequency to the user agent. The user agent should not poll too often, say at most each 5 minutes, as this will increase the load of the origin server. In each polling reply, the origin server could provide the number of seconds before the next poll, depending on the current load of the server (a kind of expectation management). If a user agent is polling earlier than expected, an easy error status code should be provided. **Decision**: As proposed.
3a	**Issue** [WG06]**:** do we only provide asynchronous or also synchronous response of the origin server? **Proposal**: Allow for both. Therefore, the solution as provided by DICOMweb will be hybrid, as is DIMSE. This makes that happy flows include both 200 (`OK`, so done) and 202 (`Accepted`, so still working) responses to the `POST` request. The origin server determines the synchronicity of the commit transaction; the user agent needs to follow suit. **Decision:** As proposed.
3b	**Issue:** How to convey the (possible) failure codes as defined for storage commitment? **Proposal:** Provide these in the response payload. HTTP errors are only for that level of communication. This approach implies that the result needs to be checked by the user agent (as is done for DIMSE too). **Decision:** As proposed.
3c	**Issue:** What resources are used for requesting storage commitment? **Proposal:** Only one, the `commit` resource. See issue 4. **Decision:** As proposed.
3d	**Issue:** What different resource is to be used for polling for the result/checking the status of the request? **Proposal:** No resource at all. It is proposed to simplify the pattern by using `GET` on the (single) Commit resource. This approach is simple as it requires no other resources (and management of them). **Decision:** As proposed.
3e	**Issue:** What resource is being created as status resource? **Proposal:** No resource will be created as status resource. The HTTP status codes are being used to make the distinction between the different scenarios (ready, (still) working, error). Again, the advantage is not to create resources for single use (or so). **Decision:** As proposed.
3f	**Issue:** What resource is being created as result? **Proposal:** No resource is being created as result. The result will be given back as the payload of the response. Same advantage as before. **Decision:** As proposed.
3g	**Issue:** What kind of HTTP status codes are supported? **Proposal:** 200 (OK, done with the request, check the result), 202 (still working), 400 (for a bad request), and 404 (when the result of a request with the specified transaction UID cannot be found. **Decision:** As proposed.
3h	**Issue:** Do we want to be able to cancel this long running request? **Proposal:** No as this is also not possible in DIMSE. **Decision:** As proposed.

4	**Issue**: Do we have a separate commit storage transaction that takes a list of references SOP Instance UIDs, or do we commit per Instance resource? The first is more in line with the DIMSE way of working (and requires a lot less transactions) while committing per separate SOP Instance fits the resources model best (e.g. `/instance/{uid}/commit`). **Proposal**: Keep the DIMSE model: one request with a lot of Instance UIDs, as this has a quite smaller number of transactions compared to separate calls. This is also the way Orthanc works. Having commitment per separate Instance too (as a second way to achieve the same) would be interface overload and is not chosen to be supported. Note that we could – in principle – have commit transactions on study or series level, but that would limit the granularity, and still increase the number of transactions. **Decision** (2022-09-19 WG06): Agree with proposal. If people want to commit per instance, they still can, using the chosen interface.
5	**Issue**: Do we need to pass the Referenced SOP Class UIDs with the commit storage request as is done in DIMSE? What is/has been the purpose of that? If there is no clear purpose, we could skip it. However, in that case behavior is different than the DIMSE storage commit. When this cannot be skipped, it makes much more sense to resolve issue 8 with payload instead of parameter. **Proposal**: Get rid of the Referenced SOP Class UIDs (and the optional Storage Media File-Set (U)ID). However, this would require a new sequence attribute, as the Referenced SOP Class UID is type 1. **Decision** (2022-09-19 WG06): Do not remove the Referenced SOP Class UID, as this would violate the proxy-ability.
6	**Issue**: Does the origin server need to pass back all Referenced SOP Instance UIDs that have successfully been committed by the origin server? It is like DIMSE, but what can we do with it (except check whether the origin server is giving back some strange results)? **Proposal**: Pass back all Referenced SOP Instance UIDs, as it may be easier for the user agent this way (may not need a separate administration). **Decision** (2022-09-16 WG06): As proposed, also for backwards compatibility.
7	**Issue**: Does the origin server need to pass back the Referenced SOP Class UIDs? The approach to this item should match that of issue 5. **Proposal**: No, this is no longer needed. In line with this, the optional Storage Media File-Set (U)ID are no longer possible. **Decision** (2022-09-19 WG06): keep in line with issue 5, so do return this too.
8	**Issue**: Shall we pass the list of Referenced SOP Instance UIDs as HTTP parameter or as payload? Parameter seems to fit the current model (as it is also used in querying), but that seems not possible for the response, and would hence be asymmetrical. **Proposal**: pass as payload (as the size of the parameter could be too big, e.g. when requesting storage commitment for an entire MR study). **Decision** (2022-09-16 WG06): as proposed; agreed with justification.
9	**Issue**: Do we add the Referenced Study and Series UIDs (optionally) to the Instance UIDs of the request and response payload? It may be easier for the Origin Server to find the appropriate Instance UIDs having these at hand. **Proposal**: Yes, the user agent may add the Referenced Study and Series UIDs, and the Origin Server is required to accept them. **Repercussion**: when the Instance UID is not part of the Study or Series that is provided in the request, a new kind of error is possible. **Decision** (2022-09-16 WG06): as proposed; understood the justification. Applicable failure code will be (the already existing) 0112H – No such object instance.

10	**Issue**: It should be easy to write a wrapper from classic DICOM to this DICOMweb variant of Storage Commit. This should be the case for both the SCP and the SCU. **Proposal**: The wrappers as described (from classic DICOM to DICOMweb) are relatively easy to create. Note that the proposals for Issue #5 and Issue #7 remove the Referenced SOP Class UIDs, and when there are current implementations that use these UIDs, reverse wrappers (un-wrappers?!) cannot be created. This is, however, not perceived as an issue. **Decision** (2022-09-16 WG06): make it backwards compatible, so that it is easy to write a wrapper in two directions. So keep the information model as is.
11	**Issue**: Should the Commit service also be in PS3.18, section 9. URI Service? **Proposal:** no, as store is not part of this service. **Decision** (2022-09-19 WG06): As proposed.
12	**Issue** [WG27]: Is it possible to make the Studies and Series references mandatory? **Proposal:** Given backwards compatibility with DIMSE, this is not possible, but we can de-fine a structure that allows for mandatory attributes when the user agent wants to. See also issue 14. **Decision:** As proposed.
13	**Issue**: What should be the way to pass the transaction UID to the result check? There are two options: as an HTTP parameter or as Payload. **Proposal**: pass as Payload, as a) this is similar to the request, and b) the UIDs will not show up in HTTP logging, preventing possible security issues. **Decision:** As proposed.
14	**Issue** (follow-up of issue 9): How are the Study and Series UID incorporated in the data structure as specified in the Storage Commitment Request – Action Information and as specified in the Storage Commitment Result – Event Information? There are three alterna-tives: • *Straightforward* – Add the Referenced Study Instance UID and the Referenced Series Instance UID as optional items in the Referenced SOP Sequence (and in the Failed SOP Sequence). This is quite easy to specify and understand but will create a lot of du-plicate data. • *Innovative* – Create an entirely new data structure, in which there is a Referenced Study Sequence. This holds the Referenced Study Instance UID, and the Referenced Series Sequence. This series sequence holds the Referenced Series Instance UID, and the Referenced SOP Sequence. The latter is defined as in DIMSE. Similarly, this nested ap-proach could be taken for the Failed SOP Sequence too. The advantage of this would be the lack of duplication (imagine a 64K slide fMRI scan), really appreciated in REST-ful/cloud worlds; the disadvantage is that it is not backwards compatible, so in conflict with the conclusion of issue 10 (be able to create wrappers). • *Hybrid* – Extend the existing data structure with an optional structure like in the second bullet. In this case, there should be the condition that it is not possible that both the (original) Referenced SOP Sequence and the (new) Referenced Study Sequence are non-empty. In that case, this new structure can be viewed as an either-or of the original structure and a nested structure. The advantage of this approach is that it is very flexi-ble, both backwards compatible and RESTful/cloud-proof. The disadvantage is that there is a structure with duplication in the definition, that has conditions that need to be checked run-time (to prevent duplication in the instances). **Proposal**: Go for the third option. The first approach will duplicate a lot (think about fMRI studies with 64K SOP Instances and requesting for storage commit for a day's production of these in one go). The second prevents bi-directionally proxyability. **Decision:** As proposed.

15	**Issue**: How to support the SOP Class UID in the hierarchical data structures? How should it be part of the hierarchical payload. There are two options, namely a) to have it in as a separate layer of the hierarchy (this saves on data to be sent), or b) just have a Referenced SOP Sequence per Series (this saves on new attributes to be defined).
	Proposal: Have it in as a separate layer in the hierarchy. Data efficiency is a recurring gain, while definition is only a one-time cost.
	Conclusion (WG06, 2023-01-17): Do as proposed.
16	**Issue:** Can storage commit in DICOMweb be solved in a (more) RESTful way, such that resources like series and instances can be set to be committed, and also be questioned about their commitment state?
	Proposal: While this is possible technically, there are several serious drawbacks. Such a pure approach generates more client-server traffic, is considerably less efficient in execution, and is harder to implement. Finally, it is also not possible to create bi-directional proxies with DIMSE services.
	Conclusion (WG06, 2023-01-17)**:** continue with currently chosen approach.
17	**Issue:** What Sequence and UID tags are to be used in the data structure? There are several tags referring to items that are needed: SOP Instance Sequences, SOP Class UIDs, Study UID sequences, etc.
	Proposal: let WG06 decide what are the most appropriate tags.
	Conclusion (2023-03-24 WG06)**:** use existing Referenced Study Sequence instead of proposed new Referenced Study Instance Sequence; likewise, use existing Referenced Series Sequence instead of new Referenced Series Instance Sequence; also, use existing Referenced Instance Sequence instead of new Referenced SOP Instance Sequence. Furthermore, use existing Study Instance UID instead of new Referenced Study Instance UID, and use Series Instance UID instead of new Referenced Series Instance UID.

4

5

6   **Scope and Field of Application**

7   This supplement defines the means to perform storage commitment in DICOMweb. The Storage Commit-
8   ment Service enables a user agent to arrange the safekeeping of Instances on an origin server.

9   The DICOMweb Storage Commitment Service is an extension to the existing DICOMweb services, mim-
10 icking the storage commitment service that is already available using DIMSE. The DICOMweb Storage
11 Commitment Service is bi-directional proxyable, i.e. it is relatively easy to create proxies from/to DIMSE
12 to/from DICOMweb Storage Commitment Service.

13

14 # Changes to NEMA Standards Publications PS 3.18

15 | ***Add a new reference to section 2.*** |
|---|

16 # 2 Normative References

17 …

18 ## 2.3 Other References

19 …

20 [ARRp] *Asynchronous Request-Reply pattern*, https://learn.microsoft.com/en-us/azure/architecture/pat-
21 terns/async-request-reply.

22 …

23

24

25 | ***Add new section X Storage Commitment Service and Resources*** |
|---|

26 # X Storage Commitment Service and Resources

27 ## X.1 Overview

28 The Storage Commitment Service enables a user agent to arrange the safekeeping of Instances on an
29 origin server. It corresponds to the DIMSE Storage Commitment Service Class as defined in Annex J of
30 PS3.4 and has the same semantics.

31 As committing to storage of Instances is often a long-running operation on the origin server, the use of
32 this service may be split into two transactions, at the discretion of the origin server: 1) requesting the com-
33 mitment, and – when the origin server cannot give the result yet – 2) checking for the result, in line with
34 the asynchronous request-reply pattern [ARRp].

35 Note A PACS may wait with a response to the storage commitment request it receives, for instance until the
36 VNA that it uses for long term storage has given commitment for the referenced Instances.

37 Figure X.1-1 shows the possible scenarios of requesting storage commitment. This starts when the user
38 agent sends a Request to the origin server. This requests the origin server's commitment to safekeep a
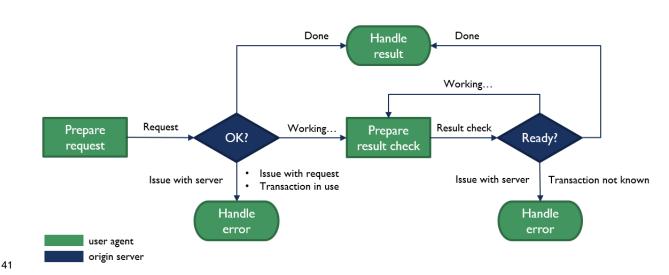39 set SOP Instances, specified by their respective UID.

40   **Figure X.1-1. Process of the Storage Commitment Service**

42   In case the origin server responds with Done, it behaves synchronously, and returns, for each instance,
43   whether it commits to safekeeping that instance, or not; the user agent can handle this result appropri-
44   ately, for example by deleting the local copies of the instances that now are safely kept by the origin
45   server.

46   In case the origin server responds to the Request with Working …, it behaves asynchronously, and is
47   working on the request. In this case, the user agent needs to perform a Result Check after some time.
48   When this check is performed, the origin server may respond with Done, and will provide the same kind of
49   result as in the synchronous case, which can be handled in the same way by the user agent. The origin
50   server may also respond to the Result Check with Working…, which will trigger the user agent to perform
51   a Result Check again. This process continues until the origin server responds with Done, finalizing the
52   process.

53   For both the Request and the Result Check it is also possible that the origin server returns an error, and
54   this also needs to be handled appropriately by the user agent; see Table X.4.3-1 for more details.

55   **X.1.1   Resource Descriptions**

56   There is one resource defined by this service:

/commitment-requests	Storage commitment requests for Instances managed by the origin server.

57

58   **X.1.2   Common Query Parameters**

59   The origin server shall support Query Parameters as required in Table X.1.2-1.

60   The user agent shall supply in the request Query Parameters as required in Table X.1.2-1.

61   **Table X.1.2-1. Common Query Parameters**

Name	Value	Usage		Section
		User Agent	**Origin Server**	
Accept	media-type	O	M	Section 8.3.3.1
Accept-Charset	charset	O	M	Section 8.3.3.2

62

63 See also Section 8.4.

64 **X.1.3   Common Media Types**

65 The origin server shall support the media types specified as Default or Required in Table X.1.3-1.

66 **Table X.1.3-1. Default, Required, and Optional Media Types**

Media Type	Usage	Section
application/dicom+json	Default	Section 8.7.3.2
application/dicom+xml	Required	Section 8.7.3.2
multipart/related; type="application/dicom+json"	Required	Section 8.7.3.2
multipart/related; type="application/dicom+xml"	Required	Section 8.7.3.2

67

68 **X.2   Conformance**

69 Implementations conforming to the Storage Commitment Service shall support the transactions as listed
70 as Required in Table X.2-1.

71 **Table X.2-1. Required and Optional Transactions**

Transaction	Support	Section
Request	Required	Section X.4
Result Check	Required	Section X.5

72

73 Implementations conforming to the Storage Commitment Service shall specify their role in their Conform-
74 ance Statement (see PS3.2): origin server, user agent or both.

75 In addition, for each supported transaction they shall specify:

76 • the supported Query Parameters, including optional Attributes, if any;
77 • the supported DICOM Media Types;
78 • the supported character sets (if other than UTF-8).

79 An origin server conforming to the Storage Commitment Service shall implement the Retrieve Capabilities
80 Transaction, specifying its role (see Section 8.9 and Annex H).

81 Implementation-specific warning and error codes shall be included in the Conformance Statement.

82 An origin server implementation defines how it provides its commitment to storage. Certain origin servers
83 may commit to permanently store the SOP Instances (e.g., an archive system) while other origin servers
84 may commit to provide storage of the SOP Instances for a limited amount of time. The origin server is re-
85 quired to document in its Conformance Statement the nature of its commitment to storage (e.g., duration
86 of storage, retrieve capabilities and latency, capacity).

87 Once the origin server has accepted the commitment to store the SOP Instances, the user agent may de-
88 cide that it is appropriate to delete its copies of the SOP Instances. These types of policies are outside
89 the scope of this Standard; however, the user agent is required to document these policies in its Conform-
90 ance Statement.

91 When an implementation claims to play the role of origin server, it shall specify in its Conformance State-
92 ment until when the result of a Request will be available for the user agent. This is either the amount of

93 time after the result has become available or the amount of time after the first (unsuccessful) result check,
94 whatever comes last.

X.3 Transactions Overview

96 The Storage Commitment Service consists of the transactions listed in Table X.3-1.

97 **Table X.3-1. Storage Commitment Service Transactions**

Transac- tion Name	Method	Payload		Description
		Request	**Success Re- sponse**	
Request	POST	SOP Instance UIDs; optionally Study, Series, and SOP Class UIDs	OK: Storage Commitment Result	Per referenced Instance, commits or fails to commit to the safekeeping. Returns commit- ment status per referenced Instance.
			Accepted: none	Working to commit to the safekeeping of the referenced Instances.
Result Check	GET	N/A	OK: Storage Commitment Result	Per referenced Instance of the applicable Stor- age Commit Request, commits or fails to com- mit to the safekeeping. Returns commitment status per referenced Instance.
			Accepted: none	Still working to commit to the safekeeping of the referenced Instances.

98

99 These transactions share the same resource (/commitment-requests) but are differentiated by their
100 method.

X.4 Request Transaction

102 This transaction allows a user agent to request an origin server to commit to the safekeeping of a set of
103 Instances.

X.4.1 Request

105 The request shall have the following syntax:

```
POST SP /commitment-requests/{transactionUID} SP version CRLF
Accept: 1#media-type CRLF
*(header-field CRLF)
CRLF
Payload
```

X.4.1.1 Target Resource

112 The Target Resource of this transaction is a commitment request.

X.4.1.2 Query Parameters

114 The request has no Query Parameters.

X.4.1.3 Request Header Fields

116 The origin server shall support Request Header Fields as required in Table X.4.1-2.

117 The user agent shall supply Request Header Fields as required in Table X.4.1-2.

118

Table X.4.1-2. Request Header Fields

Name	values	Usage		Description
		User Agent	Origin Server	
Accept	media-type	M	M	The Acceptable Media Types of the response payload.

119

120   See also Section 8.4.

121   **X.4.1.4   Request Payload**

122   The request payload shall be present and shall contain one representation consistent with the Content-
123   Type header field. The representation shall conform to Media Types described in Section 8.7.3 DICOM
124   Media Type Sets. The payload shall conform to Section 8.6 Payloads.

125   The request payload shall contain the Referenced SOP Instance UIDs that the user agent requests the
126   origin server to commit storage for.

127   A request payload shall contain a Storage Commitment Request Module. See Annex J.1.

128

129   **X.4.2   Behavior**

130   The origin server shall process the storage commitment request. A success response either returns a re-
131   sult (indicating success or failure of committing to storage per referenced SOP Instance) or indicates to
132   the user agent to retrieve such a result later.

133   **X.4.3   Response**

134   The response shall have the following syntax:

```
135    version SP status-code SP reason-phrase CRLF
136    [retry-after CRLF]
137    CRLF
138    [Payload]
```

139

140   **X.4.3.1   Status Codes**

141   Table X.4.3-1 shows some common status codes corresponding to this transaction. See also Section 8.5
142   for additional status codes.

143

Table X.4.3-1. Status Code Meaning

Status	Code	Meaning
Success	200 (OK)	The origin server finished processing the storage commitment request
	202 (Accepted)	The origin server has not finished processing the storage commitment request yet
Failure	400 (Bad Request)	The origin server cannot handle the storage commitment request because of errors in the request headers or parameters
	409 (Conflict)	The origin server cannot handle the storage commitment request because the provided transaction UID is already in use
	503 (Service Unavailable)	The origin server cannot handle the storage commitment request; this may be a temporal or permanent state

144

145 In case of OK, the Payload shall describe in detail what SOP Instances have been committed for safe-
146 keeping, and what instances have not been committed for safekeeping by the origin server.

147 In case of Accepted, the user agent is expected to follow-up with the Result Check transaction, as de-
148 scribed in section X.5, to retrieve the result of the storage commitment request.

149 **X.4.3.2   Response Header Fields**

150 The origin server shall support header fields as required in Table X.4.3-2.

151
Table X.4.3-2. Response Header Fields

Name	Value	Origin Server Usage	Description
Content-Type	media-type	C	The media type of the response payload. Shall be present if the response has a payload.
Content-Encoding	encoding	C	Shall be present if the response payload has a content encoding. See Section 8.4.3.
Content-Length	uint	C	Shall be present if the response payload does not have a content encoding. See Section 8.4.3.
Retry-After	uint	O	The number of seconds the user agent is requested to wait until a (next) result check or retrying the request.

152

153 All success responses shall also contain the Content Representation (see Section 8.4.2) and Payload
154 header fields (see Section 8.4.3) with appropriate values.

155 It is recommended that the text returned in the Warning header field (see [RFC7234] Section 5.5) contain
156 a DICOM Status Code (see PS3.4 and Annex C "Status Type Encoding (Normative)" in PS3.7) and de-
157 scriptive reason. For example:

158 `Warning: A700 <service>: Out of memory`

159 **X.4.3.3   Response Payload**

160 A success response payload shall contain a Storage Commitment Response Module. See Annex J.2.

161 A failure response payload may contain a Status Report describing any failures, warnings, or other useful
162 information.

163

164 **X.5 Result Check Transaction**

165 This transaction allows a user agent to request an origin server to provide the result of an earlier Request.

166   Note   The user agent uses this transaction when the origin server has responded that it has accepted but not
167   yet completed the storage commitment request (returning status code 202).

168 **X.5.1   Request**

169 The request shall have the following syntax:

```
170 GET SP /commitment-requests/{transactionUID} SP version CRLF
171 Accept: 1#media-type CRLF
172 *(header-field CRLF)
173 CRLF
```

174 **X.5.1.1   Target Resource**

175 The Target Resource of this transaction is a commitment request.

176 **X.5.2.2   Query Parameters**

177 The request has no Query Parameters.

178 **X.5.2.3   Request Header Fields**

179 The origin server shall support Result Check Header Fields as required in Table X.5.1-2.

180 The user agent shall supply Result Check Header Fields as required in Table X.5.1-2.

181 **Table X.5.1-2. Result Check Header Fields**

Name	values	Usage		Description
		User Agent	Origin Server	
Accept	media-type	M	M	The Acceptable Media Types of the response payload.

182

183 See also Section 8.4.

184   Note   The presence and values of the storage commitment result check header fields should be the same as
185   those of the storage commitment request header fields.

186 **X.5.1.4   Request Payload**

187 The request has no payload.

188 **X.5.2   Behavior**

189 If the result identified by the Transaction UID is available on the origin server, this result is returned in an
190 Acceptable Media Type (see section 8.7.4); if this result is not yet available, the server will return that it is
191 still working on the storage commitment request.

192 **X.5.3   Response**

193 The response shall have the following syntax:

194 ```
version SP status-code SP reason-phrase CRLF
```
195 `[retry after CRLF]`
196 `CRLF`
197 `[Payload]`

198 **X.5.3.1        Status Codes**

199 Table X.5.3-1 shows some common status codes corresponding to this transaction. See also Section 8.5
200 for additional status codes.

201 **Table X.5.3-1. Status Code Meaning**

| Status | Code | Meaning |
|---|---|---|
| Success | 200 (OK) | The origin server finished processing the request |
| | 202 (Accepted) | The origin server has not finished processing the request yet |
| Failure | 404 (Not Found) | The origin server could not find the storage commitment request with the supplied Transaction UID |
| | 503 (Service Una-vailable) | The origin server cannot handle the request; this may be a temporal or permanent state |

202

203 In case of OK, the Payload describes in detail what SOP Instances have been committed for safekeeping,
204 and what instances have not been committed for safekeeping by the origin server.

205   In case of Accepted, the user agent is expected to follow-up with another Result Check transaction, to re-
206   trieve the result of the storage commitment request.

207   Note    When the 'Not Found' status code is returned, this means that either a wrong Transaction UID has been
208           supplied, or that the origin server has deleted the applicable result.
209   Note    When the 'Not Found' status code is returned, the user agent may simply retry with a new storage com-
210           mitment request. When the 'Service Unavailable' status code is returned, the user agent may retry later
211           with another Result Check.
212

213   **X.5.3.2 Response Header Fields**

214   See Section X.4.3.2.

215   **10.x.5.3          Response Payload**

216   See Section X.4.3.3.

217

218   ___*Add new examples for the Storage Commitment Service*___


219   # B        Examples (Informative)


220   …

221   **B.x1            Request Storage Commitment for Multiple Instances with JSON**

222   This example shows the flow of messages between the user agent and the origin server for the scenario
223   in which a) the user agent requests storage commitment for two SOP Instances in JSON, b) the origin
224   server tells the user agent to check for the result of this request later, c) the user agent checks for the re-
225   sult, and d) the result provided by the origin server shows that it commits to safely store one of the in-
226   stances, while it does not commit to safely store the other instance.

227   Step 1 of this scenario involves the user agent sending a POST request for the two instances with trans-
228   action UID 1.1.99999.20220901 in the HTTP header:

```
229   POST /radiology/commitment-requests/1.1.99999.20220901 HTTP/1.1
230   Host: www.hospital-stmarco
231   Content-Type: application/dicom+json
232   …
233   {
234     "00081199": {
235       "vr": "SQ",
236       "Value": [
237     {
238         "00081150": {
239         "vr": "UI",
240         "Value": [
241           "1.2.840.10008.5.1.4.1.1.2"
242         ]
243       },
244         "00081155": {
245         "vr": "UI",
246         "Value": [
247           "1.3.12.2.1107.5.99.3.30000012031310075961300000059"
248         ]
249       }
250     },
251     {
```

```
252            "00081150": {
253            "vr": "UI",
254            "Value": [
255              "1.2.840.10008.5.1.4.1.1.2"
256            ]
257          },
258            "00081155": {
259            "vr": "UI",
260            "Value": [
261              "1.3.12.2.1107.5.99.3.30000012031310075961300000060"
262            ]
263          }
264        }
265        ]
266      }
267
```

268 Here, the references to the applicable SOP instances are in the Referenced SOP Sequence (0008,1199);
269 see Table X.4.1-3 for the possible structures of the storage commitment request. The SOP Class UID of
270 both the instances is CT Image (for both instances (0008,1150) has value 1.2.840.10008.5.1.4.1.1.2), and
271 the applicable instances are identified by their respective SOP Instance UIDs (the values of (0008,1155)
272 are 1.3.12.2.1107.5.99.3.30000012031310075961300000059 and ….00060) respectively).

273 In step 2 the origin server returns its response to the request. In this scenario this is the asynchronous
274 case where there is no result immediately (return code 202 Accepted), and where the server also notifies
275 the user agent that it ought to wait at least 300 seconds before making a follow-up request for the result;
276 the synchronous response case would skip steps 2 and 3, and would continue at step 4.

```
277      HTTP/1.1 202 Accepted
278      Retry-After: 300
279      …
280
```

281 In step 3, the user agent GETs the status of the request using the same transaction UID as given in the
282 original request, after waiting the suggested period of time:

```
283
284      GET /radiology/commitment-requests/1.1.99999.20220901 HTTP/1.1
285      Host: www.hospital-stmarco
286      Content-Type: application/dicom+json
287      …
288
```

289 Step 4 of this scenario involves the origin server returning the result of the storage commitment request.
290 In this case it is the response to the check result as shown in step 3. In case the server initially responds
291 to the POST request of step 1 with the HTTP response status code 200 (the synchronous case) the same
292 result would be returned:

```
293
294      HTTP/1.1 200 OK
295      Content-Length: 705
296      Content-Type: application/dicom+json; charset=utf-8
297
298      {
299        "00081199": {
300          "vr": "SQ",
301          "Value": [
302        {
303            "00081150": {
304            "vr": "UI",
305            "Value": [
306              "1.2.840.10008.5.1.4.1.1.2"
307            ]
308          },
309            "00081155": {
310            "vr": "UI",
311            "Value": [
312              "1.3.12.2.1107.5.99.3.30000012031310075961300000059"
313            ]
314          }
315        }
```

```
316            ],
317          "00081198": {
318            "vr": "SQ",
319            "Value": [
320          {
321              "00081150": {
322              "vr": "UI",
323              "Value": [
324                "1.2.840.10008.5.1.4.1.1.2"
325              ]
326            },
327              "00081155": {
328              "vr": "UI",
329              "Value": [
330                "1.3.12.2.1107.5.99.3.30000012031310075961300000060"
331              ]
332            },
333            "00081197": {
334              "vr": "US",
335              "Value": [ 274 ]
336              ]
337          }
338          ]
339        }
340
```

The origin server provided 274 as value of the failure reason (0008,1197). This is 0112H and means "No
such object instance" (see section C.14.1.1 of Part 3). Apparently, the SOP Instance identified by SOP
Instance UID 1.3.12.2.1107.5.99.3.30000012031310075961300000060 is not on the origin server.

**B.x2   Request Storage Commitment for Multiple Instances with XML and Referenced
Study and Series Instance UIDs**

The intent of this example is the same as presented in B.x1, namely the scenario to request storage com-
mitment for two SOP Instances, where for one it is given, and for one it fails. The differences are in the
synchronicity (in this case synchronous), syntax (in this case using XML), and in the structure (in this case
using the hierarchical study-series-SOP Class-instance structure, starting with a Referenced Study In-
stance Sequence (0008,xxx1); see Table X.4.1-3 for more details on this structure).

Step 1:

```
POST /radiology/commitment-requests/1.1.99999.20220901 HTTP/1.1
Host: www.hospital-stmarco
Content-Type: application/dicom+xml

<?xml version="1.0" encoding="UTF-8"?>
<NativeDicomModel>
  <DicomAttribute Tag="0008XXX1" VR="SQ" Keyword="ReferencedStudyInstanceSequence">
    <Item number="1">
    <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
      <Value number="1">1.2.250.1.59.40211.12345678.678910</value>
    </DicomAttribute>
    <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
      <Item number="1">
      <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
                <Value number="1">1.2.250.1.59.40211.789001276.14556172.67789</value>
      </DicomAttribute>
      <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
        <Item number="1">
        <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
       <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
      </DicomAttribute>
        <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
          <Item number="1">
          <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
            <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000059</value>
          </DicomAttribute>
          <Item number="2">
```

```
379              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
380                <Value number="2">1.3.12.2.1107.5.99.3.30000012031310075961300000060</value>
381              </DicomAttribute>
382            </DicomAttribute>
383          </DicomAttribute>
384        </DicomAttribute>
385      </DicomAttribute>
386    </NativeDicomModel>
```

In the above, the applicable study is identified by its Study Instance UID (0008,xxx2) with value
1.2.250.1.59.40211.12345678.678910. The applicable series is identified by its Series Instance UID
(0008,xxx3) with value 1.2.250.1.59.40211.789001276.14556172.67789. SOP Class UIDs and SOP In-
stance UIDs are equal to the example given in B.x1.

Step 2:

```
393    HTTP/1.1 200 OK
394    Content-Length: 2795
395    Content-Type: application/dicom+xml
396
397    <?xml version="1.0" encoding="UTF-8"?>
398    <NativeDicomModel>
399      <DicomAttribute Tag="0008XXX1" VR="SQ" Keyword="ReferencedStudyInstanceSequence">
400        <Item number="1">
401        <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
402          <Value number="1">1.2.250.1.59.40211.12345678.678910</value>
403        </DicomAttribute>
404        <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
405          <Item number="1">
406          <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
407                    <Value number="1">1.2.250.1.59.40211.789001276.14556172.67789</value>
408          </DicomAttribute>
409          <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
410            <Item number="1">
411            <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
412          <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
413        </DicomAttribute>
414            <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
415              <Item number="1">
416              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
417                <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000059</value>
418              </DicomAttribute>
419            </DicomAttribute>
420          </DicomAttribute>
421        </DicomAttribute>
422      </DicomAttribute>
423      <DicomAttribute Tag="0008XXX7" VR="SQ" Keyword="FailedStudyInstanceSequence">
424        <Item number="1">
425        <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
426          <Value number="1">1.2.250.1.59.40211.12345678.678910</value>
427        </DicomAttribute>
428        <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
429          <Item number="1">
430          <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
431                    <Value number="1">1.2.250.1.59.40211.789001276.14556172.67789</value>
432          </DicomAttribute>
433          <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
434            <Item number="1">
435            <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
436          <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
437        </DicomAttribute>
438            <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
439              <Item number="1">
440              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
441                <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000060</value>
442              </DicomAttribute>
443              <Item number="2″>
444              <DicomAttribute Tag="00081197" VR="UI" Keyword="FailureReason">
445                <Value number="2">274</value>
```

```
446                     </DicomAttribute>
447                   </DicomAttribute>
448                 </DicomAttribute>
449               </DicomAttribute>
450             </DicomAttribute>
451         </NativeDicomModel>
452
```

453 The Failed Study Instance Sequence (0008,xxx7) has the same structure as the Referenced Study In-
454 stance Sequence, except that it adds a Failure Reason (0008,1197) to each Referenced SOP Instance
455 UID, indicating why the origin server could not commit to safely store the referenced SOP Instance.
456

457 **B.x3   Request Storage Commitment with HTTP Multipart Request for Instances from Mul-**
458 **tiple Studies**

459 This example has the same intent as B.x2, but differs in having a multipart request, and the SOP In-
460 stances belonging to different studies.

461 Step 1:

```
462     POST /radiology/commitment-requests/1.1.99999.20220901 HTTP/1.1
463     Host: www.hospital-stmarco
464     Content-Type: multipart/related; type="application/dicom+xml"; boundary=MESSAGEBOUNDARY
465
466     --MESSAGEBOUNDARY
467     <?xml version="1.0" encoding="UTF-8"?>
468     <NativeDicomModel>
469       <DicomAttribute Tag="0008XXX1" VR="SQ" Keyword="ReferencedStudyInstanceSequence">
470         <Item number="1">
471         <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
472           <Value number="1">1.2.250.1.59.40211.12345678.678910</value>
473         </DicomAttribute>
474         <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
475           <Item number="1">
476           <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
477                     <Value number="1">1.2.250.1.59.40211.789001276.14556172.67789</value>
478           </DicomAttribute>
479           <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
480             <Item number="1">
481             <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
482           <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
483          </DicomAttribute>
484             <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
485               <Item number="1">
486               <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
487                 <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000059</value>
488               </DicomAttribute>
489             </DicomAttribute>
490           </DicomAttribute>
491         </DicomAttribute>
492       </DicomAttribute>
493     </NativeDicomModel>
494     --MESSAGEBOUNDARY
495     <?xml version="1.0" encoding="UTF-8"?>
496     <NativeDicomModel>
497       <DicomAttribute Tag="0008XXX1" VR="SQ" Keyword="ReferencedStudyInstanceSequence">
498         <Item number="1">
499         <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
500           <Value number="1">1.2.250.1.59.40211.12345678.678911</value>
501         </DicomAttribute>
502         <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
503           <Item number="1">
504           <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
505                     <Value number="1">1.2.250.1.59.40211.789001276.14556172.68856</value>
506           </DicomAttribute>
507           <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
508             <Item number="1">
509             <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
510           <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
```

```
511          </DicomAttribute>
512            <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
513              <Item number="1">
514              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
515                <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000060</value>
516              </DicomAttribute>
517            </DicomAttribute>
518          </DicomAttribute>
519        </DicomAttribute>
520      </DicomAttribute>
521    </NativeDicomModel>
522    --MESSAGEBOUNDARY
523
524    Step 2:
525
526    HTTP/1.1 200 OK
527    Content-Length: 2694
528    Content-Type: application/dicom+xml
529
530    <?xml version="1.0" encoding="UTF-8"?>
531    <NativeDicomModel>
532      <DicomAttribute Tag="0008XXX1" VR="SQ" Keyword="ReferencedStudyInstanceSequence">
533        <Item number="1">
534        <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
535          <Value number="1">1.2.250.1.59.40211.12345678.678910</value>
536        </DicomAttribute>
537        <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
538          <Item number="1">
539          <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
540                  <Value number="1">1.2.250.1.59.40211.789001276.14556172.67789</value>
541          </DicomAttribute>
542          <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
543            <Item number="1">
544            <DicomAttribute Tag="00081150" VR="UI" Keyword="ReferencedSOPClassUID">
545          <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
546          </DicomAttribute>
547            <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
548              <Item number="1">
549              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
550                <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000059</value>
551              </DicomAttribute>
552            </DicomAttribute>
553          </DicomAttribute>
554        </DicomAttribute>
555        <Item number="2">
556        <DicomAttribute Tag="0008XXX2" VR="UI" Keyword="ReferencedStudyInstanceUID">
557          <Value number="1">1.2.250.1.59.40211.12345678.678911</value>
558        </DicomAttribute>
559        <DicomAttribute Tag="0008XXX3" VR="SQ" Keyword="ReferencedSeriesInstanceSequence">
560          <Item number="1">
561          <DicomAttribute Tag="0008XXX4" VR="UI" Keyword="ReferencedSeriesInstanceUID">
562                  <Value number="1">1.2.250.1.59.40211.789001276.14556172.68856</value>
563          </DicomAttribute>
564          <DicomAttribute Tag="0008XXX5" VR="SQ" Keyword="ReferencedSOPClassSequence">
565            <Item number="1">
566            <DicomAttribute Tag="00081150" VR="UI" Keyword="Referenced SOP Class UID">
567          <Value number="1">1.2.840.10008.5.1.4.1.1.4</value>
568          </DicomAttribute>
569            <DicomAttribute Tag="0008XXX6" VR="SQ" Keyword="ReferencedSOPInstanceSequence">
570              <Item number="1">
571              <DicomAttribute Tag="00081155" VR="UI" Keyword="ReferencedSOPInstanceUID">
572                <Value number="1">1.3.12.2.1107.5.99.3.30000012031310075961300000060</value>
573              </DicomAttribute>
574              <Item number="2″>
575              <DicomAttribute Tag="00081197" VR="UI" Keyword="FailureReason">
576                <Value number="2">274</value>
577              </DicomAttribute>
578            </DicomAttribute>
579          </DicomAttribute>
580        </DicomAttribute>
```

```
581        </DicomAttribute>
582      </NativeDicomModel>
583
584
```

585 | ***Update Table H-1 Resources and Methods*** |
|---|

586   **H   Capabilities Description**

587 …

588 **Table H-1. Resources and Methods**

Service	Resource	Transactions	Reference
Studies (see Section 10.1.1)			
	studies	Search for Studies	Section 10.6
		Store Instances	Section 10.5
	{StudyInstance}	Retrieve Study	Section 10.4
		Store Study Instances	Section 10.5
	metadata	Retrieve Study Metadata	Section 10.4
	series	Search for Study Series	Section 10.6
	{SeriesInstance}	Retrieve Series	Section 10.4
	metadata	Retrieve Series Metadata	Section 10.4
	instances	Search for Study Series Instances	Section 10.4
	{SOPInstance}	Retrieve Instance	Section 10.4
	metadata	Retrieve Instance Metadata	Section 10.4
	frames	N/A	N/A
	{framelist}	Retrieve Frames	Section 10.4
	instances	Search for Study Instances	Section 10.6
	series	Search for Series	Section 10.6
	{SeriesInstance}	N/A	N/A
	{instances}	Search for Instances	Section 10.6
	instances	Search for Instances	Section 10.6
	{BulkDataReference}	Retrieve Bulkdata	Section 10.4
Worklist (see Section 11.1.1)			
	workitems	Search for Workitem	Section 11.9
		Create Workitem	Section 11.4
	{Workitem}	Retrieve Workitem	Section 11.4
		Update Workitem	Section 11.6
	state	Change Workitem State	Section 11.7
	cancelrequest	Request Workitem Cancellation	Section 11.8

	subscribers	N/A	N/A
	{AETitle}	Subscribe	Section 11.10
		Unsubscribe	Section 11.11
	1.2.840.10008.5.1.4.34.5	N/A	N/A
	subscribers	N/A	N/A
	{AETitle}	Subscribe	Section 11.10
		Unsubscribe	Section 11.11
	suspend	Unsubscribe	Section 11.11
	1.2.840.10008.5.1.4.34.5.1	N/A	N/A
	subscribers	N/A	N/A
	{AETitle}	Subscribe	Section 11.10
		Unsubscribe	Section 11.11
	suspend	Suspend Worklist Subscription	Section 11.11
Non-Patient Instance (see Section 12.1.1)			
	color-palettes	N/A	N/A
	{uid}	Retrieve	Section 12.4
		Store	Section 12.5
		Search	Section 12.6
	defined-procedure-protocol	N/A	N/A
	{uid}	Retrieve	Section 12.4
		Store	Section 12.5
		Search	Section 12.6
	hanging-protocol	N/A	N/A
	{uid}	Retrieve	Section 12.4
		Store	Section 12.5
		Search	Section 12.6
	implant-templates	N/A	N/A
	{uid}	Retrieve	Section 12.4
		Store	Section 12.5
		Search	Section 12.6
	inventories	N/A	N/A
	{uid}	Retrieve	Section 12.4
		Store	Section 12.5
		Search	Section 12.6
Storage Commitment Requests (see Section X.1.1)			
	commitment-requests	**Request**	**Section X.4**
		Result Check	**Section X.5**

589

---

590   *Add new Annex J Storage Commitment Modules*

591   **J**   **Storage Commitment Modules**

592 **J.1**   **Storage Commitment Request Module**

593 Table J.1-1 specifies the Attributes of the Storage Commitment Request Module.

594

Table J.1-1. Storage Commitment Request Module

Attribute Name	Tag	Type	Attribute Description
Referenced SOP Sequence	(0008,1199)	1C	The SOP Instances for which storage commitment is requested. One or more Items shall be included in this Sequence. Required if the Referenced Study Sequence (0008,1110) is absent.
>*Table 10-11 "SOP Instance Reference Macro Attributes" in PS3.3*			
Referenced Study Sequence	(0008,1110)	1C	The Studies containing Instances for which storage commitment is requested. One or more Items shall be included in this Sequence. Required if the Referenced SOP Sequence (0008,1199) is absent.
>Study Instance UID	(0020,000D)	1	Uniquely identifies the referenced Study.
>Referenced Series Sequence	(0008,1115)	1	The Series containing Instances for which storage commitment is requested. One or more Items shall be included in this Sequence.
>>Series Instance UID	(0020,000E)	1	Uniquely identifies the referenced Series.
>>Referenced SOP Class Sequence	(0008,xxx1)	1	The SOP Class for which storage commitment of specified SOP Instances is requested. One or more Items shall be included in this Sequence.
>>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.
>>>Referenced Instance Sequence	(0008,114A)	1	The SOP Instances for which storage commitment is requested. One or more Items shall be included in this Sequence.
>>>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.

595

596 **J.2 Storage Commitment Reply Module**

597 Table J.2-1 specifies the Attributes of the Storage Commitment Response Module.

598

Table J.2-1. Storage Commitment Response Module

Attribute Name	Tag	Type	Attribute Description
Referenced SOP Sequence	(0008,1199)	1C	The SOP Instances for which storage has been committed. Required if the request payload contained the Referenced SOP Sequence (0008,1199), and there is at least one SOP Instance in that supplied sequence for which storage has been committed.
>*Table 10-11 "SOP Instance Reference Macro Attributes" in PS3.3*			
Failed SOP Sequence	(0008,1198)	1C	The SOP Instances for which storage has not been committed. Required if the request payload contained the Referenced SOP Sequence (0008,1199), and there is at least one SOP Instance in that supplied sequence for which storage has not been committed.
>*Table 10-11 "SOP Instance Reference Macro Attributes" in PS3.3*			
>Failure Reason	(0008,1197)	1	The reason that storage commitment could not be provided for this SOP Instance. See PS3.3, section C.14.1.1 for possible values.
Referenced Study Sequence	(0008,1110)	1C	The Studies containing Instances for which storage has been committed. Required if the request payload contained the Referenced Study Sequence (0008,1110), and there is at least one SOP Instance for which storage has been committed
>Study Instance UID	(0020,000D)	1	Uniquely identifies the referenced Study.
>Referenced Series Sequence	(0008,1115)	1	The Series containing Instances for which storage has been committed.
>>Series Instance UID	(0020,000E)	1	Uniquely identifies the referenced Series.
>>Referenced SOP Class Sequence	(0008,xxx1)	1	The SOP Class for which storage of specified SOP Instances has been committed.
>>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.
>>>Referenced Instance Sequence	(0008,114A)	1	The SOP Instances for which storage has been committed.
>>>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.

Failed Study Sequence	(0008,xxx2)	1C	The Studies containing Instances for which storage commitment has been rejected. Required if the request payload contained the Referenced Study Sequence (0008,1110), and there is at least one SOP Instance in that supplied sequence for which storage has not been committed.
>Study Instance UID	(0020,000D)	1	Uniquely identifies the referenced Study.
>Referenced Series Sequence	(0008,1115)	1	The Series containing Instances for which storage commitment has been rejected.
>>Referenced Series Instance UID	(0020,000E)	1	Uniquely identifies the referenced Series.
>>Referenced SOP Class Sequence	(0008,xxx1)	1	Per SOP Class, the Instances for which storage commitment has been rejected.
>>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.
>>>Referenced Instance Sequence	(0008,114A)	1	The SOP Instances for which storage commitment has been rejected.
>>>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.
>>>>Failure Reason	(0008,1197)	1	The reason that storage commitment could not be provided for this SOP Instance.

599

600

601 **Changes to NEMA Standards Publications PS 3.2**

602 | *Add new subsection to N.1.3.* |
| :-- |

603 # N   DICOM Conformance Statement Template (Normative)

604 …

605 **N.1   Overview**

606 …

607 **N.1.3   DICOM Web Services**

608 …

609 **N.1.3.x   Storage Commitment Service**

610 Table 0-1 lists details on the support of the Storage Commitment Service.

611 *[Complete Table 0- to indicate support for the Storage Commitment Web Service]*

612 **Table 0-x1 Storage Commitment Service**

Service	Transaction	Resource	User Agent	Origin Server
Storage Commitment Service	*Request*	commitment-requests		
	Result Check	commitment-requests		

613

614

615 | *Add a new subsection on the Storage Commitment Service to section N.5.3 Supported DICOM* |
616 | *Web Services* |
| :-- |

617 **N.5   Service and Interoperability Description**

618 …

619 **N.5.3   Supported DICOM Web Services**

620 …

621 **N.5.3.x   Storage Commitment Web Service**

622 This section provides details regarding the Storage Commitment Web Service. For an overview of sup-
623 ported Transactions and resources see Table 0-xx1 Storage Commitment Service.

624 **N.5.3.x.1   Request Transaction – Storage Commitment Service**

625 **N.5.3.x.1.1   User Agent**

626 The Request Transaction user agent can request resources listed in Table N.5-xx1.

627 *[List the supported resources for your Storage Commitment Request Transaction user agent. Remove the non-sup-*
628 *ported resources rows. Fill in information on your implementation in the Comments column when necessary.]*

629

Table N.5-xx1: Resources Request Transaction – User Agent

Resource	Comments
	See resource path in section X.1.1 in PS3.18
commitment requests	

630

631 The Request Transaction user agent supports Header Fields listed in Table N.5-xx2.

632 *[List the supported Header Fields and their supported Values. Fill in information on your implementation in the "Com-*
633 *ments" column when necessary.]*

634

Table N.5-xx2: Header Fields for Request Transaction – User Agent

Header Field	Supported Values	Comments
Content-Type	application/dicom+json application/dicom+xml multipart/related; type="application/dicom+json" multipart/related; type="application/dicom+xml"	
Content-Length		*[If Content-Encoding is not present]*
Content-Encoding		*[If Content-Length is not present]*

635

636 **N.5.3.x.1.2   Origin Server**

637 The Request Transaction origin server receives POST requests for storage commitment of the referenced
638 SOP Instances.

639 The user agent specifies the Target Resource as part of the URI and specifies the UIDs of the SOP In-
640 stances as part of the data in the request body with a proper Content-Type (i.e. XML or JSON).

641 The URI is composed by a Base URI: See Base URI for the origin server in Section N.6.3.x.

642 The Request Transaction origin server supports resources listed in Table N.5-xx3.

643 *[Fill in information on your implementation in the Comments column when necessary.]*

644

Table N.5-xx3: Resources Request Transaction – Origin Server

Resource	Comments
	See resource path in section X.1.1 in PS3.18
commentment requests	

645

646 The Request Transaction origin server supports Header Fields listed in Table N.5-xx4.

647 *[List the supported Header Fields and their supported Values. Fill in information on your implementation in the "Com-*
648 *ments" column when necessary.]*

649

Table N.5-xx4: Header Fields for Request Transaction – Origin Server

Header Field	Supported Values	Comments
Content-Type	application/dicom+json	

	application/dicom+xml multipart/related; type="application/dicom+json" multipart/related; type="application/dicom+xml"	
Content-Length		*[If Content-Encoding is not present]*
Content-Encoding		*[If Content-Length is not present]*

650

N.5.3.x.2   Result Check Transaction – Storage Commitment Service

N.5.3.x.2.1   User Agent

The resources and header fields supported by the user agent for the Result Check Transaction are the same as for the Request Transaction; see section N.5.3.x.1.1.

N.5.3.x.2.2   Origin Server

The Result Check Transaction origin server receives GET requests to check whether there is a result for a storage commitment request.

The Base URI, resources and header fields supported by the origin server for the Result Check Transaction are the same as for the Request Transaction; see section N.5.3.x.1.2.

Add a new subsection on the Storage Commitment Service to section N.6.3 Configuration of DICOM Web Services.

---

662   …

N.6   Configuration

664   …

N.6.3   Configuration of DICOM Web Services

666   …

N.6.3.x   Storage Commitment Service Configuration

N.6.3.x.1   Request Transaction Configuration

Table N.6-xx5 lists configuration parameters for the Request Transaction of the Storage Commitment Service:

[Remove the unsupported parameters from the local and remote configuration parameters.]

Table N.6-xx5: Request and Result Check Transaction Parameters

Local Configuration Parameters – Request and Result Check Transaction			
Parameter	**Configurable**	**Default Value**	**Comments**
	<<USER SERVICE FIXED>>	*[If there is no default, leave blank]*	*[Provide comments or Values/ranges if applicable]*
Commit local Origin Server URL (Base URI)	*FIXED*	*http://<hostname>:<port>/commit*	
Port	*SERVICE*	8081	

Secured Commit local Origin Server URL (Base URI)	*SERVICE*		
Secured Port	*SERVICE*		
Result Availability Duration	*FIXED*	*24*	The number of hours that the storage commitment request result is guaranteed to be retrievable from the origin server.
<Specific Commit Service parameter>			
Remote Configuration Parameters – Request and Result Check Transaction			
[Either document the number of supported remote hosts, e.g <Product> supports configuration of up to <X> remote hosts or state that there is no limitation other than the ones mandated by the operating system.]			
Parameter	**Configurable**	**Default Value**	**Comments**
	<<USER SERVICE FIXED>>	*[If there is no default, leave blank]*	*[Provide comments or Values/ranges if applicable]*
Commit remote Origin Server URL	*USER*		
Port	*USER*		
Secured Commit Remote Origin Server URL	*SERVICE*		
Secured Port	*SERVICE*		
Result Availability Duration	*FIXED*	*24*	The number of hours that the storage commitment request result is guaranteed to be retrievable from the origin server.
<Specific Commit Service parameter>			

673

N.6.3.x.2   Result Check Transaction Configuration

Table N.6-xx5 lists configuration parameters for the Result Check Transaction of the Storage Commitment Service.

Add a new subsection on the Storage Commitment Service to section N.7.3.3 DICOM Web Services.

N.7   Network and Media Communication Details

…

681 **N.7.3** **Status Codes**

682 …

683 **N.7.3.3** **DICOM Web Services**

684 …

685 **N.7.3.3.x** **Storage Commitment Service**

686 **N.7.3.3.x.1** **Request Transaction as Origin Server**

687 Table N.7-xx6 lists the Status Codes that an origin server supports for the Request Transaction of the
688 Storage Commitment Service and the condition in which any of the listed Status Codes is sent:

689 *[Describe below the condition in which the application sends the specific Status Codes in the Retrieve Transaction*
690 *response as origin server.]*

691 **Table N.7-xx6: Status Codes of Origin Server for Request Transaction**

Status	Code	Condition
Success	200 (OK)	The origin server finished processing the storage commitment request
	202 (Accepted)	The origin server has not finished processing the storage commitment request yet
Failure	400 (Bad Request)	The origin server cannot handle the storage commitment request because of errors in the request headers or parameters
	409 (Conflict)	The origin server cannot handle the storage commitment request because the provided transaction UID is already in use
	503 (Service Unavailable)	The origin server cannot handle the storage commitment request; this may be a temporal or permanent state

692

693 **N.7.3.3.x.2** **Request Transaction as User Agent**

694 Table N.7-xx7 lists the Status Codes that a user agent supports for the Request Transaction of the Stor-
695 age Commitment Service and the defines the application behavior, when encountering any of the listed
696 Status Codes:

697 *[Describe below the behavior of the application when it receives various Status Codes in the Retrieve Transaction*
698 *response]*

699 **Table N.7-xx7: Status Codes of User Agent for Request Transaction**

Status	Code	Behavior
Success	200 (OK)	Mark all SOP Instances for which the origin server committed safe storage as ready for deletion
	202 (Accepted)	Retry later to get the result of the request
Failure	400 (Bad Request)	Reformat the request to proper HTTP
	404 (Not Found)	Retry with another transaction UID
*	Any other code	Do further analysis

700

701 **N.7.3.3.x.3   Result Check Transaction as Origin Server**

702 Table N.7-xx8 lists the Status Codes that an origin server supports for the Result Check Transaction of
703 the Storage Commitment Service and the condition in which any of the listed Status Codes is sent:

704 *[Describe below the condition in which the application sends the specific Status Codes in the Retrieve Transaction*
705 *response as origin server.]*

706   **Table A.7-xx8: Status Codes of Origin Server for Storage Commit Result Check Transaction**

Status	Code	Condition
Success	200 (OK)	The origin server finished processing the storage commitment request
	202 (Accepted)	The origin server has not finished processing the storage commitment request yet
Failure	400 (Bad Request)	The origin server cannot handle the storage commitment request because of errors in the request headers or parameters
	409 (Conflict)	The origin server cannot handle the storage commitment request because the provided transaction UID is already in use
	503 (Service Unavailable)	The origin server cannot handle the storage commitment request; this may be a temporal or permanent state

707

708 **N.7.3.3.x.4   Result Check Transaction as User Agent**

709 Table N.7-xx9 lists the Status Codes that a user agent supports for the Result Check Transaction of the
710 Storage Commitment Service and the defines the application behavior, when encountering any of the
711 listed Status Codes:

712 *[Describe below the behavior of the application when it receives various Status Codes in the Retrieve Transaction*
713 *response]*

714   **Table N.7-xx9: Status Codes of User Agent for Storage Commit Result Check Transaction**

Status	Code	Behavior
Success	200 (OK)	Mark all SOP Instances for which the origin server committed safe storage as ready for deletion
	202 (Accepted)	Retry later to get the result of the request
Failure	400 (Bad Request)	Reformat the request to proper HTTP
	404 (Not Found)	Retry with another transaction UID
*	Any other code	Do further analysis

715
716

717   **Changes to NEMA Standards Publications PS 3.6**

718   ***Add the new attributes to table 6-1 of section 6.***

719 # 6   Registry of DICOM Data Elements

720 …

721
Table 6-1. Registry of DICOM Data Elements

Tag	Name	Keyword	VR	VM	
…	…	…	…	…	…
(0008,xxx1)	**Referenced SOP Class Sequence**	**ReferencedSOPClassSequence**	**SQ**	**1**	
(0008,xxx2)	**Failed Study Sequence**	**FailedStudyInstanceSequence**	**SQ**	**1**	
…					

722

723 **Changes to NEMA Standards Publications PS 3.15**

724 ***The new attributes need not be added to Table E.1-1 in section E.1.1, as they are never persisted.***