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MINUTES

MEETING NAME 09-WG33: WG-33 Data Archive and Management

MEETING PLACE/DIAL IN

DATE & TIME Wednesday, September 30, 2020 | 11:00 am – 12:30 pm US ET

PRESIDING OFFICERS Matthew Bishop, UnityPoint Health
Keith Eklund, Healthcare Tech Solutions

VOTING MEMBERS PRESENT

AAPM	Bevins, Nicholas
Ambra Health	Ostrow, Daniel
Argentix Informatix	Silver, Elliot
Canon/Vital Images	Dawson, Tim
Canon/Vital Images	Whitby, Jonathan
Change Healthcare	Ho, Kinson
DesAcc EMEA	King, Graham
Grafimedia	Georgiadis, Pantelis
Healthcare Tech Solutions	Eklund, Keith
Laitek, Inc.	Brown, Barry
Laitek, Inc.	Costea-Barlutiu, Razvan
Laitek, Inc.	Solomon, Harry
Mayo Clinic Rochester	Persons, Kenneth
Society for Imaging Informatics In Medicine	Bishop, Matthew
Society for Imaging Informatics In Medicine	Carey, Cheryl

OTHERS

DeJarnette Research Systems	Wineke, Steve
Hyland Software	Ullrich, Mike
London Health Science Center	Aizawa, Luiz

VOTING MEMBERS ABSENT	AAPM	Knazik, Shayna
	Canon Medical Research USA	O'Donnell, Kevin
	European Society of Radiology	Mildenberger, Peter
	GE Healthcare	Nichols, Steven
	GE Healthcare	Numan, Jouke
	Laitek, Inc.	Sluis, Douglas
	Mach7 Technologies	Ulanov, Alexey
	PixelMed Publishing	Clunie, David
	Society for Imaging Informatics In Medicine	Henson, Kyle
	Varian Medical Systems, Inc.	Schwere, Thomas

DICOM SECRETARIAT Anna Zawacki, SIIM

1 CALL TO ORDER AND REVIEW OF ANTI-TRUST RULES AND DICOM PATENT POLICY (Co-Chairs, Secretariat)

The meeting was called to order. Guidelines for Conducting NEMA Meetings were read and attendance was recorded.

2 REVIEW AND APPROVE AGENDA (Co-Chairs)

The agenda was reviewed and approved.

3 REVIEW MINUTES (Co-Chairs)

The minutes of the previous meeting will be reviewed and approved.

4 TOPIC ITEMS TO BE DISCUSSED (All)

Continue going through the Draft Supplement
ftp://d9-workgrps@medical.nema.org/MEDICAL/Private/Dicom/WORKGRPS/WG33/2020/2020-09-30/SupXXX_01_ArchiveInventoryIODandServices.docx

Open Issues / To Do

1	Referencing Files, File Sets, etc. – how to specify in Parts 10/11/12?	HS
2	How to specify matching keys for inventory?	RC
3	Count of inventory objects in set (n of m) – do we need to record 'm' in each object of set? How is it known before entire set is complete?	KH DO
4	PACS that manages multiple distributed archives (e.g., VNAs), but holds metadata updates itself (it proxies DIMSE/DICOMweb retrieves and applies updates) – how does it identify to migration client that metadata updates in inventory need to be applied when retrieving directly from VNA?	DO
5	Need required behavior for applying metadata updates to SOP Instances retrieved by non-DICOM protocol. (in Part 4 Annex I? – depends on approach to Pts 10/11/12)	HS
6	Do we need variable richness of metadata in inventory (e.g., additional Instance level attributes)? Can one size fit all, or do we need a few sizes, or totally variable?	
7	For inventory divided into multiple SOP Instances (for creator performance with enormous data sets), do we need a meta-inventory of inventory objects?	
8	What topics should be included in an informative Pt17 Annex?	

#1 still open, not addressed yet with a draft proposal
#2 Harry & Razvan have been having conversations about
#3 Kinson + Daniel to work on
#4 Daniel – we'll get to it later
#5, 6, 7, 8 – have not been addressed yet

First element is instance creation date and time
Then content date and time – time in which the inventory was begun

Table C.YY.1-1 Inventory Module Attributes

Name	Tag	Type	Description
Instance Creation Date	(0008,0012)	1	With Instance Creation Time, time point at which the SOP Instance was created. See Section C.YY.1.1.1
Instance Creation Time	(0008,0013)	1	With Instance Creation Date, time point at which the SOP Instance was created. See Section C.YY.1.1.1
Content Date	(0008,0023)	1	With Content Time, time point at which the inventory was begun. See Section C.YY.1.1.1
Content Time	(0008,0033)	1	With Content Date, time point at which the inventory was begun. See Section C.YY.1.1.1

C.YY.1.1 Inventory Module Attributes

C.YY.1.1.1 Instance Creation Date and Time, Content Date and Time

Content Date (0008,0023) and Content Time (0008,0033) establish the time point at which the inventory was begun. Conceptually, all Studies received before this timepoint, and which match the specified Scope of Inventory key attributes, are included in the inventory, and all patient updates through this timepoint have been applied to inventoried Studies. Instance Creation Date (0008,0012) and Instance Creation Time (0008,0013) establish the time point at which the inventory was complete and encoded in the current Inventory SOP Instance.

Production of the inventory may take considerable time (the period between Content Date and Time and Instance Creation Date and Time) during which period the storage system may be actively receiving new studies and updates. The status of such new studies and updates, e.g., whether they are wholly, partially, or not included in the inventory, is implementation specific.

For instance creation date and time since they are long-running processes, there will be many values of that across the entire inventory, one for each instance that gets created as part of it, each instance may finish at a different time. They should all though have the same content date & time – make a note of that.

Requesting AE. Need to add a definition of what it is. – AE that initiated inventory.
It would be good to use this inventory at certain points in time, so institutions keep track of the data in a system in a standard format and maybe so some data mining on it. Consider doing this as a monthly checkpoint - a good safety practice.

Next item – Inventory Group UID Number and Total Number

Requesting AE	(0008,0Fx1)	1C	Required if inventory creation initiated by DICO Storage Management Service; may be present otherwise (e.g., to record AE Title of storage system that auto-generated inventory)
Inventory Group UID	(0008,0Fx2)	1	UID of the group of Inventory SOP Instances created by, and fulfilling, a transaction that initiated of the inventory. See Section C.YY.1.1
In-Group Number	(0008,0Fx3)	1	Identifier for this SOP Instance within Inventory Group. See Section C.YY.1.1.3
Inventory Group Total Number	(0008,0Fx4)	1	The number of SOP Instances sharing the sam Inventory Group UID. See Section C.YY.1.1.3
Referenced Study Sequence	(0008,1110)	1	Sequence of Studies whose attributes match th Scope of Inventory

The only way that we can get to the total number is at end. So either you have to go through to the end and then update all the instances that you have created as part of closing off the inventory OR we need some sort of meta inventory (if we want to track a total count) that we write out at the end, DICOMDIR of inventories: his inventory was completed and here is the total instance count.
Strike through –Inventory Group Total Number.

C.YY.1.1.3 Inventory Group UID, In-Group Number, and Inventory Group Total Number

For implementation specific reasons (such as practical limits on the maximum size of an individual SOP Instance) the content of an inventory may need to be split into more than one SOP Instance. A single Inventory Group UID (0008,0Fx2) value is assigned to all such SOP Instances created from a single initiation of inventory creation. Inventory Group Total Number (0008,0Fx4) specifies the total number of SOP Instances in the Inventory Group. In-Group Number (0008,0Fx3) is a unique identifier for this SOP Instance within the Inventory Group; within the Inventory Group, one SOP Instance shall have In-Group Number value of 1, and subsequent Instances shall have values monotonically increasing by 1.

Note

This use is similar to the Concatenation UID, In-concatenation Number, and In-concatenation Total Number used for very large multi-frame images (see section 7.5.1 and C.7.6.16)

If inventory creation was initiated by a transaction of the DICOM Inventory Initiation SOP Class, the value of Inventory Group UID may be set to the Transaction UID of the N-ACTION Request (see PS3.4 Section ZZ.2.2).

Next we get into the List of Studies.

Study			
>Instance Coercion DateTime	(0008,0015)	1	Datetime of last update to Study metadata
>Modalities in Study	(0008,0061)	1	Modality values for all Series in Study, without duplicates
>Metadata Update Flag	(0008,0Fx5)	1	Patient or study attributes coerced/updated afte study stored. Indicates stored instance accessible through Media Storage Service and specified pathname may have out-of-date metadata. See C.YY.1.2.2 Enumerated Values: Y N
>Not For Clinical Use Flag	(0008,0Fx6)	1C	Indicator that Study is not valid for clinical use. Required if referenced study is not to be used f clinical purposes. See C.YY.1.2.3
>Study Instance UID	(0020,000D)	1	Unique identifier for the Study
>Study ID	(0020,0010)	2	User or equipment generated Study identifier
>Study Date	(0008,0020)	2	Date the Study started
>Study Time	(0008,0030)	2	Time the Study started
>Study Description	(0008,1030)	2	description or classification of the Study performed
>Procedure Code Sequence	(0008,1032)	3	the type of procedure performed. One or more Items are permitted in this Sequence.

No requirement today that one inventory object will have the full study in it?
Potentially for one particular study, it depends how the source created this inventory object, Study itself may be broken up into multiple inventory objects.

Presumption – study would be complete within one inventory object.
This may not be correct. Study may span multiple objects.
Metadata update flag when you do a catchup – will the inventory produce complete studies or only those things that changed. If the latter, by default, the inventory won't contain everything, but only what changed in the study.
Or is it a complete re-representation of the study?

Added to open items – How to describe study whose inventory is split across multiple inventory SOP instances? Is it allowed?
If after inventorying an individual study but before the inventory completes a new image for that study comes in, what is the behavior?
Logically system will create full study content within one inventory object, but it may not always be the case. State that its most of the time, but not always so false assumptions won't be made that it's always the case.
Content date & time – is that an attribute of the return entries in the inventory rather than top level? Or maybe we need them at both levels.
Can a binary tag be created just to inform that study was already created? It's an option
Simplest solution – when a group of objects represented by a study gets inventoried, we cut it off and say you should not retrospect that study as part of the inventory.
Refresh or catchup – use top level content date & time for that.

Modalities in Study - Why do we need that aggregate?
There is a utility to it. Allows us to do searches same way we do CFIND queries.

Next element is the Metadata Update Flag
The system needs to know what is stored in the storage and what has been updated. If you don't know, you always set it to true. Is it useful to have this? How does it differ from instance coercion date/time? Use the flag, if present, or the date, if present, to say – you can move the files in state as is without having to worry their data being wrong, gives a consumer a shortcut path to get stuff that has not changed, knowing it hasn't.

How likely are we to have bad implementations with this? we may have many that this becomes useless.
At minimum – don't put metadata update flag as type 1.
In the absence of the attribute you need to go and update the object. Absence is equal to true as is defined now.

>Not For Clinical Use Flag	(0008,0Fx6)	1C	Indicator that Study is not valid for clinical use. Required if referenced study is not to be used f clinical purposes. See C.YY.1.2.3
>Study Instance UID	(0020,000D)	1	Unique identifier for the Study
>Study ID	(0020,0010)	2	User or equipment generated Study identifier
>Study Date	(0008,0020)	2	Date the Study started
>Study Time	(0008,0030)	2	Time the Study started
>Study Description	(0008,1030)	2	description or classification of the Study performed
>Procedure Code Sequence	(0008,1032)	3	the type of procedure performed. One or more Items are permitted in this Sequence.

C.YY.1.2.3 Not For Clinical Use Flag

The Not For Clinical Use Flag (0008,0Fx6) attribute is defined at the Study, Series, and Instance levels. If present, it indicates the Study, Series, or Instance is not appropriate for clinical or diagnostic use, although it may be retained in the storage system for other reasons (e.g., for audit of patient radiation exposure).

Notes

1. The Type 1C conditionality means the attribute shall not be present if the study or instance is valid for clinical use (see PS3.5 Section 7.4.2).
2. Studies, Series, or Instances marked Not For Clinical Use typically do not appear in Query/Retrieve responses, but records of them do appear in Inventory SOP Instances.
3. Studies, Series, or Instances might be marked Not For Clinical Use by actions associated with the processing of specific Key Object Selection SOP Instances, e.g., in accordance with IHE Radiology IOCM Profile. Those Key Object Selection SOP Instances, and their Series, may themselves be marked as Not For Clinical Use.

Defined Terms include code values from DCM coding scheme (PS3.16 Annex D), but here they are used as Code Strings defined for this attribute (without a Coding Scheme identifier). The Defined Terms are:

Who makes the decision about not for clinical use? It's that we can capture things like IOCM updates, things that are done manually through the PACS UI, i.e. deletion, flag to gather that info.
Study level attribute. Actually, it's at all levels. Allows you to use the IOCM codes.
Are we in DICOM defining what's the expected behavior? It's defined in IHE. We are not defining anything in DICOM just capturing what the PACS knows about the object/study.

Anatomic Regions in Study Code Sequence

C.YY.1.2.8 Anatomic Regions in Study Code Sequence

The Anatomic Regions in Study Code Sequence (0008,0063) consolidates all values of Anatomic Region Sequence (0008,2218) and Body Part Examined (0018,0015) in the SOP Instances of this Study. The values of Body Part Examined shall be transcoded to their SNOMED CT equivalent value, using the tables of **Annex L "Correspondence of Anatomic Region Codes and Body Part Examined Defined Terms" in PS3.16**.

In the query retrieve model, it is one of the tags specifically called out as optional
Technically speaking the anatomic region study code sequences should include or be a roll up of body part examined and anatomic region
Is there a convenient subset of tags that we can say a vast majority of PACS on the market have in their information model – and just target those.

>Retrieve AE Title	(0008,0054)	1C	AE Title from which referenced study may be retrieved Required if Retrieve URL (0008,1190) is not present. May be present otherwise.
>Retrieve URL	(0008,1190)	1C	DICOMweb RS Origin Server from which referenced study may be retrieved Required if Retrieve AE Title (0008,0054) is not present. May be present otherwise.
>Stored Instance Root URI	(0008,0FxA)	1C	First part of URI for accessing SOP Instances within the study through a non-DICOM protocol See C.YY.1.2.5. Required if Folder Pathname (0008,0FxB) or File Pathname (0008,0FxC) are present within this Sequence Item (including in subsidiary Sequence attributes)

C.YY.1.2.5 Stored Instance Root URI

If some or all of the stored SOP Instances of the Study are in the DICOM File Format accessible through a non-DICOM protocol, the Stored Instance Root URI (0008,0FxA) contains the protocol, server address, and optionally the common part of the resource identifier shared by all the SOP Instances. This root URI is concatenated with Folder and/or File Pathnames to provide the full access URI.

Note

For instance, the Stored Instance Root URI value may be nfs://pacs.exampleinstitution.org/study-JZ0078555/, which when combined with a File Pathname 2.25.916804767294.dcm gives a URI to access a SOP Instance through the Network File System protocol.

How are we defining our well-known and accepted protocol schemes as the head of that URI? Good question - needs to be added to the TO DO List.
Well-know – NFS, SNB, HTTP
Do we want to restrict to IANA-defined schemes only? Vote Yes
Then there are things like S3, another layer on top of HTTP – how do we want to specify/include/or not include those?
Only HTTP endpoint called out differently is DICOMweb
Authentication authorization parameters – Daniel to write up a section on this

5 OLD BUSINESS

6 NEW BUSINESS

7 Adjourn: 12:30PM ET.

8 DATE AND TIME OF NEXT MEETINGS (Secretariat)

- Continue T-con meetings bi-weekly for the time being
- Next call is October 14, 2020 between 11:00 am and 12:30 pm ET

NEMALINK CODE	09-WG33
SUBMITTED BY	Hull, Carolyn
SUBMITTED ON	11/16/20
LEGAL APPROVAL	Peter Tolsdorf, 11/23/2020
UPLOAD LOCATION	Enter upload location.