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MINUTES

MEETING NAME	09-WG33: WG-33 Data Archive and Management	
MEETING PLACE/DIAL IN		
DATE & TIME	Wednesday, February 17, 2021 | 11:00 am – 12:30 pm US ET	
PRESIDING OFFICERS	Matthew Bishop, UnityPoint Health	
	Keith Eklund, Healthcare Tech Solutions	
VOTING MEMBERS PRESENT	ACR	Maldonado, Josh
	Argentix Informatix	Silver, Elliot
	DesAcc EMEA	King, Graham
	Grafimedia	Georgiadis, Pantelis
	Healthcare Tech Solutions	Eklund, Keith
	Laitek, Inc.	Brown, Barry
	Laitek, Inc.	Solomon, Harry
	Society for Imaging Informatics In Medicine	Bishop, Matthew
OTHERS	Laitek, Inc.	Behlen, Fred
VOTING MEMBERS ABSENT	AAPM	Bevins, Nicholas
	Ambra Health	Ostrow, Daniel
	Canon Medical Research USA	O'Donnell, Kevin
	Canon/Vital Images	Dawson, Tim
	Canon/Vital Images	Whitby, Jonathan
	Change Healthcare	Ho, Kinson
	European Society of Radiology	Mildenberger, Peter
	GE Healthcare	Nichols, Steven
	GE Healthcare	Numan, Jouke

Laitek, Inc.	Costea-Barlutiu, Razvan
Laitek, Inc.	Sluis, Douglas
Mach7 Technologies	Ulanov, Alexey
Mayo Clinic Rochester	Persons, Kenneth
PixelMed Publishing	Clunie, David
Society for Imaging Informatics In Medicine	Carey, Cheryl
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.

3 REVIEW MINUTES (Co-Chairs)

The minutes of the previous meeting were reviewed.

4 TOPIC ITEMS TO BE DISCUSSED (All)

- Meta-inventory proposal

  ftp://d9-workgrps@medical.nema.org/MEDICAL/Private/Dicom/WORKGRPS/WG33/2021/2021-02-17/meta-inventory-r3.pptx

- Draft#19 of Supp 223

ftp://d9-workgrps@medical.nema.org/MEDICAL/Private/Dicom/WORKGRPS/WG33/2021/2021-02-17/Sup223_19_InventoryIODandServices.docx

Some decisions made last week were rolled into Draft 19 of the Supplement 223 – see link above.

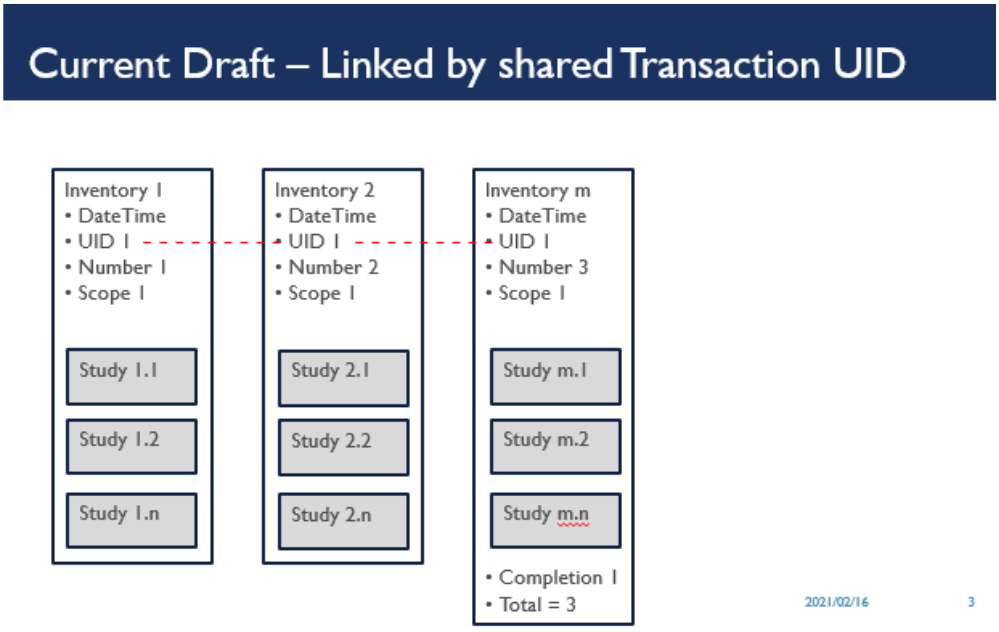
In the inventory at the instance level – put in file access sequence that allows multiple URIs to access an instance as a file (on different servers or different transfer syntaxes). Text associated with it reviewed. Addressing multiple paths to the file.

Another change was inventory study sequence removed the requirement that study only be recorded once – given study can appear multiple times, items may have different content.

Base URI – moved the base URI to the series level but am changing it to in Draft 20, you could define base URI at the study, series level, if you have a relative path you just go to find whatever the appropriate base URI is.

Added instance availability – at the study, series and instance levels. See Instance Availability defined under C.YY.1.2.9, line 567-579.

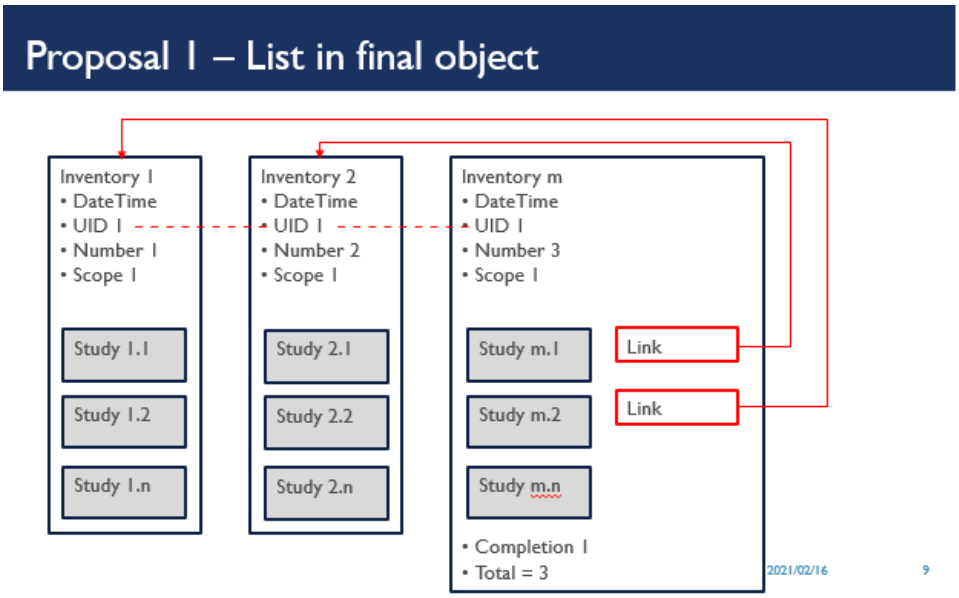
Meta-inventory discussion



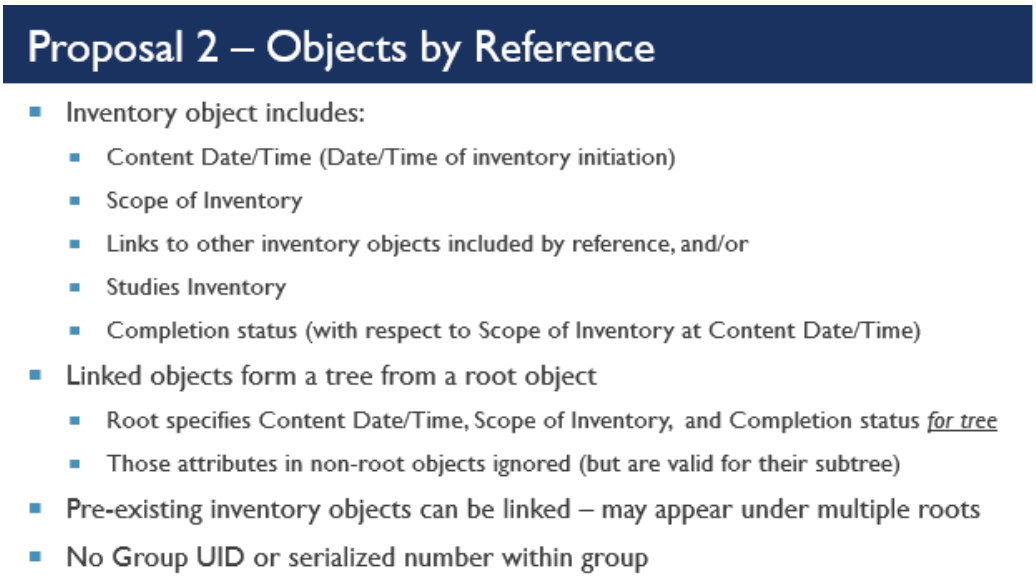
Multiple objects that constitute the inventory, they are associated/ linked by having the same transaction UID, but there is no place where you get the full list of what the

objects are. You have to look for the last object that has the completion flag for the scoped specified, and it tells you how many objects are there, and you have to go and find them.
We have now removed the requirements on study appearing only once.
Last time we discussed the 2 most viable approaches. Harry drew diagrams for both.

Proposal 1



Just keep things as we define them but in the last object put in links to the other objects in the inventory group.



Will include all the usual things + links to other inventory objects included by reference, and/or studies inventory.

Basic Structure

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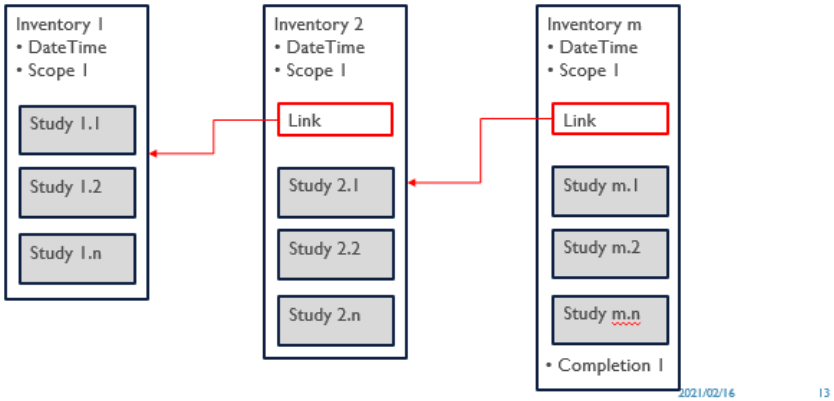
Serial production – last object becomes root



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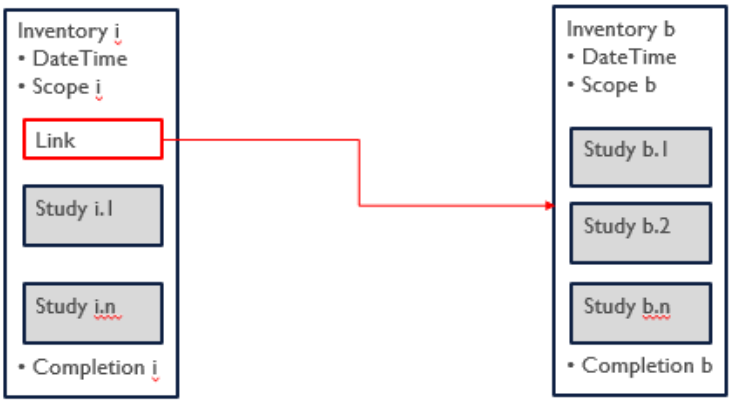
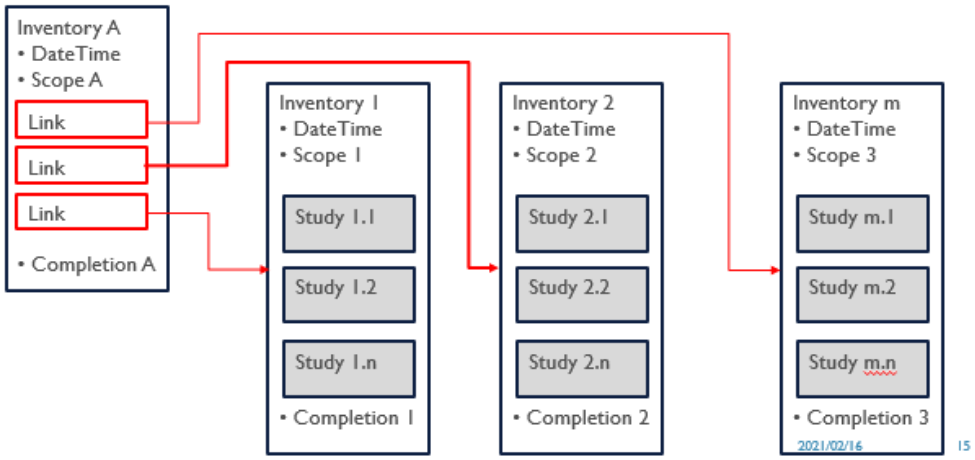
So, if you are producing an inventory, you can create an inventory object and start adding studies to it. If you run out of room for whatever implementation reasons and want to start another object, start another object, link back to the prior object, add in its studies, and if you run out of room again – you repeat this process.
In this case the last object is now a root of the tree that includes the entire inventory
When it's done it sets its completion flag in the last object you were working on.

Baseline plus Incremental Inventory – like serial production, but baseline complete WRT its scope



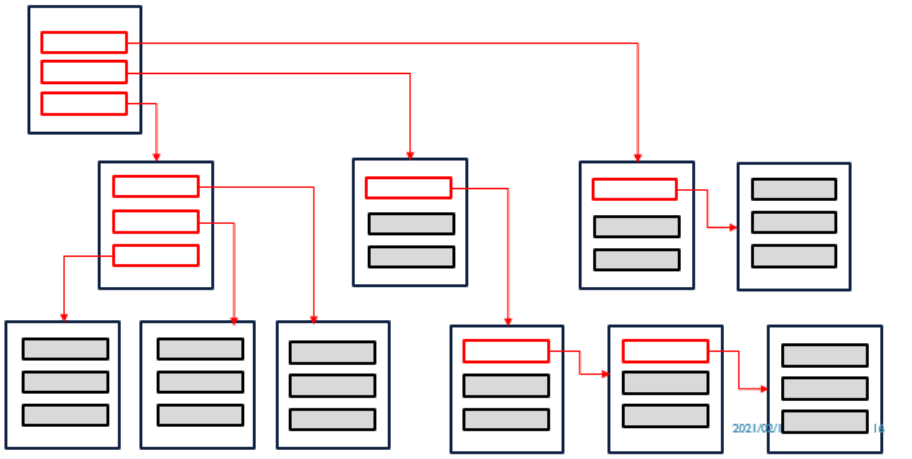
When you have a baseline inventory and you want to produce monthly inventory, you can do it with an incremental inventory that has the scope and links back to the baseline. Some of the studies may have been updated and they will appear in the new inventory, has a completion flag say – we are complete with respect to our scope.

Distributed Inventory and Aggregation



If you want to have a distributed inventory you can have each of your subsystems do its own inventory and have a top-level inventory that just aggregates by linking to those subsystem specific inventories, each inventory can have a completion flag with respect to its own scope.

Arbitrary tree



By doing this you can have an arbitrary tree of inventory objects.
And you can construct it by a variety of methods and allows a lot of flexibility to the implementor to be able to efficiently create inventories according to its system architecture.

Handling multiple records of same study

- Study may appear multiple times in tree
- Several possible causes for different record content
  - Study divided between to two storage subsystems (each inventorying its own data)
  - Study replicated to two storage subsystems
  - Study changed during the production of the inventory (e.g., baseline and increment)
- Ultimately up to client to decide how to handle
  - Each subsystem simply reports what it knows about the contents of its repository
- Inventory objects give sufficient context for client to make decisions
  - Inventory Date/Time for each study record
  - Context (e.g., repository subsystem or partition name)

The client has to be able to reconcile multiple records of the same study. To support that the inventory object needs to give sufficient data to make those decisions, including date time when the study was created and the context of what repository system it's in.

Next node, list, or hierarchical subtree links

- Link can minimally be to next node in tree
  - User can navigate tree of inventory objects - but requires opening every object in tree
- Link could also include additional list of all directly or indirectly referenced objects in subtree
- Link could include hierarchical structure of subtree links
- Applies to all reference links
  - Inclusion by reference link in Inventory
  - Inventory Creation N-EVENT REPORT response link to root object
  - Inventory C-FIND response link to root object

IOD structure for link to next level inventory

Included Inventory Sequence	One or more Items
>SOP Class UID	
>SOP Instance UID	
>Retrieve AE Title	For DIMSE Q/R
>Retrieve URL	For DICOMweb Q/R
>Base URI	For non-DICOM file access
>File Pathname	For non-DICOM file access
>Container File Type	For non-DICOM file access to ZIP or GZIP
>Filename in Container	For non-DICOM file access to ZIP or GZIP
>Stored Instance Transfer Syntax UID	
>Expiration Datetime	
>MAC Algorithm	For non-DICOM file access
>MAC	For non-DICOM file access

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Links to next node + list of subsidiary links

Links from referenced object added to referenced links list

If you want to do this as a list

IOD structure for link to next level inventory + list of subsidiary links

Included Inventory Sequence	One or more Items
>Include Table X "Inventory Reference Macro"	
>Referenced Inventory Sequence	One or more Items
>>Include Table X "Inventory Reference Macro"	

Table X. Inventory Reference Macro

SOP Class UID	
…	
MAC	

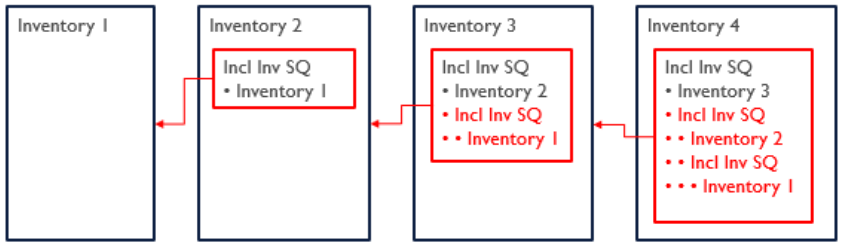
We could also do this as a hierarchical list same as we do in DICOM SR where the links become hierarchical.

IOD structure for arbitrary hierarchy of links (similar to DICOM SR mechanism)

Table X. Included Inventory Macro

Included Inventory Sequence	One or more Items
>SOP Class UID	
>…	
>Include Table X "Included Inventory Macro"	Recursive inclusion

Links with hierarchical structure of subtree links



Links structure from referenced object added in toto as subsidiary attribute

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We are not guaranteed that study records are unique, so we always have to just take the recent ones, especially when we start dealing with consolidation across orgs, where studies may have been forwarded to the tertiary facility.
Preference – hierarchical or list linking?
Group consensus – prefer hierarchical. It will go into Draft 20 of the Supplement.

Other Open issues
Containers – now gets handled by the ability to have the study inventory more than once.

Filepaths – agreed that we can have multiple paths, we can have different protocols, use or not use the base URI at any level, in any reference.

De-identification – not done anything, not clear we can or should do anything.

Patient matching demographics – haven't found any uses cases for additional demographics to be included in the inventory.

Scope of inventory and coding is a non-issue.

Physician roles – haven't heard anything for any other physician roles or whether we need them at all.

One thing WG6 was concerned about was just having a URI that says http and then S3, Azure – do we need to be more specific? Their concern was: you are going to have an implementation, you don't really give enough info how to handle that – my opinion is

that's all details, site specific how you are using AWS for your storage, what's your encryption mechanism, etc. Here are details we may not really be able to specify. Remember the use case here – you are transferring the entire archive, you are not giving a CD to someone, it's part of a big effort, can involve some negotiation of how things were stored, access, etc. part of a much larger effort than sticking a DVD in a drive.

Tape management – we have addressed it as much as we can.

Next effort will be to have Harry complete draft 20 and the group will look at it line by line.
WG-6 meets the week of March 21, so we have 2 more meetings to work with before the Supplement goes in front of them again.

5 OLD BUSINESS

6 NEW BUSINESS

7 DATE AND TIME OF NEXT MEETINGS (Secretariat)

- Continue T-con meetings bi-weekly
- Next call is March 3, 2021 between 11:00 am and 12:30 pm ET

NEMALINK CODE	09-WG33
SUBMITTED BY	Hull, Carolyn
SUBMITTED ON	2/24/21
LEGAL APPROVAL	2/25/21
UPLOAD LOCATION	Enter upload location.