

## MINUTES-v2

DICOM WG 10-Strategic Advisory  
Monday 30 September 2019, 0900 – 1600 (Bangkok local time)  
Bangkok, Thailand, Chatrium Hotel Riverside

*Secretary's note: Attendance roster was updated between v1 and v2. No other changes were made.*

### Presiding Officers

Kenneth Persons, User Co-chair, The Mayo Clinic  
Kevin O'Donnell, Producer Co-Chair, Canon Medical Research USA, Inc.  
Lisa Spellman, DICOM General Secretary, MITA

#### Voting Members Present

ADA  
B<>com  
Canon Medical Systems  
Carl Zeiss Meditec AG  
Fairhaven Technologies  
Laitek  
Mayo Clinic  
NVIDIA  
PixelMed  
Siemens Healthineers  
Univ. of Arkansas for Medical Sciences  
JIRA

#### Voting Members Not Present

ACR  
Agfa Healthcare  
Change Healthcare  
GE Healthcare  
Philips  
SIIM  
VISUS Health IT GmbH

#### Represented by

Trishul Allareddy (alt voting)  
Emmanuel Cordonnier  
Kevin O'Donnell  
Régis DeShayes  
Robert Horn (phone)  
Fred Behlen (phone)  
Ken Persons  
Brad Genereaux (phone)  
David Clunie  
Antje Schroeder (alt voting)  
Lawrence Tarbox  
Nakano Shinichi

#### Represented by

Charles Kahn, James Philbin  
Paul Siefert  
Elliot Silver  
No one named at this time  
Jeroen Medema  
Cheryl Kreider Carey

Marc Kaemmerer

#### Alternate Voting Members, Observers, Guests Present

Mayo Clinic	Fon Ngokkham (Guest)
Mahidol University	Pattanasak Mongkolwat
Mahidol University	Professor Dr. Peter Haddawy (Guest)
Mahidol University	Dr. Wudhichart Sawangphol (Guest)

## 1. Opening

- 1.1. Call to order and roll call.
- 1.2. Antitrust and patent guidelines review.
- 1.3. Agenda was reviewed and approved with a minor adjustment to move item #5 “WG 05\_NWIP\_Enhanced\_Directory + Shared\_Fileset to earlier in the meeting to accommodate time zone difference.
- 1.4. Minutes from F2F Rennes meeting, 5 April 2019 were approved with no changes.

## 2. Host welcome to Thailand

## 3. DICOM SWOT

### 3.1. Brief Call for Additions, Priority Escalations

- Kevin opened the SWOT document and noted that a full review of the SWOT is typically done at the first meeting of the year so after allowing for urgent additions or priority changes, the focus now will be on actions around the current priorities
- Suggested to move “Security” to the Threat section. This was accepted.
- Divergent profiling and Need for toolkits were moved down the Threat list
- “AI Buzz” was moved up the Opportunity list
- XML Edition Applications, Radiology “value”, and CDE were moved down the Opportunity list
- Add “Produce informative information about DICOMweb conformance” to the Opportunity list:

### 3.2. Review of Actions for Priority SWOT Items

- Review status of prior actions and plan new actions for SWOT items in the top 5 for their category.
- There was an extensive security-related discussion, details below.
- Discussed if WG-14 will make formal comments on NIST Framework and NSA Security Framework.
- Status: WG-14 co-chairs asked members (several times) about evaluating HIP and NIST Framework, but no responses received as of 2019-09-29.
- It was suggested that DICOM can be seen to be part of the solution or part of the problem
- Strategic Problem: vendors often don’t actively review and comment on these frameworks. And while DICOM can comment/handle DICOM protocol details, it is more up to MITA to comment on product design and features.
- Agreement that most current security issues are not a DICOM flaw. Often, the main problem is how end users choose to configure their systems – many are not done properly and thus, security issues arise, the most recent have been:
  - Simulated lesions (hackers making it appear as though lesions are present) took advantage of physical access to the device to insert an eavesdropping tool.
  - Open image servers on the internet with poor configuration choices allowing open access
- If DICOM is perceived as being insecure, it is problematic – who owns the responsibility for communicating? Depending on the details and the audience (End users, Vendors, Media) it could be up to DICOM or MITA or both.
- Ken commented that many end users’ older systems that have not implemented the DICOM security mechanisms. It would be very expensive to replace or upgrade those systems to ones that provide that support. End users have to conduct risk assessments and decide the real problems versus the media hype and come up with a plan and roadmap for improving the security in their imaging environments.

- The WG noted there are multiple frameworks: SIIM, MITA, NIST, NSA Framework.
- It was noted that an updated MDS2 is due to be released by MITA very soon – before early Oct 2019. Vendors will provide security information in the MDS2 for a product but will also need to include some security details in new sections of the updated DICOM Conformance Statement (DCS) template.
- Ken was asked, is there a recipe book to help end users, such as Mayo, to handle these kinds of issues? He indicated that at present there is not a cookbook that he is aware of listing the steps to secure your existing imaging enterprise, or how to ensure that the new imaging-related equipment that you are about to purchase supports the desired security features before you buy it. This would be helpful. There are focused initiatives, such as the recent effort by the National Cybersecurity Center of Excellence and NIST, to put together and publish information on securing PACS (NIST SP 1800-24) which should be informative.
- Issue of concern: DICOM has a lack of “cookbooks.” We need to produce an informative annex, white paper or “cookbook”
- It is felt that WG-27 is ignoring DICOM security protocol that is already in place. Does DSC have authority to require WG-27 to write a security whitepaper on DICOMweb? It is felt that such a resource would help end users understand how to handle web-based security. We would like to have someone in WG-27 to write an informative annex regarding how to address internet security include DICOM but broader.
- Lawrence noted that there is already a work item on the annex in development, but the problem is that there are not enough people to help with the writing in WG-14 or WG-27. There has been a lot of staff turnover in WG-14 & WG-27 so have lost people.
- Ideas for additional activities to improve security:
  - **1. Restart the MITA “Committee for the Advancement DICOM”** to handle calls for feedback (e.g. from NIST).
    - The Committee for Advancement was useful for projects on SR, presentation states, & media (CDs) before there was IHE
    - RT Video would benefit from such a committee
  - **2. Recruit academics:** We rarely take advantage of academics, let’s work to do more recruiting.
  - **3. Do a competition:**
    - **Possible topic:** “How to deploy DICOMweb using existing security controls” Here is how you could do X/Y and provide deployment examples
    - **Will need to decide** There will be issues with how to evaluate and such.
    - Should this be a joint project between MITA and DICOM?
- It was noted that Gunter’s project is close to what we need off the shelf
- We would also like to see a couple of demonstrations, to include:
  - Server
  - Toolkit DCMK
  - Client
  - Need a zero-footprint open source web server
- Also need an Open Source (OS) EMR simulator as a secure actor

**Proposed Project:** The following project was proposed (perhaps with SIIM, MITA & DICOM)

- Create a DICOMweb security demonstration project as outlined below.
- Assemble common Open Source DICOMweb actors (i.e., viewers (OHIF, WEASIS), toolkits (DCMTK) and servers (DCM4CHEE) and EMR simulators (?-TBD) to demonstrate using contemporary web security mechanisms for confidentiality (TLS), access control, authorization and authentication (of people & devices) (OAUTH2, OpenIDConnect).
- **Possible mechanism:** Reconstitute the Committee for the Advancement of DICOM (restart as a Task Group) under NEMA/MITA since need vendor(s) to lead (ideally) (possibly Kevin and Zack on MITA side, Rob Horn as possible PM)
- Address Cloud and mobile (DICOMweb designed to operate in those environments)
- Need an open source (OS) commercially viable solutions
- Funding: Scope the project and call on vendors to fund based on the benefit to them.
- Involve the MITA Cybersecurity Committee to show the vendors are active & involved.
- Project sounds similar to the NIST Cybersecurity Project Cybersecurity Center of Excellence
- A project manager is needed. WG-26 learned nothing happens without a project manager (Steve Moore has been doing)

**Goals / benefit / value:**

- This will help answer the question: How to scale DICOMWeb for large scale deployments, and for external access on the internet at large and internal access in a ZeroTrust Framework (internal as risky as external).

**<Action 1>:**

- 1a. WG-14 to spearhead. Lawrence to speak with Rob to see if he would be willing to draft a proposed statement of work (SOW).
- 1b. Wim said he would check into a possible resource at Philips to help.
- 1c. Lisa to speak with Stephen about history of The Committee for the Advancement of DICOM.
- 1d. Lisa and Lawrence to inform WG-10 on the outcome of these initial steps.

**4. WG-05\_NWIP\_Enhanced\_Directory + Shared\_Fileset**

- Fred Belen reviewed a presentation that he provided describing a proposal for an enhanced directory (DICOMDIR for image repositories) and the media format for a large, shared Fileset. The premise is that as time has passed, there are becoming some very large image repositories, and migrating them using the current DICOM methods is tedious and time consuming. The premise is also based on the fact that most image repositories (PACS, VNAs) do not update the file system (images themselves) as changes are made over time (e.g. patient last name changes, or a patient merge is processed) – rather they update the database that is managing the file system (PACS or VNA database). Then, when the images are retrieved, the information in the DICOM image header is updated just-in-time during the retrieval process. This proposal desires to define a standard enhanced directory and file set. The idea is that consumers (e.g. PACS or VNA migration, or any other image consuming application) could read the enhanced directory to get a list of current information, and then retrieve the associated file(s) from storage to create a correct/current version of the images. Fred cited multiple ways that this might be used – for example, in a PACS or VNA disaster recovery where the image data and enhanced directory was still accessible, a new application that understood the enhanced directory and file structure could begin using the data right away – not requiring an extensive downtime as the data was migrated to a new system. He

also indicated that it could be used to greatly shorten the time it takes to migrate of large image archives – perhaps not even requiring the images themselves to be migrated – if the target application could access the images directly.

- There was an extensive discussion about this proposal. There was recognition of the problem being addressed (time consuming migration of very large image repositories), however, there were concerns expressed with adding this new approach to transfer/access DICOM images. The concerns noted were:
  - Formalizing access to “bad” DICOM files (that were created internal to a system and contain incorrect header values not intended for external consumption) generates some serious issues around safety, data integrity, and the perceived validity of DICOM files
  - There are already multiple methods to access the data (DICOM DIMSE, DICOMweb). Much of the DICOM workflow/dataflow standards and vendor solutions (toolkits) are built around the use of these protocols (e.g. C-Store, C-Move, C-Find, STOW, WADO, storage commit, IAN’s, etc.). Adding another way to “come in thru the back door” and interact with the stored data would compromise much of that work and may in the end be a dis-service to the standard itself.
  - The concern that new applications might use the solution in a different way than it was intended.
  - The problem is a real problem, but is also a niche problem. Most of the data flows in clinical practice are able to use the existing DICOM standard tools just fine to accomplish their workflow needs.
  - The main concern expressed was compromising the standard itself. There are other ways to address the problem of large data migrations – using the existing toolsets.
  - Is this really a standards problem ?
- We appreciate the use case but is believed to be out of scope for DICOM.
- **Next steps:** Following the WG-10 discussion, the sponsor requested the item be tabled pending further internal discussion. May be resubmitted for the December 2019 RSNA meeting.

## 5. DICOM Austria status

- Brief overview: There is a DICOM User Community in Austria that refer to themselves as DICOM Austria. HL7 has national chapters. DICOM doesn’t do national chapters, rather keep international committees and endorse DICOM use globally.
- 1. Can DICOM Austria become a DICOM General Interest member?
  - Yes, as a user group of DICOM they have a valid interest in the Standard.
- 2. We would prefer they changed the name of their organization to avoid any confusion.

**<Action 2>** Lisa to inform Andreas and see if he wishes to contact them or Lisa will do so.

## 6. ISO Clinical Imaging Reference Standards Portfolio (RSP)

- Kevin provided a status update and review of document that will be going out for ISO DIS

**<Action item 3>**

3a. Lisa will request the current status, including publication schedule, for the RSP

3b. Kevin requested feedback on the document in today’s meeting folder and send directly to Kevin.

In particular, look at the adoption levels throughout (based on X.3)

2c. Send to specialty WGs to get input: 09-Ophthalmology WG-26 Pathology , 22 Dentistry -

**Action Item 4:** Luiza will send email addresses of those WG leadership to Kevin.

## 7. WG-04 Compression update – Request from JPEG on medical requirements for compression.

- David said he had sent an email to WG-04 and didn't receive any feedback
- IFCN may host a competition to get some ideas for stating compression needs, seeking OS solution
- WG-32 is working to develop a waveform for EEG and they are considering hosting a competition for compression codecs
- If the MFER people are interested, they would be welcome to submit

## 8. Imaging IT Security

### 8.1. SIIM Virtual Summit Update (Ken, Kevin)

- 7-8 October, two afternoons US Eastern time – focus is on Enterprise Imaging Security – considerations for developing a security strategy around the customers imaging environment – the tools available to use – and suggestions on getting started.
- Ken will be present Mayo Security Strategy; Duke and others also presenting
- Zack Hornberger (MITA) will speak about vendor/user shared responsibilities
- Mostly not DICOM-specific, however, could be presentation opportunity for SIIM 2020

### 8.2. TLS Implementation Initiative (Kevin)

- TLS implementations in products are limited
- Strategically, should DICOM do some work about driving end user uptake for TLS?
- It was noted that for many years there were some successful Connectathon testing outcomes, but not seem to have made it into products.
- Recently the NIST framework has proposed use of HIP (router-based network micro-segmentation approach) rather than TLS. Request WG-14 investigate HIP versus TLS and provide feedback and guidance.
- **Decision:** Return to this topic after review is completed.

### 8.3. DICOM response to Cylera

- Informative – documents are available on the DICOM website, DICOM in the News section
- In terms of ongoing process, does the DSC want involvement? Do they want to delegate to WG-14? Do we need to get approval from entire DSC? The move forward proposal is for WG-14 to proceed and vote to be taken in the DSC meeting.

8.3.1. <https://www.dicomstandard.org/dicom-in-the-news/>

8.3.2. <https://www.cvedetails.com/cve/CVE-2019-11687/>

### 8.4. Any other recent events to discuss?

- German Public Radio & ProPublica inquiry was also handled by WG-14
- It was noted that it would have been good for the researcher (and others) who identify open ports to notify those end users to facilitate remediation.
- <https://www.greenbone.net/en/unprotected-patient-data-on-the-internet-a-massive-global-data-leak/>
- The information in its raw form indicates this is not a DICOM issue, rather, problematic decisions by end users with their configuration.
- We don't see any gaps that need to be closed. However, similar issues will continue to arise. We are gathering the questions and continue to develop answers. At some point, consider working with SIIM or MITA since deployment/implementation is more in their wheelhouse.

**9. Review:** Basic Requirements of Communication and Conformance for Medical X-ray Image Equipment issued by China Food and Drug Administration, five (5) part series

- Action 3 from Nov 2018 DSC meeting and Action 2 from Rennes was a request for these to be reviewed by WG-06. WG-06 sent back to WG-10 and DSC for review.
- We don't do national DICOM documents. In brief, end users can.
- There were no matters of concern to DICOM found in these documents. China was encouraged in past interactions (Harry, Kevin) to put additional requirements on top of DICOM, but not contradict DICOM. They seem to have done so and may start to do some conformance testing. As a vendor/MITA question, they may wish to challenge some of the feature thresholds, but the document does not require violating DICOM so it is more of a trade association matter.
- We suggest that MITA continue to keep an eye on this.

**10. Collaboration projects**

- Action 1 from Rennes: Possible presentation/demonstration at SIIM 2020 (Ken)
- The SIIM virtual webinar on security – the two half-day webinars as mentioned.
- SIIM may have security sessions at the end of SIIM2020 – to be determined at SIIM retreat. They expect security will be raised as a topic, a chair will be identified, and content determined

**11. Secretariat/MITA Topics (Lisa)**

11.1. Status: DICOM Governance / Policies and Procedures update.

- Ballot and review are complete.
- Secretariat will post the DSC mark-up and clean versions and present at RSNA2019.

11.2 Status: Action item tracking tools across DICOM WGs, Jira, Confluence (Lisa, Luiza)

- Lisa and Luiza submitted an internal 2020 project to investigate DICOM tools, will include WG-10 and ExCom to help create planning and review documents, so more to come.

**12. Other strategic topics**

- No additional topics were raised.

**13. Old Business**

- No old business was presented.

**14. New Business**

14.1. DICOM 4

- It was proposed to restart discussions about the future of DICOM (aka "DICOM 4"). What problems would it solve beyond our current extensions approach?
- If decided to do, must start with a blank sheet of paper, would not make any sense to piecemeal. Start with a "wish list" and develop use cases.
  - Must maintain backwards compatibility pathway
  - Post-processing in the cloud as part of a use case
- Once data really becomes distributed in the cloud and not location-based, this will be needed
- Will need to have something available for end users to use early in the process
- Be careful not to constrain too early. Will this be evolutionary or revolutionary?
- Where is DICOM in the larger hospital enterprise? The place for processing and managing are now separate where use to have constraint

**<Action 4>**

- 1a. Add as a standing agenda item – Future of DICOM
- 2b. If anyone has any new items to put on the wish list, Lisa will create a GoogleDoc Wish List.

## 15. Next Meetings

### 2020 meetings

- HL7 will be in Sydney, Australia 2-7 February 2020 which may be hard to justify for many WG-10 members. Discuss alternatives to meet with ISO/TC215 and HL7.
- **Decision:** Skip the Winter WG-10 meeting, but we will prepare our annual report to ISO/TC215 and send to the session in Sydney. If we can call in, we will do so.
- Schedule 1-2 tcons in late 2019/early 2020 to discuss RSP once have the schedule info from Rachel/ISOTC215 Secretariat, tcons might be as soon as December 2019
- April/May 2020: TBD based on DSC scheduling
- Sept/Oct 2020: TBD based on DSC scheduling

### 2021 meetings

- Winter 2021, HL7, Jan 16-22 - Henderson, Nevada
- Spring 2021: TBD based on DSC scheduling
- Fall 2021: TBD based on DSC scheduling
- Any meetings where might make sense to co-locate? Do something different?

## 16. Adjournment

The meeting adjourned at 16.00. Report prepared by Lisa Spellman, DICOM General Secretary. Report reviewed by MITA/NEMA legal counsel. Clark Silcox, November 1, 2019.