

DICOM OVERVIEW

DICOM is an acronym for **D**igital **I**maging and **C**ommunications in **M**edicine.

DICOM is the industry standard for transferring medical images and information between electronic devices. The goal is to have open architecture so that equipment from different manufactures covering a range of modalities can be interconnected. DICOM supports networking not just point to point interfacing.

DICOM is based on the OSI model {Open Systems Interconnect}. DICOM falls into layer 7 the application layer. DICOM is an object-oriented framework in which information and functions or routines that operate on the information are grouped together in easy to manage packets called **objects**. DICOM has explicit information objects. Now when a modality wants to print an image it wants to know how the printer handles the information since it affects the way the image is tone-scaled, & formatted. With DICOM the modality can control these functions by using explicit information objects that correspond to film boxes (one file, or film), film sessions (a group of films such as a study), image boxes (the area on a film in which the images appear).

OSI Model

	Purpose for communication:
7. Application:	e-mail, file transfer, client/server.
6. Presentation:	Translation, Encryption, data conversion.
5. Session:	Starts, stops and governs transmission order.
4. Transport:	Ensures delivery of complete messages.
3. Network:	Internetworking, Routing, and Network control.
2. Data Link:	Frame synchronization, Flow control, Error control.
1. Physical:	Transmission Media, Transmission devices, Data signals.

In the language of DICOM: An information object corresponds to a specific type of image (CT, MRI). A Service Class defines the service or operation that can take place (Printing, Storage). An Application Entity is a device that can perform services on objects. A Service/Object pair (SOP) is the combination of an information object and a service.

Information Object + Service Class = SOP. The basic unit of DICOM conformance is the SOP or SOP class. A DICOM conformant device must conform to one or more dicom Sop's. In addition, the device must conform to the service class as a service class user (SCU) or a service class provider (SCP). An SCU uses services, which an SCP provides. Some devices can conform in both categories.

A Modality can be an SCU that uses the services of devices such as workstations and laser printers to display images. A printer is an SCP, providing printing services for modalities & workstations. A workstation can be both an SCU and an SCP. It can use the services of a printer and provide image display for modalities.

Information Objects (Image Types)	Application Entities (Programs) A device that can perform a Service on an info. Object.	Service Classes
CT	Workstations	Storage
X-ray	Archives	Study Content Notification
MRI	Film Digitizers	Patient Management
Nuclear Medicine	Printers	Query /Retrieve
Ultrasound	CR	Study Management
CR	Modalities	Print Management
DR	DR	