

## Conquest DICOM Server 1.4.19beta CONFORMANCE STATEMENT and detailed software revision history

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Revision 1; 19961103	As taken from the 'developers cut' distribution of MicroPACS
Revision 2; 19980703	Conquest additions; pre-release 1.3.1.
Revision 3; 19980713	Conquest additions; release 1.3.1
Revision 4; 19990415	Updated (mainly for RT), release 1.3.2
Revision 5; 19990527	Small software updates, birthday, sex, bolus, release 1.3.3
Revision 6; 20000131	NKI sops updated, new compression mode, mirroring, release 1.3.4
Revision 7; 20000316	Added operation as NT service, pre-release 1.3.5
Revision 8; 20000403	Unlimited servers/services, auto-login, self-test, sop choices, fixes for GE Hi-Speed, improved display, fixed hang concurrent C-ECHO's, final release 1.3.5
Revision 9; 20000701	Improved browser menu, other ODBC drivers, release 1.3.6
Revision 10; 20001129	Multithread UNC path fixes, edit ID, sendto, edit, release 1.3.7
Revision 11; 20010318	Hostname fix, runs 4 services, show incoming, release 1.3.8
Revision 12; 20010502	GUI additions database fixing; faster compression; fixed leaks, release 1.3.9
Revision 13; 20011109	better forward/export, extended DB/sop, zip, drag/drop, rel 1.3.10
Revision 14; 20020508	reliability and error handling fixes, UID configurable, dbrev 6
Revision 15; 20020613	StudyModality, db rev 7, find local missing pats, release 1.3.11
Revision 16; 20020822	FilenameSyntax for DICOM-Works; printing, release 1.3.12
Revision 17; 20021215	Various fixes. Non-ODBC driver; read-ahead thread; <b>release 1.4.0</b>
Revision 18; 20030303	Bug fix release 1.4.1
Revision 19; 20030710	Release 1.4.2, flexible compression and transfer fixes, db rev 11
Revision 20; 20030922	release 1.4.3, registry/administrator bug/doc; long filenames
Revision 21; 20040406	Release 1.4.4, mysql fix / large disks / db rev 13 / jpeg fixes / GUI uses MAG0..9 / system DSN
Revision 22; 20040426	Release 1.4.4a, mysql fix broke MS-access and SQL server, added DoubleBackSlashToDB (see 4.1.3)
Revision 23; 20040615	Release 1.4.5, built-in DbaseIII suitable for huge archives; better deletion tools; auto-move
Revision 24; 20040722	Release 1.4.6, Added FixKodak; Added "nj" compression; FixPhilips/FixKodak defaults 0 (!)
Revision 25; 20040805	Release 1.4.6a, Fix in move for single image
Revision 29; 20041129	Release 1.4.7, JPEG fix, bugreport button; split/merge, 'k' compress, uid list matching, AE with ~xx
Revision 30; 20050131	Release 1.4.8, Fixed delete, nightlymove, 4-server; hold failed forwards/copies; distribution compiles, initial linux release and initial web interface
Revision 31; 20050912	Release 1.4.9, Fixes in web and Linux, modality worklist
Revision 32; 20051024	Release 1.4.9a, Fix crashes due to no patch in controls.pas
Revision 33; 20060103	Release 1.4.10, VirtualServerFor, fixes leaks, linux, postgres
Revision 34; 20060328	Release 1.4.11, K-Pacs viewer, native MySql, worklist fix, virtualserver fix, flexible filenamesyntax, WEBReadOnly, Fix forwarder retry logic
Revision 35; 20060708	Release 1.4.12alpha: bug fixes, db performance improved, and appendix 5-7
Revision 36; 20061222	Release 1.4.12: bug fixes in dbaseIII driver and in deleting, forwarding and grabbing, resizeable GUI
Revision 37; 20070127	Release 1.4.12b: importconverters, converter scripting, fixes in dbaseIII driver and web access, no nki compression in .dcm

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Revision 38; 20070201 Release 1.4.12c: "storage" importconverter, fix ExportFilter and problem in most GUI commands

Revision 39; 20070305 Release 1.4.13alpha: "defer" exportconverter, stuff for k-pacs web viewer; manual split into user and technical part by radtraveller – this is the technical part

Revision 39; 20070707 Release 1.4.13beta: native mysql fixes, delayed converters, sqlite

Revision 40; 20070709 Release 1.4.13beta2: some last fixes

Revision 41; 20071116 Release 1.4.13: more fixes and parameters

Revision 42; 20080322 Release 1.4.14beta: uj compression; database changes; fixes

Revision 43; 20080902 Release 1.4.14: fixes, improved web pages; added query on 'Number of Patient Related Studies' items etc.

Revision 44; 20090412 Release 1.4.15alpha: 64 bits, postgres, jpg graphic, etc.

Revision 45; 20090929 Release 1.4.15: mostly bug fixes and a few scripting extensions

Revision 46; 20100905 Release 1.4.16beta: JPEG and JPEG2000 added by Bruce Barton  
Further extended scripting options; bug fixes; GUI prints to AE

Revision 47; 20101023 Release 1.4.16beta5: bug fixes, WADO server and client, more converters, improved serversideviewer, caching repetitive queries, enabled MAG0\incoming folder, upload from web server, optional overlap of get and send in virtualservers, animated GIF support.

Revision 48; 20110105 Release 1.4.16rc1; service cleans and zips, fixes and more commands

Revision 49; 20110106 Release 1.4.16rc2 bug fixes

Revision 49; 20110208 Release 1.4.16rc4 added lua scripting

Revision 50; 20110402 Release 1.4.16 full release, typo in study table

Revision 51; 20121016 Release 1.4.17alpha full release

Revision 52; 20130525 Release 1.4.17 full release with ZBS scripting IDE interface

Revision 53; 20130813 Release 1.4.17b release, bug fixes

Revision 54; 20130813 Release 1.4.17c bug fixes

Revision 55; 20140309 Release 1.4.17d bug fixes and features

Revision 56; 20160319 Release 1.4.19beta

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## SECTION 1. INTRODUCTION

The MicroPACS is a Windows or Linux based PACS system that has, at it's core, the UCDMC DICOM Network Transport libraries. This system has been combined with a complete user interface (Windows only), which also acts as installation program (written in Borland Delphi) to form the Conquest DICOM server. The Information Definition is designed to be field/run-time programmable. Below the DICOM interface is a database connectivity class that uses a stable built-in SQLite or DBASEIII driver, or talks to ODBC compatible data sources (Windows only), MySQL, or PostGres. This combination permits a PACS system with the following features:

- Complete DICOM Interface. Including SCP's for run-time programmable storage IOD's, and SCP for DICOM Queries and Retrieves.
- Programmable SQL Database tables. This user-programmable feature allows the MicroPACS to be custom tailored to a particular Clinical/Research area. For instance, in a CR setting, the PACS system can be programmed to allow users to query on kvp and ma or in a CT setting, the PACS can be programmed to allow queries on slice-distance.
- Communication to database is done via a SQLite (default and advised for small archives of up to 1000.000 images), a built-in dbaseIII driver, any ODBC database (Windows only), MySQL or PostGres. This allows decoupling PACS and SQL technology. ODBC was tested with:
  - Microsoft Access
  - SQL server
  - Some users have reported successful operation using Interbase and Oracle. Oracle requires manual editing of the DICOM.SQL file, where the names of fields 'rows' and 'columns' are changed to, e.g., 'qrows' and 'qcolumns'.

**Note:** The built-in dBaseIII driver (Conquest addition) is not a full SQL server and poses limitations on query keys: only queries like 'key' = exact match; 'key\*' = value starts with key; and '\*key\*' = value contains key, are supported, as well as date-range queries and multiple UID matching queries. Only common hierarchical queries are supported with fields that are listed in the single de-normalized table for the selected query level (see file DICOM.SQL). Regular queries passing PatientID, StudyUID, and/or SeriesUID will be (very) fast, even for huge archives. Other (image) queries in large archives (>1000.000 images) may be very slow. Server startup time for huge archives may be long due to in-memory index creation (about 1 minute per 1000.000 images). During indexing the server is read-only and only shows indexed images.

- (Conquest addition) Fast and safe (CRC checked) error free compression (>2x) of image data on disk. Do not use this option if you want to read the image files directly from disk yourselves using third party software.
- (Conquest addition) Easy installation of many servers on a single PC. Servers may run as service(s).
- (Conquest addition) A database browser and slice viewer (Windows only) integrated in the PACS system with options for: viewing the DICOM information in a slice, creating BMP files (ideal for slides), sending selected images, printing, and database fix tools such as changing patient IDs, and deleting and anonymizing studies and series. Also tools to merge or split series. Drag and drop to load DICOM or HL7 files, directories, or a variety of zip files.

- (Conquest addition) A simple query/move user interface (Windows only) for diagnostic purposes, to improve your knowledge of DICOM, and to grab missing data from another server.
- (Conquest addition) Fully integrated functionality in one user interface.
- (Conquest addition) Simple print server (Windows) - to default printer.
- (Conquest addition) Log files, which are daily zipped (Windows only).
- (Conquest addition) Correct display of JPEG, JPEG2000, JPEGLS and RLE compressed images in browser.
- (Conquest addition) Flexible configuration of JPEG and NKI private compression with optional (de)compression of incoming, dropped, transmitted and archived files. All JPEG interfacing was done by Bruce Barton).
- (More conquest additions) Highly improved performance (e.g., using a read-ahead thread), and image forwarding/action capability.
- The archive is well suited as DICOM server for the DICOMWORKS viewer by Phillipe Puech.
- For the browser, we use the MiTeC DBFTable component by MichaL MutL. Native drivers use the DLL's from the database system (MySQL or Postgres).
- Version 1.4.12 up includes a preliminary advanced series viewer based on EZDicom / K-Pacs (many thanks to Chris Rorden and Andreas Knopke). Fixes: strip group 2 information of any files sent, retry logic, worklist query.
- Version 1.4.12 improves database performance, has some important bug fixes (rare crashes, incomplete deletion and grabbing, and rare database corruption on dbaseIII). Further it has the possibility to forward multiple images on a single association, and improved documentation
- Version 1.4.12b and c add importconverters and bug fixes in dbaseIII driver and web access and do not allow .dcm with nki compression
- Version 1.4.13 has a web viewer based on K-PACS, SQLite is now included, and more import and export converter options were added such as delayed forwarding and preretrieval. Then small fixes were made in native mysql (also the driver is now included in the package), and several other aspects of the server, such as handling of compression errors, out of memory conditions, and others.
- Version 1.4.14 has a more web options (move, delete and viewers), more exportconverters and 'Number of Patient Related Studies' etc. query items
- Version 1.4.15alpha fixes small bugs; and adds QueryConverters, color jpeg decoding with built-in code, frame control, several command line options, an anonymization script, postgres support, and jpeg web export graphics
- Version 1.4.15 fixes more small bugs and adds more scripting options
- Version 1.4.16beta adds internal JPEG and JPEG2000 codecs adapted by Bruce, more scripting options, bug fixes and print to AE from GUI
- Version 1.4.16rc1 adds WADO, virtual query cache, zipping and cleanup at night also for a service, animated gif support, more commands and fixes

- Version 1.4.16rc2 fixes some bugs
- Version 1.4.16rc4 adds lua as very fast and flexible scripting language for converters (with access to configuration, connection, dicom objects, pixel data, database, queries) and web page design
- Full release 1.4.16 fixes several bugs
- Full release 1.4.17alpha fixes bugs and really enhances scripting
- Version 1.4.17 offers connections to the ZeroBraneStudio Lua IDE and further enhances scripting; some fixes for jpeg transfer syntax
- Version 1.4.17b, c and d offer bug fixes and more scripting options
- Version 1.4.17e includes a few fixes in the DICOM communication
- Version 1.4.18 is Bruce Barton's release for MAC and Windows
- Version 1.4.19beta sees a complete recoding of the browser in the GUI for speed and lots of new options such as flexible DICOM modification, server speedup, JpegLS and better Jpeg2000 compression (thanks Bruce Barton), a completely scripted web interface with a new interactive viewer, and options for a new flexible anonymisation server.



## SECTION A(2). CONFORMANCE STATEMENT

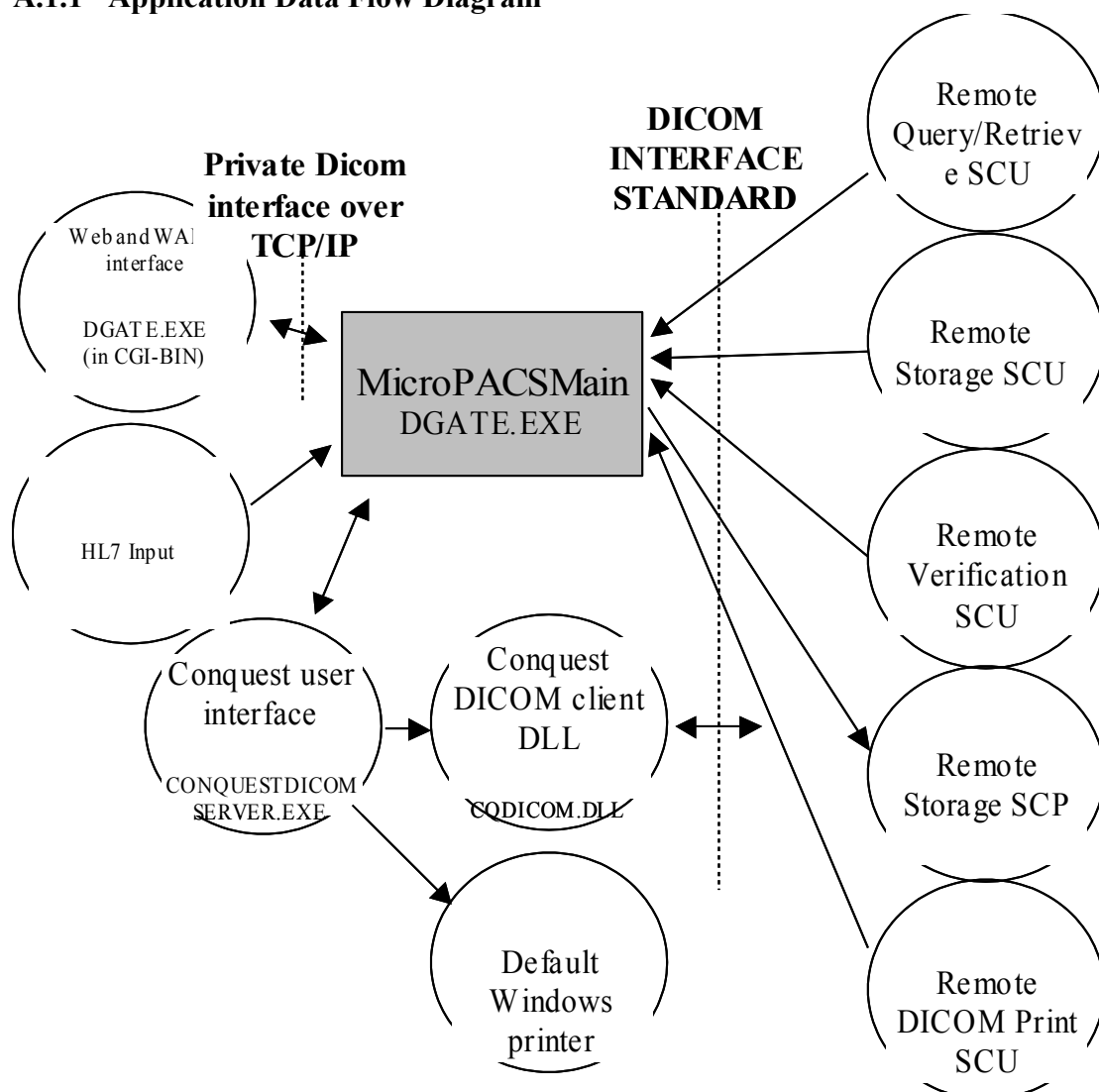
### A.0 INTRODUCTION

This conformance statement (CS) details the MicroPACS compliance to DICOM v3.0. It covers all DICOM Service Class roles in this product:

- Various Storage Service Class (SCP) Roles
- Morphing Storage Service Class (SCU) Roles
- Patient Root Query & Retrieve (SCP) Roles
- Study Root Query & Retrieve (SCP) Roles
- Patient/Study Root Query & Retrieve (SCP) Roles
- Verification Service Class (SCP) Role
- Print Management (SCP) Role
- Worklist Query (SCP) Role
- WADO Server (http) Role
- Scripting host role

### A.1 IMPLEMENTATION MODEL

#### A.1.1 Application Data Flow Diagram



### A.1.2 Functional Definition of AE's

Application Entity 1, MicroPACSMMain

Supports the following functions:

- Has access to patient demographics and pixel data in the local database.
- Responds to DICOM associations containing image and worklist query requests using the information in the local database.
- Moves IOD modules to any configured DICOM AE when requested to do so by a remote DICOM AE.
- Responds to DICOM associations containing storage requests and places the IOD in the local database.
- Responds to DICOM associations containing verification requests.
- Responds to DICOM associations containing print requests and prints items on the default local Windows printer.
- Responds to private DICOM associations to support the WEB interface and maintenance functions.
- Responds to private DICOM associations to initiate scripting

**NOTE:** Viewer applications (not part of the server release) such as Kpacs or ClearCanvas will use separate AE's which **MUST** be configured in ACRNEMA.MAP (use the “**Known DICOM providers**” page) to allow access of images from the DICOM server.

### A.1.3 Sequencing of Real - World Activities

Image Store:

- The remote AE will initiate a DICOM association.
- Any association will trigger Lua scripts *association* and *endassociation*.
- The MicroPACSMMain AE will select the appropriate Abstract and Transfer Syntax's from those proposed by the remote AE.
- The remote AE will initiate a C-Store to send the IOD.
- Any command will trigger Lua script *command*.
- The MicroPACSMMain AE will respond with a C-Store-RSP upon receipt of the IOD.
- If AllowEmptyPatientID is set to 0 (default), a missing PatientID is replaced by “00000000”. If AllowEmptyPatientID=1 and the patient ID is not set, it is looked up from the database for the corresponding study. Conversely if AllowEmptyPatientID=1 and there is no patient ID in the database but there is in the image, the database is updated.
- The following processing occurs using the WorkList database (can be enabled/disabled using 'WorkListMode' in DICOM.INI):
  - WorkListMode=0: no processing occurs.
  - WorkListMode=1: The AccessionNumber is looked up in the local WorkList database, if it is found, any element in the DICOM object that is also present (and non-NULL) in the WorkList database, will be replaced by the value from the WorkList database. These changes are made both in the database and in the image that is stored on disk.
  - WorkListMode=2: As mode 1, but the image will be refused if the AccessionNumber is not found. Rejected images trigger event RejectedImageWorkListConverter.

- Note: there is no DICOM method of filling the worklist database (see the description of WorkListMode).
- The following processing (can be enabled/disabled by defining 'FixPhilips = 0/1' in DICOM.INI) of the patient ID occurs to conform patient ID's generated by a Philips scanner with NKI policy:
  - From a patient ID of 10 digits (i.e., only exactly 10 digits) and a numeric value larger than 0001000000, starting with at least 2 zeros, the first 2 or 3 leading zeros are stripped. I.e., '0123456789' is not changed, '0020101234' is replaced by '20101234', '0009901234' is replaced by '9901234', and '0000012345' is replaced by 0012345. The result is that a 10 digit ID from Philips that consists of a valid NKI patient ID with extra leading zeros is converted to a valid NKI patient ID. These changes are made both in the database and in the image that is stored on disk.
- The following processing (can be enabled/disabled by defining 'FixKodak = 0/1' in DICOM.INI) of the patient ID occurs to conform patient ID's generated by a Kodak RIS worklist with NKI policy:
  - From a patient ID of 8 digits (i.e., only exactly 8 digits) and a numeric value larger than 01000000, starting with at least 1 zero, the leading zero is stripped. I.e., '0123456789' is not changed, '09901234' is replaced by '9901234', and '00012345' is replaced by 0012345. The result is that a 8 digit ID from Kodak RIS that consists of a valid NKI patient ID of before 2000 with a superfluous leading zero, is converted to a valid NKI patient ID. These changes are made both in the database and in the image that is stored on disk.
- Trailing space are discarded from the patient ID.
- Up to 99 importConverters are called as scripts or rules to modify, delete or log images or VR's in them. These scripts can also start external programs and delete/retrieve/forward parts of the patient's information. All scripts can optionally be programmed in Lua with full access to server configuration and DICOM objects.
- The pixel data is (re or un)compressed if this option is enabled.
- The image is stored and disk and image header data is (re-)entered in the database at all four levels (patient, study, series, and image). The following consistency checking is performed on the data entered in the database (without changing the image information that is stored):
  - Inconsistent link information (e.g., two images of the same series belong to different patients), lead to a reject to store the new image with reported failure to the sending client. The rejected images are passed through (lua) script 'RejectedImageConverter0' to allow extensive logging or repair actions.
  - Filled items will not be overwritten by empty items.
  - Known sex (M or F) in the patient database will not be overwritten with any other value than M or F.
  - A known date of birth in the database will not be overwritten with an empty date or with a date on the 1st of January (which has a high probability to be wrong). When the original date of birth is empty, any value will be accepted.
  - In case of any other inconsistency, the newer values will be written in the database, and the change will be logged as a warning in serverstatus.log. Inconsistencies in the birthdate are also logged in PacsTrouble.log.

- The (series) Modality field is appended to the Study Modality field in the database if it does not already contain this Modality.
- The PatientName, PatientBirthDate and PatientSex items are duplicated in the study table (database rev8 and up), to allow detection of patient ID mix-ups.
- Optionally the image is processed or forwarded (compressed or uncompressed) if Modality and StationName match with values specified in dicom.ini and the optional ExportFilter test is passed using scripts ExportConverter0 .. ExportConverter19 (see appendix 7).
- Some logging of activity occurs.

#### Query/Retrieve:

- The remote AE will initiate a DICOM association.
- The MicroPACSMMain AE will select the appropriate Abstract and Transfer Syntax's from those proposed by the remote AE.
- Queries and retrieves can be inspected, modified or rejected by (Lua) scripts 'QueryConverter0' and 'RetrieveConverter0'. The script can also trigger move or deletes of associated data.
- Queries can be forwarded to up to 10 VirtualServerFor entries. Queries that are forwarded are processed by VirtualServerQueryConverter0. The received data is processed by VirtualServerQueryresultConverter0 and will be merged with the data from the server's database and cleaned of duplicates (see appendix 7). Query results may be cached to speed up repetitive queries.
- Optionally the 'Number of Patient Related Studies'-like items will be computed (this executes another query for each result of the first query) and is somewhat slow.
- The returned query results can be processed by a (Lua) script called 'QueryResultConverter0'.
- Upon receipt of a C-Move request, the MicroPACSMMain AE will initiate an SSC/SCU association morphing to the stored IOD SOP Class to the specified and configured DICOM AE. Compressed pixel data will be decompressed or recompressed prior to transmission. Optionally a (Lua) script 'RetrieveResultConverter0' will process the retrieved image data. A C-Move response message will be generated synchronously with the associated C-Store.
- Retrieval of data stored on one or more of the VirtualServerFor entries and not on the local server will initiate automatic transfer from the listed servers in the VirtualServerFor table to the local server, followed by (or overlapping) a transfer to the C-MOVE destination. After the retrieval data can be optionally deleted again (see appendix 7).
- Some logging of activity occurs.

#### Worklist Query:

- The remote AE will initiate a DICOM association.
- The MicroPACSMMain AE will select the appropriate Abstract and Transfer Syntax's from those proposed by the remote AE.
- Queries can be inspected, modified or rejected by a (Lua) script called 'WorkListQueryConverter0'.
- The MicroPACSMMain AE will query the Worklist database and respond with zero or more modality worklist items. The sequence structure of the responses duplicates that of the query.

- The query results can be processed with a (Lua) script called 'ModalityWorkListQueryResultConverter0'.
- Some logging of activity occurs.
- Note: there is no DICOM method of filling the worklist database. It can be filled through the web interface, by drag and dropping HL7 files or programmatic (see the description of WorkListMode).

#### Verification:

- The remote AE will initiate a DICOM association.
- The remote AE will initiate a C-ECHO.
- The MicroPACSMMain AE will respond with a C-ECHO-RSP.
- Many private command options can be added to the C-ECHO command.
- Some logging of activity occurs.

#### DICOM Print:

- The remote AE will initiate a DICOM association.
- The remote AE will create a basic film session using N-CREATE.
- The MicroPACSMMain AE will ignore the information but will respond with a N-CREATE-RSP.
- The remote AE will create a basic film box using N-CREATE.
- The MicroPACSMMain AE extracts the Image Display Format (only "STANDARD\#rows,#cols" is accepted), and the film orientation (LANDSCAPE or PORTRAIT) and passes this information to the CONQUEST user interface. All other information is ignored.
- The MicroPACSMMain AE creates the correct amount of Basic Grayscale or Color Image Box objects for the film page and transmits their UIDs to the remote AE in the N-CREATE-RSP. The UIDs contain information about the page number, number of rows and columns, and the image location on the page that will be used by the CONQUEST user assemble the printed page.
- The remote AE will use N-SET to fill each Image Box object.
- The MicroPACSMMain AE will store each incoming Image Box onto disk (in directory "printer\_files" on device MAG0) and responds with N-SET-RSP. The name (UID) of the files is passed to the CONQUEST user interface.
- The CONQUEST user interface (Windows only) will queue incoming images and will asynchronously convert each DICOM file into a BMP file, load it in memory and assemble the pictures to be printed on a page. Processed DICOM files and BMP files are deleted. *Note: the basic print support in the CONQUEST user interface will not handle multiple simultaneous print requests correctly!*
- The remote AE will request printing of each film or of the complete session using an N-ACTION command for a basic film session or a basic film box.
- The MicroPACSMMain AE passes these requests onto the CONQUEST user interface and responds with an N-ACTION-RSP.
- The CONQUEST user interface (Windows only) prints the pages on the default Windows printer. The only way to configure this printer is to change its default document settings in Windows. Printing progress is shown using a simple progress bar on the server status page.
- The remote AE may query the printer status with a N-GET request on the printer object.

- The MicroPACSMMain AE will always respond with a N-GET-RSP with a “NORMAL” status and the name of the printer, which is pre-set to “Conquest dicom printer”.
- Other N-DELETE, N-SET, and N-EVENTREPORT requests are acknowledged with an adequate RSP and ignored.
- Some logging of activity occurs.

#### Web and WADO access:

- The remote client will request a web page from cgi-application dgate.exe
- The cgi-application will fill a page with information. Patient information is requested over a private DICOM protocol (e.g., query2 or patientlist) from the main server to fill tables. Furthermore links may be added to:
  - GIF, BMP or JPG images
  - Viewer controls
- Links to GIF/BMP/JPG images will access the cgi-application, which in turn will request them from the main server over a private DICOM protocol. The main server is responsible for converting DICOM to GIF/BMP/JPG.
- The CGI application can generate arbitrary web pages based on a simple scripting language and/or Lua scripts.
- Since 1.4.16, the server honors WADO requests which can be converted into normal DICOM retrievals to another server defined in the file `cgi-bin/dicom.ini` using item `[wadoservers]bridge`.
- The links to the viewer controls (OCX or Java) have two purposes. First the control will be downloaded and installed in the web viewer. This requires reduced security settings (trusted site), download of Java and/or installation of the OCX control with `regsrv32.exe`. Then the viewer controls will request DICOM images as needed from the cgi-application, which in turn will request these from the main server over a private DICOM protocol. The main server is responsible for (de)compressing and optionally downsizing the DICOM images.
- Web viewers based on the original k-pacs OCX control, ImageJA, Weasis, dwy, iaViewer and simple GIF/JPEG images are included with this release and can be configured in file `cgi-bin/dicom.ini`. The (Lua) scripts provided to drive most of these viewers can be user modified.

```

client    -> webserver      url      http://127.0.0.1/scripts/dgate.exe?mode=seriesviewer&series=...
webserver -> dicomserver    query   imagelister:CONQUESTSRV1|.....
client    <- webserver <- dicomserver query results      (to build list of urls of dicom slices)

client    <- webserver      activex control http://127.0.0.1/ActiveFormProj1.ocx

Then for each slice that is required (the following line can also use WADO syntax):

control   -> webserver      url      http://127.0.0.1/scripts/dgate.exe?mode=dicom&slice=.....
webserver -> dicomserver    request  convert_to_dicom:....
control   <- webserver <- dicomserver dicom data

```

## A.2 AE SPECIFICATIONS

### A.2.1 AE1 Specification

This Application Entity provides Standard Conformance to the following DICOM v3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Verification (Echo)	1.2.840.10008.1.1
* Unknown IOD Storage	* See note

**NOTE:** This MicroPACS will initiate outgoing DICOM C-STORE requests masquerading as any stored IOD module. The behavior of this outgoing association link will be like the DICOM defined SCU role: Storage Service Class.

This Application Entity provides Standard Conformance to the following DICOM v3.0 SOP Classes as SCP:

SOP Class Name	SOP Class UID
Verification (Echo)	1.2.840.10008.1.1
Patient Root Query/Retrieve Info. Model -FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Info. Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info. Model -FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Info. Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient Study Only Query/Retrieve Info. Model -FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient Study Only Query/Retrieve Info. Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Modality WorkList Query	1.2.840.10008.5.1.4.31
* Unknown IOD Storage	* See note

**NOTE:** This MicroPACS will accept any incoming DICOM C-STORE request sent using the DICOM defined SCP role: Storage Service Class. The dgatesop.lst file (see configuration section and dicom.ini file) can be used to selectively restrict this ability.

#### A.2.1.1 Association Establishment Policies

##### A.2.1.1.1 General

The DICOM Application Context Name (ACN) that is always proposed is:

<b>Application Context Name</b>	<b>1.2.840.10008.3.1.1</b>
---------------------------------	----------------------------

The Maximum Length PDU negotiation is included in all association establishment requests. The maximum length PDU for an association initiated by the NetMain AE is:

<b>Maximum Length PDU</b>	<b>16Kbytes</b>
---------------------------	-----------------

The SOP class Extended Negotiation is not supported and ignored.

There is no limit on the maximum number of Presentation Contexts Items that will be proposed. In this implementation, each Abstract syntax will be proposed with either a single Transfer Syntax, or with a few JPEG(2000) transfer syntaxes, depending on the configuration in *acrnama.map*.

The user info items sent by this product are:

- Maximum PDU Length
- Implementation UID
- Implementation Version

**Note:** Max PDU length is not configurable at run time.

#### **A.2.1.1.2 Number of Associations**

MicroPACSMMain AE will initiate one DICOM association to perform image store for each concurrently incoming C-MOVE request.

There is no artificial maximum placed on the number of simultaneous DICOM associations open at one time. It should be noted that system response time will be degraded, and this could possibly adversely effect a time-out period on other remote AE's.

The Print Management function will correctly handle multiple simultaneous associations, but the elementary print support in the CONQUEST user interface will not correctly print (i.e., images on the pages will be mixed up) when multiple print jobs are sent simultaneously.

#### **A.2.1.1.3 Asynchronous Nature**

Asynchronous mode is not supported. All operations will be performed synchronously.

#### **A.2.1.1.4 Implementation Identifying Information**

The Implementation UID allows unique identification of a set of products that share the same implementation.

The Implementation UID for this ID/Net v3.0 Implementation is:

<b>Storage &amp; Q/R UID</b>	<b>1.2.826.0.1.3680043.2.135.1066.101</b>
------------------------------	---

#### **A.2.1.2 Association Initiation by Real-World Activity**

##### **A.2.1.2.1 Proposed Presentation Contexts**

Presentation Context Table – Proposed			
Abstract Syntax &	Transfer Syntax	Role	Expanded



configuration					Negotiation
*Unknown	un,as,n1..n4,uj,nj	Little Endian	1.2.840.10008.1.2	SCU	None
*Unknown	j3..j6	JPEGBaseLine1	1.2.840.10008.1.2.4.50	SCU	None
*Unknown	j3..j6	JPEGExtended2and4	1.2.840.10008.1.2.4.51	SCU	None
*Unknown	j5	JPEGSpectralNH6and8	1.2.840.10008.1.2.4.53	SCU	None
*Unknown	j6	JPEGFullINH10and12	1.2.840.10008.1.2.4.55	SCU	None
*Unknown	j2	JPEGLosslessNH14	1.2.840.10008.1.2.4.57	SCU	None
*Unknown	j1, j2	JPEGLossless	1.2.840.10008.1.2.4.70	SCU	None
*Unknown	jk	JPEG2000 Lossless	1.2.840.10008.1.2.4.90	SCU	None
*Unknown	jl	JPEG2000 Lossy	1.2.840.10008.1.2.4.91	SCU	None
*Unknown	js	JPEGLS Lossless	1.2.840.10008.1.2.4.80	SCU	None
*Unknown	j7	JPEGLS Lossy	1.2.840.10008.1.2.4.81	SCU	None

**Note:** Due to the morphing nature of the outgoing SSC-SCU engine, the specific Abstract Syntax that is proposed depends upon the nature of the stored image. The actual proposed Transfer Syntaxes depend on the configuration in *acrnema.map* and are the same for each class of stored images.

#### **A.2.1.2.1.2 SOP Specific Conformance Statement for Image Storage SOP Class**

This implementation can perform multiple C-STORE operations over a single association.

Upon receiving a C-STORE confirmation containing a successful status, this implementation will perform the next C-STORE operation. The association will be maintained.

Upon receiving a C-STORE confirmation containing an Error, Refused or Warning status, this implementation will fail the specific IOD in question. If more images need to be sent, they can be sent in the same association.

#### **A.2.1.2.2 Association Acceptance Policy**

##### **A.2.1.2.2.1 Real-World Activity**

This AE accepts associations for the Query/Retrieve (Q/R) SOP using the Patient Root, Study Root, and Patient/Study Only Query Model.

This AE accepts associations for the Image Storage Class using any defined IOD class.

This AE accepts associations for the Verification Service Class.

This AE accepts associations for the Print Service Class.

This AE accepts associations for the WorkList Query Service Class.

##### **A.2.1.2.2.2 Real-World Activity**

This AE is indefinitely listening for Q/R, Storage Class, Verification and Print Management associations

##### **A.2.1.2.2.3 Proposed Presentation Contexts**

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Expanded Negotiation
Patient Root Query/Retrieve Info. Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Little Endian	1.2.840.10008.1.2	SCP	None
Patient Root Query/Retrieve Info. Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Info. Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Info. Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Query/Retrieve Info. Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Query/Retrieve Info. Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Little Endian	1.2.840.10008.1.2	SCP	None
Modality WorkList Query	1.2.840.10008.5.1.4.31	Little Endian	1.2.840.10008.1.2	SCP	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Little Endian	1.2.840.10008.1.2	SCP	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Little Endian	1.2.840.10008.1.2	SCP	None
*Unknown	*Unknown	Little Endian*	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	Little Endian	1.2.840.10008.1.2	SCP	None

**Note:** Due to the morphing nature of the incoming SSC-SCP engine, the specific Abstract Syntax accepted will depend upon the nature of the stored image, and the *dgatesop.lst* configuration file (of which a default version is automatically created when installing the Conquest DICOM server).

\*The server can accept many transfer syntaxes as configurable by *dgatesop.lst*.

#### **A.2.1.2.2.4 SOP Specific Conformance for Query/Retrieve FIND SOP Class SCP**

The C-FIND response status values are supported as defined in DICOM v3.0 Part 4.

All Required (R) and Unique (U) Study, Series, and Image Level Keys for the Patient Root, Study Root, and Patient/Study Only Query/Retrieve Information Model are supported. Many optional (O) Keys are supported, as described later in this document.

#### **A.2.1.2.2.5 SOP Specific Conformance for Query/Retrieve MOVE SOP Class SCP**

Prioritization of C-FIND & C-MOVE requests is all set to normal - 0.

All images requested in a single C-MOVE will be sent over a single association (the association will not be re-established for each image).

#### A.2.1.2.2.6 SOP Specific Conformance for “Unknown” Storage SCP

The specific Storage SCP classes accepted are programmable (by the user) at runtime, and cannot be explicitly stated here.

No optional elements are discarded.

The duration of the storage is temporary. Least recently added patients are deleted when the disk space is less than the amount specified in the “Cleanup disk space below (MB)” field in the Conquest DICOM server. This amount is run-time configurable. When the DICOM server is connected to a, e.g., jukebox archival system, the duration of storage can be made permanent.

#### A.2.1.2.2.7 Presentation Context Acceptance Criterion

No criterion.

#### A.2.1.3 Transfer Syntax Selection Policies

The server can accept most transfer syntaxes as configurable by *dgatesop.lst*. Outgoing connections can be made over uncompressed, loss-less or lossy JPEG(2000) transfer syntaxes. If so, the images are recompressed to conform to the accepted transfer syntax. The configuration is done through *acrnama.map*. Lossy compression configuration settings like j3 and j1 may be followed by a 2 digit quality percentage factor. Note that the effect of this quality factor differs between jpeg and jpeg2000.

Configuration	Proposed transfer syntaxes	Name
un <sup>1</sup> , as <sup>2</sup> , n1..n4 <sup>3</sup> , nj <sup>4</sup> , uj <sup>4</sup>	1.2.840.10008.1.2	ImplicitLittleEndian
ub	1.2.840.10008.1.2.1/2	ExplicitLittle/BigEndian
ul	1.2.840.10008.1.2.1	ExplicitLittleEndian
u2	1.2.840.10008.1.2.2	ExplicitBigEndian
j1	1.2.840.10008.1.2.4.70	JPEG Lossless sv1
	1.2.840.10008.1.2	ImplicitLittleEndian
j2	1.2.840.10008.1.2.4.57	JPEG Lossless sv 6
	1.2.840.10008.1.2.4.70	JPEG Lossless sv1
	1.2.840.10008.1.2	ImplicitLittleEndian
j3, j4 (or e.g., J380 for 80%quality)	1.2.840.10008.1.2.4.51	JPEG extended (12 bits)
	1.2.840.10008.1.2.4.50	JPEG baseline (8 bits)
	1.2.840.10008.1.2	ImplicitLittleEndian
j5	1.2.840.10008.1.2.4.53	JPEG spectral selection
	1.2.840.10008.1.2.4.51	JPEG extended (12 bits)
	1.2.840.10008.1.2.4.50	JPEG baseline (8 bits)
	1.2.840.10008.1.2	ImplicitLittleEndian
j6	1.2.840.10008.1.2.4.55	JPEG progressive
	1.2.840.10008.1.2.4.51	JPEG extended (12 bits)
	1.2.840.10008.1.2.4.50	JPEG baseline (8 bits)

	1.2.840.10008.1.2	ImplicitLittleEndian
js <sup>5</sup>	1.2.840.10008.1.2.4.80	JPEGLS Lossless
j7 <sup>5</sup> (or e.g. j780)	1.2.840.10008.1.2.4.81	JPEGLS Lossy
jk <sup>5</sup>	1.2.840.10008.1.2.4.90	JPEG2000 Lossless
jl <sup>5</sup> (or e.g. jl80)	1.2.840.10008.1.2.4.91	JPEG2000 Lossy

**Note:** The transfer syntaxes are listed in order of priority. I.e., if a host is configured as j1 and it accepts JPEG lossless, the image will be lossless JPEG compressed before transmission, even if it was not stored in that way.

- 1) un = uncompressed. Images will be decompressed prior to transmission.
- 2) The configuration “as” will transmit images as-is. Independent of how images are stored on disk (with JPEG or NKI compression), they will be transmitted over an ImplicitLittleEndian connection. This behavior does not conform to the DICOM standard and for many hosts this may therefore not work. NKI clients will work, though.
- 3) Configurations n1..n4 will transmit images with NKI private compression, which can only be read by NKI clients.
- 4) nj = nki compressed, leave all jpeg as is; uj = uncompressed, leave all jpeg as is
- 5) JPEG2000 compression is relatively slow compared to other compressors.

### A.3. COMMUNICATION PROFILES

#### A.3.1 Supported Communication Stacks (parts 8,9)

DICOM Upper Layer (Part 8) is supported using TCP/IP.

#### A.3.2 OSI Stack

OSI stack not supported.

#### A.3.3 TCP/IP Stack

The TCP/IP stack is inherited from the Windows/Linux operating System. (Conquest addition): We have used the excellent Delphi TCP/IP components from François Piette (<http://www.overbyte.be>) in the CONQUEST user interface GUI.

##### A.3.3.1 API

Developers can base client programs on **TEST.EXE** and **DICOMP.EXE** that are included with source code in the **DICOMLIB1417b.ZIP** release file. The actual DICOM server (with many options) is **DGATE.EXE** that is included with source code in release file **DGATE1419beta.ZIP** and **DICOMLIB1419beta.ZIP**. Source code of the Windows user interface, client DLL (used for queries only) and web viewer OCX is *not* included. Developers can also add scripts in Lua or a limited private scripting language for several core server tasks to provide extensive processing of DICOM objects such as images and queries, develop web pages or provide batch processing.

##### A.3.3.2 Physical Media Support

Any Windows (Linux) supported physical media.

#### A.3.4 Point-to-Point Stack

A 50 pin ACR-NEMA connection is not supported.

#### A.4. EXTENSIONS / SPECIALIZATION / PRIVATIZATIONS

VR (0x7fdf, 0x0010) contains compressed pixel data if NKI compression is used. In the normal configuration, the server will never transmit NKI compressed data, but will compress and decompress the data on the fly. The following presentation contexts have been added to allow NKI private compressed data to be transmitted and to allow retrieval of downsized images for higher speed:

1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.1.2	PatientRootRetrieveNKI
1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.2.2	StudyRootRetrieveNKI
1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.3.2	PatientStudyOnlyRetrieveNKI

These contexts contain sub-classed versions of the standard C-MOVE commands with the following additional optional control parameters (numbers are hexadecimal):

(9999, 0100): MaxVrSize	Do not send VRs larger than this number of bytes
(9999, 0200): MaxRowsColumns	Downsize image to maximal this #rows and columns
(9999, 0201): Frame	If given, return only the selected frame of a MF object
(9999, 0300): ConsoleText	Text will be printed to server console
(9999, 0400): Silent	If sent, console does not log transaction
	Also used internally by GUI, WEB and scripting interface
(9999, 0500): MaxSlices	Send at most # slices irrespective of query result
(9999, 0600): MaxCompression	Maximum supported compression by NKI client (default 4)
(9999, 0700): Recompression	Recompress style NKI or JPEG (default none)
(9999, 0802): VirtualServerMask	Restrict access to selected virtual servers (default all used)
(9999, 0900): Script	'ImportConverter' with which transmitted objects are processed
(9999, 0a00): MoveOriginatorAE	The outgoing C-MOVE impersonates the passed AE

#### A.5. WADO FUNCTIONALITY

Standard WADO functionality is provided through the Conquest web server (see the Windows manual). The WADO interface supports the following CGI keywords (in e.g., [http://128.0.0.1/cgi-bin/dgate.exe?](http://128.0.0.1/cgi-bin/dgate.exe?requestType=WADO&contentType=image/gif&studyUID=xxx&seriesUID=yyy&objectUID=zzz)

`requestType=WADO&contentType=image/gif&studyUID=xxx&seriesUID=yyy&objectUID=zzz`)

studyUID, seriesUID, objectUID:	to select the object returned
contentType:	to select the way it is returned
image/gif	single or multiframe image
image/jpeg	single frame
image/png	not implemented returns jpeg
image/jp2	not implemented returns jpeg
video/mpeg	not supported
text/plain	returns header as text
text/html	returns header as HTML
application/dicom	returns DICOM object
transferSyntax : DICOM returned uncompressed (default) or compressed with:	
1.2.840.10008.1.2.4.50 → j3 (jpeg)	
1.2.840.10008.1.2.4.51 → j4 (jpeg)	
1.2.840.10008.1.2.4.53 → j5 (jpeg)	
1.2.840.10008.1.2.4.55 → j1 (jpeg)	
1.2.840.10008.1.2.4.57 → j2 (jpeg)	
1.2.840.10008.1.2.4.70 → j1 (jpeg)	
1.2.840.10008.1.2.4.90 → jk (jpeg2000)	
1.2.840.10008.1.2.4.91 → jl (jpeg2000)	
rows, columns	to downsize image
region	to crop image
windowCenter, windowWidth	window/level for gif/jpg
frameNumber	to select a frame (default first)
anonymize	if "yes" call anonymize_script.cq if "other" calls named anonymizer

annotation	read but not supported
imageQuality	passed to jpeg encoder
charset	ignored for now
presentationUID	ignored for now
bridge	server to access as WADO bridge

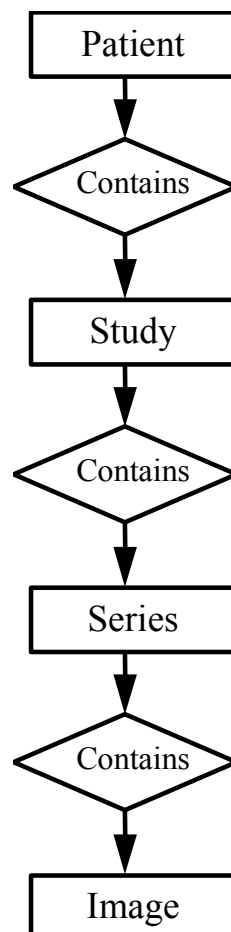
bridge default is the current server or taken from **[wadoservers]bridge** in dicom.ini in the web servers *cgi-bin* folder

### SECTION 3 DEFAULT QUERY/RETRIEVE INFORMATION MODEL DEFINITION

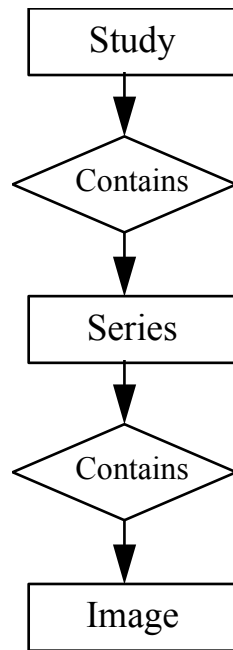
This section describes the subset of the DICOM v3.0 Patient Root, Study Root, and Patient/Study Only, Query/Retrieve Information Model Definition used by this product.

#### 3.0 INTEROPERABILITY SCHEMA

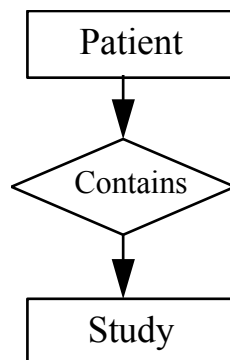
##### 3.0.1 PATIENT ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP



### 3.0.2 STUDY ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP



### 3.0.3 PATIENT/STUDY ONLY QUERY/RETRIEVE ENTITY RELATIONSHIP



### 3.1 ENTITY DESCRIPTIONS

See DICOM Standard Part 4

### 3.2 PATIENT ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINITION

#### 3.2.1 Patient Level Keys for Patient Root Query/Retrieve Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 10 (plus computed items)			
Patient Name	(0010,0010)	R	1
Patient ID	(0010,0020)	U	1
Patient Birth Date	(0010,0030)	O	
Patient Sex	(0010,0040)	O	
Number of Patient Related Studies	(0020,1200)	O	Computed* - not database
Number of Patient Related Series	(0020,1202)	O	Computed* - not database
Number of Patient Related Instances	(0020,1204)	O	Computed* - not database

\*requires setting EnableComputedFields = 1 in dicom.ini

Note 1: If setting AllowEmptyPatientID = 1 (default it is 0), these items may be missing on all objects of a study – the system will then not support PatientRoot operations, or on some objects of a study, where the system will update the database appropriately

#### 3.2.2 Study Level Keys for Patient Root Query/Retrieve Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 17 (plus computed items)			
Study Instance UID	(0020,000D)	U	
Study Date	(0008,0020)	R	
Study Time	(0008,0030)	R	
Study ID	(0020,0010)	R	
Study Description	(0008,1030)	O	
Accession Number	(0008,0050)	O	
Referring Physician	(0008,0090)	O	
Patients Age	(0010,1010)	O	
Patients Weight	(0010,1030)	O	
Study Modality	(0008,0061)	O	Multiple entry item, automatically updated by server
Number of Study Related Series	(0020,1206)	O	Computed* - not database
Number of Study Related Instances	(0020,1208)	O	Computed* - not database

\*requires setting EnableComputedFields = 1 in dicom.ini

#### 3.2.3 Series Level Keys for Patient Root Query/Retrieve Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 17 (plus computed items)			



Series Instance UID	(0020,000E)	U	
Series Number	(0020,0011)	R	
Series Date	(0008,0021)	R	
Series Time	(0008,0031)	R	
Series Description	(0008,103E)	O	
Modality	(0008,0060)	O	
Station Name	(0008,1010)	O	
Institution	(0008,0080)	O	
Patient Position	(0018,5100)	O	
Contrast Bolus Agent	(0018,0010)	O	
Manufacturer	(0008,0070)	O	
Model Name	(0008,1090)	O	
Body Part Examined	(0018,0015)	O	
Protocol Name	(0018,1030)	O	
Frame of Reference UID	(0020,0052)	O	Computed* - not database
Number of Series	(0020,1209)	O	
Related Instances			

\*requires setting EnableComputedFields = 1 in dicom.ini

### 3.2.4 Image Level Keys for Patient Root Query/Retrieve Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 13			
SOP Instance UID	(0008,0018)	U	
SOP Class UID	(0008,0016)	O	
Image Number	(0020,0013)	O	
Image Date	(0008,0023)	O	
Image Time	(0008,0033)	O	
Echo Number	(0018,0086)	O	Multiple entry item
Number Of Frames	(0028,0008)	O	
Acq Date	(0008,0022)	O	
Acq Time	(0008,0032)	O	
Receiving Coil	(0018,1240)	O	
Acq Number	(0020,0012)	O	
Slice Location	(0020,1041)	O	
Samples Per Pixel	(0028,0002)	O	
Photometric Interpret.	(0028,0004)	O	
Rows	(0028,0010)	O	
Columns	(0028,0011)	O	
Bits Stored	(0028,0101)	O	
Image Type	(0008,0008)	O	Multiple entry item
Image ID	(0054,0400)	O	

## 3.3 STUDY ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINITION

### 3.3.1 Study Level Keys for Study Root Query/Retrieve Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 17 (plus computed items)			
Patient Name	(0010,0010)	O	
Patient ID	(0010,0020)	O	
Patient Birth Date	(0010,0030)	O	
Patient Sex	(0010,0040)	O	
Study Instance UID	(0020,000D)	U	
Study Date	(0008,0020)	R	
Study Time	(0008,0030)	R	
Study ID	(0020,0010)	R	
Study Description	(0008,1030)	O	
Accession Number	(0008,0050)	O	
Referring Physician	(0009,0090)	O	
Patients Age	(0010,1010)	O	
Patients Weight	(0010,1030)	O	
Study Modality	(0008,0061)	O	Multiple entry item – automatically updated by server Computed* - not database
Number of Study Related Series	(0020,1206)	O	
Number of Study Related Instances	(0020,1208)	O	Computed* - not database

\*requires setting EnableComputedFields = 1 in dicom.ini

### **3.3.2 Series Level Keys for Study Root Query/Retrieve Information Model**

See Section 3.2.3

### **3.3.3 Image Level Keys for Study Root Query/Retrieve Information Model**

See Section 3.2.4

## **3.4 PATIENT/STUDY ONLY QUERY/RETRIEVE INFORMATION OBJECT DEFINITION**

### **3.4.1 Patient Level Keys for Patient/Study Only Query/Retrieve Information Model**

See Section 3.2.1

### **3.4.2 Study Level Keys for Patient/Study Only Query/Retrieve Information Model**

See Section 3.2.2

### 3.5 MODALITY WORKLIST QUERY INFORMATION OBJECT DEFINITION

#### 3.5.1 Keys for Modality Worklist Query Information Model

Attribute Name	Element Tag	Type	Notes
Revision: 17			
Accession Number	(0008,0050)	O	Primary Key
Patient ID	(0010,0020)	R	
Patient Name	(0010,0010)	R	
Patient Birth Date	(0010,0030)	O	
Patient Sex	(0010,0040)	O	
Medical Alerts	(0010,2000)	O	
Contrast Allergies	(0010,2110)	O	
Study Instance UID	(0020,000D)	O	
Requesting Physician	(0032,1032)	O	
Requested Procedure Description	(0032,1060)	O	
Requested Procedure Code Sequence	(0032,1064)	R	1 instances of this sequence required
>Modality	(0008,0060)	R	
>Requested contrast agent	(0032,1070)	O	
>Scheduled AE	(0040,0001)	R	
>Start date	(0040,0002)	R	
>Start time	(0040,0003)	R	
>Performing Physician	(0040,0006)	R	
>Scheduled Procedure Step Description	(0040,0007)	O	
>Scheduled Procedure Step ID	(0040,0009)	O	
>Scheduled Station Name	(0040,0010)	O	
>Scheduled Procedure Step Location	(0040,0011)	O	
>Premedication	(0040,0012)	O	
>Scheduled Procedure Step Comments	(0040,0400)	O	
Requested Procedure ID	(0040,1001)	O	
Requested Procedure Priority	(0040,1003)	O	
Character set	(0008,0005)	*	Returned as “ISO_IR NNN” only when WorkListReturnsISO_IR_100 is set to NNN

To code this information into a database, the contents of the sequence are unfolded to the same level as the other fields. \*This field will be optionally returned whether requested or not.

## 4.1 FILES

### Installation files (in DicomServer1419beta.zip):

windowsmanual.pdf	Documentation
DicomConformance_FilesLST_Changes.pdf	This file
conquestdicomserver.exe	User interface (GUI)
dgate.exe	console mode version of MicroPACS system
dgate64.exe	Idem for 64 bits (automatically selected)
dgate.dic	DICOM dictionary for dgate.exe
cqdicom.dll	Conquest DICOM client DLL (for GUI only).
dgateserv.exe	NT service wrapper for dgate.exe V1.1
libmysql.dll	Mysql client dll for 5.0.22
libmysql64.dll	64 bit mysql client dll for 5.0.22
libmysql.txt	Mysql license text
libpq64.dll	64 bit client DLL for postgres (hard to find)
7za.exe	7-zip command line version
7za.txt	7-zip license text
sample.hl7	Example HL7 input file
anonymize_script.cq	anonymizer script (calls lua/anonymize_script.lua script)
ZeroBraneStudio\*.*	integration files for the ZeroBraneStudio IDE
lua\*.*	(sample and serious) lua scripts
data\HEAD_EXP_00097038\0001_002000_892665661.v2	
data\HEAD_EXP_00097038\0001_003000_892665662.v2	
webserver\htdocs	logo and old OCX viewer
webserver\cgi-bin\dicom.ini	sample web page configuration
webserver\cgi-bin\lua	default lua webpage
webserver\cgi-bin\samples\*.*	sample web scripts
webserver\cgi-bin\OpenClinica\*.*	scripts to drive an OpenClinica – PACS coupling
webserver\cgi-bin\viewers\*.*	scripts to drive different web viewers
webserver\cgi-bin\newweb\*.*	new fully scripted web interface

### Configuration files (automatically generated):

dicom.ini	Configuration file
dicom.sql	Database table definition file
acrnema.map	System/IP map file
dgatesop.lst	SOP Class definition file
USE.....	Determines database driver to be installed

### Database files (automatically generated, example for SQLite):

data\dbase\conquest.db3	Database tables
data\dbase\XDicompatients.dbf	extract of database table used by browser for dbaseIII
data\dbase\XDicomstudies.dbf	extract of database table used by browser for dbaseIII
data\dbase\XDicomseries.dbf	extract of database table used by browser for dbaseIII
data\dbase\XDicomimages.dbf	extract of database table used by browser for dbaseIII
data\dbase\XDicomworklist.dbf	extract of database table (not used)
data\printer_files	temporary and printer files
data\printer_files\querycache	optional cache for repetitive queries to virtualservers
data\incoming	folder – monitored for data to load if present

### Log files (automatically generated):

Installation.log	logs from installation page
Maintenance.log	logs from maintenance page
ServerStatus.log	logs from server status page or service
PacsTrouble.log	relevant errors from server status log
PacsUser.log	all users who accessed the server
ConquestDicomServer.log	log about main actions and server start/stop
logs\logs_yyyymmdd.zip	automatically zipped set of log files

**Data files (automatically generated – 5678 is the servers port #):**

ExportFailures5678_0	data of failed exports for later retrying
CopyFailures5678	data of failed mirror copies for later retrying
DelayedFetchForwardFailures5678	data of failed delayed forwards
Note: The server deletes these files (or delete manual) to abort retrying	

**Image file (example, for FileNameSyntax parameter set to 3) :**

Dir	PatientID	seriesUID	series	slice	time	counter
Data\QA_phantom\1.2.840.113619.2.22.287.1.19980710.202026_0001_000006_9537982720005.v2						

## 4.2 PRODUCT INTERACTION / DESCRIPTION

- dgate.exe\*:** DICOM MicroPACS AE Main. This is the principal PACS application. It handles all connections (see threading model note in section 4.4 of this part). Contained in this executable are verification, storage, print, and various query and retrieve DICOM SOP classes. This executable interfaces to the PACS database via ODBC, MySQL or Postgres drivers, or using a built-in SQLite or dBaseIII driver. In the event that disk space is low, it will optionally delete least recently entered patients. This application also contains code for installation, maintenance, and archival operations that is used by the Conquest DICOM server. For these purposes a second copy of dgate.exe is started. Type “**dgate -?**” for more information.
- Then dgate.exe can send commands to a running Conquest PACS using dgate – commands. Then dgate.exe can interpret lua scripts in itself (dgate –dolua:) or trigger the server to do so (dgate –lua: and dgate –luastart:). Finally, the same executable may act as CGI/WADO server application. In some rare cases, the dgate process may still be running even though the user interface has closed (after a crash or after killing it with the task manager). The user interface, when restarted, then assumes that the dgate process belongs to a service (and displays “**user interface**” in the caption), but cannot control the running process. Killing the dgate process with the task manager or rebooting will solve this problem. All source code of dgate.exe is included in **DGATE1419beta.ZIP** and **DICOMLIB1419beta.ZIP**. To compile dgate.exe one can use total.cpp (documentation included). A github repository was set up for more mac and linux orientated version dgate 1.4.18.
- dgate64.exe** Identical application for use in a 64 bits windows OS. Dgate.exe or dgate64.exe are automatically selected. Delete dgate64.exe to force use of 32 bits in a 64 bit OS. At least one of dgate.exe or dgate64 must be present.
- dgate.dic\*:** DICOM dictionary used by dgate.exe. Must be present.
- dgameserv.exe:** Optional wrapper (V1.2) for dgate.exe to make it run as a Windows service. May be used (advanced users only) to manually (even remotely) start / stop / install / uninstall service(s). Type “**dgameserv /?**” for more information. Note that DICOM server services are named after the AE of the server. Once dgate.exe is installed as a service, the DICOM server(s) starts automatically when the computer is booted. When the user interface is started it will detect that the server is already running and connect to it. Source code is not included. Service install for Windows7 requires running the server in administrator mode.
- conquestdicomserver.exe:**
- This executable is the user interface and installation program and contains parts of the print server. See the installation section of this document for its functions. The

database browser tries to use the Borland Database Engine. Without BDE, the server will run fine, except one filter option in the browser. Source code is not included. This file is optional, the server can also run without a GUI.

cqdicom.dll: This is code for the Conquest DICOM client. It is used here to convert DICOM images for printing, list the image file header and provide query, move and echo actions from the GUI. The source code of this DLL is not included but it is based on the programs "TEST.EXE" and "DICOMP.EXE" that are included with source code. This file is not needed if the GUI is not used.

Libmysql.dll: When present, provides native access to MySQL, both for GUI and the server core. Redistributed because binary compatibility is required between compiled applications and the interface DLL: i.e. this file has to be of a specific version, even if it is used to communicate with MySQL databases of other versions. Comes from <http://downloads.mysql.com/archives/mysql-5.0/mysql-noinstall-5.0.22-win32.zip>

Libmysql64.dll: provides native access to MySQL for 64 bits server core

Libpq64.dll: provides (hard to find) native access to PostGres for 64 bits server core. Comes from: <http://forum.manifold.net/forum/t49971.21>. Note: the 32-bit PostGres client DLL's are not included in the distribution and must be taken from the bin folder of your PostGres distribution.

7za.exe: 7-zip command line version: used by the server core to unzip dropped zip files with dicom files, to zip log files, and to zip dicom data sets for submission over ssh-2.

These files are generated by the GUI on install:

dicom.ini\* Configuration settings. File must be present but does not need to contain all settings.

acrnema.map\* List of known DICOM providers. The file must be present but may be empty if no C-MOVES are used.

dicom.sql\* Database table configuration. This file must be present if the database is used on if dicomquery is called from a lua script.

\*Minimal set of files for a server without a GUI.

### Web server (place minimally these files marked with \* in your web server):

cgi-bin/Dgate.exe\*: exactly the same dgate.exe as in the server.

cgi-bin/Dicom.ini\*: specialized ini file for server running as web(cgi) client.

cgi-bin/acrnema.map\* List of known DICOM providers (may be in dicomserver folder).

cgi-bin/dicom.sql\* Database table configuration. (as above).

htdocs/ActiveFormProj1.ocx: Optional ActiveX web viewer, to be registered manually or downloaded from your web server and installed.

htdocs/conquest.jpg: Icon for use on the web pages

cgi-bin\samples\*.*	sample web scripts
cgi-bin\OpenClinica\*.*	scripts to drive an OpenClinica – PACS coupling
cgi-bin\viewers\*.*	scripts to drive different web viewers
cgi-bin\clibs\*.*	lua extensions used by lua scripts run on the web server
cgi-bin\newweb\*.*	Fully lua scripted web interface (experimental)

### 4.3 THREADING ARCHITECTURE

The MicroPACS system was designed to run in two multithreading models. The first model is “Multithreaded”, the second is “Multiprocess”. The Multithreaded model can best be described as a monolithic application. Each incoming DICOM association is allocated a separate thread of execution within the same memory and address space of the master process. These threads share the same code within the single (monolithic) executable. The Multiprocess model is similar to "inet" on UNIX operating systems. There is a controlling application (conquestdicomserver.exe) which handles incoming TCP/IP connections. For each connection, a new copy of the MicroPACS main executable (dgate.exe) is loaded and executed. A separate process that runs in a separate address space from all other associations handles each DICOM association.

The multithreaded application is slightly faster than the multiprocess one; But the multiprocess one is more secure, and should be more reliable. Because each process runs in it's own address space, an association from one connection cannot corrupt or undermine (in any possible way) another simultaneous association. For this reason, the default installation of the MicroPACS was the multiprocess model.

However, extensive testing of the Conquest DICOM server showed that the multiprocess version sometimes failed to work correctly on Windows (some ODBC problem). For this reason, the multithreaded version is currently used with the Conquest DICOM server. Several fixes have increased its speed and made it very reliable.

Also, the built-in DBASEIII driver applies in-memory indexing and depends on the server process staying in memory to achieve a high speed. In the Linux version, the built-in DBASEIII driver, SQLite, PostGres and MySQL are the database drivers available.



## APPENDIX 1.

### Fixes, modifications and extensions of MicroPACS by Marcel van Herk and Lambert Zijp of the Conquest project:

#### DICOM.SQL (Database definition):

19980624	StudyNumber (StudyID in DICOM) is now 64 long Required for correct operation with SQL server
19990109	Made imagenumber 10 characters wide
19991222	Moved MODALITY to the series level (for DICOM-RT)
19990315	Added EchoNumber and NumberOfFrames in image table
20010830	Revision to 4, extended database significantly
20010416	Revision 5: Added patientID in series and images for more efficient querying
20010416	Revision 6: Added frame of reference UID in series table
20020519	Revision 7: Added ImageType in image table, StudyModality to 64 chars, AcqDate to SQL_C_DATE
20021028	Revision 8: Denormalized study table (add patient ID, name, birthdate) to show consistency problems. Revision 9 is a further de-normalized version that is used with the built-in DbaseIII driver.
20030319	Revision 10: Fixed width of ReceivingCoil: to 16 chars
20030907	Note: revisions 9, 11 and 12 refer to the ODBC-less version
20040402	Revision 13: Added ImageID to image database
20040905	Revision 14: Added WorkList database with HL7 tags
20080124	Revision 15: Added patient position to denormalized image table for built-in DBF driver');
20080124	Revision 16: Moved Stationname and InstitutionalDepartmentName to series table');
20080818	Revision 17: EchoNumber, ReqProcDescription to 64 characters; StudyModality, EchoNumber, ImageType to DT_MSTR; use Institution instead of InstitutionalDepartmentName');

#### DGATE.CPP (main of DGATE.EXE):

19980327:	Disable logfile for speed and save disk
19980327:	-! Enables logging to Personal pacs console; RunServer works; -p breaks
19980327:	All printf's to systemdebug
19980320:	Integrated dumppacs code here for convenience
19980320:	Fixed -p option; SaveToDisk returns filename, printed in stats
19980320:	Documented and added print of usage (-? option)
19980404:	Added test options, ODBC config option and command line specified console pipe / udp logging
19980409:	added FileCompressMode option; use local save to disk code instead of pdu member
19980409:	Return on failed GenerateFileName in SaveToDisk
19980409:	Cleaned up NKI private compression code and allow >15 bit differences
19980410:	Added run length encoding for equal pixels to compressor; fix 3-byte case

19980415: Cleaned up the messages; -! does not enable debug; do not enable accessupdates (use aroute)

19980618: Some work on manual and database layout listing

19980621: Added -z option: zap patient

19980624: Comm test also produces systemdebug and long text output; added \n to some output

19980625: SaveDicomDataObject in loadddo.cpp supports NKI private compression

19980704: Added some test code for counting disk space and renaming device for patient

19980705: Added CACHE devices in free store check; added FindPhysicalDevice (searches for file)

19980709: Added archiving options: -as, -au, -ab, -ac, -ad

19981217: Temporary use PDU.Save... code for testing DICOM objects (does not compress)

19981218: Temp use Pdu.Load as well (no compression)

19981228: Disabled ljz's code until it has been completed

19990108: Reenabled ljz's code: Replace uncompressed by compressed pixeldata VR in SaveToDisk (it seemed to work anyway...)

19990109: Removed some commented out code; added comments for alternative load and save routines. Added Regen of specified device

19990110: Added n, for MAGn, as parameter in -as and -ab archiving options (default all). Use exit(1) on failure

19990111: Fixed exit code on -ar option

19990117: If the filename is \*.dcm (depends on FileNameSyntax) use uncompressed chapter 10 format

19990317: Added NKI-private stuff

19990628: Temporary enabled debug in -!nnnn option

19990630: Added MIRROR option; disabled debug in -!nnnn option

19990707: Fixed MIRROR option; added MIRROR message; added check on FindPhysicalDevice result

19990817: Added ability to spawn ExportConverters at the end of SaveToDisk

19990827: Optimized read of slices: cache a DB to pass to GetFileName (10% faster)

19991117: Added parameter FileCompressMode to in nki\_private\_compress call

20000318: Added private command object 9999, 0300 = print to console  
Added private command object 9999, 0400 = force C-Echo to be 'silent' (no log). Display C-Move Destination; print time info about threads

20000323: Serious fix: MainThread 'hangs' when several associations occur simultaneously, caused by compiler-optimization. Solution: DriverApp.Lock should be 'volatile'.

20000329: On request by ljz: designed crash of server if silent VR receives 'DEAD'

20000501: Compare dicom modality with UPPER-case ini-file setting (ExportConverters)

20000621: Initialize TroubleLogFile and UserLogFile; log C-STORE and C-MOVE

20000703: Logging of trouble now starts with '\*\*\*\*'

20000703: Exclude archival messages from trouble log; removed force dcm code

20001104: Added WINAPI to thread routines

20001105: Replaced malloc by new where a mix could occur (vr->data)  
Made compilable for MSC and BC and WC using some #ifdefs  
Changed order of verification and store; better localized  
new/delete DDO more

20001106: Run-time load odbinst routine for BC and WC, use spawn...  
i/s/o \_spawn...

20001106: Use delete [] operation for vr->Data

20010328: Added -av: verify mirror disk

20010415: Added DeleteSeries, DeleteStudy and DeleteImage routines and  
-f options

20010416: Added -f options: -feFile = enter MAGN file into DB, -fdFile =  
delete file from DB -faFile = add (also makes copy) file into  
server, -f?=ask UID of file, -fu = generate UID,  
-fcNEWPATID,file = modify patient ID of image file (moves  
file!). NOTE: -fc is irreversible in the sense that if a portion of a  
study/series is changed and changed back it winds up as a  
different study/series. This occurs because the UIDs must be  
changed for each image modification. This problem does not  
occur when a whole series or study is changed

20010417: Simplified code to change uids to allow easy extension to  
referenced SOPs. Check after load on common UIDs to avoid  
accepting dropped non-dicom files. NOTE: ChangeUIDinDDO  
should also change sequences and referenced SOPs  
(0008,1155)

20010418: Fix in above change

20010418: Changed names of database fields in UIDMODS - did not work  
on MsAccess

20010419: Added -fk option: copy image file to other patient ID (as -fc but  
no delete). Added version number 1.3.9 to command line help

20010429: Added -fz option: zap file from server and database

20010430: Some work on read ahead thread: note that thread must not use  
any pointer copy!

20010502: Made read ahead thread working; fixed thread counter; fix odbc  
option: strings too short

20020506: Fixed handle leak in read ahead thread

20020507: Fixed memory leak in read ahead thread; kbhit() test #ifdef  
DO\_LEAK\_DETECTION

20010509: Added RenameDevice is -ae option

20010730: Replaced parameter argv[0] of ExportConverters to proper  
value.

20010829: Added ExportStationName as export filter; default Export...  
value set to "\*"; Made export comparisons case insensitive;  
added special 'forward to AE' ExportConverter; Version to  
1.3.10

20010831: Added extended syntax for exportconverters with %f=filename,  
%m=modality, %s=stationname, %b=file base name, %p=file  
path; Also allows 'copy %f destination', but for windows NT  
only (uses cmd.exe). Added ExportFilter option that uses an  
SQL statement to filter.

20010901: Added a simple queue to process exportconverters  
asynchronously; Create a queue for each converter; queue  
mirror copy requests

20010902: Added %o = SOP; %n = newline; added the following hard coded converters: append "text" to file; write "text" to file; copy file to file; copy file to dir

20010904: Re-entered change of 20010730

20010905: Fix: After 'SaveToDisk', do not free pDDO

20011109: Fix: made ExportConverter stuff case insensitive  
Note: empty filter tests for empty contents - this is not the same as '\*'

20011110: Note: in release 1.3.10, the " to " in e.g., write "%f%n" to file must be lowercase

20011115: Made " to" case insensitive; Added \*\*\* before some error messages for better logging. Removed cache db: would hang the server if SQL has gone down and up. Now use one DB per thread which is passed to the read ahead thread = fast too!

20011207: Added extra errormessage when creation of datasource fails

20020109: Disabled this code for watcom or borland (instead of run-time loading an address)

20020314: Implemented ignore of C-CANCEL request for ADAC NM (was error before). Blocked out SQLInstallerError call; does not compile on clinical MS4.2

20020413: Added some notes about thread safety and db's: The serverchild is not thread safe when reading and writing is done on the same association.

20020415: Added -atDEVICE option: sanity check of images on disk; version to 1.3.11

20020416: Made UID generator configurable through UIDPrefix in dicom.ini; made time print unsigned

20020422: Sleazy fix of ModifyPatID: time(null) created same UID: now wait 1 s per changed file

20020426: Generate filename no longer gives an error: is done at higher level

20020428: Only serious error messages use \*\*\* in message

20020428: Added FAILSAFE\_STORAGE: tries to save incoming files even when DB errors occur

20020429: Put SaveToDisk in myUnknownStorage: pass DB failures to caller; Disabled FAILSAFE\_STORAGE: any storage failures should now be detected by client

20020508: Do not rewrite image not on MAG but it is not an error (warning is generated earlier)

20020520: Added -gSERVER,DATE option: grab images on date from remote server

20020521: fix displaying junk filename when rewriting image not on MAG

20020522: Fix in SetStringVR: strings must be padded with a space

20020529: -i and -r now have mode parameter (0=normal and default, 1=simple, e.g., for DBASEIII)

20020531: In 'QualifyOn', support case-sensitive call to 'GetACRNema', but make AE-Title uppercase after retrieving IP and port.

20020613: Better handling of Compression ON/OFF in 'SaveToDisk'  
Fixed crash in DeleteImageFile (twice free of VR->Data)

20020613: compress to specified mode, check (de)compress result, decompresses data before forward; added 'export compressed to AE' export; -fa has optional ,NEWPATID syntax;

20020802: Simplified rmdir code and allow multiple subdirectories in rmdir and mkdir code. Version to 1.3.12 (unreleased)

20020804: Use PATHSEPCHAR where possible

20020807: Changed SaveToDisk order: only make patientdir when DB save succeeded

20020812: Added skeleton of printer support

20020816: Added color imagebox; Save incoming print DDO as file

20020819: UIDs of imageboxes end on rows.cols.position for easy print handling

20020819: Fix in delete nonexistent mirror files for changepatientUID  
Extract pixel data from sequence in ImageBox; added sleep(10) in -fk option

20020819: Added better UID generation (but gets close to 64 chars)

20020821: Fix printer UID generation; display page orientation and film #; shorter info

20021016: Added (indexed) patid to exportfilter query and getfilename for speed; The option tests for rev5 db or higher; increase 64 strings to 66; Note: GrabImagesFromServer option does not yet pass patid to the query (i.e., will be slow with non-odbc driver)

20021017: Control NeedPack from here; added -c option: set UID counter at startup. Removed Sleep from anonymize options; do not re-create UIDMODS

20021018: Pass NoKill through GenerateFilename for interactive DGATE

20021028: Fix query on study in PatientStudyOnlyQuery (did an image query)

20021105: Revamped read-ahead thread logic to try fix rare crash where ratd->DDOOutPtr became NULL

20021115: Use Generic style retrieve classes with NKIqrsop code instead of older qrsop code. Advantages: read ahead thread used, and allows print of error messages from C-MOVE. Required changes such that ratd->pcdo can be NULL.

20021121: Disabled read-ahead thread for time being

20021212: Also loop ServerApp.Server(Port) in threaded mode server

20021213: Re-entered fix by Hanne Kooy: compressed forwarding had extra ;

20021213: Re-enabled use of generic query classes with read-ahead thread; but made read-ahead thread configurable with "EnableReadAheadThread". Made grab query faster by including date - note grab is independent of FixPhilips

20021215: Found read-ahead thread problem reported by Aaron Cann - missing Sleep in wait for slices

20021223: Version to 1.4.1 pre-release; added in dgatefn forbidden filename chars suggest by Thomas Buerer

20030113: Removed loop ServerApp.Server(Port): gave endless loop error messages

20030120: Added cleanup-code when DO\_LEAK\_DETECTION is defined for easy leak checking

20030205: Fix bug found by Frank-Andre Siebert: read ahead thread crashed when ID or SOP is missing. Also fix 2 other potential missing VR problems

20030228: Fixed bug reported by Jeff Babcock: series retrieve from E-film crashed (patid not passed)

20030424: Changed calls to obsolete PDU.Write(&DDO). In 'SaveToDisk' the call to PDU.SaveDICOMDataObject now has parameter

DICOM\_CHAPTER\_10\_EXPLICIT (which writes IMPLICIT files if not compressed)

20030606: Fixed incremental counter when creating UIDs or generating filenames Fix: QueryRetrieveLevel is mandatory for a QueryResponse

20030625: Fix NGET of BasicPrinterSOPClass

20030625: Fix in above fix

20030627: Adapted for MSC4.2; Finally really fix NGET of BasicPrinterSOPClass (wrong UID used)

20030629: Added -nd, -nc, -jd and -jc options: (de)compress NKI; (de)compress JPEG (used OFFIS executables)

20030630: Started on compression for dropped, incoming, transmitted; NKI vr 0x9999,0x700=custom compression. Added 'forward compressed as xx to ...'

20030701: QualifyOn now also has compression parameter

20030703: Moved compression code to nkiqrsop; dgate -j-xx and -j\*xx = test compression options. Removed "forward compressed to" because "forward compressed as .. to" is better. Note that FileCompressMode is now obsolete. KNOWN BUG: JPEG compressed images may be rewritten as V2 (when written originally as NKI) which are then not correctly read.

20030704: Made that FileCompressMode parameter still works even though is obsolete. Moved faulty delete DDO after SOPUnknownStorage.Read

20030705: Added check of Transfer Syntax next to extension for save type; ProcessDDO takes \*\*DDO

20030706: Use dgate.dic; Attach VRType to PDU's for implicit little endian support; small fix in dump code

20030709: Printer support fix; version to 1.4.2; Added SendUpperCaseAE parameter (default 0)

20030730: Force ImplicitLittleEndian, ExplicitLittleEndian and ExplicitBigEndian objects that must be stored in Chapter10 format, to ImplicitLittleEndian.

20030815: Version to 1.4.3

20030905: Allow longer filenames

20030910: Added check on rights to write (trouble) log file and printer\_files in MAG0

20030921: Allow write to any MIRROR if MAG is full; added -ff# option: delete until # MB free

20030922: Added StorageFailedErrorCode (default 0x110 = 272 decimal = failed processing)  
Added ExportCallingAE and ExportCalledAE export filters (also %u=SCU, %c=calledAE in converter)

20030401: Version to 1.4.4; pass status pointer to compress routines

20040402: Delete DDOptr when SaveToDisk cannot write but does not give an error; Added "Cannot rewrite jpeg/rle image in v2 format" check; Use system DSN for ODBC (easier login)

20040406: Always use EXPLICIT syntax for jpeg, fix v2 always use DUMP

20040426: Version to 1.4.4a

20040520: Version to 1.4.4b

20040523: Added patient ID to speed GetFileName for single slice move

20040528: Set NeedPack (controls DbaseIII indexing) for regen, archive, maintenance; Version to 1.4.4c

20040528: Added built-in maintenance commands through silent VR in ECHO; pass patid in DeleteImageFile

20040530: extract (DBF only) to database like XDicomImages in same directory; Version to 1.4.5

20040601: Added deletestudy, deleteseries and packdbf maintenance commands

20040602: Fix: 'forward compressed as' always failed

20040605: packdbf maintenance command sets NeedPack to 3: forces pack

20040606: fix rewrite to not MAG (JUKEBOX) was NOT ignored

20040607: Merged fix ljz 20040602; do not allow rename and delete with empty name

20040610: Added maintenance server tasks for archival and regeneration

20040612: Added indexdbf maintenance server task

20040614: dgate command line maintenance options use NeedPack=5: non-threaded index generation. Added -am option: move(all) device data; for selected data use -amMAG0.Archiving,MAG1

20040624: Version to 1.4.5a

20040626: Pass study and series UID to getfilename; version to 1.4.5b; Fixed leak of pats array

20040713: Version to 1.4.6

20040805: Fix in C-MOVE for single file (from jlz); version to 1.4.6b

20040909: Increased length of ExportFilter (was 64, now 510)

20041020: Added mergeseries(file) and mergestudy(file) maintenance commands, silenttext to 1024

20041101: Added deletesopfromdb maintenance command; version to 1.4.7

20041103: called, e.g., AE~nj overrides IncomingCompression to nj

20041108: Added \$c test compression mode (alt-drop files with \$c as patient ID tests compression modes)

20041109: Added \$tSERVER test compressed forward; some fixes in forward compressed to (server name read wrong)  
\$s tests all filename syntaxes

20041112: Added \$rN N times repeated entry test, and \$tN which enters image N time each on its own thread

20041128: Added -^file: log to file (timestamped) instead of to server console; -#file: same with debug

20041129: Added silent commands debuglog\_on and log\_on to set logging to UDP or file; Added silent command read\_amap to re-read acrnema.map without restarting the server

20050102: Small modifications to allow compile through total.cxx

20050107: Added code to hold and retry queued forwards and mirror copies when failed: After failed export/copy, start storing entries in file ExportFailuresN (CopyFailures). If a new export/copy is requested >1 minute after last failed one, try again; if queue is empty, >100 seconds after last fail, try export/copy stored ones. Processing queued entries has priority over processing stored entries.

20050107: Version to 1.4.8; modifications for linux compile

20050108: Added server PORT# to fail files, so that multiple servers on different ports do not share files

20050109: Added configurable TCPIPTimeOut, FailHoldOff, RetryDelay and QueueSize

20050109: Adapted thread code for linux; still need to implement WaitForSingleObject

20050111: Added ctype.h (for mingw)

20050118: Linux: crudely implemented WaitForSingleObject; detach pthreads to avoid leaks; crudely implemented export converter apps

20050119: Added grabimagesfromserver, regendir and makespace server commands; dgate -- sends server commands to other running server; adapted manual

20050121: Small updates to manual

20050124: Replaced BackGroundExec with simpler system() for Linux; added query server command, e.g., dgate "--query:DICOMpatients|patientid,patientname,patientsex|patientsex='F'|%s %s %s|t.t"; Added read\_ini: server command to reread dicom.ini; changes most config except: TCPPort (busy), UseBuiltInDecompressor (cached) and FileNameSyntax (cached)

20050130: added get\_param, get\_freestore, get\_amap, get\_sqldef that respond through echo-response; also: get\_sop, get\_transfer, get\_application, get\_localae, get\_remoteae, get\_dic, forward. added: dump\_header (to file), convert\_to\_gif (to file); adapted query (to file) where file="cgi" for stdout in cgi/mime mode, file="" to send to stdout as is; most GUI commands can now pass PatientID|SOPInstanceUID instead of filename of dicom object; added put\_amap, write\_amap, put\_sop, put\_transfer, put\_application, put\_localae, put\_remoteae, put\_param. Note: get/put\_param work through disk (read\_ini activates), get/put\_amap through memory (write\_amap writes to disk), get/put\_sop etc read from memory and write to mem and disk.

20050204: Added delete\_param, delete\_amap and fix cgi out (double \n)

20050204: most GUI commands can now pass PatientID|?\*:SOPInstanceUID; added delete sop etc commands  
More fixes in cgi data passing VR vr() is mostly wrong; use VR \*vr=new VR()

20050205: Allow up to 16 output fields in query; repeat queried fields over all 16 outputs. Added counters for server status; start on display\_status server command

20050206: More work at display\_status, renamed testtable to xtesttable: default not opened. Access ObjectFile and DeviceName through query instead of with GetFileName up to 3 x faster!! Also fixes potential leak in read ahead thread: pats, series and studies not always freed. Allow up to 32 cgi query outputs, tidied dump layout, start on web interface (put dgate and ini in cgi-bin)

20050207: Added query2 option: limits number of output rows as asked; gui command not counted as association. Some more work for web interface

20050210: Adapted web interface queries such that they run on sql server

20050212: Removed need for thread local storage; automatically adapt dgate extension in cgi scripts depending in OS

20050213: Added more parameters to server configuration web page

20050214: Added update button to server config (updateconfig page to be implemented)

20050215: Fix in LoadForGUI: Drag 'n' drop of files in the server did not work anymore. Fixed dgate crash in case of failure in 'recompress()' (pDDO=NULL when OFFIS failes). Merged



20050327: Added rudimentary gz unzip support for dropped files (uses 7za.exe)

20050401: Start on Modality WorkList Support

20050404: List End/Start sequence db types (only supported for worklist)

20050411: Fix incorrect space after filename and device in C-MOVE internal query

20050414: Added addrecord server command: for now only option to enter worklist entries

20050603: Fix servercommand query(2) for empty where part

20050825: Fix web interface queries for sql server (were OK for dbase)

20050826: More work on web interface and added worklist there; deleterecord command

20050827: Fixes in addrecord and query commands, editworklist,saveworklist,deleteworklist

20050829: More fixes in web interface, disable caching for most/all? of it

20050831: Allow command line length of up to 4096, allow edit all worklist database fields

20050901: Removed invalid cache-control: cache; added WorkListMode:0= off, 1=optional, 2=compulsory

20050902: Read db config for worklist edit page in web interface; use generic webpages for db edit. Added HL7Tag in DumpDD

20050903: Added 'simple' loadhl7: server task implementation and HL7->DICOM translation. Also addimagefile will enter HL7 files into the server, i.e., drag and drop works

Fix some web queries for sql server with denormalized tables

20050904: Some more tweaks to hl7 code; max query formats to 48; max format to 8192

20050905: Auto split HL7 subfields and repeats without using a list

20050907: Merged change by Hans-Peter Hellemann: fixes extension problem for linux web interface for some browsers

20050908: Protect convert\_to\_gif when file not found

20051121: Recompute SQLResultLength because it does not work in PostGres BindField

20051123: put in #ifdef POSTGRES

20051208: put in #if 0 (fixed in odbci.cpp); start on virtual server: will grab images from other server as needed in read-ahead thread: when in db but not on disk; for now use R.A.T also for single image access to avoid code duplication

20051209: Start on virtual query: image (!) query is passed to other server, results populate db

20051210: Added "vX" incomingcompression (stores dbf but not image; forwarding disabled). Added virtual queries on all queries and moves: now works as transparant file cache. Added VirtualServerFor0..9 configuration entries: server merges own data with these AE's. Added CacheVirtualData control; if set data not deleted after use (db kept for now)

20051211: Fix: override query level in virtual query

20051212: Store virtual server # in device; saved on query, used when retrieving, stripped when storing

20051214: Use different sleep lenghts under linux - not all sleep(0); small fix in virtual server

20051215: Implemented a linux version of Sleep using nanosleep

20051217: Use new VR::ReAlloc method to replace data in VR; added quit: command

20051218: Use ReplaceVR instead of Push in anonymize etc; also changes in sequences. Version to 1.4.10; show version and exe date in startup log. Do not start mirror copy queue unless it is needed; show some thread startup info. Added -b = NOTHREAD: run server as single process, useful for debugging and profiling. Fixed doc of --regendir: command

20051219: Fixed several small leaks - as tested with Linux malloc\_stats

20051222: Started on bypass server for virtual query - not functional yet (cleanup required)  
Removed debugVR logic: errors should now list DCO

20051228: Fix virtual device logic for VirtualServerFor0;  
Cleanup vr's and duplicates when bypassing server for virtual query, seems functional

20051229: NonDestructiveDumpDICOMObject now also list sequences; DebugLevel>0 lists DCO, >1 lists query DDO; fixed leaks in virtual query and some others

20051230: Added --debuglevel: command, small fix in NonDestructiveDumpDICOMObject

20060103: Small fix in virtual query; disabled virtual query for worklist; debuglevel 3 shows some query results

20060123: Added patient/study/seriesfinder (server parameter ignored for now, later for virtual servers etc)

20060125: Added serieslister (server parameter ignored for now, later for virtual servers etc)

20060128: Renamed to imagelister, added serieslister

20060131: Sort filenames from imagelister on ImageNumber (0020,0013)

20060226: Version to 1.4.11

20060228: Small fix in isxdigit thanks to ljz

20060311: Use ReplaceVR in virtual query - level was sent twice (thanks David Lang)  
Added WEBReadOnly flag

20060317: Support calledae and callingae in filenamesyntax - for virtualquery called is always MYACRNEMA

20060324: Strip group 2 from outgoing c-stores if not compression "as" or "is"

20060328: Improved forwarder, always propose Verification and use IsAbstractSyntaxAccepted(iUID) to test if host accepts image

20060402: Fix hang condition when a file failed to read in the read-ahead thread

20060402: Do not remove transfer syntax prior to dcmdjpeg/dcmjpeg (here in test recompress only)

20060405: Tried fix for multiple moves on same assoc (thanks Andrej Savelov)

20060405: Added message when IOD fails to read

20060603: Fix crash when started as dgate -v: empty statbuf

20060607: Finally fixed multiple moves on same assoc (thanks Andrej Savelov and Fred Röhner)

20060618: Renamed dfilecopy and define ODBC\_ADD\_SYS\_DSN if needed

20060619: Set version to 1.4.12alpha1

20060621: Added clonedb: command; transfer FULL db from other server to this one using virtualquery

20060628: AddToDatabase has JustAdd parameter: skip one unnecessary query

20060701: Speeded filter string handling

20060702: Pass DB to GenerateFilename to avoid zillions of db open and closes

20060704: Print number of records found in all queries

20060708: Set version to 1.4.12alpha

20061126: Moved servertask temporary files to MAG0/printer\_files; protected query: and query2 against empty input

20061126: Experimental forwarding on same association: close unused association after 5 seconds. Clean collected sopclasses after one hour of inactivity. Note 1: there is a problem with AReleaseRQ: do not use in this task; Note 2: maximal 20 forwarders have a remaining association

20061127: Added ForwardAssociationLevel (PATIENT, SERIES, STUDY, IMAGE, SOPCLASS; default STUDY), ForwardAssociationRefreshDelay (default 3600 s), and ForwardAssociationCloseDelay (default 5 s). Limit maximum number of ExportConverters to MAXExportConverters=20 (for static arrays used in forwarders). Forwarders keep association open as long as UID at ForwardAssociationLevel does not change. Show filename in forward log; document where fixkodak should operate for virtual queries

20061128: Added ForwardAssociationLevel GLOBAL: use association until timeout or incompatible  
Close ForwardAssociation after send when ForwardAssociationLevel is IMAGE

20061129: VirtualServerForN may be "server, FIXKODAK" to clean queries (add 0) and their response (remove 0)  
Hardcoded filters for exportconverters (modality, called, calling, station) can now match e.g., RT\*

20061130: Pass series and study in virtualserver outgoing c-move

20061213: Fixed nasty bug in query2 and TestFilter: Query without bindfield overwrites previous bound strings!  
Maybe was problem causing crash on linux with query2: and problem with option -g reportedly stopping incorrectly

20061219: Version to 1.4.12

20061231: Added ForwardAssociationRelease to allow testing reconnect problem (default 0 = just hangup)

20070103: FixKodak blocks \*xxxx wildcard virtual queries on date (not allowed in Kodak)

20070103: Version to 1.4.12b; start on ImportConverters e.g., <set 0008,1040 to "%V0008,0080">

20070104: ImportConverters %QP %QS %QE %QW; <destroy> <delete xxxx,yyyy> <save to filename>  
Added %% and %i to Export and Import converters

20070105: <set 0008,1040 if "...">, <setifempty 0008,1040 to "...">, <setifempty 0008,1040 if "...">  
Import/export converters only report when syntax OK and report when action is void  
Added %Vxxxx,yyyy to export converters and %d(date/time) to import and export converters  
An import/export converter can thus be used to extensively log incoming images

- Added import converters: <stop>, <if "string">, <ifempty "string">, <nop> (also export)  
 Added general purpose variables x, y, z (read as %x, %y, %z) to import converters; Definition of number of ImportConverters now unnecessary. Note: importconverter and exportconverter strings may be changed run-time in dicom.ini
- 20070105: Some fixes in dgate --archiving options manual; fixed dgate --restoremagflags:
- 20070107: Fix web access broken by change in odbci for dbaseIII; query must now always include spaces around =
- 20070113: Do not store NKI compressed data in v2 format: decompress and give error message  
 Recompress to NKI format now enables StripGroup2; Tested with \$c server debug command
- 20070117: Allow multiple rules per Export or ImportConverter separated by ; and zero or more spaces  
 <nop> statement prints itself on console: useful for logging anything that follows
- 20070117: Now maintain multiple connections per ExportConverter line (max 20x20 forwards); Added <stop>, <silentstop>, <if> and <ifempty> to ExportConverters; but they only affect single rule (while these would cross over to the subsequent rules in ImportConverters)
- 20070122: Now also show free space on mirror devices
- 20070123: Fixed TestFilter for patientid with '
- 20070125: Removed <if> and added <ifnotempty>, <ifequal>, <ifnotequal>, <ifmatch>, <ifnotmatch>, <ifnumequal>, <ifnumnotequal>, <ifnumgreater>, <ifnumless> as im/exportconverters  
 Added %xxx[first,last] substring operator; and protect it against overrange  
 <ifxxx> no longer crosses over importconverters; added {} block for im/exportconverters  
 E.g.: ifequal "%V0008,0020[0,3]", "2004"; { forward to CONQUESTSRV3; forward to CONQUESTSRV4; } nop test  
 Note: 1) all (also ifxxx) statements end with ; 2) statements may begin with { or };  
 3) extra spaces only allowed after ;{} and single space after ,
- 20070127: Fix {} in exportconverters. Release 1.4.12b to fix more or less critical odbci error
- 20070131: Fix in TestFilter (quotes double); Version to 1.4.12c
- 20070201: Added <storage MAGn> import converter: sets device to store this (new) image to (default MAG0). Fixed importconverters stop and destroy: did not break current line
- 20070204: Added extra format starting with # to ImageFileLister: e.g. # %s:%s prints MAG0:filename
- 20070206: Added create database: dgate -esapw name user password
- 20070207: Fix query string bug on applyworklist found by capolan1
- 20070207: dgate -e name root <blank> works for mysql: root is used as admin and login  
 Also implemented dgate -esapw name sa sapw where sapw may be empty
- 20070210: Added CheckDuplicates to UpdateOrAddToTable; added @ in imagefilelister: replace \ by /

- Start on ocx based viewer integrated in cgi interface; used dicom over http:
- Small change in gif export; added \* as separator in query/2
- 20070211: Added WebScriptAddress (default http://server/cgi-bin/dgate), WebMAG0Address (defaults http://server/mag0) and WebServerFor (default 127.0.0.1). Fix in cgi query parser: now loads dsize and size correctly  
Version to 1.4.12d
- 20070212: Added WebCodeBase, show version in status\_display, added config of which dicom server the web server connects to, added [webdefaults] section, added iconsize parameter
- 20070213: Added : as format in imagefilelist: use to list pat:sopuid  
Fixed sorting problem by using adapted imagefilelist for seriesviewer; Fixed default for WebCodebase; Version to 1.4.12e; Use correct case of sql table names in cgi interface: required by mysql on linux; Unsolved: n3 does not always decompress correctly in dview.pas see p20401977:i47, changed default to n4
- 20070215: Fixed logging and added \*\*\* Association rejected message when association is rejected
- 20070304: Added <defer> exportconverter: retry later as if connection unavailable
- 20070305: Note: n3 problem fixed in dview.pas, version to 1.4.13alpha; Allow merging of up to 1000 UIDs: set SilentText to 64000 and \*uids[1000] (thanks mp); Allow named pipes for log\_on and debuglog\_on
- 20070307: Work on extending extract: allow e.g. SQLite -> dbaseIII
- 20070308: Made changes for big endian and Apple's DARWIN
- 20070314: Finished extract: allow e.g. SQLite -> dbaseIII in directory MAGO dbase
- 20070315: Merged DARWIN stuff; Set TCPIPTimeOut for PDU that moves images
- 20070316: Display defer import converter; Clumsily added <compression> import converter and improved <storage> import converter; Made <storage> thread safe. Failed recompress() no longer reason to fail drag and drop; add convert\_to\_bmp. Use | instead of , to separate patientid from file in addimagefile:  
Distributed , code to each of the server commands to make it more , safe. Note: it is NOT a good idea to use a , in a flexible filenamesyntax. Added level & window to convert\_to\_gif and convert\_to\_bmp; longer log lines for dump VR
- 20070317: <prefetch> using new prefetch\_queue, mayprocess and into\_queue\_unique, <preforward>, <preget>
- 20070324: preget now <preretrieve> and avoids looping by checking orgmessageid!=0xfbad I.e., data collected by <preretrieve> does not go through import/exportconverters. Added delayed exportconverters <forward patient>, <forward study>, <forward series> with optional compression  
Removed "forward compressed to" (without as section) as is never used. Version to 1.4.13beta; delay to 10 minutes
- 20070326: Fixed leak in <forward patient> etc. preretrieve also checking orgmoveae
- 20070330: Change by Mark Pearson: read dicom.ini from same dir as exe in unix mode; merged more Darwin stuff. Also taken over bcb's

fix for the finder: studymodality was asked at patient level.  
 Also put in a more ENxxxx as command and messageid

20070404: Added CommaInFilenameWorkAround()  
 20070407: Use reentrant ctime\_r when available; moved static  
 SOPPatientRootQuery etc to stack to fix reentrancy problem:  
 concurrent outgoing c-move of CT and MRI on different  
 associations would share PDU causing sopclass not accepted on  
 one. Also seems to reduce linux crash problems on multiple  
 inbound (4 or more) C-stores. Also moved  
 CreateBasicFilmSessionRequest etc to fix potential reentrance  
 problem for printing.

20070410: Merged CommaInFilenameWorkAround()  
 20070413: "extract:" will just create dbase III clone of full patient DB;  
 added "prefetch" server command

20070415: Added Prefetcher option to dicom.ini: is set will aggressively  
 pre-read queried patient or studies

20070416: Prefetcher prints more information; use windows calls in  
 windows for faster pre-read

20070705: extract: uses DT\_DBASEIIINOINDEX to disable indexing and  
 packing when extracting from e.g. sqlite to dbaseiii  
 Note: extract: non dbaseIII goes to MAG0\dbase, dbaseIII goes  
 to DataSource

20070706: Added <between "9", "17"> (9:00 to 16:59) or <between "17",  
 "9"> (17:00 to 08:59) import/exportconverter

20070709: Fixed print of clone db done

20070720: Fixed problem where waiting "forward ... to " task caused high  
 CPU load

20070901: Added dgate --checklargestmalloc:

20071027: Added ForwardCollectDelay for delayed forwarding (default  
 600 sec)

20071030: Fill in called and calling AE for SaveToDisk for e.g., dropped  
 files etc. Fix %u and %c in Export and ImportConverters:  
 called and calling AE. Log flow control Export and  
 ImportConverters only in debug mode. Added retrying to  
 delayed forwards or prefetches

20071102: SetDicomErrorHandler: orderly shutdown of server on serious  
 DICOM library errors. Fixed a bug in  
 ForwardAssociationLevel: last UID was lost when reading INI  
 file to szTemp. Added MaximumExportRetries and  
 MaximumDelayedFetchForwardRetries (default=0 is no  
 maximum)

20071103: Version to 1.4.13; defer resets queue fails -> keeps on retrying

20071104: Use local as AE for imagelister in web page instead of  
 CONQUESTSRV1; Enable remote servers (use AE instead of  
 'local') in finder and lister commands; Fix crash when dgate --  
 option gets empty filename: now lists to stdout

20071114: Put --checklargestmalloc: in dgate -?

20071118: Adapted for 64 bits (use SQLLEN for BindField)

20071120: Fixed KodakFixer for empty patient ID (crashed on 64 bits  
 only). Added [modality xx] and [date yyyyymmdd-yyyyymmdd]  
 clauses to export [patient|study|series] to AE

20071121: Added %V\*GGGG,EEEE: search VR in any sequence; version  
 to 1.4.13a; Added [now -ddd+ddd] and [age -ddd+ddd] clauses

- to export [patient|study|series] to AE. No retry on remote dicom error in forward xxx to: would retry zero records response  
Use study date for data, age and now clauses
- 20071123: Made forward command case insensitive; added forward image; added get [patient|study|series|image] from AE. The latter option makes preretrieve obsolete
- 20071124: Added [sop xxx] clause to [forward|get]. Reorganized exportconverter code: all converters now do % substitution; reduced code duplication. Added reading of sequence items like in %V/300c,0060.0/0008,1155 or %V/300c,0060/0008,1155; Real life example (must all be one one line, max 512 characters):  
ifnotequal "%m", "RTPLAN"; stop;  
nop "tests modality = RTPLAN";  
    ifnotequal "%V\*300a,00b2[0,1]", "A2"; stop;  
nop "test machine name = A2";  
    forward to XVI\_A2;  
nop "forwards the current recieved RTPLAN";  
    get study modality CT from NKIPACS;  
nop "collects associated CT";  
    get study modality RTSTRUCT sop  
V/300c,0060.0/0008,1155 from NKIPACS;  
nop "collects associated RTSTRUCT";  
    forward study modality CT imagetype \*AXIAL\* to  
XVI\_A2;  
nop "forwards associated CT";  
    forward study modality RTSTRUCT sop  
%V/300c,0060.0/0008,1155 to XVI\_A2;  
nop "forwards associated RTSTUCT";
- 20071125: Fixed syntax for %V/gggg,eeee.i/\*gggg,eeee (search all groups under a specified one)
- 20071126: Start on StorageCommitment (unfinished)
- 20080103: Switched to ms7 compiler; fixed forward and get date, modality, sop filters: would not supress the UIDs
- 20080107: Fixed malformed web viewer header: worked for IE but not for other browsers. Check presence of dicom.sql in web pages that need it. Deal with spaces in patient IDs in web pages
- 20080126: Check presence of dgate.dic when starting server
- 20080129: Fix KodakFixer: wrote one byte outside VR data (pr)
- 20080129: Added [imagetype xxxx] clause to [forward|get] (pr)
- 20080130: Small fix in above
- 20080205: Added experimental PadAEWithZeros flag; version to 1.4.14alpha
- 20080210: Added experimental IgnoreOutOfMemoryErrors;  
Added "delete [patient|study|series|image] [date yyyyymmdd-yyyyymmdd] [now -ddd+ddd] [age -ddd+ddd]  
    [modality mm] [sop xxxx] [imagetype xxxx]" export  
converter
- 20080221: Added [seriesdesc xxxxx] filter and "process [patient|study|series|image] [by command]"
- 20080222: Small fix in imagetype filter code; process by clause not part of unique check
- 20080302: Fixed case of DICOM table names

20080316: Added dgate --deletestudies:date(range) and dgate --movepatient/study/studies/series

20080318: Added [series xxxx] and [study xxxxx] filters; work on web page --deleteseries/study and --moveseries/study allow patid:uid as parameter; Web interface can now push and delete on series and study level, but delete is disabled in readonly web interface; Version to 1.4.14beta

20080319: Delete in browsers fixed?; added %v(desc)desc: search VR in given sop of same patient. Example:  
%V(/300c,0060/0008,1155)/3006,0010/3006,0012/3006,0014/0020,000e Gives referenced CT series UID in referenced structure set from forwarded RTPLAN

20080321: Fixes in browser; added graphic web setting; may be gif or bmp for now; Fix %V for non-existing items

20080322: Added dgate --anonymize that uses general scripting

20080323: Small fix in (local) for DcmMove: overwrote destination

20080404: Fixes in series and study filter (rethink naming); added value\* match for in match() routine

20080618: Added extra logging in IARQ()

20080620: Only show extra logging in IARQ when assoc rejected

20080816: IARQ shows which sops are accepted; and differentiates no sop from connection terminated

20080817: Small layout fixes; <process with> import converter; show PDU length in log. Check saving of file succeeded (thanks Jeff Bellamy and Alberto Smulders)

20080819: Added experimental DT\_MSTR: multi-value entry, e.g. query on 'PET' matches 'PET\CT'

20080819: added --get\_ini\_param (same as get\_param) and get\_ini\_num to list parameter by index

20080819: Added get\_ini to list all parameters in DICOM.INI

20080819: Added code by map but kept original get\_param for old web cgi client compatibility; Version to 1.4.14

20080820: Solaris 10 fixes, and general UNIX fixes (map): configfiles may not be in current dir

20080821: Default of ForwardAssociationRelease to 1; added sleep export converter

20080823: Added study UID search to PatientStudyFinder; fixed DcmMove: would call local when remote addressed; Added rudimentary query/move web pages

20080825: query/move looks better; added "thumbs" column to local series lister; config patched to readonly; added background color and display of icon (to be placed in WebCodeBase)

20080826: One more fix in DcmMove, still called wrong server sometimes  
Do not use 0xfbad as message ID for DcmMove from web page; webreadonly defaults to true; CGI viewer configurable: seriesviewer, seriesviewer2, noviewer, aiviewer

20080827: Added slice number and repeat output data in ImagefileLister and SeriesUIDLister for more flexible formatting; Added flexviewer: reads code from dicom.ini in web server directory

20080831: Translate yyyy and yyyyymm to date range in finder; further only accept valid date and date ranges; Added dgate --get\_amaps: lists all non wildcard entries from acrnema.map; Fixed handling of patient ID with spaces in ImageFileLister mode ;; All undefined cgi modes can come from the cgi dicom.ini; added



- special and cgi script variables; Lines can start with -- to start dgate, with # as comment, any other passed as HTML; Added source parameter: flex pages can be read from script file; Added serversideviewer: requires javascript only, nothing to install
- 20080901: Fixed some leaks in printing and --commands; fixed --get\_ini: formatting
- 20080902: Added header option for web scripts; added some CGI environment variables
- 20080905: Made new changes for big endian and undid some old ones.
- 20080908: Index in filelister format is now a string (%s), and added next string that gives index+1 (is1); Fixed manual of --modifypatid: and --anonymize;; dicom mime to application/dicom; Added modes imagelisthttp, imagelisturls and imagelistfiles; added ? format for imagelister: gives #files
- 20080909: Added studyuid option to moveseries; pass it studyuid in seriesmover call from seriesfinder; Added --modifyimage:file,script (uses import converter scripting language, where you can use ' instead of ")
- 20080910: In modifyimage only replace ' with " conditionally; version to 1.4.14a;
- 20080910: Forbid patid, studuid and seruid change in modifyimage; medged bcb Mac stuff
- 20080913: Modified and use SetStringVR to correctly send UIDs with padded 0
- 20081016: Show bitness on startup
- 20081104: Attach dictionary to DcmMove PDU
- 20081105: Fixed display of bitness in web page
- 20081116: Adapted for very large objects (use unsigned int for length); remove extra 0 byte in HTML generator; fixed CheckLargestMalloc
- 20081121: Added create database for PostGres
- 20081123: Skip export converters for dropped, modpatid, modimage, merging
- 20081124: show database type on startup; Temp version to 1.4.14a1; fix many scripting crashes
- 20081129: start on better patient ID change: process all UIDs; fix drag/drop error introduced in 1.4.14a1
- 20081129: Removed double access of SOPInstanceUID in SaveToDisk; fix: do not free ddo after SaveToDisk; added <newuids> and <newuids except > import converters; added --genuid, --changeuid and --checksum commands
- Version back to 1.4.14a; modifyimage can change patient ID and study/seriesUID if newuids used as well set can now also work in exactly one deep sequence: set gggg,eeee/gggg,eeee to "string"
- 20081130: Added --attachrtplantortstruct:planfile,structfile command using script; also --attachanytopatient/study/series stop now stops one importconverter- not the chain; added <call file> and <return> statements to return from file
- Added optional anonymize\_script.cq: overrules fixed anonymizer; added %A = %V but then gives CRC32 of data and %E = %V but gives new UID for given UID
- 20081201: added --convert\_to\_jpg and web page use (experimental)

20081203: If jpg graphic: list options as jpg, yes, no; fix slice number display is serversideviewer  
Added frame control to convert\_to\_jpg etc as l/w/frame; add optional frame control to convert\_to\_dicom; added frame control in serversideviewer

20090203: Removed DNS reversing (you can use wildcard AE instead); work on zip loading

20090204: Finished zip loading (to be tested on linux), uses now waiting BackgroundExec

20090206: Added QueryConverter0, WorkListQueryConverter0, RetrieveConverter0: can read called (%c), calling (%u), and c-move destination for retrieve (in %s), as well as all data in data object

20090209: Made compiling under linux

20090211: Export MyDcmError; only DCM\_ERROR\_MEMORY is fatal

20090212: Recoded virtual server (kept old code), to provide better grouping of move requests

20090215: Added VirtualPerSeries0..9 flags: determines if virtual gets are per image (default) or per entire series

20090216: Added %Rgggg,eeee: gives restored UID for newly generated one. Prepare for RetrieveResultConverter0

20090411: Added simple wildcard matching in match(), accept \*text\*

20090411: Version to 1.4.15alpha

20090513: Added CompressionConverter0 .. 9: called from recompress to 's0' to 's9'; Added <fixkodak> and <unfixkodak> import converters; added <after NN> clause to <forward study> etc; Blocked out StorageCommitment

20090514: %QXgggg,eeee reads aliasfileqX.txt with lines like old<tab>new<return> to map VR to new value

20090616: Add ^/~ after % command to convert to upper/lowercase, %^ %~ %[]; fixed leak when save to sql fails

20090616: Include file stuff; fixes to Unix 7z stuff

20090618: VirtualServerPerSeries is now a limit: if set to N, more than N images go per series

20090620: Version to 1.4.15beta

20090802: Support DCM\_ERROR\_DEBUG (debug messages from library) that print only if debuglevel>0

20090821: Removed need to specify "delete series modality \*" instead of "delete series"; Fixed "process by " command; now uses all command string upto ;

20090824: Version to 1.4.15beta1

20090921: Added extract\_frames: command

20090922: Tried to fix <compression> import converter; added <reject> import converter

20090924: Restructured manual; fix crash of studyfinder without search string; Note: on vista, commands like dgate --imagelister wont give large lists (does when piping)

20090926: %t = tab in scripts; fixed failed storage error message; added RetryForwardFailed flag (default 0)

20090929: Added ImportExportDragAndDrop flag (default 0)

20090929: Version to 1.4.15

20090930: Version to 1.4.15a

20091005: Version to 1.4.15b

20091012: Optimized preprocessing of read-ahead thread by saving tt

20091108 Started on <merge study> import converter  
 20091120 Started on <forward> import(!) converter  
 20091229 Version to 1.4.15c  
 20091230 Merged bcb changes: DGATE\_VERSION, PATH\_MAX, const char, bigendian fixes  
 20091231 Defined PATH\_MAX for Apple's Snow Leopard, endian fixes, & fixed gcc4.2 warnings (char to const char, VERSION, DEBUG and char\* to program memory)  
     Added jpeg2k stuff (HAVE\_LIBJASPER)  
 20100111 Merged; but keep cgi formats local (less changes)  
 20100113 Fixed one signed/unsigned mix in dump routines  
 20100119 cast %d print to (int), %ud to (unsigned int); one more const issue  
 20100120 Fixed two const issues detected with ms8  
 20100122 fixed: %ud should be %u  
 20100122 DcmMove uses study-root query when UID passed to fix move to osirix from web interface  
 20100123 Fixed rare crash in function VirtualServer2; started on DT\_FL and DT\_FD; version to 1.4.16alpha  
 20100123 Added counters for jpeg2000; put info about jpeg libraries into serverstatus display  
 20100124 Blocked old VirtualServer(); rephrased cancel message; changeuidback and count\_frames commands; Optimized DcmError call to gpps  
 20100124 Use much faster MyGetPrivateProfileString: profiled as followed: Installed C:\Program Files\Microsoft SDKs\Windows\v6.1\Bin\xperf\_x64.msi set \_NT\_SYMBOL\_PATH=e:\quirt\comps\exe\dgate;srv\*c:\symbols\*http://msdl.microsoft.com/download/symbols; set \_NT\_SYMCACHE\_PATH=C:\symbols; xperf -on latency -stackwalk profile; run dgate; xperf -d out4.etl; xperfview out4.etl; select time range; select trace-load symbols; right click selection; summary table (takes very long the first time - downloads all symbols!)  
 20100207 Added uncompress command; version to 1.4.16alpha2  
 20100209 Fixed another rare crash in function VirtualServer2 (thanks PR)  
 20100227 Fixed Scotts modifyimage problem: <http://forum.image-systems.biz/viewtopic.php?f=33&t=2143>  
 20100227 Added -q option to set target address of dgate -- command; version to 1.4.16alpha3; pass DCO also for non-nki clients: used in %s for RetrieveResultConverter; Added more extensive printer activity logging  
 20100228 Changed HAVE\_LIBJASPER to HAVE\_J2K so Jasper or OpenJPEG can be used  
 20100309 Added double parentheses (gcc4.2 Warnings)  
 20100309 Changed int to unsigned int, commented out unused variables and routine (gcc4.2 Warnings)  
 20100619 Added #ifndefs and fixed shadowed variables(gcc4.0 Warnings)  
 20100723 Merged: Reread all changed; agreed with all but two in checklargestmalloc and cgi; 1.4.16alpha4  
 20100728 Added delete vr's after ->ReplaceVR's  
 20100815 Merged; version to 1.4.16alpha5  
 20100815 Fixed bug 32 in t=2127: seriesdesc filter

20100816 Added QueryResultConverter and ModalityWorkListQueryResultConverter

20100816 Fixed bug in VirtualQuery introduced by only partly renaming shadowed variable

20100816 Allow dicom.ini and other files to be moved; fixed / as cmd line option

20100816 removed (a) from #ifndef EnterCriticalSection(a) etc

20100819 Added system export converter; added "get study" etc import converter. Allow "set" in sequence items; Allow "set" to add sequence items.

20100823 Extended virtualservermask; pass server directly to VirtualServer to override server list

20100823 Merged and simplified bcbs basedir code; use exe dir as default basedir; Fixed overlap in ImportConverter number; Made %xyz variables local; Version to 1.4.16beta

20100824 Use dFileSize to test if file is written correctly: caught 0 byte files with full disk

20100827 Fixed two typos in warning fix extract: command

20100901 Fixed empty virtual query sent if no images there

20100905 Removed file functions: now use RecompressFile; document -j\* and -j-; WIP: added testmode: function to allow internal file comparison

20100914 Fixed leak in PrinterSupport

20101017 Added MergeSeriesConverter and MergeStudyConverter

20100918 Merged; version to 1.4.16beta2; testmode does not affect LoadForGUI direct filenames; Fixed that changing patid etc in importconverter breaks exportconverter data

20100919 Added <format> clause to <set> importconverter command

20100920 Fixed [,fromend] operator

20100924 Started on error handling in virtualserver

20100925 Fixed problem in <forward> IMPORT converter; only worked as first command in line; SearchDicomObject now checks on buffer overflow; ; # lines are comment in script file; note: <system> converter should run hidden; <call> now passed called and calling

20100925 Version to 1.4.16beta3

20100926 Added <mkdir> and <rm> IE converters

20100927 Added <save frame> and <save bmp/gif/jpg> IE converters, <save to> E converter

20100928 Fixed in delayed <merge>, <delete>; fixed MergeSeriesConverter and MergeStudyConverter crash  
Fixed 1.4.16beta2 introduced bug: patientid was passed incorrectly into importconverter

20101003 Added seriesdesc filter and script to DcmMerge, script to DcmMove

20101003 --browsepatient command; fixed that split/merge series generated new study

20101003 Version to 1.4.16beta4; merged jd scheduletransfer

20101003 ImageFileLister now internally also takes study and sop

20101003 Added dgate --submit:patid,studyuid,seriesuid,sopuid, username@machine:folder,password; Requires 7za.exe and pscp.exe

20101003 Modified dgate --Scheduletransfer:patid,studyuid,seriesuid, sopuid,username@machine:folder,password; Added IE

<submit> command with target and password clause; Added next slice and frame buttons in serversideviewer

20101005 Fixed ? imagefilelister (count), added \$ imagefilelister (#frames), started on passing frames to serversideviewer

20101005 Started on WADO

20101006 Enabled WADO; do not try to remove images from failed virtualserver request (double messages)

20101008 Started on rudimentary WADO client (PatientStudyFinder now also lists images)

20101009 Enabled rudimentary VirtualServer for WADO client: loadforgui will try virtualservers

20101009 Tried to speedup query result processsing; implemented POST method (no multipart yet)

20101009 WADO server and client function; upload button, not functional yet as requires multipart parser

20101010 Set default WADO correct for conquest; finished (single file) upload fuctionality;

20101010 Scan incoming folder once per second (thread starts when incoming folder exists on startup); Some fixes in serversideviewer; started on VirtualQueryCached

20101013 Fix : CreateDatabase "root", used UserName as Password for postgres

20101014 Fix in virtualserver for LoadForGUI

20101016 Improved virtualserver for LoadForGUI; Cached queries start to work; virtual queries now return computed fields; use e.g., VirtualServerFor0 = AE,CACHESERIES or AE,CACHESTUDIES

20101017 Added OverlapVirtualGet parameter: controls interleaving of recieve and send of virtualserver (suggest: 16)

20101018 Limited memory use of OverlapVirtualGet, tried out of order processing but this failed; dated folders for querycache; Submit and scheduletransfer call submit.cq if exists to anonymize

20101020 Small fix in querycache: query file sometimes not stored; and study cache did not read date

20101108 Added --loadanddeletedir command

20101116 Warnings

20101120 Fix reading of FIXKODAK in virtualserver if e.g., CACHESERIES appended; merged bcb warnings (and fixed introduced errors); version to 1.4.16releasecandidate; Added warning if cached virtualserver does not provide computed fields; Added NONVIRTUAL flag to allow block recursive virtualserver connections; Do not forward transfer syntax to virtual queries data object

20101121 Fixed NONVIRTUAL flag for non-cached queries if caching is ON; Added dgate --export: command to zip/7z/tar selected data; Added dgate --safequit: command and OpenThreadCount; prepare for ArchiveConverter0 (1900); Show in log when a file is rewritten; Added [wadoservers] section in cgi config; Document ul, ub, and ue in acrnema.map

20101122 Pass script to export: command; added ZIP thread that runs when the system is a service; Fix for spaces in zipfilename for export; background exe for 7za

20101124 Fix compile and 2 warnings for linux; drop zip file extracts with paths to avoid overlapping filenames

20101209	Fixed FIXKODAK parameter detection of virtualservers
20101212	Warn if FIXKODAK paramater set in virtualquery does not match FixKodak global; Fix rewrite message for virtual server data
20101212	Correct file formats listed and accepted for 7za decompression
20101212	Version to 1.4.16
20101213	Implemented NightlyCleanThreshhold here for Linux and Windows (if logging to file)
20101220	newuids will change empty uids into a new one
20101222	Fix for empty cached query that crashed
20101227	Fixed some delete NULL crashes on failures
20101227	Added org clause to forward <compressed as xx> to AE org AE
20101227	ImportConverters now also use ForwardAssociationLevel
20101228	Added \n after cloning db message
20110105	Use MakeSafeStringValue for exact match; Added MoveDeviceScript0
20110105	Added --echo and --selectseriestomove commands
20110105	Version to 1.4.16rc1
20110106	Added --moveseriestodevice; changed --selectseriestomove syntax
20110106	Todo: NightlyMoveSource, NightlyMoveDest, NightlyMoveAmount, NightlyMoveAge, NightlyTestAge
20110106	Version to 1.4.16rc2
20110110	Note: mergestudiesconverter called for series and other way around
20110111	Check for empty patient ID in virtual query and for other empty VRs
20110111	merge study converter merges series: now calls MergeSeriesConverter. Merging studies now calls MergeStudiesConverter
20110111	changed logic of converters passing study or series uid to be consistent
20110111	reject or destroy in merge script stops object from being merged
20110113	fix script clause in merge study, call also tries line in [scripts] in dicom.ini
20110113	Allow script clause without "" as well; unrecognized line attempts call
20110114	"" in script string; script command evaluates string as script
20110115	delete changed UIDs after merge study (remerge will create new series)
20110115	fixed "script" converter and substitution of ""; experimental "lua" command
20110116	fixed error message for incorrect script commands; first lua functions built-in
20110116	SearchDicomObject now supports %VName; allow setting/reading more than 10 sequence items
20110116	The set command now accepts names, e.g., set PatientID to "9999"; nop %VPatientID
20110116	Lua now allows, e.g., Data.PatientID = 'aap'; print(Data.PatientID)
20110117	Started on lua Global, Association, Command
20110118	Primary PDU is Extended to allow embedding lua state in it
20110119	Added a global PDU as script context; associations add new contexts

20110120 Fix in Association.Calling/Called; for now each thread has an isolated lua state. Fix in speed of query results (were all processed by ImportConverter). Added lua startup/command/QueryConverter0 etc; count all threads including gui threads

20110121 Added prefetcherPDU for delayed forwards and such

20110122 Fixed lua print, added lua error handling; added %f %b %p to ImportConverter

20110122 Fixed SearchDicomObject for US,SS,UL,SL tags (note: 'set to' not fixed yet)

20110124 bug fixes in new code; implemented reject in lua

20110125 Put UID changes into debuglog

20110127 Added lua getpixel and setpixel (takes 3-5 microseconds)

20110129 Added lua getrow, setrow, getcolumn, setcolumn, readdicom, writedicom; sd.ddo leaks

20110201 Lua: R/W sequence e.g., print('0 implied', Data.InstitutionCodeSequence.InstitutionName) or Data.InstitutionCodeSequence[2].InstitutionName = 'write for now max one level deep'

20110203 Lua: Unified reading and writing of Data/Command/Sequences; Allow write at any depth in existing sequences

20110204 Allow creating sequence in script and in Lua: Data.xxxx = {}

20110205 Added newdicomobject and deletedicomobject

20110206 Fix for set .. to ""; added set .. to nil for simple VR; create sequence will not overwrite existing sequence; lua web page creation: CGI(), HTML(), <?lua ?> <%= %> source=xx.lua

20110207 Added lua: get\_amap(N) -- N starts at 1, dbquery(db, flds, query, sort) { returns table of tables starting at 1)

20110208 lua gc for dicomobject; lua dicomarray and dicomquery; allow virtualquery without setting level in DDO

20110208 1.4.16rc4

20110214 Fixed lua Data access; fixed "" in exportconverter; 1.4.16rc4a

20110216 Fixed calling and called in ExportConverter; fixed %f etc in ImportConverter; mkdir IE converter also creates subdirs; 1.4.16rc4b

20110228 Added Write, Read and Dump methods to lua dicomobject as closure with passed method name

20110320 Fixed Association.Calling in lua; Added RejectedImageConverter0; added t\_1500 checks to all queries

20110320 1.4.16rc5

20110326 1.4.16rc6

20110328 Fix crash when setting lua Filename for import file

20110331 Added NoDICOMCheck option: if set, do not stop parsing DICOM stream on error; FlushPrivateProfileStringCache after writing to dicom.ini

20110331 1.4.16

20110404 Fix in CGI behavior for IIS (check REQUEST\_METHOD); version to 1.4.16a (unreleased)

20110413 NoDICOMCheck also forces use of sequence enabled reader (allows JPEG compressed V2 file)

20110419 Added lua getvr(Object, g, e), Object:GetVR(g, e), setvr(Object, g, e, data), Object:SetVR(g, e, data); full lua webpage now basically works and gives error messages to web page

20110419 version 1.4.16a  
 20110501 added heapinfo() in lua; version 1.4.16b  
 20110502 Made DcmMove almost always work on study level; added lua  
 dicommove(source, dest, obj, patroot) and sql(statement)  
 20110603 loadkfactor now required for dgate -a commands; added -h  
 option (wait for getkey)  
 20110604 lua endassociation and clienterror events; added retry command  
 for rejectedImageConverter0  
 20110604 implemented/fixed size (may be %)/dsize for sliceviewer  
 /serversideviewer/seriesviewer; version 1.4.16c; also allow  
 size="": use original size or 80% for those requiring a fixed size  
 20110605 Added zip download of series/study through push page  
 20110606 Added --modifystudy and --modifyseries commands, e.g., dgate  
 "--modifystudy:20000321,,compression j2"  
 20110628 Set PDU.Link.Connected to FALSE on !PDU.Read(&DCO)) in  
 StorageApp::ServerChild() to avoid subsequent use of a closed  
 socket in AReleaseRQ::Write() and AReleaseRP::Read() in  
 PDU\_Service::Close() (called in destructor of PDU\_Service)  
 20110710 Added RejectedImageWorkListConverter0; fixed retry for  
 RejectedImageWorkList and RejectedImage  
 20110710 Fixed WADO application/dicom mime header  
 20110710 zip from web page calls zip.cq script on each file; also forces  
 DCM extension  
 20110710 Fix compile of getch and heapinfo linux  
 20110710 Version to 1.4.16d  
 20110904 Clear address (0010,1040) in default anonymizer; Fixed lua  
 deletedicomobject, leak in readdicomobject; Create empty  
 sequence is really empty, # operator for DICOM sequence in  
 lua; Version to 1.4.16e  
 20110904 Fix read of %i, %s, %m in lua not from ImportConverter;  
 protect getpixel etc against missing pixel data; Fix crash  
 of %QX if file does not exist  
 20110905 Fixed leak in %QP etc; fixed leaks in ADDO cleaning in web  
 interface  
 20110906 Added optional script instead of submit.cq to dgate  
 --scheduletransfer: and dgate --submit:  
 20110907 Added script clause to forward; e.g., forward to PACS001fir  
 org SELF script fixkodak  
 20110927 Added "crop x1,x2,y1,y2" and "tomono" importconverters  
 20110928 Added the DEST clause to e.g., "forward to AE org CALLING  
 dest CALLED script nop"  
 20110930 Fixed crash forwarding from lua; Version to 1.4.16f  
 20111009 Fixed sequence writing problem; make it one long when first  
 writing; Fixed AliasFile reading issue: i index into command  
 updated incorrectly; Fixed lua dbquery issue due to typo;  
 Added channel clause to forward import converter; use  
 PDU[19,channel] from lua; fix forward org dest clauses; fixed  
 forward to HOST:PORT  
 20111010 Protect channel clause against incorrect values; Version to  
 1.4.16g  
 20111015 Fixed wado dcm compression (incorrect extension)  
 20111018 Added TempDir ini file option  
 20111114 Version to 1.4.16h  
 20111120 Default size in convert\_to\_gif etc is now 0: as is



20120112	Fix in passing script to submit command
20120211	Allow passing optional DDO as first arg to set/getpixel set/getrow Object:SetPixel, Object:GetPixel, Object:SetRow, Object:GetRow
20120212	Fixed uncompress WADO; fix POST code for SOAP serving; export globals to lua in CGI mode
20120212	Fixed POST for IIS (read len, not len+1)
20120213	Small fix in x:GetRow etc; Setting Dictionary and ACRNemaMap for CGI enables moves and queries
20120213	Moved some set and virtualquery logging to SystemDebug
20120214	Allow any file to be POSTed, saves as xxx.dat; Added DefaultPage and AnyPage items
20120215	Reversed CGI key test to allow query string where e.g., mode= appears twice, hit on first
20120215	Added optional markseries and markstudy pages if passing value 'key' down into them
20120217	Added shoppingcart option; enabled if configured and passing value 'key'
20120218	Added DefaultPage to make own top and AnyPage to totally disable built-in CGI server
20120219	Disabled WEB push to self, and zip from remote server (which was invalid anyway)
20120220	Added WebPush configuration to allow disabling push options; show more config items
20120220	Version to 1.4.16i
20120221	lua can run script on any dicom object; empty tag does not return NIL to lua; lua dictionary(); fix uploadedfile
20120222	Fix webpush and crash on IIS for empty QUERY_STRING
20120229	Extended number of possible columns in PatientStudyFinder
20120302	Added gpps lua function; DefaultPage may be e.g., *.lua; any mode is that mapped to mode.lua
20120304	Implemented region and anonymize options to wado
20120304	Made DefaultPage and AnyPage sections; Fixed WADO text output; Version to 1.4.16j
20120305	Added statusstring for simple web feedback of dicommove and submit (not multiuser safethough)
20120306	Added lua callback to dcmmove2; added statusstring: server command
20120306	A failed virtualserver request will now not wait until a timeout and log error messages
20120307	Added bridge=AE option to make local WADO server a proper bridge (see MyBridgeStorage and LoadForBridge and 0x2bad)
20120317	Documented imagefinder; added process study series with xxxx.lua (just command_line is passed)
20120318	Allow "file.lua" directly as importconverter instead of lua "dofile('file.lua')"
20120319	Implemented lua: filenamesyntax; e.g. lua:dofile('generatefilename.lua') or lua>Data.SOPInstanceUID..'dcm'
20120320	Added [wadoservers] bridge = AE to force wadoserver by default to bridge for one given AE
20120325	"lua" and [lua] ExportConverter, "copy" ImportConverter and "defer" ImportConverter (for lua ExportConverter)
20120327	Document status_string: command

20120402 Improved OverlapVirtualGet: allow to reverse operation - give slices out mainly in incoming order; Avoid deadlock by conflicting requirements; SystemDebug some status messages in OverlapVirtualGet and ReadAheadThread

20120402 Released 1.4.16j

20120525 When retrieve from virtualserver is ready cancel outstanding c-move requests; Increased virtualserver timeout to 200 sec

20120601 Implemented WORKLIST query from lua

20120621 Fix readahead crash when client hangs up in the middle of the transfer

20120624 Limit virtualserver to 64 per move; virtualserverperseries obsolete; fixes crash when series larger than move

20120624 move mkdir etc defines in dgate.cpp up to line 2220

20120624 Keep move object intact in lua dicommove and dicomquery; report fail for lua sql and readdicom functions

20120624 Prerelease 1.4.16k

20120630 Allow compression to be e.g. JL etc or JLNN, J3NN, J4NN, J5NN, J6NN: NN is quality factor

20120630 Reverse .dcm check: all is assumed .DCM except .V2

20120701 Added dicomdelete; note: tried to make heapinfo() thread safe but failed; added [lua]nightly script that runs at 03:00; and [lua]background that runs every second

20120701 release 1.4.16k

20120702 Protect lua\_setvar against NULL string

20120721 Fixed CGI code that got extension wrong on unix with . in folder name

20120722 Added LUA\_5\_2 compatibility by bcb; removed unneeded buf[1024]

20120723 Fixed \*count-- --> (\*count)--

20120829 "mkdir " script command no longer requires a trailing / or \

20120829 Force even text/plain output; first pad ' '; then strip when odd

20120829 Version to 1.4.17

20120905 Fixed bug found by Bruce Barton in [lua] ExportConverter

20120908 Added fix for virtualserver on imagetype and NOIMAGETYPEFIX flag VirtualServerForN may be e.g., "server,NOIMAGETYPEFIX,FIKKODAK"

20120914 Changed default of above fix to off: flag is now IMAGETYPEFIX

20120914 Attempt to use VirtualQueryCached to build list of images to be retrieved in VirtualQuery. Filter response in virtualquery (for virtualserver) for incorrect response of carestream to IMAGETYPE query

20120916 Cleaned up code; split in VirtualQuery and VirtualQueryToDB (that uses VirtualQueryCached); Renamed option IMAGETYPEFIX to send only 3rd element of ImageType to IMAGETYPEFIX3; IMAGETYPEFIX just tests each received record for a match against queried ImageType

20120917 Move dumps response in case of error; finished IMAGETYPEFIX

20120922 IMAGETYPEFIX also works on EchoNumbers

20121015 Fixed check on V2 filename extension to enable NKI compression again

20121016 1.4.17alpha release

20121201 Added and disabled code to link optional socket.core library

20121208 Added \_\_tostring method to lua representation of dicom objects; fix luaGlobalNewIndex: writes dicom.ini as well as direct variables; Blocked delayed export converters of non-existent objects; Added WatchFolder parameter (second monitored incoming folder)

20121214 Enabled socket.core; use .zip for submit version to 1.4.17beta  
Fixed 'forward compressed as ' in import and export converter (viewtopic.php?f=33&t=15588); Added lua Association.ConnectedIP member (WIP)

20121216 Added DicomObject as class factory with new and newarray, added :free(), fixed ConnectedIP

20130125 Added changeuid and changeuidback to lua interface;  
Anonymizer accepts anonymize\_script.lua as well as anonymize\_script.cq; Added ImportConverters "olduids" and "olduids except"

20130127 Added dgate --luastart: (returns immediate)

20130128 Added crc to lua interface

20130202 Added getimage, setimage, :GetImage, :SetImage to string  
GetVr has extra parameter (binary), SetVR accepts (binary) string; Added "pack" library hardcoded; lua genuid; protect lua :Read filename

20130210 mvh Fixed e.g. process study after 5 with test.lua %i:%o;  
Note: there must be arguments passed to command\_line

20130215 Fixed source = xxx.lua cgi starter

20130218 re-allow readdicom on empty Data object; header now works for lua cgi script (default disabled)

20130218 Report move failure in dgate -- commands

20130218 Added studyviewer (default disabled); added dgate --dolua:  
Documented lua command line options; socket.core only for win32 now

20130219 1.4.17beta released as update

20130320 Added lua system() call; fix BackgroundExec with spaces in path

20130321 Add BaseDir\clibs to path; added missing logs for converters such as rm

20130417 fix lua dicommove parameter 5; fixed 'webscriptad(d)ress'

20130417 Unescape % in luaSeqnewindex generated "set ..@ script

20130502 Added \nAccess-Control-Allow-Origin: \* or \nAccess-Control-Allow-Origin:\* to all WADO generated messages, the space is omitted to force header EVEN

20130502 1.4.17beta2 update

20130522 Added options to pass command line to submit data (dgate --submit2:, IE submit2 ..)

20130522 Fixed incorrect case of dicomworklist name found by marek

20130523 Reset dummyddo to avoid incorrect freeing of what it points to

20130523 Fixed bug introduced 20130417 with unescaping Data.xxx = nil or {} no longer worked

20130523 In ModifyPATIDofImageFile change PatientID after running script (assumed changes uids)

20130523 1.4.17 release

20130606 Fixed crash in headerdump of RTSTRUCT (buffer overrun)

20130709 Added float to short conversion in luasetimage

20130709 Added support for setting simple US and UL items with e.g. set Rows to 256

20130711 Fixed luasetimage, fixed some lua return values, version to 1.4.17a

20130716 Added dgate --moveaccession: using 7777 magic number

20130804 dgate --lua: and --luastart: now run in local environment

20130806 dcmmove callback and process with lua now thread safe

20130806 fixed setimage(frame, string), version to 1.4.17b

20130808 Enabled logging of process series by command

20130808 Fixed importconverter command that used patid in memory; failed after anonymization

20130808 Added import\_critical and export\_critical to make "forward to xxx" thread safe

20130810 Removed export\_critical (is serialized), added channel \* to importconverter forward to

20130810 Added closing of importconverter forward to PDU after ForwardAssociationCloseDelay

20130811 Fixed that missing images were removed from db even of no virtualserver is defined

20130812 Fixed deadlock of closing of importconverter

20130812 added lua sleep() in ms; removed unused TransmitCompression

20130813 Removed unnecessary double N checks in forward import converter; added lua addimage() and :AddImage() added VirtualServerQueryConverter and VirtualServerQueryResultConverter; Pass file.lua(command) and patient ID of anonymizer to command\_line & set version

20130820 Fixed forward compressed as XX to IP:PORT

20130826 Test presence of lua file with same name as exe, if exists run that passing arg[]; Pass arg[] for dgate --dolua.; allow dgate --dolua:filename, searched in . and lua/.

20130829 Version to 1.4.17c

20130903 Greatly improved read speed for very large c-moves by reordering if statement in search loop

20130912 Documented where the merge of virtual query computed fields should be added. The field should also not be stripped and there are other issues as well

20131013 Set rc to 1 for [lua] converters; should fix QueryResultConverter0; added quality to ToJPG

20131030 Fix in virtual server if c-move callback occurs less than once per image; test did not generate proper filenames and error message was given improperly

20131103 Fix in VirtualServerPerSeries when exact #images, would omit SOP tag but set level to IMAGE

20131104 Reversed logic: 1 image gives IMAGE move and SOP uid

20131107 Added quality clause to save jpg; Release 1.4.17c

20131219 Fixed that MIRRORDevice0 setting starts mirror copy thread

20140128 added copydicom(source) DicomObject:Copy(); DicomObject:Compress(string)

20140209 mvh Added dgate --compress: command

Spectra0008 Tue, 4 Feb 2014 17:40:17 -0200: Fix cppcheck bug #6 'items[4]' index 4 out of bounds

Spectra0012 Wed, 5 Feb 2014 16:37:14 -0200: Fix cppcheck bug #5.5 printf format string has 1 parameters but only 0 are given

Spectra0013 Wed, 5 Feb 2014 16:57:49 -0200: Fix cppcheck bugs #8 e #9

20140215 Processed Pablo's cppcheck issues

20140219	Added generic decompressor dgate -nu file_in file_out (works for XDR and DCM)
20140304	Detect Data:Read() and do not crash server on it (just fails)
20140309	fixed lua/file.lua returns status rc; newuids no longer generated or changes empty uids; lua mkdir(), dicomquery() now returns raw; fixed luacompress and luacopy; dicomquery2 old one fixed some linux warnings
20140311	Started adding response codes to dgate -- commands; Stop LoadForGui accessing non-configured virtual servers
20140314	1.4.17d release
20140319	Updated command line documentation
20140417	Changed the array initialization loop in RemoveQueryDuplicates
20140506	merged release comment
20140509	Note: DicomObject:Read('p:sop') does not access virtual servers while DicomObject:Read('stu\ser\sop') does
20140519	Avoid uninitialized index in RemoveQueryDuplicates(), removed duplicate includes and corrected check on "vr" in getptr(), corrected "testmode" message in CallExportConverterN()
20140527	Fixed exit codes: 0 is OK, 1 is ERROR; block filename containing .partial from incoming import
20140527	1.4.17e1 prerelease
20140910	Fixed moveaccession; call RejectedImageConverter for failed load in incoming; 1.4.17e2 prerelease
20140916	Fix buffer overflow in html processing of long cgi query results
20140916	Fixed mirrorcopy: it failed to perform mkdir
20150416	Header lister, SearchDicomObject, and lua GetVR and SetVR now support types: UL, US, SL, SS, FD, OF, FL and OW. Lua GetVR and SetVR tables now start at 1
20150504	Added lua string:reshape to reorder large strings representing binary data
20150629	Keep quality spec in "forward compressed as"
20150719	Version to 1.4.19alpha
20150720	Fixed case of DICOMWorklist in web interface; holding message in queue no longer warning; Start work on luaexport; todo: get filename
20150730	Expose DeleteFile option in ModifyData; split ServerTask from main loop; add --modifier: option Allow redirects of logging in --dolua call; -lfile and -Lfile logging
20150902	Added -x#: progress port; added NewDeleteDICOM and NewModifyDICOM lua interface, added Progress info to DcmMove2
20151023	Fixed wado region for non-rectangular images
20151026	Fixed anypage and exceptions logic in web interface
20151108	Added extract:n,query mode to allow extraction from individual tables
20151108	1.4.19beta; protect thread count with critical section; Object:ListItems and DeleteFromSequence method calls; Array:Delete command
20151123	Added progress information to: delete, move, grab, loadfromdir, modify and prefetch

20160108 Updated ChangeUID calls to support staged anonymization, added newuids stage and olduids stage commands

20160113 WADO Anonymize=string other than yes passed to lua/anonymize\_script.lua(string)

20160118 Export: now names files in zip file with SopInstanceUID; added changeuid fourth parameter: Type string

20160119 Fixed named anonymizer in wado request

20160124 Pass Type to ChangeUIDBack; name zip entries to SopInstanceUID; fix wado named anonymizer

20160220 Allow forward slash in code detection autostart lua file

20160306 Added sop to modifier: command; DeleteImage can take patient:sopinstanceuid; Added empty study and series to deleters where needed; deleteimage: command

20160306 Added move: command

20160306 Fix progress info of DicomMove function

20160316 Added progress to export: - note does not uncompress data unless scripted so; extract:-n,query sorts

20160317 Added todbf: command; removed convoluted extract:n and extract:-n

20160319 Decompress images in WADO jpg client, forgotten when cropping

20160319 1.4.19beta release for windows

#### **DGATE.HPP (part of DGATE.EXE):**

19980705: Added CACHEDDevices and JUKEBOXDevices, FindPhysicalDevice

19990108: Added LoadImplicitLittleEndianFile and NKI PrivateCompression algorithms

19990109: Regen has extra parameter

19990317: Changed parameters of LoadImplicitLittleEndianFile

19991117: Added parameter FileCompressMode to prototype of nki\_private\_compress

20000629: Added TroubleLogFile and UserLogFile

20010415: Added KeepImages flag to RemoveFromPacs: clear from DB only Added SubDir parameter to regen to allow regen of one directory only

20010416: Added ChangeUID routine and RegenFile - to allow modification of images

20010429: Changed decompressor: now has extra parameter

20020529: InitializeTables now has mode parameter (0=normal, 1=simple)

20021018: GenerateFileName has NoKill option (for interactive dgate tasks)

20030120: Added prototype of FreeDeviceTables

20030701: compression parameter for amap

20030703: Added prototypes of recompression functions + ArchiveCompression

20030706: Optional filename parameter for recompress

20030706: Export VRType for implicit little endian support

20030921: Added DEVICE\_TYPE\_MIRROR

20040401: Added Changed and ActualMode flags to compress routines

20040626: Added study and series UID to getfilename interface

20040930: Adapted return type of SetString; added maxlen to BuildSearchString

20041013: Added MAXQUERYLENGTH  
 20041029: Added MergeUIDs  
 20041108: Added Syntax input to GenerateFileName  
 20050108: Adapted for linux compile  
 20050109: Added configurable TCPIPTimeOut  
 20050129: Added optional FILE to DumpVR, added  
 CheckFreeStoreOnMIRRORDevice  
 20050401: Added QueryOnModalityWorkList, WorkListTableName,  
 WorkListDB  
 20050404: Added DT\_START/ENDSEQUENCE to code sequence in  
 WorkList table  
 20050902: Made space for HL7Tag in DBEntry  
 20051229: Added iDepth to DumpVR  
 20060317: Added called and calling to GenerateFilename  
 20060324: Added StripGroup2 option to recompress  
 20060628: AddToDatabase has JustAdd parameter: skip one unnecessary  
 query  
 20060702: Pass DB to GenerateFilename to avoid zillions of db open and  
 closes  
 20070122: Added MIRRORDevices  
 20070201: Added DebugLevel  
 20070207: Added MakeTableString  
 20080818: DbaseIII check now uses DB flags, not PATHSEP in  
 datasource name; Added DT\_MSTR  
 20090620 Include file stuff  
 20091231: Changed char\* to const char\* for gcc4.2 warnings  
 20100111: Merged  
 20100123: Added DT\_FL and DT\_FD  
 20100125: Removed linux warning  
 20100309: Changed SQLLength to unsigned int  
 20100703: Merged  
 20110119: Moved two functions to the correct place  
 20160108: Updated ChangeUID calls to support staged anonymization  
 20160219: Removed BOOL TRUE and FALSE defines

#### **LOADDDO.CPP (part of DGATE.EXE):**

19980409: added NKI private decompression engine VR 0x7fdf,0x0010  
 19980410: added run length encoding of zero differences  
 19980410 Fix 16 bit absolute value decode  
 19980415 Fix leak on decompress  
 19980625 Added compression in SaveDicomDataObject(C10)  
 19980703 Made DObjectSerialize thread save (removed statics)  
 19990105 Fix: SaveDICOMDataObjectC10 created VR 0x0002 0x0013  
 twice. Added comment in SaveDICOMDataObjectC10;  
 CleanUp. Put the nki-routines also in dgate.hpp. Added  
 LoadImplicitLittleEndianFile  
 19990317 Decompression removed from LoadImplicitLittleEndianFile;  
 added a VR-sizelimit of that reader  
 19990827 NOTE: LoadImplicitLittleEndianFile allocates 100 MB and  
 crashes when passing chapter 10 file (happens when extension  
 is wrongly .v2)  
 19990830 Fixed problem above: 'LoadImplicitLittleEndianFile' uses  
 'PDU.LoadDICOMDataObject' in such cases.

19991117	Added parameter FileCompressMode to in nki_private_compress call
20000629	Logging of trouble now starts with '***'
20001104	Renamed _LittleEndianUID to _LittleEndianUID_space
20001105	Fixed where malloc and new were mixed (vr->data)
20001106	Use delete [] operation for vr->Data
20001128	Fix in 'Implicit length' code in LoadImplicitLittleEndian
20010429	Use faster and safer decompressor
20020412	Added class CBufferedIO for faster reading from DVD (stream functions do not seem to be caching.)
20020415	Removed diagnostic time code (did not compile on ms4.2). Made buffer size dependent on iVrSizelimit (i.e, use smaller for regen, slightly faster)
20030706	Attach VRType to PDU's for implicit little endian support
20041130	Documented crash on win2000 server in code - remains to be fixed – rare crash related to read error of DVD
20050107	Adapted for linux compile
20051219	Use ReAlloc instead of new BYTE[] to fill VR data
20070308	And little/big endian.
20081116	Adapted for very large objects (use unsigned int for length)
20090211	Safety checks in LoadImplicitLittleEndian to avoid crash on corrupted V2 file; Removed lots of dead code
20090412	Fixed for linux compile (tell does not exist)
20091215	Fixed LoadImplicitLittleEndian() when iVrSizeLimit is used (e.g. regen) (assumption that the pixeldata would be the last VR is not correct).
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100210	Fixed reading some old V2 files (-1 VR length).
20100309	Changed int to unsigned int, cast m_iNbBytesInBuffer to long (gcc4.2 Warnings)
20100309	Commented out unused (gcc4.2 Warnings)
20100619	Fix gcc4 warnings, improve speed and prevent CBufferIO from being copied.
20100717	Merged

#### **DGATEFN.CPP (part of DGATE.EXE):**

19980326:	changed file name generator to ensure correct sorting of image files by external applications
19980327:	Added FileNameSyntax option in dicom.ini; 0=original, 1=allow sorting by name
19980407:	avoid /;<>  in filename; for Philips: allow up to 9999 series and 999999 slices
19980409:	do not free passed DDOPtr on failure: crashed the lot
19980415:	Error messages to operatorconsole
19980620:	Check error flag from GetDevice (for out of disk message)
19981005:	Added FileNameSyntax 2: filename starts with SeriesUID_
19981005:	Replaced size%64 by min(size, 63) for correct truncation
19981217:	FileNameSyntax 3: same as 2 but accept errors
19981220:	Fixed FileNameSyntax code
19990117:	FileNameSyntax 4: same as 3 but .dcm extension (forces ch10 format)



19990117: Avoid attempts to rewrite image that is not on MAG store (e.g., on CD)

19990315: Do not allow '.' in directory name. In Syntax 3 directory name is now patient ID only (better for ACRVIEW). Better unique filenames by using time + counter.

20000127: FileNameSyntax 4 now does not truncate patid, as 3 already did

20000131: FileNameSyntax 4 has patient ID only as directory name (same as 3)

20000701: Added MaxFileNameLength option: truncates from start

20010419: FileNameSyntax 5 on request of Jason Foster - uses patientname as dir

20011109: Made MAG name check case insensitive

20020416: Made filename counter 4 digits for when writing >100 files/s

20020416: Made all instances of time() unsigned

20020426: Cannot rewrite image not on MAG store is now a message without \*\*\*

20020508: The above message will not lead to a fail of GenerateFileName

20020802: Added FileNameSyntaxes 6..9; cleaned FileNameSyntax code a bit

20020804: Truncate patient ID to 32 chars for mode 6 and 8 (make sure len<255)

20021016: Pass indexed patid to GetFilename for speed

20021018: GenerateFileName has NoKill option (for interactive dgate tasks)

20021223: Added forbidden chars \*, ?, " and : (comment from Thomas Buerer)

20030401: Overrule '.v2' filenames with '.dcm' when object is not ImplicitLittleEndian

20030522: Replaced 'static int counter' by 'unsigned int gl\_iCounter'

20030606: Fixed incremental counter when creating UIDs or generating filenames

20030730: Overrule v2 only when not ImplicitLittleEndian, ExplicitLittleEndian ExplicitBigEndian (c.f. 20020401)

20030819: Allow longer filenames

20030921: Added DEVICE\_TYPE\_MIRROR TO GetDevice call

20040129: Added FileNameSyntax 10 = all files in one directory

20040301: Small fix for FileNameSyntax 10

20041108: Added Syntax input to GenerateFileName (overrides ini setting)

20050107: Adapted for linux compile

20050126: FileNameSyntax 11: StudyUID\SeriesUID\SOPUID.dcm

20050131: Changed root to 'name' for FileNameSyntax 11

20051210: Clear root output string when image already in database

20060312: FileNameSyntax 12: similar to 11 but uses Modality\_StudyID as dir

20060312: Checked it:  
12=name\_ID\Modality\_StudyID\SeriesUID\SOPUID.dcm

20060314: 12=name\_ID\Modality\_StudyID\SeriesID\SOPUID.dcm

20060314: new filenamesyntax, e.g., %name\_%id%\%modality\_%studyid%\%seriesid%\%sopuid.dcm

20060317: Added calledae and callingae to GenerateFilename flexible syntax

20060325: imagenum is image number as text, fix imageid, accept all errors

20060402: Fix potential problem when patient ID not there

20060701: Speeded string handling in new filenamesyntax  
 20060702: Pass DB to GenerateFilename to avoid zillions of db open and closes  
 20070125: Fix %modality; add %studydate and substring (year = %studydate[0,3])  
 20071027: Extended length of FileNameSyntz parameter to 256  
 20071027: Stripped spaces of called and calling in flexible filenamesyntax  
 20071030: Small fix in the above  
 20071104: Added %series: 4 digit series number  
 20090620 Include file stuff  
 20090620 Include file stuff  
 20090926 Added %studydesc and %vxxxx,yyyy etc  
 20090927 Added Cleanup ro %vxxxx,yyyy  
 20091231 Changed char\* to const char\* for gcc4.2 warnings  
 20100111 Merged; but cast Time to print to (unsigned int)  
 20100125 GetPrivateProfileString -> MyGetPrivateProfileString  
 20100126 Fixed readout of studydate (typo mix with studydesc)  
 20100303 Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)  
 20100703 Merged  
 20100828 Update history fix  
 20101222 Fixed that ascii codes > 128 where replaced by zero (truncated) in Cleanup; now kept  
 20110201 Changed prototype of SearchDICOMObject  
 20110606 A change of extension when rewriting is now allowed; object is then deleted first  
 20120319 Implemented lua: filenamesyntax  
 20121208 Added %date to filenamesyntax gives yyyymmdd  
 20131013 Default FileNameSyntax set to 4  
 20160316 Avoid buffer overflow reading string[-1]

### **DEVICE.CPP (part of DGATE.EXE):**

19980620: Setting MAGDeviceThreshHold to 0 causes out of disk error below 10 MB without cleanup  
 19980620: Implemented PanicKillOff thread here as alternative to spawning killer.exe  
 19980702: Started support functions for maintaining/determining amount of used space on device  
 19980704: NOTE: JukeBox code only TruncateFieldNames compatible for now; used mp's filecopy  
 19980709: Finished first version of archive options: prepare, undo, copy, compare, delete  
 19980721: Set default # cache and jukebox devices to 0  
 19990110: Made strings longer since got truncated, fixed some messages  
 19990110: Archive one MAG device or MAG?; fixed SQL syntax for update; speeded 0x7fffffff. Return False if SelectLRUForarchival selects no data  
 19990111: Reset archive flag reports to operator console; protected against illegal device#  
 19990113: Run up to 10 patient further to try and fill CD more exact; max patients = 10000  
 19990114: Added quick routine MakeListOfPatientsOnDevice and used instead of 0x7fffffff

19990117: Accept any, not only \*.v2, for computing patient size, assume max file size=30 Mb

19990630: Added support for MIRROR devices (e.g., try MIRROR1 if MAG1 fails)

19990707: Fixed default MIRRORDevices (now 0)

19990708: NOTE: archiving should make use of mirror device if required as well!

19990712: Fixed that MagRampage thread was started over and over again (fixed for WIN32 only)

19990831: Fix: Several BOOL functions returned -1, which is TRUE !!

20000621: Changed layout of this update-history

20000629: Logging of trouble now starts with '\*\*\*'

20001104: Fixed aDB.Close -> should be aDB.Close(); added WINAPI to MagRampage thread

20010328: Added verify mirror disk

20010329: DeleteBunchAfterBurning also deletes data on MIRROR0 if it exists; verify mirror disk keeps on going after error but does return error

20010312: Check if we already selected some patients for archiving from the device

20010509: Added RenameDevice

20010522: Do not call RestoreMagFlags if something goes in wrong in PrepareBunchForBurning

20011114: Replaced slow updates for magdevice by much faster ones. The update that now no longer has the IN part might not work for ACCESS or DBF. So: for jukebox purposes, SQL server is required

20011115: Replaced 'LIKE' by faster '=' in query strings; fixed previous fix

20020412: PanicKilloff will delete now delete 5 MB data at a time. (high water = low water + 5)

20020415: Added TestImages: sanity check of images on disk

20020416: Reversed read order for TestImages and VerifyMirrorDisk: MRU first

20020802: Allow multiple subdirectories in rmdir and mkdir code

20020804: Cleaned up a bit

20021018: GenerateFileName has NoKill option (for interactive dgate tasks); moved ALERT warning

20021020: Simplified and speeded queries for archiving using ImagePat field (requires rev5+ of db); Removed " and added [ in MakeSafeString; hand-code one query for built-in dbase driver; Changed SQL construct in SelectLRUForArchival for compatibility with built-in driver

20030120: Added FreeDeviceTables

20030702: Start on ArchiveCompression; for now KB is specified -before!- compression

20030705: Replaced ProcessDDO by more correct DecompressNKI to check pixel data

20030706: Attach VRType to PDU's for implicit little endian support

20030724: Fix in GetKBUsedForPatient: missing %s in printf

20030819: Allow longer filenames

20030905: Allow longer filenames when reading device paths

20030921: Added DEVICE\_TYPE\_MIRROR in GetDevice; allow PanicKilloff to be called with variable threshold

20031217	Fix: Support harddisks bigger than 2 GigaByte!!! in CalcMegsOnDevice (Thanks to Clifford Sweet)
20040403	Moved ArchiveCompression to SelectLRUForArchival -> fills disks correctly
20040614	Added MoveDataToDevice
20050107	Adapted for linux compile (no threads yet, no check of disk space on device)
20050109	Added threads for linux
20050118	Detach thread after starting it to avoid leaks
20050119	GetKBUsedOnDevice is not used --> no problem to return -1 under linux
20050414	Fix CalcMegsOnDevice for relative path
20050421	Fix: MAGThreshHold is space for largest file != space for cleanup. Now set to 30 MB independent of MAGDeviceThreshHold
20050901	Fix free space check for unc paths (error counting \)
20060311	When GetDiskFreeSpaceEx fails allow storing data anyway (fix for Marius Petruc)
20061213	Fixed nasty bug in MakeListOfPatientsOnDevice: Query without bindfield overwrites previous bound strings!
20070316	Cleanup now starts at MAGDeviceThreshHold to MAGDeviceThreshHold+1000, was start on 30 to MAGDeviceThreshHold; Allow both MAG0 and MAG0.Archiving as input for PrepareBunchForBurning
20071027	Protect MakeListOfPatientsOnDevice on MAXPATIENTS; LRU selection now configurable using routine MakeListOfOldestPatientsOnDevice. E.g. if LRUSort = StudyDate, deletes or archives least recent scanned patients first. The default "" means that the original sort order on db entry date is kept
20071031	Catch out of memory errors and return error status if so
20071118	Adapted for 64 bits (use SQLLEN for BindField)
20071128	Fix by kamil.krasnik of Cache device disk space test for UNIX Also fix Cache and Mirror for UNC paths
20080126	Fixed bug reported by Ali: second move to MAG1 of more data if same patient would fail on delete. Added new logic: attempt to delete file from MAG0 that is not in MAG0 but is in MAG1 is OK. Similar attempt to delete file from MAG0 that is in MAG0 but not in MAG1 is an error
20080302	Fixed case of DICOM table names
20080317	Fixed deletebunchafterburning change (Ali)
20080604	Modified device searching order when file not found: JUKEBOX now also searches other JUKEBOX
20080617	Fixed bug in above: second jukebox not accessed correctly
20080818	DbaseIII check now uses DB flags, not PATHSEP in datasource name
20081016	Fix check of max patients in MakeListofOldestPatientsOnDevice
20081120	Added UseEscapeStringConstants and DoubleBackSlashToDB
20081124	restrict PanicKillOff to 10 runs (to stop when no patients left)
20090821	Added new FileExists function that uses stat; maybe does not try to mount tape or disk too early
20090926	MakeListOfOldestPatientsOnDevice returns newest if Max<0

SelectLRUForArchival always use new code (use KB<0 to select MRU); Default MakeListOfOldestPatientsOnDevice use AccessTime to emulate old code

20091231 Changed char\* to const char\* for gcc4.2 warnings

20100111 Merged

20100120 Fixed two const issues detected with ms8

20100124 Use MyGetPrivateProfileString

20100309 Added double parentheses (gcc4.2 Warnings)

20100309 Changed int to unsigned int, commented out unused variables and routines (gcc4.2 Warnings)

20100619 Added UNUSED\_ARGUMENT.

20100717 Merged

20100901 Added IgnoreMAGDeviceThreshHold

20101121 Added ArchiveConverter0 (1900)

20110105 Do not stop deleting on single error; added MoveDeviceConverter0 (2000)

20110105 SelectSeriesForArchival: selects data older than age days (age>0) or younger (age<0) from device

20110106 added kb limit to SelectSeriesForArchival; Added moveseriestodevice

20110106 fixes in series code and new MakeSafeString; #if code to allow select on AccessTime instead of SeriesDate

20110119 Pass PDU to some archiving code as script context

20110320 Added MAGDeviceFullThreshHold, system will only write to device if more than # MB avail (def 30)

20110603 Fully init vr used for MakeSafeString

20110606 RecompressPatient also changes filename if script (ArchiveConverter0, MoveDeviceConverter0) passed

20110904 Fixed leak in InitializeDeviceTable (occurs in read\_ini command)

20120723 Fixed string overflow found by bcb in MakeListOfLRUPatients

20130817 TestFile will uncompress all read data to test it

Spectra0011 Wed, 5 Feb 2014 14:36:36 +0000: Fix cppcheck bug #4 (strncpy termination)

Spectra0010 Wed, 5 Feb 2014 11:54:40 +0000: Fix cppcheck bug #3 (and others in same function)

20140215 Fixed potential Patlist memory leaks; and also always free PatientIDList in calling;

Spectra0018 Thu, 6 Mar 2014 15:43:54 -0300: Fix mismatched new/delete in device.cpp

20150629 Use configurable table names for sql queries

20150730 Expose KeepFile parameter of ModifyData

#### **DBSQL.CPP (part of DGATE.EXE):**

19980321: Changed ObjectFile and DeviceName field length to 250 for dbf compatibility

19980321: Added define TRUNCATEFIELDNAMES for DBF compatibility (apply in makefile)

19980322: Added run-time check on DbaseIII (should also be added in parse.cpp somehow)

19980325: Added TruncateFieldNames entry in dicom.ini to allow DBF compatibility

19980327: Made MaxFieldLength configurable

19980327: Set default event notification to UDP (for personal pacs)  
 19980407: Added FileCompressMode config  
 19980409: Check vr!=NULL in MakeSafeString, MakeSafeDate  
 19990630: Remove also files from MIRROR disks  
 19990707: Added UpdateOrAddToTable to refresh database contents without first removing  
 19990707: Cache Updates; and AccessTime with ~31 to allow update times to be the same  
 19990707: Added fix for Philips PATID; fix cleaning of MIRROR device  
 19990708: Added (and disabled) stress code for SQL server  
 19990712: Fixed FIX\_PHILIPS; atoi failed sometimes because vr->data not zero terminated  
 19990827: Added creation of key and link indices  
 19991117: Added a check on ini-file value of FileCompressMode  
 20000621: Changed layout of this update-history. Fix: In 'SetString', type DT\_UINT32 was treated as DT\_UINT16 Added TroubleLogFile and UserLogFile  
 When updating PatientRecord, verify the new Name and BirthDate  
 20000629: Logging of trouble now starts with '\*\*\*'  
 20000701: Remove \*all\* trailing spaces in MakeSafeString before enters database  
 20000703: Merged changes: made patient change verification table and record name independent and extended to other databases as well; removed trailing before comparison; show patid on all error messages  
 20000705: refuse inconsistent update of link: show error on operatorconsole  
 20000707: fixed above addition  
 20001104: Replaced \_rmdir by equally valid rmdir  
 20001106: Use delete [] operation for vr->Data  
 20001128: Fix: protected 'GetFileName' with a critical section.  
 20010415: Added KeepImages flag to RemoveFromPacs: clear from DB only  
 20010416: Added ChangeUID routine and UIDMODS table - to allow modification of images  
 20010418: Changed names of database fields in UIDMODS - did not work on msaccess  
 20010429: Renamed genuid routine and variables to allow compile in one big file  
 20010713: Reduced devicename to 32 chars to space space  
 20010902: Improved UpdateCache to be thread safe and made it longer, no test on image db.  
 20011109: Made MAG check and database field consistency check case insensitive.  
 20011115: Replaced 'LIKE' by faster '=' when possible  
 20011116: Fixed error handling of db entry. It was possible that db entry failed without any message!  
 20011121: Create indices on ImagePat and SeriesPat if these fields exist  
 20020403: Do not overrrule the PatientTable with: empty data, or birthdate xxxx0101, or sex other than MmFf.  
 20020409: made LastPatid non-static  
 20020409: Removed non-thread safe caching of LastADBE  
 20020409: Moved entry into UpdateCache to after succesful Update

20020412 Made NCACHE configurable and changed it from 16 to 1024 (8 MB); Set lastfield (limit of #fields) to 20 (was 16)  
Added checksum code in update cache to make it faster

20020412 Made key fields unique. Reversed writing of db's. In this case a db write fail will still result in a valid db. The db write code is not multi-user safe. A new record may be written at the same time by two processes -> fail

20020413 Set NCACHE to 256, enough for single thread regen  
Modified another non-thread safe construct

20020415 Fix display of PatientID in 'Inconsistent' error message

20020416 Made UID generator configurable through UIDPrefix in dicom.ini. Made all instances of time unsigned. Note: accesstime in the db is signed int: problem around 2038

20020418 Added TimeStamp, Flags, and Spare fields on all dbs for future use

20020430 Fix in spare fields: name was reserved in some odbc implementations

20020515 Process all db fields; enter (1) Modality into StudyModality

20020517 Modality is merged into StudyModality without size limit (enforced by sql server)

20020518 Skip missing VR's again; max nr fields to 30; fix reading of NULL fields (clear s[][])

20020519 Also skip writing empty VR's (vr->Length==0); made FixPhilips configurable (default 1). Remove / from date to allow writing mm/dd/yyyy into sql server

20020522 Test on empty Modality vr

20020529 Added PRIMARY KEY to key DB fields (needed for replication)

20020529 InitializeTables now has mode parameter (0=normal, 1=simple)  
Do not make Index for primary keys (is done automatically)

20020609 Added compression modes 3 and 4

20020802 Simplified rmdir code and allow multiple subdirectories

20020804 Use PATHSEPCHAR where possible

20020806 Fix: cleanup entries of refused item in database

20020819 Added better UID generation

20021016 Use patid in SaveToDatabase and GetFileName query (both test for rev5 or higher of the database)

20021017 Allow set of UIDpostfix from extern (-c option of dgate)  
Removed creation of unused tables

20021020 Added [ to MakeSafeString; removed "  
Note: VR's containing ', ? give spurious inconsistency warning when rewritten

20021028 Also removed dropping of unused tables; reversed table search to image.pat in FindDBE. Made inconsistent birtdate a severe error message (added \*\*\*)

20021110 Made date range inclusive (bug reported by Aaron Cann)

20030113 Added PatientQuerySortOrder etc overrides for sorting

20030205 Fix potential empty patient ID and SOP problems in GetFilename

20030321 Extra check on vr!=NULL in SaveToDatabase

20031104 Added \\ to MakeSafeString

20040301 Do not double \\ when already doubled

20030425 Added DoubleBackSlashToDB control for \\

20040528 Pass patient ID in RemoveFromPacs and Enable KeyOnAll

20040529	Implemented faster delete from database
20040530	Pass a field to query in delete - obligatory for sql server
20040601	Removed enable KeyOnAll - added some more checks in NewDeleteFromDB
20040609	Check for DB revision for fast delete from database queries
20040610	Truncate too long VR's before putting into db; log to pacstrouble
20040623	Fix for non-DBASE datasources in 'UpdateOrAddToTable'
20040626	Added study and series UID to getfilename interface
20040713	Added FixKodak: replace pat 0nnnnnnnn with nnnnnnnnn
20040722	Defaults for FixKodak and FixPhilips to 0 (!)
20040930	Added multiple UID matching: UID\UID\UID in BuildSearchString (list truncates at maximum length) SetString now returns a char * which is newed (with lots of extra space for MakeSafeString which is done in-place) if Max length is passed 0. DICOM2SQLQuery has no max length anymore
20041003	Truncated printf's of SqlStatement
20041029	Added MergeUIDs routine
20041101	Added NewDeleteSopFromDB
20041220	Fix: in 'RemoveFromPACS', an even PatientID was not zero-terminated !!
20050109	Adapted for linux compile
20050111	Added ctype.h (for mingw)
20050205	Added counters for database activity
20050206	Allow empty DBE in ConstructVRFromSQL: used to get ObjectFile and Device in query
20050401	Added WorkListDB and WorkListTableName
20050404	Dicom types DT_START/ENDSEQUENCE are ignored during table creation/adding to table
20050414	Allow undefined worklist database; Delete patient will delete worklist entries as well (but needs at least one image)
20050417	Delete from DB will also delete worklist as patient goes
20050826	Added mode 2 for initializetables: clear/create worklist only
20050831	Mode 0 and 1 will now not delete worklist if it contains data
20050831	VerifyIsInDBE will not return DT_START/ENDSEQUENCE
20050901	Do not call FixImage in SaveToDataBase: is done in SaveToDisk before
20051121	Enabled SQLRealSize because SQLResultLength does not work in PostGRES BindField
20051123	Fixed it, and only enable it when #ifdef POSTGRES
20051204	Disabled it, fixed postgres driver instead
20051210	GetFilename returns FALSE for an image that has no filename or device set
20051212	Clear update cache when any records deleted - drastic but safe
20051216	Small fix in above
20051217	Use new VR::ReAlloc method to replace data in VR
20051218	Fix study modality when DoubleBackSlashToDB=1; changed modality search
20051228	Truncate invalid trailing spaces (>1) from patient ID. Fiximage warns to SystemDebug
20060210	Removed order: first remove spaces and then fix the patient ID because patient ID consisting of 14 spaces caused huge troubles



20060220	Check max 50 fields when update; fix Inconsistent check for DoubleBackSlashToDB
20060607	Fix character translation for entering *?%[' into sql using MakeSafeStringValue. Fix consistency check for these characters as well (thanks Robert Chrzan)
20060607	Added "not null" to "PRIMARY KEY" to satisfy Sybase (thanks Marcin Litoborski)
20060618	Added not null to UIDmods as well, unified case of DICOMWorkList table name (may be done for other tables as well) (thanks Marcin Litoborski)
20060618	Remove " added by MakeSafeStringValue prior to inconsistency check (thanks Robert Chrzan)
20060621	Increased size of s from [50][255] to [51][256] in UpdateOrAddToTable fixes VirtualQuery crash
20060628	AddToDatabase has JustAdd parameter: skip one unnecessary query
20060706	Replaced faulty new vr construct when doing consistency check: faulted on Linux
20061213	Protect Clear_UpdateCache with critical section Fixed nasty bug in NewDeleteFromDB. MergeUIDs, NewDeleteSopFromDB: Query without bindfield overwrites previous bound strings!
20070123	Fixed GetFileName for patientid with '; Recoded some of the inconsistency checking: now no failure on patient ID (link) with ,
20070131	Fixed GetFileName for all patientid's ;->>>>
20070201	Fixed (unused) UpdateAccessTimes for weird patient IDs
20070210	Added CheckDuplicates to UpdateOrAddToTable: used on DicomStudies to catch inconsistent patientID Enabled KeyOnAll on UpdateOrAddToTable: only delete exact records (needed if inconsistent patientID)
20070308	Changed to set patient ID to 0 for anonymized patients
20070315	Merged; also noted that changed possible use of AND at start of sql where
20071027	Also truncate too long date fields with error message; added AllowTruncate: if sql name in comma separated list: warning only else ***error
20071118	Adapted for 64 bits (use SQLLEN for BindField)
20080302	Fixed case of DICOM table names
20080319	Fixed typo in above change; fixed worklist delete for patients with space in ID
20080817	Added WorkListReturnsISO_IR_100 flag (default 1)
20080818	DbaseIII check now uses DB flags, not PATHSEP in datasource name; Added experimental DT_MSTR: multi-value entry, e.g. query on 'PET' matches 'PET\CT' if studymodality is given type DT_MSTR instead of DT_STR. Note: not implemented for DBASEIII
20080819	Added warning when querying DT_MSTR field on dbase
20080902	added EnableComputedFields (default 0)
20080910	Added create Patient ID for 0 length ID (old Picker CT)
20080910	Missing patient ID is now not filled with "0" but with PatientName + Date
20081104	Fixed crash in UpdateOrAddToTable due to missing BindField (1, ...)

20081120	Strip all trailing spaces of modality prior to merging: some scanners add more than 1; Added UseEscapeStringConstants
20081124	Blocked RemoveFromWorld when 0 images found for safety; default SQLServer to "" = black hole
20090216	Added ChangeUIDBack and ChangeUIDTo
20090616	Create index for UIDMods on OldUID; protected UIDMod functions with ChangeUIDCritical; Convert ** query field to *; old efilm version seems to create those
20090616	Include file stuff
200912308	Merged changes by Bruce (bitsltd)
20091231	Changed char* to const char* and cast time_t to int for gcc4.2 warnings
20100111	Merged
20100123	Added DT_FL and DT_FD types, added swapping in ConstructVRFromSQL, and fix DT_UINT32 and DT_UINT16 there, size is 4 and print as %u
20100123	fixed typo for Linux compile Time -> time
20100124	fixed typo in ChangeUIDBack
20100124	Use MyGetPrivateProfileString
20100309	Added double parentheses (gcc4.2 Warnings)
20100309	Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)
20100324	swap for big endian only.
20100619	Added #ifndefs (gcc4.0 Warnings) and UNUSED_ARGUMENT
20100717	Merged; but still use deprecated atof as change would not compile
20100726	Added cast at atof to suppress warning
20100802	Added SUBMISSIONS table
20100816	Allow dicom.ini and other files to be moved.
20100816	removed (a) from #ifndef EnterCriticalSection(a) etc
20100818	Merged jd SUBMISSIONS table
20100823	Merged and simplified basedir logic
20101121	Do not make AccessionNumber primary key in worklist
20101212	Made FixKodak global
20101227	Added \ prior to _ in query value
20101229	Modified \_ to [_] etc; presence of [ now also forces LIKE
20101229	% -> [%]; _ -> [_]; [ -> [[; ] -> []]
20110105	Moved local routines to vrtosql: MakeSafeString, DICOM2SQLQuery, BuildSearchString, BuildColumnString
20110105	Use MakeSafeStringValues for exact match; added DICOM2SQLValue
20110105	Removed SUBMISSIONS table
20110106	Fixed regen crash due to missing vr==NULL check in MakeSafeStringValues
20110111	Extended check for vr in MakeSafeStringValues
20110115	Added DeleteUIDChanges
20110214	MakeSafeStringValues 20110111 change broke dbextract; fixed now (return " if vr invalid or empty)
20110326	Fixed crash in SetString on findscu --key 0010,0010 --key 0010,0020 127.0.0.1 5678
20110419	Added sequences to MakeCopy (to fix bug: "save to" did not write sequences)
20110603	Fully init vr used for MakeSafeString

20120214 Added WorkListReturnsISO\_IR to also allow setting 192  
20130806 Added FixID (default 1), set to 0 to disable any ID fixing,  
data without patient ID skips write to patient table -  
experimental  
20130807 Worked on accepting data without patient ID if  
AllowEmptyPatientID = 1  
20130808 Added substitution of patient ID for database purpose if  
AllowEmptyPatientID = 1  
20131013 Default TruncateFieldNames set to 10  
20140309 ChangeUID functions leave empty UID as is and escape '  
Spectra0015: Thu, 6 Mar 2014 15:34:35 -0300: Fix mismatched new/delete in  
dbsql.cpp  
20150902 Added NewDeleteDICOM and NewModifyDICOM  
20151122 Updated progress information  
20160108 Updated UIDMods table and ChangeUID calls to support  
staged anonymization  
20160111 Undefined stage becomes (empty)  
20160115 Olduid may no longer be primary key, allow stage=NULL and  
stage=""  
ChangeUIDTo allows "" for NewUID, generates UID then  
20160124 Optional Type for ChangeUIDBack; add Annotation to  
UIDMods database

### **VRTOSQL.CPP (part of DGATE.EXE)**

20000629 Logging of trouble now starts with '\*\*\*'  
20010330 Added a few debug printf's  
20010420 Fixed memory leaks in all query levels  
20020519 Clear BindField result strings before reading (NULL does not  
read)  
20021028 Restructured queries to give lowest level of de-normalized  
databases. Fixed sorting on PatientName in denormalized study  
query  
20021030 Reversed this again apart from study level because SQL server  
becomes very slow  
20030113 Added PatientQuerySortOrder etc overrides for sorting  
20030114 Added in querycolumns (even if already present);  
tested for SQL server, requires testing for other datasources  
20030122 Remove unused entries from Tables string in queries  
20040930 Started adapt such that query strings etc and not limited in  
length. For now: query string max 8192 (here and in  
odbc.cpp); sql statement max 16384 (in odbc.hpp)  
Enough for query with one multiple values UID of about 100  
images (list truncated if too long). Added safestreat protection  
of SearchString  
20041003 Truncated debug prints, malloc strings at image level.  
Analysed string lengths; limited 'records =' debug log  
20041013 Used MAXQUERYLENGTH  
20050107 Removed UNIX flags: solve difference in database interface  
20050206 Image query can send filename and device in 0x9999,0x800 /  
0x0801  
20050401 Added QueryOnModalityWorkList; - todo - put selected items  
into sequence 0040,0100

20050404	Take query for Scheduled Procedure Step from sequence, put results into sequence
20050414	Made sequence unfolding for worklist more generic - accepts any number of and nested N=1 sequences. This is correct behavior for query input, but limited for query results
20050417	Removed unused variable
20050831	Fixes in worklist code: is ok for all OFFIS tests except 1 (empty seq not returned) and 10 (undef non-empty seq takes one entry from higher level) - good enough for initial release?
20050901	Fix for test 10: allow undefined sequence in query
20050907	Merged change by Hans-Peter Hellemann: fix missing max() macro
20051229	Debug log show records of all queries. DumpVR only left in worklistquery and shows sequence layout
20051230	Removed 2 forgotten dumpvr's
20050103	Added debug info from testing phase inside nested sequences for modality query
20050211	Added empty required modality sequences 8,1110 and 8,1120 when not there
20050224	Fixed modality worklist query: empty result sequences were not handled correctly (Thanks Tony Tong)
20050311	Worklist change was tested OK with Agfa (thanks Frank Grogan), cleaned debug log a bit
20060607	Fix crash when coding empty sequence as last item in worklist query (thanks Francois Piette)
20061219	Small fix in layout debug log
20071118	Adapted for 64 bits (use SQLLEN for BindField)
20080817	Fixed bug found by larc: worklist sql syntax error (fields start with ,) when 1st item is sequence; Fixed bug found by Alberto Smulders: sometimes sequence level in response would not come down; The problem was that a higher levels the reported sequence level was inconsistent with the 1st level; Changed CodeSequence stop criterium and level coding for deeper levels; now works with varies sequence combination; Added WorkListReturnsISO_IR_100 flag (default 1)
20080818	DbaseIII check now uses DB flags, not PATHSEP in datasource name
20080901	Implemented 'Number of Patient Related Studies' (0x0020, 0x1200) etc
20080902	Fixed that option for VirtualServers; added EnableComputedFields
20080905	Added void* cast for deivr change
20081016	Fixed for WC compile
20081121	Fixed ISO_IR 100
20090930	Fixed ImageQuerySortOrder: crashed on C-MOVE, because sortcolumn was inserted before the filename
20091005	Fixed ComputeField: return VR was used during cleanup
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100309	Added double parentheses (gcc4.2 Warnings)
20100309	Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)
20100706	Init Level
20100717	Merged

20100822	Delete 9999,0802 virtualservermask control VR from searches and pass it to ComputeField
20100823	Fixed compile for ms8amd64
20100901	Rephrased "Failed on VR Search...."
20101003	Delete 9999,0900 script control from queries
20101120	Delete 0002,0010 transfer syntax from queries
20101127	Added CountOnly mode to accelerate e.g., NumberOfStudyRelatedInstances queries
20110105	Pass database to MakeSafeString to allow db_type dependent processing; use LIKE only when needed
20110105	Moved local routines here: MakeSafeString, DICOM2SQLQuery, BuildSearchString, BuildColumnString
20110603	Fully init vr used for MakeSafeString
20110605	Allow '*' for query
20120214	Allow WorkListReturnsISO_IR_100 to be any value (e.g., 192)
20120422	Fix search in DT_MSTR with embedded _ to use =, was a LIKE that failed for MySQL
20120624	Fix DT_MSTR for DoubleBackSlashToDB (mysql and postgresql): requires 4 backslashes (!)
20120701	Fix in BuildSearchString for UseEscapeStringConstants for DT_MSTR and DT_DATE
20131013	DT_MSTR warning for DBASEIII reports now to console
20131017	Put the changes of 20120701 back because dgate fails for PatientID with '_'

#### **DPRINTF.CPP (part of DGATE.EXE):**

20000211	Removed MajorEvent and MinorEvent instances of 'Debug'. Cosmetics. Added UserLog and TroubleLog. Added timestamp option. Added CriticalSection when printing to file or stdout.
20011110	Post release 1.3.10: keep log files closed while working
20021027	Avoid crash when logfile cannot be opened
20041003	Note: max 1200 chars (use %.1000s to print long strings)
20060618	Define _SH_DENYNO if needed
20070105	Added timestamp for linux users (thanks, Mark Pearson)
20070406	Use reentrant ctime_r and localtime_r when available
20070408	Protected entire .printf() with global critical section
20070712	Closed/opened critical section where recursive call to printf would hang linux version with sqlite
20071120	Use fputs instead of fprintf at end: otherwise % removed
20080821	Fix for Solaris SUNWspro compiler
20090620	Include file stuff
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100125	Removed linux warning
20100309	Removed Windows only variable from unix build.
20100619	Added #ifndefs made Port a local IPort (gcc4.0 Warnings)
20100717	Merged
20100816	removed (a) from #ifndef EnterCriticalSection(a) etc
20150902	Added Progress socket
20160221	Made print buffer much larger

#### **DPRINTF.HPP (part of DGATE.EXE):**

20000211	Removed MajorEvent and MinorEvent instances of 'Debug' Added UserLog and TroubleLog Added bAddTimeStamps member
20011110	Replaced MessagePipeName by FilePipeName Blocked out critical section
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100619	Fix gcc4.0 warnings and prevented coping of classes with pointers.
20100717	Merged

### **REGEN.CPP (part of DGATE.EXE):**

19980327:	put messages in one SystemDebug for UDP message layout
19980415:	changed messages to OperatorConsole
19980605:	Need to add regen for optical devices and cachedevices !!!!!
19981218:	temp use pdu.load
19990108:	Replaced PDU.Load by LoadImplicitLittleEndian in RegenToDatabase
19990109:	Set HeaderOnly flag for LoadImplicitLittleEndianFile to TRUE. Added regen of CACHE and JUKEBOX devices; NOTE: full regen imposes name restrictions on JUKEBOX and CACHE directories
19990117:	Filenames with .v2 are assumed raw; added extension .dcm for chapter 10 format
19990317:	Parameters of LoadImplicitLittleEndianFile have been changed
19990521:	.img files react same as .dcm files
20000629:	Logging of trouble now starts with '***'
20010415:	Added SubDir parameter to regen to allow regen of one directory only
20010416:	Added RegenFile - to allow modification of images
20011109:	Made file extension checking case insensitive
20020409:	Experimental multithread version.
20020413:	Made NTHREADS variable and tested. Time to regen 6900 files about 3 min and 40 s.
20020415:	Tested with new loaddo code by ljz. Note: multithread works and has allowed fixing MT some errors in other modules. However, due to a problem in concurrent db writing (in UpdateOrAddToTable) it should not be used clinically.
20020613:	Removed some warnings
20020802:	Simplified regen code; traverse subdirectories recursively (allow e.g., e-film data format)
20020804:	Use PATHSEPCHAR where possible
20021014:	Exclude directory PRINTER_FILES during regen (contains slices without ID and such)
20030120:	Removed some warnings
20030706:	Attach VRType to PDU for implicit little endian support
20030819:	Allow longer filenames
20040614:	Do not regen CACHE devices; first regen JUKEBOX then MAG (e.g., in historical order)
20050118:	Adapted for LINUX compile
20060628:	AddToDatabase has JustAdd parameter

20070210: Increased maxvsize for regen v2 files from 0x400 to 0x4000 ->  
UIDs were sometimes not found  
20070308: Ignore .DS\_Store for DARWIN  
20091231: Changed char\* to const char\* for gcc4.2 warnings  
20100111: Merged; fixed WIN32 changes  
20120630: Regen now allows files without 3 letter extension

#### **PARSE.CPP (part of DGATE.EXE):**

19980321: Added define TRUNCATEFIELDNAMES for DBF  
compatibility (apply in makefile)  
19980325: Added TruncateFieldNames entry in dicom.ini to allow DBF  
compatibility  
19980327: Added MaxFieldLength entry in dicom.ini to allow DBF  
compatibility  
20001105: Renamed some enums and variables to allow compile in one  
big chunk  
20010713 Renamed DT\_UINTxx to DT\_INTxx as temp fix for bug in  
LEX.CPP  
20010829 Undone above change as LEX.CPP has been fixed by ljz  
20050107 Added include file gpps for GetPrivateProfileString  
20050401 Added WorkList Support  
20050404 Added DT\_START/ENDSEQUENCE to code sequence in  
WorkList table  
20050902 Added HL7 column to be used for WorkList table  
20050908 Fixed pointer error that crashed linux version  
20080818 Added DT\_MSTR  
20100122 Hex2Dec incorrect for uppercase HEX numbers!  
20100123: Added FL and FD types  
20100125: GetPrivateProfileString -> MyGetPrivateProfileString  
20100309: Changed int to unsigned. (gcc4.2 Warnings)  
20100703: Merged

#### **LEX.CPP (part of DGATE.EXE):**

20000822 Created  
20000823 Support cases where the input-file is empty or contains only  
white-space.  
20010716 Fix: Allow TOKENs that are substrings of other TOKENs.  
20050103 Changed include file to lower case (for linux)  
20050108 Removed window.h for linux compile  
20050118 GNU C++ knows BOOL etc, do not redefine  
20090620 Include file stuff  
20100120 Fixed const issue detected with ms8  
20100309 Changed int to unsigned int, add ui as unsigned int in for loop  
(gcc4.2 Warnings)  
20100619 Fix gcc4 warnings, improve speed and  
UNUSED\_ARGUMENT.  
20100717 Merged

#### **LEX.HPP (part of DGATE.EXE):**

20091231 Changed char\* to const char\* for gcc4.2 warnings  
20100111 Merged

20100619 Added no-copy to the classes.  
20100717 Merged

### **NKIQRSOP.CPP (part of DGATE.EXE):**

19990317 NKI-specific code moved here  
19990903 Implemented NKI MaxRowColumn VR in DCO  
19990906 Improved implementation of MaxRowColumn  
19991022 Changed the root of NKI-made UIDs to the official one  
supplied by Medical Connections(UK):  
1.2.826.0.1.3680043.2.135.1066.xxxxxxxxxx  
19991122 Added NKI-CompressionMode 2: safer, with CRC checks  
20000131 Regardless the FileCompressMode in Dicom.ini, always send  
images compressed (mode=2) when communicating with an  
NKI application.  
20001105 Fixed where malloc and new were mixed (vr->data)  
20001106 Use delete [] operation for vr->Data  
20001106 Temporary fix of BC leak in CompressNKI and  
DecompressNKI  
20001120 Fix bug - vr->data was reallocated without changing vr->length  
20001127 Fix: Crashes happened when more than one  
ServerChildThread' was active. m\_pDCO is wrongly shared by  
all threads !!  
20010424 Plugged in faster and safer decompress  
20010426 Fixed leak when connection is aborted  
20010429 Interleaved CRC computation with compress code (factor 2  
faster) Added GetADD0 to allow read ahead within calling  
program  
20010501 Merged ljz's change of 20010426  
20010502 Added extrabytes pointer to Read and RetrieveOn  
20010502 Added vr(9999,0300)=SliceLimit: send at most so many slices  
20010502 Changed this vr to (9999,0500)=SliceLimit  
20011219 Added extra check in case other manufacturers than NKI use  
VR (0x7fe0, 0x0010), such as ACUSON  
20020317 Replace true by TRUE  
20020415 Added error handling on ProcessDDO  
20020429 fixed reporting of number of complete slices (now starts with 1)  
return cancel status if C\_STORE failed  
20020609 Added compressor modes 3 and 4  
20020609 Added VR (9999,0600): MaxCompressionLevel (default 2)  
Note: This level (max of 4) is also used when downsizing  
20020613 Exported DecompressNKI and CompressNKI  
20020619 Damn! ELSCINT uses (0x7fe0, 0x0010) too (see modification  
on 20011219). Extra check on zero-length pixeldata  
20020930 Fixed SliceLimit VR  
20021016 Removed \_\_BORLANDC\_\_ language construct - to fix  
downsize with BC55  
20021115 Added Generic style retrieve classes; print error messages from  
c-move  
20030522 Added function ComputeCRC  
20030605 Fix in DecompressNKI: dgate crashed when DCMTK's  
'storescu.exe' wants to send an NKIcompressed image to dgate;  
it refuses to send the pixeldata!



20030701 QualifyOn now also has compression parameter; transfer syntax work in progress

20030703 Tested recompress functions

20030704 Disabled decompression in ProcessDDO for non-nki clients; is done by recompress. When downsizing use DecompressImage(); also supports JPEG; Removed MaybeRecompress. Recompression for NKI clients only when downsizing; otherwise as specified in acrnema.map

20030705 Moved recompression out of ProcessDDO into StandardRetrieveNKI::Read. Skip recompression to same level as incoming

20030706 Optional filename parameter for recompress (not used yet); set env for offis tools

20030706 Attach VRType to PDU's for implicit little endian support

20030709 Removed DCMDICPATH; is not needed

20030819 Allow longer filenames

20030905 Note: recompressfile; DecompressImageFile and CompressJPEGImageFile do not allow spaces in filename

20040401 Added Changed and ActualMode flags to compress routines; only give compress message if something changed

20040401 Set maxcompression to 4 for NKI send

20040403 Added own SaveDICOMDataObject as in dgate.cpp

20040406 Also copy TypeCode in DecompressNKI when converting (0x7fdf, 0x0010) to (0x7fe0, 0x0010); Make TypeCode of (0x7fdf, 0x0010) OW instead of OB, because OFFIS refuses to compress OB

20040406 Always use EXPLICIT syntax for jpeg, fix v2 always use DUMP; Use -F +ti option for dcmdjpeg for writing to v2: creates raw dump, implicit; Refuse to jpeg compress V2 files and images != 16 bits; \n is all messages; Fix error handling of CompressJpegImage

20040530 Removed unused variable

20040722 Added "nj" compression: leaves JPEG as is; else MAXNKICOMPRESSION

20041101 Added built-in JPEG and RLE decompressor

20041102 Fix problem with external JPEG compression: clear transfer syntax prior to save for OFFIS tools with DICOM\_CHAPTER\_10\_EXPLICIT

20041103 Added k1,k2,k4,k8 compressors: downsize to 1024,512,256,128 pixels if bigger to start with

20041112 Called AE SERVER~xx in C-MOVE lets xx override outgoing compression as well (e.g., call CONQUESTSRV1~k4 to always get images downsized to 256x256)

20050102 Added NOINTJPEG flag to allow compile through total.cxx

20050103 Changed include file to lower case (for linux)

20050108 Adapted for linux compile (work in progress)

20050109 Added configurable TCPIPTimeOut

20050118 replaced thread local storage under linux with variables in object

20050119 added rudimentary support to start external (de)compressors under linux

20050121 Changed filename to lower case

20050122 Improved external jpeg support under Linux: load dictionary, wait until ready

20050130	Added To8BitMonochrome and ToGif
20050204	Small fix in ToGif for non-square images; also interpret RescaleIntercept as float
20050205	Added counters for compression activity
20050206	Optimized downsizing: do not decompress if no downsizing to occur
20050206	Note: replaced thread local storage under linux with variables in object is incorrect. Under linux, the server now can also serve one at a time. Fix for color to gif; added limited auto scaling in 16 bits to gif.
20050211	Now really removed need for thread local storage
20051210	Added "vX" compression (same as as is)
20051217	Use system() to call on offis apps in linux (now works)
20051217	Use new VR::ReAlloc method to replace data in VR; fixed 2 float warnings
20051229	Fixed several leaks in (jpeg)compression code; changed alloc for nki compression
20051230	Added +sr option to dcmjpeg: compress without changing rescaleslope/intercept This option is required for our viewers: slices must all have same rescale
20060219	Removed warning in writgif
20060222	Added extra checks (not on ID strings) to pass as NKI compressed data
20060311	dcmjpeg opts string got truncated (thanks Rainer Libowski) fixed unused CompressJPEGImageFile (wrong exe called) external decompress temporary files now in printer_files (thanks Rainer Libowski)
20060324	Added StripGroup2 option to recompress; strip group 2 from outgoing c-stores if not compression "as" or "is"
20060328	Use IsAbstractSyntaxAccepted(iUID) to test if host accepts image
20060402	Fix crash when recieving or dropping jpeg compressed color images. Consider not removing transfer syntax (0x0002, 0x0010) prior to dcmdjpeg/dcmjpeg. Would fix problem with external decoding color jpeg images
20060402	Changed IsAbstractSyntaxAccepted(iUID) test back (thanks Andrej Savelov)
20060405	That was not the problem
20060618	Tested IsAbstractSyntaxAccepted - seems to work. Removed need for min()
20060619	Do not remove transfer syntax before decompression (20060402 suggestion). Maintain original object when decompression fails, changed wording of message.; Only complain about internal decompressor for jpeg
20070104	Export automatic SaveDICOMDataObject
20070113	Never delete transfer syntax (was left in CompressJpegImage, solves coding error in jpeg store). Tested with \$c server debug command
20070210	Export MaybeDownsize and check on 0 for passed size
20070307	Added several debug prints in retrieve, e.g. at bail out because connection dropped
20070308	removed #include <wait.h> from DARWIN

20070314 Send 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in SS->Write as result of Move

20070315 Merged bcb DARWIN stuff; Set TCPIPTimeOut for PDU that moves images

20070316 Added (color) ToBMP for convert\_to\_bmp; added level and window to ToGif and ToBMP

20070407 Use ~p1..9A..Z to override C-MOVE port (adds 1..36 to port number)

20070902 WriteGif now cpp

20071027 Added quotes around filenames passed to dcmdjpeg and dcmjpeg; avoids errors with spaces in paths

20071101 Enabled JPEG compression and decompression of non-16 bit data

20071104 Added DecompressNon16BitsJpeg (default TRUE)

20071105 Restore image when dcm/djpeg failed to start

20080103 Added mode 'uj': leave jpeg as is, otherwise uncompress  
Added DecompressImage to recompress()

20080820 Solaris fix (do not use variable name SS)

20081116 Adapted for very large objects (use unsigned int for length)

20081201 Added JPG converter

20081203 Enabled internal decompressor for color, added frame extraction for jpg etc; Add frame extraction control = 0x09999,0x0201

20090209 Added QueryMoveScript callback; removed unused variable

20090325 Added RetrieveResult converter, impact on performance to be tested

20090412 Changed jpeg encode\_image mode to correct BGR RGB mixup

20090513 Added modes 's0' to 's9' call script CompressionConverter0 to 9

20090518 Added modes ka, kb and kc to downsize to 64, 32 and 16

20090921 Added ExtractFrames

20090927 Stop jpg compression for PR SR and RT

20091231 Added HAVE\_LIBJPEG (version 6c!) and HAVE\_LIBJASPER for external library support (beta for now)  
Changed char\* to const char\* and cast time\_t as int for gcc4.2 warnings

20100111 Fixed downsize for 32 bits pixel; bcb const; cast of Time() to (int)

20100112 Merged

20100113 A few more errors in downsize for 32 bits

20100116 Fixed DecompressImage compile error if HAVE\_LIBJPEG is defined

20100118 Added one missing else in CompressJPEG2K

20100119 The else was not really missing; added some const

20100120 Catch jpeg2000 configuration if HAVE\_LIBJASPER not defined

20100121 Blocked out old jpeg decompressor if HAVE\_LIBJPEG, removed color checks as both decompressors do color now; Made lossy to lossless switch a warning not error in CompressImage; Set mode to 'l' instead of 1 after switch

20100122 Note: the HAVE\_LIBJPEG code supresses RLE support

20100122 Added experimental C-CANCEL support for all C-MOVES

20100123 Added counters for jpeg2000

20100124 Added GetNumberOfFrames

20100125 GetPrivateProfileString -> MyGetPrivateProfileString

20100126	Include gpps.hpp
20100207	Fixed ExtractFrame(s) for frames packaged into pixel data without sequences
20100209	Run RetrieveResult also for non-nki clients
20100210	Fix memory leak
20100214	Merged
20100223	Combined DecompressImage and DecompressImageFile Add FUJI_FIX for evil LittleEndianImplicit jpeg compressed images.
20100224	Added libopenjpeg to use in place of Jasper, fixed more warnings (-Wall)
20100227	After 1.4.16alpha3: crash when jpeg compressing RT object
20100330	Frames to LIBJPEG, JASPER, and OPENJPEG
20100619	Many fixes for leaks, allow both Jasper and openJPEG as a dicom.ini choice (not finished).
20100703	Merged; snprintf to _snprintf
20100706	Merged, replaced _snprintf with memcpy.
20100721	Merged back; fixed a few ascii to int conversions with atoi
20100723	Merged bcb fixes in new version of ToJPG
20100728	Installed RLE support with HAVE_LIBJPEG, used new deivr Get's and ChangeVR's
20100815	Merged; do not use GETUINT8 for US type; added space =TRUE to setting PixelSpacing; Simplified DecompressRLE
20100815	Fixed bug 30 in t=2127: YBR_FULL_422 images not passed to dcmjpg
20100823	bcb moved that check to the right place
20100824	Pass local VariableVRs to script engine
20100826	bcb fixed lossy jpeg2000 for signed data
20100901	bcb Added fix for PlanarConfiguration=1 data
20100905	Removed file functions: now RecompressFile uses Recompress
20100905	Merged; Added UseBuiltInJPEG flag
20100914	Fixed RLE decode for frames, added Deplane, DecodePalette for regular and segmented palettes
20100918	Attempted merged (very difficult as fixes were made in older version)
20100920	Fixed warnings
20100922	Merged
20100928	Fixed ExtractFrame(s) for NKI compressed data
20101003	Added 9999,0900 script
20101004	Use updated gif codec; started on animated gif
20101009	Protected gif coder for out of memory
20101018	Swap BGR to RGB for ToJPG
20100920	Fixed j2k decompressing of j2k file instead of just the stream (used by Accusoft Pegasus).
20100923	ToJPG can be used to create MPG files using external tools
20101116	Add UL, UB, UI, and UE compression to fix big endian receive, merged, warnings
20101121	Merged
20101220	Fixed color swap for jpg and bmp; fix deplane and depalette are called when needed
20101227	Fixed 'un' in bcb 'ui' etc code in recompress
20110106	Fix ToBMP for linux 64 bits (used long)
20110119	Use ExtendedPDU_Service to pass scripting state

20110320	Fix downsize & tojpg when #bytes in image is odd; Only apply RescaleIntercept for CT in tojpg
20110326	Increased temp string in linux ExecHidden that caused decompress crash
20110326	Increased temp string in linux ExecHidden that caused decompress crash
20110413	Allow test of jpeg or rle decompression even if no group 0002 data
20110414	Moved jpeg decompression height errors to SystemDebug
20110419	normalized line endings; taken out superfluous prints
20110423	Fixed "UJ" broken when UI etc were introduced
20110502	always write bitstored 0x0028,0x0101 when writing highbit 0x0028,0x0102
20110904	Fixed J1 and J2 distiction
20110926	Added DcmConvertPixelData for tomono and crop
20111010	Fix in J1 and J2 distiction fix: '2' was not translated into 2 invalidating subs. tests
20111011	Fix in SaveDicomDataObject (archive): 'cannot rewrite .. in v2 format' led to a double DDO->Free
20111018	Added TempDir ini file option
20111022	Added private move command option 0x9999, 0a000 ConquestMoveOriginatorAE; let retrieveconverter work with command
20111113	Restored the original float DeYBRFULL code; the modified code did not work; read VR again, is used for deplane
20120214	Allow size==0 in DICOM to image conversion
20120327	Fix LossyQuality entry in dicom.ini for built-in JPEG compression
20120401	Fix in print (crashes when modality not passed)
20120402	Default UseBuiltInJpeg properly to 0
20120624	Set Header (0028,2110) to 01 after lossy compression
20120624	Do not modify bitstored, highbit and numberofbits after compression
20120628	Some layout of debug prints
20120630	Reverse .dcm check (dicom if not .V2); Pass lossy quality to CompressJPEGImage from compression string
20120723	Fixed 'l' or 'l' to 'l' or 'L' found by bcb
20120918	Fixed comparison with .v2 in SaveDICOMDataObject()
20121208	Block deplane if SamplesPerPixel is not 3
20130218	JPEG compression did not set right sopclass!!!!
20130823	Fixed lossy jpeg compression for 12 bits data
20130920	Corrected the calculation of new pixel spacing in MaybeDownsize
20131013	Default UseBuiltInJPEG set to 1; added quality parameter to ToJPG
20140207	Fixed RLE (signed char 127)+1 gave overflow, now use (int)cCurrent+1
20140209	Fix decompressjpegl here: fix lossless colorspace to RGB
20140219	Added generic DecompressNKI (works for XDR and DCM)
20140309	Catch error if no image VR present in jpeg2000 decompression
20140319	uj and nj now pass MPEG 100, 102, 103; fix in UI; WIP support UJ outgoing
20140608	Blocked MPEG changes for now; fix VR==NUL error handling in To8bitMonochromeOrRGB

20140608 use bitsallocated in ExtractFrame to fix philips enhanced MR  
 20151024 Fixed out of bounds check of cropimage  
 20160219 Removed defines of BOOL TRUE and FALSE  
 20160219 Removed JASPER and OPENJPEG here; now in Bruce's  
     JpegConv.cpp  
     Added CHARLS code; fix lossy/lossless switch;  
 20160220 Removed dead code  
 20160221 Added JASPER code back in; openjpeg2 is still buggy  
 20160229 Use HAVE\_LIBOPENJPEG2 define  
 20160316 Fix autoscale of 32 bits images  
 20160317 Fully implemented rescale intercept if window passed; removed  
     uint<0 test  
 20160318 Limit this to slope=1

#### **JPEGCONV.CPP (part of DGATE.EXE, Bruce Barton):**

20120710 Created.  
 20130218 JPEG compression did not set right sopclass!!!!  
 20130226 Replaced gpps with IniValue class, fixed size warnings.  
     Version to 1.4.18a and b.  
 20131207 add jpeg-ls decode  
 20160220 Made to compile in mvh's build environment: bcb please check  
     these changes were applied  
     20121208 mvh Block deplane if SamplesPerPixel is not 3  
     20130823 mvh Fixed lossy jpeg compression for 12 bits data  
     20140209 mvh Fix decompressjpegl here: fix lossless  
         colorspace to RGB  
     20140309 mvh Catch error if no image VR present in jpeg2000  
         decompression  
 20160229 potential issue: calloc/malloc on this side free in  
     opj\_image\_destroy  
 20160306 use CHARLS\_STATIC and statically link libraries to avoid  
     calloc/opj\_image\_destroy issue above

#### **JPEGCONV.HPP (part of DGATE.EXE, Bruce Barton):**

20120710 Created.  
 20131111 Changed from #include<> to #include"" for Xcode  
 20131207 Added JPeg\_LS  
 20151203 Moved some dependent defines from total.cpp to here.  
 20160203 Fix VS 2015 Libjpeg bool redefine.

#### **UNCOMPCONV.CPP (part of DGATE.EXE, Bruce Barton):**

20140513 Created.

#### **UNCOMPCONV.HPP (part of DGATE.EXE, Bruce Barton):**

20140513 Created this file.

#### **IMAGEDATA.CPP (part of DGATE.EXE, Bruce Barton):**

20131224 Created this file.

20160203      Fix error to work with OsiriX JPEG-LS and strncpy warning.

**IMAGEDATA.HPP (part of DGATE.EXE, Bruce Barton):**

20131224      Created this file.  
20151203      Moved some dependent defines from total.cpp to here.

**NKIQRSOP.HPP (part of DGATE.EXE):**

19990317      NKI-specific code  
20001128      Fix: Crashes happened when more than one ServerChildThread' was active. m\_pDCO was wrongly shared by all threads !!  
20010429      Added GETADDO to allow optional read ahead withing calling program  
20010502      Added extrabytes pointer to Read and RetrieveOn  
20020415      ProcessDDO now returns status (to allow compression error check)  
20020613      Added prototypes for DecompressNKI and CompressNKI  
20021115      Added Generic retrieve classes  
20030522      Added prototype of ComputeCRC  
20030701      QualifyOn now also has compression parameter  
20030702      added ExtendedPDU\_Service  
20030704      Changed ProcessDDO parameter to \*\*DDO (for recompress)  
20050118      replaced thread local storage under linux with variables in object  
20050121      Changed filename to lower case  
20050211      Removed need for thread local storage  
20090209      Added QueryMoveScript callback  
20091231      Added HAVE\_LIBJPEG (version 6c!) and HAVE\_JASPER for external library support (beta for now)  
                Changed char\* to const char\* and cast time\_t as int for gcc4.2 warnings  
20100111      Merged  
20100703      Merged some bcb OpenJPG changes  
20100706      Added support for J2K and Jasper  
20100721      Merged  
20110118      Derived ExtendedPDU\_Service from CheckedPDU\_Service  
20110118      Added lua\_State to ExtendedPDU\_Service  
20110119      Added \*VariableVRs and ThreadNum to ExtendedPDU\_Service  
20110122      Added ExtendedPDU\_Service destructor  
20160219      Removed jasper and openjpeg stuff here

**ODBCI.CPP (part of DGATE.EXE):**

19980415      Blocked one error message  
19990628:      experimental locking call  
19990628      temp defined DB\_DEBUG and introduced experimental statement options  
19990707:      Undefined DB\_DEBUG and removed statement options  
19990827:      Added CreateIndex  
20000629      Logging of trouble now starts with '\*\*\*' \*/  
20001105      Run-time load ODBC routines for BC and WC

20001128: Added InitializeCriticalSection in 'Open' and DeleteCriticalSection in 'Close'

20010829: Enabled DB\_DEBUG to show db errors in verbose mode

20020412: Use SQLExecDirectWithRetry to retry in case of any error (deadlock=1205). Added CreateUniqueIndex function, and GetLastError. Ignore error from unique index to make multi-user safe.

20020413: NOTE: A SINGLE DB MAY NOT BE USED BY MULTIPLE THREADS.

20020417: Extended deadlock wait time to about 1 min for safety

20021014: Added built-in dbf support for stable ODBC less-operation  
Note: requires fully de-normalized database; notes: in dbsql, first bind row not set; in vrtsql; debug query print with %s in search crashes

20021016: Added about 1 MB of in-memory hashed index in patient ID for all tables; speed OK to 10.000 objects; pack db on server start (for speed it is wise to keep DBF files on local harddisk)

20021017: Made NeedPack a global for control from dgate; fix base\_trunc; fix in Updaterecords; fix first num field in AddRecord

20021020: Made querymodes an array, so that each query field can be key, key% or %key% ; Use querymode also when hashing the entries (part of db entry); Fix process\_escape for " and \[ and also use it before dbase\_write

20021028: Set open retries shorter for normal readonly access

20021030: Match alternative patientID fieldname such that built-in DBF queries work

20021113: Added <= comparison in dbase\_query (used for date comparison)

20030113: Do not use () in sort order when multiple columns specified

20030128: Added alternative field names for series

20030321: Also handle 'write lock' for M\$Access (NativeError 1205 for sql-server equals -1102 in M\$Access). Other dbf-drivers???

20030819: Allow longer filenames

20031104: Added \\ to process\_escape

20030425: Added DoubleBackSlashToDB control

20030520: Speedup by fix dbaseIII hashing, setting hashfield was wrong

20030523: Implemented in-memory index to speed dbase queries; added IndexDBF and PackDBF settings

20040528: Fix built-in DbaseIII for > 2 GB; index fixed at 10.000.000 records; Fix problem when spaces in patient ID in index generation

20040528: Added ExtractRecords (dbase III only); fix update/delete for record 0

20040530: IndexDBF gives MB extra to allocate; skip dbf files starting with X; convert normal queries in SeriesInstanceUID or StudyInstanceUID to indexed ones

20040601: Added LongQueryDBF flag: report if query took longer than LongQueryDBF ms (default 1000); Min 20 MB index during regen; allow pack on command (NeedPack=TRUE; DB.Open) Increase query buffer size to 16384 (often reread), pack buffer to 65536

20040605: Optimize speed for huge files, extract max 100000 records; made lockstart \_\_int64; Do not lock for read in extract (is very slow for huge files); Record lock no longer on physical bytes



but on rec#; attempt to speed memory index; NeedPack==3 -> force pack

20040606 Fix lock whole file; fix index patient ID database; fix in dbcreate for test

20040609 Implemented fast in-memory locking and enabled for all shared files

20040610 on dbase\_create set indexcount to 0; dbase\_trunc truncs indexcount

20040612 Put index creation in a thread; server runs (but does not find non yet indexed records) during indexing; implemented indexdbf command NeedPack=4

20040614 Added NeedPack=5: create non-threaded index (for archival options)

20040615 Added warning when index is full; keep indices when creating db

20040930 Added multiple value query; protect length of copy of where string

20041003 Reused very long SQLStatement string for wheres string  
For lengths see dbsql.cpp; truncated debug printf's  
set cols length to 4096; malloc tmp in query at 310000;  
for length calculation see dbsql.cpp

20041013 Used MAXQUERYLENGTH

20041029 Fixes in multiple query (query string truncated + mode mix problem)

20041101 DB is read only while in-memory indexing of DbaseIII active

20050102 Small modifications to allow compile through total.cxx

20050107 Export NumIndexing to tell dgate when indexing is done

20050116 Adapted for use with LINUX (built-in dbase driver only)  
Notes: 1) delay poorly implemented; 2) no support for >2 GB

20050118 Detach pthreads to avoid leaks

20050119 Documented rare crash in Fill\_Memory\_Index

20050124 Added support for huge files under Linux (not suitable for ext2 filesystem); Allow = without spaces in query

20050205 Added counters for db activity

20050206 Small fixes to counters; allow "&" instead of " and " for CGI use

20050905 Postgres code by Piotr Filipczuk checked by mvh, will not affect other operations, but not tested yet (postgres will not compile on my linux system)

20050907 Merged change by Hans-Peter Hellemann: lseek64 not always defined, should be mapped by unistd.h

20050909 Put check for = in query below >=: date range matching failed (Thanks Paolo Marcheschi)

20050911 Removed postgres print statements

2005112 Fixed BindField for postgres - now returns actual and not reserved length

20051217 Maximum locks in dbaseIII driver from 1000 to 100 to speed up qunlock (20% regen speed)

20051218 Respond to -b = NOTHREAD: run server as single process, useful for debugging and profiling

20051219 Fixed slow leak of queryfields for built-in dbase driver

20051230 Put index of DicomWorkList on AccessionNumber

20060219 Start on native mysql driver

20060220 Some more work: get correct length in bindfield; todo: user and password

20060226 Runtime load MYSQL in WIN32

20060313 Use username and password for mysql

20060402 Start index threads with a short delay to give GUI priority to test startup

20060607 Changed escape char processing for sql values (not queries) to match dbsql.cpp change

20060618 Fix for Borland C++ builder

20060628 Moved location of disabled query logging

20060630 Speeded dbaseIII AddRecord lots and linux string handling

20060701 Added and use mysql\_fetch\_lengths; protect query result

20060702 Tested native mysql driver: does not like fast open/close: clonedb crashed after 4000 or so (avoided now)

20061212 Found critical error in built-in dbase driver sql parser: Adding patient with ID containing certain character sequences will immediately overwrite the whole patient database. Queries with these sequences will return too many records (less dangerous). Issue not yet really fixed but greatly reduced its likelihood

20061213 Fixed issue by replacing spaces inside strings in sql statement with non-breaking spaces. Only match on keywords and field names which include spaces; replace with normal spaces in process\_escape

20070123 clear NativeError, State and Msg on db.open (e.g. for dbf that does not use them but prints)

20070126 Added missing break in non breaking space field of process\_escape: failed on multiple spaces in string

20070201 DebugLevel 4 prints all sql activity\

20070203 Fixed >2GB file support in linux: use O\_LARGEFILE and lseek64() - sorry Hans-Peter Hellemann

20070206 Added CreateDatabase (created db and login)

20070207 Removed creation of login from CreateDatabase for mysql and postgres

20070210 Moved debug prints to SystemDebug; removed double log in QueryDistinct for dbaseIII

20070218 Added SQLite (win32 dll version): seems to run now; very slow when sync, very fast async

20070307 Made database type flag local, added Database(type) creator

20070308 Fixed DARWIN ifs, made DARWIN/MySQL auto start. ( MySQL is included with DARWIN )

20070315 Merged; changed two nested ifs that had an else that would be wrong

20070406 Use reentrant rand\_r and localtime\_r when available

20070507 Native mysql does not correctly return empty fields (Steini)

20070702 Fixed above fix; test version for Stephan Winter

20070703 Removed test version code; display mysql connection errors on OperatorConsole

20070705 Added DT\_DATABASEIII NOINDEX: disables indexing and packing; #define USESQLITE\_DLL to load DLL; otherwise use statically linked sqlite3.c; Extended max number of dbf files to 20

20070709 Fixed crash when mysql not started: format error in the error print

20070711	Some fixes to compile with sqlite under linux
20070715	Removed debug print statements for sqlite
20071027	Maybe fix postgres error handling: reset ntuples
20071030	More fixes to postgres error handling: missing returns in PrintLastError
20071115	Fixed SQL database creation for SQL server 2005
20071118	Adapted for 64 bits (use SQLEEN for BindField)
20071124	Removed dangling WHERE and ORDER in SQL server interface when passing "" instead of NULL
20081116	Adapted for 64 bits linux (avoid use of "long", in dbase code and when reading SQL_C_ULONG)
20081117	Allow compile with both POSTGRES and USEMYSQL
20081119	added run-time loading of postgres for WIN32
20081120	Added UseEscapeStringConstants for dbase (is needed only in one place because in other place the E in E'\\...' is ignored by the current code)
20081121	Implemented CreateDatabase for Postgres; also try load libmysql64.dll (for easy 64 bit deployment)
20081124	Added DT_NULL (black hole)
20081125	Fix critical section in DT_NULL
20081126	Todo: all realloc of dbase index when full; don't use threads to fill
20090202	Fixed problem of database fail open in GUI after install: XADICOMPatients was never closed, as connected was not set when there were no databases
20090203	Fix crash on SQLite error
20090429	Added libpq64.dll
20090616	Added OldUID as hashfield: indices UIDMods table; increased default index to 10 MB
20090620	Include file stuff
20091230	Merged bcb change
20091231	Changed char* to const char* and added blank[]="" for gcc4.2 warnings
20100111	Merged
20100123	Allow host:port syntax for hostname in MySQL and PostGres
20100125	GetPrivateProfileString -> MyGetPrivateProfileString
20100309	Cast k to unsigned int, commented out unused variables (gcc4.2 Warnings)
20100309	Added returnn FALSE to the end of CreateDatabase
20100309	Added double parentheses (gcc4.2 Warnings)
20100619	Fix gcc4 warnings, improve speed and added #ifndefs and UNUSED_ARGUMENT.
20100703	Merged; but fixed random seed change (initialize static)
20100717	Merged
20100815	Fixed linux compile for SQLite
20100816	removed (a) from #ifndef EnterCriticalSection(a) etc
20101121	use strncpy to avoid access errors in SQLite where fields may exceed defined length
20101121	Disallow SQLite with DoubleBackSlashToDB
20101129	Filter [x] like sequences in dbaseIII driver process_escape
20110102	retry connect to postgres once; more postgres error handling
20110104	Undone [x] change of 20101129
20110305	Replaced Sleep(555) in linux code by delay(555)
20110319	Normalized line endings

20110502	Added db:Exec
20111113	Fixed leak in DT_NULL driver (SQLStatement not freed)
20120107	Accept 64 bits DLL's also as e.g., x64\libpq.dll
20131029	typo in lPassword
20140629	Allow CONSTRAINT errors in mysql, pqsq and sqLite to deal with race condition in UpdateOrAddToTable
20140701	Fixed CONSTRAINT for MySQL
20160313	Removed incorrect * in mysql_errno checks
20160317	Initialize th->n on dbase_open; rare accesses invalid index if non-init

### **ODBCI.HPP (part of DGATE.EXE)**

19990827	Added CreateIndex
20001128	Added CRITICAL_SECTION member of 'Database'
20020415	Added error info, GetNativeError, SQLExecDirectWithRetry and CreateUniqueIndex
20021020	Added built-in dbf support (for stable operation without ODBC) Note: requires de-normalized database
20030120	Ignore Micro\$oft complaint C4200
20030321	Enlarged buffer for SqlErrorMessages (Database->Msg)
20030819	Allow longer filenames
20040528	Added ExtractRecords (dbase III only)
20040530	Added InternalQuery (for converting normal to indexed queries)
20040605	Made lockstart __int64
20040612	Made lockstart in again - now pure record#; added TotalRec, MBExtra
20041003	Statement length set to 310 kb (see dbsql.cpp for explanation)
20041013	Malloc SQLStatement instead
20050109	Adapted for linux compile
20050905	Postgres code by Piotr Filipczuk checked by mvh, will not affect other operations
20060219	Start on native mysql driver
20060220	Include all required mysql defines here
20060226	Runtime load MYSQL in WIN32
20060628	Use mysql.h proper (for datastructures) even when runtime loading (sorry for the hard include path)
20060701	Added mysql_fetch_lengths
20070206	Added CreateDatabase
20070218	Added SqLite
20070307	Made database type local, added Database(type) creator
20070705	Added DT_DBASEIIINOINDEX: disables indexing and packing; Extended max number of dbf files to 20
20071115	Static mysql use <mysql.h>
20071118	Adapted for 64 bits (use SQLLEN for BindField)
20080107	Removed double declaration of SQLLEN
20080821	Fix for SUNW\$pro compiler
20081116	Adapted for 64 bits linux (avoid use of "long")
20081117	Allow compile with both POSTGRES and USEMYSQL
20081119	added run-time loading of postgres for WIN32
20081120	Finished it
20081124	Added DT_NULL
20090114	Increased MAXFIELDS to 100 for clone_xvi

20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100619	Added no-copy to the Database class.
20100717	Merged
20110502	Added <a href="#">db:Exec</a>
20140629	Added access to last error functions for mysql and psql

#### **AMAP.CPP (part of DGATE.EXE):**

19990827:	added (limited) wildcard mapping in GetACRNema: AE, port or IP may end on '*'
20001105:	replaced m-alloc by new
20011109:	Made AE mapping case insensitive
20020524:	In function 'GetACRNema', first try case SENSITIVE then INSENSITIVE
20030701:	Added compression column (with this code is this column is not optional!)
20030703:	KNOWN BUG: number of columns may not be 3 (crashes)
20030709:	Solved above problem; rewritten parsing of Acnema.map
20030709:	known bug: trailing spaces lead skip of next line
20030711:	Fixed trailing spaces in acnema.map
20031118:	Fixed leak InitACRNemaAddressArray

#### **XVGIFWR.CPP (part of DGATE.EXE):**

20050129	Adapted for use in the Conquest DICOM server (see //)
20050130	Made it ansi C
20050826	Made it reentrant to avoid gif file corruption in server
20051219	Fixed leak
20070902	Made cpp
20080905	Removed malloc.h for DARWIN
20090620	Include file stuff
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100309	Commented out unused variables (gcc4.2 Warnings)
20100619	Added UNUSED_ARGUMENT.
20100717	Merged
20101004	Taken lsp's code of avs_animatedgif into use
20101116	Warnings fixed
20101120	Merged
20101128	Fixed double fclose

#### **JPEG\_ENCODER.CPP (inactive part of DGATE.EXE):**

20090215	Started on update history
20090412	Added BGRto444(14): accepts RGB instead instead of BGR (!)
20100224	Fix warning redefine INT32 with HAVE_LIBJPEG
20100309	Fixed Operation on 'x' may be undefined warnings (gcc4.2)
20100703	Merged except typedef INT32
20100706	Accepted INT32 change
20100717	Merged

#### **WINTYPES.HPP (part of DGATE.EXE, Linux only):**

20050111 added SWORD and UWORD

**NPIPE.CPP (inactive part of DGATE.EXE, Linux only):**

20050111 Blocked out sys/conf.h; compiles with linux but gives linker warning: fattach not implemented and will always fail  
20051217 Return (unsigned) 0xFFFFFFFF instead of signed -1  
20070308 Change things for BSD and DARWIN.  
20070316 Some more fixes  
20091229 Completely disabled call to fattach, ioctl, and isastream as per <http://www.image-systems.biz/forum/viewtopic.php?f=33&t=1666>  
20100111 Some layout  
20100619 Fix gcc4 warnings.  
20100717 Merged

**NPIPE.HPP (part of DGATE.EXE, Linux only):**

20070308 Added changes for BSD and DARWIN  
20100619 Added no-copy to the NamedPipe class.  
20100717 Merged

**GPPS.CPP (part of DGATE.EXE):**

20040111 Fixes: defaults now work, allow DOS type files, case insensitive  
20070330 mvh Change by Mark Pearson: also allow tabs instead of spaces around =  
20090620 Include file stuff  
20091231 Changed char\* to const char\* and added blank[]="" for gcc4.2 warnings  
20100111 Merged  
20100124 Fix: blank item (e.g., password = ) returned default not empty  
20100124 Added cache for ini items: accelerates server with cached disk data 7x!!!  
20100124 ini file is tested for newer version every second  
20100309 Added double parentheses (gcc4.2 Warnings)  
20100703 Merged  
20100619 Added no-copy to the NamedPipe class.  
20100717 Merged  
20110320 Removal of trailing blanks in value also removed one character after blank  
20110331 Added FlushPrivateProfileStringCache  
20110407 Extended FlushPrivateProfileStringCache to reset timestamp  
Fixed that was reading beyond current section

**GPPS.HPP (part of DGATE.EXE):**

20091231 Changed char\* to const char\* for gcc4.2 warnings  
20100111 Merged  
20100124 Renamed to MyGetPrivateProfileString used for windows and linux  
20110331 Added FlushPrivateProfileStringCache

## **TOTAL.CPP (part of dgate.exe for most builds)**

20020822 This file compiles to TOTAL.EXE = DGATE.EXE with, e.g., BC55  
20050102 Added NOINTJPEG flag: jpeg8/12/16 sources cannot be compiled at once  
20050107 Changed order of compile  
20050111 Added npipe.cpp and gpps.cpp for LINUX  
20050118 Documented how to compile under linux and with visual c++  
20050121 Changed filename to lower case  
20050130 Added xvgifwr.c  
20070315 bcb added DARWIN stuff  
20070330 bcb added DARWIN compile example  
20080820 Solaris compile example  
20080910 fixed DARWIN compile example for build version of mysql  
20081016 Fix link to xvgifwr.cpp; 64 bit example code  
20090209 Added jpeg\_encoder.cpp  
20090411 Added second SUN example  
20100120 removed DARWIN (PPC, 10.4, now old) compile example. JPEG lib is internal, so undef NOINTJPEG if used.  
20100123 Include stddef here for windows to avoid jasper.h compile problem  
20100124 Also use gpps for windows.  
20100224 Added defines for OpenJPEG  
20100706 Allow both libraries at once  
20100721 Merged  
20100815 bcb added two defines; Merged  
20140417 Change the order of include files.  
20160219 Use Bruce Bartons new jpeg sources.  
Note: CHARLS requires Visual studio 2015 to compile  
20160220 Allow build without jpeg support  
20160229 use LIBOPENJPEG2 define; add \_\_iob\_func to allow mixed VS2008/2015 compile  
20160306 Use OPJ\_STATIC link all codecs statically

## **KILLER.CPP (main of KILLER.EXE, which is not part of this release of the Conquest DICOM server ):**

19980619: Added some doc on command line options and modes  
Fixed -L option (moved db.close)  
19980620: Made code suitable for external calling; copied some of it to device.cpp. Killer.exe is not needed anymore with NKI Dgate.exe except as sleeper task because the alert task has been integrated into Dgate.exe  
20030702: Adapted because of compression externals required by device.cpp  
20030706: Attach VRType to PDU's for implicit little endian support  
20050129: Adapted dummy for DumpVR  
20071118: Adapted for 64 bits (use SQLLEN for BindField)

## **AAAC.CXX (part of DICOM core library):**

19980327: Removed evaluation of Count without initialization in ReadDynamic  
 20001106: Use memcpy instead of ByteCopy  
 20030122: Fixed initialization of AAssociateAC  
 20050108: Fixed for linux compile  
 20080203: Added experimental ConfigPadAEWithZeros  
 20080313: Removed some warnings  
 20100619: Fix gcc4 warnings and improve speed  
 20100717: Merged  
 20111010: Fix reading of accepted presentation contexts: array was ot cleared and eventually overflowed  
 20140528: Kept member initialization only in constructors: not GNUC specific  
 20140910: Added hasTrn flag to fix issue in communication with Aria  
 20150908: Set count to 0 after skipping unknown element

#### **AAAC.HPP (part of DICOM core library):**

20140910 added hasTrn flag for Aria issue

#### **FARRAY.THH (part of DICOM core library):**

20100309 Changed INT to unsigned UINT.(gcc4.2 Warnings)  
 20100621 Added no-copy to classes  
 20100707 Merged  
 Spectra-0017: Thu, 6 Mar 2014 15:37:26 -0300: Fix mismatched new/delete in farray.thh  
 20140813 Private copy ctor and member initialization not GNUC specific

#### **AARQ.CXX (part of DICOM core library):**

20001106: Use memcpy instead of ByteCopy  
 20001128: Removed two warnings  
 20030122: Fixed initialization of AassociateRQ  
 20060618: Added definition of min()  
 20080203: Added experimental ConfigPadAEWithZeros  
 20080313: Removed some warnings  
 20100619: Fix gcc4 warnings and improve speed.  
 20100717: Merged  
 20140528: Kept member initialization only in constructors: not GNUC specific  
 20150512: user info fix in count calculation (lsp)  
 20150729: Reverted change as it broke Mirada connectivity  
 20150730: Reapplied change and fixed UserInfoBaggage calculation for ignored sub-items  
 20150908: Added HasImpVersion to UserInformation; needed for VITREA which does not send it  
 Set count to 0 after skipping unknown element

#### **AARQ.HPP (part of DICOM core library):**

20001106: Use memcpy instead of ByteCopy  
 20091231: Changed char\* to const char\* for gcc4.2 warnings  
 20100111: Merged



20100619: Fix gcc4 warnings, improve speed and added  
UNUSED\_ARGUMENT.  
20100717: Merged; Q1 OK  
20100728: Added PresentationContext(const PresentationContext&)  
20100815: Merged  
20140528: Member initialization and assignment operator are not GNUC  
specific: latter is used in CqDicom project  
20150908: Added HasImpVersion to UserInformation; needed for  
VITREA which does not send it

#### **AARJ.CXX (part of DICOM core library):**

20100619: Fix gcc4 warnings and improve speed.  
20100717: Merged  
20140309: Default AAbort source to 0 (service-user initiated abort)  
20131129: Fixed AAbort PDU with Source value set to 3. Now 0 or 2  
(default).  
20140528: Kept member initialization only in constructors: not GNUC  
specific  
20160221: Imported bcb change 20131129

#### **ARRAY.TCC (part of DICOM core library):**

20050125 Added 'ReplaceAt()' to the 'Array' class  
20100619 Fix gcc4 warnings and improve speed.  
20130429 Corrected (unused) printf format string  
20130812 Removed non-thread safe caching of last value  
Does not seem to affect speed, throughput remains  
at 320 MB/s receive with 3 senders and receivers  
in same dgate on 8-core machine  
20131016 Merged

#### **ARRAY.THH (part of DICOM core library):**

20050125 Added 'ReplaceAt()' to the 'Array' class  
20100617 Fix gcc4 warnings, improve speed and added constructors.  
20100717 Merged; QUES:6 ok; changed = operator; QUES:7 ?  
20100816 Merged bcb cleanup  
20130812 Removed non-thread safe caching of last value  
20140310 Initialize "last" member in copy constructor to avoid access  
violation

#### **CCTYPES.H (part of DICOM core library):**

20001107: Fixed to allow compile with BC  
20010705: Fixed to allow compile with MSVC 6 (see note below)  
20040111 Fix for \_\_GNUC\_\_  
20040117 Fix for linux  
20070308 Added for DARWIN apple endian defs  
20070902 Changed INT32 and UINT32 from long to int for ms7/ms8  
compile  
20100706 Made INT32 match libjpeg if HAVE\_LIBJPEG.  
20100717 Merged; fixed for WIN32 64 bits  
20140611 Fix for INT32 under unix

### **ENDIAN.CPD (part of DICOM core library):**

20001106: removed unneeded (and sometimes uncompileable)  
XE\_UINTX::XE\_UINTX (int x)

### **ENDIAN.HPD (part of DICOM core library):**

20001106: removed unneeded (and sometimes uncompileable)  
XE\_UINTX::XE\_UINTX (int x)

### **ENDIAN.CXX (part of DICOM core library):**

20070330 Merged bcb stuff  
20070726 Removed some duplicates from endian.hpp  
20130508 Removed unused XE\_UINTX and include "endian.cpd"

### **ENDIAN.HPP (part of DICOM core library):**

20090215 Started an update history

### **DICOM.HPP (part of DICOM core library):**

20071102: Define SetDicomErrorHandler etc  
20080203: Added experimental ConfigPadAEWithZeros  
20090211: Added DCM\_ERROR\_PARSE  
20090802: Added DCM\_ERROR\_DEBUG  
20091231: Changed char\* to const char\* for gcc4.2 warnings  
20100111: Merged  
20110231: DicomError returns FALSE when handler not installed - to  
allow some errors to pass  
20110605: Added DCM\_ERROR\_ASSOCIATION

### **RTC.CXX (part of DICOM core library):**

19980330 Added an RTC memberfunction for loading the dicom  
library from memory (e.g. a resource).  
19980331 Added function for writing binary RTCs (function was  
originally implemented in 'makebrtc.cxx')  
19980414 Added RTC::GetGroupElement memberfunction, to retrieve  
the Group and Element numbers using a library-keyword.  
20040930 Also return TypeCode in RTC.GetGroupElement()  
20071128 Do not remove existing TypeCode if new one is unknown  
20090620 Always include stdlib.h  
20091028 pack(4) for \_\_Binary\_RTC\_Header  
20091029 More adjustments for 64-bits (reading/writing binary RTC)  
20100309 Changed int to unsigned int, commented out unused variables  
(gcc4.2 Warnings)  
20100717 Merged  
20130503 Make sure that padding bytes are set to zero  
20130508 Use delete [] StringTable rather than delete StringTable as  
indicated by Klocwork  
20130619 Added fclose(fp) before return, added checks to  
AttachBinaryRTC(), again as indicated by Klocwork

Spectra-0016 Thu, 6 Mar 2014 15:36:06 -0300: Fix mismatched new/delete in  
rtc.cxx  
20140528 Kept member initialization only in constructors and non GNUC  
specific code in GetGroupElement()

**RTC.HPP (part of DICOM core library):**

19980331 Added prototype for writing binary RTCs  
20091029 Adjustments for 64-bits  
20100619 Added no-copy to the RTC class.  
20100717 Merged  
20130429 Made no-copy generic (not only for \_\_GNUC\_\_)

**TRNSYN.CXX (part of DICOM core library):**

19980409: Fixed possible transition between presence and absence  
of TypeCodes in 'Dynamic\_ParseRawVRIntoDCM'  
19990904: Treat type UN same as OB,OW and SQ when reading Explicit  
files.  
20001106: Replaced == operator by strcmp  
20010905: Several fixes: UCDCM should NOW be able to read  
ExplicitBigEndian files  
20011220: Fixes in Sequence and Item delimiters  
20030122 Fixed small leak in Dynamic\_ParseRawVRIntoDCM  
20030205 Support new datatype 'UT' (unlimited text). Thanx to William  
Peterson  
20030424 Changed prototype of ParseDCMIntoRawVR. Fixed huge bug  
in sending of ExplicitLittleEndian sequences  
20030627 Fix for MSC 4.2  
20030725 Keep GroupLength for group 0x00 (Radworks 6.0 was choking  
in this)  
20040406 Make TypeCode 'UN' if not known, and conversion to Explicit  
is wanted  
20050112 Fixed huge bug in Explicit\_ParseDCMIntoRawVR, causing  
data-loss. Thanx to Goran Peros.  
20051217 Use new VR::ReAlloc method to replace data in VR  
20051218 Use memcpy to enter UID (extra 0 will be available: end of  
string)  
20051219 Use ReAlloc instead of new BYTE[] to fill VR data  
20051229 Moved Push in ParseRawVRIntoDCM so that not done when  
VR exists  
20070308 Added big endian stuff  
20071031 Removed some commented out code  
20071108 In Dynamic\_ParseDCMIntoRawVR(), let group 0x08 behave  
the same as all other groups greater than 0x02.  
20071118 NOTE: previous change is not in release 1.4.13  
20071128 Add TypeCodes if needed using AttachedRTC->RunTimeClass  
20080913 Fix in bigendian input: interpret group 0 as littleendian  
20090211 Added many checks on corrupt dicom data during parsing;  
removed blocked out code  
20090212 Fixed a problem in the check code if some (but not all) group  
lengths are missing  
20090215 Improved formatting of length error message  
20090620 Added <stdlib.h>

20090824	Resume parsing after invalid element length if length was not too big
20100102	Merged bcb changes for bigendian
20100111	bcb moved setting 0002,0010 to work for all transfers in ParseRawVRIntoDCM: fix for osiris; Added JASPER stuff; const
20100118	Always allow jp2k
20100119	Put HAVE_LIBJASPER back in (unfortunately that creates a dependency between dicomlib and dgate)
20100119	Changed Dynamic_ParseRawVRIntoDCM and ParseImagePixelDataRawToDCM to read NovaRad files and remove the errors.
20100121	Merged but put into NOVARAD_FIX define; not bcb alsp prints which parser reports errors
20100125	Linux warnings.
20100224	Changed HAVE_LIBJASPER to HAVE_J2K for OpenJPEG and fixed more warnings (-Wall)
20100309	Added double parentheses (gcc4.2 Warnings)
20100309	Changed int to UINT, commented out unused variables (gcc4.2 Warnings)
20100419	Fixed Dynamic_ParseRawVRIntoDCM big endian
20100619	Made VRBuffer local IVRBuffer.
20100707	Merged
20100718	Looked at and rejected the date change: you can use importconverters for this job
20100722	iorgmode change breaks the reader for me!
20100724	Put back date change with DATE_FIX inclosing it.
20101001	Allow CurrentGroupLength==0 as warning
20101018	Fixed big endian in Dynamic_ParseRawVRIntoDCM.
20101020	Merged.
20101116	Added to/from big endian and used it to fixed big endian recieve.
20101120	Merged
20110231	allow some parsing errors when DicomError handler not installed
20105001	This is the rolled back dicom decoder to 1.4.16beta4 version; with dummy FALSE passed to Implicit_ParseRawVRIntoDCM
20105001	It fixes a small leak that fragments memory
20110502	merged IgnoreDicomError change (20110231)
20111020	Enabled NOVARAD_ODD_FIX for rubo demo images; added warning
20120723	bcb fixed datefix (extra ; after if)
20130514	Fixed Big Endian parse, fixed warnings with strlen32u()
20130523	Merged Big Endian parse fix not strlen32u()
20130619	Fixed problem in GetTransferSyntaxUID() indicated by Klocwork
20130711	Merged
20131207	Fixed Jpeg_LS
20140125	Set TypeCode to SQ if SQObjectArray defined and TypeCode was UN
20140319	Allow MPEG encoding
20140608	Blocked MPEG for now
20140611	I16 macro to replace multicharacter literals
20140617	Reverted I16(): considered a major change by mvh

20141111	Added type 'OF' with 32 bits length
20141230	Add proper byte swapping to read and write bigendian; set transfer syntax to littleendian after read bigendian and swap
20150629	If encoding short dicom tag with length > 64k make it 'UN'
20151207	put DATE_FIX where it belongs.
20160221	Imported bcb changes 20131207 20151207
20160229	Removed #ifdefs for CharLS and J2k

#### **DEIVR.CXX (part of DICOM core library):**

19990318	Added 'DICOMObject::DeleteVR'
20001106	Used delete [] operator for vr->Data
20010426	Fixed small leaks in 'DICOMObject::DeleteVR'
20010730	Added 'DICOMObject::ReplaceVR'
20010802	Added 'VR::GetSpecialValueCodeOfVR'
20011121	Added VR_SPECIAL_RGB_TO_MONO. Used by a conversion-tool to change ultrasound Kretz RGB images to monochrome that VariSeed (brachytherapy) understands.
20011121	Added VR_SPECIAL_RGB_TO_MONO_PLUS. Same as above, but tries to preserve colored drawings.
20051217	Added 'VR::ReAlloc'
20051217	Use malloc/free instead of new char[] and delete []
20051229	Removed unnecessary reset() in DeleteVR
20071031	Temp printf memory error messages
20071102	Send allocation errors to DicomError
20080313	Removed some warnings
20080910	Added VR::VR(UINT16 g, UINT16 e, UINT32 l, LE_UINT16*d) &VR::VR(UINT16 g, UINT16 e, UINT32 l, LE_UINT16 *d, BOOL mFlag) for big endian.
20081016	Fix for WC: new of 0 gives NULL (check Length in error message)
20090620	Added <stdlib.h>
20091230	Merged bcb bigendian change
20100110	And const change
20100309	Added double parentheses (gcc4.2 Warnings)
20100619	Fix gcc4 warnings and improve speed and added questions.
20100717	Merged except keep default ReleaseMemory to TRUE and check data when adjusitn length
20100728	Removed unused AutoMakeDO, added Get's to VR and DICOMObject. Added ChangeVR's. Fixed LastVR & LastVRG?
20100815	Merged; fix VR constructors for failed malloc; added max parameter to GetCString function; Moved defaults from implementation to header files
20100826	bcb noved another default, size_t
20100901	bcb changed alloc of US to 2
20110231	DicomError returns FALSE when handler not installed - to allow some errors to pass
20140512	Updated the implementation of VR* DICOMObject::GetVR()
20140528	Kept member initialization only in constructors: not GNUC specific

#### **DEIVR.HPP (part of DICOM core library):**

19990318	Added 'DICOMObject::DeleteVR'
20010730	Added 'DICOMObject::ReplaceVR'
20010802	Added 'VR::GetSpecialValueCodeOfVR'
20051217	Added 'VR::ReAlloc'
20080910	Added VR::VR(UINT16 g, UINT16 e, UINT32 l, LE_UINT16 *d) & VR::VR(UINT16 g, UINT16 e, UINT32 l, LE_UINT16 *d, BOOL mFlag) for big endian.
20100619	Fix gcc4 warnings and improve speed, and prevented coping of classes with pointers.
20100717	Merged
20100728	Removed unused AutoMakeDO, added Get's to VR and DICOMObject. Added ChangeVR's.
20100815	Merged; added max to GetCString; Moved defaults from implementation to header files
20100823	bcv moved default parameter here
20140528	Member initialization and private copy constructors are not GNUC specific

### **SOCKET.CXX (part of DICOM core library):**

20010426	Added 'setsockopt' in 'Listen' and 'Open'
	Call 'shutdown' before closing a socket
20010720	Changed 'print' to 'fprintf(stderr,...)'
20050116	Adapted for LINUX compile
20050119	Blocked out SOCKET END ERROR message
20070406	Use reentrant gethostbyname_r when available
20070415	Small fix there for windows
20090620	Added unistd.h for UNIX
20090824	Debug output of adress connecting to socket
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100122	Gethostbyname: fixed bug reported by Arash 2station would not be found
20100122	Added Poll() method: returns TRUE if data available
20100125	Linux warning
20100309	Commented out or inited to fix unused variable warning (gcc4.2 Warnings)
20100619	Fix gcc4 warnings, improve speed and made TimeOut local.
20100707	Merged
20121214	Set l_onoff to 0 (3x) to fix connection with some dicom systems
20130429	Removed unused FarProc
20140528	Kept member initialization only in constructors: not GNUC specific

### **SOCKET.HPP (part of DICOM core library):**

20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100122	Added Poll function
20100619	Added no-copy to the Socket class.
20100707	Merged
20121214	Mode sa public
20140528	Private copy constructor is not GNUC specific

### **SAFEMEM.CXX (inactive part of DICOM core library):**

20010720      Changed 'printf' to 'fprintf(stderr,...)'

### **DIMSEN.CXX (part of DICOM core library):**

19990415      Removed static on TranslateUIDToVR  
20020822      Use instead of DIMSEN.CPP  
20071118      Removed faulty overloaded 'NGetRQ::Write'  
20080905      Removed (void\*) cast for deivr change  
20100309      Added double parentheses (gcc4.2 Warnings)  
20100619      Added UNUSED(x)  
20100717      Merged

### **DIMSEN.HPP (part of DICOM core library)**

20020822      Cleanup layout  
20100619      Added virtual destructors  
20100717      Merged  
20140528      Virtual destructors are not GNUC specific

### **DIMSEC.CXX (part of DICOM core library):**

20030219      Removed MessageID and Priority from the 'write' functions of CStoreRSP, CFindRSP and CMoveRSP  
20030606      Added parameter 'QueryRetrieveLevel' to CFindRSP::Write  
20030811      Do not send DDO in CMoveRSP::Write (DicomEye and OFFIS do not like that).  
20050129      Added Write with extra vr to CEchoRSP  
20051222      Do not add query level if already exists  
20070308      Made changes for big endian  
20070314      Allow send of 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in CStoreRQ  
20070330      Merged bcb's Darwin and Endian stuff  
20080203      Added experimental ConfigPadAEWithZeros  
20080910      Removed big endian changes from here and moved to deivr  
20100309      Added double parentheses (gcc4.2 Warnings)  
20100619      Added UNUSED\_ARGUMENT.  
20100717      Merged  
20120624      Delete transfer syntax in data object of outgoing images  
20120628      Undo above change that only affects 'as': would probably break 'as' transfer of jpeg  
20140608      Added BYTE PCid to CStoreRSP::Write  
20140611      This change is under review: pcid does not seem to get the right value

### **DIMSEC.HPP (part of DICOM core library):**

20030606      Added parameter 'QueryRetrieveLevel' to CFindRSP::Write  
20050129      Added Write with extra vr to CEchoRSP  
20070314      Allow send of 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in CStoreRQ  
20100619      Added virtual destructors (gcc4.0 Warnings)

20100717	Merged
20140528	Virtual destructors are not GNUC specific
20140607	Added BYTE PCid to CStoreRSP::Write
20140610	Merged

#### **UNIQ.CXX (part of DICOM core library)**

19990511	Fix: All routines wrongly used '%' instead of '&'
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#### **MAKEBRTC.CXX (part of DICOM core library)**

19990415	Note: requires changelog
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#### **PDATA.CXX (part of DICOM core library):**

20100619	Fix gcc4 warnings, improve speed and made locals.
20100717	Merged (note: locals means changes parameter names)
20130807	Detect invalid Length returned to fix hanging thread issue Fixed >0 check on UINT32

#### **PDATA.HPP (part of DICOM core library):**

20100619	Added no-copy to the classes and init list to LinkedBuffer.
20100717	Merged
20140528	Private copy constructors and member initialization are not GNUC specific
20140528	Kept member initialization only in constructors: not GNUC specific

#### **PDU.CXX (part of DICOM core library):**

19980322	Blocked one remaining printf statement "comparing ..."
19990202	Added PDU memberfunction 'IsAbstractSyntaxAccepted'
19990415	Merged both versions
20000322	Fix in search for PresentationContext when identical AbstractSyntaxes occur (e.g. GECT-scanner). Do not break out of the inner loop in PDU_Service::InterrogateAAssociateAC.
20000322	Fix of PresentationContextID in PDV: in routines PDU_Service::Write(DICOMObject*, UID*), set PresentationContextID to TempByte, not to TempByte1.
20000911	Removed two warnings
20020316	Added GetLocalAddress and GetRemoteAddress
20030306	Fix: Huge bug in 'InterrogateAAssociateRQ'
20030424	Blocked out obsolete PDU.Write(&DDO) Some work on offering other TransferSyntaxes than ImplicitLittleEndian when running in SCU mode (Note: when running in SCP mode, 'dgatesop.lst' is used) Fix: CommandObjects are always ImplicitLittleEndian
20030627	Fix for MSC4.2; re-enabled obsolete write calls for test.cxx
20030710	Adjusted test.cxx, and disabled obsolete calls again
20080816	ValidPresContexts is now a global: how many incoming connection can handle
20090802	Added DCM_ERROR_DEBUG statements to debug failed connect



20100303	Commented out unused variables (gcc4.2 Warnings)
20100619	Fix gcc4 warnings, improve speed.
20100717	Merged
20100726	bcB documented the mess in function AddAbstractSyntaxAlias
20100728	May have fixed AddAbstractSyntaxAlias, but I have no way to test.
20100815	Merged
20100914	Cleaned up AddAbstractSyntaxAlias problems (double release)
20100918	Merged
20110604	Count and show #candidates for "No valid presentation contexts found"
20110605	Added more DCM_ERROR_ASSOCIATION info that will show as proper server errors
20130619	Return NULL from DetachRTC() rather than pointer to deleted object 20120820 Fixed a case where k-pacs sent a leading empty Transfer Syntax Name.
20130807	Testing result of all :: Read operations fixes hanging thread problem if you ctrl-c a c-store script
20131016	Merged
20131106	Removed return FALSE on Failed read in Multiplex(int Socketfd) fixes multiplex connection terminated on some clients.
20140528	Kept member initialization only in constructors: not GNUC specific
20140607	Added PDU_Service::Write(DICOMCommandObject *DCMObject, UID &uid, BYTE PCid)
20140610	Merged
20140611	Fixed accidentally blocked if() statement
20141009	Added many debug messages to identify sources of failure
20160221	Clear ItemType to avoid endless loop after connection lost

#### **PDU.HPP (part of DICOM core library):**

19990202	Added PDU memberfunction 'IsAbstractSyntaxAccepted'
20020316	Added GetLocalAddress and GetRemoteAddress
20030424	Changed prototype of ParseDCMIntoRawVR
20030627	Fix for MSC4.2
20030905	Removed spurious ;
20080816	ValidPresContexts is now public: how many incoming connection can handle
20080819	CanYouHandleTransferSyntax is now public; use BOOL not bool
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100619	Fix gcc4 warnings and improve speed, and prevented copying of the PDU_Service class with pointers.
20100723	Merged
20101120	bcB added parameter
20110320	Rollback of dicom decoder (parameter) to 1.4.16beta4 version
20110326	Put it back again
20130619	Made no-copy generic (not only for __GNUC__)
20140528	Private copy constructor and member initialization are not GNUC specific

20140607	Added PDU_Service::Write(DICOMCommandObject *DCMObject, UID &uid, BYTE PCid)
20140610	Merged

**FILEPDU.CPP (part of DICOM core library):**

20000420	Fix in MakeChapter10: type of AffectedSOPClassUID and RequestedSOPClassUID
20030205	Fixed FileMetaInformationVersion for big-endian machines
20030424	Put the correct TransferSyntaxUID in chapter10 files
20041108	Fix strdup memory access problem (found using \$c drop file test mode)
20051229	Fixed LEAK of 68 bytes when 0002,0010 not defined
20060618	Added definition of _SH_DENYNO
20090211	Check result of Dynamic_ParseRawVRIntoDCM
20091231	Changed char* to const char* for gcc4.2 warnings
20100111	Merged
20100309	Added double parentheses (gcc4.2 Warnings)
20100309	Cast multichar as UINT16, commented out unused variables (gcc4.2 Warnings)
20100706	Fixed TransferSyntax in SaveDICOMDataObject(ACRNEMA_VR_DUMP) for testcompress.
20100726	Merged
20100823	Merged small comment fix
20130508	Fixed problem in SaveDicomDataObject() indicated by Klocwork

**BUFFER.CXX (part of DICOM core library):**

20001106:	Use memcpy instead of ByteCopy
20071031:	Temp printf allocation errors
20071102:	Send allocation errors to DicomError
20081016:	Default buffer size from 1024 to 10240
20100619:	Fix gcc4 warnings and improve speed.
20100717:	Merged
20130416:	Set DEFAULT_BREAK_SIZE for UNIX to 8192 to fix not understood ubuntu12.04 problem with zeros tranmitted after 1st 64k
Spectra-0009:	Wed, 5 Feb 2014 10:57:52 +0000: Fix cppcheck bug #1
Spectra-0019:	Thu, 6 Mar 2014 17:02:42 -0300: Fix mismatched new/delete
in	buffer.cxx
20140528	Kept member initialization only in constructors: not GNUC specific
20160221	Clear data if buffer read fails; avoids infinite loop if connection is broken

**BUFFER.THH (part of DICOM core library):**

20100309	Changed BufferSize, InSize and OutSize from INT to UINT
20100621	Added no-copy to the BufferSpace classes.
20100707	Merged
20140528	ensure INT32 define
20140610	Sorry this breaks dicom server compile

nkiqrsop.cpp; e:\quirt\comps\exe\dgate\jpeg-6c\jmorecfg.h(202)  
: error C2632: 'int' followed by 'int' is illegal

### **VERSION.H (part of DICOM core library):**

200107017	Changed ImplementationClassUID to a valid UID: the Agfa dicom validation tool protested against the original 'UID'. Changed ImplementationVersion from "0.1B/WIN32" to "1.01/WIN32"
20020416	Changed IMPLEMENTATION_VERSION_STRING to 1.3.11/WIN32
20021018	Changed IMPLEMENTATION_VERSION_STRING to 1.4.0/WIN32
20020208	changed IMPLEMENTATION_VERSION_STRING to 1.4.1/WIN32
20030424	changed IMPLEMENTATION_VERSION_STRING to 2.0.1/WIN32
20030709	changed IMPLEMENTATION_VERSION_STRING to 1.4.2/WIN32
20030815	changed IMPLEMENTATION_VERSION_STRING to 1.4.3/WIN32
20030402	changed IMPLEMENTATION_VERSION_STRING to 1.4.4/WIN32
20040530	changed IMPLEMENTATION_VERSION_STRING to 1.4.5/WIN32
20040713	changed IMPLEMENTATION_VERSION_STRING to 1.4.6/WIN32
20041101	changed IMPLEMENTATION_VERSION_STRING to 1.4.7/WIN32
20050901	changed IMPLEMENTATION_VERSION_STRING to 1.4.9/WIN32
20060103	changed IMPLEMENTATION_VERSION_STRING to 1.4.10/WIN32
20060311	changed IMPLEMENTATION_VERSION_STRING to 1.4.11/WIN32
20060708	changed IMPLEMENTATION_VERSION_STRING to 1.4.12/WIN32
20070307	changed IMPLEMENTATION_VERSION_STRING to 1.4.13/WIN32
20080831	changed IMPLEMENTATION_VERSION_STRING to 1.4.14/WIN32
20100713	changed IMPLEMENTATION_VERSION_STRING to 1.4.16/WIN32; added osx
20160221	changed IMPLEMENTATION_VERSION_STRING to 1.4.19/WIN32

### **FLPDU.CXX (part of DICOM core library):**

20050130	Allocate 1 item longer lists to allow configuration from GUI
20050213	Fix to allow windows created file as input under linux
20060618	Added definition of _SH_DENYNO
20090802	Added DCM_ERROR_DEBUG statement to debug failed connect
20100309	Commented out unused variable (gcc4.2 Warnings)

20100619      Fix gcc4 warnings and improve speed  
 20100717      Merged  
 20110118      Added unchecked CheckedPDU\_Service () using NULL default  
 Spectra 0014 - Wed, 12 Feb 2014 15:48:27 -0200: Patch mismatches  
                  new/delete in flpdu.cxx  
 20140528      Kept member initialization only in constructor and removed  
                  InitializeFrom(): not GNUC specific

#### **FLPDU.HPP (part of DICOM core library):**

20050129      Made tables public for config  
 20080819      Made CanYouHandleTransferSyntax public  
 20100619      Added no-copy to the CheckedPDU\_Service class.  
 20100713      Merged  
 20110118      Added unchecked CheckedPDU\_Service () using NULL default  
 20140528      Private copy constructor of CheckedPDU\_Service not GNUC  
                  specific

#### **VERIFY.CXX (part of DICOM core library):**

20050129      Added ReadRequest and WriteResponse, allows extra response  
                  vr

#### **VERIFY.HPP (part of DICOM core library):**

20050129      Added ReadRequest and WriteResponse

#### **QRSOP.CXX (part of DICOM core library):**

20020429      Fixed reporting of number of complete slices (now starts with  
                  1); return cancel status if C\_STORE failed  
 20030606      Added parameter 'QueryRetrieveLevel' to CFindRSP::Write  
 20050401      Added ModalityWorkListQuery  
 20051222      Added pADDO to Query::Write method - answer appended to  
                  pADDO if set  
 20080820      Solaris fix (do not use variable name SS)  
 20090205      Added QueryMoveScript callbacks  
 20100122      Added support for C-CANCEL: poll the socket for any data and  
                  cancel if so  
 20100309      Added double parentheses (gcc4.2 Warnings)  
 20100619      Made Port local (lPort).  
 20100707      Merged  
 20100816      Added QueryResultScript  
 20140414      Added std::vector to store database query results  
                  because indexing in linked-list takes too much time.  
 20140527      Replaced std::vector by straight malloc to fix compile issue on  
                  some systems  
 20151115      Added <malloc.h>

#### **QRSOP.HPP (part of DICOM core library):**

20030606      Added member-variable 'QueryRetrieveLevel' to  
                  StandardQuery  
 20050401      Added ModalityWorkListQuery

20051222	Added pADDO to Query::Write method - answer appended to pADDO if set
20090205	Added QueryMoveScript
20100816	Added QueryResultScript

#### **STORAGE.CXX (part of DICOM core library):**

20020429	check status of C-STORE RSP and return FALSE if failed
20030922	Added PDU_Service to CheckObject call
20070307	Added more debug error messages to retrieve
20070314	Allow send of 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in StandardStorage : Write
20070315	Blocked out printf statements
20100309	Commented out unused variable (gcc4.2 Warnings)
20100619	Added #ifndefs (gcc4.0 Warnings) and UNUSED_ARGUMENT
20100717	Merged
20140607	Make sure CStoreRSP::Write uses same Presentation context as CStoreRQ

#### **STORAGE.HPP (part of DICOM core library):**

20030922	Added PDU_Service to CheckObject call
20050108	Fixed for linux compile
20070314	Allow send of 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in StandardStorage : write

#### **PRINTSOP.CXX (part of DICOM core library):**

20020814	Added some comments and block-out mvh's debug code
20020816	Fix in 'AbstractPrintManagementMeta::Write'
20130429	Removed unused variables
20130411	Fix error C4355 (also a leak).
20140520	Unix compatibility
20160221	Imported change 20130411

#### **CQSERVER.CPP (inactive part of conquest interface DLL):**

1998xxxx	Creation. This file contains DicomServer code. A 'DicomServer' is an application that receives images, and is called a server because it 'provides' disk-space!? All code is reached by the routine 'ReceiveThread' at the end of this file. The ReceiveThread is launched by the exported function 'DcmMoveHere' in CqDicom.cxx. Communication with the mainthread is done by using global variables (sorry).
19990318	Added support for MultiFrame modalities
19990407	Swapped priority of VRs 0020-0050 and 0020-1041; now the slicelocation is preferably deduced from 0020-1041.
19990915	FillSliceInfo now also indicates whether pixeldata are 'unsigned'.
19991028	Fix (in cases that went wrong anyhow): changed 'free' to 'DllFree'.
19991029	Added 'Signed_compute' to convert unsigned short pixeldata
19991122	nki_private_decompress now supports Mode=2

20000131	Fix: Replaced an instance of free by DllFree
20000321	FillSliceInfo now also retrieves 'BitsStored'
20000405	Added CheckRangeOfCT, to Calibrated CT-values to Hounsfield + 1024, and to cut the values below 0.
20000418	Fix: crash on (INVALID !!) Siemens demo-data on RSNA 1994(CR images of RXDpat1-1994). PixelRepresentation tag was empty!
20000530	Use different pixelspacing tag for RTIMAGE
20010123	Moved code to GetSliceCoord; added static keywords
20010410	Improved communication between MainThread and ServerThread
20010411	Do not 'sleep' the ServerThread, but let it terminate
20010426	Again improved communication between MainThread and ServerThread
20010508	Replaced nki_private_decompress by a faster version
20010717	Added 'CheckRTDoseScaling'
20010720	Made Dummy::printf do nothing
20010905	Added 'CheckModalityLUT'
20020227	Support US pixelspacing (hiding in SequenceOfUltrasoundRegions)
20020425	Added exported funtion 'ComputeCRC'
20020609	Pasted extended decompressor from NKIQRSOP.CXX
20020613	Moved MkTypedDicomObject to here
20020620	Guess SliceLocation in multi-frame images.
20021028	Support multiframe dose-grid in 'CheckRTDoseScaling', and slice-positions in 'GridFrameOffsetVector' NOTE: Varian multiplies and Helax divides by the DoseGridScalingFactor !!!
20021113	Guess SliceLocation in multi-frame images (SliceThickness).
20021213	Adjusted field-coordinates of RTIMAGE
20030122	Support various Ultrasound pixelspacings
20030127	FillSliceInfo now also retrieves 'PhotometricInterpretation'
20030128	Support for 3D TimeSequences, resulting in 4D 4-space output scans
20030213	Fixed bug in change above
20030624	Workaround for Varian Vision 7.1 multiframe dosegrids Support for integer dosegrids and very small DoseGridScaling
20030904	Improved workaround for Helax DoseGridScaling
20041119	Added support for 4D object in slices
20051219	Use vr->ReAlloc
20060515	Also apply RescaleSlope and NEXT_VOXEL_DOUBLE to modality PT
20060704	Don't apply yet...
20060913	Work on Philips MR: get PixelSpacing and PatientPosition from deep inside sequences. Replaced GetFloatsFromKey call by GetFloatsFromVR calls
20070404	Heavily optimized InsertSlice: first transpose then insert biggest gain (10 s) Uncompress during read gains 2 s
20070506	Added optional prealloc data pointer to CreateOutputField If LargeScan (>256 MB) decompress later to save memory
20070522	In CheckRTDoseScaling() take PLATO negative dose into account
20070704	Fixed InsertSlice(): non-square slices went totally wrong

20070730	Dirty fix for CMS RTDOSE
20071127	Fixed bug in AddToOutputField (affects multiframe slice positions)
20080313	Removed some warnings
20080410	Fix: In CheckRangeOfCT(), unsigned CT pixels were ill-treated.
20080818	Added support for philips 3D US (200d, 3303)
20081014	Fixed dose reading: broken by above change
20090131	Exported tranpose routines for CqCreateDcm
20090602	Added sensible Time-coordinate (AcquisitionTime) for 4D slice-based images. Works for our PET and MR scanner...
20110525	In CreateOutputField(), check whether the PreAlloc size is big enough
20110818	Do not call progress callback in ServerChild (call it in the main thread instead)
20110927	Finish receive-thread (ServerChild) when all slices have been received
20120312	In AddToOutputField(), ignore fSlicePosition for Siemens multiframe RTDOSE
20120629	Removed MkTypedDicomObject(). Library is now always attached in ServerChild()
20120913	More work on Spectroscopy
20121009	Use EchoTime for coords of 4th dimension in MR BOLD and R2* images
20130211	Added CheckPETScaling
20130214	Known bug: SC series with different image sizes crash AddToOutputField
20130424	Removed unused functions AddStudyInstanceUID(), AddSeriesInstanceUID(), FixImage(), SaveToDisk(), get_nki_private_compress_mode(), no need to check input CRC in nki_private_decompress()
20130425	Merged
20130522	Added GetSliceCoord to find sldir
20130711	Merged
20130812	Updated B1 Map check for Philips Scanners because Philips uses different scale slope and intercept for each slice. Pixel values need to scaled accordingly.

#### **CQDICOM.CXX (part of conquest interface DLL):**

19980330	Creation
19980331	Added exported DcmMkBinaryLib
19980414	Restricted the HeaderDump to max 4096 data, and the number of bytes on one line to 256.
19980416	Added sequence support in HeaderDump
19980420	Fixed last written line in multiple line sequence dump. Added functions DcmFind, DcmMove and DcmMoveHere
19980526	Added DcmCreateBitmap
19980610	Changed BGR to RGB in DcmCreateBitmap. Added DcmMoveHeaderHere
19980629	Fix: DimX and DimY were reversed. Improved efficiency when loading one slice.
19980630	Fix: last change caused crashes

19980707	Removed some checks to allow non-standard Philips images. Added DcmSetProgressHook
19980708	Added DcmReplaceInHeader, which can be used for anonymization of dicom images.
19980709	Added C-CANCEL command object when a ProgressHook stops or aborts a DcmMove operation. Added support for NkiPrivateCompressed images in DcmMoveHere.
19980826	Added #pragma pack(1) in Field.h
19981105	Added DcmReadHeader
19981127	Added DcmGetLastXfms
19990108	Updated the dictionary for DICOM-RT support
19990114	Slices are sorted on coord. When duplicate coords exist, the last received slice eliminate previous ones. Included changed SOP- list by MvH
19990318	Added three xxxRetrieveNki PresentationContextSOPs in the function DcmMoveHere
19990407	Swapped priority of VRs 0020-0050 and 0020-1041; now the slicelocation is preferably deduced from 0020-1041.
19990511	Added DcmSetLocal(char* pszLocalAE, char* pszLocalPort)
19990628	Fix: DcmCreateBitmap did not like MultiFrame dicom files
19990826	Added DcmSetFreeHook and DcmMoveFilesHere
19990906	Added DcmSetExtraParams to support (amongst others in the future) transmission of downsized Dicom images between NKI stations.
19990913	Private VRs of unknown type, will possibly be shown in the headerdump as character strings.
19990915	Fix in ParseLine of headerdump. Added support for unsigned pixeldata in DcmCreateBitmap.
19991019	Allow multiple slices with the same or without a coordinate, if this is the case for ALL slices (e.g. multiple scout-views in one series)
19991022	Changed the root of NKI-made UIDs to the official one supplied by Medical Connections(UK): 1.2.826.0.1.3680043.2.135.1066.xxxxxxxxxxx
19991028	Converted unsigned short pixels to signed int pixels
19991122	Added DcmStoreFiles
20000126	Fix in WorldXfm (bug introduced on 19991019)
20000128	Fake slice-coords when a '3D volume' consists of e.g. multiple scout-views (Siemens MR produces such series). Prevents viewer-crash when loading a second volume into it.
20000321	Convert unsigned short to integer ONLY if all 16 bits of the pixeldata are used. Better contrast-stretch in DcmCreateBitmap.
20000327	Added C-ECHO command
20000405	Calibrated CT-values to Hounsfield + 1024. Cut-off below 0.
20000707	Added DcmSetCacheAddress
20000829	Added an ErrorMessage
20001128	Replaced 'Oh shit!' errormessage by 'Cannot find related scan'.
20010123	Added static keywords. Moved code to GetSliceCoord; this routine checks besides tags (0x0020,0x1041) and (0x0020,0x0050) also (0x0020, 0x0032). This last tag (ImagePositionPatient) had to be used for Philips MR scanners.
20010302	Fix: improved temporary filename



20010410	Improved communication between MainThread and ServerThread. Again improved temporary filename...
20010411	Kill ServerThread only if it is not responding
20010413	Fix: allways close the threadhandle
20010426	Again improved communication between MainThread and ServerThread
20010508	Adjusted call of nki_private_decompress to a faster version
20010619	Fix in GetFloatsFromKey (crashed on PatID 1234567890 NuclearMedicin testpatterns)
20010717	Adjusted DcmMoveHere for RTDose post-processing
20010802	DcmReplaceInHeader now also supports replacements inside sequences; Added export DcmVersion
20010808	Fix: SetStringVR appended a NULL byte to strings with uneven characters. This is correct for UIDs, all other strings should have a space appended.
20010824	Updated 'soplist.txt' resource to DICOM 1999 final text.
20010905	Fix: Headerdump was incomplete when a VR consists of more than one short or int; Start implementation of ModalityLUT
20011121	Replaced 'SetStringVR' by 'SetAnyTypeVR' (Used by DcmReplaceInHeader)
20011218	Added DcmWriteKretzFile: extracts a Kretz 3D file from a dicomfile
20020225	Fix for Helax-TMS: when determining XFM's and (0x20, 0x1041) and (0x20, 0x50) are both absent, use (0x20, 0x32)
20020403	Fixed bug when UIDs are 64 bytes long. Some code butififying.
20020411	Added DcmWriteVRTToFile
20020502	Added cacheing properties
20020522	Replaced ad hoc field allocation code by 'AVSdata_alloc'
20020523	Do not give warning for slice-order (DCM_E_SLICEORDER)
20020609	Pass MaxCompressionMode that is set to 4
20020620	Adjustment to CalcXfm for multi-frame images.
20020814	Added two Print error-messages
20020930	Added MAXSLICES to optional extraparams
20021028	Exported GetFloatsFromKey. Try te get XFM's of multiframe objects right.
20021105	Get rid of scout-views when loading a volume (in 'SortSliceDDOs')
20021118	Fix in multiframe XFM containing 'GridFrameOffsetVector'
20030122	JPEG pixeldata support; Fixed memory leak
20030128	When SliceCoords are not provided, sort dicom-objects on imagenumber
20030130	Support for 3D private Kretz ultrasound
20030424	Changed all calls to obsolete PDU.Write(&DDO) to PDU.Write(&DDO, uid). Fix in handling of JPEG compressed images. Version to 2.0
20030519	Fix XFM's when ImagePositionPatient contradicts SliceLocation. Now the slicecoord in ImagePositionPatient is preferred (Marconi-fix).
20030523	Fix: above change frustrated coronal and sagittal MRI
20030716	Workaround for sloppy Adac NM multiframe reconstructions (@#\$\$%^&*)
20041116	Start on time series recognition, now return unsorted
20041117	'proper' time series (with exact N copies of each slice with given coordinate) are sorted on derived frame# (order of

image#) then coords; but still returned as 3D. MATPEL and WRDLDMATC know how to make 4D data out of such image data (CONQUEST does not yet).  
This option should read 4D CT (not tested) as well as 4D MRI/DTI (tested) as long as all frames are sent as one series.

20041119 Adjustment in CalcXfm

20041119 Added support for 4D sliced object, now sent out as 4D field

20041124 Merged fix ljz 20041119

20041201 Improved detection of 4D data, now allow fringes, e.g., if slices at certain locations occur NMMMMKL times, N slices at start and K+L slices at end are removed. In this way, both Philips and GE DTI and perfusion data (without fringes, e.g., MMMMMM) and Siemens RCCT data is supported. Note 1: Siemens writes % of cycle in 0018,0022 as 'TP100PC5576', where 100 is the %. Not used for now, 4D data is just ordered based on slice number instead, with coordinates 0, 1, .. Note 2: some localizer series are now returned as 4D as well.

20041221 Fix in 4D reader for out-of order images; first sort on image#, later in index

20050301 Fix in dubious check on 'Proper4D'

20050308 One more check on 'Proper4D': at least half of the slices should be Proper4D; Fix in last check

20050418 Fix in WriteBmp when all pixelvalues are equal

20050804 Fix in check on 'Proper4D'

20050905 Added SOP 31 for query: modality worklist query

20060531 Moved FreeOutputField to field.cpp and field.h

20060701 Added warning on order of 4D data - MessageBox needs to be replaced

20060913 Replaced GetFloatsFromKey call by GetFloatsFromVR calls

20061020 Fixed bug in GetFloatsFromVR

20061030 SortSliceDDOs crashed on MR scans from Lucas hospital

20070112 Added exported function DcmReadJpeg

20070119 Using DcmSetExtraParams SORTMODE=1, slices will be sorted on ascending coordinate, SORTMODE=2 means descending. Fixed bug in SortSliceDDOs.

20070220 Fixed bug in SetAnyTypeVR; Added an error message

20070220 Attempt to fix frame reversal - debug code temp off

20070506 prealloc data pointer during receive to allocate large block first: allows loading larger scans

20070730 Dirty fix for CMS RTDOSE

20070902 DcmWriteVRToFile will now also write sequence item to file as raw VR dump; takes Index as extra par

20071127 Support for multiframe-objects where ImagePositionPatient is located in a DetectorInformationSequence

20080313 Fix: In SortSliceDDOs(), long ScanOptions could lead to crashes or other undesired behaviour; Removed some warnings

20080318 In CreateLastPropertiesField(), a few properties that resided deep in sequences for RTDOSE were added.

20080320 ...and put in a separate function

20080717 Support of Pinnacle DOSE in CalcXfm()

20080812 Support of Varian's Eclipse DOSE in CalcXfm()

20080908 Implemented &Philips to load embedded 4D ultrasound

20081007 Compute location of philips subvolumes by length/N

20081014	Also accept QueryIni-fields that contain Header/Key/Value instead of Key/Value
20090605	Fixed crash in DcmMoveHere() when GetDDOarray() returns OK, but no data were received
20090608	Fix: Due to different AcquisitionTime the warning 'Inconsistent Slices' was given too often
20090610	Added "Upi is NOT unique: DANGER !!" error-message
20091029	Adapted for 64-bits version
20100427	Added workaround for illegal (incomplete) query response from Kodak
20100811	Always return at least one record in DcmFind(), containing the query tags; Recoded the Kodak workaround. Now only matches to the query tags are returned, not any additional info that the server might provide. In parameter pszNKIcommand1 of DcmEcho() starts with '#', then the EchoResponse sent by the server in (0x9999,0x0401) will be dumped to file.
20100827	Fixed memory leak in ProcessVRs(), updated documentation
20101130	In DicomMoverHeaderHere, translate 'Unknown' tags that ARE present in the library back to (gggg,eeee)
20101208	Fix: Prealloc did not allocate enough in case SamplesPerPixel is unequal to one
2011013	Fix: Prealloc did not allocate enough in case BitsAllocated is eight or more bits higher than BitsStored
20110202	Fix: Prealloc was overdoing the alloc by a factor 8
20110418	Removed MessageBox "Respiratory cycle probably transmitted wrong"
20110525	Fix: Prealloc might not allocate enough if a smaller scout-view is transmitted as the last slice of a volume; administrate the pre-allocated amount.
20110817	Added errormessages for DCM_E_CTREF_REDEFINED and DCM_E_ISOC_REDEFINED
20110818	Call progress callback for QUERY and MOVE (in the main thread)
20110912	Support float and double type in header dump
20120110	Fixed rare access violation in FillDDO()
20120329	Increased MAXFRAMECOUNT from 100 to 250 because DCE-MR can have a lot of timeframes. (If in future a 4D scan is mistaken for a 3D one, increasing it more might help...)
20120628	Some work on Spectroscopy
20120629	Removed MkTypedDicomObject(). Library is now always attached in ServerChild(); Replaced 'ImageNumber' by 'InstanceNumber'
20120913	More work on Spectroscopy
20121030	In DcmReplaceInHeader() write chapter 10 explicit files (except when the destination filename has a v2 extension)
20121102	In GetSliceCoord(), for US images, use ImageTranslationVector
20130122	Corrected handling of vecLen==strlen() in FillDDO() (see 20120110)
20130125	Added DcmFreeCache()
20130211	Added CheckPETScaling
20130212	DCM_E_INCONSISTANT_SLICES if PET scaling has been adjusted

20130410	Simplified FindResource() in DllMain(): now also supports x64\CqDicom.dll
20130503	Allow reentry of CqDicom.dll, removed unused gl_imageNo, resolved memory leaks, do not wait 100 seconds in case of 0xc004 server response, make sure that gl_pLastProperties is not freed after caching and explicitly pass gl_pLastProperties to CreateLastProperties() for readability, replaced DcmMoveHere() by DcmMoveHereInternal() to allow exported function to free up memory
20130522	Use GetSliceCoord to find sldir
20130619	More advanced error handling: use DCM_E_MAX+1 for custom message trapped by HandleError being passed to SetDicomErrorHandler();
20130620	Improved error handling for all exported functions
20130711	Merged
20130712	Added check output file check before calling CheckRTDoseScaling() in DcmMoveHereInternal()
20130812	Added special case for B1 Map from Philips Scanners.
20131014	Corrected wrong slice direction and transformation calculation for sagittal and coronal scan by checking which value of coordinate index varies over slices.
20131015	Layout, typos in comments

#### **CQDICOM.H (part of conquest interface DLL):**

19980330	Creation
19980331	Added exported DcmMkBinaryLib
19980414	Restricted the HeaderDump to max 4096 data, and the number of bytes on one line to 256.
19980416	Added sequence support in HeaderDump
19980420	Fixed last written line in multiple line sequence dump Added functions DcmFind, DcmMove and DcmMoveHere
19980526	Added DcmCreateBitmap
19980610	Changed BGR to RGB in DcmCreateBitmap. Added DcmMoveHeaderHere
19980629	Fix: DimX and DimY were reversed. Improved efficiency when loading one slice.
19980630	Fix: last change caused crashes
19980707	Removed some checks to allow non-standard Philips images Added DcmSetProgressHook
19980708	Added DcmReplaceInHeader, which can be used for anonymization of dicom images.
19980709	Added C-CANCEL command object when a ProgressHook stops or aborts a DcmMove operation. Added support for NkiPrivateCompressed images in DcmMoveHere.
19980826	Added #pragma pack(1) in Field.h
19981105	Added DcmReadHeader
19981127	Added DcmGetLastXfms
19990108	Updated the dictionary for DICOM-RT support
19990114	Slices are sorted on coord. When duplicate coords exist, the last received slice eliminate previous ones. Included changed SOP-list by MvH
19981127	Added DcmTree, DcmPatientList and DcmSetLocal
19990825	Added extended patientlist export: DcmPatientList2

19990826	Added DcmMoveFilesHere
20000824	Added DcmFileGetRtStructNames and DcmFileGetRtStruct
20020425	Added DcmVersion and DcmCreateRtStructFile

**CQCREATEDCM.CPP (inactive part of conquest interface DLL):**

20020417	Created. All created DICOM stuff should go in here
20020502	DcmCreateRtStructFile seems to work
20041119	Work on DcmCreateSliceFiles
20041128	Tested write new scan on grid (and properties) of existing scan: needs ScanToDicom matrix to correctly compute ImagePositionPatient; writes too many \\ in tags; SliceLocation not written; Now write abs slice thickness; Added missing *10 in Z coordinate of ImagePositionPatient; Added a minus to the Z coordinate of ImagePositionPatient: this is a kludge that works only for scans read with CQDICOM without rotations in scanner. Added creation date and time in default series description
20041223	Added XFM parameter to DcmCreateSliceFiles Added DcmCreateRtPlanFileLight Fix: also incorporate ImageOrientationPatient, FrameOfReference, StudyID
20050906	Some fixes in DcmCreateSliceFiles Added 'DcmCreateRtPlanFileLight()'
20051018	Several fixes in DcmCreateSliceFiles: - Required tags KVP and PositionReferenceIndicator were missing - Element numbers of RescaleSlope and RescaleIntercept were wrong; Set all MU's to 0 in DcmCreateRtPlanFileLight; added OperatorsName
20060704	Increased stringbuffer in GetContouData() (crashed ridiculously detailed on ESTRO data)
20061018	In DcmCreateSliceFiles, don't insert sequence items.
20070220	Moved UID_ROOT to somewhere else
20070423	In DcmCreateSliceFiles, use scan or extra properties for ImagePositionPatient
20070510	Made GetInterpretedType() more aware of markers.
20070705	Fixed bug in DcmCreateSliceFiles()
20070726	In DcmCreateSliceFiles, don't insert sequence items of ExtraProperties either!
20071018	In DcmCreateRtStructFile(), the created UID is stored in a global for later use
20080416	DcmCreateSliceFiles() also supports 4D and non-CT data
20080603	Few adjustments in DcmCreateSliceFiles()
20080708	Made PixelSize always positive in DcmCreateSliceFiles()
20080717	The filename parameter of DcmCreateSliceFiles() may also contain RemoteAE;RemoteIP;RemotePort for immediate pushing of created slices
20080930	Fixed bug in last change
20081001	Adapted for BCB's VR() change
20081002	Moved filename containing RemoteAE;RemoteIP;RemotePort to separate function
20081027	In DcmCreateUID(), the last digits are now time related, and not the IP address of the caller (adjustment to XVI requirements).

20090127 Had a go in implementing xfm in DcmCreateSliceFiles  
Fixed access to ReferencingPhysician in DcmCreateSliceFiles  
Fixed read only problem of pszFileName in DcmCreateSliceFiles, and allow AE;IP;PORT without trailing ;

20090128 Revamped xfm in DcmCreateSliceFiles: xfm is now ScanToDicomPatient

20090130 Fixed it! And documented code to write as read

20090131 Created ad-hoc, dicom and siddon modes (passed in iNewSTudy)

20090210 In DcmCreateSliceFiles, Series and Image Date/Time can be set in pExtraProps when it is NOT a new Study. SoftwareVersion can also be set in pExtraProps.

20090513 Support private and short tags in DcmCreateSliceFiles()

20090523 Allow RTDOSE export through DcmCreateSliceFiles: expects dose always in 0.01 Gy; Max number of slices to 2000; added missing test on presence of pXfm

20090524 Reverted a line of test code

20090602 Fixed handling private tags in IsGroupElement()

20100303 Added DcmCreateSC (Secondary Capture, Monochrome or color image); Fix : DcmCreateSliceFiles messed up non-square slices

20100409 DcmCreateSliceFiles() now uses SeriesNumber and StudyID from ExtraProperties

20100512 Kodak did not like our SC files without PlanarConfiguration (0x0028, 0x0006)

20110104 Do not override StudyTime when no new study  
Take AccessionNumber from extraprops or props when present  
Take AcquisitionNumber from extraprops when present

20110127 DcmCreateSliceFiles() now accepts xxxx[y].zzzzz sequence properties

20110203 Fixed stack problem in GetPropertyValue()

20110204 Made sure that the pixel data is not stored twice due to sequences

20110215 Fix '\w' and hexstrings in the header when writing dicom files

20110908 Added DcmConvertPixelData

20110909 Fixed small bug (RGBtoMONO) in DcmConvertPixelData()

20120406 Added support for setting float tags; NewFloatVR()

20120927 Fixed problem in DcmCreateSliceFiles() when a sequence was passed in the properties in (gggg,eeee) format

20121024 In DcmCreateSliceFiles, reduce (if possible) BitsStored and HighBit so that the dicom-scan (when reading it back) will not become integer.

20130216 Fixed CREATE\_SLICE\_FILES Siddon mode for non-square images (transpose called wrong)

20130620 Improved error handling for all exported functions

20130627 Fixed the memory leak in DcmCreateRtStructFile. The reason for this is the fact that GetPropertyValue function uses static pointer, and returns this. After the last call, dynamically allocated static pointer remains in the memory. Also corrected the buffer size check in GetPropertyValue.

20130627 Fixed memory leaks reported by Klockwork, and added missing free(pTmp)s

- 20130628      Removed static pointer from GetPropertyValue, and passed a local pointer from upper calling function.
- 20130702      Corrected a typo in history and the added Null pointer dereference check for pTmpPropertyStr.
- 20130819      Fixed a few malloc/free problems in DcmCreateSliceFiles which resulted in a crash.
- 20131017      Added if checks around scan and extra property field in DcmCreateSliceFiles and DcmCreateSC before accessing members of the field.

**CQGLOBAL.H (part of conquest interface DLL):**

- 19990318      Some cosmetics
- 19990511      Added a few warnings and prototype of MoveDDOHere
- 19990915      Added PixelRepresentation (0028,0103) in SLICE\_INFO.
- 19991028      Added prototype of Signed\_compute()
- 19991122      Added errorcode of failed C-STORE-RSP
- 20000317      Added BitsStored (0028,0101) in SLICE\_INFO.
- 20000405      Added CheckRangeOfCT prototypes
- Added RescaleIntercept (0028,1052) in SLICE\_INFO.
- Added RescaleSlope (0028,1053) in SLICE\_INFO.
- 20000530      Added ImagePlanePixelSpacing (3002,0011)
- 20000707      Added gl\_ppvCache
- 20000710      Added prototype of CacheInitFromSelectionStrings
- 20000824      Added prototype of CacheSetReferencedStruct
- 20000828      Added prototype of Dxfrm\_compute
- 20000829      Added an ErrorCode
- 20010123      Added prototype of GetSliceCoord
- 20010410      Added gl\_hevEndReceive
- 20010426      Renamed gl\_hevEndReceive to gl\_hReceiveThreadIsListening
- 20010508      Changed prototype of nki\_private\_decompress()
- 20010629      Added DoseGridScaling (3004,000e) in SLICE\_INFO.
- 20010717      Added gl\_pszExtraParams
- 20010831      Added prototype of CheckModalityLUT
- 20020418      Added prototypes for cache-ing properties
- 20020424      Added declaration of field gl\_pLastProperties
- 20020613      Added prototype of MkTypedDicomObject
- 20020814      Added two Print error-codes
- 20021028      Added prototype of GetFloatsFromKey
- 20021213      Added RtImagePosition to SLICE\_INFO structure
- 20030122      Added prototype of DecompressJPEG
- 20030128      Added 'iNbTimeSequences' and szPhotometricInterpretation to the SLICE\_INFO structure
- 20030129      Added prototype of READ\_KRETZ\_compute
- 20041119      Added support for 4D sliced object
- 20050203      Added prototype of CacheCleanupRtObjectFiles
- 20050906      Added prototype of CacheGetReferencedProperties
- 20060913      Added prototype of GetFloatsFromVR
- 20070130      Added ec DCM\_E\_INVALID\_RTPLAN
- 20070220      Added a few prototypes and an errorcode
- 20070506      Added optional prealloc data pointer to CreateOutputField
- 20070522      Added szSoftwareVersions to SLICE\_INFO structure
- 20080717      Added prototype of DcmStoreFiles
- 20081002      Added prototype of FileNameOrDicomNode

20090204	Added prototypes for transpose_Xbytes_inplace()
20090602	Added fAcquisitionTime to SLICE_INFO, for coordinates of 4th dimension
20090610	Added DCM_E_MULTIPLE_RTPLAN, used when 'UPI' is not unique
20110126	Added prototype of FieldToDicomObject
20110418	Added warning DCM_E_RESPIRATORY_CYCLE
20110525	Added optional iPreAllocSize to CreateOutputField
20110817	Added errorcodes DCM_E_CTREF_REDEFINED and DCM_E_ISOC_REDEFINED
20120629	Removed MkTypedDicomObject() prototype
20120913	Changed returntype of FillSliceInfo()
20121002	Added comment on SLICE_INFO.fAcquisitionTime
20130125	Added extern void FreeCache();
20130211	Added CheckPETScaling
20130424	Removed undefined gl_pOutputField
20130522	Added gl_sldir
20130619	Added DCM_E_CUSTOM, gl_LastError, gl_LastErrorText[] and HandleError()
20130812	Added szImageType[64] in SLICE_INFO, and functions CacheGetReferencedScanUrlForBeam and CheckB1MapScaling.

#### **CQRTOBJECTS.CPP (inactive part of conquest interface DLL):**

19990407	Created. All DICOM RT stuff should go in here
19990404	Added RTSTRUCT
19990511	Added RTPLAN. Still under construction !!!
19990825	Some changes in RTPLAN; still under construction
20000619	Added GetStructInfo to be used by TREE
20000707	Lots of work on RTSTRUCT and RTPLAN
20000828	Structure and beams has wrong XFM when patient is prone
20000829	Added GetRtBeamFromRtImage
20010302	Fix: improved temporary filename
20010410	Again improved temporary filename...
20010619	Added some comments on RTPlan organization.
20010717	Store szReferencedFrameOfReference in STRUCT_TREE_INFO; To do: in 'CalcBeamXfms' the collimator angle is not treated right when the patient is prone.
20000824	Added DcmFileGetRtStructNames and DcmFileGetRtStructFixed two small memory leaks.
20020225	Fixed free-ing twice in 'GetRtStruct'
20020502	Removed some warnings
20020613	Moved MkTypedDicomObject to CqServer.cpp
20030122	Some work on GetRtBeamFromRtImage: still under construction due to world-wide lack of good data!!!
20030520	In GetRtStruct, fail with DCM_E_INTERNAL when there is no cached underlying scan.
20050125	Made beam field output contain short data instead of char data GetRtBeam has an optional string parameter to load a specific segment (= controlpoint); Added GetPlanInfo for TREE building purposes
20050131	Moved MkTypedDicomObject() in GetRtBeam to StoreBeamPropertiesInCache



20050201	Fix: do not delete pDDO in GetRtBeam anymore
20050202	Fix: When settings of a controlpoint do not change, they may be defined only at controlpoint 0.
20050921	Change in CalcBeamXfms for FeetFirst and Prone patient-positions (This change is already in use for two months, and has been approved by Peter Remeijer)
20070705	Gave individual contours instead of organs a unique number (solves the problem of more than one contour in a slice)
20080313	Removed some warnings
20080717	Removed empty structures from the PatientTree in GetStructInfo()
20091028	Adapted for 64-bits version
20111206	Fixed table-angle for prone patients.
20120629	Removed MkTypedDicomObject(). Library is now always attached in ServerChild(); Replaced 'ImageNumber' by 'InstanceNumber' in comments
20130124	Save ROIDisplayColor in StructTreeInfo; use some default color scheme if ROIDisplayColor is not found
20130125	Avoid memory leaks in GetRtStruct()
20130129	Typo in color generation
20130206	Merged
20130620	Improved error handling for all exported functions
20130812	Added CacheGetProperties in CalcBeamXfms if the referenced properties is not cached.

#### **CQRTOBJECTS.H (inactive part of conquest interface DLL):**

19990407	Created
20000619	Added prototype of GetStructInfo
20000707	Added more RtObjectXXX prototypes
20000824	Added szReferencedStruct to BEAM_TREE_INFO. To be used in order to get the XFM of a beam IFF RTPlanGeometry equals 'PATIENT'. In the other case (when RTPlanGeometry equals 'TREATMENT_DEVICE'), the the XFM is defined by the 'IEC fixed coordinate system'; this case is not handled in CqDicom.
20000829	Added prototype of GetRtBeamFromRtImage
20010717	Added szReferencedFrameOfReference in STRUCT_TREE_INFO To do: in 'CalcBeamXfms' the collimator angle is not treated right when the patient is prone.
20050126	Moved DCM_PLAN and DCM_STRUCT typedefs to here; added a few strings to DCM_PLAN; Added prototype of GetPlanInfo; Added parameter to GetRtBeam
20130124	Added iColor to STRUCT_TREE_INFO

#### **CQTREE.CPP (inactive part of conquest interface DLL):**

19990504	Creation: Moved Tree and PatientList from Avs_dcm to here
19990511	Adjustments concerning DcmSetLocal
19990825	Added extended patientlist export: DcmPatientList2
19990826	Implemented DcmPatientList2
19990830	Fix: ParseSelInfo did not handle an 'extra' Key/Value pair in a selection-string.
19990906	Improved Alias-names of Dicom Tree Interface

19991019 Besides CT and MR, the images of modalities US, DR and DS belonging to the same series are grouped into a single volume.

19991026 Use SeriesDescription in tree if no SeriesNumber/SeriesTime available

19991028 MultiFrame images will be treated as '.scan' instead of '.image'.

19991029 Added support for multiple multi-frame images in one series  
When MovingHere only one image, the C-FIND operation is skipped. Fix: EchoNumber was discarded when retrieving header-info

20000126 Fix: EchoNumber was used even when value is '(empty)', only in cases where EchoNumbers were needed in other parts of the tree.

20000128 Fix: three memory leaks

20000426 Adjustment for difference in response of Borland ODBC and Microsoft SQL: an empty string-field is returned as "" and " " respectively.

20000707 Put structures in the tree under a scan

20000710 Fix: Update cache when TREE has been bypassed

20000717 Fix: XFMs of multiframe-scans were not returned

20000808: Extra check: SOPInstanceUID must be passed in selection for RT objects;

20000823 Fix: Crash in building of TREE when the move-response of an RT-object was OK, but no DDO was transmitted.

20000828 Fix: Structure and beams has wrong XFM when patient is prone

20000829 Added RTIMAGE properties: 'refmeam', 'refbeamwordxfm' and 'refbeamgantryxfm'

20010420 Added support for PatientID containing '/' or '\\'.  
Start implementation of RTDose objects.

20010619 When RTStructs do not reference a Series, use ReferencedFrameOfReference if possible. Caller may use 'IMAGESONLY=1' in DcmSetExtraParams when grouping of images into scans is not desired.

20011214 Damn! It now seems best that US images are not grouped together anymore...

20020403 Fixed bug when UIDs are 64 bytes long. Got rid of two #defs

20020501 Added cacheing properties

20020521 When modality equals PT, combine slices to a volume.

20020613 Always use SeriesDescription in tree

20020619 Split date parts with dots; display studymodality (0008,0061) in study alias

20020620 Merged 20020613 with 20020619. Do not split dates.

20020815 In 'ParseDicomInfo' allow also ':' as a separator

20021011 Fix: When bypassing the TREE, cache was not initialized when retrieving a single image or a multi-frame volume

20021011 Added other query modes (4..9) for DICOM\_LOAD\_PATIENTLIST (CreatePatientList)

20021014 Merged the two versions

20021028 Try to get XFM's of multiframe objects right.

20030128 Support for 3D TimeSequences, resulting in 4D 4-space output scans. Make check on QueryResponse case-insensitive (choked on PatientID Test vs test)

20030130 Support for 3D private Kretz ultrasound

20030213 Above change crashed when in a FIND operation there is US present, and the queried dicomserver did not supply the 'Manufacturer' key.

20030624 Support for multiframe dosegrids

20030710 Additional sorting of C-FIND result on SOPInstanceUID

20040525 Also send PatientID when query/retrieving RT objects

20050126 Made better ALIAS in TREE for RTPLAN  
Made ALIAS in TREE of a series '(empty)' if no good ALIAS can be constructed  
Implemented interface to load individual segments in a beam  
Moved DCM\_PLAN and DCM\_STRUCT typedefs to "CqRtObjects.h"

20050131 Check empty sequences in 'StoreBeamPropertiesInCache', and made DDO a TypedDDO

20050201 Handle possibility of retrieval of beam properties before retrieval of outline in ReadKeys()

20050203 Function GetRtDDO now caches DicomRT files. When a NEW PatientTree is constructed, these files (of a different patient) are deleted. This speeds up things enormously

20051018 Support for Corvus in FixControlPointProperties

20060103 Studydate queries on val instead of \*val\* (kodak could not handle it)

20060531 Added exported function 'DcmGetPlanPois'

20061018 Apply rotations to DcmGetPlanPois when the patient is not HFS

20061101 Recoded 'DcmGetPlanPois' (pretty complicated now...)

20061109 ROI and POI RTStructs from Pinnacle do NOT have exactly the same timestamp

20070112 Extra consistency check in DcmGetPlanPois

20070220 Adjusted DcmGetPlanPois so it can handle 'derived' plans  
Added DcmShiftPlanIsoc

20070419 Fix in PatientTree in presence of long RTPlanName

20070423 Added outputstring pszCreatedUID to DcmShiftPlanIsoc

20070508 Fix: date query on empty mask failed

20070522 Temporary workaround for XVI-upi-bug in DcmShiftPlanIsoc()

20070530 Added DcmGetPlanStructUIDs()

20070530 Fixed bug in DcmGetPlanPois() when more than 1 isoc defined in RTSTRUCT

20071018 Added DcmGetLastCreatedStructUID and DcmSetLastCreatedStructUID. This is a mechanism so that a newly created RTStruct can be referenced in a shifted RTPlan.

20071031 In DcmGetPlanPois(), support 'QUIRT CqDicom ' structuresets too. In CreateTree(), treat a marker as a structure

20080313 Support markers; treat them as structures; In DcmGetPlanPois(), the consistency check on isoc in plan and structureset is omitted. We take the isoc from the plan.

20080318 Store RTPLAN properties also in cache, and added 'NumberOfFractionsPlanned'

20080320 In ReadKeys(), also use SOPInstanceUID for RTDOSE

20080717 Moved prototype of DcmStoreFiles to CqGlobal.h

20080818 Made to compile with MS7 (fabs on integer)

20080908 ix xfm2 for &Kretz, and implemented those for &Philips

20081002 Adjustment in the Tree for Pilips ultrasound (possible 3D scan in private VR)

20081124	Fix matrix for philips 4D US (AMC patient 0321)
20090202	Fix display of study modality in patient list (is now in dictionary)
20090610	Added safety check in DcmGetPlanPois(), DcmShiftPlanIsoc() and DcmGetPlanStructUIDs() in case our so called UPI is NOT unique
20091028	Adapted for 64-bits version
20091103	Adjusted DcmGetPlanPois() to new Pinnacle version; should be backwards compatible.
20100629	Fixed FixControlPointProperties() for Nucletron RTPlans
20100827	Caller may use "EXCLUDERTOBJECTS=1" in DcmSetExtraParams when loading of RT Objects is not desired (e.g. for faster calls to CreateTree())
20101214	Fix: GetRtDDO() now checks on whether something was actually received; Work on DcmGetDoseFromPlanURL()
20110427	Recoded CreateTree(). Also support for MR sub-volumes when ImageType is different
20110503	Created nice ALIAS for MR sub-volumes when ImageType is different
20110516	Fixed CreateTree() when there are stand-alone MR images with different ImageType
20110525	Fixed CreateTree() when an RTPLAN can be queried but not be loaded
20110629	Corrected CreateTree() for bExcludeRTObjects: the value of the first item was checked only
20110708	Added ReferencedStructureSetSequence[X].ReferencedSOPInstanceUID to PlanProperties
20110810	Increased Tree-field from 96 to 128 vector because ImageType can be long...
20110817	In GetPoisFromRTStruct(), check on redefinition of CTREF and ISOC in an RTSTRUCT. If so: fail (Pinnacle allows this to happen).
20110909	Fixed ReadModality() when ExtraKey contains BOTH EchoNumber and ImageType
20120104	When attaching an RTSTRUCT to a scan in CreateTree(), do not use ReferencedFrameOfReference anymore when ReferencedSeries could not be found.
20120628	Fix: GetImageTypeAlias() could crash DicomTree can be confined to a specific STUDYINSTANCEUID; Some work on combining PET series to a 4D volume
20120629	Removed MkTypedDicomObject(). Library is now always attached in ServerChild(); Replaced 'ImageNumber' by 'InstanceNumber' and 'EchoNumber' by 'Echonumbers'
20120906	StudyLister: use DcmPatientList2() with iMaskMode=10. The StudyInstanceUIDs are returned in the last column.
20120913	ImageType in URLs are replaced (if possible) by a SubType of that ImageType that is unique within the Series. The aliases are replaced accordingly.
20120914	Fix: Improved logic in FindUniqueImageTypeSubstrings()
20120924	Reversed the sort-order in fnSortDicomQueryResult(). Now first on ImageType, then on EchoNumbers. This is needed so that MR volumes having 'BOLD' in the SeriesDescription can be grouped to form 4D datasets.\

20121009	Treat MR r2* the same as BOLD
20121102	Group US images together when the manufacturer is "V "
20130124	Added COLOR=%d to RTSTRUCT in tree
20130125	Avoid memory leak in ReadModality()
20130206	Merged
20130423	Resolved memory leaks in TreeAdjustImageTypeMR() (always) and CreateTree() (error case only), addressed CppCheck issues
20130503	Replaced DcmMoveHere() by DcmMoveHereInternal(), ensure that gl_pLastProperties is not freed after caching
20130503	Added missing break in case statment in CreatePatientList, and changed the iMaskMode check from PatientSex(4) to StudyDate(5)
20130619	Installed error handler passed to SetDicomErrorHandler() to intercept a.o. "out of memory" errors
20130620	Improved error handling for all exported functions
20130809	Resolved memory leaks in DcmGetPlanStructUIDs()
20130812	Updated Caching in CqDicom. Main problem was reading Xfms and beam properties.
20131004	Made sure that an empty patientlist does not result in an exception in CreatePatientList
20131009	Added DCM_MODALITY_DOSE case in retrieval of bostonscantosiddonworld. Otherwise, it returned fixed DicomToSiddon transform which is not true at all.
20131014	Corrected wrong array selection in PatientSetupSequence in StoreBeamPropertiesInCache.

#### **CQCACHE.CPP (inactive part of conquest interface DLL):**

20000710	Added CacheInitFromSelectionStrings
20000808	Fix in comparison of selection with cache
20000824	Added ReferencedStruct to cache (used for beams)
20000829	Also store 'image' in cache
20010717	Some work on RTDose objects
20020418	Added cache-ing of properties
20040616	In CacheInit (Called from PatientTree), keep the cache if the tree is from the same patient
20050203	Added CacheCleanupRtObjectFiles. This is done just before a PatientTree of a different patient than last patient is being constructed
20050906	Added 'CacheGetReferencedProperties()'
20050919	Increased MAX_SEL_CACHE from 200 to 2000
20061109	Increased MAX_SEL_CACHE from 2000 to 10000
20080318	RTPLAN properties are now cached too
20091028	Adapted for 64-bits version
20110207	CacheInit() was not prepared for 'marker'. This caused the message 'cannot find related scan' when there are no delineations present.
20130125	ea+isp Added FreeCache()
20130429	Removed unused variables from FreeCache()
20130625	Added missing lower-vase conversion {strlwr(szSOP)} in CacheCleanupRtObjectFiles(char* pszPatientID)
20130712	Fixed the memory leak while freeing the previous cache in CacheInit()

20130812 Updated Caching in CqDicom and added  
CacheGetReferencedScanUrlForBeam

**CQPRINT.CPP (part of conquest interface DLL):**

20020814 Added exported functions 'DcmPrintScan' and 'DcmPrintFile';  
Altered 'PDU.AttachRTC' in 'PrintGrayScaleImages'; Tested  
with OFFIS and Mallinckrodt  
20020816 Padded uneven string VR's with space  
Support of byte images. (RGB does not work yet)  
20020823 DcmPrintFile accepts multiple filenames (separated by ;) and  
decompresses NKI data  
20020825 Added DllProgress calls during print (used by server to ensure  
printing without losing socket data)  
20051217 Use nicer method to replace compressed by uncompressed data  
20080313 Removed some warnings  
20080818 Made to compile with MS7  
20091028 Adapted for 64-bits version  
20130620 Improved error handling for all exported functions

**CQINI.CPP (inactive part of conquest interface DLL):**

20020814 Added exported functions 'DcmPrintScan' and 'DcmPrintFile';  
20081002 Created  
20081014 Fixed parsing of backslashes in KeyValueToVR  
20081015 Fixed translating hex values in KeyValueToVR  
20081029 When the data of a VR exceeds MAX\_DATA\_LENGTH, then  
a '\*' is appended to the Key in DcmReadIniObject()  
The '\*' is ignored (stripped) in DcmWriteIniObject()  
20081106 In DcmSetField() and DcmSetString(), also accept a new VR.  
For now, this is only implemented when the VR is not  
inside a sequence.  
20081111 Fixed errorhandling in above functions  
20090602 Added DcmPlanIniToPrescription.  
20100218 Two fixes in GetVRFromDDO. DcmGetString and  
DcmSetString crashed when parameter pszKey is sequence  
item AND a literal string passed from Delphi. When the  
sequence item is out of range, now DCM\_E\_MISSING\_VR is  
returned instead of DCM\_E\_INVALID\_VR.  
20100701 Recoded DcmSetString()  
20100810 Recoded DcmSetField()  
20110126 Made FieldToDicomObject() public  
20110316 Set gl\_szValue[0]=0 before calling PrintData from DumpLevel  
to prevent 64 bits problems  
20110711 Improved error-handling of DcmWriteIniObject()  
20110920 Added DcmSetIni (comparable to multiple calls of  
DcmSetString)  
20120629 Made LoadTypedDicomFile() more efficient  
20120913 In KeyValueToVR, fixed type of keys that were not passed by  
name, but by '(gggg,eeee)'  
20130418 Support float and double type in PrintData()  
20130424 Also convert "Unknown" and "?" into "(gggg,eeee)" to match  
with

	behavior of ProcessHeader() in CqDicom.cxx, addressed CppCheck issues (1 leak and incorrect return value of DcmGetField())
20130620	Improved error handling for all exported functions

### **SQLITE3.C**

20120611	version 3.7.13
20140527	version 3.8.5
20160318	version 3.11.1

### **CQJPEG8.CPP (inactive part of conquest interface DLL and dgate.exe): CQJPEG12.CPP CQJPEG16.CPP**

20020301	Created
20030415	Better exception handling
20030417	Support for multi-frame images
20041221	Changed include files
20050215	Fixed for fragmented frames in a sequence
20050901	Renamed errorcodes.h to errcodes.h
20070112	Return Width, Height and BitDepth of the image
20071001	Output of JPEG error messages to OperatorConsole in server
20080819	Suppress large amounts of jpeg errors; added \n
20081116	Adapt for very large objects (use unsigned int lenght)

### **CQJPEG.CPP (part of conquest interface DLL):**

20030123	Created
20030128	Start work on RLE decompression
20030415	Fix in determining RLE decompressed size\
20080313	Removed some warnings

### **DICOMP.CXX (sample print program)**

20020816	Fix in (unfinished) main server code
20020822	Made this sample program part of code base
20080113	Fixed for MS7 compiler
20100120	Fixed for MS8 compiler

### **TEST.CXX (sample client program)**

19980322:	played around; added comments in query client
19980322:	Added command line interface for c-find
19980323:	Added command line interface for c-move
20000318:	Added optional NKI command vr's to echoclient
20020315:	Started on -fe: forwarding server; implemented echo, working on move and find
20020316:	Added cstoreclient -t; load dd.txt as dicom dictionary; -fd=diagnostic mode (logs) Added IARQ; note: cast of PDU to dump() seems to crash sometimes. Forwarder works between QUIRT/conquest apps and conquest dicom server.

- 20020317: Made forwarder more general; works between EFilm and Conquest
- 20020811: Fixed forwarder such that it works for dicom-print  
Fix: Forwarder did not work with OFFIS because OFFIS checks message command/data pdu bit 6[1] that is was not set correctly by forwarder (command/data object)
- 20020822: Made this sample program part of code base
- 20030630: Fixed crash in cast of Dump(PDU) (c.f. 20020316)  
Fixed passing of cmds to Find and Move  
Fixed continuous CechoServer  
Removed calls to obsolete PDU.Write()
- 20030721: Fixed SetStringVR (pad uneven strings with a space)  
C-Find and C-Move wildcards "\*" seem not to be valid
- 20040711: Fixed forwarder: status=0xff00 loops responses; status==0 keeps association open
- 20040712: Added auto-returner to forwarder - functions with NKI viewers (assumes viewerAE of X%ip or XX%ip).  
You need to set AE and port of return forwarder in your PACS though; see gatewayname, gatewayport, returndump and viewerport for configuration
- 20040713: Attempt to make it multithreaded; however return connection only starts once (supports single client only!)
- 20040713: Split into modes -fp: for printer; -fb: forwards and returns; -fe normal forward; -ff fixing forwards
- 20051217: Use new ReAlloc method to replace data in VR
- 20060618: Allow (and disabled) looping of c-move to test repeated c-move problem in read-ahead thread
- 20061127: Allow (and disabled) looping alternating c-move and c-find to test server
- 20070902: Fixed for ms7 and ms8
- 20090411: mode -fp adds more transfer syntaxes uid2..uid8 (experimental)

#### **DGATESERV.DPR (part of dgateserv.exe)**

- 20000316 Created
- 20000326 Close handle on terminate  
Dgate runs via new SlaveProcess mechanism of Uservice

#### **USERVICE.PAS (part of dgateserv.exe)**

- 19990316 Fixed English of some messages  
Added account and password as optional parameters for install
- 19990325 Added option to start/stop/install/uninstall on remote machine  
Works fine with start / stop / uninstall  
Remote install works except for wrong exe path  
Therefore added ExeName property and command line switch
- 19990326 Added service option: makes it a generic installer!  
Made ServiceName and ServiceDisplayName read/write  
Added AllowSlaveProcess: command line can set slave process  
Added SlaveProcess and SlaveProcessArgs: executable to start  
Fixed arguments passing when /start is followed by more /  
Fixed ServiceName: is read as first arg in DoCmdLineStart  
Note: SlaveProcess is killed when service stops



20100827	WaitforStop also tests the SlaveProcess: service stops when slave crashes; Version in help text: now V1.1
20100901	Avoid RaiseLastWin32Error for common errors: it now shows a crash window
20101111	Avoid RaiseLastWin32Error for failure to start, use ShowMessage
20101113	Fix for vista - stop does not reach service
20101116	Stop before uninstall fixes uninstall for vista

### **SERVERDRIVER.PAS (part of conquestdicomserver.exe)**

19980405	Created
19980407	Added dgatesop.lst file creation; max AE to 16 chars
19980407	Sorted image list on SOPINSTANC to get correct order
19980412	Added DuplicateHandle code; but still deadlocks
19980413	Threaded mode avoids TCP/IP component (seems to fix deadlock)
19980414	Restart after switching server mode does not always work; Fix application to threaded mode for now. Added compression configuration.
19980415	Some fixes for the first installation code
19980505	Made length of directory field in MAGDEVIC 250 chars
19980608	Replaced TQuirtViewer with TImage => no need to load ntpars.dll
19980614	Merged code with use FPiette tcp components
19980616	All OK with new fpiette code; actually I had to fix my own bug
19980617	Save as bitmap and dump header in popup menu
19980618	Query and Move options for CQDICOM.DLL
19980619	Added header lister; default MagDeviceThreshHold to 10 MB
19980620	MagDeviceThreshHold is now configurable
19980621	Renamed table to MagDevice; use full table names Nicely coded DBF/Access choice; but fixed to DBF Delete patient and refresh database menu options
19980622	Double click query memo to make new query Show on bitmap: patient is being deleted/file not found
19980623	Save bookmarks of tables; move to next record after delete
19980624	DICOM.SQL: StudyNumber (StudyID in DICOM) is now 64 long (Microsoft SQL server does not allow truncation) Update bitmap after loading for fast display Text strings in UDP input to 1024 (for long SQL errors) Default password and user name to 'conquest' PAGETIMEOUT to 600 for better database performance Made DataSource name more or less configurable Made all port numbers more or less configurable Installing a second server on one PC while one server is running works
19980702	Added KBUSED field in MAGDEVICE table
19980703	Some changes in static texts and hints
19980704	Found a handle leak in RunDgate; not fixed yet
19980708	Make anonymous; show progress for move
19980710	Added experimental archive option; fix stopcopying option
19980711	Fix double click query on empty form; use tray icon
19980713	Add Name of server in tooltip of tray icon; fix DiskFree
19980717	Fix crash if directory does not exist

19980721	Clicking tray icon restores window
19981219	Improved error handling display;
19981220	List header of undisplayable object in static Read and save FileNameSyntax; default=3
19981221	Supress display of large files (>1 MB)
19981222	Use FieldByName, added combobox selectors Disable study navigator if only 1 available Moved modality from the study to the series level
19981229	Changed order of TableN.close to avoid side effects
19990104	Fixed MAGDEVICE creation under SQL server (KBused optional)
19990109	Made ImageNumber 10 bytes wide (for GE AdvantageWin)
19990110	Combobox1 is now patient filter and or selector Added access to cache and jukebox in browser but with limited support: up to 10 devices (one character) Added archiving page; fixed most handle leaks
19990112	Finished first archiving page; -hide command line option Added clear database and regen single device buttons Clear combobox for each page select NOTES: Archive page is configured by editing Restore original configuration or restart to load it Archiving allows up to 10 Jukeboxes, but only the selected one is used for writing. Only the drive with MAG0 is checked for disk space for automatic archiving. Only device CACHE0 is passed correctly to the burn program. This means: stick to 1 MAG device and 1 CACHE device for now.
19990113	Speeded archiving by selecting MAG0 if there is only 1 Renamed entry to BurnThresholdMB, made BurnProgramList Note: to do - keep log file of archiving operations. - add RT objects to default sop file.
19990114	Added date and time formats for burnprograms
19990115	label format burnprograms; no write empty ini Sync magdevice0 with DataDir; %% and %p formats
19990315	Added EchoNumber in image table - used to separate PD,T2 Completed dgatesop.lst with Philips, GE, RT Added NumberOfFrames in image table - to find multiframe objects
19990413	truncate QUERY request depending of level
19990510	Allow AEs starting with a digit (Siemens MRI)
19990527	Revision 3 of database layout (birthday, sex, bolus)
19990902	Added load/store of mirror devices and export converters
19990905	Switched word wrap off for memo's Added DcmMoveFilesHere on right click of copy; but seems to crash; Problem: if we pass DcmMoveFilesHere servers AE/PORT saving slices from own server will fail. Now pass 'test;1234'
20000127	Hide archiving tabsheet in new install; Add NKI sops to install;
20000128	Added extra GE sop; compressmode 2; disabled movefiles here
20000316	version 1.3.5: Integrates dgate as service operation New install does not start dgate right away
20000317	Truncate patient list if too long
20000318	'\$ RESTART' as console message kills and restarts server '& DGATE xx' as console message runs dgate with args xx

20000323 Added query sop choices through level dropdown list  
 20000326 Service supported for more than one server:  
 servicename=AE; port passed as /process dgate.exe -!port  
 Removed need to enter password for SQL access  
 Save and restore user and password in dicom.ini  
 Added 'ping' option for remote check of archiving:  
 Deletes ConquestDICOMServer.Ping and makes  
 ConquestDICOMServer.response with archive status  
 Allow up to four servers at the same time, also as services  
 Note: only the first server will start correctly on boot!  
 (on boot, the /process parameter is not passed and the  
 default IP message port will be used -!1111); Presence of file  
 USESQLSERVER allows install on SQL server  
 Presence of file USEMSACCESS allows install using access db  
 20000328 Added tests of local server at key moments  
 added -noconfirmquit option; show VERSION in caption  
 20000402 Install service with startup at right socket  
 Read service socket from registry on startup  
 20000403 Improved socket handling; fixed space in path when not  
 service; space in path blocks service install.  
 Now recognizes installed but not running service  
 Number of servers on one PC is now unlimited.  
 20000417 Fixed MSACCESS ODBC creation  
 20000501 ExportModalityx should be UPPER-case  
 20000528 Added "force display of large image", "remove image from  
 database", "run external viewer" and demoviewer option  
 Removed '.' as workdir from runprogram etc (allow bat files ?)  
 Added democopy option: copy incoming to dir + CallingAE.v2  
 20000529 Merged two changes  
 20000529 Release to 1.3.6  
 20000616 Attempt to create NewInstallForm database selector  
 20000625 Added NewInstallForm database selector; default to  
 MSACCESS  
 Added Send ... To menu items in popupmenu  
 Removed '\*' items from Dicom system selectors  
 Added Send Selected Images for more flexibility  
 Added animated display menu options  
 20000626 Added Send Selected Images selector window  
 20000701 Some adaptations of Send Selected Images;  
 MaxFileNameLength  
 TrimRight strings in query - trailing spaces depend on db  
 20000707 Added Edit Database by Hand menu option  
 20000808 Added ,0 code in timed archiving  
 20000915 Added ListenSocket.Addr (0,0,0,0) in multi-app mode  
 20001107 Added CheckBoxViewIncoming for demo display of  
 incoming images  
 20001108 Display originating server on incoming image;  
 Disable menus when the ViewIncoming option is selected  
 20001129 Added fix so that DICOM.INI may contain UNC path  
 Added menu choice to change ID of selected series  
 Version to 1.3.7  
 20010312 Trimmed remote IP so that hostnames can be resolved in  
 CqDicom.dll  
 20010318 Trim servername and ip;

alt-rightclick the service buttons installs service 4 times  
e.g., at ports 5678, 5679, 5680 and 5681 (all with same data)  
This may be used for efficiency and to limit the effect of  
crashes; Version to 1.3.8

20010327 Always pass curdir to runprogramxxx and startprogram -  
required because directoryview changes current directory!

20010328 Uppercase account for service; colors for archive status  
Added verify mirror disk button; burn only once per time  
Show date and time for archival steps; added KeepAlive  
Added MirrorVerifyTime (verifies whole MAG0)  
Added conquestdicomserver.log with major messages

20010405 Added comma-separated list option for patid in query page

20010406 Ctrl-dblclick adds patid to comma-separated list

20010406 All status memo's are now limited in length and save to  
separate log files  
Added (and disabled) simple zip code for log files per day

20010409 Do not log query page

20010409 Added Tape backup page; replace few GetCurrentDir by  
CurDir

20010410 Added timeouts (10s and 5 hours) to tape backup

20010412 Separate tape backup button - some fixes

20010416 Improved anonymize and change patient ID using new dgate -f  
options; Added drag and drop interface to add files to server

20010418 Changed description of forced backup set; refuse dropped  
directories; Version to 1.3.9

20010418 Update maintenance memo during drag and drop

20010418 Fix: timer4 was enabled if no KeepAlive specified in dicom.ini  
Hide tape backup page in new installation  
Added default install button in firstinstall

20010419 Added anonymize and change patient ID for study

20010502 Added DeleteThisStudy/Series

20010830 revision 4 of database definition (extended)  
Added ExportStationName in dicom.ini  
Updated dgatesop.lst to conform to DICOM 1999 final text  
Version to 1.3.10

20010903 Suggest .username as account

20010904 Fix: Query was freed twice when a DicomMove failed

20011108 Added automatic zipping of log files  
Make sure that tape backup and archive pages are not shown  
Added save/restore of ExportFilter settings

20011109 Small fixes:  
do not write empty configuration strings (empty<=>default)  
keep some settings with original case (see sorg)  
use StrToIntDef to avoid exceptions on invalid settings  
Added ZipTime as configurable

20011127 Added SeriesPat and ImagePat fields to DICOM.SQL  
Surpress fail message box when using SQL server  
Version to 1.3.11

20020402 Adapted controls.pas: exception handling in  
finddragtarget and findvclwindow

20020409 DB rev 6: added frame of reference UID to series

20020416 Store/save UIDPrefix for in dicom.ini  
When creating dicom.ini, create unique UIDPrefix:  
'1.2.826.0.1.3680043.2.135.Date.Time

20020417 Added configurable TestReadTime: regular check of MAG0  
 Fix: QueryResult has not necessarily 64 char  
 Renamed some data structures  
 20020422 Do not save empty UIDPrefix; fix change patid for study  
 20020424 Added simple weekly checks page; mail ALL failures  
 20020426 Fix in mail sender list; use first e-mail as 'to' address  
 20020428 All recipients show in to: header  
 Only serious error messages have \*\*\* in string  
 Added MailCollectTime and MailWaitTime  
 Avoid starting check more than once  
 20020510 Added CheckDicomSubmits (send mail when users forgot to  
 send images to the PACS)  
 20020513 Checks: empty time runs all day; added log header/footer  
 Updated CONTROLS.PAS: more exception handling  
 Fixed reading of weeklychecks; display CD num in header  
 Fix warnings and patient ID checks in CheckDicomSubmits  
 20020515 Added ImageType to database (rev 7)  
 Added find missing patients button;  
 allow more than one weekly check time (; separated, not  
 adjacent)  
 20020515 Fix missing pats when query empty  
 Added grab options to weekly checks  
 20020517 Changed StudyModality to 64 chars (e.g., fits :  
 CT\MR\PT\XA\ST\MG\MS\RTIMAGE\RTDOSE\RTSTRUCT\RTPLAN\RTRECORD)  
 20020518 Fix in weeklychecks tag: too many with tag 0  
 20020519 Fix in rev 7 db definition: AcqDate is now SQL\_C\_DATE  
 Added FixPhilips in DICOM.INI  
 20020520 Use DGATE.EXE for grabbing  
 20020522 Fix reading of entries with an '=' in e.g., dicom.ini  
 20020524 Fix acrnema.map problem with new install  
 20020529 Fixed duplicate mailing of messages, added WriteMemo  
 Added archive.log; extra parameter for regen for DBASEII  
 Removed MessageBoxes  
 20020609 Read and write FileCompressMode, default remains 2  
 20020613 Added alt-drop code: enter with new patient ID  
 20020819 Basic printer support; view incoming shows printer data  
 20020819 Process messages as files are dropped  
 Print incoming imageboxes on default printer  
 20020821 Printer accepts landscape and portrait any pictures per page  
 Progressbar shows printer queue activity  
 Note: printer queue is single user (but may be fixed, using  
 film#)!  
 20020823 Added print options in browser - print to local dicom server  
 20020825 Headerlister is modeless - added CTRL-A, CTRL-C, CTRL-F,  
 CTRL-S, F1, F3 end ESC  
 Printer has progress hook - required to avoid socket data loss  
 Selection of print page format; edited info text  
 Added all 1.3.11 fields to edit database by hand  
 20021015 Start deleting patient started delete "=ALL when no patient in  
 list!!!!  
 Protect all pop-up functions for no selection  
 20021016 Better support for copying large #patients, even if one or more  
 missing  
 Added denormalized database option (for DBF without ODBC)

Removed obsolete magdevice button  
 20021017 Added "" around dropped filenames; use filter instead of master-detail (requires index) for built-in dbf support  
 Version to 1.4.0; added dropping of directories  
 Added UID counter passed to dgate to avoid UID problems  
 20021018 Fixed browser fail and missing dbase dir after non-odbc install  
 Limit dbase list in browser (alternative to image) to 100 lines  
 20021020 Added Kill and Restart the Server weekly check (packs built-in dbf); Fix reading of database name if not default  
 20021021 Small fix in maintenance memo for very long strings  
 20021028 Also denormalized series database; default de-normalize study (rev 8); Show denormalized study entries in database editor  
 20021029 Fixed query keys transmittal (sent sop when not needed)  
 20021213 Added EnableReadAheadThread as configurable parameter  
 Disabled GECTStorage amd GEMRStorage in dgatesop.lst  
 20030113 Version to 1.4.1; Fixed keepalive option (was never enabled)  
 Added PatientQuerySortOrder and such  
 20030128 Fix update of headerlister when no image shown  
 Make DBF table links case insensitive  
 20030319 Fix: ImageDB entry 'ReceivingCoil' is 16 bytes (not 12)  
 20030324 Start on 1.4.2: db rev 10: made ReceivingCoil 16 wide  
 20030402 Merged above two changes  
 20030409 Handle DicomPrint error; several path fixes in tape-handling  
 20030613 Catch WM\_QUERYENDSESSION: shutdown disables close dialog  
 20030628 Fix that more than one dropped directory will be loaded  
 20030706 Prepare for release 1.4.2; new dicom.ini; kill server  
 Compression column in acrnema.map  
 20030707 Added manufacturer to denormalized db (rev 11)  
 Write registry key  
 HKEY\_LOCAL\_MACHINE\SOFTWARE\NKI AVL\Conquest\Dicomserver\SERVERNAME  
 with values: directory=path without trailing backslash and  
 laststarted=yyyymmdd. For use by Dicom-works only.  
 Note: servername changes are updated on GUI startup only.  
 20030708 Made JPEG compression configurable (affects dgatesop.lst)  
 20030709 Write version into registry  
 20030710 Install service as system account (no user required)  
 Fix attempt to mail when not wanted  
 ----- release 1.4.2 -----  
 20030717 Fix problems when registry access fails  
 20030809 Will automatically use ADO or MDBF when BDE not installed  
 Set version to 1.4.3  
 20030810 Log used DB engine; Added partial ID matching for MDBF  
 Default enable uncompressed button before install  
 Force user to push 'Save config button'  
 Added some text to install and maintenance pages  
 Do not display images when on jukebox (use force display)  
 20030819 Made max drop filename length longer (256->1024)  
 20030905 Date of zip file is one day before if zip before 8 in the morning  
 Hide external viewer menu directly after install  
 Optional configuration of SendUpperCaseAE added  
 Removed obsolete flush button  
 Do not allow install in directory with spaces in its name  
 Removed faulty extra text from install page

20030907	Fix ODBC generation for directory with spaces Just warn against directory with spaces
20030909	Test write access to log files prior to startup
20030920	Mail messages that contain 'fail' instead of 'failed' Added tape full warning (that will be mailed) Added enables for timed archival (to allow retry/timer disable) Changed order of burn CD message / tape backup Added NextSlotToUse (slot n) next to NextCDToBurn (JUKEBOX0.n); % in burn parameters %n = NextSlotToUse, %c = NextCDToBurn; Manual archive buttons control checkboxes as well
20030921	CTRL-Double click "automatic archival label" starts archival CTRL-Double click "weekly checks time" starts check Added NightlyCleanThreshold parameter (clean # MB at 01:00)
20040401	Added ImageID to database; version to 1.4.4 Show ImageID in database editor and browser
20040402	Allow anonymize etc on MAG0..MAG9; changed datasource name (now system DSN)
20040425	Added DoubleBackSlashToDB to dicom.ini
20040426	Version to 1.4.4a
20040528	Use built-in servertask commands for maintenance and browser
20040530	Browser for built-in DBASEIII driver uses extract server command; Database editor to read only for built-in DBASEIII driver; These changes allow efficient use of in-memory index for dbaseIII; OK for 10 <sup>7</sup> images when patientID, studyUID or seriesUID passed in Queries; Added PackDBF and IndexDBF to dicom.ini; Reworded some in popup menu; wait for patient deletion to finish; Fix refresh for sql server
20040601	Added LongQueryDBF flag
20040605	Fix extract when no patients; kill server stops loop of server tasks; start server on activate (after windows shows) Pack the Database as Weekly Check Action
20040606	Fix in formactivate; display @ startup
20040610	use servertask to clear index and rebuild it in built-in dbase mode
20040614	small fix in keep server alive; added nightlymove option
20040615	small fix in nightlymove option; also reindex after regen device
20040713	Added FixKodak; version to 1.4.6
20040722	Installation defaults for FixPhilips and FixKodak are now 0
20040804	Added *.lst to zipped log files; added bug report option Version to 1.4.7
20041029	Added merge and split series options; Process messages during long GUI actions if possible (no DB)
20041030	Modified GUI of merge and split, process messages
20041101	Check for MAG storage for split/merge Delete from DB does not use image (for orphaned DB) USEDATABASEIIIWITHOUTODBC replaced by Pos('\', Datasource)>0 while running
20041102	Added nj compression mode
20041108	Added warning when alt-dropping file(s) with \$.. as Patid (debug)
20041128	Fixed wording of delete messages: works on all mag devices Fixed problem in DeleteThisSeries, Anonymize, and change

Patient ID: last series could not be modified/deleted  
 20041129 Made font size of server status window selectable; Made debug log switchable; service will continue to log to file even if user interface is closed (but with different date/time layout)  
 Now can save and use acrnema.map without server restart  
 Fix startup problem when disk 'c' not available  
 20041201 Backup fail 1..5 files temp logged as ALMOST OK -> continues  
 20050106 Fixed install as four services, fixed nightlymove amount  
 Is now nightlymovethreshhold - free space: i.e., attempts to make nightlymovethreshhold MB free space  
 Fixed nightlymove: forgot to pass '0' for MAG0  
 Also, try move even if select failed to avoid stall after partial failed select  
 20050109 Made backup of and warn when dicom.sql is overwritten  
 Added TCPIPTimeOut, FailHoldOff, RetryDelay, QueueSize  
 Version to 1.4.8  
 20050114 On startup ask to delete ExportFailures\*, CopyFailures\*  
 20050422 Added BurnTime2 (2 dvds per day) and BurnWeekend (all weekend through)  
 20050429 db rev 14: added worklist support  
 20050829 recurse directories when dropping files to ease load dicom CD  
 20050831 Added find modality worklist to dgatesop.lst  
 20050901 Added clear worklist button, version to 1.4.9, WorkListMode  
 20050905 Modality worklist query, auto append worklist to dicom.sql  
 20050907 Avoid dicom.sql message in new install, v\* and s\* in acrnema.map  
 20050912 Small changes to dicom.ini, dicom.sql, dgatesop.lst; added SQLHost. Small change to mdbf: extra refresh avoids browser failures  
 20051024 Version to 1.4.9a: recompiled with patched controls.pas  
 20051230 Version to 1.4.10  
 Moved clear worklist button and add pack database button  
 Added warning when worklist is added to dicom.sql: clear worklist required  
 Added settings: DebugLevel, CacheVirtualData, LargeFileSizeKB, VirtualServerFor#  
 enable study controls prior to return if same (none) image shown  
 20060102 Update of hints  
 20060103 1.4.10 Release  
 20060201 Added K-Pacs/EZDICOM based viewer  
 20060312 Keep case of VirtualServerFor; Message buffers from 1024 to 8192; Open k-pacs viewer on correct series; version to 1.4.11  
 20060314 Added experimental native Mysql access; installs when libmysql.dll is found - uses mysql version 4.1.14  
 20060315 Keep case of FileNameSyntax  
 20060328 Updated hints and file version for release 1.4.11  
 20060618 Set default user for mySQL to root (thanks Chris Muller)  
 Seems to then also work with mySQL 5.0.22, version to 1.4.12  
 20060707 Bug reported by Paolo Marchesi: save config loses DBF  
 Now only set to default when previous does not exist  
 Use same zipmaster as in previous versions (zipmaster\org)  
 20061101 Added SeriesDescription to query page



20061129 Added control for debuglevel, and allow queries on UID  
Double click queries labels to change mode

20061130 Added new dgate parameters; consolidated debuglevel control  
and param; Made application forms resizable and set size  
constraints; Small font control works on all status pages;  
Double click image to force display it

20061220 Pass Tempfile to kpacs viewer form

20070123 Added processfilter to allow browsing of patients with ' in  
patientid

20070126 Importconverters stuff and ForwardAssociationRelease in  
dicom.ini; Version to 1.4.12b

20070201 Version to 1.4.12c

20070204 Fix in generation of UIDPrefix: was not automatically  
generated on startup

20070206 ODBC buttons will also create database for SQL server

20070207 ODBC button creates database for native mysql

20070211 Native MYSQL did not create indices during install  
Fixed selection of DBF (with odbc)

20070221 Started to SQLite (not yet fully functional)

20070305 Version to 1.4.13alpha

20070316 Use | in patid instead of , in drag and drop to allow dropping  
files with a , in them while changing patientid (not backwards  
compatible)

20070415 Back to , in patid in drag and drop: ljj fixed it in dgate.exe  
Added Prefetcher flag in dicom.ini (default 0)

20070520 Fixed missing completed message in regen single device

20070705 Added BrowseThroughDBF: unified browser used for SQLite  
Works for other datasources but not configured as such  
Small fixes in completed message in several regen functions  
Fixed view/edit database second time round (enable)

20070706 Auto create mysql registry settings for native mysql  
Disallow anonymize and change to empty name  
Message on end of odbc or db creation  
Version to 1.4.13beta

20070708 Patched forms.pas for Chad Moser's crash problem.  
Added BrowseThroughDBF setting in dicom.ini  
Default 1 for SQLite, 0 for others  
Use extract: also for dbaseIII: to avoid multi-user problems  
when browsing and writing at same time

20070709 Small fix in dbf+bde browsing  
Auto register webserver\ActiveFormProj1.ocx if found  
Do not use extract: for dbaseIII: browser does not work  
while indexing

20071030 Also delete DelayedFetchForwardFailures\* on startup

20071103 Added LRUSort, AllowTruncate, ForwardCollectDelay,  
MaximumExportRetries,  
MaximumDelayedFetchForwardRetries  
Version to 1.4.13

20071104 Added DecompressNon16BitsJpeg, UseBuiltInDecompressor  
Made IncomingCompression editable (double click label)  
Made FileNameSyntax editable (double click label) and  
allow choice of V2 and DCM through radiobuttons

20071114 Save root password while installing for mysql with password

20071115	Disabled multi-process mode in RunInThreadedModeClick to allow multiple saves of ini file during install (for above password)
20071115	Save password and username for SQL server install as well
20071116	Longer default password for sql server 2005
20080124	Added mailer settings in dicom.ini
	Disable LittleEndianExplicit on install
	Added configuration for mode UJ
	Database revision 16: Moved Stationname and InstitutionalDepartmentName to series table
	Added extra warning when revision 16 not detected
	moved Stationname and InstitutionalDepartmentName in view/edit database
	Version to 1.4.13a
20080126	Automatic add backslash to read MAGDEVICES etc and give a warning message
20080322	Version to 1.4.14beta
20080322	Fix first install bug in test dicom.sql; fix send image crash in UID mode; display selected UIDs in query/move page
	added PadAEWithZeros and IgnoreOutOfMemoryErrors
20080818	Database revision 17: extended size of EchoNumber and ReqProcDescription to 64; EchoNumber, StudyModality and ImageType are DT_MSTR: multiple values; use Institution (8,80) instead of InstitutionDepartmentname (8, 1040)
	Added WorkListReturnsISO_IR_100
20080819	Version to 1.4.14
20080831	Default ForwardAssociationRelease to 1
20080902	mvh Added EnableComputedFields, default 0
20081104	Fixed install as four NT services: trim IP port before convert to int; Fixed save of database name to dicom.ini for mysql install
	version to 1.4.14a
20081121	Added Postgres support; attempt fix MySQL support
	Automatically choose the 64 bit dgate if possible
20081123	Retry server test for 4 sec after db install
20090203	Trim data read from dicom.ini to remove trailing spaces
20090205	Added MailPort option
20090411	version to 1.4.15alpha; Added PrintSquareLandscape, max converters to 19, VirtualPerSeries0..9, RetrieveResultConverter0, QueryConverter0, WorkListQueryConverter0, RetrieveConverter0
	Let OCX registration fail without warning (for vista)
20090927	Added RetryForwardFailed
20090927	Optionally use 7za.exe instead of zipmaster (when zipdll.dll deleted); Added RetryForwardFailed
20090928	Default sql password to conquest1415;
20090929	Added ImportExportDragAndDrop flag (default 0)
20090929	Version to 1.4.15
20100202	version to 1.4.16alpha; check other GUI running; jpeg2000 stuff; LossyQuality
20100206	use convert_to_bmp in browser to allow JPEG2000
20100207	export servertask; added spinedit for frames;
	UseKpacsDecompression flag
20100207	version to 1.4.16alpha2; made it a const; removed warnings
	write zips to folder logs if exists; create logs folder on install

20100227 version to 1.4.16alpha3; added DICOM print to selected AE  
 20100827 version to 1.4.16beta; Fixed display of jpeg2000 config in GUI  
 LargeFileSizeKB to 4096; note: jpeg2000 requires HAVE\_J2K  
 in cqdicom.dll; Fixed viewincoming; fixed enable NJ mode  
 choice logic; fixed service detection to warn for existing but not  
 running service  
 20100828 Automatically start installed but not running service when GUI  
 comes up; Added QueryResultConverter and  
 ModalityWorkListQueryResultConverter  
 20100905 Added UseBuiltInJPEG and IgnoreMagdevicethreshold flags  
 20101003 Added browsepatient command; show record counts in browser  
 hints; Fixed frame number passed to BMP generator  
 Improved query page text selection when brackets in text  
 20101003 Version to 1.4.16beta4  
 20101110 Typo in reading UseBuiltInJPEG (save will always write 1)  
 20101111 Version to 1.4.16beta6; added tests to service control  
 Issue: uninstall often fails (and leaves dgate.exe running)  
 20101116 Fixed uninstall in dgateserv, changed messages  
 More checks in service code  
 20101122 Add option to log to file only with gui running  
 Added export to zip file options  
 20101123 Default EnableComputedFields to 1, added OverlapVirtualGet,  
 ArchiveConverter0, update acrnema.map header with  
 ui, ul, ue  
 20101212 Right lock new checkbox; version to 1.4.16  
 20101212 Disabled BigEndianExplicit for new; default file type to DCM  
 20101212 Removed nop export script  
 20101213 Enable delete even if no file found;  
 stop zipping and cleanup (dgate will do it) if only log to file  
 enabled  
 20101213 Fixed update of grid hints for totals: note count = unfiltered  
 20101220 Block spinedit for 1 frame image  
 20101227 Reset CheckBoxOnlyLogToFile when restarting server etc  
 20110105 version to 1.4.16rc1; default BrowseThroughDBF=1 for  
 SQLSERVER  
 20110123 version to 1.4.16rc3; other support for other sections in  
 dicom.ini  
 20110326 version to 1.4.16rc6; Also show incoming 'Rewritten' images  
 20110329 Version to 1.4.16; added MAGDeviceFullThreshHold  
 20110331 Added NoDICOMCheck; release date  
 20120818 Padd text queries with spaces not nulls; fix setting JL  
 compression; Increases convert\_to\_bmp resolution for print  
 jobs and bmp creation; Display some info in the query window  
 on startup; delayed GUI test; Version to 1.4.17  
 20120826 Accept server messages without \n; backup Failure files when  
 deleting  
 20120912 Fixed tab order of all server tabsheets  
 20121016 Document J3NN .. JLNN in acrnema.map  
 20121212 1.4.17beta  
 20130517 Fixed anonymizer; 1.4.17  
 20130517 DoubleBackSlashToDB = 1 could happen when installing MS  
 SQL server  
 20130522 Added WorkListTableName to dicom.ini  
 20130523 More anonymizer work

20130813	Choose .dcm extension radiobutton for lua file name syntax Added AllowEmptyPatientID to dicom.ini Added missing converters to dicom.ini code
20130813	Version to 1.4.17b, release date
20131013	Version to 1.4.17c, release date
20131123	Fix uid based image query, broken due to 20120818 fix
20131219	Fix mailer when weekly checks config is absent
20140304	Added W* wildcard AE
20140309	Updated dgatesop.lst to revision 5
20140309	Version to 1.4.17d, release date
20140618	Updated dgatesop.lst to revision 6
20140618	Version to 1.4.17e, release date, LargeFileSizeKB default to 100000
20141102	Only set DcmSetProgressHook on DcmMove, reset after use - needed for latest cqdicom
20150718	Adapted for Delphi XE8, removed DBE and slow directory tree selector
20150718	Create custom controls runtime, removed zipmaster, direct sqlite and mysql access
20150719	1.4.19alpha
20150730	reorganized menu for clarity; hide "force display of large image" if not needed; added advanced modify images dialog
20160306	Added image commands to modifier and delete; hide refresh command and animation menu; Added JPEGLS options (bug: quality not yet saved; default j7 quality is lossless) BrowsethroughDBF now default on; simplify dicom.ini by not writing defaults
20160307	Navigating series removes image; click series to display Added testmode const: 0 is normal 1 is show servertask commands with optional execute; Version to 1.4.19beta and builddate; new Anonymizer at 4 levels using modifier: command new ChangePatid at 4 levels usign modifier: command new ExportAnonymousZIP at 4 levels; new DICOM move at four levels
20160308	Greatly improved testmode; used it to fix move: call; UseKpacsDecompression default off Enable/disable menu items according to image visibility in browser encompass servercommands by luastart:servercommand[[..]] to run in background Enable JpegLS in dgatesop.lst and document in acrnema.map header Removed MAG only warnings; fix modify patient ID script syntax
20160309	clear progress data when read fails; wait until database file is ready to avoid 'image not found' Added refresh logic (after progressbar disappears)
20160310	Show **working** and #images; go back to this/next record at refresh
20160312	Show DICOM file in explorer; ImportExportDragAndDrop default to 1 Updated hints; click image now shows imagea and set focus to image list for wheel

retry fixes failed to find image on first opening browser; beware  
 for deadlock  
 Filter patients on ID using extract:1 command; test on 15000 pat  
 list  
 Removed BrowseThroughDBF (always on)  
 Keyboard shortcuts F2..F9; pgup/pgdown/num+/num-; Show  
 study/series sequence number  
 20160313 Removed commented code; show keyboard shortcuts;  
 F2=KPACS viewer / F11=show database  
 20160314 Added some code to reduce flickering of image; Label25 shows  
 slice / total; Show n/total for series and studies; disable modify  
 - test syntax when no image shown  
 Left mouse slices through multiframe object; hint on spinedit  
 20160315 Code review, reverted sockets to Recieve; jpeg2000 setting read  
 fix  
 20160316 1.4.19beta; allow optional scripted bitmap conversion;  
 uncompress on export; experimental sort  
 20160317 Use new todbf: command instead of extract for more control  
 Added sorting on/off by clicking column headers; limit patlist  
 to 10000; Disable ODBC button for SQLITE and DBASEIII;  
 warning hint for ODBC on win64  
 20160318 Show sorting in table hint; fix zip decompress scripts  
 20160319 Move curdir to tempdir (make sure no dbfs there)  
 Delete temp files when done with them  
 Install method; copy files from install32/64 when dgate/64 not  
 found  
 20160319 1.4.19beta release

#### **SERVERABOUT.PAS (part of conquestdicomserver.exe)**

19980405 Created  
 19980618 Added reference to Fpiette; use form also as file lister  
 19980624 Removed line about backdoor  
 19980721 Removed line about Mark Oskin going away  
 19990527 Release to 1.3.3  
 20000128 Release to 1.3.4  
 20000316 Release to 1.3.5  
 20000529 Release to 1.3.6  
 20001129 Release to 1.3.7  
 20010318 Release to 1.3.8  
 20010318 Release to 1.3.9; fixed dbaseIII text  
 20010830 Release to 1.3.10;  
 20011127 Release to 1.3.11;  
 20020816 Release to 1.3.12;  
 20020825 Made Lambert's e-mail address more prominent  
 20021018 Version to 1.4.0; added release date  
 20021020 Update release date  
 20021028 Update release date  
 20021215 Update release date  
 20030113 Version to 1.4.1; release date  
 20030128 new release date  
 20030303 new release date  
 20030710 Version to 1.4.2; release date  
 20030809 Version to 1.4.3

20030810	Added reference to offis, zipmaster, and mitec
20030922	Release date
20040402	Version to 1.4.4
20040406	Release date
20040426	Version to 1.4.4a; Release date
20040615	Version to 1.4.5; Release date
20040722	Version to 1.4.6; Release date
20040805	Version to 1.4.7; Release date
20041129	Release date
20050106	Version to 1.4.7a; Release date
20050109	Version to 1.4.8; Release date
20050303	Release date
20050912	Version to 1.4.9; Release date; worklist info
20051024	Version to 1.4.9a; Release date
20060103	Version to 1.4.10; Release date
20060314	Version to 1.4.11; Release date; new acknowledgements
20060402	Changed fpiette's website; Release date
20060708	Version to 1.4.12alpha; Release date
20061222	Version to 1.4.12; release date
20070126	Version to 1.4.12b; release date
20070201	Version to 1.4.12c; release date
20070706	Version to 1.4.13beta; release date; sqlite reference
20071116	Version to 1.4.13; release date
20080322	Version to 1.4.14beta; release date
20080831	Version to 1.4.14; release date
20081121	Version to 1.4.14a; release date
20090411	Version to 1.4.15alpha
20090927	Version to 1.4.15
20100202	Version to 1.4.16alpha
20100207	Version comes from define in the serverdriver
20160313	Update

#### **SENDSELECTED.PAS (part of conquestdicomserver.exe)**

#### **MODIFYDICOM.PAS (part of conquestdicomserver.exe)**

20150730	started this added advanced modify dialog
20160313	protected against missing modifier.lua

#### **HEADERLISTER.PAS (part of conquestdicomserver.exe)**

20020825	added keyboard interface (see serverdriver.pas)
20160313	Added F9 is close

#### **EDITDATABASEFORM.PAS (part of conquestdicomserver.exe)**

20150719	Always operate readonly
20160306	Send click messages to main form to control image visibility
20160319	F11 is close

#### **ABOUTNEW.PAS (part of conquestdicomserver.exe)**

20000625	Added NewInstallForm database selector; default to MS ACCESS
20010418	Changed text; added default install button

20010830	Version to 1.3.10
20011127	Version to 1.3.11
20020816	Version to 1.3.12
20021016	Added DBF without ODBC
20021017	Version to 1.4.0
20021018	Default to USEDBASEIIIWITHOUTODBC
20030324	Version to 1.4.2
20030810	Version to 1.4.3 - removed ODBC DBASEIII choice
20040102	Version to 1.4.4
20040426	Version to 1.4.4a
20040530	Version to 1.4.5
20040713	Version to 1.4.6
20041029	Version to 1.4.7
20050106	Version to 1.4.7a
20050901	Version to 1.4.9
20051024	Version to 1.4.9a
20051230	Version to 1.4.10
20060313	Added experimental native Mysql install when libmysql.dll is found
20060618	Version to 1.4.12
20070126	Version to 1.4.12b
20070201	Version to 1.4.12c
20070305	Version to 1.4.13alpha
20070305	Added experimental (not fully functional) native SQLite install when sqlite3.dll is found
20070706	Version to 1.4.13beta; sqlite always enabled (driver linked in)
20071103	Version to 1.4.13
20080322	Version to 1.4.14beta
20080819	version to 1.4.14
20081121	Added postgres; mysql unconditional; version to 1.4.14a
20090411	version to 1.4.15alpha
20090927	version to 1.4.15
20100202	Default to SQLITE; version to 1.4.16alpha
20100207	version comes from define in the serverdriver
20160318	Added UoM to labels

#### **DVIEW.PAS (k-pacs viewer part of conquestdicomserver.exe)**

20000625	Added NewInstallForm database selector; default to MS
20060116	Adapted for Delphi 5 compatibility Do not use TFormatSettings; Do not use DelimitedText
20060116	Included NKI decompression (without CRC check)
20060117	Reset NKICompress flag if normal pixel data found
20060117	Fixed AddDelimitedText; fixed for multiframe data
20060117	Fix NKI compression when DCMloadMultipleFiles is true
20060117	Fix Get_ZDimension when DCMloadMultipleFiles is true
20060117	Accept conquest .V2 files as dicom in DCMloadMultipleFiles
20060120	DcmFilename now accepts multiple filenames separated by "*"
20060120	Added new dcmTool kSlice to stack through an image
20060120	New global boolean gNoOffsetList to bypass gOffsetList array
20060121	Reimplemented tiled display (mosaic), set with procedure DCMSetMosaic
20060123	Restored layout to allow windiff, lossy jpeg now gives correct error

20060126 Added support of value representation "UT"  
 20060126 Improved scaling of text overlay and measurements  
 20060129 Added option to save image in RAW format  
 20060129 New OnMouseEnter and OnMouseLeave events and custom cursors for several gTool's  
 20060129 Added overlay text color option  
 20060129 Fixed JPEG bug in multifile mode  
 20060130 Changed mosaic slice# place  
 20060130 Fixed nki\_private\_decompress: error for large pixel values (>32768)  
 20060131 Fixed reading of ELSCINT and ACUSON images that use NKI private tag 7fdf:0010  
 20060201 Improved real-time image zooming through bypassing the SetDimension procedure  
 20060202 Fixed display of slice numbers in empty fields in multview mode, fixed mosaic mode for multiframe dicom images  
 20060204 Enabled saving to TIFF using W. Krug's Bmp2Tiff unit  
 20060205 Added Tool kShutter  
 20060223 Changed rescale method to rescale buffer directly after reading pixeldata  
 20060223 Reverse NKI test: if nki compression mode >4 it is not made by NKI  
 20060304 Fixed NKI compression of 8-bit and color images; todo: 1966 and some PT images level&window wrong  
 20060420 Added orientation indicators to text overlay  
 20060421 Implementation of TdcmOverlay record to describe custom overlay  
 20060425 Added TRuler class to show spacing  
 20060502 Implementation of basic VOI\_LUT support. Currently only 16bit VOI LUTs are supported.  
 20060607 Merged changes mvh 20060223 and 20060304  
 20060608 Need CONQUEST define to enable NKI compression, fix crash in TdView.AdjustOrientChars  
 20060609 Fixed VOI Lut crash when encoded explicit  
 20060611 Added PixelPaddingValue and PixelRepresentation to DicomData and fixed an unwanted pixel value correction if pixel padding is out of SS range  
 20060618 Merged again; added 20060223 and 20060304 changes back in  
 20060712 fixed wrong orientation label display when ImageOrientation and ImageOrientationPatient string is available  
 20060728 Added support for non-square Pixel Aspect Ration  
 20060801 Bitmap overlay support implemented  
 20060830 3D Cursor function implemented using open source vector math units  
 20061107 ?  
 20061220 Made compileable again in conquest: stripped html support in conquest mode  
 20061220 Found endless recursion on double click: IFNDEF conquered  
 20061222 Tried to restore layout  
 20070204 Added (dumb) access to http: files  
 20070216 Important bug fix: allow switch to implicitVR: I found a NKI compressed image with VR length 03544C = 'L', 'T', 3 and LittleEndianImplicit --> length was seen as LT code causing reader to go out of sync see: { mvh 20070216 }



20070216	Fix that magnifier would never return its cursor by setting Screen.Cursor to default when changing modes
20070305	Put downloaded dicom file in TempPath, document download code: note not safe when using multiple controls side by side.
20100207	Added uncompress mode (uses dgate.exe, not for OCX); delete temp before using it
20150719	Adapted for delphi XE using ansistrings, block out unused code and variables
20160313	Removed volumemath
20160314	Truncate conversion of very long strings for verbose output to speedup read of some MR data

### **LABEL3D.PAS (part of k-pacs viewer in conquestdicomserver.exe)**

20150719	Adapted for Delphi XE8
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### **WSOCKET.PAS (part of fpiette in conquestdicomserver.exe)**

20150718	Adapted for Delphi XE8
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### **SMTPPROT.PAS (part of fpiette in conquestdicomserver.exe)**

20150718	Adapted for Delphi XE8
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### **MDBFTABLE.PAS (Michal Mutl's Mitec dbf datasource)**

20030809:	changed control page; added exception handling on CreateFields
20030810:	Added 'name*' partial key matching for filter
20030810:	Fixed huge leaks
20040530:	Fixed illegal memory access at CharToOemBuff
20080215:	Fixed empty buffer causing filter exceptions in case of no records; Open DBT file readonly
20080325:	Adapted for delphi 7
20100907:	Adapted to D2009
20130730:	Fixed Unicode issue in ProcessFilter(), respect foCaseInsensitive and foNoPartialCompare
20131020:	Added matching *val*
20150713:	Fix in case insensitive matching for exact value
20150719:	Adapted for Delphi XE6 and XE8
20160311:	Fix ansichar / char mixup in locate

### **UVIEWER.PAS (wraps k-pacs viewer in conquestdicomserver.exe)**

20060130	Replaced Japanese fonts (never create forms on a japanese laptop ;->>>)
20060304	Set limit to 2000 studies
20060312	Slice with + and -: keep other keys for series browser Added OpenSeries; disallow hor scrollbar in stringrid
20060618	Removed unused variable; moved slice controls into toolbar
20061220	Replaced viewertemp.\$\$\$ by passed tempfile
20061222	Added some logic for better control of zoom and l&w
20070305	Made mosaic global

20071103	Use DLL way of accessing server to avoid 'server not running' error
20080108	Fixed hard-coded IP port 5678 for K-PACS viewer
20080901	Added flip left-right button; OCX define
20100207	Added uncompress option (if set uncompression done by dgate)
20150719	Adapted for delphi XE, use ansistrings for DLL
20160313	Fixes in layout; force refresh of slice count (for dgate as decompressor)
20160319	F2 is close

### **UViewerActiveFormImpl1.PAS (wraps k-pacs viewer in activeX control)**

20070305	Created update history
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### **MDBFTabl.PAS (Dbase III access, Michal Mutl)**

20030809	changed control page; added exception handling on CreateFields
20030810	Added 'name*' partial key matching for filter
20030810	Fixed huge leaks
20040530	Fixed illegal memory access at CharToOemBuff
20080215	Fixed empty buffer causing filter exceptions in case of no records
	Open DBT file readonly
20080325	Adapted for delphi 7
20100907	Adapted to D2009
20130730	Fixed Unicode issue in ProcessFilter(), respect foCaseInsensitive and foNoPartialCompare
20131020	Added matching *val*
20150713	Fix in case insensitive matching for exact value
20150719	Adapted for Delphi XE6 and XE8
20160311	Fix ansichar / char mixup in locate

### **dgate.dic (dictionary file)**

19990915	Moved all uneven (private) group-codes to dd-private.txt
20030706	Add NKI Pixel Data
20081104	Add 0008,0061
20100214	Added compression info
20101227	Fixed 0020,1209 etc; added Conquest private commands (in 1.4.17alpha branched to)
19990915	Moved all uneven (private) group-codes to dd-private.txt
20030706	Add NKI Pixel Data
20030802	Adjusted to dicom 2001 (retired elements still in lib)
20060913	Adjusted to dicom 2005
20090812	Added Philips private tags
20090828	Put those private tags in alphabetical order
20091124	Added more Philips private tags
20100909	Changed two MRI private tags (2005,100d) (2005,100e)
20101004	Added
20120628	Adjusted to dicom 2011 (VERS="4")
20121016	Added conquest private commands