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; **release 1.4.0**
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

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
Revision 57; 20160827	Release 1.4.19beta3
Revision 58; 20161122	Release 1.4.19 (prerelease)
Revision 59; 20170208	Release 1.4.19

Contact, ConQuest DICOM server and many MicroPACS extensions
Lambert Zijp or Marcel van Herk; Radiotherapy department; The Netherlands Cancer Institute; Amsterdam, the Netherlands; Fax: +31-20-6691101 / Email: zijp@nki.nl or portal@nki.nl

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Server core based upon:
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Developed by: Mark Oskin, ~~mhoskin@ucdavis.edu~~; University of California, Davis Medical Center; Department of Radiology with a Solaris port done and maintained by: Terry Rosenbaum; Michigan State University; Department of Radiology.

Original MicroPACS developer (not active anymore)
Mark Oskin; UC Davis Medical Center; PACS Research and Development Lab. (916)734-0308 / FAX (916)734-0316 / Email: ~~mhoskin@ucdavis.edu~~

Administrative / Licensing Contact, original MicroPACS components
Richard L. Kennedy; UC Davis Medical Center
(916)734-7267 / FAX (916)734-0316 / Email: rlkennedy@ucdavis.edu

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TABLE OF CONTENTS

SECTION 1 INTRODUCTION.....6

SECTION A(2) CONFORMANCE STATEMENT.....9

A.0.....INTRODUCTION 9

A.1.....IMPLEMENTATION MODEL 9

A.1.1.....Application Data Flow Diagram 9

A.1.2.....Functional Definition of AE's 10

A.1.3.....Sequencing of Real - World Activities 10

A.2.....AE SPECIFICATIONS 15

A.2.1.....AE1 Specification 15

A.2.1.1.....Association Establishment Policies 15

A.2.1.1.....General 15

A.3.....COMMUNICATION PROFILES 20

A.3.1.....Supported Communication Stacks (parts 8,9) 20

A.3.2.....OSI Stack 20

A.3.3.....TCP/IP Stack 20

A.3.3.1.....API 20

A.3.3.2.....Physical Media Support 20

A.3.4.....Point-to-Point Stack 20

A.4.....EXTENSIONS / SPECIALIZATION / PRIVATIZATIONS 20

A.5.....WADO FUNCTIONALITY 21

SECTION 3 DEFAULT QUERY/RETRIEVE INFORMATION MODEL DEFINATION.....22

3.0.....INTEROPERABILITY SCHEMA 22

3.0.1.....PATIENT ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP 22

3.0.2.....STUDY ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP 23

3.0.1.....PATIENT/STUDY ONLY QUERY/RETRIEVE ENTITY RELATIONSHIP 23

3.1.....ENTITY DESCRIPTIONS 23

3.2.....PATIENT ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINATION 24
3.2.1.....Patient Level Keys for Patient Root Query/Retrieve Information Model 24
3.2.2.....Study Level Keys for Patient Root Query/Retrieve Information Model 24
3.2.3.....Series Level Keys for Patient Root Query/Retrieve Information Model 24
3.2.4.....Image Level Keys for Patient Root Query/Retrieve Information Model 25

3.3.....STUDY ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINATION 25
3.3.1.....Study Level Keys for Study Root Query/Retrieve Information Model 25
3.3.2.....Study Level Keys for Study Root Query/Retrieve Information Model 26
3.3.2.....Image Level Keys for Study Root Query/Retrieve Information Model 26

3.4 PATIENT/STUDY ONLY QUERY/RETRIEVE INFORMATION OBJECT DEFINATION 26
3.4.1.....Patient Level Keys for Patient/Study Only Query/Retrieve Information Model 26
3.4.1.....Study Level Keys for Patient/Study Only Query/Retrieve Information Model 26

3.3.....STUDY ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINATION 27
3.3.1.....Study Level Keys for Study Root Query/Retrieve Information Model 27

4.2 FILES.....28

4.4 THREADING ARCHITECTURE.....30

APPENDIX 1: CONQUEST MODIFICATIONS TO MICROPACS..... 33

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 de-coupling 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, JPEG2000 and JPEGLS interfacing was done by 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 fixed 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 1.4.15alpa 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.
- Version 1.4.19beta3 is mainly a minor bug fix release, although exportconverters were broken in 1.4.19beta.
- Version 1.4.19 fixed one major bug: anonymisation failure for old databases and a few small bugs; scripting adds Rclient and overflow no longer crashes jpegLS and jpeg2000 compressors

SECTION A(2). CONFORMANCE STATEMENT

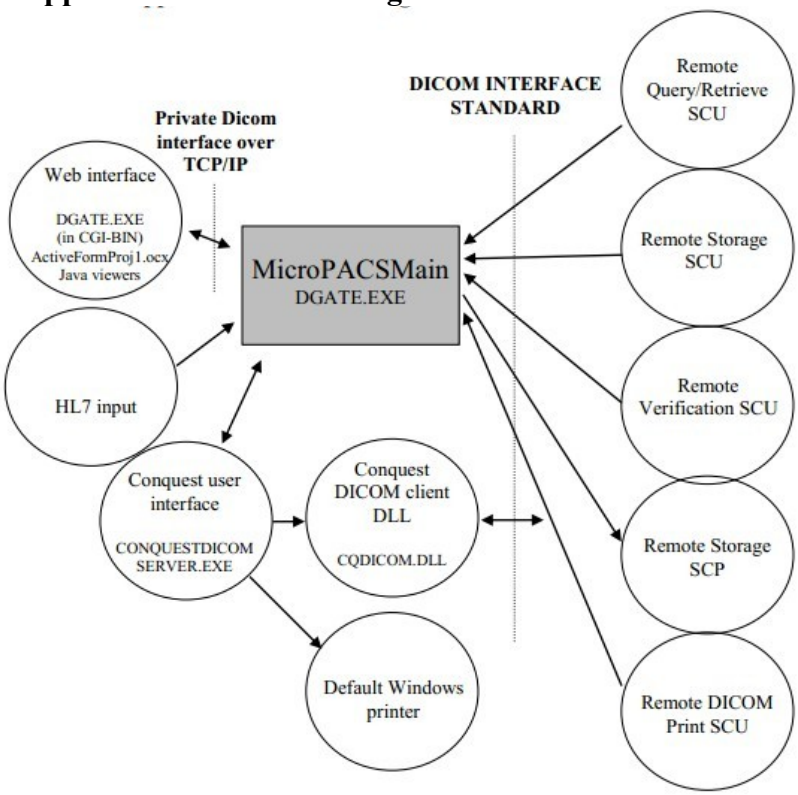
A.0 INTRODUCTION

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, MicroPACSMain

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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 MicroPACSMain 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 patientlister) 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 converter into normal DICOM retrieves 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, dwv, 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:

Application Context Name	1.2.840.10008.3.1.1

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:

Maximum Length PDU	32Kbytes

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 *acrnema.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

MicroPACSMain 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:

Storage & Q/R UID	**1.2.826.0.1.3680043.2.135.1066.101**

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	JPEGFulllNH10and12	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 *acrnema.map*. Lossy compression configuration settings like j3 and jl 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[1], as[2], n1..n4[3], nj[4], uj[4]	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[5]	1.2.840.10008.1.2.4.80	JPEGLS Lossless
j7[5] (or e.g. j780)	1.2.840.10008.1.2.4.81	JPEGLS Lossy
jk[5]	1.2.840.10008.1.2.4.90	JPEG2000 Lossless
jl[5] (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.
6) JPEG2000 and JPEGLS compression can crash on poorly formatted images in 1.4.19.

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 **DICOMLIB** folder file. The actual DICOM server (with many options) is **DGATE.EXE** that is included with source code in the release file . 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. Lua scripting can be debugged in ZeroBraneStudio.

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): MaxRowsColums	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, 0800): ObjectFileName	returns ObjectFileName of image when queried

(9999, 0801): ObjectMAGDevice	returns Mag Device of image when queried
(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?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)
- 1.2.840.10008.1.2.4.80 → js (jpegLS)
- 1.2.840.10008.1.2.4.81 → j7 (jpegLS)
- 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/bmp
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

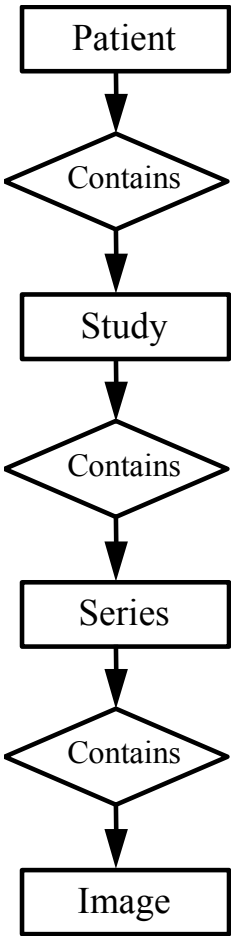
bridge default is the current server or taken from **[wadoservers]bridge** in dicom.ini in the web servers *cgi-bin* folder

SECTION 3 DEFAULT QUERY/RETRIEVE INFORMATION MODEL DEFINITION

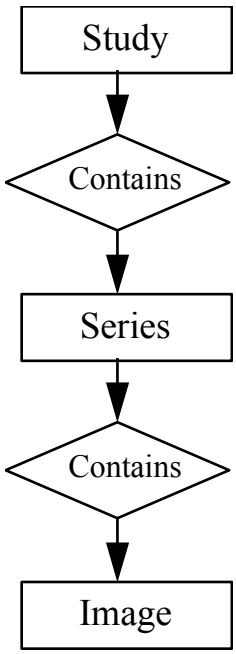
This section describes the subset of the DICOM v3.0 Patient Root, Study Root, and Patient/Study Only, Query/Retrieve Information Model Definition used by this product.

3.0 INTEROPERABILITY SCHEMA

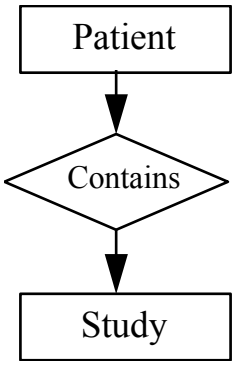
3.0.1 PATIENT ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP



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 Number of Series Related Instances	(0020,0052) (0020,1209)	O O	Computed* - not database

*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
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

3.3.2 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 Character set	(0040,1003) (0008,0005)	O *	 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 DicomServer1419.zip):

7za.exe	7-zip command line version
7za.txt	7-zip license text
anonymize_script.cq	anonymizer (-> lua/anonymize_script.lua script)
ConquestDICOMServer.exe	User interface (Windows GUI)
CqDicom.dll	Conquest DICOM client DLL (for GUI only).
dgate.dic	DICOM dictionary for dgate.exe
DgateServ.exe	NT service wrapper for dgate.exe V1.1
DicomConformance_FilesLST_Changes.pdf	This file
linuxmanual.pdf	Linux installation manual
maklinux	Linux build/install script
sample.hl7	Example HL7 input file
update.bat	For internal use
windowsmanual.pdf	Documentation
clibs*.*	location for Lua extension DLLs (empty)
data*.*	Sample data (two images)
extensions*.*	Lua scripts to improve GUI display and print (copy to conquestdicomserver.exe folder enable)
install32*.*	32 bits exe and DLLs
dgate.exe	console mode version of MicroPACS system
libmysql.dll	Mysql client DLL 5.0.22 and associated DLLs
libeay32.dll	
libiconv-2.dll	
libintl-8.dll	
libssh2.dll	
lua51.dll	32 bit Lua interpreter
install64*.*	64 bits exe and DLLs
dgate64.exe	Idem for 64 bits (automatically selected)
libpq64.dll	64 bit client DLL for postgres (hard to find)
libmysql64.dll	64 bit mysql client dll 5.0.22
lua51.dll	64 bit Lua interpreter
linux*.*	Linux configuration files
lua*.*	(sample and serious) lua scripts
lua\anonymizer*.*	Batch anonynization system scripts
src\dgate*.*	Sources to compile for Linux
webserver\cgi-bin\.lua	default lua webpage
webserver\cgi-bin\.lua.linux	idem for Linux
webserver\cgi-bin\dgate.dic	Copy of DICOM dictionary
webserver\cgi-bin\dgate.exe	Copy of executable, used as CGI application
webserver\cgi-bin\dicom.ini	Webserver configuration
webserver\cgi-bin\dicom.ini.linux	idem for Linux
webserver\cgi-bin\Alea*.*	For Alea ECRF integration
webserver\cgi-bin\newweb*.*	New fully scripted web interface
webserver\cgi-bin\newweb\dgate.exe	Copy of executable, used as CGI application
webserver\cgi-bin\newweb\dicom.ini	New webserver configuration
webserver\cgi-bin\newweb\dicom.ini.linux	idem for Linux
webserver\cgi-bin\newweb*.lua	Lua scripts for each page
webserver\cgi-bin\OpenClinica*.*	For OpenClinica ECRF integration
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 various web viewers
dwv005.lua	Old dwv HTML5 viewer
dwv016.lua	New dwv HTML5 viewer
flexviewer.lua	flexviewer driver
imagejaviewer.cq	ImageJA Java applet as viewer
launchWeasis.cq	Weasis as series viewer
LaunchWeasisStudy.cq	Weasis as study viewer
LaunchWeasisStudy_old.cq	Weasis as study viewer (old)
launchWeasis_old.cq	Weasis as series viewer (old)
wadoseriesviewer.lua	Standalone HTML5 Conquest series viewer
wadostudyviewer.lua	Standalone HTML5 Conquest study viewer
wadoviewerhelp.lua	For HTML5 Conquest series viewer

weasisseriesxml.lua	For Weasis
weasisstudyxml.lua	For Weasis
webserver\htdocs	logo and old OCX viewer
webserver\htdoc\dicomviewer100	Placeholder for obsolete Java viewer
webserver\htdoc\dwv	Placeholder for dwv code (dwv-0.16.0)
webserver\htdoc\weasis	Placeholder for weasis Java code (2.07)
ZeroBraneStudio*.*	integration files for the ZeroBraneStudio IDE
conquest.lua	Code completion file
conquestdicomserver.lua	Interpreter (link between ZBS and Conquest)
conquestdicomutil.lua	Other interpreter – can run without server
install.lua	Automatic Install script
readme.txt	Some information
wordwrap.lua	Extension to turn wordwrap on and off

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 in included in the zip file. 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 but not for the 1.4.19.

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.

dgateserv.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 **"dgateserv /?"** 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 conatin all settings.

acrnema.map* List of known DICOM providers. The file must be present but may be empty of 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.

*Mimimal 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 significanltly
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 odbcinst 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 asynchroniously; 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 unexistent 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 anonimize 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 Tranfer 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 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/dcmcjpeg (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 timout 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 ifxxxx) 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 imagefilelister: use to list pat:sopuid
Fixed sorting problem by using adapted imagefilelister 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 aggresively preread queried patient or studies

20070416: Prefetcher prints more information; use windows calls in windows for faster preread

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 yyyymmdd-yyyymmdd] 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 yyyymmdd-yyyymmdd] [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 yyyymm 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: catched 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 MakeSafeStringValues 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 deletedicmobject, 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 againt 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 unnecesary 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 NewICOM 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
20160424	Linux fixes
20160516	Added JpegLS to WADO interface
20160516	Small fix in cgi status display get_remotea --> get_remoteae; do not use hardcoded "acrnema.map"
20160516	Split images counter for Jpg and Bmp (e.g. ImagesToBmpFromGui)
20160716	Added lua tempfile and returnfile; added n0 and nN transferSyntax to wado server: simplify and NKI compression
20160718	WADO now supports image/bmp and experimental bmp strip (set frameNumber<0)
20160723	Added experimental jpeg strip function; allow multiple for jpeg and bmp (set frameNumber to -columns)
20160827	Added Lua destroy, reject and retry functions; version to 1.4.19beta3
20160828	properly copy Called and Calling, fix ExportConverter script passing; version to 1.4.19beta4
20160830	Fix in importconverter change above, version to 1.4.19beta3a
20160901	Fix passed windowwidth from CGI WADO request to wadorequest, was divided by 2
20160905	Fix stripping of space from called and calling: crashed when empty e.g. all spaces
20160905	version to 1.4.19beta3b
20160913	Added lua ConvertBinaryData to allow fast R interface without vstruct
20160917	Completed it with s conversion
20161120	dbquery returns nil if query fails not {}; version to 1.4.19
20161204	Catch image VR null in getptr (lua image access), test return of recompress in scripting
20161212	Retry after 5s in Linux LoadAndDeleteDir after discussion with snalbansed; This is because there is no other way of finding if a file is finished
20161214	Loop retry 30 times
20170203	Replace ' with _ in loadhl7
20170208	Release 1.4.19

DGATE.HPP (part of DGATE.EXE):

19980705: Added CACHEDevices and JUKEBOXDevices, FindPhysicalDevice
19990108: Added LoadImplicitLittleEndianFile and NKI PrivateCompession 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 lenght).
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 MaxFileNameLenght 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: Ovverrule '.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 to 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 compatibity (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 PaientRecord, 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 equaly 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 allready 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 0nnnnnnn with nnnnnnnn
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	Trucated printfs 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 MakeSafeStringValues. 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 MakeSafeStringValues 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 supress 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

20160716	Detect UIDMODS without stage option and if so fallback to unstaged anonymization
20161120	Fix fallback to unstaged anonymization, passed incorrect '' value

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 odbci.cpp); sql statement max 16384 (in odbci.hpp) Enough for query with one multiple values UID of about 100 images (list truncated if too long). Added safestrcat protection of SearchString
20041003	Truncated debug prints, malloc strings at image level. Analysed string lenghts; 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 pgsql): requires 4 backslashses (!)

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 lPort (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 maxvrsize 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 compatibity (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 GetADDO 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 dcmcjpeg: compress without changing rescaleslope/intercept

	This option is required for our viewers: slices must all have same rescale
20060219	Removed warning in writegif
20060222	Added extra checks (not on ID strings) to pass as NKI compressed data
20060311	dcmcjpeg 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/dcmcjpeg. 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 dcmcjpeg: 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 dcmc/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 '1' 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 dcmcjpg
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 recieve, 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 tojp
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 bitsstored, 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
20160716	Added NKI compression mode 5
20160718	Added experimental BMPStrip function
20160723	Added experimental JpegStrip function; allow multiple columns
20160724	JpegStrip now creates proper array of images
20160905	Fix stripping of space from called and calling: crashed when empty e.g. all spaces

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
20170205 Define guard as extra space for botched compression
20170205 Move image creating inside frame loop of jpeg2000 compression to avoid crash on multiframe
Known issue: 12 bits images with too many bit not error free in jpegLS and jpeg2000
20170208 Check input pixel value against precision; refuse to compress if outside

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.
20160619: bcb added sgnd flag
20161204: catch imageVR not present

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

20131224 Created this file.
20151203 Moved some dependent defines from total.cpp to here.
20160619: bcb added sgnd flag

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 vrtosql; 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 lenghts see dbsql.cpp; tructated debug printfs 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 realy fixed but greatly reduced its likelyhood
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 CreateDtabase 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
20770308	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_DBASEIIINOINDEX: disables indexing and packing; #define USESQLITE_DLL to load DLL; otherwise use statically linked sqlite3.c; Extented 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 SQLLEN 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 igored 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 retunn 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, pqsql and sqlite to deal wih 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; Extented 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 SUNWspro 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 db:Exec
20140629 Added access to last error functions for mysql and pqsql

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 Acrnema.map
20030709: known bug: trailing spaces lead skip of next line
20030711: Fixed trailing spaces in acrnema.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 redifine 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 libaries 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 Meged 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 uncompilable) XE_UINTX::XE_UINTX (int x)

ENDIAN.HPD (part of DICOM core library):

20001106: removed unneeded (and sometimes uncompilable) 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 implemeted 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: UCDMC 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 Changedprototype 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 lenghts are missing
20090215 Improved formatting of lenght 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 lVRBuffer.
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 strnlen32u()
20130523	Merged Big Endian parse fix not strnlen32u()
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 belonges.
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 clases 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 bcb 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 'fprint(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 '&'

MAKEBRTC.CXX (part of DICOM core library)

19990415 Note: requires changelog

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
20140528 Kept member initialization only in constructors: not GNUC specific
20160827 Added DARWIN change by bcb as described here:
The speed problem in OSX dropped the files transfer from 110 seconds to 1 second on my Apple. I found this when trying to send the file that crashed jpeg 2000 and jpegls that you sent me. Just a one nanosecond delay fixed a race. By the way, this test was done in non threaded mode. So it is a race in the operating system.

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::InterogateAAssociateAC.
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 'InterogateAAssociateRQ'
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 object20120820 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 endloss loop after connection lost
20160827	Released with 32768 PDU max size

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
20160827 PDU size configurable

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>
20160827	respond to destroy in QueryResultScript
20160830	fixed that, reversed the test

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 slicepositions)
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 cehck 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.xxxxxxxxxx
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 XFMs and (0x20, 0x1041) and (0x20, 0x50) are both absent, use (0x20, 0x32)
20020403	Fixed bug when UIDs are 64 bytes long. Some code butifying.
20020411	Added DcmWriteVRToFile
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 XFMs 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 WRLDMATC 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 errormessage
20070220	Attempt to fix frame reversal - debug code temp off
20070506	prealloc data pointer during recieve 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 DicomMoverHedaerHere, 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 BitsAlocated is eight or more bits higher than BitsStored
20110202	Fix: Prealloc was overdoing the alloc by a factor 8
20110418	Removed MessageBox "Respiratory cycle propably 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_iImageNo, 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 incoporate 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 RefereningPhysician in DcmCreateSliceFiles Fixed read only problem of pszFileName in DcmCreateSliceFiles, and allow AE;IP;PORT without traling ;
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 '\\' 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 Dxfm_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	Sdded 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 coodinates of 4th dimension
20090610	Added DCM_E_MULTIPLE_RTPLAN, used when 'UPI' is not unique
20110126	Added prototype of FieldToDicomObject
20110418	Added waring 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 '\\'.
20010619	Start implementation of RTDose objects.
20010717	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	Allways 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 S7OPInstanceUID
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 inteface 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	Fucntion 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	Adjested 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 propertries 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	Ajustment in the Tree for Plilps 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 bevause 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 arereturned 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+lsp 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 loosing 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 worked with OFFIS because OFFIS checks message command/data pdv 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 movefileshere
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	Attemp 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
	Added configurable TestReadTime: regular check of MAG0
20020417	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 NightlyCleanThreshhold 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 10^7 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) USEDBASEIIIWITHOUTODBC 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 patientif (not backwards compatible)
20070415	Back to , in patid in drag and drop: ljz 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 Navigating series removes image; click series to display
20160307	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
20160717	Change patient ID option now leaves patient name the same
	Made border of install page wider
20160827	Allow larger film sizes in printer; list defined in gui: SendSelectedForm.ComboBox1; Save as bitmap also does JPG and GIF (GIF is animated for multiframe); Protect browser when dgate crashed: test dbf files really appear. Mouse up/down scrolls through slices; left right through frames
	Fix sorting for Postgres; coded running server test on install but does not work; Suppress most browser messages in server; removed some compiler warnings; Fix display of jukebox number in browser; 1.4.19beta3 release
20161120	Find missing patients also now works from study root level
	Disable progress bar when debug log is enabled

	Added code to update UIDMODS table in verify database installation button; Version to 1.4.19
20170208	Removed ADO components; prompt ID/newid as filename when zipping; Block test database does frame table update until NewInstallDone; Release 1.4.19

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
20161120 test syntax for DBASEIII now limited in functionality to avoid it starting new database indexing

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
/20161120 Hidden edit buttons; updated layout image list

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 trough 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 meassurements
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 lable 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 conquested
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 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

WSOCKET.PAS (part of fpiette in conquestdicomserver.exe)

20150718 Adapted for Delphi XE8

SMTPPROT.PAS (part of fpiette in conquestdicomserver.exe)

20150718 Adapted for Delphi XE8

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 Japansese 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

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
20160425	Fix PixelPaddingValue