

## Conquest DICOM Server 1.4.16beta CONFORMANCE STATEMENT and detailed software revision history

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

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Revision 38; 20070201 Release 1.4.12c: "storage" importconverter, fix ExportFilter and problem in most GUI commands  
Revision 39; 20070305 Release 1.4.13alpha: "defer" exportconverter, stuff for k-pacs web viewer; manual split into user and technical part by radtraveller – this is the technical part  
Revision 39; 20070707 Release 1.4.13beta: native mysql fixes, delayed converters, sqlite  
Revision 40; 20070709 Release 1.4.13beta2: some last fixes  
Revision 41; 20071116 Release 1.4.13: more fixes and parameters  
Revision 42; 20080322 Release 1.4.14beta: uj compression; database changes; fixes  
Revision 43; 20080902 Release 1.4.14: fixes, improved web pages; added query on 'Number of Patient Related Studies' items etc.  
Revision 44; 20090412 Release 1.4.15alpha: 64 bits, postgres, jpg graphic, etc.  
Revision 45; 20090929 Release 1.4.15: mostly bug fixes and a few scripting extensions  
Revision 46; 20100905 Release 1.4.16beta: JPEG and JPEG2000 added by Bruce Barton  
Further extended scripting options; bug fixes; GUI prints to AE

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*Contact, ConQuest DICOM server and many MicroPACS extensions*

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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.

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## SECTION 1. INTRODUCTION

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

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

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

- (Conquest addition) Fast and safe (CRC checked) error free compression (>2x) of image data on disk. Do not use this option if you want to read the image files directly from disk yourselves using third party software.
- (Conquest addition) Easy installation of many servers on a single PC. Servers may run as service(s).
- (Conquest addition) A database browser and slice viewer (Windows only) integrated in the PACS system with options for: viewing the DICOM information in a slice, creating BMP files (ideal for slides), sending

selected images, printing, and database fix tools such as changing patient IDs, and deleting and anonymizing studies and series. Also tools to merge or split series. Drag and drop to load DICOM or HL7 files, directories, or a variety of zip files (you then need to place 7za.exe in the server directory).

- (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). We use the TZipMaster VCL by Chris Vleghert and Eric W. Engler.
- (Conquest addition) Correct display of JPEG(2000) 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. Since version 1.4.16, JPEG and JPEG2000 engines are built-in using the International JPEG group and Jasper code (Interfacing by Bruce Barton). JPEG (de)compression used to be done (and this can still be configured) using executables from the OFFIS DICOM toolkit (DCMTK version 3.5.3), developed by Kuratorium OFFIS e.V..
- (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 Phillippe Puech.
- If the BDE is not installed, we use the MiTeC DBFTable component by MichaL MutL. For other data sources ADO is used (Windows only). Native drivers use the DLL's from the database system (MySQL or Postgres).
- Version 1.4.12 up can use a native MySQL driver (based on Rangel Gustavo Reale's TMySQLDataset and Matthias Fichtner's mysql.pas) and includes a preliminary advanced series viewer based on EZDicom / K-Pacs (many thanks to Chris Rorden and Andreas Knopke). Fixes: strip group 2 information of any files sent, retry logic, worklist query.
- Version 1.4.12 improves database performance, has some important bug fixes (rare crashes, incomplete deletion and grabbing, and rare database corruption on dbaseIII). Further it has the possibility to forward multiple images on a single association, and improved documentation
- Version 1.4.12b and c add importconverters and bug fixes in dbaseIII driver and web access and do not allow .dcm with nki compression
- Version 1.4.13 has a web viewer based on K-PACS, SQLite is now included, and more import and export converter options were added such as delayed forwarding and preretrieval. Then small fixes were made in native mysql (also the driver is now included in the package), and several other aspects of the server, such as handling of compression errors, out of memory conditions, and others.
- Version 1.4.14 has a more web options (move, delete and viewers), more exportconverters and 'Number of Patient Related Studies' etc. query items

- Version 1.4.15alpha fixes small bugs; and adds QueryConverters, color jpeg decoding with built-in code, frame control, several command line options, an anonymization script, postgres support, and jpeg web export graphics
- Version 1.4.15 fixes more small bugs and adds more scripting options
- Version 1.4.16beta adds internal JPEG and JPEG2000 codecs adapted by Bruce, more scripting options, bug fixes and print to AE from GUI

## SECTION A(2). CONFORMANCE STATEMENT

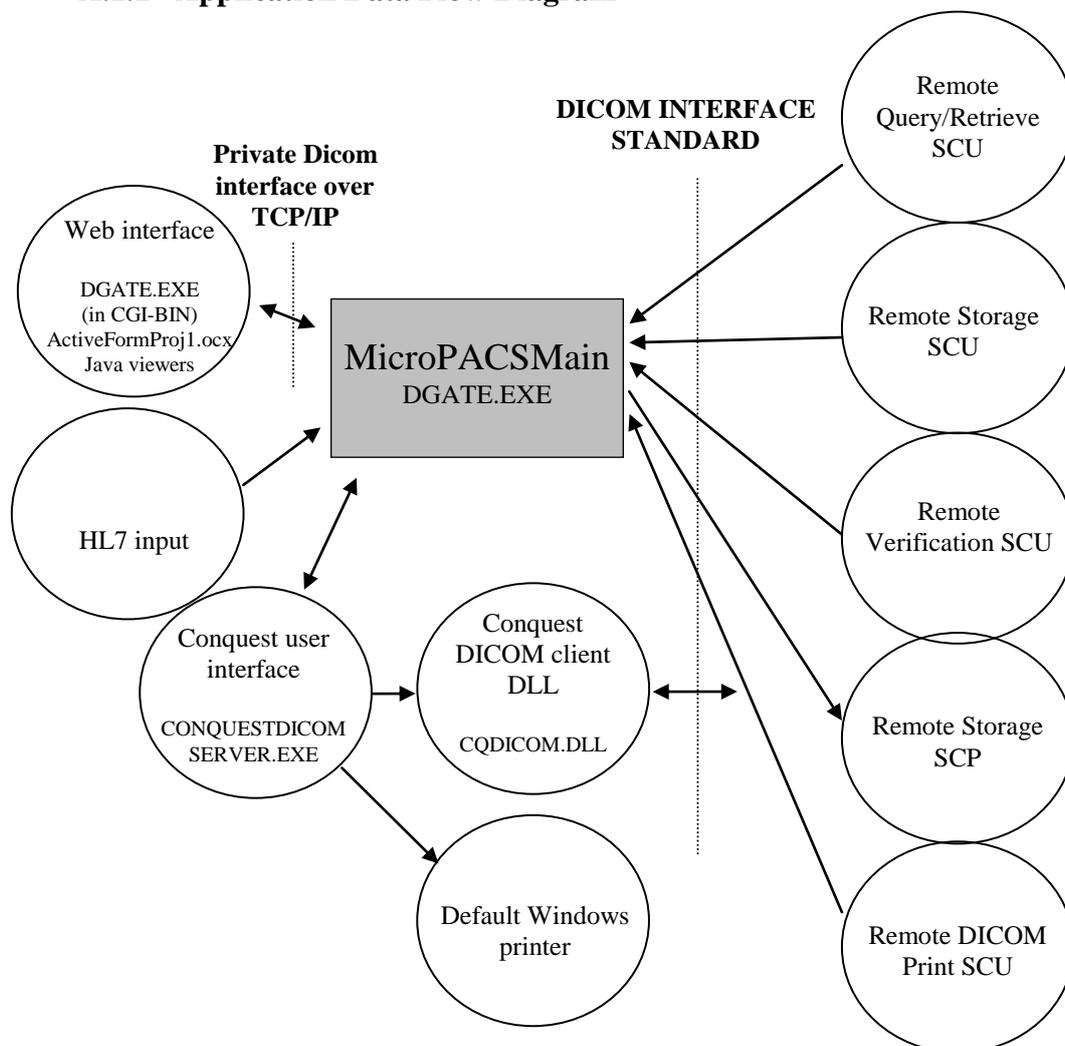
### A.0 INTRODUCTION

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

### 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.

**NOTE:** The Conquest Applications (not part of the server release) or other DICOM network viewers (e.g., KPacs) 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.
- 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.
- The MicroPACSMain AE will respond with a C-Store-RSP upon receipt of the IOD.
- 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.
  - 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.
- 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.
- 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.
  - 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 (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 a script
- Queries can be forwarded to up to 10 VirtualServerFor entries. The received data will be merged with the data from the server's database and cleaned of duplicates (see appendix 7).
- Optionally the 'Number of Patient Related Studies'-like items will be computed (this executes another query for each result of the first query)
- The returned query results can be processed by a script.

- 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 script 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 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 script
- The MicroPACSMain AE will query the Worklist database and respond with zero or more modality worklist items.
- The query results can be processed with a script.
- 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 programatically (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 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 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.

```
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:

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

## A.2 AE SPECIFICATIONS

### A.2.1 AE1 Specification

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

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

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

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

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

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

#### A.2.1.1 Association Establishment Policies

##### A.2.1.1.1 General

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

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

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

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

The SOP class Extended Negotiation is not supported and ignored.

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

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

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

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

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

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

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

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

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

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

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

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

|                                       |
|---------------------------------------|
| Presentation Context Table – Proposed |
|---------------------------------------|

| Abstract Syntax & configuration |                    | Transfer Syntax     |                        | Role | Expanded Negotiation |
|---------------------------------|--------------------|---------------------|------------------------|------|----------------------|
| *Unknown                        | un,as,n1..n4,uj,nj | Little Endian       | 1.2.840.10008.1.2      | SCU  | None                 |
| *Unknown                        | j3..j6             | JPEGBaseLine1       | 1.2.840.10008.1.2.4.50 | SCU  | None                 |
| *Unknown                        | j3..j6             | JPEGExtended2and4   | 1.2.840.10008.1.2.4.51 | SCU  | None                 |
| *Unknown                        | j5                 | JPEGSpectralNH6and8 | 1.2.840.10008.1.2.4.53 | SCU  | None                 |
| *Unknown                        | j6                 | JPEGFullINH10and12  | 1.2.840.10008.1.2.4.55 | SCU  | None                 |
| *Unknown                        | j2                 | JPEGLosslessNH14    | 1.2.840.10008.1.2.4.57 | SCU  | None                 |
| *Unknown                        | j1, j2             | JPEGLossless        | 1.2.840.10008.1.2.4.70 | SCU  | None                 |
| *Unknown                        | jk                 | JPEG2000 Lossless   | 1.2.840.10008.1.2.4.90 | SCU  | None                 |
| *Unknown                        | jl                 | JPEG2000 Lossy      | 1.2.840.10008.1.2.4.91 | SCU  | None                 |

**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 will 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**

| 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*.

| Configuration  | Proposed transfer syntaxes | Name                    |
|--|----------------------------|-------------------------|
| un <sup>1</sup> , as <sup>2</sup> ,<br>n1..n4 <sup>3</sup> , nj <sup>4</sup> , uj <sup>4</sup> | 1.2.840.10008.1.2          | ImplicitLittleEndian    |
| 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   | 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    |
| jk   | 1.2.840.10008.1.2.4.90     | JPEG2000 Lossless       |
| jl   | 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 jpeg as is; uj = uncompressed, leave jpeg as is

### **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.

##### **A.3.3.1 API**

Developers can base client programs on **TEST.EXE** and **DICOMP.EXE** that are included with source code in the **DICOMLIB1416alpha.ZIP** release file. The actual DICOM server (with many options) is **DGATE.EXE** that is included with source code in release file **DGATE1416alpha.ZIP** and **DICOMLIB1416alpha.ZIP**. Source code of the Windows user interface, client DLL and web viewer OCX is *not* included.

##### **A.3.3.2 Physical Media Support**

Any Windows (Linux) supported physical media.

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

A 50 pin ACR-NEMA connection is not supported.

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

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

|  |                             |
|--|-----------------------------|
| 1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.1.2 | PatientRootRetrieveNKI      |
| 1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.2.2 | StudyRootRetrieveNKI        |
| 1.2.826.0.1.3680043.2.135.1066.5.1.4.1.2.3.2 | PatientStudyOnlyRetrieveNKI |

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

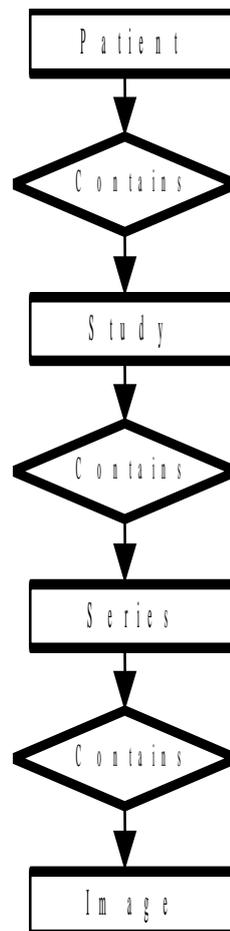
|                                 |  |
|---------------------------------|--|
| (9999, 0100): MaxVrSize         | Do not send VRs larger than this number of bytes   |
| (9999, 0200): MaxRowsColumns    | Downsize image to maximal this #rows and columns   |
| (9999, 0201): Frame             | If given, return only the selected frame of a MF object                                    |
| (9999, 0300): ConsoleText       | Text will be printed to server console   |
| (9999, 0400): Silent            | If sent, console does not log transaction<br>Also used internally by GUI and WEB interface |
| (9999, 0500): MaxSlices         | Send at most # slices irrespective of query result   |
| (9999, 0600): MaxCompression    | Maximum supported compression by NKI client (default 4)                                    |
| (9999, 0700): Recompression     | Recompress style NKI or JPEG (default none)  |
| (9999, 0802): VirtualServerMask | Restrict access to selected virtual servers (default all used)                             |

## SECTION 3 DEFAULT QUERY/RETRIEVE INFORMATION MODEL DEFINITION

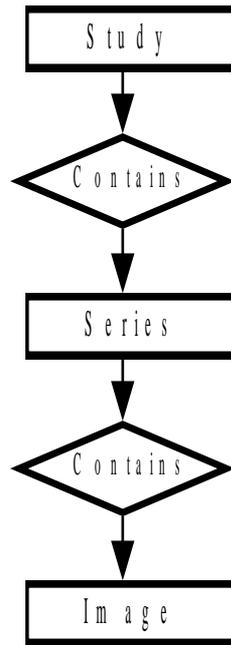
This section describes the subset of the DICOM v3.0 Patient Root, Study Root, and Patient/Study Only, Query/Retrieve Information Model Definition used by this product.

### 3.0 INTEROPERABILITY SCHEMA

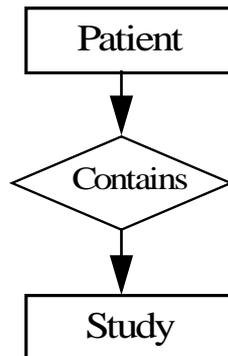
#### 3.0.1 PATIENT ROOT QUERY/RETRIEVE ENTITY RELATIONSHIP



### 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    |                          |
| Patient ID                          | (0010,0020) | U    |                          |
| 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

#### 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                | (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

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

| Attribute Name                     | Element Tag | Type | Notes |
|------------------------------------|-------------|------|-------|
| Revision: 17 (plus computed items) |             |      |       |
| Series Instance UID                | (0020,000E) | U    |       |
| Series Number                      | (0020,0011) | R    |       |
| Series Date                        | (0008,0021) | R    |       |

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

\*requires setting EnableComputedFields = 1 in dicom.ini

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

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

### 3.3 STUDY ROOT QUERY/RETRIEVE INFORMATION OBJECT DEFINITION

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

| Attribute Name                     | Element Tag | Type | Notes |
|------------------------------------|-------------|------|-------|
| Revision: 17 (plus computed items) |             |      |       |
| Patient Name                       | (0010,0010) | O    |       |

|                                   |             |   |   |
|-----------------------------------|-------------|---|---|
| Patient ID                        | (0010,0020) | O |   |
| Patient Birth Date                | (0010,0030) | O |   |
| Patient Sex                       | (0010,0040) | O |   |
| Study Instance UID                | (0020,000D) | U |   |
| Study Date                        | (0008,0020) | R |   |
| Study Time                        | (0008,0030) | R |   |
| Study ID                          | (0020,0010) | R |   |
| Study Description                 | (0008,1030) | O |   |
| Accession Number                  | (0008,0050) | O |   |
| Referring Physician               | (0009,0090) | O |   |
| Patients Age                      | (0010,1010) | O |   |
| Patients Weight                   | (0010,1030) | O |   |
| Study Modality                    | (0008,0061) | O | Multiple entry item – automatically updated by server |
| 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          | (0040,1003) | O    |   |
| Character set                         | (0008,0005) | *    | Returned as "ISO_IR 100" only when WorkListReturnsISO_IR_100 is set |

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 DicomServer1416beta.zip):

|   |  |
|---|--|
| windowsmanual.pdf                               | Documentation  |
| DicomConformance_FilesLST_Changes.pdf           |  |
| conquestdicomserver.exe                         | User interface   |
| dgate.exe                                       | console mode version of MicroPACS system                   |
| dgate64.exe                                     | Idem for 64 bits (automatically selected)                  |
| dgate.dic                                       | DICOM dictionary for dgate.exe                             |
| cqdicom.dll                                     | Conquest DICOM client DLL.                                 |
| dgateserv.exe                                   | NT service wrapper for dgate.exe V1.1                      |
| zipdll.dll                                      | ZipMaster DLL zips log files (optional, else uses 7za.exe) |
| libmysql.dll                                    | Mysql client dll for 5.0.22                                |
| libmysql64.dll                                  | 64 bit mysql client dll for 5.0.22                         |
| libmysql.txt                                    | Mysql license text   |
| libpq64.dll                                     | 64 bit client DLL for postgres (hard to find)              |
| 7za.exe   | 7-zip command line version                                 |
| 7za.txt   | 7-zip license text   |
| sample.hl7                                      | Example HL7 input file                                     |
| webserver\ActiveFormProj1.ocx                   | ActiveX web viewer   |
| webserver\conquest.jpg                          | conquest logo for on web page                              |
| webserver\dicom.ini                             | sample web page configuration                              |
| webserver\sample.cq                             | sample scripted web page                                   |
| webserver\dgate.exe                             | same as above, here used as CGI application                |
| data\HEAD_EXP_00097038\0001_002000_892665661.v2 |  |
| data\HEAD_EXP_00097038\0001_003000_892665662.v2 |  |

### Configuration files (automatically generated):

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

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

|                               |  |
|-------------------------------|--|
| data\dbase\Dicompatients.dbf  | patient database table                                 |
| data\dbase\Dicomstudies.dbf   | study database table                                   |
| data\dbase\Dicomseries.dbf    | series database table                                  |
| data\dbase\Dicomimages.dbf    | image database table                                   |
| data\dbase\Dicomworklist.dbf  | worklist database table                                |
| 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\dbase\Submissions.dbf    | not used yet   |
| data\dbase\testtable.dbf      | not used   |
| data\dbase\UIDMODS.dbf        | used for changing Patient ID and anonymizing           |

### Log files (automatically generated):

|                         |  |
|-------------------------|--|
| Installation.log        | information from installation page             |
| Maintenance.log         | information from maintenance page              |
| ServerStatus.log        | information from server status page or service |
| PacsTrouble.log         | relevant errors                                |
| PacsUser.log            | all users who accessed the server              |
| ConquestDicomServer.log | log about main actions and server start/stop   |
| logs_yyyyymmdd.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. Finally, the same executable may act as CGI server application. In some rare cases, the dgate process may still be running even though the user interface has closed (after a crash or after killing it with the task manager). The user interface, when restarted, then assumes that the dgate process belongs to a service (and displays “**user interface**” in the caption), but cannot control the running process. Killing the dgate process with the task manager or rebooting will solve this problem. All source code of dgate.exe is included in **DGATE1416beta.ZIP** and **DICOMLIB1416beta.ZIP**. To compile dgate.exe one can use total.cpp (documentation included).
- 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.
- dgate.dic:** DICOM dictionary used by dgate.exe.
- dgateserv.exe:** Wrapper (V1.1) 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.
- 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 but with reduced filter options. Source code is not included.
- 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. 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.

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 and to zip log files.

### Web server (place these 5 files 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/sample.cq: Sample of script-based web page

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

## **4.3 THREADING ARCHITECTURE**

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

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

simultaneous association. For this reason, the default installation of the MicroPACS was the multiprocess model.

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

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

## APPENDIX 1.

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

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

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

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

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

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

19980618: Some work on manual and database layout listing

19980621: Added -z option: zap patient

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

19980625: SaveDicomDataObject in loadddo.cpp supports NKI private compression

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

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

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

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

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

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

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

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

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

19990111: Fixed exit code on -ar option

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

19990317: Added NKI-private stuff

19990628: Temporary enabled debug in -!nnnn option

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

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

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

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

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

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

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

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

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

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

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

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

- 20001104: Added WINAPI to thread routines
- 20001105: Replaced malloc by new where a mix could occur (vr->data)  
Made compilable for MSC and BC and WC using some #ifdefs  
Changed order of verification and store; better localized  
new/delete DDO more
- 20001106: Run-time load odbinst routine for BC and WC, use spawn...  
i/s/o \_spawn...
- 20001106: Use delete [] operation for vr->Data
- 20010328: Added -av: verify mirror disk
- 20010415: Added DeleteSeries, DeleteStudy and DeleteImage routines and  
-f options
- 20010416: Added -f options: -feFile = enter MAGN file into DB, -fdFile =  
delete file from DB -faFile = add (also makes copy) file into  
server, -f?=ask UID of file, -fu = generate UID, -  
fcNEWPATID,file = modify patient ID of image file (moves  
file!). NOTE: -fc is irreversible in the sense that if a portion of a  
study/series is changed and changed back it winds up as a  
different study/series. This occurs because the UIDs must be  
changed for each image modification. This problem does not  
occur when a whole series or study is changed
- 20010417: Simplified code to change uids to allow easy extension to  
referenced SOPs. Check after load on common UIDs to avoid  
accepting dropped non-dicom files. NOTE: ChangeUIDinDDO  
should also change sequences and referenced SOPs  
(0008,1155)
- 20010418: Fix in above change
- 20010418: Changed names of database fields in UIDMODS - did not work  
on MsAccess
- 20010419: Added -fk option: copy image file to other patient ID (as -fc but  
no delete). Added version number 1.3.9 to command line help
- 20010429: Added -fz option: zap file from server and database
- 20010430: Some work on read ahead thread: note that thread must not use  
any pointer copy!
- 20010502: Made read ahead thread working; fixed thread counter; fix odbc  
option: strings too short
- 20020506: Fixed handle leak in read ahead thread
- 20020507: Fixed memory leak in read ahead thread; kbhit() test #ifdef  
DO\_LEAK\_DETECTION
- 20010509: Added RenameDevice is -ae option
- 20010730: Replaced parameter argv[0] of ExportConverters to proper  
value.
- 20010829: Added ExportStationName as export filter; default Export...  
value set to "\*"; Made export comparisons case insensitive;  
added special 'forward to AE' ExportConverter; Version to  
1.3.10
- 20010831: Added extended syntax for exportconverters with %f=filename,  
%m=modality, %s=stationname, %b=file base name, %p=file  
path; Also allows 'copy %f destination', but for windows NT  
only (uses cmd.exe). Added ExportFilter option that uses an  
SQL statement to filter.
- 20010901: Added a simple queue to process exportconverters  
asynchronously; Create a queue for each converter; queue  
mirror copy requests

- 20010902: Added %o = SOP; %n = newline; added the following hard coded converters: append "text" to file; write "text" to file; copy file to file; copy file to dir
- 20010904: Re-entered change of 20010730
- 20010905: Fix: After 'SaveToDisk', do not free pDDO
- 20011109: Fix: made ExportConverter stuff case insensitive  
Note: empty filter tests for empty contents - this is not the same as '\*'
- 20011110: Note: in release 1.3.10, the " to " in e.g., write "%f%n" to file must be lowercase
- 20011115: Made " to" case insensitive; Added \*\*\* before some error messages for better logging. Removed cache db: would hang the server if SQL has gone down and up. Now use one DB per thread which is passed to the read ahead thread = fast too!
- 20011207: Added extra errormessage when creation of datasource fails
- 20020109: Disabled this code for watcom or borland (instead of run-time loading an address)
- 20020314: Implemented ignore of C-CANCEL request for ADAC NM (was error before). Blocked out SQLInstallerError call; does not compile on clinical MS4.2
- 20020413: Added some notes about thread safety and db's: The serverchild is not thread safe when reading and writing is done on the same association.
- 20020415: Added -atDEVICE option: sanity check of images on disk; version to 1.3.11
- 20020416: Made UID generator configurable through UIDPrefix in dicom.ini; made time print unsigned
- 20020422: Sleazy fix of ModifyPatID: time(null) created same UID: now wait 1 s per changed file
- 20020426: Generate filename no longer gives an error: is done at higher level
- 20020428: Only serious error messages use \*\*\* in message
- 20020428: Added FAILSAFE\_STORAGE: tries to save incoming files even when DB errors occur
- 20020429: Put SaveToDisk in myUnknownStorage: pass DB failures to caller; Disabled FAILSAFE\_STORAGE: any storage failures should now be detected by client
- 20020508: Do not rewrite image not on MAG but it is not an error (warning is generated earlier)
- 20020520: Added -gSERVER,DATE option: grab images on date from remote server
- 20020521: fix displaying junk filename when rewriting image not on MAG
- 20020522: Fix in SetStringVR: strings must be padded with a space
- 20020529: -i and -r now have mode parameter (0=normal and default, 1=simple, e.g., for DBASEIII)
- 20020531: In 'QualifyOn', support case-sensitive call to 'GetACRNema', but make AE-Title uppercase after retrieving IP and port.
- 20020613: Better handling of Compression ON/OFF in 'SaveToDisk'  
Fixed crash in DeleteImageFile (twice free of VR->Data)
- 20020613: compress to specified mode, check (de)compress result, decompresses data before forward; added 'export compressed to AE' export; -fa has optional ,NEWPATID syntax;
- 20020802: Simplified rmdir code and allow multiple subdirectories in rmdir and mkdir code. Version to 1.3.12 (unreleased)

20020804: Use PATHSEPCHAR where possible  
20020807: Changed SaveToDisk order: only make patientdir when DB save succeeded  
20020812: Added skeleton of printer support  
20020816: Added color imagebox; Save incoming print DDO as file  
20020819: UIDs of imageboxes end on rows.cols.position for easy print handling  
20020819: Fix in delete 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 Transfer Syntax next to extension for save type; ProcessDDO takes \*\*DDO
- 20030706: Use dgate.dic; Attach VRType to PDU's for implicit little endian support; small fix in dump code
- 20030709: Printer support fix; version to 1.4.2; Added SendUpperCaseAE parameter (default 0)
- 20030730: Force ImplicitLittleEndian, ExplicitLittleEndian and ExplicitBigEndian objects that must be stored in Chapter10 format, to ImplicitLittleEndian.
- 20030815: Version to 1.4.3
- 20030905: Allow longer filenames
- 20030910: Added check on rights to write (trouble) log file and printer\_files in MAG0
- 20030921: Allow write to any MIRROR if MAG is full; added -ff# option: delete until # MB free
- 20030922: Added StorageFailedErrorCode (default 0x110 = 272 decimal = failed processing)  
Added ExportCallingAE and ExportCalledAE export filters (also %u=SCU, %c=calledAE in converter)
- 20030401: Version to 1.4.4; pass status pointer to compress routines
- 20040402: Delete DDOptr when SaveToDisk cannot write but does not give an error; Added "Cannot rewrite jpeg/rle image in v2 format" check; Use system DSN for ODBC (easier login)
- 20040406: Always use EXPLICIT syntax for jpeg, fix v2 always use DUMP
- 20040426: Version to 1.4.4a
- 20040520: Version to 1.4.4b
- 20040523: Added patient ID to speed GetFileName for single slice move
- 20040528: Set NeedPack (controls DbaseIII indexing) for regen, archive, maintenance; Version to 1.4.4c
- 20040528: Added built-in maintenance commands through silent VR in ECHO; pass patid in DeleteImageFile

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

20040601: Added deletestudy, deleteseries and packdbf maintenance commands

20040602: Fix: 'forward compressed as' always failed

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

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

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

20040610: Added maintenance server tasks for archival and regeneration

20040612: Added indexdbf maintenance server task

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

20040624: Version to 1.4.5a

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

20040713: Version to 1.4.6

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

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

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

20041101: Added deletesopfromdb maintenance command; version to 1.4.7

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

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

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

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

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

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

20050102: Small modifications to allow compile through total.cxx

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

20050107: Version to 1.4.8; modifications for linux compile

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

20050109: Added configurable TCPIPTimeOut, FailHoldOff, RetryDelay and QueueSize

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

20050111: Added ctype.h (for mingw)

- 20050118: Linux: crudely implemented WaitForSingleObject; detach pthreads to avoid leaks; crudely implemented export converter apps
- 20050119: Added grabimagesfromserver, regendir and makespace server commands; dgate -- sends server commands to other running server; adapted manual
- 20050121: Small updates to manual
- 20050124: Replaced BackGroundExec with simpler system() for Linux; added query server command, e.g., dgate "-- query:DICOMpatients|patientid,patientname,patientsex|patients ex='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 fails). 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

20050904: Fix some web queries for sql server with denormalized tables

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

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

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

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

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

20051123: put in #ifdef POSTGRES

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

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

20051210: Added "vX" incomingcompression (stores dbf but not image; forwarding disabled). Added virtual queries on all queries and moves: now works as transparent 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 lengths under linux - not all sleep(0); small fix in virtual server

20051215: Implemented a linux version of Sleep using nanosleep

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

- 20051218: Use ReplaceVR instead of Push in anonymize etc; also changes in sequences. Version to 1.4.10; show version and exe date in startup log. Do not start mirror copy queue unless it is needed; show some thread startup info. Added -b = NOTHREAD: run server as single process, useful for debugging and profiling. Fixed doc of --regendir: command
- 20051219: Fixed several small leaks - as tested with Linux malloc\_stats
- 20051222: Started on bypass server for virtual query - not functional yet (cleanup required)  
Removed debugVR logic: errors should now list DCO
- 20051228: Fix virtual device logic for VirtualServerFor0;  
Cleanup vr's and duplicates when bypassing server for virtual query, seems functional
- 20051229: NonDestructiveDumpDICOMObject now also list sequences; DebugLevel>0 lists DCO, >1 lists query DDO; fixed leaks in virtual query and some others
- 20051230: Added --debuglevel: command, small fix in NonDestructiveDumpDICOMObject
- 20060103: Small fix in virtual query; disabled virtual query for worklist; debuglevel 3 shows some query results
- 20060123: Added patient/study/seriesfinder (server parameter ignored for now, later for virtual servers etc)
- 20060125: Added serieslister (server parameter ignored for now, later for virtual servers etc)
- 20060128: Renamed to imagelister, added serieslister
- 20060131: Sort filenames from imagelister on ImageNumber (0020,0013)
- 20060226: Version to 1.4.11
- 20060228: Small fix in isxdigit thanks to ljz
- 20060311: Use ReplaceVR in virtual query - level was sent twice (thanks David Lang)  
Added WEBReadOnly flag
- 20060317: Support calledae and callingae in filenamesyntax - for virtualquery called is always MYACRNEMA
- 20060324: Strip group 2 from outgoing c-stores if not compression "as" or "is"
- 20060328: Improved forwarder, always propose Verification and use IsAbstractSyntaxAccepted(iUID) to test if host accepts image
- 20060402: Fix hang condition when a file failed to read in the read-ahead thread
- 20060402: Do not remove transfer syntax prior to dcmdjpeg/dcmjpeg (here in test recompress only)
- 20060405: Tried fix for multiple moves on same assoc (thanks Andrej Savelov)
- 20060405: Added message when IOD fails to read
- 20060603: Fix crash when started as dgate -v: empty statbuf
- 20060607: Finally fixed multiple moves on same assoc (thanks Andrej Savelov and Fred Röhner)
- 20060618: Renamed dfilecopy and define ODBC\_ADD\_SYS\_DSN if needed
- 20060619: Set version to 1.4.12alpha1
- 20060621: Added clonedb: command; transfer FULL db from other server to this one using virtualquery
- 20060628: AddToDatabase has JustAdd parameter: skip one unnecessary query

- 20060701: Speeded filter string handling
- 20060702: Pass DB to GenerateFilename to avoid zillions of db open and closes
- 20060704: Print number of records found in all queries
- 20060708: Set version to 1.4.12alpha
- 20061126: Moved servertask temporary files to MAG0/printer\_files; protected query: and query2 against empty input
- 20061126: Experimental forwarding on same association: close unused association after 5 seconds. Clean collected sopclasses after one hour of inactivity.  
Note 1: there is a problem with AReleaseRQ: do not use in this task  
Note 2: maximal 20 forwarders have a remaining association
- 20061127: Added ForwardAssociationLevel (PATIENT, SERIES, STUDY, IMAGE, SOPCLASS; default STUDY), ForwardAssociationRefreshDelay (default 3600 s), and ForwardAssociationCloseDelay (default 5 s).  
Limit maximum number of ExportConverters to MAXExportConverters=20 (for static arrays used in forwarders). Forwarders keep association open as long as UID at ForwardAssociationLevel does not change. Show filename in forward log; document where fixkodak should operate for virtual queries
- 20061128: Added ForwardAssociationLevel GLOBAL: use association until timeout or incompatible  
Close ForwardAssociation after send when ForwardAssociationLevel is IMAGE
- 20061129: VirtualServerForN may be "server,FIXKODAK" to clean queries (add 0) and their response (remove 0)  
Hardcoded filters for exportconverters (modality, called, calling, station) can now match e.g., RT\*
- 20061130: Pass series and study in virtualserver outgoing c-move
- 20061213: Fixed nasty bug in query2 and TestFilter: Query without bindfield overwrites previous bound strings!  
Maybe was problem causing crash on linux with query2: and problem with option -g reportedly stopping incorrectly
- 20061219: Version to 1.4.12
- 20061231: Added ForwardAssociationRelease to allow testing reconnect problem (default 0 = just hangup)
- 20070103: FixKodak blocks \*xxxx wildcard virtual queries on date (not allowed in Kodak)
- 20070103: Version to 1.4.12b; start on ImportConverters e.g., <set 0008,1040 to "%V0008,0080">
- 20070104: ImportConverters %QP %QS %QE %QW; <destroy> <delete xxxx,yyyy> <save to filename>  
Added %% and %i to Export and Import converters
- 20070105: <set 0008,1040 if "...">, <setifempty 0008,1040 to "...">, <setifempty 0008,1040 if "...">  
Import/export converters only report when syntax OK and report when action is void  
Added %Vxxxx,yyyy to export converters and %d(date/time) to import and export converters  
An import/export converter can thus be used to extensively log incoming images

- Added import converters: <stop>, <if "string">, <ifempty "string">, <nop> (also export)  
 Added general purpose variables x, y, z (read as %x, %y, %z) to import converters  
 Definition of number of ImportConverters now unnecessary.  
 Note: importconverter and exportconverter strings may be changed run-time in dicom.ini
- 20070105: Some fixes in dgate --archiving options manual; fixed dgate --restoremagflags:
- 20070107: Fix web access broken by change in odbci for dbaseIII; query must now always include spaces around =
- 20070113: Do not store NKI compressed data in v2 format: decompress and give error message  
 Recompress to NKI format now enables StripGroup2; Tested with \$c server debug command
- 20070117: Allow multiple rules per Export or ImportConverter separated by ; and zero or more spaces  
 <nop> statement prints itself on console: useful for logging anything that follows
- 20070117: Now maintain multiple connections per ExportConverter line (max 20x20 forwards)  
 Added <stop>, <silentstop>, <if> and <ifempty> to ExportConverters; but they only affect single rule (while these would cross over to the subsequent rules in ImportConverters)
- 20070122: Now also show free space on mirror devices
- 20070123: Fixed TestFilter for patientid with '
- 20070125: Removed <if> and added <ifnotempty>, <ifequal>, <ifnotequal>, <ifmatch>, <ifnotmatch>, <ifnumequal>, <ifnumnotequal>, <ifnumgreater>, <ifnumless> as im/exportconverters  
 Added %xxx[first,last] substring operator; and protect it against overrange  
 <ifxxx> no longer crosses over importconverters; added { } block for im/exportconverters  
 E.g.: ifequal "%V0008,0020[0,3]", "2004"; { forward to CONQUESTSRV3; forward to CONQUESTSRV4; } nop test  
 Note: 1) all (also 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 aggressively pre-read queried patient or studies
- 20070416: Prefetcher prints more information; use windows calls in windows for faster pre-read
- 20070705: extract: uses DT\_DBASEIIIINOINDEX 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)/3006,0010/3006,0012/3006,0014/020,000e Gives referenced CT series UID in referenced structure set from forwarded RTPLAN

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

20080322: Added dgate --anonymize that uses general scripting

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

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

20080618: Added extra logging in IARQ()

20080620: Only show extra logging in IARQ when assoc rejected

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

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

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

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

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

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

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

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

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

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

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

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

- 20080831: Translate yyyy and yyyyymm to date range in finder; further only accept valid date and date ranges; Added dgate --get\_amaps: lists all non wildcard entries from acrnema.map; Fixed handling of patient ID with spaces in ImageFileLister mode ;; All undefined cgi modes can come from the cgi dicom.ini; added special and cgi script variables; Lines can start with -- to start dgate, with # as comment, any other passed as HTML; Added source parameter: flex pages can be read from script file; Added serversideviewer: requires javascript only, nothing to install
- 20080901: Fixed some leaks in printing and --commands; fixed --get\_ini: formatting
- 20080902: Added header option for web scripts; added some CGI environment variables
- 20080905: Made new changes for big endian and undid some old ones.
- 20080908: Index in filelister format is now a string (%s), and added next string that gives index+1 (is1)  
Fixed manual of --modifypatid: and --anonymize::; dicom mime to application/dicom  
Added modes imagelisthttp, imagelisturls and imagelistfiles; added ? format for imagelister: gives #files
- 20080909: Added studyuid option to moveseries; pass it studyuid in seriesmover call from seriesfinder  
Added --modifyimage:file,script (uses import converter scripting language, where you can use ' instead of ")
- 20080910: In modifyimage only replace ' with " conditionally; version to 1.4.14a;
- 20080910: Forbid patid, studuid and seruid change in modifyimage; medged bcb Mac stuff
- 20080913: Modified and use SetStringVR to correctly send UIDs with padded 0
- 20081016: Show bitness on startup
- 20081104: Attach dictionary to DcmMove PDU
- 20081105: Fixed display of bitness in web page
- 20081116: Adapted for very large objects (use unsigned int for length); remove extra 0 byte in HTML generator; fixed CheckLargestMalloc
- 20081121: Added create database for PostGres
- 20081123: Skip export converters for dropped, modpatid, modimage, merging
- 20081124: show database type on startup; Temp version to 1.4.14a1; fix many scripting crashes
- 20081129: start on better patient ID change: process all UIDs; fix drag/drop error introduced in 1.4.14a1
- 20081129: Removed double access of SOPInstanceUID in SaveToDisk; fix: do not free ddo after SaveToDisk; added <newuids> and <newuids except > import converters; added --genuid, --changeuid and --checksum commands  
Version back to 1.4.14a; modifyimage can change patient ID and study/seriesUID if newuids used as well  
set can now also work in exactly one deep sequence: set gggg,eeee/gggg,eeee to "string"
- 20081130: Added --attachrtplantortstruct:planfile,structfile command using script; also --attachanytopatient/study/series

stop now stops one importconverter- not the chain; added <call file> and <return> statements to return from file  
Added optional anonymize\_script.cq: overrules fixed anonymizer;  
added %A = %V but then gives CRC32 of data and %E = %V but gives new UID for given UID

20081201: added --convert\_to\_jpg and web page use (experimental)

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

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

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

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

20090209: Made compiling under linux

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

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

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

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

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

20090411: Version to 1.4.15alpha

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

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

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

20090616 Include file stuff; fixes to Unix 7z stuff

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

20090620 Version to 1.4.15beta

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

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

20090824 Version to 1.4.15beta1

20090921 Added extract\_frames: command

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

20090924 Restructured manual; fix crash of studyfinder without search string

Note: on vista, commands like dgate --imagerlister 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  
ls\*http://msdl.microsoft.com/download/symbols; set  
\_NT\_SYMCACHE\_PATH=C:\symbols; xperf -on latency -  
stackwalk profile; run dgate; xperf -d out4.etl; xperfview  
out4.etl; select time range; select trace-load symbols; right click  
selection; summary table (takes very long the first time -  
downloads all symbols!)

20100207 Added uncompress command; version to 1.4.16alpha2

20100209 Fixed another rare crash in function VirtualServer2 (thanks PR)

20100227 Fixed Scotts modifyimage problem: <http://forum.image-systems.biz/viewtopic.php?f=33&t=2143>

20100227 Added -q option to set target address of dgate -- command; version to 1.4.16alpha3; pass DCO also for non-nki clients: used in %s for RetrieveResultConverter; Added more extensive printer activity logging

20100228 Changed HAVE\_LIBJASPER to HAVE\_J2K so Jasper or OpenJPEG can be used

20100309 Added double parentheses (gcc4.2 Warnings)

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

20100619 Added #ifndefs and fixed shadowed variables(gcc4.0 Warnings)

20100723 Merged: Reread all changed; agreed with all but two in checklargestmalloc and cgi; 1.4.16alpha4

20100728 Added delete vr's after ->ReplaceVR's

20100815 Merged; version to 1.4.16alpha5

20100815 Fixed bug 32 in t=2127: seriesdesc filter

20100816 Added QueryResultConverter and ModalityWorkListQueryResultConverter

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

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

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

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

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

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

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

20100827 Fixed two typos in warning fix extract: command

20100901 Fixed empty virtual query sent if no images there

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

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

19980705: Added CACHEDevices and JUKEBOXDevices, FindPhysicalDevice

19990108: Added LoadImplicitLittleEndianFile and NKI PrivateCompression algorithms

19990109: Regen has extra parameter

19990317: Changed parameters of LoadImplicitLittleEndianFile

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

20000629: Added TroubleLogFile and UserLogFile

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

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

20010429: Changed decompressor: now has extra parameter

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

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

20030120: Added prototype of FreeDeviceTables

20030701: compression parameter for amap

20030703: Added prototypes of recompression functions + ArchiveCompression  
 20030706: Optional filename parameter for recompress  
 20030706: Export VRType for implicit little endian support  
 20030921: Added DEVICE\_TYPE\_MIRROR  
 20040401: Added Changed and ActualMode flags to compress routines  
 20040626: Added study and series UID to getfilename interface  
 20040930: Adapted return type of SetString; added maxlen to BuildSearchString  
 20041013: Added MAXQUERYLENGTH  
 20041029: Added MergeUIDs  
 20041108: Added Syntax input to GenerateFileName  
 20050108: Adapted for linux compile  
 20050109: Added configurable TCPIPTimeOut  
 20050129: Added optional FILE to DumpVR, added CheckFreeStoreOnMIRRORDevice  
 20050401: Added QueryOnModalityWorkList, WorkListTableName, WorkListDB  
 20050404: Added DT\_START/ENDSEQUENCE to code sequence in WorkList table  
 20050902: Made space for HL7Tag in DBEntry  
 20051229: Added iDepth to DumpVR  
 20060317: Added called and calling to GenerateFilename  
 20060324: Added StripGroup2 option to recompress  
 20060628: AddToDatabase has JustAdd parameter: skip one unnecessary query  
 20060702: Pass DB to GenerateFilename to avoid zillions of db open and closes  
 20070122: Added MIRRORDevices  
 20070201: Added DebugLevel  
 20070207: Added MakeTableString  
 20080818: DbaseIII check now uses DB flags, not PATHSEP in datasource name; Added DT\_MSTR  
 20090620 Include file stuff  
 20091231: Changed char\* to const char\* for gcc4.2 warnings  
 20100111: Merged  
 20100123: Added DT\_FL and DT\_FD  
 20100125: Removed linux warning  
 20100309: Changed SQLLength to unsigned int  
 20100703: Merged

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

19980409: added NKI private decompression engine VR 0x7fdf,0x0010  
 19980410: added run length encoding of zero differences  
 19980410 Fix 16 bit absolute value decode  
 19980415 Fix leak on decompress  
 19980625 Added compression in SaveDicomDataObject(C10)  
 19980703 Made DObjectSerialize thread save (removed statics)  
 19990105 Fix: SaveDICOMDataObjectC10 created VR 0x0002 0x0013 twice. Added comment in SaveDICOMDataObjectC10; CleanUp. Put the nki-routines also in dgate.hpp. Added LoadImplicitLittleEndianFile

19990317 Decompression removed from LoadImplicitLittleEndianFile; added a VR-sizelimit of that reader

19990827 NOTE: LoadImplicitLittleEndianFile allocates 100 MB and crashes when passing chapter 10 file (happens when extension is wrongly .v2)

19990830 Fixed problem above: 'LoadImplicitLittleEndianFile' uses 'PDU.LoadDICOMDataObject' in such cases.

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

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

20001104 Renamed \_LittleEndianUID to \_LittleEndianUID\_space

20001105 Fixed where malloc and new were mixed (vr->data)

20001106 Use delete [] operation for vr->Data

20001128 Fix in 'Implicit length' code in LoadImplicitLittleEndian

20010429 Use faster and safer decompressor

20020412 Added class CBufferedIO for faster reading from DVD (stream functions do not seem to be caching.)

20020415 Removed diagnostic time code (did not compile on ms4.2). Made buffer size dependent on iVrSizelimit (i.e, use smaller for regen, slightly faster)

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

20041130 Documented crash on win2000 server in code - remains to be fixed – rare crash related to read error of DVD

20050107 Adapted for linux compile

20051219 Use ReAlloc instead of new BYTE[] to fill VR data

20070308 And little/big endian.

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

20090211 Safety checks in LoadImplicitLittleEndian to avoid crash on corrupted V2 file; Removed lots of dead code

20090412 Fixed for linux compile (tell does not exist)

20091215 Fixed LoadImplicitLittleEndian() when iVrSizeLimit is used (e.g. regen) (assumption that the pixeldata would be the last VR is not correct).

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

20100111 Merged

20100210 Fixed reading some old V2 files (-1 VR length).

20100309 Changed int to unsigned int, cast m\_iNbBytesInBuffer to long (gcc4.2 Warnings)

20100309 Commented out unused (gcc4.2 Warnings)

20100619 Fix gcc4 warnings, improve speed and prevent CBufferIO from being copied.

20100717 Merged

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

19980326: changed file name generator to ensure correct sorting of image files by external applications

19980327: Added FileNameSyntax option in dicom.ini; 0=original, 1=allow sorting by name

19980407: avoid /;<>| in filename; for Philips: allow up to 9999 series and 999999 slices

19980409: do not free passed DDOPtr on failure: crashed the lot

19980415: Error messages to operatorconsole

19980620: Check error flag from GetDevice (for out of disk message)

19981005: Added FileNameSyntax 2: filename starts with SeriesUID\_  
19981005: Replaced size%64 by min(size, 63) for correct truncation  
19981217: FileNameSyntax 3: same as 2 but accept errors  
19981220: Fixed FileNameSyntax code  
19990117: FileNameSyntax 4: same as 3 but .dcm extension (forces ch10  
format)  
19990117: Avoid attempts to rewrite image that is not on MAG store (e.g.,  
on CD)  
19990315: Do not allow '.' in directory name. In Syntax 3 directory name is  
now patient ID only (better for ACRVIEW). Better unique  
filenames by using time + counter.  
20000127: FileNameSyntax 4 now does not truncate patid, as 3 already did  
20000131: FileNameSyntax 4 has patient ID only as directory name (same  
as 3)  
20000701: Added MaxFileNameLength option: truncates from start  
20010419: FileNameSyntax 5 on request of Jason Foster - uses  
patientname as dir  
20011109: Made MAG name check case insensitive  
20020416: Made filename counter 4 digits for when writing >100 files/s  
20020416: Made all instances of time() unsigned  
20020426: Cannot rewrite image not on MAG store is now a message  
without \*\*\*  
20020508: The above message will not lead to a fail of GenerateFileName  
20020802: Added FileNameSyntaxes 6..9; cleaned FileNameSyntax code a  
bit  
20020804: Truncate patient ID to 32 chars for mode 6 and 8 (make sure  
len<255)  
20021016: Pass indexed patid to GetFilename for speed  
20021018: GenerateFileName has NoKill option (for interactive dgate  
tasks)  
20021223: Added forbidden chars \*, ?, " and : (comment from Thomas  
Buerer)  
20030401: Overrule '.v2' filenames with '.dcm' when object is not  
ImplicitLittleEndian  
20030522: Replaced 'static int counter' by 'unsigned int gl\_iCounter'  
20030606: Fixed incremental counter when creating UIDs or generating  
filenames  
20030730: Overrule v2 only when not ImplicitLittleEndian,  
ExplicitLittleEndian ExplicitBigEndian (c.f. 20020401)  
20030819: Allow longer filenames  
20030921: Added DEVICE\_TYPE\_MIRROR TO GetDevice call  
20040129: Added FileNameSyntax 10 = all files in one directory  
20040301: Small fix for FileNameSyntax 10  
20041108: Added Syntax input to GenerateFileName (overrides ini setting)  
20050107: Adapted for linux compile  
20050126: FileNameSyntax 11: StudyUID\SeriesUID\SOPUID.dcm  
20050131: Changed root to 'name' for FileNameSyntax 11  
20051210: Clear root output string when image already in database  
20060312: FileNameSyntax 12: similar to 11 but uses Modality\_StudyID  
as dir  
20060312: Checked it:  
12=name\_ID\Modality\_StudyID\SeriesUID\SOPUID.dcm  
20060314: 12=name\_ID\Modality\_StudyID\SeriesID\SOPUID.dcm

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

20060317: Added calledae and callingae to GenerateFilename flexible syntax

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

20060402: Fix potential problem when patient ID not there

20060701: Speeded string handling in new filenamesyntax

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

20070125: Fix %modality; add %studydate and substring (year = %studydate[0,3])

20071027: Extended length of FileNameSyntz parameter to 256

20071027: Stripped spaces of called and calling in flexible filenamesyntax

20071030: Small fix in the above

20071104: Added %series: 4 digit series number

20090620 Include file stuff

20090620 Include file stuff

20090926 Added %studydesc and %vxxxx,yyyy etc

20090927 Added Cleanup ro %vxxxx,yyyy

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

20100111 Merged; but cast Time to print to (unsigned int)

20100125 GetPrivateProfileString -> MyGetPrivateProfileString

20100126 Fixed readout of studydate (typo mix with studydesc)

20100303 Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)

20100703 Merged

20100828 Update history fix

### **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

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

19980321: Changed ObjectFile and DeviceName field length to 250 for  
 dbf compatibility  
 19980321: Added define TRUNCATEFIELDNAMES for DBF  
 compatibility (apply in makefile)  
 19980322: Added run-time check on DbaseIII (should also be added in  
 parse.cpp somehow)  
 19980325: Added TruncateFieldNames entry in dicom.ini to allow DBF  
 compatibility  
 19980327: Made MaxFieldLength configurable  
 19980327: Set default event notification to UDP (for personal pacs)  
 19980407: Added FileCompressMode config  
 19980409: Check vr!=NULL in MakeSafeString, MakeSafeDate  
 19990630: Remove also files from MIRROR disks  
 19990707: Added UpdateOrAddToTable to refresh database contents  
 without first removing  
 19990707: Cache Updates; and AccessTime with ~31 to allow update  
 times to be the same  
 19990707 Added fix for Philips PATID; fix cleaning of MIRROR device  
 19990708 Added (and disabled) stress code for SQL server  
 19990712 Fixed FIX\_PHILIPS; atoi failed sometimes because vr->data  
 not zero terminated  
 19990827 Added creation of key and link indices  
 19991117 Added a check on ini-file value of FileCompressMode  
 20000621 Changed layout of this update-history. Fix: In 'SetString', type  
 DT\_UINT32 was treated as DT\_UINT16 Added  
 TroubleLogFile and UserLogFile  
 When updating PatientRecord, verify the new Name and  
 BirthDate  
 20000629 Logging of trouble now starts with '\*\*\*'  
 20000701 Remove \*all\* trailing spaces in MakeSafeString before enters  
 database  
 20000703 Merged changes: made patient change verification table and  
 record name independent and extended to other databases as  
 well; removed trailing before comparison; show patid on all  
 error messages  
 20000705 refuse inconsistent update of link: show error on  
 operatorconsole  
 20000707 fixed above addition  
 20001104 Replaced \_rmdir by equally valid rmdir  
 20001106 Use delete [] operation for vr->Data  
 20001128 Fix: protected 'GetFileName' with a critical section.

20010415 Added KeepImages flag to RemoveFromPacs: clear from DB only

20010416 Added ChangeUID routine and UIDMODS table - to allow modification of images

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

20010429 Renamed genuid routine and variables to allow compile in one big file

20010713 Reduced devicename to 32 chars to space space

20010902 Improved UpdateCache to be thread safe and made it longer, no test on image db.

20011109 Made MAG check and database field consistency check case insensitive.

20011115 Replaced 'LIKE' by faster '=' when possible

20011116 Fixed error handling of db entry. It was possible that db entry failed without any message!

20011121 Create indices on ImagePat and SeriesPat if these fields exist

20020403 Do not overrrule the PatientTable with: empty data, or birthdate xxxx0101, or sex other than MmFf.

20020409 made LastPatid non-static

20020409 Removed non-thread safe caching of LastADBE

20020409 Moved entry into UpdateCache to after succesful Update

20020412 Made NCACHE configurable and changed it from 16 to 1024 (8 MB); Set lastfield (limit of #fields) to 20 (was 16)

Added checksum code in update cache to make it faster

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

20020413 Set NCACHE to 256, enough for single thread regen

Modified another non-thread safe construct

20020415 Fix display of PatientID in 'Inconsistent' error message

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

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

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

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

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

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

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

20020522 Test on empty Modality vr

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

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

Do not make Index for primary keys (is done automatically)

20020609 Added compression modes 3 and 4

20020802 Simplified rmdir code and allow multiple subdirectories

20020804 Use PATHSEPCHAR where possible  
 20020806 Fix: cleanup entries of refused item in database  
 20020819 Added better UID generation  
 20021016 Use patid in SaveToDatabase and GetFileName query  
 (both test for rev5 or higher of the database)  
 20021017 Allow set of UIDpostfix from extern (-c option of dgate)  
 Removed creation of unused tables  
 20021020 Added [ to MakeSafeString; removed "  
 Note: VR's containing ', ? give spurious inconsistency warning  
 when rewritten  
 20021028 Also removed dropping of unused tables; reversed table search  
 to image..pat in FindDBE. Made inconsistent birtdate a severe  
 error message (added \*\*\*)  
 20021110 Made date range inclusive (bug reported by Aaron Cann)  
 20030113 Added PatientQuerySortOrder etc overrides for sorting  
 20030205 Fix potential empty patient ID and SOP problems in  
 GetFilename  
 20030321 Extra check on vr!=NULL in SaveToDatabase  
 20031104 Added \\ to MakeSafeString  
 20040301 Do not double \\ when already doubled  
 20030425 Added DoubleBackSlashToDB control for \\  
 20040528 Pass patient ID in RemoveFromPacs and Enable KeyOnAll  
 20040529 Implemented faster delete from database  
 20040530 Pass a field to query in delete - obligatory for sql server  
 20040601 Removed enable KeyOnAll - added some more checks in  
 NewDeleteFromDB  
 20040609 Check for DB revision for fast delete from database queries  
 20040610 Truncate too long VR's before putting into db; log to  
 pacstrouble  
 20040623 Fix for non-DBASE datasources in 'UpdateOrAddToTable'  
 20040626 Added study and series UID to getfilename interface  
 20040713 Added FixKodak: replace pat 0nnnnnnnn with 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 Truncated printf's of SqlStatement  
 20041029 Added MergeUIDs routine  
 20041101 Added NewDeleteSopFromDB  
 20041220 Fix: in 'RemoveFromPACS', an even PatientID was not zero-  
 terminated !!  
 20050109 Adapted for linux compile  
 20050111 Added ctype.h (for mingw)  
 20050205 Added counters for database activity  
 20050206 Allow empty DBE in ConstructVRFromSQL: used to get  
 ObjectFile and Device in query  
 20050401 Added WorkListDB and WorkListTableName  
 20050404 Dicom types DT\_START/ENDSEQUENCE are ignored during  
 table creation/adding to table  
 20050414 Allow undefined worklist database;

Delete patient will delete worklist entries as well (but needs at least one image)

20050417 Delete from DB will also delete worklist as patient goes

20050826 Added mode 2 for initializetables: clear/create worklist only

20050831 Mode 0 and 1 will now not delete worklist if it contains data

20050831 VerifyIsInDBE will not return DT\_START/ENDSEQUENCE

20050901 Do not call FixImage in SaveToDataBase: is done in SaveToDisk before

20051121 Enabled SQLRealSize because SQLResultLength does not work in PostGres BindField

20051123 Fixed it, and only enable it when #ifdef POSTGRES

20051204 Disabled it, fixed postgres driver instead

20051210 GetFilename returns FALSE for an image that has no filename or device set

20051212 Clear update cache when any records deleted - drastic but safe

20051216 Small fix in above

20051217 Use new VR::ReAlloc method to replace data in VR

20051218 Fix study modality when DoubleBackSlashToDB=1; changed modality search

20051228 Truncate invalid trailing spaces (>1) from patient ID. Fiximage warns to SystemDebug

20060210 Removed order: first remove spaces and then fix the patient ID because patient ID consisting of 14 spaces caused huge troubles

20060220 Check max 50 fields when update; fix Inconsistent check for DoubleBackSlashToDB

20060607 Fix character translation for entering \*?%[' into sql using MakeSafeStringValue. Fix consistency check for these characters as well (thanks Robert Chrzan)

20060607 Added "not null" to "PRIMARY KEY" to satisfy Sybase (thanks Marcin Litoborski)

20060618 Added not null to UIDmods as well, unified case of DICOMWorkList table name (may be done for other tables as well) (thanks Marcin Litoborski)

20060618 Remove " added by MakeSafeStringValue prior to inconsistency check (thanks Robert Chrzan)

20060621 Increased size of s from [50][255] to [51][256] in UpdateOrAddToTable fixes VirtualQuery crash

20060628 AddToDatabase has JustAdd parameter: skip one unnecessary query

20060706 Replaced faulty new vr construct when doing consistency check: faulted on Linux

20061213 Protect Clear\_UpdateCache with critical section  
Fixed nasty bug in NewDeleteFromDB. MergeUIDs, NewDeleteSopFromDB: Query without bindfield overwrites previous bound strings!

20070123 Fixed GetFileName for patientid with '  
Recoded some of the inconsistency checking: now no failure on patient ID (link) with '

20070131 Fixed GetFileName for all patientid's ;->>>>

20070201 Fixed (unused) UpdateAccessTimes for weird patient IDs

20070210 Added CheckDuplicates to UpdateOrAddToTable: used on DicomStudies to catch inconsistent patientID  
Enabled KeyOnAll on UpdateOrAddToTable: only delete exact records (needed if inconsistent patientID)

20070308 Changed to set patient ID to 0 for anonymized patients  
 20070315 Merged; also noted that changed possible use of AND at start of sql where  
 20071027 Also truncate too long date fields with error message; added AllowTruncate: if sql name in comma separated list: warning only else \*\*\*error  
 20071118 Adapted for 64 bits (use SQLLEN for BindField)  
 20080302 Fixed case of DICOM table names  
 20080319 Fixed typo in above change; fixed worklist delete for patients with space in ID  
 20080817 Added WorkListReturnsISO\_IR\_100 flag (default 1)  
 20080818 DbaseIII check now uses DB flags, not PATHSEP in datasource name; Added experimental DT\_MSTR: multi-value entry, e.g. query on 'PET' matches 'PET\CT' if studymodality is given type DT\_MSTR instead of DT\_STR. Note: not implemented for DBASEIII  
 20080819 Added warning when querying DT\_MSTR field on dbase  
 20080902 added EnableComputedFields (default 0)  
 20080910 Added create Patient ID for 0 length ID (old Picker CT)  
 20080910 Missing patient ID is now not filled with "0" but with PatientName + Date  
 20081104 Fixed crash in UpdateOrAddToTable due to missing BindField (1, ...)  
 20081120 Strip all trailing spaces of modality prior to merging: some scanners add more than 1; Added UseEscapeStringConstants  
 20081124 Blocked RemoveFromWorld when 0 images found for safety; default SQLServer to "" = black hole  
 20090216 Added ChangeUIDBack and ChangeUIDTo  
 20090616 Create index for UIDMods on OldUID; protected UIDMod functions with ChangeUIDCritical; Convert \*\* query field to \*; old efilm version seems to create those  
 20090616 Include file stuff  
 200912308 Merged changes by Bruce (bitsltd)  
 20091231 Changed char\* to const char\* and cast time\_t to int for gcc4.2 warnings  
 20100111 Merged  
 20100123 Added DT\_FL and DT\_FD types, added swapping in ConstructVRFromSQL, and fix DT\_UINT32 and DT\_UINT16 there, size is 4 and print as %u  
 20100123 fixed typo for Linux compile Time -> time  
 20100124 fixed typo in ChangeUIDBack  
 20100124 Use MyGetPrivateProfileString  
 20100309 Added double parentheses (gcc4.2 Warnings)  
 20100309 Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)  
 20100324 swap for big endian only.  
 20100619 Added #ifndefs (gcc4.0 Warnings) and UNUSED\_ARGUMENT  
 20100717 Merged; but still use deprecated atof as change would not compile  
 20100726 Added cast at atof to suppress warning  
 20100802 Added SUBMISSIONS table  
 20100816 Allow dicom.ini and other files to be moved.  
 20100816 removed (a) from #ifndef EnterCriticalSection(a) etc

20100818 Merged jd SUBMISSIONS table  
20100823 Merged and simplified basedir logic

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

20000629 Logging of trouble now starts with '\*\*\*'  
20010330 Added a few debug print'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 lengths; limited 'records =' debug log  
20041013 Used MAXQUERYLENGTH  
20050107 Removed UNIX flags: solve difference in database interface  
20050206 Image query can send filename and device in 0x9999,0x800 / 0x0801  
20050401 Added QueryOnModalityWorkList; - todo - put selected items into sequence 0040,0100  
20050404 Take query for Scheduled Procedure Step from sequence, put results into sequence  
20050414 Made sequence unfolding for worklist more generic - accepts any number of and nested N=1 sequences. This is correct behavior for query input, but limited for query results  
20050417 Removed unused variable  
20050831 Fixes in worklist code: is ok for all OFFIS tests except 1 (empty seq not returned) and 10 (undef non-empty seq takes one entry from higher level) - good enough for initial release?  
20050901 Fix for test 10: allow undefined sequence in query  
20050907 Merged change by Hans-Peter Hellemann: fix missing max() macro  
20051229 Debug log show records of all queries. DumpVR only left in worklistquery and shows sequence layout  
20051230 Removed 2 forgotten dumpvr's  
20050103 Added debug info from testing phase inside nested sequences for modality query  
20050211 Added empty required modality sequences 8,1110 and 8,1120 when not there  
20050224 Fixed modality worklist query: empty result sequences were not handled correctly (Thanks Tony Tong)

20050311 Worklist change was tested OK with Agfa (thanks Frank Grogan), cleaned debug log a bit

20060607 Fix crash when coding empty sequence as last item in worklist query (thanks Francois Piette)

20061219 Small fix in layout debug log

20071118 Adapted for 64 bits (use SQLLEN for BindField)

20080817 Fixed bug found by larc: worklist sql syntax error (fields start with ,) when 1st item is sequence; Fixed bug found by Alberto Smulders: sometimes sequence level in response would not come down; The problem was that a higher levels the reported sequence level was inconsistent with the 1st level; Changed CodeSequence stop criterium and level coding for deeper levels; now works with varies sequence combination; Added WorkListReturnsISO\_IR\_100 flag (default 1)

20080818 DbaseIII check now uses DB flags, not PATHSEP in datasource name

20080901 Implemented 'Number of Patient Related Studies' (0x0020, 0x1200) etc

20080902 Fixed that option for VirtualServers; added EnableComputedFields

20080905 Added void\* cast for deivr change

20081016 Fixed for WC compile

20081121 Fixed ISO\_IR 100

20090930 Fixed ImageQuerySortOrder: crashed on C-MOVE, because sortcolumn was inserted before the filename

20091005 Fixed ComputeField: return VR was used during cleanup

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

20100111 Merged

20100309 Added double parentheses (gcc4.2 Warnings)

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

20100706 Init Level

20100717 Merged

20100822 Delete 9999,0802 virtualservermask control VR from searches and pass it to ComputeField

20100823 Fixed compile for ms8amd64

20100901 Rephrased "Failed on VR Search...."

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

20000211 Removed MajorEvent and MinorEvent instances of 'Debug'.  
Cosmetics. Added UserLog and TroubleLog.  
Added timestamp option.  
Added CriticalSection when printing to file or stdout.

20011110 Post release 1.3.10: keep log files closed while working

20021027 Avoid crash when logfile cannot be opened

20041003 Note: max 1200 chars (use %.1000s to print long strings)

20060618 Define \_SH\_DENYNO if needed

20070105 Added timestamp for linux users (thanks, Mark Pearson)

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

20070408 Protected entire .printf() with global critical section

20070712 Closed/opened critical section where recursive call to printf would hang linux version with sqlite

20071120 Use fputs instead of fprintf at end: otherwise % removed

20080821 Fix for Solaris SUNwspro compiler  
 20090620 Include file stuff  
 20091231 Changed char\* to const char\* for gcc4.2 warnings  
 20100111 Merged  
 20100125 Removed linux warning  
 20100309 Removed Windows only variable from unix build.  
 20100619 Added #ifndefs made Port a local IPort (gcc4.0 Warnings)  
 20100717 Merged  
 20100816 removed (a) from #ifndef EnterCriticalSection(a) etc

#### **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 ljj. 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

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

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

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

20000822: Created  
 20000823: Support cases where the input-file is empty or contains only white-space.  
 20010716: Fix: Allow TOKENs that are substrings of other TOKENs.  
 20050103: Changed include file to lower case (for linux)  
 20050108: Removed window.h for linux compile  
 20050118: GNU C++ knows BOOL etc, do not redefine  
 20090620: Include file stuff  
 20100120: Fixed const issue detected with ms8

20100309 Changed int to unsigned int, add ui as unsigned int in for loop  
(gcc4.2 Warnings)  
20100619 Fix gcc4 warnings, improve speed and  
UNUSED\_ARGUMENT.  
20100717 Merged

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

20091231 Changed char\* to const char\* for gcc4.2 warnings  
20100111 Merged  
20100619 Added no-copy to the classes.  
20100717 Merged

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

19990317 NKI-specific code moved here  
19990903 Implemented NKI MaxRowColumn VR in DCO  
19990906 Improved implementation of MaxRowColumn  
19991022 Changed the root of NKI-made UIDs to the official one  
supplied by Medical Connections(UK):  
1.2.826.0.1.3680043.2.135.1066.xxxxxxxxxxx  
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 ljj'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 acnema.map  
20030705 Moved recompression out of ProcessDDO into  
StandardRetrieveNKI::Read. Skip recompression to same level  
as incoming  
20030706 Optional filename parameter for recompress (not used yet); set  
env for offis tools  
20030706 Attach VRType to PDU's for implicit little endian support  
20030709 Removed DCMDICPATH; is not needed  
20030819 Allow longer filenames  
20030905 Note: recompressfile; DecompressImageFile and  
CompressJPEGImageFile do not allow spaces in filename  
20040401 Added Changed and ActualMode flags to compress routines;  
only give compress message if something changed  
20040401 Set maxcompression to 4 for NKI send  
20040403 Added own SaveDICOMDataObject as in dgate.cpp  
20040406 Also copy TypeCode in DecompressNKI when converting  
(0x7fdf, 0x0010) to (0x7fe0, 0x0010); Make TypeCode of  
(0x7fdf, 0x0010) OW instead of OB, because OFFIS refuses to  
compress OB  
20040406 Always use EXPLICIT syntax for jpeg, fix v2 always use  
DUMP; Use -F +ti option for dcmdjpeg for writing to v2:  
creates raw dump, implicit; Refuse to jpeg compress V2 files  
and images != 16 bits; \n is all messages; Fix error handling of  
CompressJpegImage  
20040530 Removed unused variable  
20040722 Added "nj" compression: leaves JPEG as is; else  
MAXNKICOMPRESSION  
20041101 Added built-in JPEG and RLE decompressor  
20041102 Fix problem with external JPEG compression: clear transfer  
syntax prior to save for OFFIS tools with  
DICOM\_CHAPTER\_10\_EXPLICIT  
20041103 Added k1,k2,k4,k8 compressors: downsize to  
1024,512,256,128 pixels if bigger to start with  
20041112 Called AE SERVER~xx in C-MOVE lets xx override outgoing  
compression as well (e.g., call CONQUESTSRV1~k4 to  
always get images downsized to 256x256)  
20050102 Added NOINTJPEG flag to allow compile through total.cxx  
20050103 Changed include file to lower case (for linux)

20050108 Adapted for linux compile (work in progress)  
20050109 Added configurable TCPIPTimeOut  
20050118 replaced thread local storage under linux with variables in object  
20050119 added rudimentary support to start external (de)compressors under linux  
20050121 Changed filename to lower case  
20050122 Improved external jpeg support under Linux: load dictionary, wait until ready  
20050130 Added To8BitMonochrome and ToGif  
20050204 Small fix in ToGif for non-square images; also interpret RescaleIntercept as float  
20050205 Added counters for compression activity  
20050206 Optimized downsizing: do not decompress if no downsizing to occur  
20050206 Note: replaced thread local storage under linux with variables in object is incorrect. Under linux, the server now can also serve one at a time. Fix for color to gif; added limited auto scaling in 16 bits to gif.  
20050211 Now really removed need for thread local storage  
20051210 Added "vX" compression (same as as is)  
20051217 Use system() to call on offis apps in linux (now works)  
20051217 Use new VR::ReAlloc method to replace data in VR; fixed 2 float warnings  
20051229 Fixed several leaks in (jpeg)compression code; changed alloc for nki compression  
20051230 Added +sr option to dcmjpeg: compress without changing rescaleslope/intercept  
This option is required for our viewers: slices must all have same rescale  
20060219 Removed warning in writегif  
20060222 Added extra checks (not on ID strings) to pass as NKI compressed data  
20060311 dcmjpeg opts string got truncated (thanks Rainer Libowski)  
fixed unused CompressJPEGImageFile (wrong exe called)  
external decompress temporary files now in printer\_files (thanks Rainer Libowski)  
20060324 Added StripGroup2 option to recompress; strip group 2 from outgoing c-stores if not compression "as" or "is"  
20060328 Use IsAbstractSyntaxAccepted(iUID) to test if host accepts image  
20060402 Fix crash when receiving or dropping jpeg compressed color images. Consider not removing transfer syntax (0x0002, 0x0010) prior to dcmdjpeg/dcmjpeg. Would fix problem with external decoding color jpeg images  
20060402 Changed IsAbstractSyntaxAccepted(iUID) test back (thanks Andrej Savelov)  
20060405 That was not the problem  
20060618 Tested IsAbstractSyntaxAccepted - seems to work. Removed need for min()  
20060619 Do not remove transfer syntax before decompression (20060402 suggestion). Maintain original object when decompression fails, changed wording of message.  
Only complain about internal decompressor for jpeg

20070104 Export automatic SaveDICOMDataObject  
20070113 Never delete transfer syntax (was left in CompressJpegImage, solves coding error in jpeg store). Tested with \$c server debug command

20070210 Export MaybeDownsize and check on 0 for passed size  
20070307 Added several debug prints in retrieve, e.g. at bail out because connection dropped

20070308 removed #include <wait.h> from DARWIN  
20070314 Send 0000,1030 (MoveOriginatorAE) and 0000,1031 (MoveOriginatorMessageID) in SS->Write as result of Move

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

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

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

20070902 WriteGif now cpp  
20071027 Added quotes around filenames passed to dcmdjpeg and 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  
 dcmcjg  
 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

### **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

### **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 lengths see dbsql.cpp; truncated debug printf's set cols length to 4096; malloc tmp in query at 310000; for length calculation see dbsql.cpp

20041013 Used MAXQUERYLENGTH

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

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

20050102 Small modifications to allow compile through total.cxx

20050107 Export NumIndexing to tell dgate when indexing is done  
20050116 Adapted for use with LINUX (built-in dbase driver only)  
Notes: 1) delay poorly implemented; 2) no support for >2 GB  
20050118 Detach pthreads to avoid leaks  
20050119 Documented rare crash in Fill\_Memory\_Index  
20050124 Added support for huge files under Linux (not suitable for ext2  
filesystem); Allow = without spaces in query  
20050205 Added counters for db activity  
20050206 Small fixes to counters; allow "&" instead of " and " for CGI  
use  
20050905 Postgres code by Piotr Filipczuk checked by mvh, will not  
affect other operations, but not tested yet (postgres will not  
compile on my linux system)  
20050907 Merged change by Hans-Peter Hellemann: lseek64 not always  
defined, should be mapped by unistd.h  
20050909 Put check for = in query below >=: date range matching failed  
(Thanks Paolo Marcheschi)  
20050911 Removed postgres print statements  
2005112 Fixed BindField for postgres - now returns actual and not  
reserved length  
20051217 Maximum locks in dbaseIII driver from 1000 to 100 to speed  
up qunlock (20% regen speed)  
20051218 Respond to -b = NOTHREAD: run server as single process,  
useful for debugging and profiling  
20051219 Fixed slow leak of queryfields for built-in dbase driver  
20051230 Put index of DicomWorkList on AccessionNumber  
20060219 Start on native mysql driver  
20060220 Some more work: get correct length in bindfield; todo: user and  
password  
20060226 Runtime load MYSQL in WIN32  
20060313 Use username and password for mysql  
20060402 Start index threads with a short delay to give GUI priority to  
test startup  
20060607 Changed escape char processing for sql values (not queries) to  
match dbsql.cpp change  
20060618 Fix for Borland C++ builder  
20060628 Moved location of disabled query logging  
20060630 Speeded dbaseIII AddRecord lots and linux string handling  
20060701 Added and use mysql\_fetch\_lengths; protect query result  
20060702 Tested native mysql driver: does not like fast open/close:  
clonedb crashed after 4000 or so (avoided now)  
20061212 Found critical error in built-in dbase driver sql parser:  
Adding patient with ID containing certain character sequences  
will immediately overwrite the whole patient database. Queries  
with these sequences will return too many records (less  
dangerous). Issue not yet really fixed but greatly reduced its  
likelihood  
20061213 Fixed issue by replacing spaces inside strings in sql statement  
with non-breaking spaces. Only match on keywords and field  
names which include spaces; replace with normal spaces in  
process\_escape  
20070123 clear NativeError, State and Msg on db.open (e.g. for dbf that  
does not use them but prints)

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

20070201 DebugLevel 4 prints all sql activity\

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

20070206 Added CreateDatabase (created db and login)

20070207 Removed creation of login from CreateDatabase for mysql and postgres

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

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

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

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

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

20070711 Some fixes to compile with sqlite under linux

20070715 Removed debug print statements for sqlite

20071027 Maybe fix postgres error handling: reset ntuples

20071030 More fixes to postgres error handling: missing returns in PrintLastError

20071115 Fixed SQL database creation for SQL server 2005

20071118 Adapted for 64 bits (use 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: XADICOMPpatients 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 return 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

### **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\_DBASEIINOINDEX: disables indexing and packing; Extended max number of dbf files to 20

20071115 Static mysql use <mysql.h>  
 20071118 Adapted for 64 bits (use SQLLEN for BindField)  
 20080107 Removed double declaration of SQLLEN  
 20080821 Fix for 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

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

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

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

20050129 Adapted for use in the Conquest DICOM server (see //)  
 20050130 Made it ansi C  
 20050826 Made it reentrant to avoid gif file corruption in server  
 20051219 Fixed leak  
 20070902 Made cpp  
 20080905 Removed malloc.h for DARWIN  
 20090620 Include file stuff  
 20091231 Changed char\* to const char\* for gcc4.2 warnings  
 20100111 Merged  
 20100309 Commented out unused variables (gcc4.2 Warnings)  
 20100619 Added UNUSED\_ARGUMENT.  
 20100717 Merged

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

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

20100717 Merged

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

20050111 added SWORD and UWORD

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

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

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

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

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

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

**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

**ERRCODES.H (part of dgate.exe):**

20041221 Moved errorcode to here  
20050901 Renamed errorcodes.h to errcodes.h

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

20020822 This file compiles to TOTAL.EXE = DGATE.EXE with, e.g., BC55  
20050102 Added NOINTJPEG flag: jpeg8/12/16 sources cannot be compiled at once  
20050107 Changed order of compile  
20050111 Added npipe.cpp and gpps.cpp for LINUX  
20050118 Documented how to compile under linux and with visual c++  
20050121 Changed filename to lower case  
20050130 Added xvgifwr.c  
20070315 bcb added DARWIN stuff  
20070330 bcb added DARWIN compile example  
20080820 Solaris compile example  
20080910 fixed DARWIN compile example for build version of mysql  
20081016 Fix link to xvgifwr.cpp; 64 bit example code  
20090209 Added jpeg\_encoder.cpp  
20090411 Added second SUN example  
20100120 removed DARWIN (PPC, 10.4, now old) compile example. JPEG lib is internal, so undef NOINTJPEG if used.  
20100123 Include stddef here for windows to avoid jasper.h compile problem  
20100124 Also use gpps for windows.  
20100224 Added defines for OpenJPEG  
20100706 Allow both libraries at once  
20100721 Merged  
20100815 bcb added two defines; Merged

### **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

**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

**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

**AARJ.CXX (part of DICOM core library):**

20100619: Fix gcc4 warnings and improve speed.  
20100717: Merged

**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

**ENDIAN.CPD (part of DICOM core library):**

20001106: removed unneeded (and sometimes uncompileable)  
XE\_UINTX::XE\_UINTX (int x)

**ENDIAN.HPD (part of DICOM core library):**

20001106: removed unneeded (and sometimes uncompileable)  
XE\_UINTX::XE\_UINTX (int x)

**ENDIAN.CXX (part of DICOM core library):**

20070330 Merged bcb stuff  
20070726 Removed some duplicates from endian.hpp

### **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

### **RTC.CXX (part of DICOM core library):**

19980330 Added an RTC memberfunction for loading the dicom library from memory (e.g. a resource).  
19980331 Added function for writing binary RTCs (function was originally implemented in 'makebrtc.cxx')  
19980414 Added RTC::GetGroupElement memberfunction, to retrieve the Group and Element numbers using a library-keyword.  
20040930 Also return TypeCode in RTC.GetGroupElement()  
20071128 Do not remove existing TypeCode if new one is unknown  
20090620 Always include stdlib.h  
20091028 pack(4) for \_\_Binary\_RTC\_Header  
20091029 More adjustments for 64-bits (reading/writing binary RTC)  
20100309 Changed int to unsigned int, commented out unused variables (gcc4.2 Warnings)  
20100717 Merged

### **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

### **TRNSYN.CXX (part of DICOM core library):**

19980409: Fixed possible transition between presence and absence of TypeCodes in 'Dynamic\_ParseRawVRIntoDCM'  
19990904: Treat type UN same as OB,OW and SQ when reading Explicit files.  
20001106: Replaced == operator by strcmp  
20010905: Several fixes: UCDCM should NOW be able to read ExplicitBigEndian files  
20011220: Fixes in Sequence and Item delimiters  
20030122 Fixed small leak in Dynamic\_ParseRawVRIntoDCM  
20030205 Support new datatype 'UT' (unlimited text). Thanx to William Peterson

20030424 Changed prototype of ParseDCMIntoRawVR. Fixed huge bug in sending of ExplicitLittleEndian sequences

20030627 Fix for MSC 4.2

20030725 Keep GroupLength for group 0x00 (Radworks 6.0 was choking in this)

20040406 Make TypeCode 'UN' if not known, and conversion to Explicit is wanted

20050112 Fixed huge bug in Explicit\_ParseDCMIntoRawVR, causing data-loss. Thanx to Goran Peros.

20051217 Use new VR::ReAlloc method to replace data in VR

20051218 Use memcpy to enter UID (extra 0 will be available: end of string)

20051219 Use ReAlloc instead of new BYTE[] to fill VR data

20051229 Moved Push in ParseRawVRIntoDCM so that not done when VR exists

20070308 Added big endian stuff

20071031 Removed some commented out code

20071108 In Dynamic\_ParseDCMIntoRawVR(), let group 0x08 behave the same as all other groups greater than 0x02.

20071118 NOTE: previous change is not in release 1.4.13

20071128 Add TypeCodes if needed using AttachedRTC->RunTimeClass

20080913 Fix in bigendian input: interpret group 0 as littleendian

20090211 Added many checks on corrupt dicom data during parsing; removed blocked out code

20090212 Fixed a problem in the check code if some (but not all) group lengths are missing

20090215 Improved formatting of length error message

20090620 Added <stdlib.h>

20090824 Resume parsing after invalid element length if length was not too big

20100102 Merged bcb changes for bigendian

20100111 bcb moved setting 0002,0010 to work for all transfers in ParseRawVRIntoDCM: fix for osiris; Added JASPER stuff; const

20100118 Always allow jp2k

20100119 Put HAVE\_LIBJASPER back in (unfortunately that creates a dependency between dicomlib and dgate)

20100119 Changed Dynamic\_ParseRawVRIntoDCM and ParseImagePixelDataRawToDCM to read NovaRad files and remove the errors.

20100121 Merged but put into NOVARAD\_FIX define; not bcb alsp prints which parser reports errors

20100125 Linux warnings.

20100224 Changed HAVE\_LIBJASPER to HAVE\_J2K for OpenJPEG and fixed more warnings (-Wall)

20100309 Added double parentheses (gcc4.2 Warnings)

20100309 Changed int to UINT, commented out unused variables (gcc4.2 Warnings)

20100419 Fixed Dynamic\_ParseRawVRIntoDCM big endian

20100619 Made VRBuffer local IVRBuffer.

20100707 Merged

20100718 Looked at and rejected the date change: you can use importconverters for this job

20100722 iorgmode change breaks the reader for me!

20100724 Put back date change with DATE\_FIX inclosing it.

**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

**DEIVR.HPP (part of DICOM core library):**

19990318 Added 'DICOMObject::DeleteVR'  
20010730 Added 'DICOMObject::ReplaceVR'  
20010802 Added 'VR::GetSpecialValueCodeOfVR'  
20051217 Added 'VR::ReAlloc'  
20080910 Added VR::VR(UINT16 g, UINT16 e, UINT32 l, LE\_UINT16 \*d) & VR::VR(UINT16 g, UINT16 e, UINT32 l, LE\_UINT16 \*d, BOOL mFlag) for big endian.  
20100619 Fix gcc4 warnings and improve speed, and prevented coping of classes with pointers.  
20100717 Merged

- 20100728      Removed unused AutoMakeDO, added Get's to VR and DICOMObject. Added ChangeVR's.
- 20100815      Merged; added max to GetCString; Moved defaults from implementation to header files
- 20100823      bcb moved default parameter here

**SOCKET.CXX (part of DICOM core library):**

- 20010426      Added 'setsockopt' in 'Listen' and 'Open'  
Call 'shutdown' before closing a socket
- 20010720      Changed 'print' to 'fprintf(stderr,...)'
- 20050116      Adapted for LINUX compile
- 20050119      Blocked out SOCKET END ERROR message
- 20070406      Use reentrant gethostbyname\_r when available
- 20070415      Small fix there for windows
- 20090620      Added unistd.h for UNIX
- 20090824      Debug output of adress connecting to socket
- 20091231      Changed char\* to const char\* for gcc4.2 warnings
- 20100111      Merged
- 20100122      Gethostbyname: fixed bug reported by Arash 2station would not be found
- 20100122      Added Poll() method: returns TRUE if data available
- 20100125      Linux warning
- 20100309      Commented out or inited to fix unused variable warning (gcc4.2 Warnings)
- 20100619      Fix gcc4 warnings, improve speed and made TimeOut local.
- 20100707      Merged

**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

**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

**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

**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

**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

**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::InterrogateAAAssociateAC.  
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 'InterrogateAAAssociateRQ'

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, 'd gatesop.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

### **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

### **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

**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

**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

**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

**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

**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

**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 (IPort).  
20100707 Merged  
20100816 Added QueryResultScript

**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

#### **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'

#### **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...

### **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: always 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 DcmWriteVRTToFile

20020502 Added cacheing properties

20020522 Replaced ad hoc field allocation code by 'AVSdata\_alloc'

20020523 Do not give warning for slice-order (DCM\_E\_SLICEORDER)

20020609 Pass MaxCompressionMode that is set to 4  
 20020620 Adjustment to CalcXfm for multi-frame images.  
 20020814 Added two Print error-messages  
 20020930 Added MAXSLICES to optional extraparams  
 20021028 Exported GetFloatsFromKey. Try to 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 error message  
 20070220 Attempt to fix frame reversal - debug code temp off  
 20070506 prealloc data pointer during receive to allocate large block first: allows loading larger scans  
 20070730 Dirty fix for CMS RTDOSE  
 20070902 DcmWriteVRToFile will now also write sequence item to file as raw VR dump; takes Index as extra par  
 20071127 Support for multiframe-objects where ImagePositionPatient is located in a DetectorInformationSequence  
 20080313 Fix: In SortSliceDDOs(), long ScanOptions could lead to crashes or other undesired behaviour; Removed some warnings  
 20080318 In CreateLastPropertiesField(), a few properties that resided deep in sequences for RTDOSE were added.  
 20080320 ...and put in a separate function  
 20080717 Support of Pinnacle DOSE in CalcXfm()  
 20080812 Support of Varian's Eclipse DOSE in CalcXfm()  
 20080908 Implemented & Philips to load embedded 4D ultrasound  
 20081007 Compute location of philips subvolumes by length/N  
 20081014 Also accept QueryIni-fields that contain Header/Key/Value instead of Key/Value  
 20090605 Fixed crash in DcmMoveHere() when GetDDOarray() returns OK, but no data were received  
 20090608 Fix: Due to different AcquisitionTime the warning 'Inconsistent Slices' was given too often  
 20090610 Added "Upi is NOT unique: DANGER !!" error-message  
 20091029 Adapted for 64-bits version  
 20100427 Added workaround for illegal (incomplete) query response from Kodak  
 20100811 Always return at least one record in DcmFind(), containing the query tags; Recoded the Kodak workaround. Now only matches to the query tags are returned, not any additional info that the server might provide. In parameter pszNKIcommand1 of DcmEcho() starts with '#', then the EchoResponse sent by the server in (0x9999,0x0401) will be dumped to file.

### **CQDICOM.H (part of conquest interface DLL):**

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 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  
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 Added functions DcmFind, DcmMove and DcmMoveHere  
 19980526 Added DcmCreateBitmap  
 19980610 Changed BGR to RGB in DcmCreateBitmap.  
 Added DcmMoveHeaderHere

19980629 Fix: DimX and DimY were reversed.  
Improved efficiency when loading one slice.

19980630 Fix: last change caused crashes

19980707 Removed some checks to allow non-standard Philips images  
Added DcmSetProgressHook

19980708 Added DcmReplaceInHeader, which can be used for  
anonymization of dicom images.

19980709 Added C-CANCEL command object when a ProgressHook  
stops or aborts a DcmMove operation. Added support for  
NkiPrivateCompressed images in DcmMoveHere.

19980826 Added #pragma pack(1) in Field.h

19981105 Added DcmReadHeader

19981127 Added DcmGetLastXfms

19990108 Updated the dictionary for DICOM-RT support

19990114 Slices are sorted on coord. When duplicate coords exist, the last  
received slice eliminate previous ones.  
Included changed SOP-list by MvH

19981127 Added DcmTree, DcmPatientList and DcmSetLocal

19990825 Added extended patientlist export: DcmPatientList2

19990826 Added DcmMoveFilesHere

20000824 Added DcmFileGetRtStructNames and DcmFileGetRtStruct

20020425 Added DcmVersion and DcmCreateRtStructFile

#### **CQCREATEDCM.CPP (inactive part of conquest interface DLL):**

20020417 Created. All created DICOM stuff should go in here

20020502 DcmCreateRtStructFile seems to work

20041119 Work on DcmCreateSliceFiles

20041128 Tested write new scan on grid (and properties) of existing scan:  
needs ScanToDicom matrix to correctly compute  
ImagePositionPatient; writes too many \\\\ in tags;  
SliceLocation not written; Now write abs slice thickness;  
Added missing \*10 in Z coordinate of ImagePositionPatient;  
Added a minus to the Z coordinate of ImagePositionPatient:  
this is a kludge that works only for scans read with CQDICOM  
without rotations in scanner. Added creation date and time in  
default series description

20041223 Added XFM parameter to DcmCreateSliceFiles  
Added DcmCreateRtPlanFileLight  
Fix: also incorporate ImageOrientationPatient,  
FrameOfReference, StudyID

20050906 Some fixes in DcmCreateSliceFiles  
Added 'DcmCreateRtPlanFileLight()'

20051018 Several fixes in DcmCreateSliceFiles:  
- Required tags KVP and PositionReferenceIndicator were  
missing - Element numbers of RescaleSlope and  
RescaleIntercept were wrong; Set all MU's to 0 in  
DcmCreateRtPlanFileLight; added OperatorsName

20060704 Increased stringbuffer in GetContouData() (crashed ridiculously  
detailed on ESTRO data)

20061018 In DcmCreateSliceFiles, don't insert sequence items.

20070220 Moved UID\_ROOT to somewhere else

20070423 In DcmCreateSliceFiles, use scan or extra properties for  
ImagePositionPatient

20070510 Made GetInterpretedType() more aware of markers.  
 20070705 Fixed bug in DcmCreateSliceFiles()  
 20070726 In DcmCreateSliceFiles, don't insert sequence items of  
 ExtraProperties either!  
 20071018 In DcmCreateRtStructFile(), the created UID is stored in a  
 global for later use  
 20080416 DcmCreateSliceFiles() also supports 4D and non-CT data  
 20080603 Few adjustments in DcmCreateSliceFiles()  
 20080708 Made PixelSize always positive in DcmCreateSliceFiles()  
 20080717 The filename parameter of DcmCreateSliceFiles() may also  
 contain RemoteAE;RemoteIP;RemotePort for immediate  
 pushing of created slices  
 20080930 Fixed bug in last change  
 20081001 Adapted for BCB's VR() change  
 20081002 Moved filename containing RemoteAE;RemoteIP;RemotePort  
 to separate function  
 20081027 In DcmCreateUID(), the last digits are now time related, and  
 not the IP address of the caller (adjustment to XVI  
 requirements).  
 20090127 Had a go in implementing xfm in DcmCreateSliceFiles  
 Fixed access to ReferencingPhysician in DcmCreateSliceFiles  
 Fixed read only problem of pszFileName in  
 DcmCreateSliceFiles, and allow AE;IP;PORT without trailing ;  
 20090128 Revamped xfm in DcmCreateSliceFiles:xfm is now  
 ScanToDicomPatient  
 20090130 Fixed it! And documented code to write as read  
 20090131 Created ad-hoc, dicom and siddon modes (passed in  
 iNewStudy)  
 20090210 In DcmCreateSliceFiles, Series and Image Date/Time can be set  
 in pExtraProps when it is NOT a new Study. SoftwareVersion  
 can also be set in pExtraProps.  
 20090513 Support private and short tags in DcmCreateSliceFiles()  
 20090523 Allow RTDOSE export through DcmCreateSliceFiles: expects  
 dose always in 0.01 Gy;Max number of slices to 2000; added  
 missing test on presence of pXfm  
 20090524 Reverted a line of test code  
 20090602 Fixed handling private tags in IsGroupElement()  
 20100303 Added DcmCreateSC (Secondary Capture, Monochrome or  
 color image); Fix : DcmCreateSliceFiles messed up non-square  
 slices  
 20100409 DcmCreateSliceFiles() now uses SeriesNumber and StudyID  
 from ExtraProperties  
 20100512 Kodak did not like our SC files without PlanarConfiguration  
 (0x0028, 0x0006)

### **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 Added a few prototypes and an errorcode

20070506 Added optional prealloc data pointer to CreateOutputField

20070522 Added szSoftwareVersions to SLICE\_INFO structure

20080717 Added prototype of DcmStoreFiles

20081002 Added prototype of FileNameOrDicomNode

20090204 Added prototypes for transpose\_Xbytes\_inplace()

20090602 Added fAcquisitionTime to SLICE\_INFO, for coordinates of 4th dimension

20090610 Added DCM\_E\_MULTIPLE\_RTPLAN, used when 'UPI' is not unique

### **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

#### **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

#### **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 Always use SeriesDescription in tree  
 20020619 Split date parts with dots; display studymodality (0008,0061) in study alias  
  
 20020620 Merged 20020613 with 20020619. Do not split dates.  
 20020815 In 'ParseDicomInfo' allow also ':' as a separator  
 20021011 Fix: When bypassing the TREE, cache was not initialized when retrieving a single image or a multi-frame volume  
  
 20021011 Added other query modes (4..9) for DICOM\_LOAD\_PATIENTLIST (CreatePatientList)  
  
 20021014 Merged the two versions  
 20021028 Try to get XFM's of multiframe objects right.

20030128 Support for 3D TimeSequences, resulting in 4D 4-space output scans. Make check on QueryResponse case-insensitive (choked on PatientID Test vs test)

20030130 Support for 3D private Kretz ultrasound

20030213 Above change crashed when in a FIND operation there is US present, and the queried dicomserver did not supply the 'Manufacturer' key.

20030624 Support for multiframe dosegrids

20030710 Additional sorting of C-FIND result on SOPInstanceUID

20040525 Also send PatientID when query/retrieving RT objects

20050126 Made better ALIAS in TREE for RTPLAN  
Made ALIAS in TREE of a series '(empty)' if no good ALIAS can be constructed  
Implemented interface to load individual segments in a beam  
Moved DCM\_PLAN and DCM\_STRUCT typedefs to "CqRtObjects.h"

20050131 Check empty sequences in 'StoreBeamPropertiesInCache', and made DDO a TypedDDO

20050201 Handle possibility of retrieval of beam properties before retrieval of outline in ReadKeys()

20050203 Function GetRtDDO now caches DicomRT files. When a NEW PatientTree is constructed, these files (of a different patient) are deleted. This speeds up things enormously

20051018 Support for Corvus in FixControlPointProperties

20060103 Studydate queries on val instead of \*val\* (kodak could not handle it)

20060531 Added exported function 'DcmGetPlanPois'

20061018 Apply rotations to DcmGetPlanPois when the patient is not HFS

20061101 Recoded 'DcmGetPlanPois' (pretty complicated now...)

20061109 ROI and POI RTStructs from Pinnacle do NOT have exactly the same timestamp

20070112 Extra consistency check in DcmGetPlanPois

20070220 Adjusted DcmGetPlanPois so it can handle 'derived' plans  
Added DcmShiftPlanIsoc

20070419 Fix in PatientTree in presence of long RTPlanName

20070423 Added outputstring pszCreatedUID to DcmShiftPlanIsoc

20070508 Fix: date query on empty mask failed

20070522 Temporary workaround for XVI-upi-bug in DcmShiftPlanIsoc()

20070530 Added DcmGetPlanStructUIDs()

20070530 Fixed bug in DcmGetPlanPois() when more than 1 isoc defined in RTSTRUCT

20071018 Added DcmGetLastCreatedStructUID and DcmSetLastCreatedStructUID. This is a mechanism so that a newly created RTStruct can be referenced in a shifted RTPlan.

20071031 In DcmGetPlanPois(), support 'QUIRT CqDicom' structuresets too. In CreateTree(), treat a marker as a structure

20080313 Support markers; treat them as structures; In DcmGetPlanPois(), the consistency check on isoc in plan and structureset is omitted. We take the isoc from the plan.

20080318 Store RTPLAN properties also in cache, and added 'NumberOfFractionsPlanned'

20080320 In ReadKeys(), also use SOPInstanceUID for RTDOSE

20080717 Moved prototype of DcmStoreFiles to CqGlobal.h

20080818 Made to compile with MS7 (fabs on integer)  
 20080908 ix xfm2 for &Kretz, and implemented those for &Philips  
 20081002 Adjustment in the Tree for Philips 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

**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

**CQPRINT.CPP (part of conquest interface DLL):**

20020814 Added exported functions 'DcmPrintScan' and 'DcmPrintFile'; Altered 'PDU.AttachRTC' in 'PrintGrayScaleImages'; Tested with OFFIS and Mallinckrodt  
 20020816 Padded uneven string VR's with space  
 Support of byte images. (RGB does not work yet)  
 20020823 DcmPrintFile accepts multiple filenames (separated by ;) and decompresses NKI data  
 20020825 Added DllProgress calls during print (used by server to ensure printing without losing socket data)  
 20051217 Use nicer method to replace compressed by uncompressed data  
 20080313 Removed some warnings  
 20080818 Made to compile with MS7  
 20091028 Adapted for 64-bits version

**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()

**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

### **SERVERDRIVER.PAS (part of conquestdicomserver.exe)**

19980405 Created  
19980407 Added d Gatesop.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 Suppress display of large files (>1 MB)  
 19981222 Use FieldByName, added combobox selectors  
 Disable study navigator if only 1 available  
 Moved modality from the study to the series level  
 19981229 Changed order of TableN.close to avoid side effects  
 19990104 Fixed MAGDEVICE creation under SQL server  
 (KBused optional)  
 19990109 Made ImageNumber 10 bytes wide (for GE AdvantageWin)  
 19990110 Combobox1 is now patient filter and or selector  
 Added access to cache and jukebox in browser but  
 with limited support: up to 10 devices (one character)  
 Added archiving page; fixed most handle leaks  
 19990112 Finished first archiving page; -hide command line option  
 Added clear database and regen single device buttons  
 Clear combobox for each page select  
 NOTES: Archive page is configured by editing  
 Restore original configuration or restart to load it  
 Archiving allows up to 10 Jukeboxes, but only the  
 selected one is used for writing. Only the drive  
 with MAG0 is checked for disk space for automatic  
 archiving. Only device CACHE0 is passed correctly  
 to the burn program. This means: stick to 1 MAG  
 device and 1 CACHE device for now.  
 19990113 Speeded archiving by selecting MAG0 if there is only 1  
 Renamed entry to BurnThresholdMB, made BurnProgramList  
 Note: to do - keep log file of archiving operations.  
 - add RT objects to default sop file.  
 19990114 Added date and time formats for burnprograms  
 19990115 label format burnprograms; no write empty ini  
 Sync magdevice0 with DataDir; %% and %p formats  
 19990315 Added EchoNumber in image table - used to separate PD,T2  
 Completed dgatesop.lst with Philips, GE, RT  
 Added NumberOfFrames in image table - to find multiframe  
 objects  
 19990413 truncate QUERY request depending of level  
 19990510 Allow AEs starting with a digit (Siemens MRI)  
 19990527 Revision 3 of database layout (birthday, sex, bolus)  
 19990902 Added load/store of mirror devices and export converters  
 19990905 Switched word wrap off for memo's  
 Added DcmMoveFilesHere on right click of copy; but seems to  
 crash; Problem: if we pass DcmMoveFilesHere servers  
 AE/PORT saving slices from own server will fail. Now pass  
 'test;1234'  
 20000127 Hide archiving tabsheet in new install; Add NKI sops to install;  
 20000128 Added extra GE sop; compressmode 2; disabled movefiles here  
 20000316 version 1.3.5: Integrates dgate as service operation  
 New install does not start dgate right away  
 20000317 Truncate patient list if too long  
 20000318 '\$ RESTART' as console message kills and restarts server  
 '& DGATE xx' as console message runs dgate with args xx  
 20000323 Added query sop choices through level dropdown list  
 20000326 Service supported for more than one server:  
 servicename=AE; port passed as /process dgate.exe -!port

Removed need to enter password for SQL access  
 Save and restore user and password in dicom.ini  
 Added 'ping' option for remote check of archiving:  
 Deletes ConquestDICOMServer.Ping and makes  
 ConquestDICOMServer.response with archive status  
 Allow up to four servers at the same time, also as services  
 Note: only the first server will start correctly on boot!  
 (on boot, the /process parameter is not passed and the  
 default IP message port will be used -!1111); Presence of file  
 USESQLSERVER allows install on SQL server  
 Presence of file USEMSACCESS allows install using access db

20000328 Added tests of local server at key moments  
 added -noconfirmquit option; show VERSION in caption

20000402 Install service with startup at right socket  
 Read service socket from registry on startup

20000403 Improved socket handling; fixed space in path when not  
 service; space in path blocks service install.  
 Now recognizes installed but not running service  
 Number of servers on one PC is now unlimited.

20000417 Fixed MSACCESS ODBC creation

20000501 ExportModalityx should be UPPER-case

20000528 Added "force display of large image", "remove image from  
 database", "run external viewer" and demoviewer option  
 Removed '.' as workdir from runprogram etc (allow bat files ?)  
 Added democopy option: copy incoming to dir + CallingAE.v2

20000529 Merged two changes

20000529 Release to 1.3.6

20000616 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 NightlyCleanThreshold parameter (clean # MB at  
 01:00)

20040401 Added ImageID to database; version to 1.4.4  
 Show ImageID in database editor and browser

20040402 Allow anonymize etc on MAG0..MAG9;  
 changed datasource name (now system DSN)

20040425 Added DoubleBackSlashToDB to dicom.ini

20040426 Version to 1.4.4a

20040528 Use built-in servertask commands for maintenance and browser

20040530 Browser for built-in DBASEIII driver uses extract server  
 command; Database editor to read only for built-in DBASEIII  
 driver; These changes allow efficient use of in-memory index  
 for dbaseIII; OK for 10<sup>7</sup> images when patientID, studyUID or  
 seriesUID passed in Queries; Added PackDBF and IndexDBF  
 to dicom.ini; Reworded some in popup menu; wait for patient  
 deletion to finish; Fix refresh for sql server

20040601 Added LongQueryDBF flag

20040605 Fix extract when no patients; kill server stops loop of server  
 tasks; start server on activate (after windows shows)  
 Pack the Database as Weekly Check Action

20040606 Fix in formactivate; display @ startup

20040610 use servertask to clear index and rebuild it in built-in dbase  
 mode

20040614 small fix in keep server alive; added nightlymove option

20040615 small fix in nightlymove option; also reindex after regen device

20040713 Added FixKodak; version to 1.4.6

20040722 Installation defaults for FixPhilips and FixKodak are now 0

20040804 Added \*.lst to zipped log files; added bug report option  
 Version to 1.4.7

20041029 Added merge and split series options;  
 Process messages during long GUI actions if possible (no DB)

20041030 Modified GUI of merge and split, process messages

20041101 Check for MAG storage for split/merge  
 Delete from DB does not use image (for orphaned DB)  
 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 d Gatesop.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, d Gatesop.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 kpac viewer form

20070123 Added processfilter to allow browsing of patients with ' in patientid

20070126 Importconverters stuff and ForwardAssociationRelease in dicom.ini; Version to 1.4.12b

20070201 Version to 1.4.12c

20070204 Fix in generation of UIDPrefix: was not automatically generated on startup

20070206 ODBC buttons will also create database for SQL server

20070207 ODBC button creates database for native mysql

20070211 Native MYSQL did not create indices during install  
Fixed selection of DBF (with odbc)

20070221 Started to SQLite (not yet fully functional)

20070305 Version to 1.4.13alpha

20070316 Use | in patid instead of , in drag and drop to allow dropping files with a , in them while changing patientid (not backwards compatible)

20070415 Back to , in patid in drag and drop: ljj fixed it in dgate.exe  
Added Prefetcher flag in dicom.ini (default 0)

20070520 Fixed missing completed message in regen single device

20070705 Added BrowseThroughDBF: unified browser used for SQLite  
Works for other datasources but not configured as such  
Small fixes in completed message in several regen functions  
Fixed view/edit database second time round (enable)

20070706 Auto create mysql registry settings for native mysql  
Disallow anonymize and change to empty name  
Message on end of odbc or db creation  
Version to 1.4.13beta

20070708 Patched forms.pas for Chad Moser's crash problem.  
Added BrowseThroughDBF setting in dicom.ini  
Default 1 for SQLite, 0 for others  
Use extract: also for dbaseIII: to avoid multi-user problems when browsing and writing at same time

20070709 Small fix in dbf+bde browsing  
Auto register webserver\ActiveFormProj1.ocx if found  
Do not use extract: for dbaseIII: browser does not work while indexing

20071030 Also delete DelayedFetchForwardFailures\* on startup

20071103 Added LRUSort, AllowTruncate, ForwardCollectDelay, MaximumExportRetries, MaximumDelayedFetchForwardRetries  
Version to 1.4.13

20071104 Added DecompressNon16BitsJpeg, UseBuiltInDecompressor  
Made IncomingCompression editable (double click label)  
Made FileNameSyntax editable (double click label) and allow choice of V2 and DCM through radiobuttons

20071114 Save root password while installing for mysql with password

20071115 Disabled multi-process mode in RunInThreadedModeClick to allow multiple saves of ini file during install (for above password)

20071115 Save password and username for SQL server install as well  
 20071116 Longer default password for sql server 2005  
 20080124 Added mailer settings in dicom.ini  
 Disable LittleEndianExplicit on install  
 Added configuration for mode UJ  
 Database revision 16: Moved Stationname and  
 InstitutionalDepartmentName to series table  
 Added extra warning when revision 16 not detected  
 moved Stationname and InstitutionalDepartmentName in  
 view/edit database  
 Version to 1.4.13a  
 20080126 Automatic add backslash to read MAGDEVICES etc and give a  
 warning message  
 20080322 Version to 1.4.14beta  
 20080322 Fix first install bug in test dicom.sql; fix send image crash  
 in UID mode; display selected UIDs in query/move page  
 added PadAEWithZeros and IgnoreOutOfMemoryErrors  
 20080818 Database revision 17: extended size of EchoNumber and  
 ReqProcDescription to 64; EchoNumber, StudyModality and  
 ImageType are DT\_MSTR: multiple values; use Institution  
 (8,80) instead of InstitutionDepartmentname (8, 1040)  
 Added WorkListReturnsISO\_IR\_100  
 Version to 1.4.14  
 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

### **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

### **SENDSELECTED.PAS (part of conquestdicomserver.exe)**

### **HEADERLISTER.PAS (part of conquestdicomserver.exe)**

20020825: added keyboard interface (see serverdriver.pas)

### **EDITDATABASEFORM.PAS (part of conquestdicomserver.exe)**

### **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

### **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 multiframe 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 multiview  
mode, fixed mosaic mode for multiframe dicom images  
20060204 Enabled saving to TIFF using W. Krug's Bmp2Tiff unit  
20060205 Added Tool kShutter  
20060223 Changed rescale method to rescale buffer directly after reading  
pixeldata  
20060223 Reverse NKI test: if nki compression mode >4 it is not made by  
NKI  
20060304 Fixed NKI compression of 8-bit and color images; todo: 1966  
and some PT images level&window wrong  
20060420 Added orientation indicators to text overlay  
20060421 Implementation of TdcmOverlay record to describe custom  
overlay  
20060425 Added TRuler class to show spacing  
20060502 Implementation of basic VOI\_LUT support. Currently only  
16bit VOI LUTs are supported.  
20060607 Merged changes mvh 20060223 and 20060304

20060608 Need CONQUEST define to enable NKI compression, fix crash in TdView.AdjustOrientChars

20060609 Fixed VOI Lut crash when encoded explicit

20060611 Added PixelPaddingValue and PixelRepresentation to DicomData and fixed an unwanted pixel value correction if pixel padding is out of SS range

20060618 Merged again; added 20060223 and 20060304 changes back in

20060712 fixed wrong orientation label display when ImageOrientation and ImageOrientationPatient string is available

20060728 Added support for non-square Pixel Aspect Ratio

20060801 Bitmap overlay support implemented

20060830 3D Cursor function implemented using open source vector math units

20061107 ?

20061220 Made compileable again in conquest: stripped html support in conquest mode

20061220 Found endless recursion on double click: IFNDEF conquered

20061222 Tried to restore layout

20070204 Added (dumb) access to http: files

20070216 Important bug fix: allow switch to implicitVR: I found a NKI compressed image with VR length 03544C = 'L', 'T', 3 and LittleEndianImplicit --> length was seen as LT code causing reader to go out of sync see: { mvh 20070216 }

20070216 Fix that magnifier would never return its cursor by setting Screen.Cursor to default when changing modes

20070305 Put downloaded dicom file in TempPath, document download code: note not safe when using multiple controls side by side.

20100207 Added uncompress mode (uses dgate.exe, not for OCX); delete temp before using it

### **UVIEWER.PAS (wraps k-pacs viewer in conquestdicomserver.exe)**

20060130 Replaced Japanese fonts (never create forms on a japanese laptop ;->>>)

20060304 Set limit to 2000 studies

20060312 Slice with + and -: keep other keys for series browser

Added OpenSeries; disallow horizontal scrollbar in stringgrid

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)

### **UViewerActiveFormImpl1.PAS (wraps k-pacs viewer in activeX control)**

20070305 Created update history

### **SQLITE.PAS (TDataset control for GUI access to SQLITE3)**

20070221 Adapted for SQLite3, but not yet fully functional

20070305 Created update history

**forms.pas (part of Delphi core library)**

20020101: added two extra nil checks to avoid windows xp multi-monitor  
crash

20090819: better documented changes

**controls.pas (part of Delphi core library)**

20020402: added exception handling in finddragtarget and findvclwindow

20020513: extended exception handling

20090819: Better documented changes