



Merge DICOM Toolkit™

5.7.0

RELEASE NOTES

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The symbols glossary is provided electronically at <http://www.merge.com/Support/Resources.aspx>.

CAUTION: U.S. federal law restricts this device to sale by, or on the order of, a physician.



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Part	Date	Revision	Description
COM-3231	June 2018	1.0	Updated bi-annually

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Chapter 1 About the Application

The Merge DICOM Toolkit provides a powerful and simplified interface to DICOM. It allows you to focus on the important details of your application, and the immediate needs of your end users, rather than the complex details of the DICOM standard.

WARNING: If using the log feature to log information to a file, Personal Health Information (PHI) may be exposed. Client application and system should be aware of this risk and take necessary procedures to prevent and identify unauthorized use or access to PHI.

This release includes the following toolkits:

Merge DICOM Toolkits	Target Development Environment
Merge DICOM Toolkit - C/C++ Toolkit V5.6.0	32-Bit Windows - Visual C++
	64-Bit Windows - Visual C++
	32-Bit Windows - Borland
	32-Bit - Linux on x86
	64-Bit - Linux on x86
	64-Bit - Linux on ARMv8
	32-Bit - Solaris 10 Intel - GCC Compiler
	64-Bit - Solaris 10 Intel - GCC Compiler
	32-Bit - Solaris 8 Sparc - Sun Compiler
	32-Bit - Solaris 8 Sparc - GCC Compiler
	32-Bit - MAC OS (Intel and Power PC)
	64-Bit - MAC OS (Intel)
	32-Bit Android on Armv7
	64-Bit Android on Armv8
	64-Bit iOS
Merge DICOM Toolkit - .NET/C# Toolkit V5.6.0	32-Bit Windows
	64-Bit Windows
Merge DICOM Toolkit - Java Toolkit V5.6.0	Windows, Solaris, Linux, Android, Mac OS X

This release also includes the following:

- [“Enhancements” on page 6](#)
- [“Fixed Issues” on page 9](#)
- [“Known Issues” on page 12](#)

Chapter 2 Enhancements

NOTE: Supplements and change proposals apply to all toolkits.

This release adds support for the following DICOM supplements:

Supplement	Title
200	Transformation of NCI Annotation and Image Markup (AIM) and DICOM SR Measurement Templates
204	TLS Security Profiles

This release also contains updates to the DICOM standard. It addresses the following correction proposals (CP):

CP#	Issue
1180	Use LOINC Short Name; code meaning capitalization insignificant
1189	Add usage of Temporal Position Time Offset to Per Frame content Macro as needed for Enhanced MR and Enhanced CT objects
1224	Add Expiration Date to UPS
1403	Clarify use of DIMSE service Status codes
1617	Constituent Mapping Macro
1632	Add Support for non-Patient Instance References
1650	Extend User Identity Sub-Item to support web tokens
1668	Add set of Codes for discontinuation of Read Request
1683	Fix error with QIDO results calculation
1698	Remove ETag requirement in Non-Patient Instance Restful service
1699	Match units to quantities
1701	Private Creator Data Elements only use Default Character Repertoire

CP#	Issue
1702	Update DICOM to reflect changes in IHTSDO SNOMED CT-DICOM Subset for JUL 2017 INT Release
1703	TLS Security Note for Web Services
1704	Relax requirement to provide default Transfer Syntax if lossless compressed image is too large
1705	Add more texture measures
1709	Biopsy Target Values in DICOM Standard attributes
1710	Correct attribute names in segmentation coding example figure
1711	Correct SR Encoding Example
1713	More compact use of Per-Frame Functional Group Macros in Non-Sparse VL Whole Slide Microscopy Image IOD
1716	Add Protocol UID to MWL Entry
1722	Consistency of Requesting Service attributes between worklist and composite instances and more general usage
1725	Add date and time of irradiation event start to CT RDSR
1727	Remove unnecessary Relationship Content Constraints (from Radiation Dose SR IODs)
1729	Update Fig 6.2-2 Media Storage and DICOM
1730	Part 10 Section 6.2.3 DICOM Data Format Layer
1731	Indentation error in Visual Evaluation Result Macro
1734	Add performing roles for research to DICOM SR person observer context
1737	Remove Note referencing retired Transformation in RT Structure Set
1739	Breast Imaging Report Template overview incomplete and missing observer context at top level
1740	WSI is missing Frame Type
1741	Add more PET Radiopharmaceuticals
1742	Add Performed Protocol Code Sequence wherever Protocol Name occurs
1743	Update Conformance Statement example to be consistent with IHE Scheduled Workflow
1744	Make anatomical information encoding in general and visible light images consistent

In addition to updating the toolkit to reflect changes to the DICOM standard, this release also contains the following enhancements:

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue #	Description
COM-655	<p>Character set encoding/decoding was ported to the Android platform (ICU4C).</p> <p>This enhancement applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3160	<p>Added support for message validation to handle "May be present otherwise" conditional clauses - Part 1*.</p> <p>* - Due to the large number of individual changes required, the enhancement will be implemented gradually, over several releases.</p> <p>This enhancement applies to all Merge DICOM Toolkits.</p>
COM-3176	<p>Retrofitted the toolkit to include support for the trial retired UPS SOP Classes.</p> <p>This enhancement applies to all Merge DICOM Toolkits.</p>
COM-3182	<p>Introduced support for the message validation to handle conditions on attributes not present in the current data set (sequence item) - Part 1*.</p> <p>* - Due to the large number of individual changes required, the enhancement will be implemented gradually, over several releases.</p> <p>This enhancement applies to all Merge DICOM Toolkit.</p>

Chapter 3 Fixed Issues

The following table lists the issues that have been fixed in this release.

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue	Description
COM-2694	Fixed issue where the RLE compressor would crash if pixel data is 1 pixel. In fact RLE compression is not effective for very small amounts of data as the compressed data tend to be larger than the uncompressed data. Therefore the minimum pixel data size that is now accepted for RLE compression is 8 rows by 8 columns. This update applies to the Merge DICOM C/C++ Toolkit.
COM-2732	Fixed issue where MC_Get_Encapsulated_Value_To_Function() would return the entire pixel data rather than the first frame or fragment and would not leave anything for subsequent calls to MC_Get_Next_Encapsulated_Value_To_Function() which would return "No more values". This issue would manifest itself only under these particular conditions: <ul style="list-style-type: none"> • no decompression callback was registered for the pixel data. • the pixel data did not have an offset table. This update applies to the Merge DICOM C/C++ Toolkit.
COM-3153	Fixed issue where an empty value 3 in the Image Type (0008,0008) attribute, which is acceptable by the DICOM Standard in a Digital X-Ray image, was being reported as a validation error. This update applies to the Merge DICOM C/C++ Toolkit.
COM-3157	Fixed issue where if the user read callback used a very small working buffer (less than 8 bytes), then the offset table from encapsulated pixel data was not being read correctly. This update applies to the Merge DICOM C/C++ Toolkit.

Issue	Description
COM-3163	<p>Fixed issue where the message database was failing to enact the recursive nature of the Content Sequence (0040,A730) attribute in the SR Document Content Module.</p> <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3171	<p>Fixed issue where the Structured Report (API MC_SRH_Create_NUM_Node()) was inadvertently attempting to create non-existent MEASURING_UNITS sequence item and the call would result in a failure.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3175	<p>Fixed issue where in A-ASSOCIATE-RQ the User Information Item length field having a value greater than the maximum length negotiated would cause buffer overflow and result in a crash.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3181	<p>Fixed issue where icon image sequence pixel data was being truncated on write back if all the following conditions were met:</p> <ul style="list-style-type: none"> • call to MC_Open_File_Upto_Tag_Bypass_Value() to read the file up to the (main data set) pixel data • callback function registered for pixel data but the icon image sequence pixel data not handled by the registered callback function (size less than CALLBACK_MIN_DATA_SIZE) • the icon image sequence pixel data read in in more than one chunk (depending on the size chosen for the buffer used by the user read callback) <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3191	<p>Fixed issue where the top level data set transfer syntax failed to propagate to the icon image sequence causing MC_Get_Encapsulated_Value_To_Function() to fail when called for compressed icon image sequence pixel data.</p> <p>Fixed issue where the compression/decompression callbacks would fail to propagate to the icon image sequence causing MC_Duplicate_Message() to fail to decompress icon image sequence pixel data.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3192	<p>Fixed issue where MC_Duplicate_Message() would fail for (non-DICOM Standard compliant) pixel data that is NULL (empty).</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>

Issue	Description
COM-3193	<p>Fixed issue where the sequence attribute validation failure would issue misleading warning "Value not one of defined terms" instead of the appropriate "Sequence item not one of permitted types".</p> <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3194	<p>Fixed issue where MC.mcLibraryRelease() would take a very long time to complete if a large number of listening ports that were created anonymously ("any available") were also released anonymously. A 10s delay was being added for each such port.</p> <p>This update applies to the Merge DICOM .NET Toolkit.</p>
COM-3195	<p>Fixed issue where a received PDV with length less than 2 bytes would cause a buffer overflow and ultimately result in a crash.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3219	<p>Fixed issue where leading spaces in an attribute value with value representation PN would cause a validation error. The DICOM standard originally specified that PN values may be padded with trailing spaces only. The 2008 edition of the standard changes that by stating that both leading and trailing spaces are allowed and considered insignificant. The fix aligns the toolkit with the present standard specification.</p> <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3272	<p>Fixed issues in tag keyword generation for retired attributes:</p> <ul style="list-style-type: none"> • MC_Get_Tag_Keyword() (C/C++ Toolkit) would alter the keyword by appending 'RETIRED' to the end effectively making it different from the DICOM standard defined keyword. • .NET: MC.GetKeywords() (.NET toolkit) and MC.getDicomKeywords() (Java toolkit) effectively drop retired attributes and don't return them in the list. <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3274	<p>Fixed issue where the sample applications failed to build in the toolkit distribution for some platforms.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3325	<p>Fixed issue where a call to the MC_Open_File_Bypass_OBOW() function would crash the toolkit if it encounters a private attribute with a value representation of OB/OW that does not have a private creator code.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>

Chapter 4 Known Issues

The following table lists the issues that have been identified but not fixed in this release:

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue #	Description	Impact	Workaround
COM-2668	DICOM C/C++: Offset table context is linked to the MsgObj although it should be tag specific.	This defect applies to all Merge DICOM Toolkits. The impact is non existent, as the scenario of having offset tables for attributes other than pixel data is practically unheard of.	Invisible to the user, no workaround is necessary.
COM-3276	DICOM C/C++: Dynamic link build fails for sample applications in the Borland distribution.	This defect applies to the Merge DICOM C/C++ Toolkit. The impact is low as a workaround exists.	The user workaround is to build using static library.