



# Merge DICOM Toolkit™

## 5.8.0

### 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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For assistance, please contact Merge Healthcare Customer Support.

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Part	Date	Revision	Description
COM-3445	December 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.

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**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.

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This release includes the following toolkits:

Merge DICOM Toolkits	Target Development Environment
Merge DICOM Toolkit - C/C++ Toolkit V5.8.0	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 V5.8.0	32-Bit Windows
	64-Bit Windows
Merge DICOM Toolkit - Java Toolkit V5.8.0	Windows, Solaris, Linux, Android, Mac OS X

This release includes the following:

- [“Enhancements” on page 6](#)
- [“Fixed Issues” on page 10](#)
- [“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
205	Encapsulation of STL Models for 3D Manufacturing

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

CP#	Issue
1670	Add number of items for Responsible Group Code Sequence
1671	Clarify use of Equivalent Meaning of Concept Name for codes
1700	Replace use of Derived Pixel Contrast Image/Frame Type Value 4 and Image Derivation with RWVM Quantity Definition Sequence
1719	Extend Referenced Image Purposes of Reference
1720	Add RT Attributes To Confidentiality Profiles
1738	Enhance Specification of Attribute usage for Normalized Services
1748	Add reference to LOINC Panel for Imaging Report
1750	Change the defined term for Modality to reflect the object type for En face Image and B-scan Volume Analysis
1751	MR Spectroscopy Functional Group Macros definition contains an improper reference of a Macro
1752	Corneal Topography Map IOD definition contains an improper reference of a Module
1753	Tractography Results IOD definition incorrectly references a retired Module
1757	Patient Orientation should not be required for Whole Slide Images

CP#	Issue
1758	Incorrect data element tag and name for Center Point Location in Slide Coordinates
1759	Real World Value Map only permitted for monochrome Whole Slide Images
1760	Add flag to distinguish studies imported from outside
1761	Correct Acquisition Context and DateTime in Confidentiality Profile Attributes
1762	Fix Omitted Attribute in Verification Control Points
1763	Source Instance Sequence for Images in Encapsulated Document IODs
1765	Retire DICOMDIR reference to unencapsulated CDA on media
1767	Correct PS3.3 Figure 7.13.4-1 Protocol Storage
1768	Correct PS3.17 Figure FFF.2.3-1
1769	Add Dose Units for Parametric Maps
1771	Update PS3.16 Context Group Table Conventions
1772	Add PathLex as Coding Scheme
1773	Correct code for common femoral artery in CID 12109
1774	Make code meaning of Great Saphenous Vein consistent
1775	Add NDC as Coding Scheme and correct codes
1778	Improve PN Separator Specification
1780	Add flag to segmentation object indicating segments are non-overlapping
1781	Clarify number of asynchronous associations
1782	Type of Patient ID Clarification
1783	Extend list of Fiducial Shape Types
1784	Add Algorithm Identification Macro to RT Structure Set

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-2203	Added support for the DICOM Native XML conversion API to the Android on ARMv7/ARMv8 platform. The DICOM Native XML conversion is now supported on all platforms, with the exception of Linux on ARMv8.  This enhancement applies to the Merge DICOM C/C++ Toolkit.
COM-2449	Added support for obtaining the reason why an association request was rejected. The exception thrown on association reject now contains the result/source/reason parameters for the rejection.  This enhancement applies to all Merge DICOM Toolkits.
COM-3024	Added support for extended character set encoding/decoding using the ICU4C Unicode conversion library to the iOS platform.  This enhancement applies to the Merge DICOM C/C++ Toolkit.
COM-3179	Improved the validation functions (MC_Validate_File(), MC_Validate_Message(), MC_Validate_Attribute()) and the mc3valid utility to make it easier to figure out where in the data set hierarchy the validation errors originate.  This enhancement applies to the Merge DICOM C/C++ Toolkit.
COM-3315	Added several integrity checks for the association negotiation PDUs: <ul style="list-style-type: none"> <li>• Presentation Context Items in A-ASSOCIATE-RQ and A-ASSOCIATE-AC</li> <li>• SOP Class Common Extended Negotiation Sub-Items in A-ASSOCIATE-AC (not allowed).</li> </ul> This enhancement applies to the Merge DICOM C/C++ Toolkit.
COM-3337	Improved usability of the mc3valid utility by: <ul style="list-style-type: none"> <li>• removing some redundant command line options</li> <li>• eliminating some unexpected behavior, such as validation yielding different results when the service/command parameters are entered on the command line or when they are selected from a list.</li> </ul> This enhancement applies to the Merge DICOM C/C++ Toolkit.
COM-3338	Added support for message validation to handle “May be present otherwise” conditional clauses - Part 2.  This enhancement applies to all Merge DICOM Toolkits.



Issue #	Description
COM-3339	<p>Introduced support for message validation to handle conditions on attributes not present in the current data set (sequence item) - Part 2*.</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>
COM-3364	<p>Added support for DICOM to JSON and JSON to DICOM conversion for Android platforms.</p> <p>This enhancement applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3378	<p>Added support for specific character sets to the high level structured report API (the MC_SRH_...() functions). Previously the API could only be used if the string parameters to the functions consisted only of ASCII characters.</p> <p>This enhancement applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3379	<p>Added support for Digital Signature capabilities as per DICOM Standard PS3.3.</p> <p>This enhancement applies to the Merge DICOM .NET Toolkit.</p>
COM-3380	<p>Added support for Digital Signature capabilities as per DICOM Standard PS3.3.</p> <p>This enhancement applies to the Merge DICOM Java Toolkit.</p>
COM-3420	<p>Enhanced run-time error logging to provide more information for on-the-fly and off-line debugging.</p> <p>This update applies to the Merge DICOM C/C++ 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-2668	Fixed issue where the offset table context (internal toolkit object) was linked to the message object, although it should have been defined per tag.  This update applies to the Merge DICOM C/C++ Toolkit.
COM-3276	Fixed dynamic link build failure for sample applications in the Borland distribution.  This update applies to the Merge DICOM C/C++ Toolkit.
COM-3362	Fixed issue where a warning returned by an ICU4C internal call, which does not indicate a failure, would instead cause the MC_Byte_To_Unicode() API to return an error and fail.  This update applies to the Merge DICOM C/C++ Toolkit.
COM-3374	The MC_Byte_To_Unicode() API was behaving incorrectly in multi-threaded use due to a race condition in the ICU4C library. Fixed by synchronizing the ICU4C calls in toolkit code.  This update applies to the Merge DICOM C/C++ Toolkit.
COM-3392	Fixed issue where the toolkit could not receive the sequence attribute over the network if the tag and value length of the attribute were in one PDU and the item tag and sequence item were in the next PDU.  This update applies to the Merge DICOM C/C++ Toolkit.

Issue	Description
COM-3402	<p>Fixed issue where insufficiently detailed encoding ranges for the ISO 2022 IR 87 and ISO 2022 IR 159 specific character sets could result in incorrect encoding of Japanese characters.</p> <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3407	<p>Fixed issue where insufficiently detailed encoding ranges for the ISO 2022 IR 87 and ISO 2022 IR 159 specific character sets could result in incorrect encoding of Japanese characters.</p> <p>This update applies to the Merge DICOM .NET Toolkit.</p>
COM-3413	<p>Fixed issue where insufficiently detailed encoding ranges for the ISO 2022 IR 87 and ISO 2022 IR 159 specific character sets could result in incorrect encoding of Japanese characters.</p> <p>This update applies to the Merge DICOM Java Toolkit.</p>
COM-3414	<p>Fixed issue where the toolkit initialization would fail when calling:</p> <ul style="list-style-type: none"> <li>• MC_Library_Initialization() in the C/C++ toolkit, or</li> <li>• MC.mclInitialization() in the .NET toolkit, or</li> <li>• MC.initialize() in the Java toolkit</li> </ul> <p>with a file path for merge.ini containing Unicode (non-ASCII) characters.</p> <p>This update applies to all Merge DICOM Toolkits.</p>
COM-3415	<p>Fixed issue where the toolkit would crash on reading icon image sequence pixel data with a missing delimiter.</p> <p>This update applies to the Merge DICOM C/C++ Toolkit.</p>
COM-3523	<p>Fixed performance degradation introduced as side effect to a fix in release 5.6.0. The original issue was about System.ArgumentException being raised when setting again the value at index 0 of an MCattribute that had a null value.</p> <p>This update applies to the Merge DICOM .NET Toolkit.</p>

## Chapter 4 Known Issues

There are no known issues in this version of the Merge DICOM Toolkit.