

Merge DICOM Toolkit™

5.21.0

Release Notes

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Merge Healthcare Incorporated
900 Walnut Ridge Drive
Hartland, WI 53029
USA

Symbols Glossary:

Symbol	Title
	Manufacturer
	Consult Instructions for Use

The full symbols glossary can be viewed at

<https://merative.com/content/dam/merative/enterprise-imaging/merge-healthcare-symbols-glossary.pdf>

For application support or to report issues with user documentation, contact Customer Support:

☎ 1-877-741-5369 (North America)
+44 203808.3608 (Europe, the Middle East and Africa)
1.800.952.156 (Australia)

✉ MC3Support@merative.com

Part	Date	Revision	Description
COM-6283	July 2025	1.0	Updated bi-annually

The latest version of this document can be found at <https://merge.my.site.com/mergecommunity>.

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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 V5.21.0	32-Bit Windows – Visual C++
	64-Bit Windows – Visual C++
	64-Bit Windows (New Edition) – VS 2019
	32-Bit Windows – Borland
	32-Bit – Linux on Intel x86
	64-Bit – Linux on Intel x86_64
	64-Bit – Linux on Intel x86_64 (New Edition) – GCC 9.4.0
	64-Bit – Linux on ARMv8
	32-Bit – Solaris 10 on Intel x86 – GCC Compiler
	64-Bit – Solaris 10 on Intel x86_64 – GCC Compiler
	32-Bit – Solaris 8 Sparc – Sun Compiler
	32-Bit – Solaris 8 Sparc – GCC Compiler
	32-Bit – MAC OS on Intel and Power PC
	64-Bit – MAC OS on Intel
	64-Bit – macOS on Intel and M1 (New Edition)
	32-Bit Android on Armv7
	64-Bit Android on Armv8
	64-Bit iOS
Merge DICOM Toolkit – .NET Framework 2.0/C# Toolkit V5.21.0	32-Bit Windows
	64-Bit Windows
Merge DICOM Toolkit – .NET Framework 4.5/C# Toolkit V5.21.0	64-Bit Windows

Merge DICOM Toolkits	Target Development Environment
Merge DICOM Toolkit – .NET Framework 4.8/C# Toolkit V5.21.0	64–Bit Windows
Merge DICOM Toolkit – .NET Core/C# Toolkit V5.21.0	64–Bit Windows
	64–Bit Linux
Merge DICOM Toolkit – .NET 6/C# Toolkit V5.21.0	64–Bit Windows
	64–Bit Linux
Merge DICOM Toolkit – .NET 8/C# Toolkit V5.21.0	64–Bit Windows
	64–Bit Linux (Intel and ARM)
Merge DICOM Toolkit – Java Toolkit V5.21.0	Windows, Solaris, Linux, Android, Mac OS X
Merge DICOM Toolkit – Python Toolkit V5.21.0	64–Bit Windows
	64–Bit Linux

This release includes the following:

- [CHAPTER 2. ENHANCEMENTS ON PAGE 6](#)
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- [CHAPTER 4. KNOWN ISSUES ON PAGE 10](#)

Chapter 2. Enhancements

This release contains the following enhancements:

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

Issue	Description
COM-6292	Add support of Merge DICOM Toolkit .NET 8 on 64-bit Linux ARM platforms This enhancement applies to Merge DICOM .NET 8/C# Toolkit.
COM-6221	Add support of RLE compression/decompression of DICOM data with Bits Allocated equals 1. This enhancement applies to all Merge DICOM Toolkits.
COM-6306	Upgrade Zlib library to version 3.1.3. This enhancement applies to all Merge DICOM Toolkits. Upgrade Libxml2 library to version 2.14.2. This enhancement applies to Merge DICOM Toolkits New Edition: <ul style="list-style-type: none">• 64-Bit Windows (New Edition) - VS 2019• 64-Bit - Linux on Intel x64 (New Edition) - GCC 9.4.0• 64-bit macOS (New Edition) with Universal Binaries on Intel x64 and ARM M1

This release adds support for the following DICOM supplements.

NOTE: Supplements and change proposals apply to all toolkits.

Supplement	Title
228	Web Services for Volumetric Rendering This Supplement applies to Merge DICOM .NET 4.5/4.8/Core/6/8 C# Toolkits, Merge DICOM Java Toolkit and Merge DICOM Python Toolkit.
232	JPEG XL Transfer Syntaxes
236	Waveform Presentation State
240	Height Map Segmentation and Revised Ophthalmic OCT En Face Image
243	Label Map Segmentation
244	Frame Deflate Transfer Syntax

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

CP#	Title
2220	Differentiate acquisition techniques for RT 3D CBCT imaging
2295	KVP attribute in CT Image Module may also be filled in multi-energy case

CP#	Title
2315	Clarify Single Conformance Statement in PS3.2
2337	Implementation Version Name will contain version information
2342	Add Clinical Fraction Number to 1st Generation RT Objects
2343	Add Device to RT ROI Interpreted Type
2346	Ocular Region Imaged Module in Ophthalmic Tomography
2347	Clarify OPT Frame of Reference Coordinate System
2349	Relax Multi-energy CT Rescale Type constraint
2364	Update outdated Note on Type of VOI LUT Sequence and Window Center
2370	Orientation guidance for vertical CT gantries
2373	Clarify Description related to Range Shifter Settings
2380	Clarify single row or column or pixel data PixelSpacing value is zero
2381	Replace attributes by Referenced SOP Instance macro for IntravascularOCT Series Module
2384	Change name of Status Code 0107H to clarify it is a Warning
2387	New Context Group for Waveform Modalities This CP applies to Merge DICOM Java Toolkit.
2388	Extended Offset Table clarification
2389	Define Fragment
2393	Update CT Scanning Length Definition
2396	JIS X 201 US-ASCII differences affecting delimiter and private creators
2398	Correct inconsistent time point concepts This CP applies to Merge DICOM Java Toolkit.
2400	Add Mixed Ion Radiation Type and add Ion species information in control points
2401	Ion Range Surface Compensator
2402	Isodose levels for RT Dose visualization
2404	Rephrase Reference Description
2405	Add note clarifying DIMSE JWT and DICOMweb access token can be the same
2406	Clarify Series and Frame of Reference relationship for Whole Slide Microscopy Images
2408	CID Entries that are inconsistent or incomplete This CP applies to Merge DICOM Java Toolkit.
2409	Multiple Inconsistencies of DCM Code Meanings in PS3.16 This CP applies to Merge DICOM Java Toolkit.

CP#	Title
2410	Formally define Attribute Value
2411	Clarify Point Coordinates origin in Microscopy Bulk Simple Annotations
2412	Add flag to whole slide microscopy images indicating tiles are nonoverlapping
2413	Clarify Admitting Diagnosis meaning and add other types of diagnosis
2414	Clarify location of ICC Profile when Optical Path Sequence present
2416	Add support for FLIO Ophthalmic Photography
2417	Note for ordering tags in XML representation
2419	Explicitly reference PS3.4 requirements from UPS-RS retrieve and search
2420	Add missing Status Codes to DIMSE Services and further improve consistency
2421	Fix inconsistent spelling and use of terms in Part 4
2423	Add missing abbreviation “MPPS” to various Parts
2429	Update ROI DateTime and ROI Observation DateTime
2431	Remove LUT restrictions for Ophthalmic Tomography Images
2432	Clarify Support of Mandatory Query Parameters in DICOMweb

Chapter 3. Fixed Issues

The following table lists the issue that has been fixed in this release.

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

Issue	Description
COM-6195	Extended logging of errors that might occur during the application build if Services and Items object definitions are missing. This update applies to Merge DICOM C/C++ Toolkit 64-bit Windows (New Edition) - VS2019.
COM-6237	Fixed the error where VR UR attributes were not correctly validated for invalid values. This update applies to all Merge DICOM Toolkits.
COM-6297	Fixed the error in the calculation of data length of nested Sequence Elements when the data length of some internal attributes exceeds the allowed VR length (64K bytes). This update applies to all Merge DICOM Toolkits.
COM-6313	Fixed Zlib compression/decompression errors due to race conditions in multithreaded SCP/SCU operations. This update applies to all Merge DICOM Toolkits.
COM-6315	Fixed the error in parsing the Toolkit configuration file when the locale is not "C" and the file contains control or non-graphic ASCII characters. This update applies to all Merge DICOM Toolkits.

Chapter 4. Known Issues

The following table lists the issue 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
COM-6314	Errors in the transfer of DICOM Deflated data in streaming mode instead of DICOM message mode.