# DICOM Conformance Statement - contextflow ADVANCE Chest CT

## Approval

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# contexflow GmbH
# DICOM Conformance Statement

## contextflow ADVANCE Chest CT ver. min. 2.0

# Document Info

| Version | Related Software Version | Release Date |
|---|---|---|
| 1.0 | min. contextflow ADVANCE Chest CT 2.0 | May 2023 |

# Copyright



# Edition

Version 1.0, May 2023

# Product Identification

Product Name: **contextflow ADVANCE Chest CT**
Device Type: Medical Device Software (MDSW)
UDI-DI: (01)09120107330075

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# 1 Overview

*contextflow ADVANCE Chest CT* is an Artificial Intelligence (AI)-based, Computer Aided Detection (CADe) system for 3D medical imaging data. *contextflow ADVANCE Chest CT* provides radiologists with complementary information for the identification and interpretation of lung-specific image patterns in Computed Tomography (CT) scans and is intended to support radiologists in objective image assessment and reporting.

This complementary information is computed based on DICOM CT Image objects and is made available as Secondary Capture, Encapsulated PDF and Enhanced SR DICOM objects. The application interacts with the PACS or the Modality via the DIMSE C-STORE service.

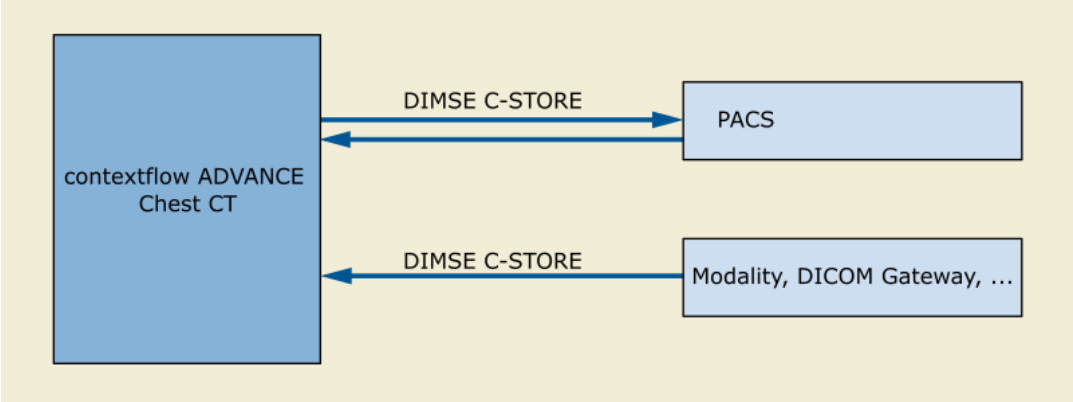


**Figure 1-1. Overview of Implemented Services**

## 1.1 Content and Transfer

Table 1-1 lists all Storage SOP Classes and the supported transfer mechanisms as well as the usage scenarios for those instances.
The "Transfer Syntax Set" column lists the sets of Transfer Syntaxes defined in Table 1-2 that are applicable to each SOP Class. The "DIMSE", "DICOM Web" and "Media Services" columns indicate the roles supported for each SOP Class.
The "Function" columns indicate how the instances are used by the system:

- Create: The system creates instances of the SOP Class. The type of the created SOP Class is indicated by one of the following abbreviations:
- S: Standard SOP Class
- SE: Standard Extended SOP Class
- SP: Specialized SOP Class
- P: Private SOP Class
- Display: The system displays the instances of the SOP Class to the user, either by displaying the SOP Instances natively or by applying instances of another suitable SOP Class to the image instances (e.g., a Presentation State or CAD SR).
- Process: The system processes the instances of the SOP Class to derive some further information that is made available to the user (e.g., a CAD processing algorithm, or a 3D Rendering).
- Archive: The system stores the instances of the SOP Class and makes them available again.

**Table 1-1. Storage SOP Classes**

| SOP Classes | | Transfer Syntax Set | DIMSE Services | | DICOM Web Services | | Media Services | | | Function | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SCU | SCP | UA | OS | FSC | FSU | FSR | Create | Display | Process | Archive |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | L,U | N | Y | N | N | N | N | N | N | Y | Y | N |
| Multi-frame True Color Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.4 | L | Y | N | N | N | N | N | N | S | N | N | N |
| Encapsulated PDF Storage | 1.2.840.10008.5.1.4.1.1.104.1 | NI | Y | N | N | N | N | N | N | S | N | N | N |
| Enhanced SR | 1.2.840.10008.5.1.4.1.1.88.22 | NI | Y | N | N | N | N | N | N | S | N | N | N |

**Table 1-2. Supported Transfer Syntaxes**

| Transfer Syntax Set | Transfer Syntax Name | Transfer Syntax UID | DICOM Web Service Bulkdata Media Type |
|---|---|---|---|
| Lossy Compressed Transfer Syntax Set (L) | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 | image/jpeg |
| Uncompressed Transfer Syntax Set (U) | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | application/octet-stream |
| | Implicit VR Little Endian | 1.2.840.10008.1.2 | N/A |
| Non-Image Transfer Syntax Set (NI) | Explicit VR Little Endian native | 1.2.840.10008.1.2.1 | application/octet-stream |

### 1.1.1 Structured Reporting Root Template IDs

Table 1-3 lists all Template IDs (TID) of Root Templates that are supported by the system. The "Function" column indicates how the system uses the content of the DICOM SR:

- CREATE: The system creates instances using the specified TID.
- RENDER: The system displays the content of the SR, without using the data for any processing.
- EXTRACT_DATA: The system can extract structured data from the content and use the data for subsequent processing (e.g. reporting).
- OVERLAY: The system uses the information in the SR to display information directly on the images (e.g. Mammography CAD markers).
- ARCHIVE: The system stores instances for later retrieval

The "SOP Class UID" column indicates which of the SR Storage SOP Classes are used to encode the information or to store it. If multiple SOP Classes are supported the "Condition" column describes the conditions for using the different SOP Classes.

**Table 1-3. Supported Root SR Template IDs (TIDs)**

| Name | Root TID | Function | SOP Classes | | Condition |
|---|---|---|---|---|---|
| Measurement Report | 1500 | CREATE | Enhanced SR | 1.2.840.10008.5.1.4.1.1.88.22 | N/A |

## 1.2 DIMSE Services

### 1.2.1 Verification N/A

N/A

### 1.2.2 Storage

For details on supported Storage SOP Classes see Section 1.1.

### 1.2.3 Workflow Management N/A

N/A

### 1.2.4 Query/Retrieve N/A

N/A

### 1.2.5 Printing N/A

N/A

## 1.3 DICOM Web Services N/A

N/A

## 1.4 Media Services N/A

N/A

## 1.5 Real Time Video Service N/A

N/A

## 1.6 De-identification Profiles N/A

N/A

## 1.7 Specific Character Sets

The system can process the character sets in the Table 1-4. All DICOM objects generated by the system are using the character set ISO_IR 192 (UTF-8).

**Table 1-4. Supported Specific Character Sets for reading**

| Defined Term | Description |
|---|---|
| Single-Byte Character Sets without Code Extensions | |
| ISO_IR 6 | Default Repertoire |
| ISO_IR 100 | Latin alphabet No. 1 |
| ISO_IR 101 | Latin alphabet No. 2 |
| ISO_IR 109 | Latin alphabet No. 3 |
| ISO_IR 110 | Latin alphabet No. 4 |
| ISO_IR 144 | Cyrillic |
| ISO_IR 127 | Arabic |
| ISO_IR 126 | Greek |
| ISO_IR 138 | Hebrew |
| ISO_IR 148 | Latin alphabet No. 5 |
| ISO_IR 203 | Latin alphabet No. 9 |
| ISO_IR 13 | Japanese |
| ISO_IR 166 | Thai |
| Single-Byte Character Sets with Code Extension | |
| ISO 2022 IR 6 | Default repertoire |
| ISO 2022 IR 100 | Latin alphabet No. 1 |
| ISO 2022 IR 101 | Latin alphabet No. 2 |
| ISO 2022 IR 109 | Latin alphabet No. 3 |
| ISO 2022 IR 110 | Latin alphabet No. 4 |
| ISO 2022 IR 144 | Cyrillic |
| ISO 2022 IR 127 | Arabic |
| ISO 2022 IR 126 | Greek |
| ISO 2022 IR 138 | Hebrew |
| ISO 2022 IR 148 | Latin alphabet No. 5 |
| ISO 2022 IR 203 | Latin alphabet No. 9 |
| ISO 2022 IR 13 | Japanese |
| ISO 2022 IR 166 | Thai |

| Defined Term | Description |
|---|---|
| Multi-Byte Character Sets without Code Extensions | |
| ISO_IR 192 | Unicode in UTF-8 |
| GB18030 | GB18030 |
| GBK | GBK |
| Multi-Byte Character Sets with Code Extensions | |
| ISO 2022 IR 87 | Japanese |
| ISO 2022 IR 159 | |
| ISO 2022 IR 149 | Korean |
| ISO 2022 IR 58 | Simplified Chinese |

# Table of Contents

# 2 Introduction

## 2.1 Revision History

| Revision | Date | Product Version(s) | Change |
|---|---|---|---|
| Rev-1 | January 20, 2023 to May 8, 2023 | min. contextflow ADVANCE Chest CT 2.0 | Initial version |

## 2.2 Audience

This document is intended for the audience listed below. It is assumed that the reader has a working knowledge of the DICOM Standard.

The document structure was designed for easier access to relevant information for different user groups:

- System Integrators can use information in Section N.6 during system installation and also information from Section 3 Service and Interoperability Description for details regarding the implemented services.
- Field Service Engineers can use the details from Section N.5 Service and Interoperability Description and from Section 5 Network and Media Communication Details for troubleshooting.
- Hospital IT staff focusing on security can use the details provided in Section 6 Security regarding implemented Security features.

## 2.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between *contextflow ADVANCE Chest CT* and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

- The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.
- This Conformance Statement should not replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, it is the user's responsibility to perform the following validation activities:
- The comparison of Conformance Statements from *contextflow ADVANCE Chest CT* and other DICOM conformant equipment is the first step towards assessing interconnectivity and interoperability between those systems.
- Test procedures should be defined and executed to validate the required level of interoperability with specific DICOM conformant equipment, as established by the healthcare facility.

*contextflow ADVANCE Chest CT* has participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement of *contextflow ADVANCE Chest CT* together with the IHE Technical Framework may facilitate the process of validation testing.

## 2.4 Terms and Definitions

The following list includes DICOM Terms, that are used throughout this Conformance Statement:

| | |
|---|---|
| Abstract Syntax | The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class. |
| Application Entity (AE) | A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities. |
| Application Entity Title (AET) | The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network. |
| Application Context | The specification of the type of communication used between Application Entities. Example: DICOM network protocol. |
| Association | A network communication channel set up between Application Entities. |
| Attribute | A unit of information in an Information Object Definition; a Data Element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032). |
| Data Element | A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly |
| Information Object Definition (IOD) | The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). |
| Media Application Profile | The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs). |
| Module | A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient' Birth Date, and Patient's Sex. |

| | |
|---|---|
| Negotiation | First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded. |
| Origin Server | Refers to the program that can originate authoritative responses to HTTP requests for a given Target Resource. The term "server" refers to any implementation that receives a web service request message from a user agent. |
| Presentation Context | The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes. |
| Private SOP Class | A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement. |
| Protocol Data Unit (PDU) | A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages. |
| Security Profile | A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data. |
| Service Class Provider (SCP) | Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP). |
| Service Class User (SCU) | Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU). |
| Service/Object Pair Class (SOP Class) | The specification of the network or media transfer (service) of a particular type of data (object) ; the fundamental unit of a DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management. |
| Service/Object Pair Instance (SOP Instance) | An information object; a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image. |
| Specialized SOP Class | A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes, by enumeration of specific permitted Values for Attributes, or by enumeration of |

| | |
|---|---|
| | specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes. |
| Standard SOP Class | A SOP Class defined in the Standard, and that is implemented and used without any modifications. |
| Standard Extended SOP Class | A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes. |
| Tag | A 32-bit identifier for a Data Element, represented as a pair of four-digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]. |
| Transfer Syntax | The encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation. |
| TLS-Secured Port | TCP port on which an implementation accepts TLS connections to exchange DICOM information. |
| Unique Identifier (UID) | A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID. |
| User Agent | A client in a network protocol used in communications within a client-server distributed computing system. In particular, the Hypertext Transfer Protocol (HTTP) identifies the client software originating the request, using a user-agent header, even when the client is not operated by a user. |
| Value Representation (VR) | The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element. |

## 2.5 Abbreviations

Abbreviations that are used in this DICOM Conformance Statement are listed here.

| | |
|---|---|
| AE | Application Entity |
| AET | Application Entity Title |

| | |
|---|---|
| CAD | Computer Aided Detection |
| CDA | Clinical Document Architecture |
| CID | Context Identifier |
| DCS | DICOM Conformance Statement |
| DHCP | Dynamic Host Configuration Protocol |
| DICOM | Digital Imaging and Communications in Medicine |
| ELE | Explicit VR Little Endian |
| FSC | File-Set Creator |
| FSU | File-Set Updater |
| FSR | File-Set Reader |
| IANA | Internet Assigned Numbers Authority |
| IHE | Integrating the Healthcare Enterprise |
| ILE | Implicit VR Little Endian |
| IOD | Information Object Definition |
| IPv4 | Internet Protocol version 4 |
| IPv6 | Internet Protocol version 6 |
| ISO | International Organization for Standardization |
| MPPS | Modality Performed Procedure Step |
| MWL | Modality Worklist |
| NEMA | National Electrical Manufacturers Association |
| NTP | Network Time Protocol |
| OID | Object Identifier |
| OS | Origin Server |
| PDU | Protocol Data Unit |

| | |
|---|---|
| PHI | Protected Health Information |
| PPS | Performed Procedure Step |
| QIDO-RS | Query based on ID for DICOM Objects by RESTful Services |
| RTV | Real Time Video |
| SCP | Service Class Provider |
| SCU | Service Class User |
| SDP | Service Description Protocol |
| SOP | Service-Object Pair |
| SPS | Scheduled Procedure Step |
| SR | Structured Reporting |
| STOW-RS | STore Over the Web by RESTful Services |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| TID | Template Identifier |
| UA | User Agent |
| UI | User Interface |
| UID | Unique Identifier |
| UL | Upper Layer |
| UPS | Unified Procedure Step |
| UPS-RS | Unified Procedure Step by RESTful Services |
| VR | Value Representation |
| WADO-RS | Web Access to DICOM Objects by RESTful Services |
| WADO-URI | Web Access to DICOM Objects by URI |

## 2.6 References

[1] National Electrical Manufacturers Association (NEMA), Rosslyn, VA USA. *PS3 / ISO 12052 Digital Imaging and Communications in Medicine (DICOM) Standard*. http://www.dicomstandard.org .

# 3 Implementation Model

The product *contextflow ADVANCE Chest CT (version min. 2.0)* is implemented within three major components each of which covering different system requirements: The application frontend is the user-interface implemented as a Web Application, components implementing the AI functionality and the backend, which is responsible for preparing incoming datasets for examination, managing query execution, combining query results and presenting this functionality in an API which is used by the application frontend. The backend is implemented following a micro service architecture, with the DICOM Report Service (DRS) generating DICOM data objects and the Medical Data Gateway (MDG) service providing all DICOM Networking related functionality.

The MDG service has one Application Entity (AE) called CTXFLW, which implements DIMSE C-STORE functionality.

## 3.1 Application Entities and Data Flow

The network and media interchange application model for the *contextflow ADVANCE Chest CT* is shown in Figure 3-1 *contextflow ADVANCE Chest CT* Application Data Flow Diagram. The arrows represent the DIMSE C-STORE service.

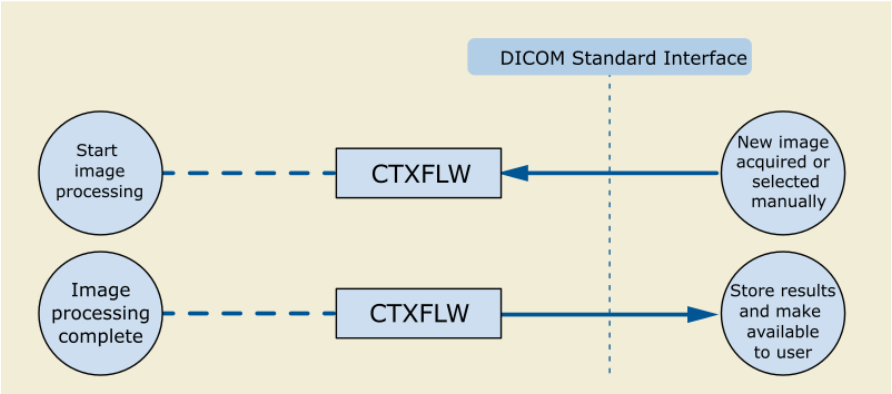


**Figure 3-1. *contextflow ADVANCE Chest CT* Application Data Flow Diagram**

### 3.1.1 Functional Definition of *CTXFLW*

The sole AE CTXFLW receives CT Images as a DIMSE C-STORE Service Class Provider (SCP) from the customer and sends Secondary Capture, Enhanced SR and Encapsulated PDF DICOM objects as a DIMSE C-STORE Service Class User (SCU) to a configurable customer DIMSE peer (usually the PACS).

# 4 Service and Interoperability Description

## 4.1 Mapping of Services to Application Entities

Table 4-1 provides an overview of the Application Entities and the Services supported by each AE.

**Table 4-1. Service to AE Mapping**

| Application Entity | Supported Services | Role | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DIMSE | | DICOM Web | | DICOM Media | | | Real-Time Video | |
| | | SCU | SCP | Origin Server | User Agent | FSC | FSU | FSR | SCU | SCP |
| CTXFLW | Storage | Y | Y | N | N | N | N | N | N | N |

## 4.2 Supported DIMSE Services

### 4.2.1 Basic Worklist Management Service N/A

N/A

### 4.2.2 Modality Performed Procedure Step Service N/A

N/A

### 4.2.3 Unified Worklist and Procedure Step Service N/A

N/A

### 4.2.4 Instance Availability Notification Service N/A

N/A

### 4.2.5 Storage Service

#### 4.2.5.1 SCU of the Storage SOP Classes

As a Service Class User of the Storage Service Class, *contextflow ADVANCE Chest CT* uses the C-STORE-RQ message to request storage of DICOM objects by a remote SCP. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

For details regarding the content of SOP Instances that are created by the system, see Section N.9, which describes the underlying IOD of the supported SOP Classes.

The storage requests are triggered automatically as soon as the analysis of a previously received study is complete and the instances containing the results have been generated. These instances are created within new series inside the study that was analyzed.

#### 4.2.5.1.1 Transcoding of Transfer Syntaxes N/A

N/A

### 4.2.5.2 SCP of the Storage SOP Classes

As a Service Class Provider of the Storage Service Class, *contextflow ADVANCE Chest CT* receives the C-STORE-RQ message from remote SCUs. See Section 1.1 *Content and Transfer* in the *Overview* for the list of supported SOP Classes.

Table 4-2 defines the conformance levels of *contextflow ADVANCE Chest CT*.

**Table 4-2. Levels of Conformance**

| | |
|---|---|
| Levels of Conformance | 2 |
| Level of Digital Signature Support | 1 |

*contextflow ADVANCE Chest CT* does not coerce any Attributes upon receiving them from other systems.

Table 4-3 lists any limitations on displaying or processing instances, e.g., display or processing of the respective SOP Instances is prevented by an unsupported Value for an Attribute or the absence of that Attribute.

The "Effect" column describes what happens if the limitation is encountered. The following Values are used:

- ND: Display is not possible
- LD: Display is limited
- NP: Processing is not possible
- LP: Processing is limited
- OT: Other effects described in the "Comments" column

**Table 4-3. Display and Processing Limitations for Storage SCP**

| Limitation Case | | | Effect | Comments |
|---|---|---|---|---|
| **Attribute Name** | **Tag** | **Value** | | |
| **CT Image Storage** (1.2.840.10008.5.1.4.1.1.2) | | | | |
| Rows | (0028,0010) | Not: 512 | NP | Only 512x512 images can be processed. |
| Columns | (0028,0011) | | | |
| Transfer Syntax UID | (0002,0010) | Not one of:<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | NP | Only uncompressed or JPEG Baseline images can be processed. |

Table 4-4 lists the actions performed upon receiving instances from a remote AE and the system behavior when certain conditions are encountered

**Table 4-4. Behavior when storing Instances**

| Action upon Receiving | Condition | System Behavior |
|---|---|---|
| Attempt to process one series of a study | No further instances from a study were received for a configurable duration. | The system selects one of the received series based on the image dimensions, slice spacing and slice thickness and attempts to process it. If successful, the analysis results for the study are based on this series. |
| Add series to an existing study | No previously received series was processed successfully. | An attempt is made to process the new series. If successful, the analysis results for the study are based on this series. |
| Ignore series | A previously received series has been processed successfully. | No action is performed and the analysis results for the study are based on the previously received series. |

Table 4-5 describes how the SCP handles compression for stored instances.

The following Values are used in the "Behavior" column:

- AS_IS: Images are stored as received.
- CONFIGURATION: Images are compressed based on internal configuration settings.
- OTHER: All other conditions, which are further described in the "Comments" column.

The Transfer Syntax is used to describe the compression mechanism applied.

**Table 4-5. Image Compression by Storage SCP**

| SOP Class | Behavior | Transfer Syntax | | Comments |
|---|---|---|---|---|
| All SOP Classes | AS_IS | | | |

### 4.2.6 Storage Commitment Service N/A

N/A

### 4.2.7 Query/Retrieve Service Class N/A

N/A

### 4.2.8 Print Management Service N/A

N/A

## 4.3 Supported DICOM Web Services N/A

N/A

## 4.4 Media Service N/A

N/A

## 4.5 Real Time Video Service N/A

N/A

## 4.6 Cross Service Considerations N/A

N/A

## 4.7 Specific Character Sets

For Specific Character Sets supported in addition to the default character repertoire, refer to Section 1.7 for the Values for Specific Character Set (0008,0005).

# 5 Configuration

The system is configured entirely based on configuration files that are managed by contextflow operators.

Throughout all subsections the following Values can be used in the "Configurable" column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

## 5.1 General Configuration Parameters

Table 5-1 lists general configuration parameters applicable across all supported DICOM Services.

**Table 5-1. General Configuration Parameters**

| Parameter | Configurable | Default Value | Comments |
|---|---|---|---|
| Max PDU | NO | 16384 | |
| Timeout waiting for instances before a study is considered complete | SERVICE | 20 seconds | |

## 5.2 Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.
In order to identify whether contextflow DETECT Lung CT is an SCP and / or an SCU, the following applies:

- SCP: The (Secured) Local Called AET and Remote Calling AET parameters are present.
- SCU: The (Secured) Local Calling AET and Remote Called AET parameters are present.

### 5.2.1 Basic Worklist Management Service Configuration N/A

N/A

### 5.2.2 Modality Performed Procedure Step Service Configuration N/A

N/A

### 5.2.3 Unified Worklist and Procedure Step Service Configuration N/A

N/A

### 5.2.4 Instance Availability Notification Service Configuration N/A

N/A

### 5.2.5 Storage Service Configuration

Table 5-2 lists Storage Service configuration parameters:

**Table 5-2. Storage Service Parameters**

| Local Configuration Parameters - Storage Service | | | |
|---|---|---|---|
| **Parameter** | **Configurable** | **Default Value** | **Comments** |
| Calling AE Title (SCU) | SERVICE | CTXFLW | |
| Called AE Title (SCP) | SERVICE | CTXFLW | |
| Port high priority | SERVICE | 1104 | |
| Port low priority | SERVICE | 1105 | Data received over the low priority port is only processed when no high priority data is available |
| Supported Transfer Syntax as SCP | FIXED | See Table 1-2 | |
| Supported storage SOP classes as SCP | FIXED | See Table 1-1 | |

### 5.2.6 Storage Commitment Service Configuration N/A

N/A

### 5.2.7 Query/Retrieve Service Configuration N/A

N/A

### 5.2.8 Print Management Service Configuration N/A

N/A

## 5.3 Configuration of DICOM Web Services N/A

N/A

## 5.4 Configuration of Media Storage Service N/A

N/A

## 5.5 Configuration of Real Time Video Service N/A

N/A

## 5.6 Configuration of Audit Trail - Syslog N/A

N/A

# 6 Network and Media Communication Details

## 6.1 General

Since there is only one AE, there are no cross interactions. The real world activities of the AE CTXFLW are depicted in the diagram below.

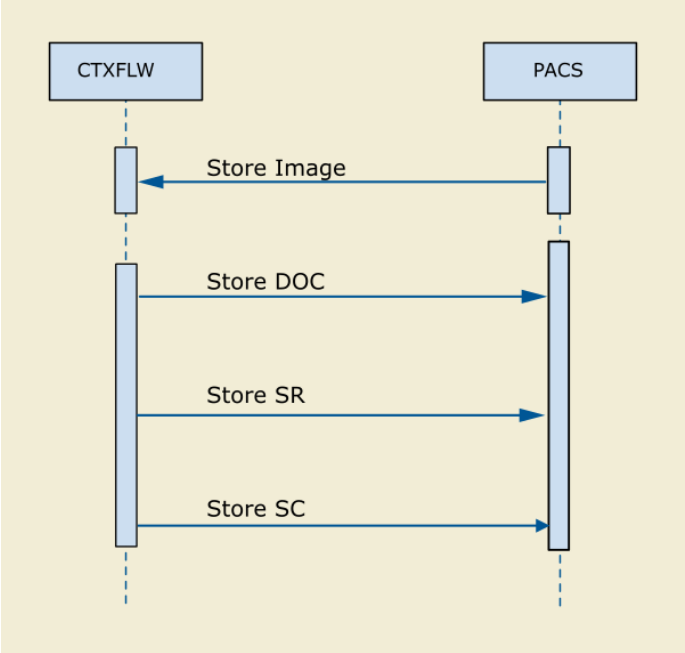


**Figure 6-1. Real-World Activity**

# 7 Security

## 7.1 Introduction

The security section describes security features implemented by this product. It includes descriptions of non-DICOM network protocols, information to configure firewalls and application whitelists, lists of supported DICOM security profiles as well as Web Security features. Additionally, secured media storage, VPN, etc. are also specified in this security section.

## 7.2 External Network Requirements N/A

N/A

## 7.3 TCP Port Configuration

See Section *5 Configuration* for information on the usage of ports for DICOM and other protocols. This section contains helpful information for product administrators to configure firewalls, application whitelists, etc.

The system requires the following open ports for inbound connections:

- 22 (SSH)
- 80 (HTTP)
- 443 (HTTPS)
- 1104 (DIMSE)

## 7.4 DICOM Security Profiles Support

### 7.4.1 Secure Use and User Identity Profiles N/A

N/A

### 7.4.2 Secure Transport Connection Profiles N/A

N/A

### 7.4.3 Media Storage Security Profiles N/A

N/A

### 7.4.4 Attribute Confidentiality Profiles N/A

N/A

### 7.4.5 Digital Signature Profiles N/A

N/A

### 7.4.6 Additional DICOM Security Profiles N/A

N/A

## 7.5 User Identity Negotiation Support N/A

N/A

## 7.6 Web Services Security Features

- Audit control mechanism used
  User interaction With PHI related datasets is logged for audit purpose.
- Personal authentication mechanisms
  User access is granted by user name and password authentication. Additionally a trusted external component (usually the PACS) can implement a token URL generation which authenticates the user without the need to provide username and password.
- Certification management tools and process
  TLS certificates must be provided by the client since the system is generally installed within the clients network.

## 7.7 Other Security Features

### 7.7.1 Media Storage Security N/A

N/A

### 7.7.2 Network Security

It is the responsibility of the client who owns the network our system operates in provide or allow Network Security components.

# Annex A Information Object Definitions (IODs)

This section describes all the SOP Instances natively created by *contextflow ADVANCE Chest CT*, i.e., all SOP Classes that are marked in the "Created" column in Table 1-1.

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.
- QUERY: The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.
- SRC_INSTANCE: The Value is copied from previously created/received SOP Instances.

The "Presence" columns reflect the usage of the Module, Functional Group Macro, Attributes, or Value in the *contextflow ADVANCE Chest CT* Implementation and is not necessarily the same as defined in the DICOM Standard. For the "Presence" column the following Values can be used:

- ALWAYS: the module, functional group macro, Attributes or Value is always present.
- CONDITIONAL: the presence of the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Conditions" column.
- SRC_COPY: The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a Value (zero length).

## A.1 Information Shared Across Multiple IODs

### A.1.1 Common Modules

All SOP Instances generated by the system use the common modules listed in Table A-1 to Table A-10 or a subset of them, as defined in the IOD specific subsections below.

**Table A-1. Patient Module**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Patient's Name | (0010,0010) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Patient ID | (0010,0020) | SRC_INSTANCE | ALWAYS | ALWAYS | | | |
| Patient's Birth Date | (0010,0030) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Patient's Sex | (0010,0040) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |

### Table A-2. General Study Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Study Instance UID | (0018,000D) | SRC_INSTANCE | ALWAYS | ALWAYS | | | |
| Study Date | (0008,0020) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Study Time | (0008,0030) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Referring Physician's Name | (0008,0090) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Study ID | (0020,0010) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |
| Accession Number | (0008,0050) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |

### Table A-3. General Series Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Modality | (0008,0060) | FIXED | ALWAYS | ALWAYS | CT, SR, DOC | | Value fixed for each IOD |
| Series Instance UID | (0020,000E) | GENERATED | ALWAYS | ALWAYS | | | |
| Series Number | (0020,0011) | FIXED | ALWAYS | ALWAYS | 11335 | | |
| Series Description | (0008,103E) | CONFIGURATION | ALWAYS | ALWAYS | See A.2 - A.3 | | Value configured for each IOD |

### Table A-4. Frame of Reference Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Frame of Reference UID | 0020,0052) | SRC_INSTANCE | ALWAYS | SRC_COPY | | | |

### Table A-5. General Equipment Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Manufacturer | (0008,0070) | FIXED | ALWAYS | NEVER | | | |

### Table A-6. General Image Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Comments |
|---|---|---|---|---|---|---|
| Instance Number | (0020,0013) | GENERATED | ALWAYS | ALWAYS | 1, ..., n | The i-th instance in a series has instance number i. |

### Table A-7. Image Pixel Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Samples per Pixel | (0028,0002) | FIXED | ALWAYS | ALWAYS | 3 | | |
| Photometric Interpretation | (0028,0004) | FIXED | ALWAYS | ALWAYS | YBR_FULL_422 | | |
| Planar Configuration | (0028,0006) | FIXED | ALWAYS | ALWAYS | 0 | | |
| Rows | (0028,0010) | GENERATED | ALWAYS | ALWAYS | | | Image dimensions depend on the number of analyzed patterns |
| Columns | (0028,0011) | | | | | | |
| Bits Allocated | (0028,0100) | FIXED | ALWAYS | ALWAYS | 8 | | |
| Bits Stored | (0028,0101) | FIXED | ALWAYS | ALWAYS | 8 | | |
| High Bit | (0028,0102) | FIXED | ALWAYS | ALWAYS | 7 | | |
| Pixel representation | (0028,0103) | FIXED | ALWAYS | ALWAYS | 0 | | |

### Table A-8. Multi-Frame Functional Groups Module

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Shared Functional Groups Sequence | (5200,9229) | FIXED | ALWAYS | ALWAYS | | | |
| >Plane Orientation Sequence | (0020,9116) | FIXED | ALWAYS | ALWAYS | | | |
| >>Image Orientation (Patient) | (0020,0037) | SRC_INSTANCE | ALWAYS | ALWAYS | | | |

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Per-frame Functional Groups Sequence | (5200,9230) | FIXED | ALWAYS | ALWAYS | | | |
| >Plane Position Sequence | (0020,9113) | FIXED | ALWAYS | ALWAYS | | | |
| >>Image Position (Patient) | (0020,0032) | SRC_INSTANCE | ALWAYS | ALWAYS | | | |

**Table A-9. Multi-Frame Dimension Module**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Dimension Organization Sequence | (0020,9221) | GENERATED | ALWAYS | ALWAYS | | | |
| >Dimension Organization UID | (0020,9164) | GENERATED | ALWAYS | ALWAYS | | | |
| Dimension Index Sequence | (0020,9222) | FIXED | ALWAYS | ALWAYS | | | |
| >Dimension Index Pointer | (0020,9165) | FIXED | ALWAYS | ALWAYS | 0020,0032 | | |
| >Functional Group Pointer | (0020,9167) | FIXED | ALWAYS | ALWAYS | 5200,9230 | | |

**Table A-10. SOP Common Module**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Specific Character Set | (0008,0005) | FIXED | ALWAYS | ALWAYS | ISO_IR 192 | | |
| SOP Class UID | (0008,0016) | FIXED | ALWAYS | ALWAYS | | | Value matches SOP Class of generated object |
| SOP Instance UID | (0008,0018) | GENERATED | ALWAYS | ALWAYS | | | |
| Instance Creation Date | (0008,0012) | GENERATED | ALWAYS | ALWAYS | | | |
| Instance Creation Time | (0008,0013) | GENERATED | ALWAYS | ALWAYS | | | |

### A.1.2 Common Functional Group Macros N/A

N/A

### A.1.3 Common Private Modules N/A

N/A

### A.1.4 Coded Values

Table A-11 lists Coded Values referenced from the "Value" column of the tables above.

**Table A-11. Values and Code Sets shared across IODs**

| Attribute Name | Tag | Value/Code | Condition | Comments |
|---|---|---|---|---|
| Specific Character Set | (0008,0005) | ISO_IR 192 | Unicode in UTF-8 | |
| Photometric Interpretation | (0028,0004) | YBR_FULL_422 | JPEG compressed Images | |

## A.2 Multi-frame True Color Secondary Capture Image IOD

Table A-12 defines the structure of Multi-frame True Color Secondary Capture Image IOD.

**Table A-12. Multi-frame True Color Secondary Capture Image IOD**

| IE | Module Name | Presence (Module) | Condition | Reference |
|---|---|---|---|---|
| Patient | Patient Module | ALWAYS | | Table A-1 |
| Study | General Study Module | ALWAYS | | Table A-2 |
| Series | General Series Module | ALWAYS | | Table A-3 |
| Frame Of Reference | Frame of Reference | ALWAYS | | Table A-4 |
| Equipment | General Equipment Module | ALWAYS | | Table A-5 |
| | SC Equipment | ALWAYS | | Table A-13 |
| Image | General Image Module | ALWAYS | | Table A-6 |
| | Image Pixel Module | ALWAYS | | Table A-7 |
| | Multi Frame Module | ALWAYS | | Table A-16 |
| | Multi-Frame Dimension Module | ALWAYS | | Table A-9 |
| | Multi-Frame Functional Groups Module | ALWAYS | | Table A-8 |
| | SC Multi-frame Image | ALWAYS | | Table A-14 |
| | SC Multi-frame Vector | ALWAYS | | Table A-15 |

### A.2.1 Multi-frame True Color Secondary Capture Image IOD Specific Modules

The following tables list Modules and Attributes specific for Multi-frame True Color Secondary Capture Image IOD.

**Table A-13. SC Equipment Module for Multi-frame True Color Secondary Capture Image IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Modality | (0008,0060) | FIXED | ALWAYS | ALWAYS | CT | | |
| Conversion Type | (0008,0064) | FIXED | ALWAYS | ALWAYS | WSD | | |

**Table A-14. SC Multi-frame Image Module for Multi-frame True Color Secondary Capture Image IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Frame Increment Pointer | (0028,0009) | FIXED | ALWAYS | ALWAYS | 0018,2005 | | |
| Pixel Spacing | (0028,0030) | SRC_INSTANCE | ALWAYS | ALWAYS | | | |
| Burned In Annotation | (0028,0301) | FIXED | ALWAYS | ALWAYS | NO | | |

**Table A-15. SC Multi-frame Vector Module for Multi-frame True Color Secondary Capture Image IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Slice Location Vector | (0018,2005) | GENERATED | ALWAYS | ALWAYS | | | |

**Table A-16. Multi-frame Module for Multi-frame True Color Secondary Capture Image IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Number of Frames | (0028,0008) | GENERATED | ALWAYS | ALWAYS | | | |
| Frame Increment Pointer | (0028,0009) | GENERATED | ALWAYS | ALWAYS | | | |

## A.2.2 Multi-frame True Color Secondary Capture Image IOD Coded Values

Table A-17 lists Coded Values referenced from the "Value" column of the tables above for Multi-frame True Color Secondary Capture Image IOD:

**Table A-17. Values and Code Sets for Multi-frame True Color Secondary Capture Image IOD**

| Attribute Name | Tag | Value/Code | Condition | Comments |
|---|---|---|---|---|
| Conversion Type | (0008,0064) | WSD | Workstation | |

## A.3. Encapsulated PDF IOD

Table A-18 defines the structure of Encapsulated PDF IOD.

**Table A-18. Encapsulated PDF IOD**

| IE | Module Name | Presence (Module) | Condition | Reference |
|---|---|---|---|---|
| Patient | Patient Module | ALWAYS | | Table A-1 |
| Study | General Study Module | ALWAYS | | Table A-2 |
| Series | Encapsulated Document Series Module | ALWAYS | | Table A-19 |
| Equipment | General Equipment Module | ALWAYS | | Table A-5 |
| | SC Equipment | ALWAYS | | Table A-13 |
| Encapsulated Document | Encapsulated Document Module | ALWAYS | | Table A-20 |
| | SOP Common Module | ALWAYS | | Table A-10 |

### A.3.1 Encapsulated PDF IOD Specific Modules

The tables below list Modules and Attributes used in Encapsulated PDF IOD:

**Table A-19. Encapsulated Document Series Module used in Encapsulated PDF IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Modality | (0008,0060) | *FIXED* | ALWAYS | *ALWAYS* | *DOC* | | |
| Series Instance UID | (0020,000E) | GENERATED | ALWAYS | ALWAYS | | | |
| Series Number | (0020,0011) | FIXED | ALWAYS | ALWAYS | 11335 | | |
| Series Description | (0008,103E) | CONFIGURATION | ALWAYS | ALWAYS | contextflow ADVANCE Chest CT - Insights PDF Report | | |

**Table A-20. Encapsulated Document General Module used in Encapsulated PDF IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Instance Number | (0020,0013) | FIXED | ALWAYS | ALWAYS | 1 | | |
| Content Date | (0008,0023) | GENERATED | ALWAYS | ALWAYS | Current date | | |

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Content Time | (0008,0033) | GENERATED | ALWAYS | NEVER | empty | | |
| Acquisition DateTime | (0008,002A) | SRC_INSTANCE | ALWAYS | NEVER | empty | | |
| Burned In Annotation | (0028,0301) | FIXED | ALWAYS | ALWAYS | YES | | |
| Document Title | (0042,0010) | FIXED | ALWAYS | ALWAYS | contextflow ADVANCE Chest CT - Insights PDF Report | | |
| Concept Name Code Sequence | (0040,A043) | FIXED | ALWAYS | NEVER | empty | | |
| MIME Type of Encapsulated Document | (0042,0012) | FIXED | ALWAYS | ALWAYS | application/pdf | | |
| Encapsulated Document | (0042,0011) | GENERATED | ALWAYS | ALWAYS | | | |

## A.4. Enhanced SR IOD

Table A-21 defines the structure of Enhanced SR IOD.

**Table A-21. Enhanced SR IOD**

| IE | Module Name | Presence (Module) | Condition | Reference |
|---|---|---|---|---|
| Patient | Patient Module | ALWAYS | | Table A-1 |
| Study | General Study Module | ALWAYS | | Table A-2 |
| Series | SR Document Series Module | ALWAYS | | Table A-22 |
| Equipment | General Equipment Module | ALWAYS | | Table A-5 |
| Document | SR Document General Module | ALWAYS | | Table A-23 |
| | SR Document Content | ALWAYS | | Table A-24 |
| | SOP Common Module | ALWAYS | | Table A-10 |

### A.4.1 Enhanced SR IOD Specific Modules

The tables below list Modules and Attributes used in Enhanced SR IOD*:*

**Table A-22. SR Document Series Module used in Enhanced SR IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Modality | (0008,0060) | FIXED | | ALWAYS | SR | | |

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Referenced Performed Procedure Step Sequence | (0008,1111) | FIXED | ALWAYS | NEVER | empty | | |
| Series Instance UID | (0020,000E) | GENERATED | ALWAYS | ALWAYS | | | |
| Series Number | (0020,0011) | FIXED | ALWAYS | ALWAYS | 11335 | | |

**Table A-23. SR Document General Module used in Enhanced SR IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Instance Number | (0020,0013) | FIXED | ALWAYS | ALWAYS | 1 | | |
| Completion Flag | (0040,A491) | FIXED | ALWAYS | ALWAYS | COMPLETE | | |
| Verification Flag | (0040,A493) | FIXED | ALWAYS | ALWAYS | UNVERIFIED | | |
| Content Date | (0008,0023) | GENERATED | ALWAYS | ALWAYS | Current date | | |
| Content Time | (0008,0033) | GENERATED | ALWAYS | ALWAYS | Current time | | |

**Table A-24. SR Document Content Module used in Enhanced SR IOD**

| Attribute Name | Tag | Source | Presence of Attribute | Presence of Value | Value | Conditions | Comments |
|---|---|---|---|---|---|---|---|
| Value Type | (0040,A040) | FIXED | ALWAYS | ALWAYS | CONTAINER | | |
| Continuity of Content | (0040,A050) | FIXED | ALWAYS | ALWAYS | SEPARATE | | |
| Content Template Sequence | (0040,A504) | FIXED | CONDITION | ALWAYS | See Annex B for encoding on supported TIDs | Present if the object follows a template | |
| Content Sequence | (0040,A730) | GENERATED | ALWAYS | ALWAYS | | | |

# Annex B Structured Report Content Encoding

This section provides the detailed content encoding for all TIDs supported by *contextflow ADVANCE Chest CT.*

Throughout the tables listed in Section N.10 the following codes are used for the "Source" and "Presence of Content Item" columns.

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.
- QUERY: The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.
- SRC_INSTANCE: The Value is copied from previously created/received SOP Instances.

In the "Presence of Conten Item" the following Values can be used:

- ALWAYS: the module, functional group macro, Attributes or Value is always present.
- CONDITIONAL: the presence of the the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Comments" column.
- SRC_COPY: The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a Value (zero length).

## B.1 Nodule Detection SR (TID 1500)

Table B-1 shows the encoding of content of a Nodule Detection SR (TID 1500).

**Table B-1. Nodule Detection SR (TID 1500)**

| NL | Rel with Parent | VT | Concept Name | Source | Presence of Content Item | Values | TID | Comments |
|---|---|---|---|---|---|---|---|---|
| | | CONTAINER | (126000,DCM,"Imaging Measurement Report") | | ALWAYS | | 1500 | |
| > | HAS OBS CONTEXT | CODE | (121005,DCM,"Observer Type") | FIXED | ALWAYS | (121007,DCM,"Device") | | |
| > | HAS OBS CONTEXT | TEXT | (121014,DCM,"Device Observer Manufacturer") | FIXED | ALWAYS | contextflow GmbH | | |

| NL | Rel with Parent | VT | Concept Name | Source | Presence of Content Item | Values | TID | Comments |
|---|---|---|---|---|---|---|---|---|
| > | HAS OBS CONTEXT | TEXT | (121015,DCM,"Device Observer Model Name") | FIXED | ALWAYS | contextflow ADVANCE Chest CT | | |
| | | | | | | | | |
| > | CONTAINS | CONTAINER | (126010,DCM,"Imaging Measurements") | | ALWAYS | | | |
| >> | HAS CONCEPT MOD | TEXT | (111001,DCM,"Algorithm Name") | FIXED | ALWAYS | contextflow ADVANCE Chest CT | | |
| >> | HAS CONCEPT MOD | TEXT | (111001,DCM,"Algorithm Version") | FIXED | ALWAYS | | | |
| >> | HAS CONCEPT MOD | TEXT | (111001,DCM,"Algorithm Parameters") | FIXED | ALWAYS | | | |
| | | | | | | | | |
| >> | CONTAINS | CONTAINER | (125007,DCM,"Measurement Group") | | ALWAYS | | 1411 | Multiple entries can be present |
| >>> | HAS OBS CONTEXT | TEXT | (112039,DCM,"Tracking Identifier") | GENERATED | ALWAYS | | | |
| >>> | HAS OBS CONTEXT | UIDREF | (112040,DCM,"Tracking Unique Identifier") | GENERATED | ALWAYS | | | |
| >>> | CONTAINS | CODE | (121071,DCM,"Finding") | FIXED | ALWAYS | (27925004, SCT,"Nodule") | | |
| >>> | CONTAINS | SCOORD | (111030,DCM,"Image Region") | GENERATED | ALWAYS | POINT{X,Y} | | |
| >>>> | SELECTED FROM | IMAGE | (260753009,SCT,"Source") | SRC_INSTANCE | ALWAYS | Source SOP Instance UID | | |
| >>> | CONTAINS | NUM | (103340004,SCT,"Short Axis") | GENERATED | ALWAYS | X (mm,UCUM,"millimeter") | | |
| >>>> | INFERRED FROM | SCOORD | (121055,DCM,"Path") | GENERATED | ALWAYS | POLYLINE {X1,Y1,X2,Y2} | | |
| >>>>> | SELECTED FROM | IMAGE | (260753009,SCT,"Source") | SRC_INSTANCE | ALWAYS | Source SOP Instance UID | | |
| >>> | CONTAINS | NUM | (103339001,SCT,"Long Axis") | GENERATED | ALWAYS | X (mm,UCUM,"millimeter") | | |
| >>>> | INFERRED FROM | SCOORD | (121055,DCM,"Path") | GENERATED | ALWAYS | POLYLINE {X1,Y1,X2,Y2} | | |
| >>>>> | SELECTED FROM | IMAGE | (260753009,SCT,"Source") | SRC_INSTANCE | ALWAYS | Source SOP Instance UID | | |

| NL | Rel with Parent | VT | Concept Name | Source | Presence of Content Item | Values | TID | Comments |
|---|---|---|---|---|---|---|---|---|
| >>> | CONTAINS | NUM | (YEKZ,IBSI,"Volume from Voxel Summation") | GENERATED | ALWAYS | X (mm3,UCUM,"cubic millimeter") | | |

### B.1.1 Code Sets

The following tables list specific code sets referenced from the Nodule Detection SR (TID 1500).

**Table B-2. Nodule Detection SR Codes**

| Coding Scheme Designator | Code Value | Code Meaning |
|---|---|---|
| DCM | 126000 | Imaging Measurement Report |
| DCM | 121007 | Device |
| DCM | 121005 | Observer Type |
| DCM | 121014 | Device Observer Manufacturer |
| DCM | 121015 | Device Observer Model Name |
| DCM | 126010 | Imaging Measurements |
| DCM | 111001 | Algorithm Name |
| DCM | 111003 | Algorithm Version |
| DCM | 111002 | Algorithm Parameters |
| DCM | 125007 | Measurement Group |
| DCM | 112039 | Tracking Identifier |
| DCM | 112040 | Tracking Unique Identifier |
| DCM | 121071 | Finding |
| SCT | 27925004 | Nodule |
| DCM | 111030 | Image Region |
| SCT | 260753009 | Source |
| SCT | 103339001 | Long Axis |
| UCUM | mm | millimeter |
| DCM | 121055 | Path |
| SCT | 103340004 | Short Axis |
| YEKZ | IBSI | Volume from Voxel Summation |
| UCUM | mm3 | cubic millimeter |

# Annex C Security Details N/A

N/A

# Annex D Mapping of Attributes N/A

N/A

# Annex E Code Set Usage N/A

N/A