

DOC-2026-138 v5 — XyDromatics VNA Repository — DICOM Conformance Statement

Document number: DOC-2026-138 **Title:** XyDromatics VNA Repository — DICOM Conformance Statement
Version: v5 **Category:** DICOM Conformance Statement **Product:** XyDromatics VNA Repository **Release version:** 1.0.2.182 **Classification:** Non-device software (FD&C Act §520(o)(1)(D)) **Owner:** Synthology Healthcare Solutions Group, LLC (SHSG) **Effective date:** (on approval) **Review cycle:** 1 year **Next review due:** TBD
Supersedes: v4 (DICOM Conformance Statement for XyDromatics VNA Repository 1.0.2.178; supersedes 1.0.1.134); v5 (2026-08-07) — release-alignment to XyDromatics VNA Repository 1.0.2.182 (RI-2026-489), canonical DOC-2026-467 masthead, no substantive content change.

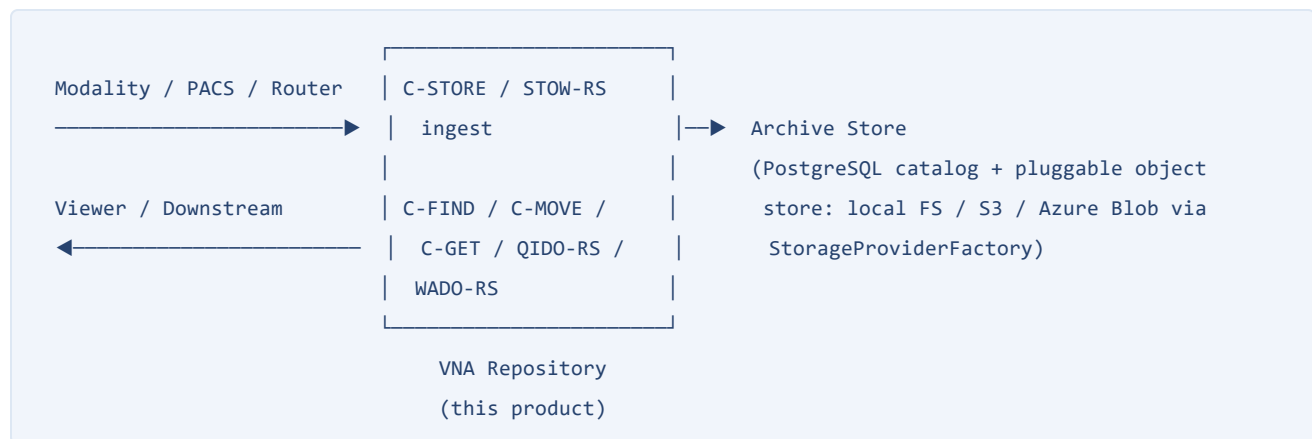
1. Conformance Statement Overview

XyDromatics VNA Repository is a Vendor-Neutral Archive component of the XyDromatics product family. Its DICOM implementation is built on .NET 10 with fo-dicom 5 for the classical DIMSE services and on ASP.NET Core controllers for DICOMweb. The services listed in the table below are **implemented and wired** in this release (1.0.2.182); services listed as *not supported* are deliberately absent from this release and their absence is not a bug.

DICOM Service	Support
Verification (C-ECHO) SCP	Yes
Storage (C-STORE) SCP	Yes
Storage (C-STORE) SCU	Yes (lossless-only outbound transcode; see §3.5)
Query/Retrieve (C-FIND) SCP	Yes (Study Root + Patient Root; PATIENT / STUDY / SERIES / IMAGE query levels)
Query/Retrieve (C-MOVE) SCP	Yes (Study Root + Patient Root)
Query/Retrieve (C-GET) SCP	Yes (Study Root + Patient Root)
Storage Commitment (N-ACTION / N-EVENT-REPORT)	Not supported (the <code>storage_commitment</code> license key is reserved for a future release)
Modality Performed Procedure Step (MPPS)	Not supported
Modality Worklist (MWL)	Not supported
DICOMweb STOW-RS	Yes
DICOMweb QIDO-RS	Yes
DICOMweb WADO-RS	Yes (study/series/instance retrieve + metadata)
DICOMweb WADO-URI	Not supported
DICOMweb Rendered Retrieve (JPEG/PNG)	Not supported
HL7 v2.x MLLP	Not supported on VNA Repository (see XyDromatics VNA Migration for HL7 ingest)

2. Implementation Model

2.1 Application Data Flow



2.2 Functional Definition

VNA Repository is non-device software under FD&C Act §520(o)(1)(D) — software that transfers, stores, converts, and forwards medical-imaging data and performs no clinical function. Its functions are: electronic transfer (DIMSE + DICOMweb), electronic storage (archive store with a pluggable object-store backend — local filesystem, S3, or Azure Blob, selected via `StorageProviderFactory`), electronic conversion (transfer-syntax decoding/encoding per PS3.5), and electronic display of DICOM metadata + thumbnails via the operator web UI. VNA Repository is **not a PACS**, is **not a diagnostic viewer**, and is **not intended for primary diagnostic image interpretation**.

2.3 Sequencing of Real-World Activities

Ingest and retrieval are stateless with respect to DIMSE associations; there is no modeled real-world-activity state machine other than the per-association negotiation and per-operation transactional semantics defined by PS3.7 and PS3.8.

3. AE Specifications

3.1 Application Entity Identification

The archive exposes a single AE by default; the deploying institution sets the AE Title and listening ports at MSI install time. Defaults if not overridden:

Parameter	Default	Configurable at	Notes
Storage SCP AE Title	XYDROMATICS_VNA_REPO	MSI + Settings → DICOM	
Storage SCP port	11112	MSI + Settings → DICOM	TCP
Query/Retrieve SCP AE Title	XYDROMATICS_VNA_REPO	MSI + Settings → DICOM	May share title with Storage SCP
Query/Retrieve SCP port	11113	MSI + Settings → DICOM	TCP
Web UI port	5201	MSI	TCP, HTTPS
DICOMweb base path	/dicomweb/	Not configurable	On the Web UI port

3.2 Association Policy

- Maximum PDU size accepted / proposed: 131 072 bytes (128 KiB)
- Association timeout: 30 s
- DIMSE timeout: 60 s
- Asynchronous operations: not negotiated (single-association synchronous)
- Called AE title validation: enforced; associations for unknown Called AE are rejected with reason `called-AE-title-not-recognized`.
- Calling AE title whitelist: **enforced when configured**. Per-peer whitelist is a supported deployment control for the Storage SCP; unlisted Calling AE titles are rejected with reason `calling-AE-title-not-recognized`.

3.3 Storage SCP — Accepted SOP Classes

VNA Repository's Storage SCP accepts any Storage-class SOP class whose UID matches the Storage category UID prefix `1.2.840.10008.5.1.4.1.1.*`. This includes (non-exhaustive):

- CT Image Storage (`1.2.840.10008.5.1.4.1.1.2`)
- MR Image Storage (`1.2.840.10008.5.1.4.1.1.4`)
- Enhanced CT / MR / Ultrasound / XA / XRF Image Storage
- Computed Radiography Image Storage (`1.2.840.10008.5.1.4.1.1.1`)
- Digital X-Ray / Mammography / Intra-Oral Image Storage
- Secondary Capture Image Storage (+ Multi-frame SC variants)
- Ultrasound Image / Ultrasound Multi-frame Image Storage
- Nuclear Medicine Image Storage
- PET Image / Enhanced PET Image Storage
- VL Photographic / Microscopic / Slide-Coordinates / Whole Slide Microscopy Image Storage
- Ophthalmic Photography / Tomography Image Storage
- Radiotherapy Image / Dose / Plan / Structure Set Storage
- Structured Report — Basic Text SR (`1.2.840.10008.5.1.4.1.1.88.11`), Enhanced SR, Comprehensive SR, Comprehensive 3D SR
- Key Object Selection Document Storage
- Presentation State Storage (Grayscale / Color / Pseudo-Color / Blending / XA-XRF / Planar MPR)
- Encapsulated PDF / CDA / STL / OBJ Storage

As of 1.0.2.182, **Basic Text SR** (1.2.840.10008.5.1.4.1.1.88.11) is a first-class accepted Storage SOP class for canonical report-SR archival. Archived SR studies are discoverable via QIDO-RS and C-FIND with **ModalitiesInStudy=SR** (see §4.2). SR content is stored and returned verbatim; VNA Repository does not author, render, or interpret SR content.

Non-Storage SOP classes (Query/Retrieve, Storage Commitment, MPPS, Worklist) are **explicitly rejected** at association negotiation on the Storage SCP presentation contexts.

3.4 Query/Retrieve SCP — Supported SOP Classes

SOP Class	SOP Class UID
Study Root Query/Retrieve Information Model — FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model — MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Information Model — GET	1.2.840.10008.5.1.4.1.2.2.3
Patient Root Query/Retrieve Information Model — FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model — MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Information Model — GET	1.2.840.10008.5.1.4.1.2.1.3
Verification	1.2.840.10008.1.1

Query levels. PATIENT, STUDY, SERIES, and IMAGE query levels are supported under both the Study Root and Patient Root models. As of 1.0.2.182, a **study-level IMAGE-level C-FIND** enumerates every SOP Instance across all series of a study in a single query, following the hierarchical query model of PS3.4 §C.6.1. Each returned instance-level identifier carries (0008,0056) Instance Availability = **ONLINE**. This full-instance enumeration backs downstream **pre-pull suppression** — a consumer can determine exactly which SOP Instances the archive already holds (and their availability) before issuing a retrieve, avoiding redundant transfers.

3.5 Transfer Syntaxes

Storage SCP — accepted (in proposal-preference order):

Transfer Syntax	UID
Explicit VR Little Endian	1.2.840.10008.1.2.1
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Big Endian (retired)	1.2.840.10008.1.2.2
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Processes 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG-LS Lossless	1.2.840.10008.1.2.4.80
JPEG-LS Lossy (Near-Lossless)	1.2.840.10008.1.2.4.81
JPEG 2000 Image Compression (Lossless-Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

Compressed pixel data is stored as received; VNA Repository does **not** transcode to a canonical transfer syntax on ingest. Retrieval honors the transfer syntax negotiated by the requester.

Storage SCU — outbound transcode. On outbound C-STORE (forward, replication, or export), VNA Repository proposes the stored transfer syntax first and, when the receiver does not accept it, may transcode. Supported outbound transcode targets are limited to **lossless** syntaxes: JPEG Lossless, Non-Hierarchical, First-Order Prediction (1.2.840.10008.1.2.4.70), JPEG 2000 Image Compression (Lossless Only) (1.2.840.10008.1.2.4.90), and the uncompressed Explicit / Implicit VR Little Endian syntaxes. Transcoding to a **lossy** syntax is refused — if a receiver offers only lossy targets, the SCU falls back to an uncompressed lossless syntax rather than degrade pixel data.

Query/Retrieve SCP — accepted:

Transfer Syntax	UID
Explicit VR Little Endian	1.2.840.10008.1.2.1
Implicit VR Little Endian	1.2.840.10008.1.2

3.6 Extended Negotiation

- Relational-Queries: **not supported**. Query keys outside the information model's hierarchy will return no-match.
- Combined Date-Time Matching: not supported.
- Fuzzy Matching of Person Names: not supported.
- Retrieve identifiers from C-FIND responses: supported (SpecificCharacterSet echoed).
- Instance Availability: instance-level C-FIND responses report (0008,0056) Instance Availability = **ONLINE** for archived instances (see §3.4).

3.7 Character Sets

Accepted on ingest and retained on retrieval:

- ISO_IR 100 (Latin-1)
- ISO_IR 101 (Latin-2)
- ISO_IR 144 (Cyrillic)
- ISO_IR 192 (Unicode UTF-8)
- GB18030 (Chinese)

Other character sets are accepted as-is but correct display in the operator UI is limited to the above set.

4. DICOMweb Specification (RESTful Services)

All DICOMweb endpoints are rooted at `{web_base}/dicomweb/` (HTTPS only in production; HTTP permitted for LAN-only pilot).

4.1 STOW-RS

Method + Route	Description
POST <code>/dicomweb/studies</code>	Store instances; studies selected from DICOM dataset
POST <code>/dicomweb/studies/{studyInstanceUID}</code>	Store instances constrained to the indicated study

Accept: `application/dicom+json` **Content-Type:** `multipart/related; type="application/dicom"`

4.2 QIDO-RS

Method + Route	Description
GET <code>/dicomweb/studies</code>	Search studies
GET <code>/dicomweb/studies/{studyUid}/series</code>	Search series
GET <code>/dicomweb/studies/{studyUid}/series/{seriesUid}/instances</code>	Search instances

Response media type: `application/dicom+json`. Supported query keys include PatientID, PatientName, StudyInstanceUID, StudyDate, StudyTime, AccessionNumber, ModalitiesInStudy, StudyDescription, and the equivalent series/instance-level keys. Archived report-SR studies are discoverable via `ModalitiesInStudy=SR`.

4.3 WADO-RS

Method + Route	Description
GET /dicomweb/studies/{studyUid}	Retrieve study (DICOM Part 10)
GET /dicomweb/studies/{studyUid}/series/{seriesUid}	Retrieve series
GET /dicomweb/studies/{studyUid}/series/{seriesUid}/instances/{sopUid}	Retrieve instance
GET /dicomweb/studies/{studyUid}/metadata	Retrieve study metadata
GET /dicomweb/studies/{studyUid}/series/{seriesUid}/metadata	Retrieve series metadata
GET /dicomweb/studies/{studyUid}/series/{seriesUid}/instances/{sopUid}/metadata	Retrieve instance metadata

Bulkdata and rendered (JPEG/PNG) retrieve endpoints are **not implemented in this release**.

5. Security

- TLS: TLS 1.2 (minimum) + TLS 1.3 (recommended) supported on the Web UI and DICOMweb port. DIMSE services over TLS (DICOM “Secure Transport Connection Profile”, BCP 195) are supported when a server certificate is provisioned.
- Mutual TLS (mTLS): client-certificate verification is supported on both the Storage SCP and Query/Retrieve SCP, and on outbound DIMSE (Storage SCU) associations, when peer certificates are provisioned.
- Authentication for DICOMweb: bearer token (same as Web UI auth); anonymous DICOMweb access is disabled by default.
- Authentication for DIMSE: Calling-AE whitelist (TCP-layer) plus optional mTLS peer-certificate verification. No User Identity Negotiation (Identity Sub-item, PS3.7 §D.3.3.7) in this release.
- Audit: every C-STORE, C-MOVE, C-GET, STOW-RS, and WADO-RS retrieval writes a row to the audit log with timestamp, Calling AE (or user), StudyInstanceUID, SOP Instance UID, and outcome.

6. Character Set and Language Support

The operator Web UI renders text in UTF-8 regardless of the DICOM Specific Character Set of the underlying study. Non-UTF-8 studies are displayed with best-effort transliteration; original byte content is preserved in the archive and returned verbatim on retrieval.

7. Codes and Controlled Terminology

VNA Repository does not author or interpret clinical codes. Code sequences (e.g., Procedure Code Sequence, Anatomic Region Sequence, View Code Sequence) are stored and returned verbatim.

8. Support of Character Sets — Patient Name

PatientName (PN) tags are stored in a UTF-8-normalized search column on ingest for QIDO-RS and C-FIND matching. The original on-disk DICOM attribute is preserved in its ingested character set.

9. Annexes

9.1 IODs and Information Models

VNA Repository is agnostic to IOD content and does not validate IOD consistency beyond what is required for indexing (Patient / Study / Series / Instance UIDs, PatientID, PatientName, StudyDate, Modality).

9.2 Data Dictionary of Private Attributes

VNA Repository preserves any private attributes present in ingested objects. No private attributes are generated by VNA Repository.

9.3 Known Implementation Notes

- **Transfer-syntax handling:** the archive stores compressed pixel data as received and does not transcode on ingest. On retrieval and outbound C-STORE, objects are delivered in the transfer syntax negotiated with the requester / receiver; where the stored syntax is not accepted, the Storage SCU transcodes to a lossless target the peer accepts (JPEG Lossless [...4.70](#) , JPEG 2000 Lossless [...4.90](#)) or falls back to Explicit VR Little Endian, performing on-the-fly decompression. Transcoding never targets a lossy syntax.
- **Outbound replication:** VNA Repository can mirror archived studies to a configured peer via C-STORE SCU / STOW-RS, with replication-coverage reporting in the operator UI. Outbound transfer honors the lossless-only transcode policy above.
- **IOCM rejection hide-on-query:** instances rejected under the IHE Imaging Object Change Management (IOCM) rejection workflow are suppressed from C-FIND / QIDO-RS results and from C-MOVE / C-GET / WADO-RS retrievals, while remaining on disk under the archive's retention policy.
- **C-GET scalability:** C-GET is implemented but C-MOVE is recommended for multi-study retrieves because the archive has no limit on sub-operation count for C-MOVE, whereas C-GET is bounded by the requester's association.
- **Duplicate SOP Instance UID:** on re-receipt of an SOP Instance UID already present in the archive, the default policy is [reject](#) (C-STORE returns [A701](#) out of resources — duplicate instance); this is configurable to [overwrite](#) per-source in Settings → DICOM.

9.4 Reserved (Future-Version) Services

The following license keys exist in the Repository feature catalog but the corresponding DICOM services are **not wired in this release**. They are reserved for a future release; conformance will be re-stated at that time:

- `storage_commitment` (Storage Commitment Push Model SCP; N-ACTION-RQ / N-EVENT-REPORT-RQ)
- `dicomweb_advanced` (QIDO-RS extended query parameters, WADO-RS rendered resources, bulkdata retrieval)

10. Cross-References

- EULA Annex: DOC-2026-133 (XyDromatics VNA Repository EULA Annex)
- Hardware & Software Requirements: DOC-2026-128 (XyDromatics VNA Repository HW/SW Requirements)
- Product-family regulatory posture: DOC-2026-114 v3 §8 (Router-pattern VNA split architecture)
- DICOM Standard versions referenced: PS3.2, PS3.3, PS3.4, PS3.5, PS3.6, PS3.7, PS3.8, PS3.17, PS3.18, PS3.19 — 2023e (where applicable)

Regulatory classification. Non-device software under the FD&C Act §520(o)(1)(D) software exclusion. This statement is published by Synthology Healthcare Solutions Group, LLC as a controlled document; the authoritative version is the approved record in the Synthology quality-management system.