

X3D & SEDRIS—Together

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X3D Standards

- ISO/IEC 19775—X3D
 - Part 1: Architecture and base components
 - Part 2: Scene access interface (SAI)
- ISO/IEC 19776—X3D encodings
 - Part 1: XML
 - Part 2: Classic VRML
 - Part 3: Compressed binary
- ISO/IEC 19777—X3D language bindings
 - Part 1: ECMAScript
 - Part 2: Java

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SEDRIS Standards

- ISO/IEC 18023—SEDRIS
 - Part 1: Functional specification
 - Part 2: Abstract transmittal format
 - Part 3: Transmittal format binary encoding
- ISO/IEC 18024-4—SEDRIS binding to C
- ISO/IEC 18025—Environmental data coding standard (EDCS)
- ISO/IEC 18026—Spatial reference model (SRM)
- ISO/IEC 18041-4—EDCS binding to C
- ISO/IEC 18042-4—SRM binding to C

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Spatial positioning

- Limited support in X3D using the current Geospatial Component
- Wide support in the SRM as specified in ISO/IEC 18026

PROPOSAL: Map the missing capabilities to X3D either as an enhanced Geospatial Component or as a separate more general Spatial Component

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X3D Geospatial Component

- Supports some geodetic, geocentric, and universal transverse Mercator SRFs
- Supports 23 Earth ellipsoids
- Supports WGS84 Earth geoid
- 10 nodes to express geolocated material and interaction

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SRM Capabilities

- 28 types of abstract coordinate systems
- A variety of reference datums, embeddings of position-space into object-space, and object reference models
- 27 SRF templates, 14 pre-defined SRFs, 7 SRF sets (incl. UTM) with standard parameterizations
- Operations between applicable SRFs
- Support for spatial operations on non-Earth celestial bodies including most solar system objects
- Algorithms provided to ensure accurate processing of spatial data

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Spatial positioning

- Proposed requirements:
 - X3D should be able to handle any SRF natively
 - X3D should integrate the functionality of the SRM
- Anticipated benefits:
 - Minimize the need to convert input data from one SRF to another
 - Ease of integrating environmental data sets

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Metadata

- General support for metadata in X3D but no specific metadata standard required
- EDCS standardizes the identification of objects and properties and can be extended

PROPOSAL: For X3D Earth, require metadata to use EDCS to standardize metadata easing interpretation

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X3D Metadata Support

- General metadata support
- Metadata accessible during run-time
- Metadata can be applied at any level to any X3D node
- Specific metadata standards can be cited
- X3D Metadata fields:
 - name: identifier for value
 - reference: applicable metadata standard
 - value: value for metadata
 - metadata: metadata nodes can have metadata

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EDCS

- Set of dictionaries with entries containing:
 - Concept definition
 - Label
 - Code
 - Reference type and reference
 - Other dictionary-dependent information
- Nine dictionaries:
 - Classification
 - Attribute
 - Attribute value characteristic
 - Attribute enumerant
 - Unit
 - Unit scale
 - Unit equivalence class
 - Organization schema
 - Group

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Metadata

- General support for metadata in X3D but no required standard
- EDCS standardizes the identification and properties of objects

PROPOSAL: Require the use of EDCS for identifying and propeertizing objects in X3D Earth

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Summary

- X3D Earth should require complete access to spatial data capabilities standardized in the Spatial Reference Model. This will require upgrading the current X3D Geospatial Component.
- X3D Earth should require use of EDCS for specifying the identification and properties of X3D Earth objects.

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Where to get standards

- X3D
 - <http://www.web3d.org/x3d/specifications>

- SEDRIS
 - <http://standards.sedris.org/>