Understanding and Using Esri’s Open i3S Specification

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What is an OGC Community Standard?

- A Community Standard is:
  - An official position of the OGC endorsing a specification or standard developed external to the OGC
  - Considered to be a normative standard by the OGC membership and becomes part of the OGC Standards Baseline
  - A “snapshot” of a mature specification

- To become a Community Standard, a submitting team must show that:
  - The specification represents a *de facto standard*
  - There is strong evidence of implementation and community support
Issues that Community Standards try to address

- **Need**: The desire to formalize a specification that is a *de facto standard*, widely deployed in the community of use.
- **Ownership**: Intellectual property MAY remain with the organization or group that developed the *de facto* standard.
- **Provenance**: Vetted and branded by OGC as a formal Standards Development Organization, so that these *de facto* standards can be specified in procurement language.
- **Citation**: The need for OGC standards to be able to reference externally developed *de facto* standards as normative.
- **Stability**: The ability to have a “version” of a *de facto* standard that is stable and does not change.
The Community Standard Process

1. Submit an OGC Work Item document that justifies why the specification should be considered as a possible Community Standard - reviewed by the TC Chair
2. Presentation of the proposed work item to the OGC TC
3. OGC TC votes on approval of the proposed work item (45 day electronic vote)
4. Submission team prepares the Standards Document
5. OGC Architecture Board (OAB) review, seeking approval for public comment
   - Submission team makes adjustments as require by the OAB and resubmits as instructed
6. Release for public comment (30 day comment period)
7. Submission team responds to ALL public comments
8. OGC TC votes on approval as an OGC Community Standard (45 day electronic vote)
9. If it passes, public announcement and publication of the standard document follows
3D content is large, heterogeneous, and distributed.

- Generated 3D features
- Photogrammetric 3D Features
- 3D Point Cloud
- Reality Capture 3D Mesh
Indexed 3D Scene Layers (I3S) – What is it?

- Open standard for storage and transmission of large, heterogeneous 3D geospatial data sets
- Cloud, Web and Mobile friendly based on JSON, REST and modern web standards
- Support 3D geospatial content, various coordinate systems along with a rich set of layer types
- An I3S data set, referred to as a Scene Layer is:
  - a container for arbitrarily large amounts of heterogeneously distributed 3D geographic data
Indexed 3D Scene Layers (I3S) – What is it?

- I3S is in process to become an OGC community standard

- The standard includes specification for Scene Layer Package (SLPK) – An archive that captures all node resources of a scene layer and allows direct access

- I3S can serve as a common tool to package and disseminate, a variety of GIS content

- Both I3S and SLPK are licensed under Creative Commons

- Available @ https://github.com/Esri/i3s-spec
Indexed 3D Scene Layers (I3S) – What is it?
I3S Design Principals for a 3D GIS visualization format

1. **Web friendly:** JSON + Typed Arrays
2. **Mobile friendly:** Works good with varying bandwidth
3. **Extensible:** Support different types of content
4. **Declarative:** Reduce required implicit knowledge
5. **Efficient:** Use spatial indexing for quick delivery
6. **Scalable:** Provide Level of Detail Support
7. **Protected:** Ensure that content is protected
8. **Open:** Full Specification publicly accessible

[https://github.com/Esri/i3s-spec](https://github.com/Esri/i3s-spec)
Scene Layer types and profiles
Support different geometry types

- 3D Objects
- Integrated Meshes
- Points
- Point Clouds
Indexed 3D Scene Layers are supported across the ArcGIS platform.
Demo: I3S Layer Examples
Joint work - Esri and HFT Stuttgart (Athanasios Koukofikis/Prof. Dr. Volker Coors)
I3S rendered in Cesium Client via 3DPS
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