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

I3S Status

- Submit an OGC Work Item document that justifies why the specification should be considered as a possible Community Standard – reviewed by the TC Chair
- Presentation of the proposed work item to the OGC TC
- OGC TC votes on approval of the proposed work item (45 day electronic vote)
- Submission team prepares the Standards Document
- OGC Architecture Board (OAB) review, seeking approval for public comment
  - Submission team makes adjustments as require by the OAB and resubmits as instructed
- Release for public comment (30 day comment period)
- Submission team responds to ALL public comments
- OGC TC votes on approval as an OGC Community Standard (45 day electronic vote)

Ends July 20

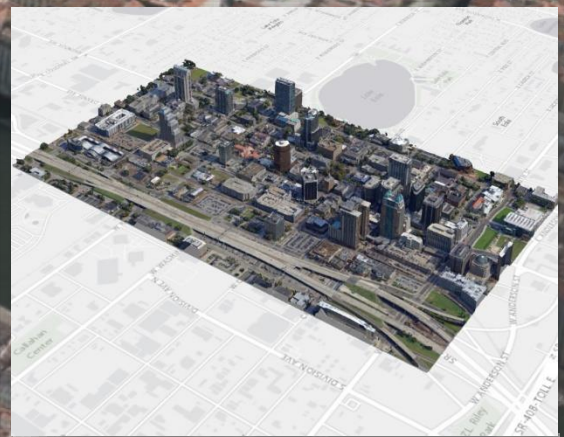
- If it passes, public announcement and publication of the standard document follows

3D content is large, heterogeneous, and distributed

Generated 3D features

Photogrammetrc 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

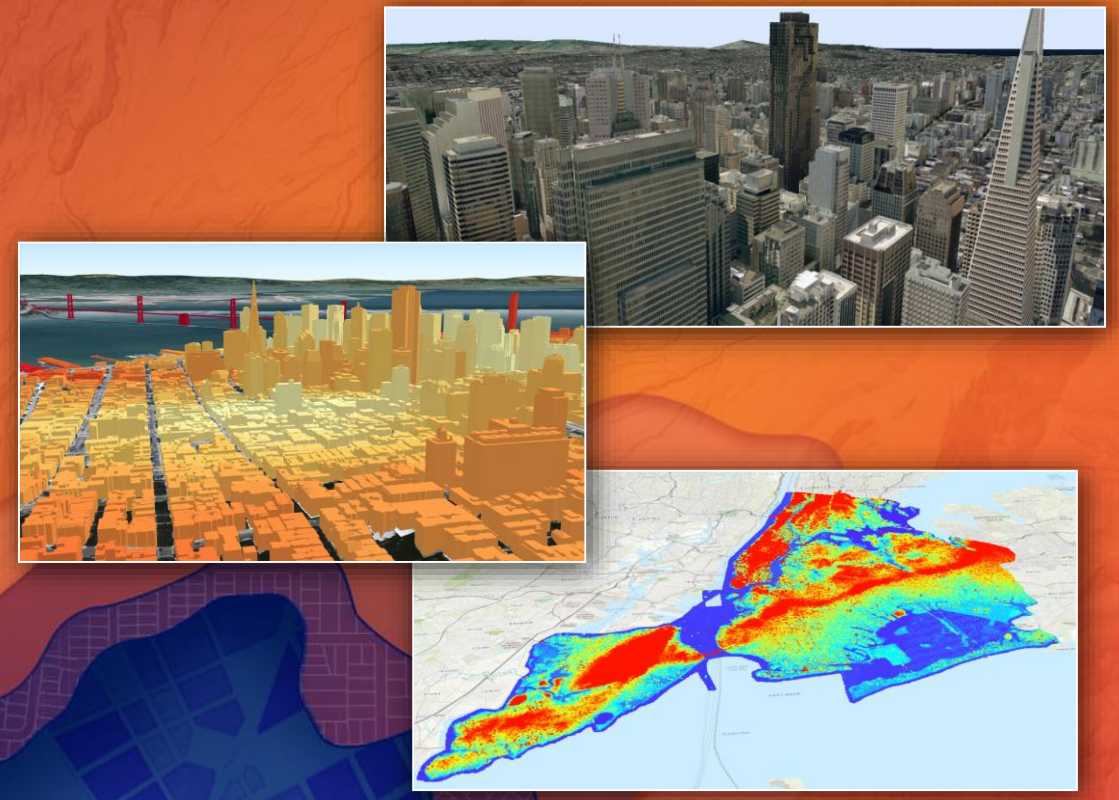
1. **Web friendly:** JSON + Typed Arrays
2. **Mobile friendly:** Works good with varying bandwidth
3. **Extensible:** Support different types of content
4. **Declarative:** Reduce required implicit knowledge
5. **Efficient:** Use spatial indexing for quick delivery
6. **Scalable:** Provide Level of Detail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

https://github.com/Esri/i3s-spec

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

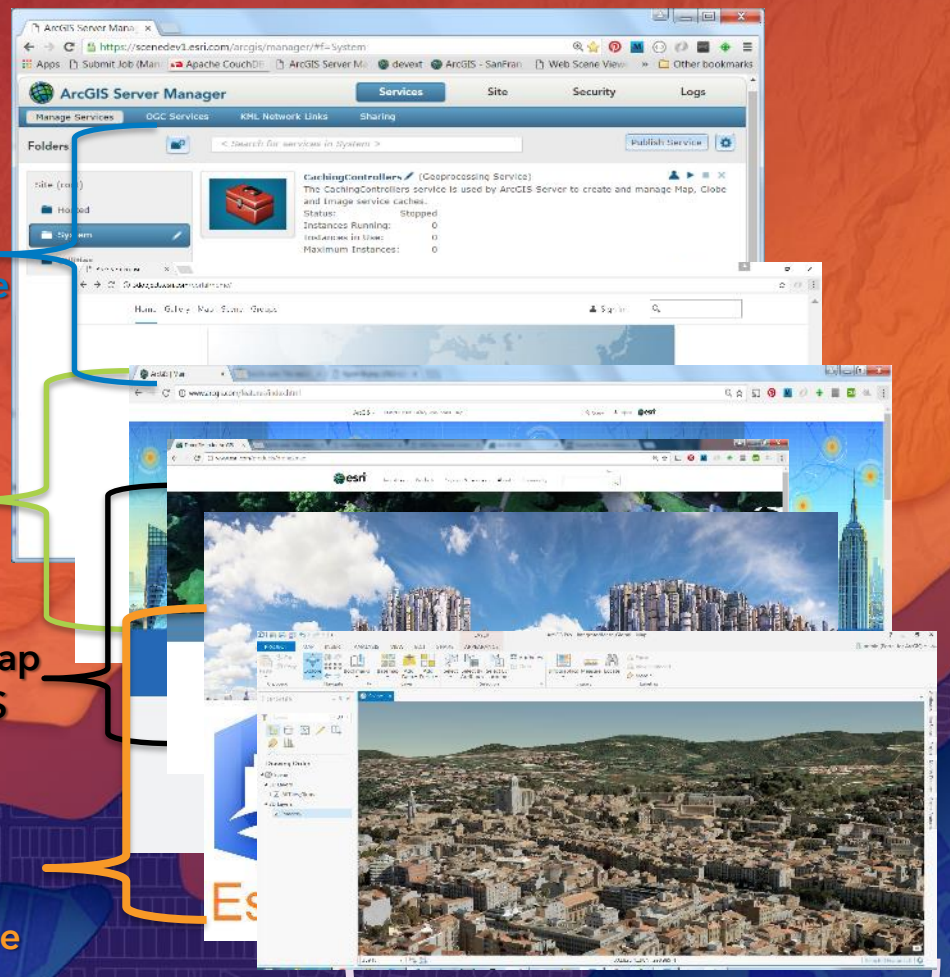
Publishing/Sharing

ArcGIS Enterprise

ArcGIS Online

Drone2Map for ArcGIS

Esri CityEngine



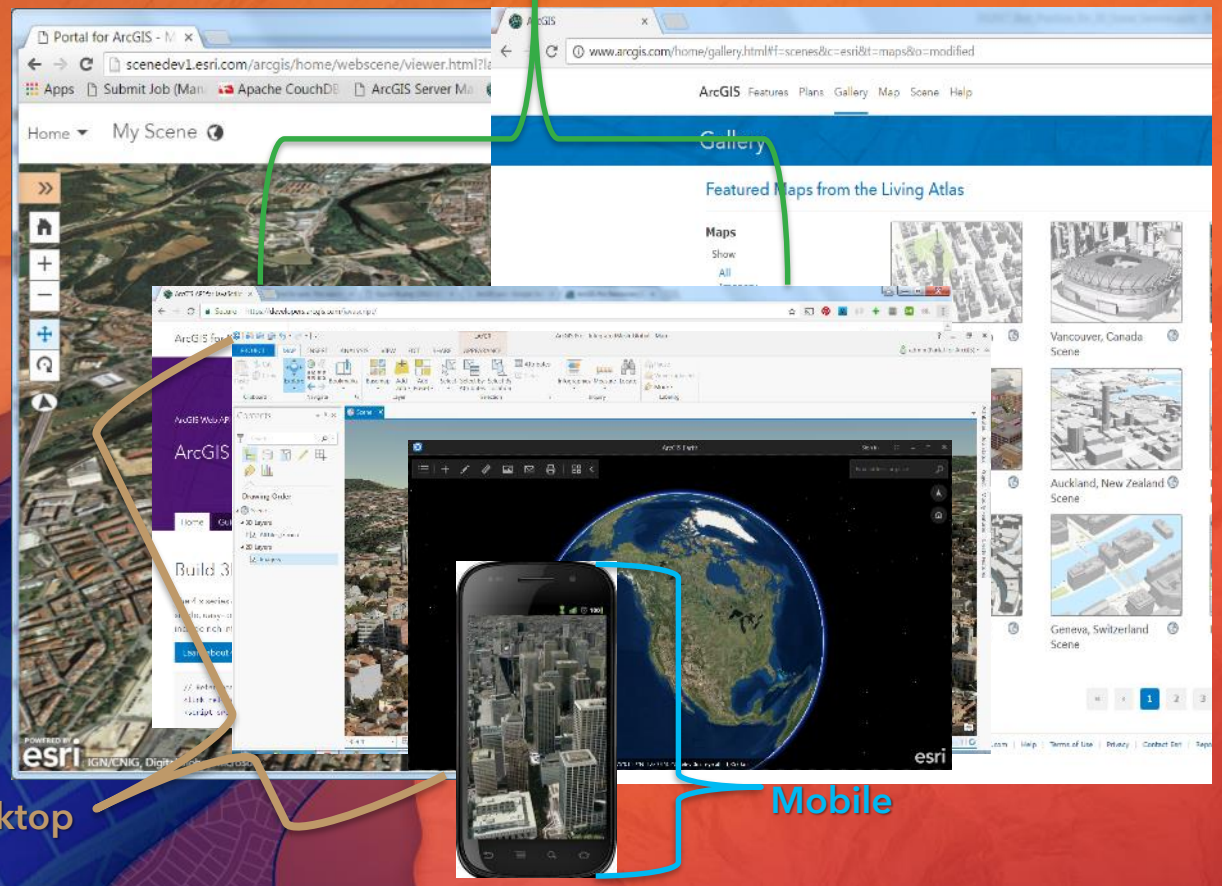
ArcGIS Pro

Consuming

Web

Desktop

Mobile

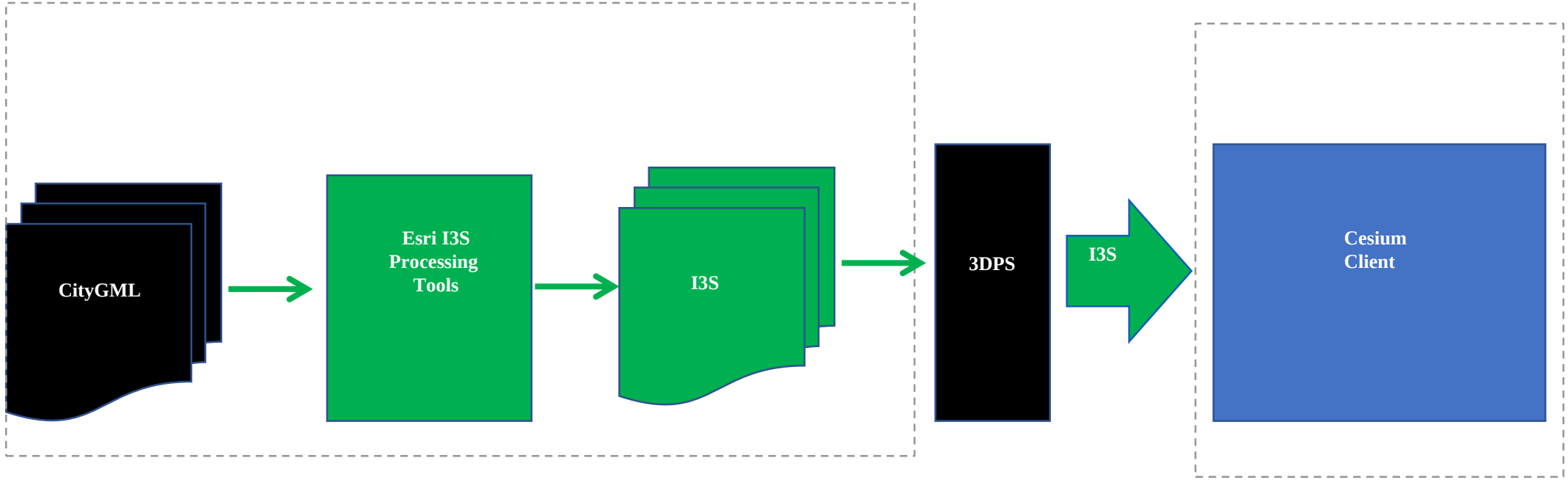


Demo: I3S Layer Examples

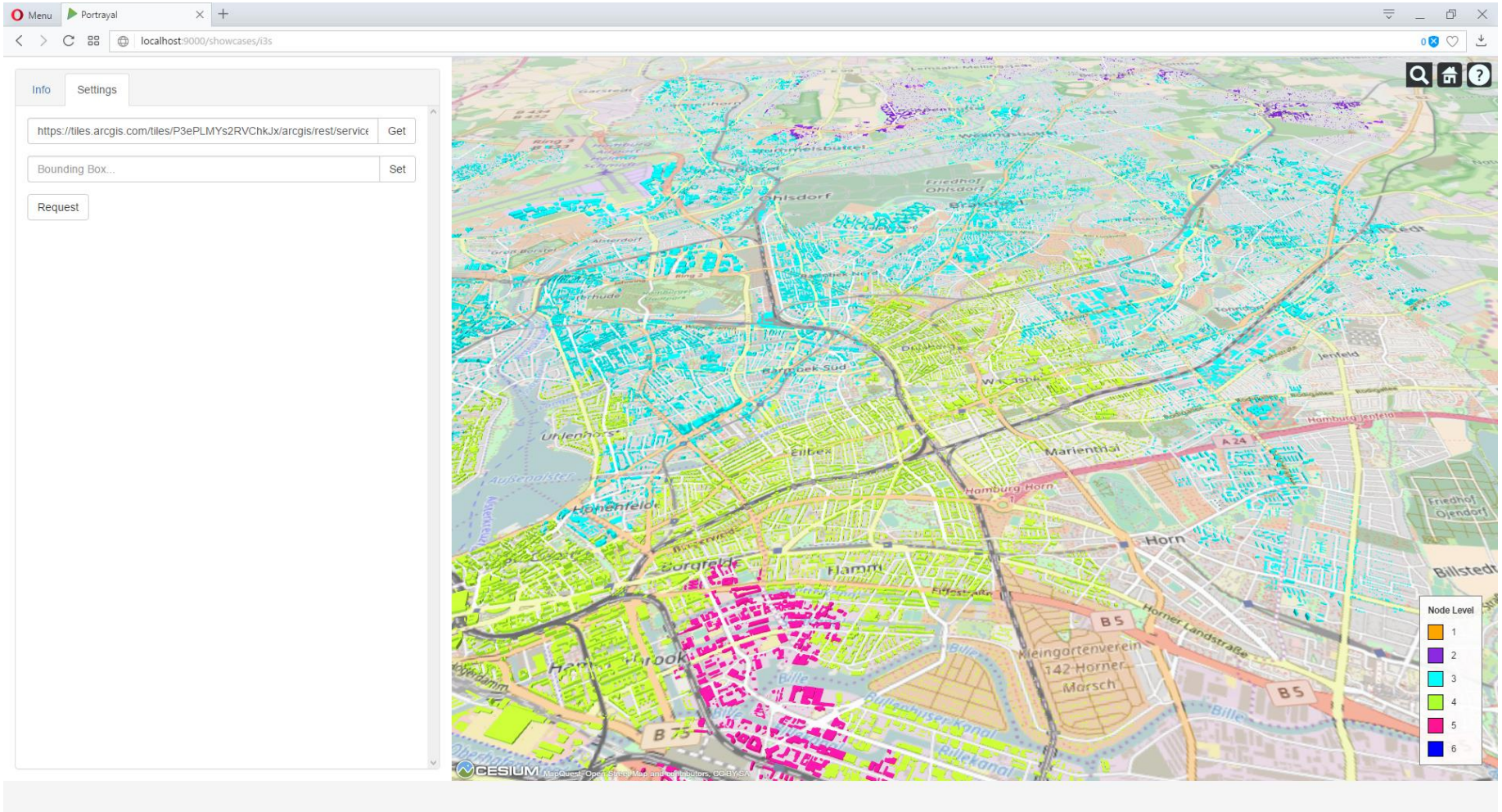
Joint work - Esri and HFT Stuttgart (Athanasios Koukofikis/ Prof. Dr. Volker Coors)

HFT Stuttgart

I3S rendered in Cesium Client via 3DPS



I3S rendered in Cesium Client via 3DPS

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