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 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](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.
I3S PCSL: By the numbers…

County of Sonoma, CA: 60,126,758,533 Points, LAS 1.9TB, PCSL SLPK 444GB

The Netherlands LiDAR surveys
638,843,557,990 Points, LAS 9.3TB
AHN3, Friesland 43,367,747,861 Points, PCSL SLPK 300GB

NYC DOITT 3D Buildings LoD2:
1,083,529 LoD2 3D Buildings, 1.7GB SLPK

USGS NYC Post Sandy 2014 LiDAR Survey: 4,583,325,042 Points, LAS 119GB, PCSL SLPK 27.5GB

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Tools and Content Providers Generating I3S

Bentley®
VRICON
PIX4D
nearmap
Skyline®
Agrisoft
PhotoScan
Melocam Technologies
Scene Layers: Service and Package Standard

This repository hosts the standard for Scene Layers which are containers for arbitrarily large amounts of geographic data. The delivery format and persistency model for Scene Layers, referred to as Indexed 3d Scene Layer (I3S) and Scene Layer Package (SLPK) respectively, are specified in detail. Both formats are encoded using JSON and binary ArrayBuffers.

I3S originated from investigations into technologies for rapidly streaming and distributing large volumes of 3D content across