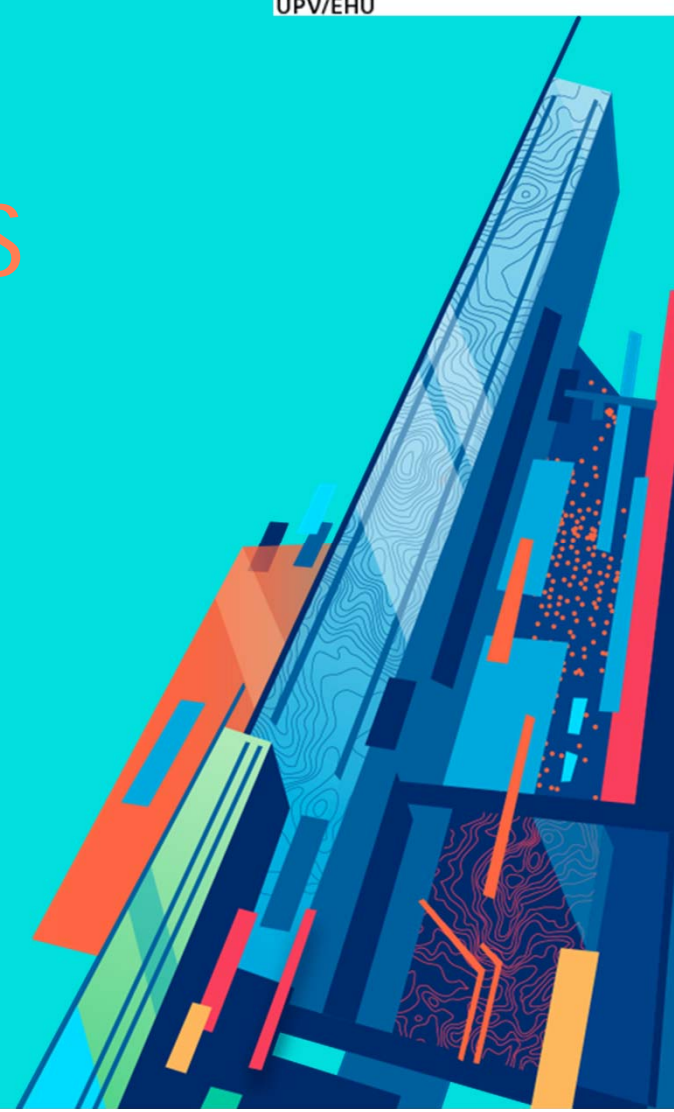


Servicios 3D con el estándar i3S

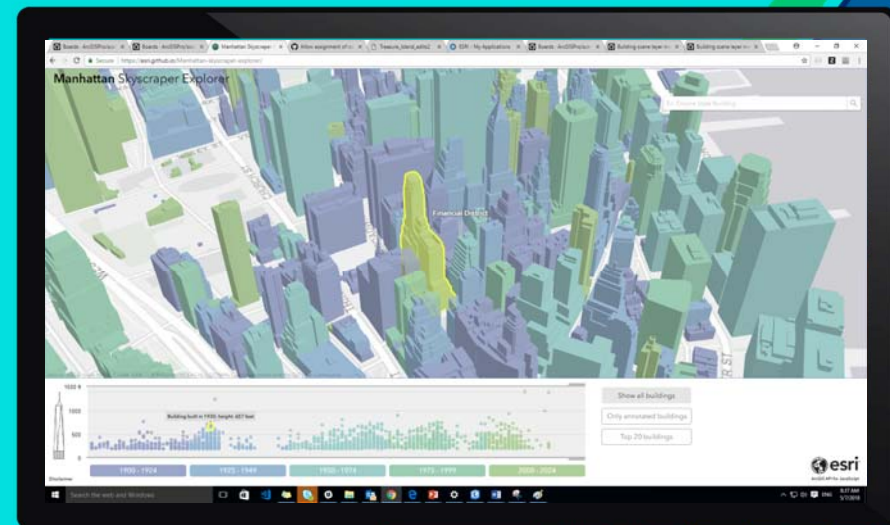
YANSA TEJADA | SOLUTION ENGINEER
AREA DE TECNOLOGÍA E INNOVACIÓN
ESRI ESPAÑA

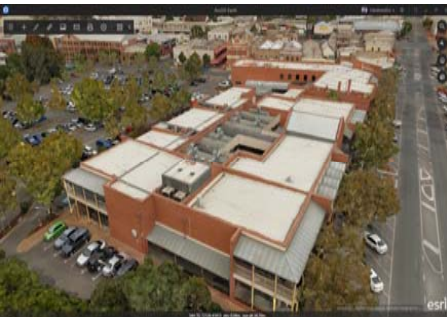


Agenda

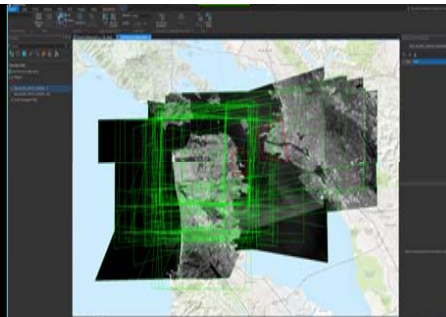
1. ¿Por qué 3D?
2. Especificación estándar i3S
3. i3S en ArcGIS
4. Ejemplos

¿Por qué 3D?





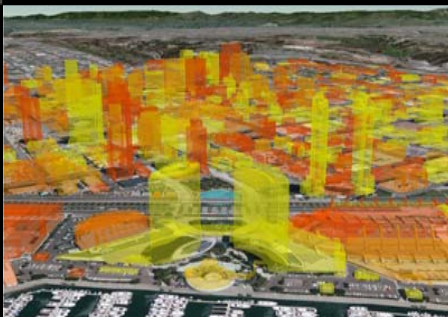
Lidar



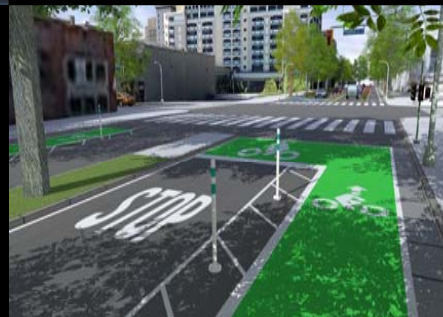
Fotogrametría
Oblicua



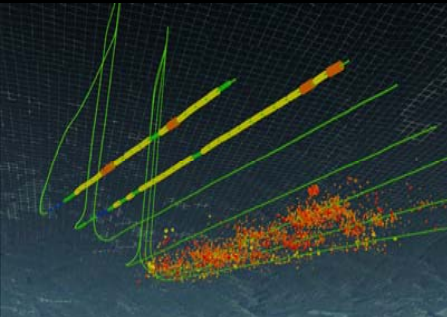
BIM



escaneo
Indoor &
subsuperficial



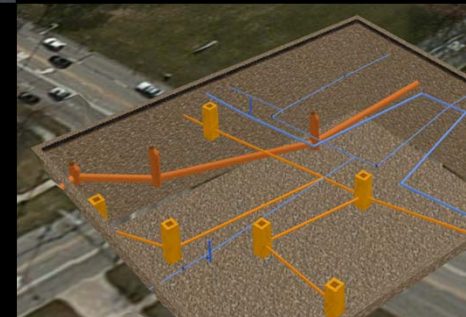
Tiempo Real (4D)



IoT



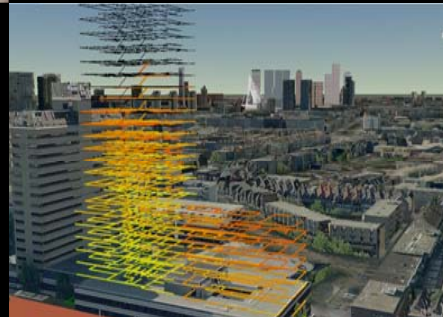
Mallas de texturas



FMV



Imágenes
esféricas &
panorámicas



UAV

A person is shown in profile, wearing a VR headset with glowing blue accents. They are holding a glowing purple controller in their right hand, which is extended forward. The background is dark, and the overall scene is illuminated by the light from the headset and controller. The image has a halftone or dot-matrix texture.

Nuevas experiencias GIS

Image property of Marco Verch



Representación
precisa
del mundo real



Comunicación para
usuarios
no-técnicos



Utilidad
3D



Visualiza entidades
que no existen
o no son visibles



Análisis y estética

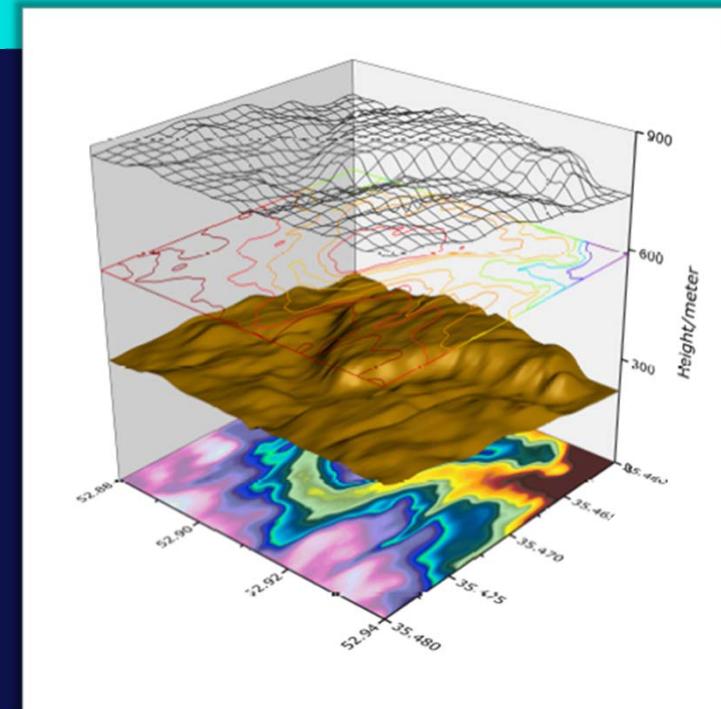
¿Qué es i3S?



¿Qué es el i3S?

i3S = Indexed 3D Scene Layers

- *Especificación abierta para el almacenamiento y transmisión datos geospaciales 3D.*
- Basado en JSON, REST → Cloud, web y dispositivos móviles.
- Soporta contenido geoespacial 3D en varios sistemas de coordenadas y varios tipos de capas.



¿Qué es el i3S?

i3S y SLPK

- Un conjunto de datos i3S, que hace referencia a una capa de escena (*Scene Layer*):
 - contenedor para grandes cantidades de datos geográficos 3D heterogéneos
- Servicio web accesible vía REST: nodos + información asociada (geometrías, atributos y texturas)
- Un archivo o paquete de capa de escena (*SLPK: Scene Layer Package*):
 - empaqueta el árbol de nodos completo, con su información (geometría, textura y atributos) en un archivo que soporta el acceso directo a cada nodo de forma individual con toda la información que contienen.



¿Qué es el i3S?

i3S = Indexed 3D Scene Layers

- Estándar abierto, sin dependencias comerciales
- Licencia: *Creative Commons*

Esri / i3s-spec

Code Issues 4 Pull requests 1 Projects 0 Wiki Insights

This repository hosts the specification for Scene Layers which are containers for arbitrarily large amounts of geographic data. The delivery and persistence model for Scene Layers, referred to as Indexed 3d Scene Layer (I3S) and Scene Layer Package (SLPK) respectively, are specified.

web-development 3d specification

29 commits 1 branch 0 releases 5 contributors

Branch: master New pull request

Create new file Upload files Find file Clone or download

File	Commit	Time
format	I3S Ver. 1.6 Updates	2 years ago
profiles	I3S Ver. 1.6 Updates	2 years ago
service	Update SceneService.md (#8)	a year ago
.gitignore	Initial commit of 1.4 public spec	3 years ago
README.md	Added link for Draft PointClouds Spec	6 months ago
sceneLayers.jpg	I3S Spec 1.5 update	2 years ago
sceneLayers_highRes.png	I3S Spec 1.5 update	2 years ago

Scene Layers: Service and Package Standard



About Standards Innovation News & Events Membership Resources

Indexed 3D Scene Layers (i3s)

- 1) Overview
- 2) Downloads
- 3) Related News

1) Overview

A single I3S data set, referred to as a Scene Layer, is a container for arbitrarily large amounts of heterogeneously distributed 3D geographic data. Scene Layers are designed to be used in mobile, desktop, and server-based workflows and can be accessed over the web or as local files.

The delivery format and persistence model for Scene Layers, referred to as Indexed 3d Scene Layer (I3S) and Scene Layer Package (SLPK) respectively, are specified in detail in this OGC Community Standard. Both formats are encoded using JSON and binary ArrayBuffers (ECMAScript 2015). I3S is designed to be cloud, web and mobile friendly. I3S is based on JSON, REST and modern web standards and is easy to handle, efficiently parse and render by Web and Mobile Clients. I3S is designed to stream large 3d datasets and is designed for performance and scalability. I3S is designed to support 3D geospatial content and supports the requisite coordinate reference systems and height models in conjunction with a rich set of layer types.

The open community GitHub version of this standard is here: <https://github.com/Esri/i3s-spec>.

2) Downloads

Version	Document Title (click to download)	Document #	Type
1.0	OGC Indexed 3d Scene Layer (I3S) and Scene Layer Package Format Specification	17-014r5	CS

- OGC® Standards
 - 3dP
 - ARML2.0
 - Cat: eBRIM App Profile: Earth Observation Products
 - Catalogue Service
 - CDB
 - CityGML
 - Coordinate Transformation
 - Filter Encoding
 - GML in JPEG 2000
 - GeoAPI
 - GeoPackage
 - GeoSciML
 - GeoSPARQL
 - Geography Markup Language
 - GeoRSS
 - Geospatial eXtensible Access Control Markup Language (GeoXACML)
 - Geospatial User Feedback (GUF)
 - GroundwaterML
 - i3s
 - IndoorGML
 - KML
 - LandInfra/InfraGML
 - Location Services (OpenLS)
 - Moving Features
 - NetCDF
 - Observations and Measurements

Diseño i3S

Principios del formato de contenido GIS 3D

1. **Web friendly:** JSON + Typed Arrays (REST / HTTP)
2. **Mobile friendly:** Buen rendimiento con diferente ancho de banda.
3. **Extensible:** Soporte diferentes tipos de contenidos
4. **Declarativo:** Reduce conocimiento implícito requerido
5. **Eficiente:** Uso de indexado espacial para entrega rápida
6. **Escalable:** Proporciona soporte a niveles de detalle (LoD)
7. **Protegido:** Asegura que el contenido está protegido
8. **Abierto:** La especificación completa está accesible al público

Interoperabilidad

- Soportado por:
 - Vricon, Bentley, Pix4D, Cyclomedia en 2016
 - SkylineGlobe, Melown en 2017
 - Safe Software en 2018



Tipos de capas de escena

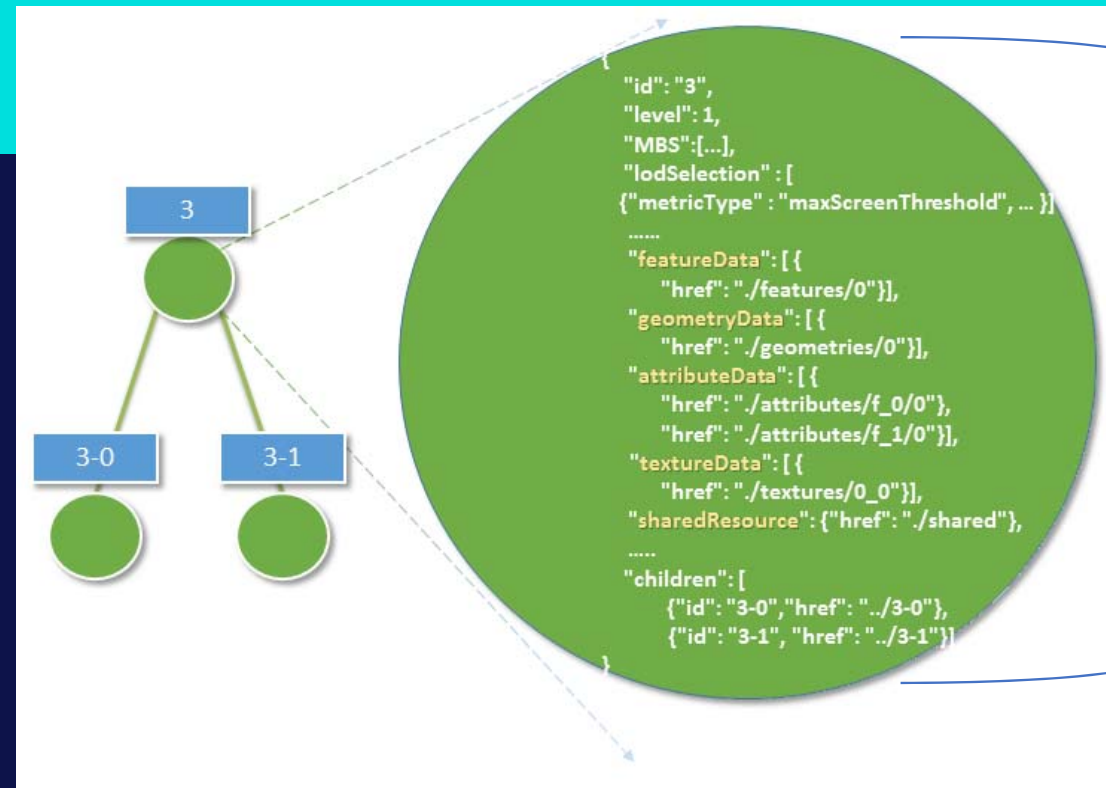
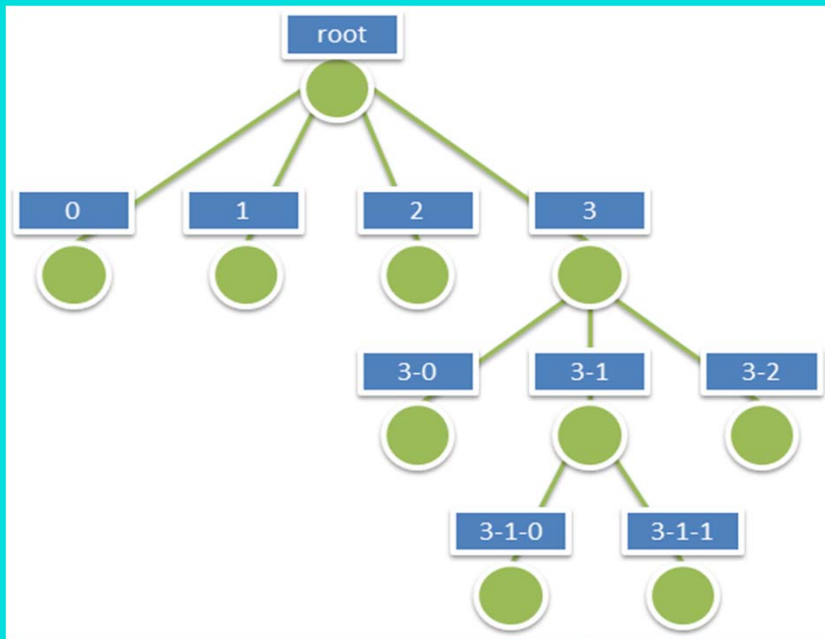
Soporte diferentes tipos de geometrias

- Objetos 3D
- Puntos 3D
- Mallas 3D
- Nubes de puntos

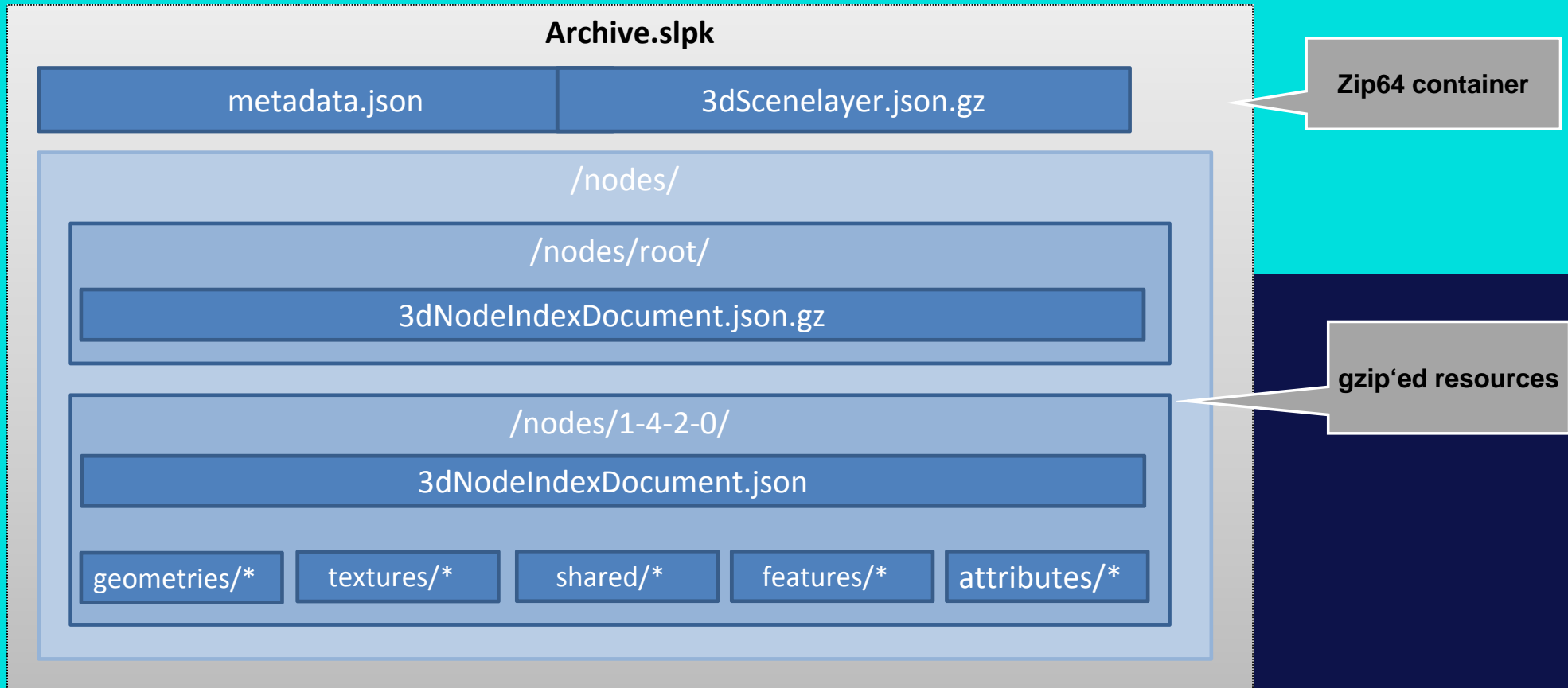


i3S: Organización y estructura

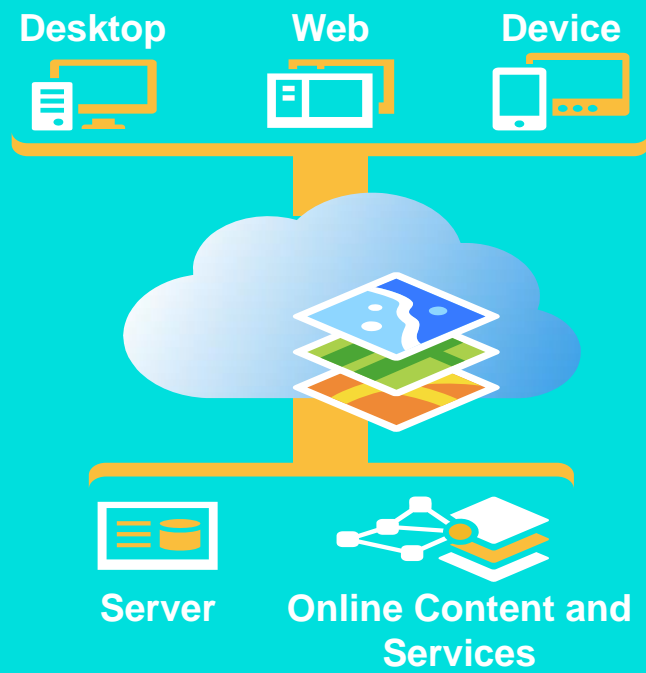
- Estructura jerárquica basada en nodos con índice espacial
- Organización física de la información dentro de cada nodo



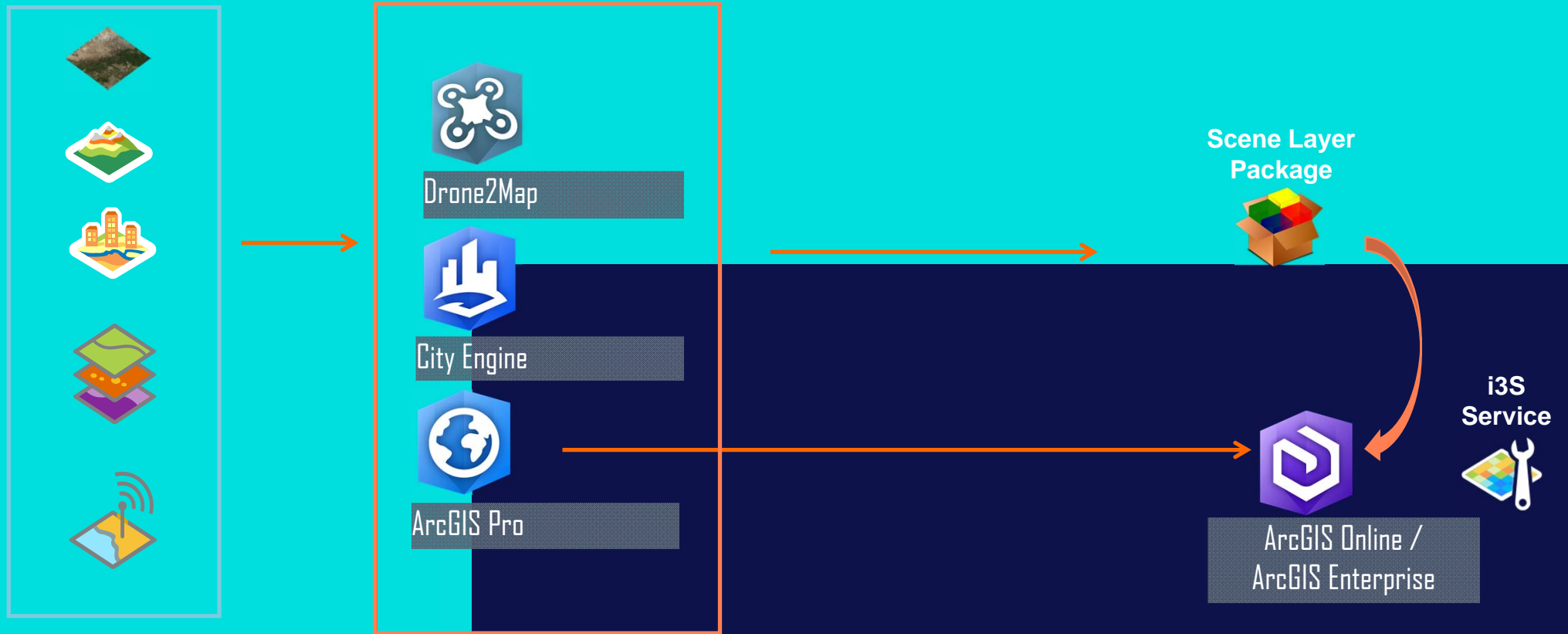
Scene Layer Package (SLPK)



i3S en ArcGIS



Creación en ArcGIS. Opciones de escritorio



Visualización /publicación en ArcGIS. Opciones



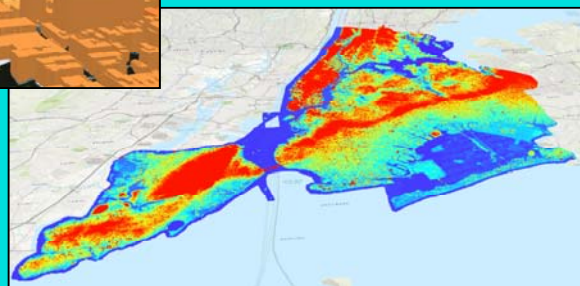
ArcGIS Software	Version	Scene Layer Types		
		3D Objects	Integrated Meshes	Points
ArcGIS Online	Current	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming
ArcGIS API for JavaScript	4.x	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming
ArcGIS Enterprise	10.6	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming
ArcGIS Pro	2.1	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input checked="" type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming
Esri CityEngine	2017.1	<input checked="" type="checkbox"/> Publishing <input type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input type="checkbox"/> Consuming
ArcGIS Earth	1.6	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input type="checkbox"/> Consuming
ArcGIS Runtime	100.2	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input checked="" type="checkbox"/> Consuming	<input type="checkbox"/> Publishing <input type="checkbox"/> Consuming

i3S en ArcGIS

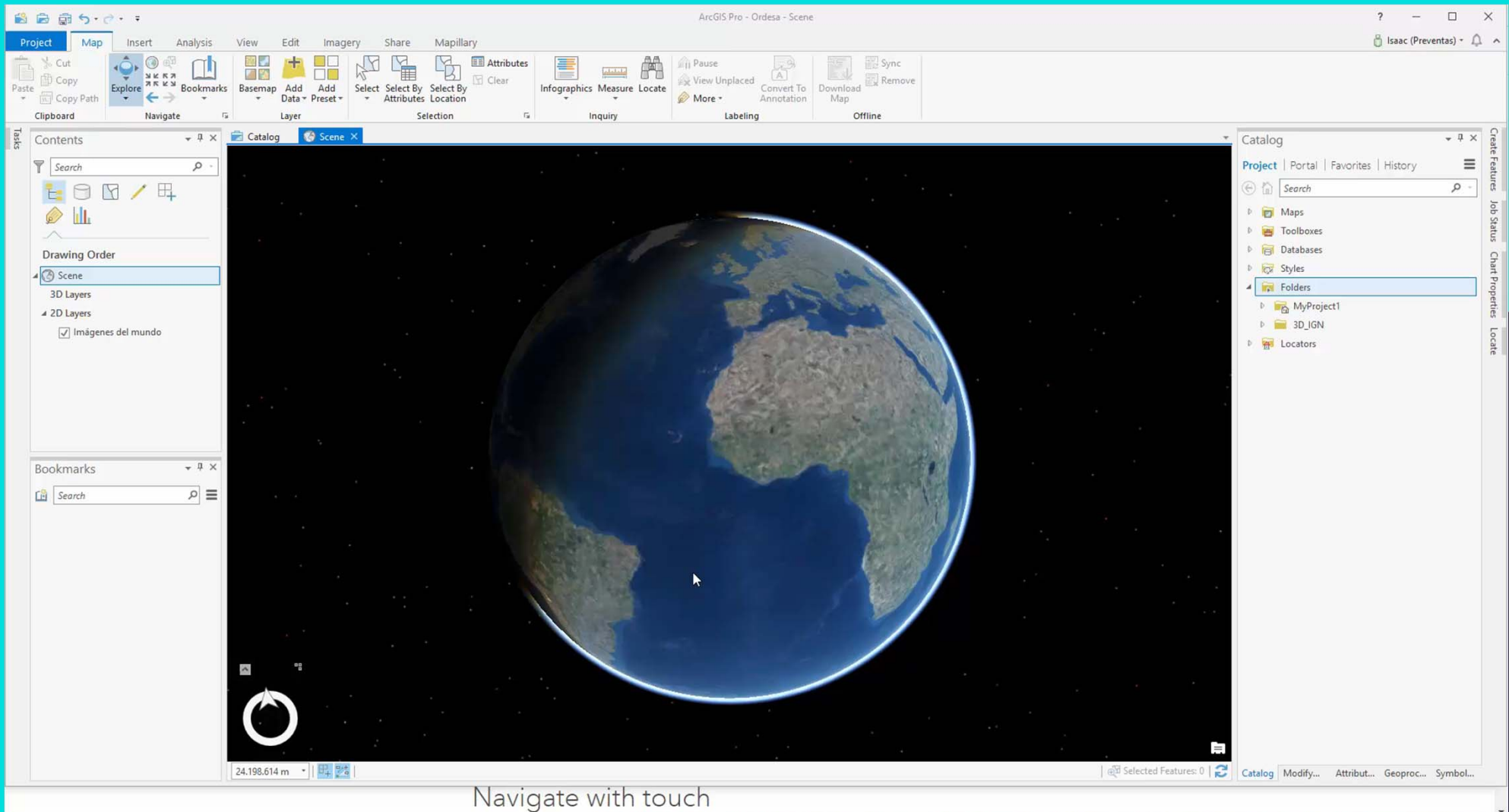
<https://github.com/Esri/i3s-spec>

Table 2: ArcGIS platform support for different scene layers types.

Ejemplos



Visualización de i3S en ArcGIS

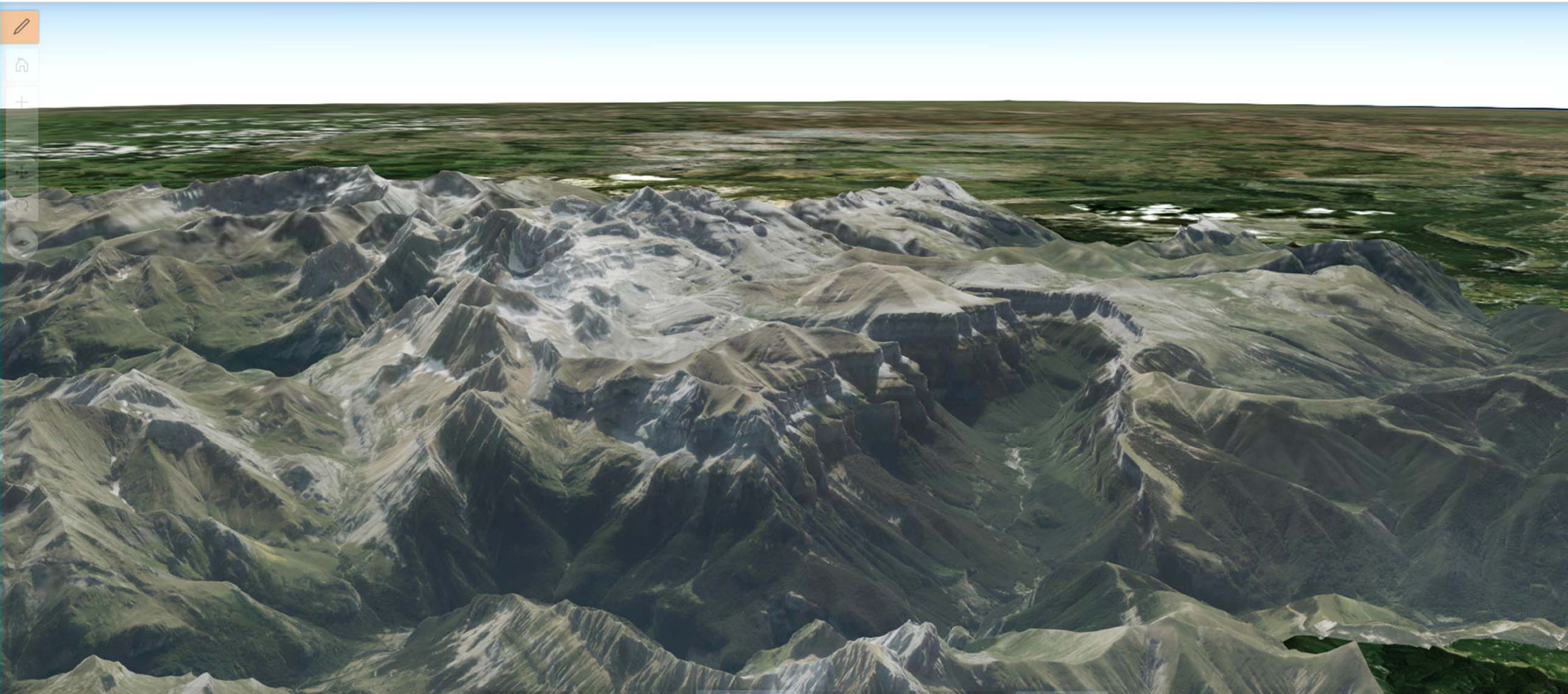


Navigate with touch

Visualización de i3S en ArcGIS Online/Enterprise

Inicio ▾ Modelos 3D IGN ©

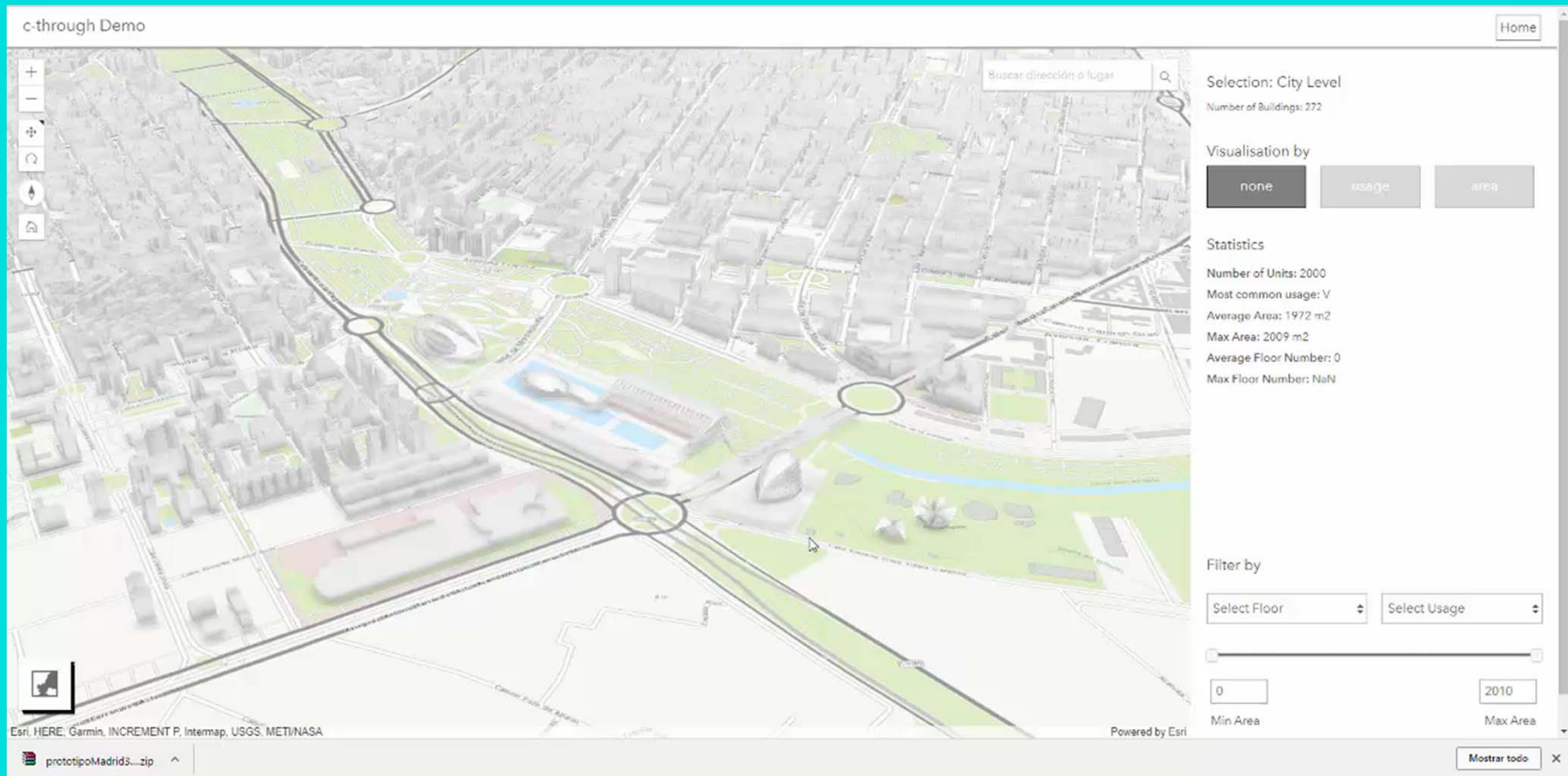
Nueva escena ▾



Ejemplos de escena



Ejemplos de escena y aplicación



Recursos

- I3S specification homepage: <http://j.mp/I3S-spec>
- OGC: <http://www.opengeospatial.org/standards/i3s>
- Ejemplos de escenas 3D: <http://bit.ly/SceneLayerPackageSamples>
- 3D plantillas y reglas: <https://bit.ly/2xNqwUq>
- Desarrollo con i3S: <https://bit.ly/2PUqv46>

Conclusiones

- Estándar abierto y multi plataforma para transmisión de datos en el marco de la OGC y 3DPS.
- Se puede usar con servicios OGC WMS, WMTS, KML y otros formatos OGC para crear visualizaciones cartográficas en 2D y 3D.
- Herramienta común para empaquetar y difundir gran variedad de contenido GIS 3D: *mallado, modelos 3D, entidades vectoriales y nubes de puntos.*

¿Preguntas?



e geo
uskadi

Eskerrik asko! Gracias!



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THE SCIENCE OF WHERE™

UDA IKASTAROAK
CURSOS
DE VERANO

UPV/EHU