



# Workshop 3D Tiles

Open Geodag, 7-11-2024

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# What is 3D Tiles?

Standard designed for streaming and rendering massive 3D geospatial content:

- Photogrammetry
- 3D Buildings
- BIM/CAD
- Instanced Features
- Point Clouds



## 3D Tiles - History

- 2018: glTF 2.0 by Khronos
- 2019 - 2021: 3D Tiles 1.0 / 1.1 OGC Community Standard
- 2023: Google/Esri/(MapBox) supporting 3D Tiles
- Last month: Bentley Systems buys Cesium

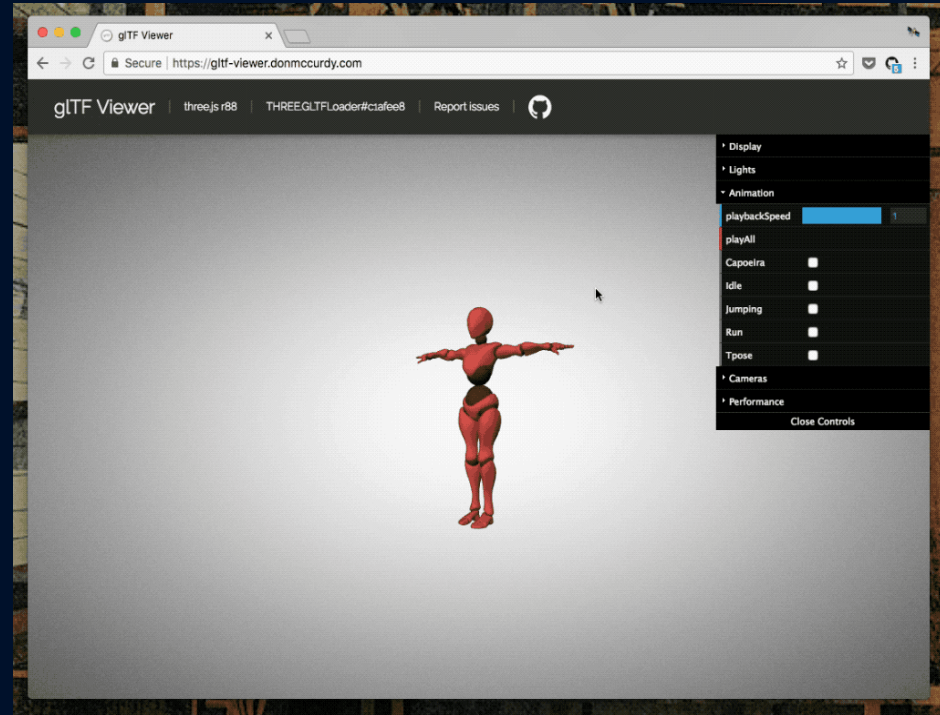




# What is glTF?

glTF: Graphics Library Transmission Format

ISO/IEC 12113 Standard file format for three-dimensional scenes and models.



# 3D Tiles Architecture

1] Tileset.json

2] Tile formats (3D Tiles 1.0)

. Batched (.b3dm)

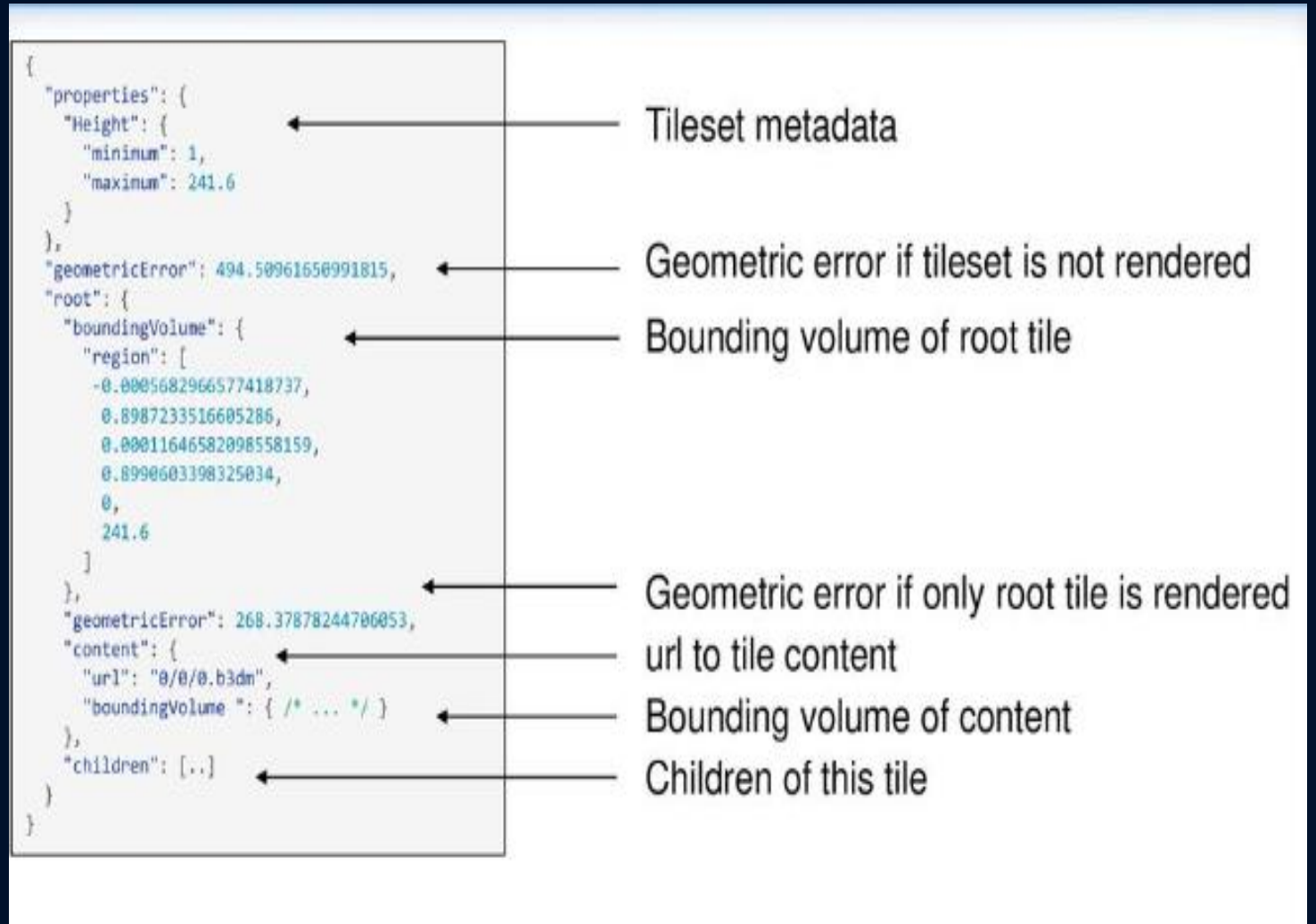
. Instanced (.i3dm)

. Point Cloud (.pnts)

. Composite (.cmpt)

OR

. GLB in 3D Tiles 1.1





# 3D Tiles Styling

1] glTF 2.0 Styling

2] 3D Tiles Styling Language

```
var buildings = new Cesium.Cesium3DTileset({
  url : './buildings/tileset.json'
});

buildings.style = new Cesium.Cesium3DTileStyle({
  color: {
    conditions: [
      ["${feature['bouwjaar']} <= 1700", "color('#430719)"),
      ["${feature['bouwjaar']} > 1700", "color('#740320)"),
    ]
  }
});
```



# 3D Tiles - Ecosystem

1] Tile generators:

FME, Py3DTiles, Virtual City Systems, Tyler

Pg2b3dm: Create Batched 3D Tiles

I3dm.export: Create Instanced 3D Tiles

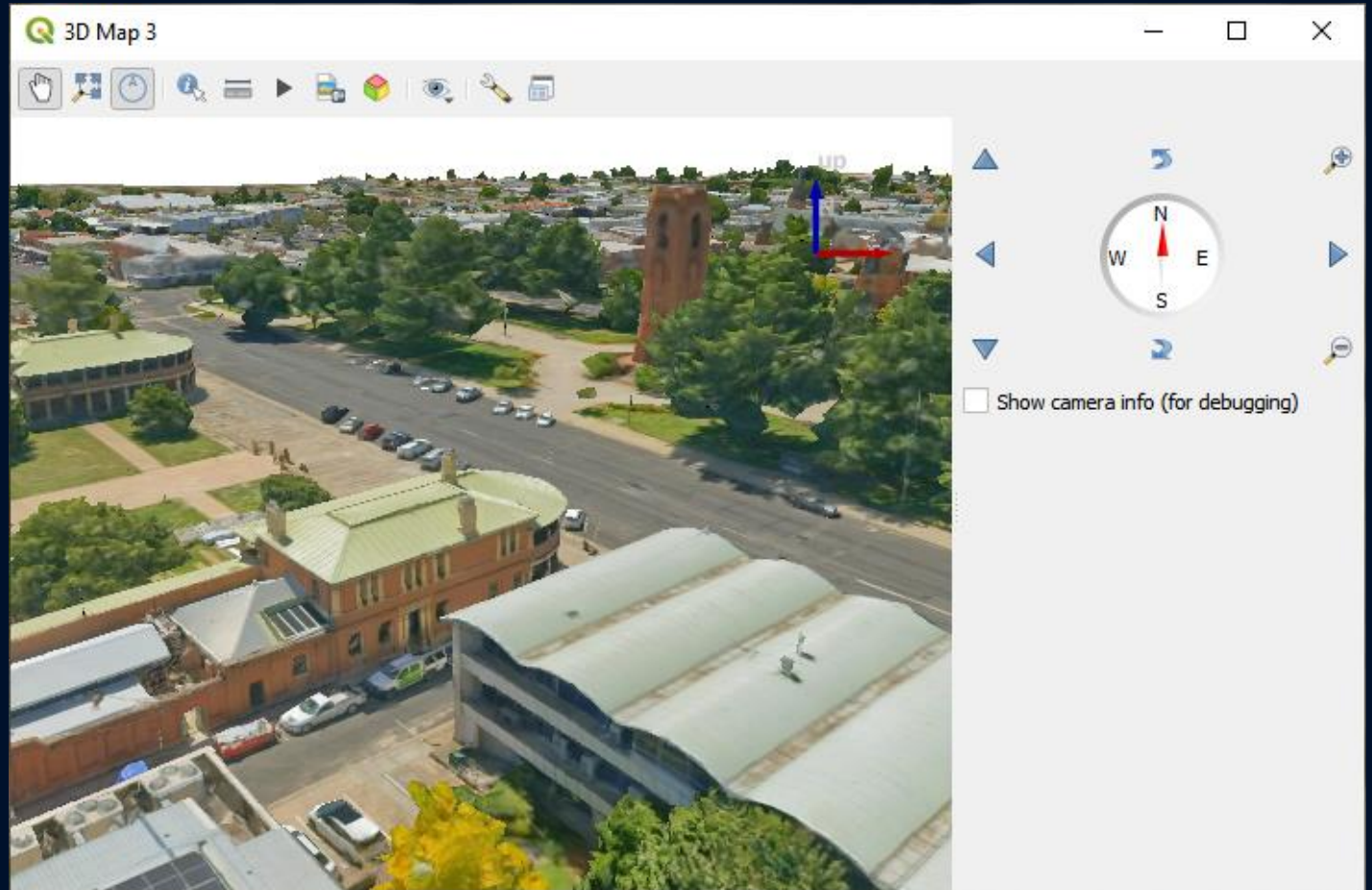
2] 3D Tiles clients

Libraries: CesiumJS, Cesium Native, 3D Tiles Renderer

Browser: CesiumJS (Leia), ITowns

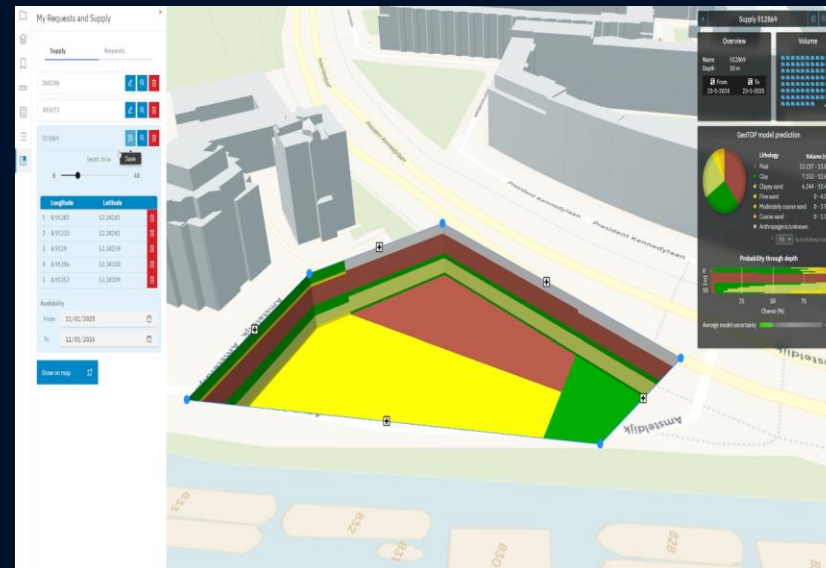
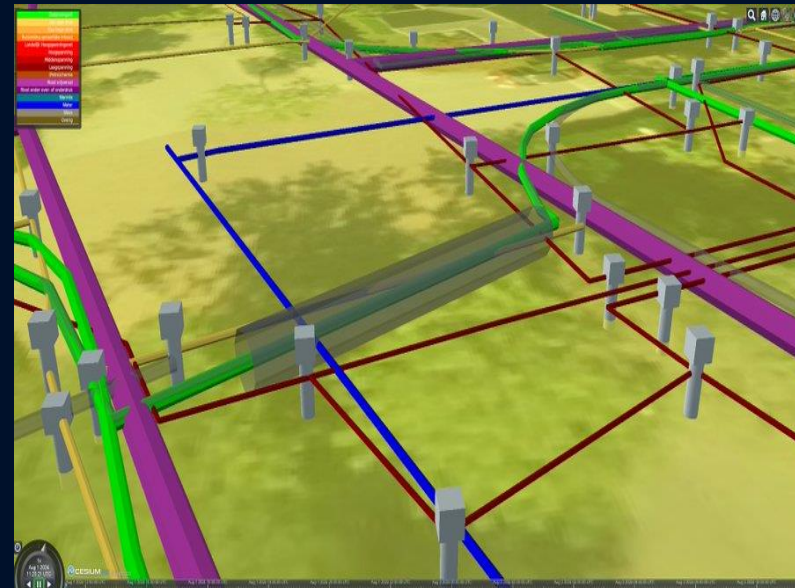
Desktop: QGIS, ArcGIS Pro

Game Engines: Unreal, Unity3D, NVidia Omniverse





# 3D Tiles - Samples





# 3D Tiles – Further reading

1] Geonovum

Handreiking 3D Tiling - <https://www.geonovum.nl/themas/digital-twins/3D-tiling>

Wegwijzer 3D Standaarden - <https://geonovum.github.io/hr-3d-standaarden/>

2] 3D Tiles Nederland

<https://3dtilesnederland.nl/>



# Workshop 13.30 - 15.30

Materiaal: <https://github.com/Geonovum/ogc-api-workshops/tree/main/02%203D-tiles>

Nodig: Windows Laptop, Node.JS, Docker, QGIS

Doel: Digital Twin Andijk maken



# 3D Tiles - Questions

Thanks!

Questions?

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