THE FOUNDATION OF INTELLIGENCE
Creating accurate, global-scale simulations in Cesium for Unreal

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Cesium is the open platform for 3D geospatial.

**The 3D Data Format**
An evolving OGC Community Standard for streaming and runtime – made for a variety of geospatial data

**Open Source Visualization**
Open source web-based runtime engine and Unreal Engine plugin

**Commercial Platform for hosting, tiling streaming & analysis**
Best available tiling tools to optimize a variety of data for streaming global scale & WGS-84 precision

**Curated 3D content**
Ready-to-stream 3D assets

More on the platform: Cesium ion
Cesium Ecosystem
Cesium Ecosystem

Sensors: (Scans, cameras, LIDAR, etc)

Processing & Building 3D Models
- Hivemapper
- Pix4D
- Bentley
- Blender
- Reveal

Artists & Procedural
- Blackshark.ai

AI/ML
- Cesium ion

Additional Sources
- 3D Tiles
- OGC

3D Tiling

The End User
- Unreal Engine
- Cesium for Unreal
- TAK

Platform of Choice with Cesium Native

Additional Sources
- Maxar
- Aerometrex
- Nearmap
Background: 3D Tiles

- **3D Tiles** is an OGC Community Standard that we at Cesium develop, maintain, and evangelize.
  - An efficient, **hierarchical level-of-detail**, streaming format for geospatial content.
  - Enables **interoperability** between a variety of user environments: native, web browser, mobile, embedded, VR, etc.
  - The 3D Tiles format as well as our 3D Tiles streaming solutions: CesiumJS, Cesium for Unreal, and Cesium for O3DE, are all **open-source**!
Background: Cesium Ion

- **Cesium Ion** is our SaaS platform to create 3D Tiles from a variety of input formats.
  - Supports photogrammetry, point clouds, terrain heightmaps, raster imagery, CityGML, CDB, and more.
  - Cesium Ion is the most comprehensive and optimal tool for creating 3D Tilesets on the market today.
  - Once tiled, 3D Tilesets can be hosted on the Cesium Ion cloud for efficient streaming.
Cesium for Unreal: Introduction

• Cesium for Unreal is an open-source plugin adding 3D Tiles streaming support to Unreal Engine 4 and 5.
  – Enables visualizations of massive datasets that are too big to be imported using conventional methods.
  – Brings global-scale precision to Unreal Engine with our unique georeferencing framework.
  – Has been in development for more than two years. Continues to receive regular feature additions as well as bug-fixes.
Cesium for Unreal: What’s Possible?
Cesium for Unreal: What’s Possible?
Prerequisites

• If you want to follow along step-by-step, you will need some basic familiarity with Unreal Engine.
  – Unreal Engine 4.26 or 4.27 should already be installed.
  – The Cesium for Unreal plugin should already be installed from the Unreal marketplace.
  – You should already have an Epic Games account and preferably a Cesium Ion account as well.
• If you only plan to watch the presentation, there is no assumed prior knowledge!
Cesium for Unreal: Live Demo
Visit Cesium at Booth: 1011!
Cesium Party!

JOIN US!
Monday, April 25
8:30 - 10:30 PM
Mountain Pass Sports Bar
Upper Level
Gaylord Rockies Resort
Appendix: Info Covered in Demo

The rest of these slides are for your reference, regarding what we went over in the hands-on demonstration.
Setting up Cesium for Unreal

• Open up a new project in Unreal Engine.
  – Go to “Edit -> Plugins” and search for Cesium for Unreal and enable the plugin.
  – Go to “Edit -> Project Settings” and search for “Extend Default Luminance Range in Auto Exposure Settings”. Enable this option.
  – You will be prompted to restart the Unreal editor to apply the two new settings, do so now.
Setting up Cesium for Unreal

- Sign in to Cesium Ion using the panel on the left. You will be instructed on how to create a new account if you don’t have one already.
Once signed-in, add the following assets from the Quick-Add menu:
- “Cesium SunSky”
- “Dynamic Pawn”
- “Cesium World Terrain + Bing Maps Aerial Imagery”
Creating a Basic Scene

• You should be able to see something like this.
Adding Photogrammetry

- In the Cesium Ion Assets panel on the bottom, search up “Denver” and add the “Aerometrex Denver Photogrammetry” tileset.
Adding Photogrammetry

- To focus the camera on the Denver tileset, double click on the “Aerometrex Denver Photogrammetry” actor in the “World Outliner” window on the right.
Explore Downtown Denver!

- Fly around and explore the photogrammetry tileset of Downtown Denver.
- Change the camera speed in the top right of the viewport as needed.
Explore Downtown Denver!
Explore Downtown Denver!
Add More Tilesets

• Now search for and add the “Melbourne Photogrammetry” tileset from the Cesium ion Assets panel.
Add More Tilesets

• Double-Click on the new Melbourne tileset actor to focus the camera.
  – On the Cesium Georeference actor click “Place Georeference Here” to fix the orientation.
  – On the Cesium SunSky actor change the “Solar Time” until you see daytime in Melbourne.
Place Objects On The Globe

• Place a Cube into the world from the “Place Actors” menu on the left.
  – Select the Cube and set its mobility to “Movable”.
  – By default, this cube will not be properly georeferenced in place when moving around or switching between locations in Cesium. To properly “anchor” it, add the “Cesium Globe Anchor” component to the Cube actor.
  – This can be used to interoperate most Unreal actors with Cesium.
Place Objects On The Globe

• Once it is anchored, you are free to move around the entire world. The object will still be in its exact location when you come back!
Place Objects On The Globe
Here I anchored another object onto a soccer field in Melbourne.
Place Objects On The Globe
Build Anywhere!