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I3S - an open standard for 3D GIS visualization on Web, Desktop and Mobile Platforms

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This session will focus on Indexed 3D Scene Layers (I3S) and its evolution, as an OGC (Open Geospatial Consortium) community Standard. I3S enables the storage and streaming of massive amounts of heterogeneously distributed geospatial content, in the form of millions of discrete 3D objects with attributes, integrated surface meshes and point cloud data covering vast geographic areas, to web browsers, mobile apps and desktop.

Ability to stream millions of triangles and billions of point cloud, regardless of platform constraints, has opened a new 3D graphics and visual computing front in the geospatial world, where there is an increasing demand for high quality 3D application.

In this session, we will describe principles and concepts for organizing geospatial data based on bounding volume hierarchy (BVH), various spatial subdivision algorithms, efficient mesh representation, as well as exploring point cloud, mesh and texture compression/decompression techniques, while keeping the content friendly to GPUs. We will also demonstrate various examples of the different layer types and profiles that are supported in I3S and how the data structure and organization help to efficiently store segmentation/classification information as well as triangle/point level attribution.

Technological advancements in 3D graphics, data structuring, mesh and texture compression, efficient client-side filtering and so forth have significantly contributed to a paradigm shift in how geospatial content is created and disseminated, regardless of size and scale. Formats such as I3S now allow 3d content to be authored/created once and be efficiently consumed in various platforms including desktop, web and mobile for both offline and online access. This phenomenon – create once and consume everywhere model, has encouraged the dissemination and sharing of geospatial content for both planetary (whole earth) and planar 3D visualization experiences.

The session will show case numerous examples (for desktop, web and mobile experience) illustrating the many advancements made in geospatial technologies that are ripe to be embraced in various geoscience disciplines.

The I3S specification was released as a free and open standard by Esri and has been adopted as an OGC community standard for the past 2 and half years and is evolving vastly with many use cases.

