

Beyond 3D

Immersive and gaming environments have achieved a remarkable level of realism creating simulations that make users feel as if they are participants within a real-world environment. Beyond 3D is the integration of those technologies and it will produce and curate the most current geospatially accurate vectors, terrain, and three dimensional (3D) feature content (textures, buildings, roads, and more.) to support United States military operational and training requirements.

Using these visualization technologies to present precise geospatial intelligence (GEOINT) content Beyond 3D can deliver immersive, 3D environments that provide the warfighter and the analyst with realistic models for both training and successful mission execution.

Benefits of Beyond 3D

- Leverages petabytes of foundation GEOINT content.
- Tools transform dense point clouds into precise, accurate 3D surfaces with correlated vector data.
- Available across cloud security domains to include NIPR, SIPR and JWICS.
- Built upon Modular Open Systems Approach (MOSA).
- Data stored in Open Geospatial Consortium (OGC) CDB authoritative archive.
- Used for live, virtual, constructive environments, image generators and selected game engines.
- Metrics based accuracy and completeness.



Beyond 3D Products

Access SDK: Serves as a mechanism to access the National Geospatial Intelligence Agency (NGA) cloud and manage roles for read/write of NGA/ODS data holdings. Through a user interface (UI), the Access Software Development Kit (SDK) searches data holdings and obtains data that match the user's criteria. The functionality of the Access SDK is a series of micro-services (Orchestration Services) within the Mayhem architecture.

Construction SDK: Leverages the CDB Productivity Application Programming Interface (API) to perform data fusion, registration, conflation, and assessments. Examples include generating a mesh from a heightmap, generating ultraviolet (UV) coordinates for a texture on a mesh, generating levels of detail, and attribution mapping. The expandable Construction SDK includes functionality like conflation, registration, and error detection using microservices.

Dissemination SDK: Reads CDB content and exports it into 3D formats readily used by government off-the-shelf (GOTS) and commercial off-the-shelf (COTS) applications such as full motion simulator image generators, Tactical Assault Kit (TAK) viewers, game engines (Unreal, Unity, and more), and web-based viewers (Cesium, OpenLayers, 3.js, and more). Beyond 3D data is easily disseminated through the NGA's cloud based portal. Modeling & Simulation export formats include OBJ, FBX, 3D Tiles, I3S, VBS, CDB, FLT, DAE, KML & GLB. Traditional GEOINT export formats include TIFF, IMG, RPF/CIB, DTED, SHP, FGDB, GeoPackage. Examples of systems supported include Unity, Unreal, CesiumJS, VBS, Esri ArcGIS, ATAK, VTAK, Google Earth, QGIS, Creator, Blender and more.

Modeling and Simulation (M&S) Quality Toolkit: The M&S Quality Toolkit performs metric assessments and validates CDB content. It leverages the CDB Validator for OGC compliance, University of Texas Metrics toolbox, and the US Army C-nergy tool to support the quality and correlation of geospatial data with end-to-end testing of automated processes, geospatial inputs, and processed output.

Performance Assessment Ranking Technology (PARTY) API: Used for decision-based workflows selected based on algorithm performance against various data sources. It quantifies processing capabilities, assesses metrics, and ranks output of algorithms. PARTY leverages the modelling & simulation (M&S) Quality Toolkit to perform metric assessments and then recommends algorithms based on performance and calculated error against known authoritative NGA products. PARTY collects these metrics over time to make better decisions and predictions of effective outcomes.

Visualization SDK: Provides users and developers the ability to visualize data in both 2D and 3D on desktop and websites. The Visualization SDK consists of three unique products: Quantum Geographic Information Systems, QGIS, CDB Editor Toolkit, Web UI 3D Editor and Web UI 2D Editor. The Visualization SDK supports CDB, 3D Tiles, OBJ, FBX, Web Map Service (WMS), Web Map Tile Service (WMTS), Web Feature Service (WFS), Web Coverage Service (WCS), and Vector Tiles.

QGIS CDB Editor Toolkit: A desktop CDB Editor as a plugin for QGIS, a free and open-source geographic information system (GIS) viewing and editing application. The CDB Editor provides a user-friendly interface for both reading and writing CDB datasets within QGIS to lower the barrier of entry of interacting with CDB data.

Web UI 2D and 3D Editors: Utilizes streams from GeoServer to view and edit 2D and 3D CDB content. The user may add, remove, and edit 2D or 3D content within the Web UI 3D Editor and save changes to the underlying CDB content.

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