

# SkylineGlobe Server

Version 7.2

## Datasheet

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## Overview

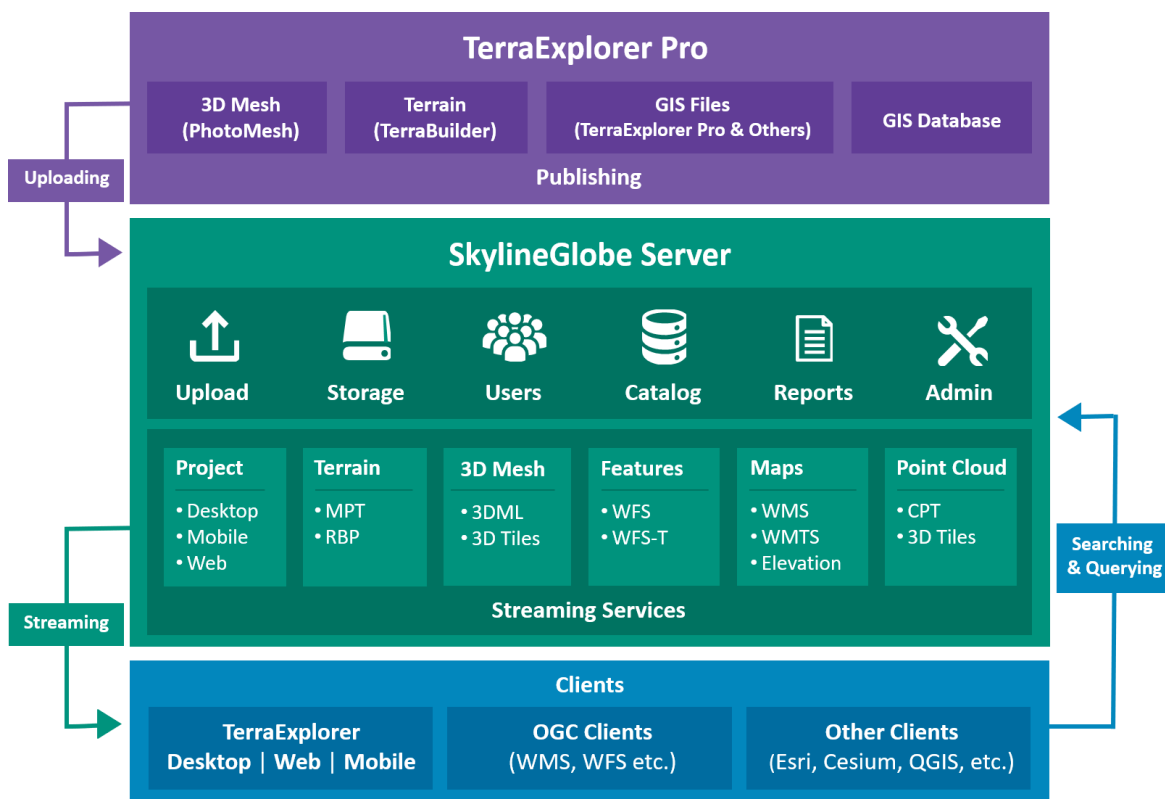
SkylineGlobe Server is a private cloud solution that provides a comprehensive set of web services for publishing, storing, managing and streaming 3D spatial data. All your spatial data types can be streamed including imagery (MPT/TBP/WMS/WMTS), elevation (MPT/TBP/WMS/WMTS), feature (WFS/WFS-T), 3D Mesh (3DML, OGC 3D Tiles, Esri I3S/SLPK), point cloud (CPT, OGC 3D Tiles), and project files.

Individual geospatial layers and complete projects can be directly uploaded and published to the cloud server from TerraExplorer Pro or other Skyline client applications. Through a single publishing operation, data is made ready for consumption by all TerraExplorer clients: Desktop, Web and Mobile, as well as other geospatial applications. Server-side geospatial layers that are stored in files and databases on the server can also be published by scanning their data stores and publishing selected layers.

In addition to streaming layers to remote TerraExplorer clients, SkylineGlobe Server can also convert and expose data in other formats, while storing only the original data formats on the server. This enables access by other clients, including Esri, QGIS and Cesium-based viewers. All data on your server is cataloged and referenced so clients can easily find the specific published layer required.

For enhanced scalability, SkylineGlobe Server can be configured as a single server or as part of a server cluster. A server cluster is a collection of servers, behind a load balancer, that communicate with each other in order to serve data to clients with higher availability.

Your data is kept safe by multiple security layers, including restriction of each user group to predefined data folders and a robust and customized user authentication mechanism. The server's built-in complete user access control system allows easy management of users, groups and virtual private servers (sites). Administrative roles can control the server side upload storage space per user/group/site, number of concurrent viewers, expiration dates and view/edit access permission.



## Streaming Services

SkylineGlobe Server (SGS) provides a comprehensive set of web services for publishing, storing, managing and streaming 3D spatial data:

- **Terrain Service** – Streams terrain data stored either in Skyline optimized terrain databases (MPT) or in terrain databases defined by the TerraBuilder project file (TBP). The terrain database (MPT) is a compressed, multi-resolution, stream-optimized file that includes all source information and applied manipulations in the TerraBuilder project. Terrain databases defined by the TerraBuilder project file (TBP) are served using SkylineGlobe Server [DirectConnect](#).
- **Maps Service** – Streams imagery layers and maps in WMS/WMTS format to most common GIS viewers.
- **Feature Service** – Streams feature layers from files and databases. It also supports advanced spatial and attribute queries from TerraExplorer and other WFS clients. With SGS's support for WFS-T (Web Feature Service-Transactional), remote clients can edit (create, delete, and update features) the feature layer and save changes to the data source. SGS supports WFS versions 1.0.0 and 1.1.0.
- **3D Mesh Service** – Streams multi-resolution and stream-optimized 3D Mesh Layers databases (3DML) from 3DML files. The 3D Mesh Service also exposes the data as Esri I3S and OGC 3D Tiles for TerraExplorer for Web and Cesium based clients. 3D mesh layers (3DML) are high-resolution, textured, 3D mesh models that have been compressed and stream-optimized to accelerate loading speed and efficiently handle memory.
- **Point Cloud Service** – Streams multi-resolution and stream-optimized point cloud data from CPT files. The Point Cloud Service also exposes the data as OGC 3D Tiles for TerraExplorer for Web and Cesium based clients. Point cloud models are created from a list of points in a 3D area that are collected by various sources including 3D scanners. The TerraExplorer MakeCPT tool converts point cloud data from various formats to a unified, visualization and stream-optimized Skyline-proprietary Point Cloud file (CPT) format.



## Supported Sources and Formats

SkylineGlobe Server streamlines your workflow, enabling you to upload and publish individual geospatial layers and complete projects to the cloud server directly from TerraExplorer Pro. All feature layers (including KML), raster layers, mesh layers (3DML, 3D Tiles, OSGB, and DAE), point cloud (CPT, LAS, and E57), project resources (icons, models etc.), and project files (TE Desktop / Web/ Mobile) are supported. Non-geospatial resources used by the project, e.g., images and documents, are also uploaded and published.

Geospatial layers that are stored in existing data stores (e.g., file systems and servers) on the server can also be published by scanning their data stores and publishing selected layers. In addition to streaming layers to remote TerraExplorer clients, SkylineGlobe Server can also convert and expose data in other formats, while storing only the original data formats on the server. This enables access by other clients, including Esri, QGIS and Cesium-based viewers.

### TerraExplorer Pro

**Features** Shapefile, SQLite, GeoPackage, KML/KMZ, File Geodatabase, MapInfo, DGN, DXF, GeoJson, VRT, S-57, TXT, XLS, CSV, Geospatial PDF, SGS, WFS/WFS-T, Oracle Spatial, SQL Spatial, ESRI REST, PostgreSQL

**Imagery & Elevation** Tiff, JPEG, NITF, IMG, GeoPackage, Webp, Cib, ER-Mapper, CIB/ADRG, TLT, MPT, DEM, DMED, TRI, ADF, SGS, WMS/WMTS, Oracle Spatial, ECW, ArcSDE Raster

**Terrain** MPT, TBP

**3D Mesh** 3DML, 3D Tiles, OSGB, DAE

**Point Cloud** CPT, LAS, E57

**BIM** FBX, IFC

Convert and publish to SGS

### SkylineGlobe Server

#### Uploaded and scanned formats

**Imagery, Elevation & Terrain** MPT, TBP

**Feature** Shapefile, GPKG, TAB, MIF, MID, DXF, DGN, MDB, SQLite, KML/KMZ

**Project** FLY

**Mesh** 3DML

**Point Cloud** CPT

#### Streaming protocols

**Imagery & Elevation** WMS, WMTS

**Terrain** MPT

**Feature** WFS, WFS-T

**Mesh** 3DML, 3D Tiles, I3S/SLPK

**Point Cloud** CPT, 3D Tiles

**Project** TerraExplorer Desktop, TerraExplorer for Web, TerraExplorer for Mobile

#### Databases

Oracle, PostgreSQL, Microsoft SQL, ArcSDE

Streaming services

### Clients

**Skyline** TerraExplorer Desktop, TerraExplorer for Web, TerraExplorer for Mobile – all data types

**ESRI** ArcGIS Earth, ArcGIS Pro, ArcGIS Online – imagery, elevation, feature, 3D mesh

**Cesium** Imagery, elevation, 3D mesh, point cloud

**QGIS** Imagery, elevation, feature

**OGC Clients** WMS, WMTS – imagery and elevation, WFS, WFS-T – feature

## Catalog Services

SkylineGlobe Server supports automatic and manual extraction of metadata & geospatial information and advanced search options for layers and projects. SGS offers partial support for the Open Geospatial Consortium (OGC) Web Coverage Service (WCS). WCS returns more information than OGC WMS, including valuable metadata and more formats, and allows more precise queries.

## Management Tools

All services, servers, users, and layers are monitored and controlled from a centralized web management interface:

- Control and monitor the services provided by SGS: Terrain Service, Feature Service, Maps Service, 3D Mesh Service, and Point Cloud Service.
- Control and monitor SGS cluster and physical servers.
- Manage virtual servers (sites).
- Manage users and user groups (e.g., add and delete users and user groups, modify permissions and passwords).
- Configure data sources for each of the different sources of data being published to SkylineGlobe Server. Data sources define the connection information to the data published to SkylineGlobe Server.
- Manage all layers from all SkylineGlobe server data sources to which you have view access, both layers from the connected site and layers from other sites.
- Generate statistic reports on data access and upload storage on the server.

## Data Security

### User Permissions

All users are assigned user roles which define their level of access: super administrators can manage all their server's sites, settings, users and layers, site administrators can manage all their site's layers and users and some server settings, publishers can view and edit published layers, while viewers can only view published content.

From SkylineGlobe Server Manager, you can view and manage the users allowed to administer and access resources on SkylineGlobe Server, and your user groups. User groups enable you to easily provide view or edit access to a specific group of users (of which you are a member). A specific data source can be defined for each group to which all data from all users in the group should be uploaded and published.

### Virtual Private Server (Sites)

SkylineGlobe Server supports the hosting of multiple virtual servers ("sites") on a single server. These virtual sites provide complete separation between customer layers and allow management and administration of the sites by the customer's admin users. Each site is distinct and separate, with its own URL and its own data sources, layers, groups/users, settings, aliases, TE4W configurations, statistics, site administrator, etc.

Site Administrators can perform SGS management and configuration activities for their own site, while Super Administrators can log in to SGS Manager to **any** of the server's sites to perform SGS

management and configuration activities, including management of all the server's data sources, layers, groups/users, and settings, and cross-site operations, e.g., setting cross-site aliases and permissions.

## Custom Authentication

SkylineGlobe Server provides the option for full customization of your server's authentication and authorization system. A server admin can create and provide a custom DLL that will be loaded by SGS at runtime, which includes a public class controlling user access to SGS.

Skyline also offers an out-of-the-box custom authentication implementation. Authentication requests can be forwarded automatically to a microservice based on Identity Server, which was customized for common Skyline customer use-cases, including PKI, LDAP, and OpenID.

## Scalability and Elasticity

SGS's server clustering supports efficient server management, increased scalability, load-balancing and redundancy. SkylineGlobe Server can be configured as part of a server cluster, a collection of servers that communicate with each other in order to serve data to clients with higher availability. When SkylineGlobe Server is running in a server cluster, all servers in the cluster share a single license. The first server that is activated borrows the floating license and shares it with the cluster. If the first SGS stops for any reason, the license is automatically released from that SGS and transferred to a different server who shares it with the cluster. This happens without interruption so that machines can be dynamically added and removed from the cluster, without requiring a separate license for each. In addition, the maximum number of concurrent active end users defined in the license is shared between all the cluster servers, with the load balancer determining the distribution of server traffic between the servers.

## DirectConnect Service

SkylineGlobe Server DirectConnect Service is a subsystem of the Terrain and Maps Services that enables you to serve terrain databases defined by the TerraBuilder project file (TBP) to TerraExplorer clients and any application that reads the standard OGC WMS/WMTS protocol. The TerraBuilder project (TBP) and all project layers are published to SkylineGlobe Server directly from TerraBuilder. SkylineGlobe Server DirectConnect eliminates the need for time-consuming re-creation of complete MPT files and allows dynamic updating of the layers and project. This is critical for projects whose source data is constantly being updated or modified. DirectConnect leverages cache technology and support for multi-core and multi-computer processing to provide scalability and accelerate publishing of the TBP.

DirectConnect projects are automatically optimized by referencing MPT source files, i.e., pre-processed optimized versions of the respective sources, that can be served to the client without fuser processing. When specific sections of the database are updated, the referenced MPT source files can be easily updated or removed and new layer MPT's referenced to show variations of the original information.

## System Requirements

Requirement	Description
<b>Operating System</b>	Windows® Server 2008 R2 / 2012 R2 / 2016 / 2019 – 64-bit.
<b>System Memory</b>	4 GB of RAM (8 GB or more recommended).
<b>Processor</b>	Dual-Core (4 or 8 cores recommended).
<b>Browser</b>	Microsoft Internet Explorer 11, Edge Legacy, Chromium Edge, Mozilla Firefox, and Google Chrome.
<b>User Privileges</b>	Administrator privileges required for installation and configuration.
<b>Additional Software</b>	Microsoft Internet Information Services IIS7.5, IIS8.5, IIS10 with .Net 4.6.1 and ASP.Net.

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📞 Office: (703) 378 3780

📠 Fax: (703) 378 3760

🌐 [www.skylinesoft.com](http://www.skylinesoft.com)

✉ Technical Support:  
[support@SkylineGlobe.com](mailto:support@SkylineGlobe.com)

📧 General Information:  
[info@SkylineGlobe.com](mailto:info@SkylineGlobe.com)

🌐 LinkedIn:  
Skyline Software Systems, Inc.

📺 Youtube:  
skylinesoft