Skyline Software Systems, Inc. is a leading provider of 3D earth visualization software and services. The company offers a comprehensive platform of applications, tools and services that enable the creation and dissemination of interactive, photo-realistic 3D environments. The SkylineGlobe software suite sets the standard for 3D desktop and web-based applications, enabling an enterprise to build, edit, navigate, query, and analyze realistic 3D environments, and rapidly and efficiently distribute them to users.

SkylineGlobe - Products Overview

Skyline Software Systems, Inc. is a leading provider of 3D earth visualization software and services. The company offers a comprehensive platform of applications, tools and services that enable the creation and dissemination of interactive, photo-realistic 3D environments. The SkylineGlobe software suite sets the standard for 3D desktop and web-based applications, enabling an enterprise to build, edit, navigate, query, and analyze realistic 3D environments, and rapidly and efficiently distribute them to users.
**Building**

**TerraBuilder**
Merges aerial photos, satellite images, and digital elevation models of different sizes and resolutions into a photo-realistic, geographically accurate terrain database.

**CityBuilder**
Merges 3D mesh models together with classification layers, and other model layers into a multi-resolution and stream-optimized 3D Mesh Layer database (3DML).

**PhotoMesh**
Fully automates the generation of high-resolution, textured, 3D mesh models, as well as true orthophoto, DSM, and DTM/DEM raster layers from standard 2D photographs.
Streaming - Skyline Globe Server

**Terrain**
Powerful terrain service technology for streaming 3D terrain geographic data from terrain databases (MPT) or directly from the original sources to thousands of concurrent remote users.

**3D Mesh**
Powerful network data server technology for streaming multi-resolution, stream-optimized 3D mesh layers to remote TerraExplorer clients.

**Feature Layer**
Powerful network data server technology for streaming feature layers from databases or pre-cached layers to TerraExplorer or WFS clients, that also provides remote clients with read-write access to edit and save changes to the data source.
TerraExplorer for Desktop

Cutting-edge 3D GIS desktop viewer and creator for viewing, querying, analyzing, and presenting geospatial data in a high resolution 3D environment, as well as creating and publishing realistic 3D views.

TerraExplorer for Web

Powerful web-based 3D GIS viewer and editor with advanced capabilities for viewing, analyzing, and creating 3D views in a high resolution 3D environment.

TerraExplorer for Mobile

Advanced 3D GIS viewer and editor for Android and iOS mobile devices with professional-grade tools for viewing, querying, analyzing and editing massive online or offline datasets in a high resolution 3D environment.
Developer

**Desktop**

TerraExplorer’s rich API provides a complete, straightforward way to develop powerful, customized 3D desktop applications.

**Web**

TerraExplorer’s powerful 3D GIS viewer and editor can be embedded in a website, and its robust capabilities supplemented by custom functionalities created using TerraExplorer’s comprehensive API.

**Mobile**

TerraExplorer’s mobile app provides a full API for custom feature development, along with easy-to-implement localization, branding and UI customization options.
SkylineGlobe Supported Formats

Feature Layers
- ESRI Shapefile
- File Geodatabase (*.gdb)
- MapInfo file (Tab, Mif, Mid)
- GeoPackage
- Microstation DGN
- DXF File
- SQLite (*.sqlite, *.db)
- TerraGate SFS server
- OGC WFS server
- ESRI ArcSDE server
- Geospatial PDF
- ESRI REST Server
- SkylineGlobe Server
- PostgreSQL database

Complex Layers
- TerraExplorer project (.fly)
- OGC KML (.kml, .kmz)
- BIM (.fbx)
- Point Cloud (.las, .cpt)

Imagery and Elevation Layers
- Jpeg (.jpg, .jp2, .j2k, .jpc)
- Tiff (.tif, .tifff)
- Gif (.gif)
- BMP (.bmp)
- MrSid (.sid)
- GeoPackage (.gpkg)
- Erdas Imagine (.img)
- ER-Mapper (.ecw, .ecwp)
- Web Map Service (WMS)
- Web Map Tile Service (WMTS)
- Oracle Spatial Database
- ECW Image Web Server
- WCS
- GoogleEarth Enterprise
- SkylineGlobe Server
- ArcSDE Raster Server

3D Models
- .3dml
- .b3dm (3D Tiles)
- .dae
- .ply
- .obj
- .x
- .3ds
- .flt
PhotoMesh fully automates the generation of high-resolution, textured, 3D mesh models, point clouds, and true orthophoto, DSM, and DTM/DEM raster layers from standard 2D photographs. This breakthrough application combines unlimited scalability with superior precision to produce consistent and accurate 3D models that enhance the realism of any 3D visualization.

**Interoperability**
Compatible with vast number of CAD and 3D solutions
- Produce georeferenced 3D models in any coordinate system
- Create 3D mesh models in a range of formats: 3DML (for loading directly into CityBuilder or TerraExplorer and streaming with SkylineGlobe Server), Cesium, DAE, OBJ, OSGB, or i3S/SPK
- Generate true-orthophotos, DSM, and DTM/DEM compatible with all standard GIS tools
- Produce dense point clouds with detailed color information that can be used in most point cloud analysis software

**Superior Precision**
Accurate representation of intricate features, details, geometry, and color
- Full-3D mesh model
- Advanced color balancing produces seamless, realistic models
- High-quality texturing
- Seamless fusion of multi-resolution source data
- Powerful compression algorithms avoid any unwanted loss of geometric accuracy

**High Performance**
Powerful and fast
- Exploits the power of graphics processing units for general purpose computation
- Multi-core and multi-computer processing allow for unlimited source data and dramatically reduce processing time
- Powerful engines can handle enormous quantities of input and output data

**Unlimited Scalability**
Grid computing and tiling mechanism support ever-increasing dataset sizes
- Elaborate tiling mechanism enables efficient handling of massive quantities of input imagery
- Use of network fusers dramatically accelerates processing time by enabling multiple computers to share the processing load
Exceptional Usability
Straightforward photo acquisition and automatic processing
>> Directly output a geometrically precise, photo-textured 3D model, without mapping texture to 3D geometry
>> Photograph subject from any mobile phone, compact digital, DSLR, photogrammetric, or multi-camera system
>> Reconstruct subjects, ranging in size from centimeters to kilometers

Geospatially Enabled
Transform mesh models into powerful geospatial data with TerraBuilder CityBuilder
>> Fully enable spatial and attribute queries by merging your mesh model with classification information
>> Combine mesh models with other model data sets
>> Optimize models for desktop, web, and mobile use
CityBuilder merges 3D PhotoMesh city models together with classification layers, individually modeled layers, and BIM datasets, into a stream-optimized, fully textured, and geospatially-enabled mesh layer (3DML). Generated 3DMLs can be made available to local TerraExplorer clients or published to remote clients (using the SkylineGlobe Server 3D Mesh Service) for a seamless integration into TerraExplorer’s terrain that supports powerful visualization and advanced geospatial analysis.

### Merge and Optimize City Model

**Unified and efficient 3D mesh layer**
- Merges any number of mesh models with BIM and other model data sets
- Reprojects layers that use different coordinate systems
- Generates fully textured model
- Optimizes models for desktop, web, & mobile

### Geospatially Enabled Mesh Models

**Transform PhotoMesh mesh models into powerful geospatial data**
- Fully enable spatial operations and attribute queries by merging PhotoMesh-generated mesh models with classification information such as building footprints
- Generated 3DML layers are integrated seamlessly in TerraExplorer’s terrain, and can be measured, analyzed, and queried using TerraExplorer’s advanced capabilities

### Individually Referenced Models

CityBuilder stream-optimizes entire city layers, modeled either manually or semi-automatically
- Integrates point feature layers that reference individual models of complete cities
- Optimizes model layers for viewing and streaming on desktop and mobile applications
**Building Information Modeling (BIM)**

BIM layers provide crucial support for the entire building life cycle

- Reads FBX format, the industry standard for BIM data
- Converts BIM from FBX to 3DML format that can be viewed and analyzed in its geographical context using TerraExplorer, while preserving all geometry and attribute data
- Stream-optimizes BIM data
- Supports spatial and attribute queries

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**Rich Editing Environment**

Efficient model creation process

- Support for multi-threading allows full utilization of computer resources
- Easily search SkylineGlobe Server for required data
- Immediate preview of created 3DMLs from CityBuilder’s 3D View

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**Efficient Data Management**

Manage and share enterprise information across your organization

- Find up to date model data by querying SkylineGlobe Server
- Upload 3DMLs to the SkylineGlobe 3D Mesh service directly from CityBuilder
TerraBuilder is a 3D terrain database creator with professional-grade tools for manipulating and merging aerial photos, satellite images, and digital elevation models of different sizes and resolutions. The resulting photo-realistic, geographically accurate terrain database can be made available to local TerraExplorer clients or published to remote clients (using the SkylineGlobe Terrain service).

**Robust Compatibility**

Supports wide range of layer types

- Load local and remote files
- Support for extensive range of formats
- Dynamic plug-in mechanism for easy installation of updated plug-ins from Skyline
- Automatic reprojection of layers that use different coordinate systems

**Flexible Layer Manipulation**

Range of editing tools for maximum precision

- Easily crop, resize, and move layers
- Adjust geographic coordinates using tie points
- Adjust color and elevation parameters
- Easily edit using Clip, Exclusion, & Fill polygons
- Edit multiple layers simultaneously
- Polygon feathering

**High Performance**

Efficient terrain creation process

- Preview mode - lets you preview and correct potentially problematic areas before MPT creation
- Use of network fusers dramatically reduces processing time
- Automatic creation of source resolution pyramids
- Multi-core/ multi-computer processing supported to accelerate massive data set publishing

**Near Real-Time Updates**

Avoid time-consuming re-creation of complete MPT files using DirectConnect

- DirectConnect projects are automatically optimized by referencing pre-processed optimized versions of sources in their native formats
- Multi-core and multi-computer processing supported to accelerate massive data set publishing
SkylineGlobe Server (SGS) is a private cloud solution that provide a comprehensive set of web services for publishing, storing, managing, and streaming 3D spatial data. The server’s built-in complete user access control system allows easy management of users, groups, and administrative roles controlling the server-side storage and client-side read/write permissions.

**Streaming**

Supports streaming services for all your data types
- Terrain (MPT/TBP)
- Map (WMS/WMTS)
- Feature (WFS/WFS-T)
- 3D Mesh (3DML, 3D Cesium tiles)
- Point Cloud (CPT, 3D Cesium tiles)

**Publishing and Cataloging Services**

Client-side and server-side publishing
- Upload and publish geospatial data to the cloud server directly from TE or other Skyline client application
- Publish server-side geospatial layers stored in files & databases on the server
- Automatic and manual extraction of metadata and geospatial information
- Advanced client-side search options for data layers and projects
- Auto-scanning of server-side folders for layer changes

**OGC Compliance**

Stream raster, and feature data to any application that reads the standard OGC WFS, WFS-T, WMS, and WMTS protocols
- Make your data available online in an open, internationally recognized format
- Remote clients can edit (create, delete, and update features) the feature layer and save changes to the data source
- Outputs WMS/WMTS tiles in JPEG and PNG formats

**Multiple Security Layers**

Keep your data safe with robust user authentication mechanism and restriction of user groups to predefined data folders
- Only registered users can upload data
- User uploads data to predefined data folder
- Each data layer has a view/edit access level: None, Only Me, My Group, Everyone, or Selected List
Server Clusters
Serve data to clients with higher availability
» All cluster computers are managed from a single web-based management interface
» Maximum number of concurrent active users defined per server cluster for increased flexibility
» Distributed SGS Terrain Service network
» Multiple sites
» Stateless transactions (allows switching of server)

Direct Uploading
Streamline your workflow and eliminate the need for any server-side login after initial installation
» Upload and publish individual geospatial layers and complete projects to the cloud server from TerraExplorer
» Publish TerraBuilder output and project
» Through single publishing operation, data is made ready for consumption by all TerraExplorer clients: Desktop, Mobile, and TE for Web, as well as other OGC clients

SGS Manager
Centralized web management and configuration
» Control and monitor all services provided by SGS: Terrain, Feature, Map, 3D Mesh, Point Cloud, and DirectConnect
» Control and monitor your SkylineGlobe servers
» Manage your users and user groups
» Configure data sources for each of the different sources of data being published to SkylineGlobe Server
» Fully manage multiple TE4W configurations
A cutting-edge 3D GIS desktop viewer and creator that provides powerful tools and a high resolution 3D environment in which to view, query, analyze and present geospatial data. With TerraExplorer’s robust and extensive capabilities and ever-increasing interoperability, stunningly realistic 3D visualizations can be created by overlaying the terrain with unlimited data layers, 3D models, virtual objects and more.

**TerraExplorer for Desktop**

**TerraExplorer Viewer**
Users can navigate through high resolution 3D world environments created by fusing aerial and satellite photography, terrain elevation data and other 2D and 3D information layers.

**TerraExplorer Plus**
Adds loading of all 2D and 3D offline formats, feature layer editing and querying, advanced objects and drawing tools, a set of tools for professional usage, and the advanced Pro API interfaces.

**TerraExplorer Pro**
Adds publishing capabilities, optimization of model files for improved display performance, and uploading of data to SkylineGlobe cloud.

**Navigate**
Wide range of navigation options
- Free flight
- Presentations with predefined flight paths
- Locations and favorites
- GPS tracking
- Online address geocoding and reverse geocoding
- Underground navigation

**Analyze the Terrain**
Increase understanding and improve decision making with a wide range of powerful terrain analysis tools
- Distance
- Area
- Contour
- Slope
- Flood
- Volume
- Terrain Profile

**Calculate Visual Exposure**
Versatile and configurable tools provide precise, actionable data
- 2D Viewshed
- 3D Viewshed
- Viewshed on Route
- Viewshed Query
- Line of Sight
- Threat Dome
**Share**
Easily share your 3D visualizations
» Create presentations with customized flight routes
» Use Collaboration tool for remote guided tours
» Publish and extract projects to web, desktop, and mobile devices

**Create**
Fuse object, feature, raster and other local and remote sources
» Terrain
» GIS feature layers
» Open Street Map
» Lidar point clouds

**Interoperability**
Supports wide range of formats
» WFS/WFS-T
» WMS/WMTS
» Tiff, JPEG, MrSID, ECW, IMG...
» WCS
» More...

» Shapefile, KML/KMZ, SQLite...
» DAE, 3DS, X, FLT...
» FBX
» 3D Tiles (B3DM)

**Edit**
Robust feature editing supported
» Spatial queries
» Edit geometry
» Modify attribute information
» Save layer changes to data source or new file
» Add and delete features

**Visual Effects**
Full range of animated effects
(fog, rain, snow, fire, explosion, water movement)
» Sun as light source
» Shadow effect
» Dynamic objects
» Video on terrain
TerraExplorer for Mobile

A cutting-edge 3D GIS desktop viewer and creator that provides powerful tools and a high resolution 3D environment in which to view, query, analyze and present geospatial data. With TerraExplorer’s robust and extensive capabilities and ever-increasing interoperability, stunningly realistic 3D visualizations can be created by overlaying the terrain with unlimited data layers, 3D models, virtual objects and more. The app can load local TerraExplorer projects as well as access online data from SkylineGlobe Server and other OGC compliant servers.

Explore
Geospatial layers seamlessly fused for photo-realistic visualization
» Terrain
» GIS feature layers
» Urban model layers
» Image and elevation raster layers

Analyze the Terrain
Increase understanding and improve decision making with a comprehensive set of powerful analysis tools
» Distance and area measurement
» 3D viewshed
» Shadow analysis
» Terrain profile

On the Go
Extends the reach of 3D GIS from the office to the field
» Online viewing and editing (WFS-T)
» Load offline kits published by TerraExplorer Pro
» Mobile optimized UI

Edit
Robust feature and white board editing supported
» Local and remote geospatial layers
» Geometry and attributes
» White board for local sketching
Customize
Localization, branding & functionality
» Your language
» Your logo and app name
» Add and remove menu entries and forms
» Full API for custom feature development

Navigate
Wide range of navigation options
» Presentations with predefined flight paths
» Locations and favorites
» My device location tracking
» Online address search
» Underground navigation
TerraExplorer for Web (TE4W) is a lightweight 3D GIS viewer that enables you to view and analyze high-resolution, stunningly realistic 3D content in a web browser, without any plug-ins. The employment of HTML5/WebGL standards allows TerraExplorer for Web to provide support for multiple platforms and browsers. Built on the powerful Cesium open source library, TerraExplorer for Web further extends the core functionality with additional capabilities and enhanced performance.

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**Lightweight 3D GIS Application**

Online viewing solution

- No plugins
- No downloads
- No installation

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**Multi-Platform, Multi-Browser**

HTML5/WebGL standards

- Windows, Mac, Linux
- Chrome, Firefox, Safari, Opera, Edge, IE11
- iOS, Android

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**Measure and Analyze**

Highly accurate analysis tools

- Distance and area measurement
- Graphic terrain profile
- Viewshed tool
- Contour map
- Slope map
**Access Data**

Integrates with other SkylineGlobe products

» TerraBuilder terrain databases
» PhotoMesh’s 3D mesh models
» Online data from Skyline’s SkylineGlobe server and other OGC-compliant servers

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**Optimized Performance**

Enhanced user experience

» Fast loading times
» Smooth navigation
Requirements

**TerraExplorer for Desktop**
*Operating System:* Windows® 7 / 8 / 10 – 64-bit required  
*Processor:* 4 cores (8 cores recommended)  
*Video Card:* 512 MB of video memory (1 GB or more recommended). Pixel and vertex shader v3.0  
*Browser:* Microsoft Internet Explorer 9 or higher

**TerraExplorer for Web**
*Operating System:* Windows / Linux / Mac OS / Android / iOS  
*Browser:* Chrome, Firefox, Edge, IE11 or higher

**TerraExplorer for Mobile**
*Operating System:* Android 4.0 and above / iOS 7.0 and above  
*Processor:* Dual-Core and higher  
*System Memory:* 1 GB of RAM (2 GB or more recommended)

**TerraBuilder**
*Operating System:* Windows® 7 / 8 / 10 – 64-bit required  
*System Memory:* 4 GB RAM (8 GB or more recommended)  
*Processor:* 4 cores (8 cores recommended)  
*Video Card:* 256 MB of video memory (1 GB or more recommended)

**PhotoMesh**
*Processor:* 4 cores (8 cores recommended)  
*System Memory:* 16 GB RAM (32 GB recommended)  
*Video Card:* 1 GB of video memory (2 GB or more recommended). Pixel and vertex shader v3.0

**CityBuilder**
*Operating System:* Windows® 7 / 8 / 10 – 64-bit required  
*System Memory:* 8 GB RAM (16 GB recommended)  
*Processor:* 4 cores (8 cores recommended)  
*Video Card:* 1 GB of video memory (2 GB or more recommended)

**SkylineGlobe Server**
*Operating System:* Windows® Server 2008 R2 / 2012 R2 - 64 bit  
*System Memory:* 4 GB RAM (8 GB or more recommended)  
*Processor:* Dual-Core (4 or 8 cores recommended)  
*Browser:* Chrome, Firefox, Edge, IEB or higher  
*Additional Software:* Microsoft Internet Information Services IIS7.5, IIS8.5, IIS10 with .Net 4.0

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