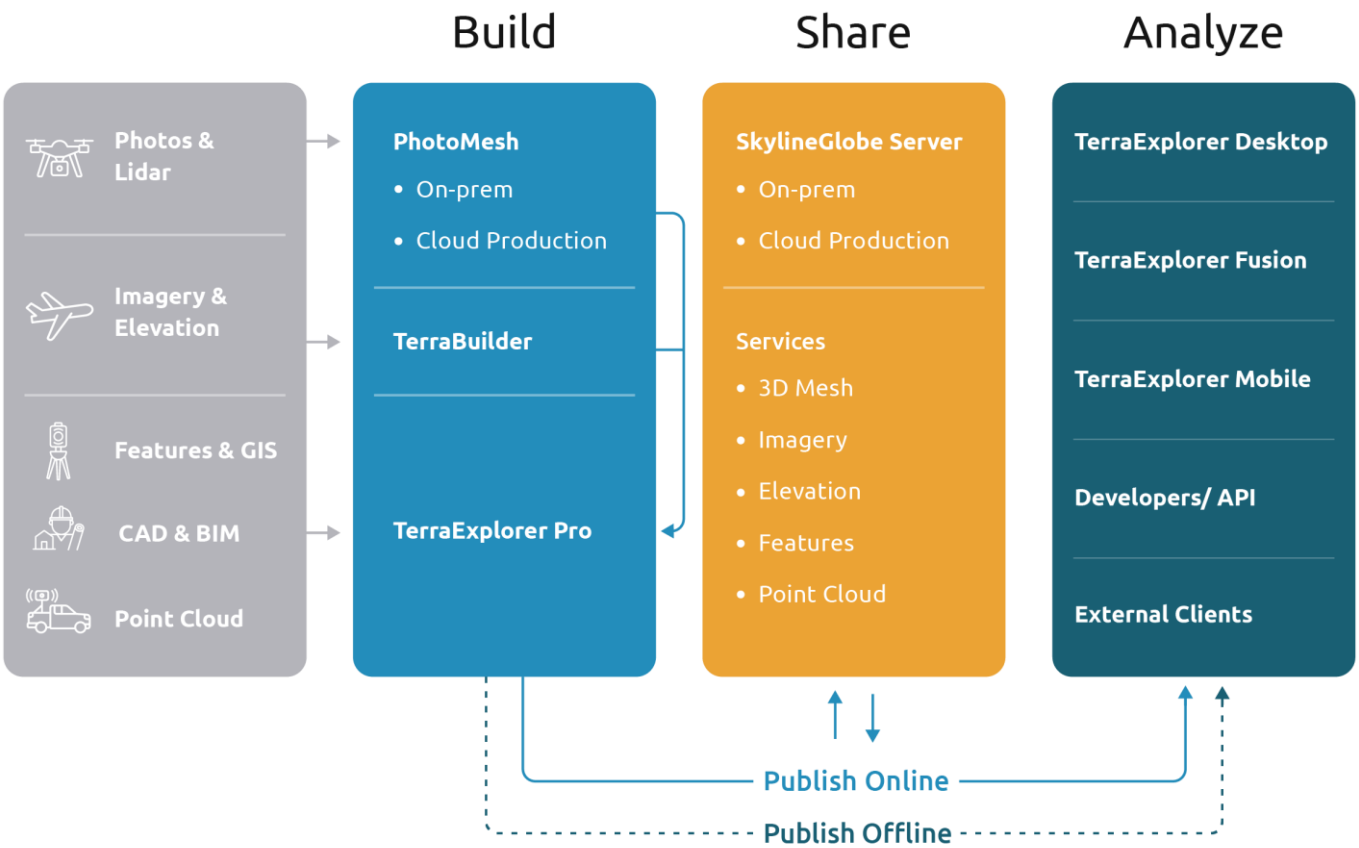
Products Overview

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 Skyline 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.



PhotoMesh

Combining photos in a wide range of formats, PhotoMesh generates highly-detailed 3D meshes, orthophotos, elevation models, point clouds, and more. PhotoMesh's breakthrough 2D and 3D mapping technology is based on the highest-performance photogrammetry, computer vision, and computational geometry algorithms. PhotoMesh employs elaborate tiling mechanisms to efficiently handle projects of any size, even large projects with hundreds of thousands of photos. Running on standard hardware, PhotoMesh can also exploit computer clusters and cloud computing to vastly accelerate the build by running a single project simultaneously on hundreds of fuser machines.

Load

Load or import photos through a wide array of methods. Extract external orientation and internal camera settings directly from Exif tags or load a photo list file that includes these details along with photo references. LiDAR data can also easily be integrated into your PhotoMesh project to refine and enhance the 3D model.

Build

PhotoMesh optimizes model reconstruction by using computer clusters, known as fusers, to distribute the intensive processing demands across multiple networked computers. This setup significantly accelerates the different stages of the build process. PhotoMesh also offers two advanced fuser options, Amazon Web Services and fuser pools, which enable dynamic allocation of resources based on specific project requirements.

Evaluate and Adjust

PhotoMesh offers a suite of tools to efficiently study & adjust project data. Project photos onto terrain to see how they fit with terrain imagery or verify they generated expected cluster form. Color-coded maps provide insights into directional coverage, overlap, and photo interconnections. A robust control point mechanism and other tools are available to improve positional accuracy.

Review and Rebuild

PhotoMesh offers an array of tools for reviewing build results. Users can examine all processed data, including AT/reconstruction tiles, camera positions, 3D models, & point clouds, within the 3D Window. Comprehensive build and production reports deliver in-depth statistical and graphical information. If the mesh has imperfections, the model can either be retouched directly in PhotoMesh or exported for this purpose. Once project review and modifications are complete, a new build can be initiated.

High Quality

PhotoMesh generates a full-3D mesh model that faithfully reproduces even small-scale details such as cars, trees, fences and walls - all with advanced color balancing and high-quality texturing.

Production Automation

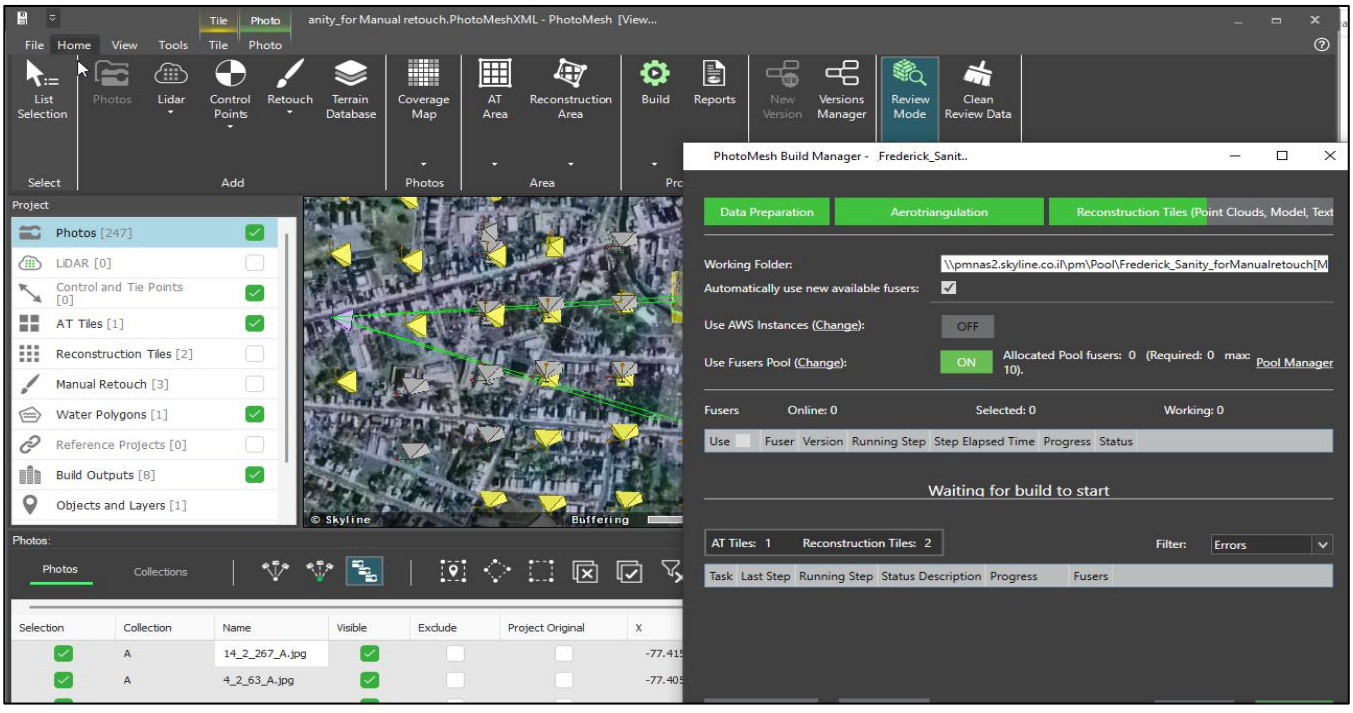
Robust REST APIs allow developers to create, monitor, and manage project queues and to automate PhotoMesh production flows on local machines, remote servers, and the cloud.

Scalability

PhotoMesh efficiently handles even hundreds of thousands of photos using an elaborate tiling mechanism. PhotoMesh exploits multi-computer architecture (fusers) to further accelerate database creation, running a single project simultaneously on hundreds of machines to process tens of km^2 per day.

Cloud Ready

PhotoMesh can exploit computer clusters and cloud computing to run a single project simultaneously on hundreds of fuser machines. Sharing the workload involved in generating PhotoMesh output vastly accelerates the build process.



Advanced Geo-Referencing

Improve your 3D modeling precision with robust geo-referencing tools. Use control points, either manually marked or automatically detected, to achieve accurate geographic positioning. PhotoMesh also offers project geo-referencing, allowing for the accurate positioning of photos without GPS data by aligning them with photos from a similar area in a different project that have verified GPS coordinates.

LiDAR Integration

Integrate LiDAR data into your PhotoMesh projects to refine and enhance 3D models, achieving cleaner results with increased accuracy. LiDAR captures detailed street-level data beneath vegetation and complex structures as well as offers reliable geographic control, significantly boosting the absolute accuracy of the final 3D mesh and geospatial outputs, and much more.

Manual Retouch

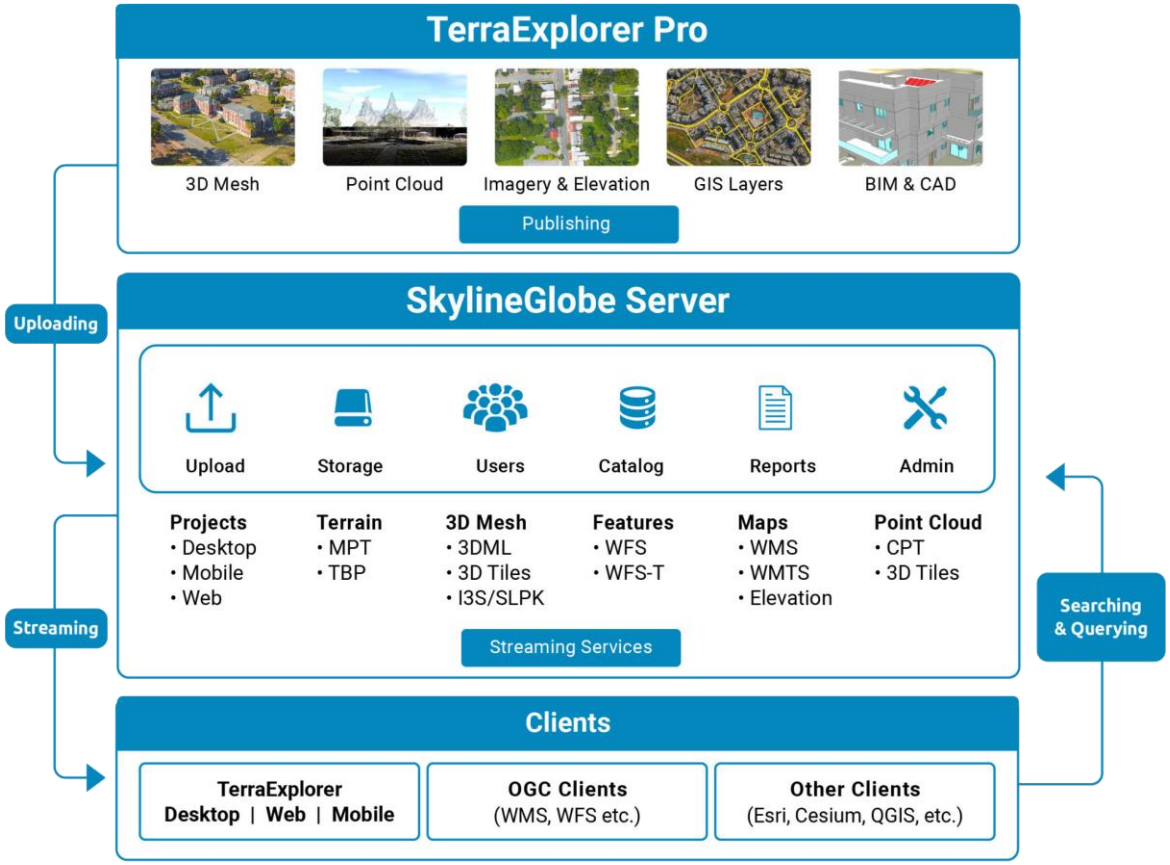
Flatten, fill, and clean up mesh imperfections with PhotoMesh's Manual Retouch tool. Simply mark areas on your 3D model or orthophoto output for retouching. During the project reconstruction, PhotoMesh utilizes this detailed input to precisely refine the mesh model, ensuring a smoother and more accurate final product.

Build Presets

Configure all essential settings of your project quickly and accurately using our Simplified Build Settings View or use the Advanced View for more complex requirements. The Advanced option not only allows for detailed manual adjustments across a broader range of parameters but also offers a wide array of Build Presets, designed to automatically configure the optimal build parameters for your specific data.

SkylineGlobe Server

The SkylineGlobe Server private cloud solution provides a comprehensive set of web services for publishing, storing, managing and streaming 2D and 3D geospatial content. All your GIS layer types are supported: 3D mesh , imagery, elevation, feature and point cloud. SkylineGlobe Server makes it easy for you to share your data by converting and exposing your content in multiple formats.



SkylineGlobe Server streams data in the format your client needs

Skyline

- 3D mesh as I3S/SLPK
- Imagery and elevation using WMS or WMTS protocol
- Feature layers using WFS protocol

Esri

- 3D mesh as I3S/SLPK
- Imagery and elevation using WMS or WMTS protocol
- Feature layers using WFS protocol

Cesium, QGIS, OGC

- 3D mesh as 3D Tiles
- Imagery and elevation by WMS/WMTS protocol
- Point cloud as 3D Tiles
- Feature layers using WFS/WFS-T

Data Security

Keep data safe with virtual private, geospatial servers, custom authentication, & user permissions. SkylineGlobe Server supports the hosting of multiple virtual servers (“sites”) on a single server. These virtual sites provide complete separation between customer layers & allow management and administration of the sites by the customer’s admin users.

Scalability and Elasticity

Add and adjust storage and compute capacity in real-time to accommodate increased or spikes in usage, as well as redundancy and failover, using dynamically clustered compute power. All servers in a cluster share a single floating license that can be passed from server to server. Cluster servers also share the maximum number of concurrent active end users defined in the license, with the load balancer determining the distribution of server traffic.

Cloud Ready

For greater scalability, redundancy, and security, SkylineGlobe Server can use any cloud platform (AWS/Google Cloud/Azure, etc.) that provides virtual machines that meet Skyline's system requirements. Skyline also offers SkylineCloud, a fully managed Skyline service based on SkylineGlobe Server, for uploading, storing, converting and streaming 2D and 3D spatial data, to help you optimize your geospatial data production.

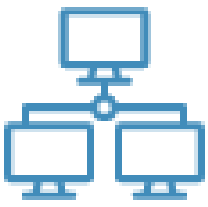
Streamlined Workflow

Upload and publish individual geospatial layers and complete projects to the cloud server directly from TerraExplorer Pro. Through a single publishing operation, data is made ready for consumption by all TerraExplorer clients: Desktop, Fusion and Mobile, as well as other 2D and 3D geospatial applications.

Interoperability

SGS enables your enterprise to realize the full potential of 3D data, or make data available to other clients, including Esri, QGIS and Cesium-based viewers. SkylineGlobe Server converts and exposes data in a range of formats, while storing only the original data formats on the server.

Convenient Centralized Web Management



Manage and control all services, servers, users, and layers from a centralized web management interface. 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.

TerraExplorer for Desktop

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.

Visualize

Overlay terrain with imagery and elevation, 3D mesh, BIM, CAD, Lidar point cloud, and feature (vector) layers, and your own custom data.

Analyze

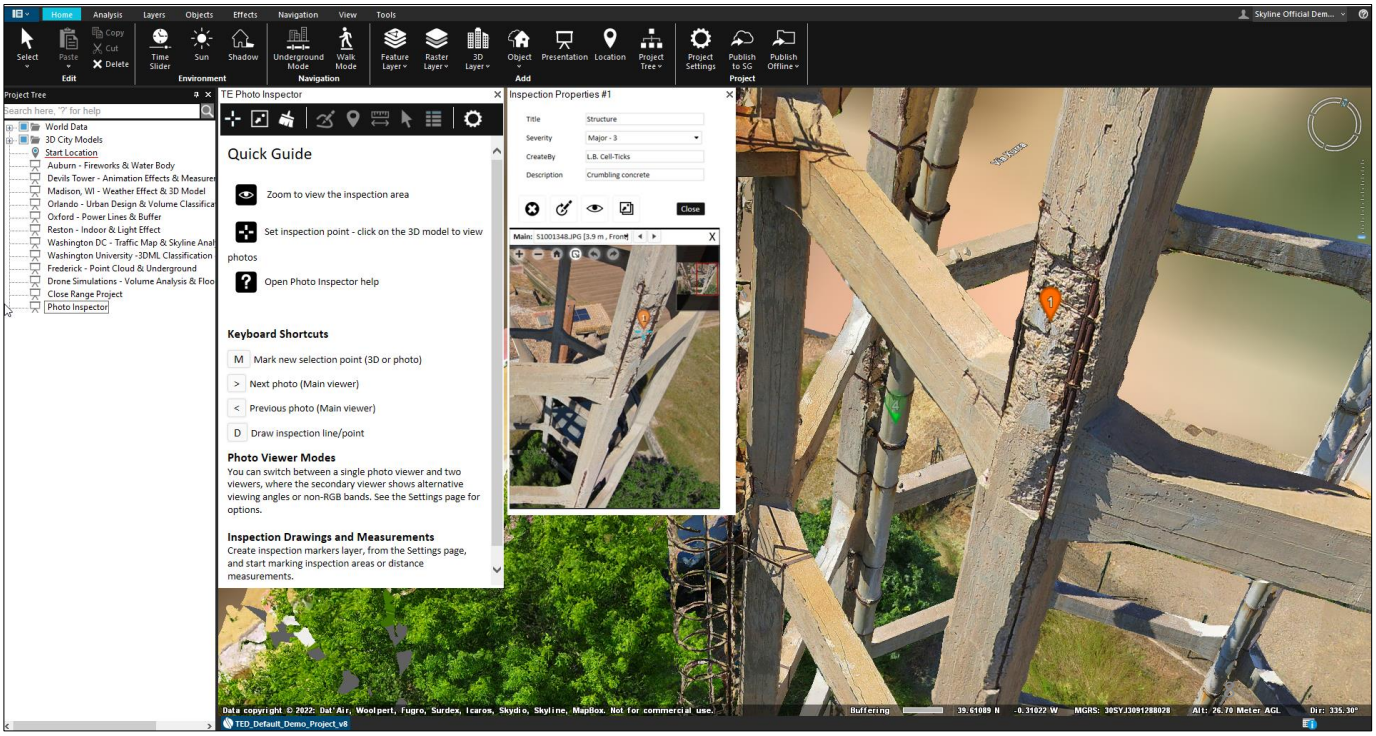
Powerful measurement, terrain analysis, line of sight, change detection/ comparison and spatial analysis tools make it easy to extract vital intelligence from your geospatial data.

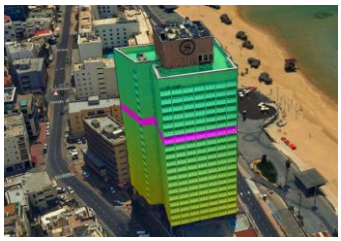
Create

Seamlessly fuse terrain, feature and raster layers, 3D models, point cloud models & 2D/3D objects into a high-resolution 3D world environment. TerraExplorer employs various mechanisms to ensure high performance even in model-rich projects.

Inspect

View & inspect PhotoMesh 3D models (tower, bridge, construction site, etc.) from within TerraExplorer, together with the source photos used to produce them. Or create inspection feature layers in which you mark and measure areas in your model or photos.





Query and Editing Tools

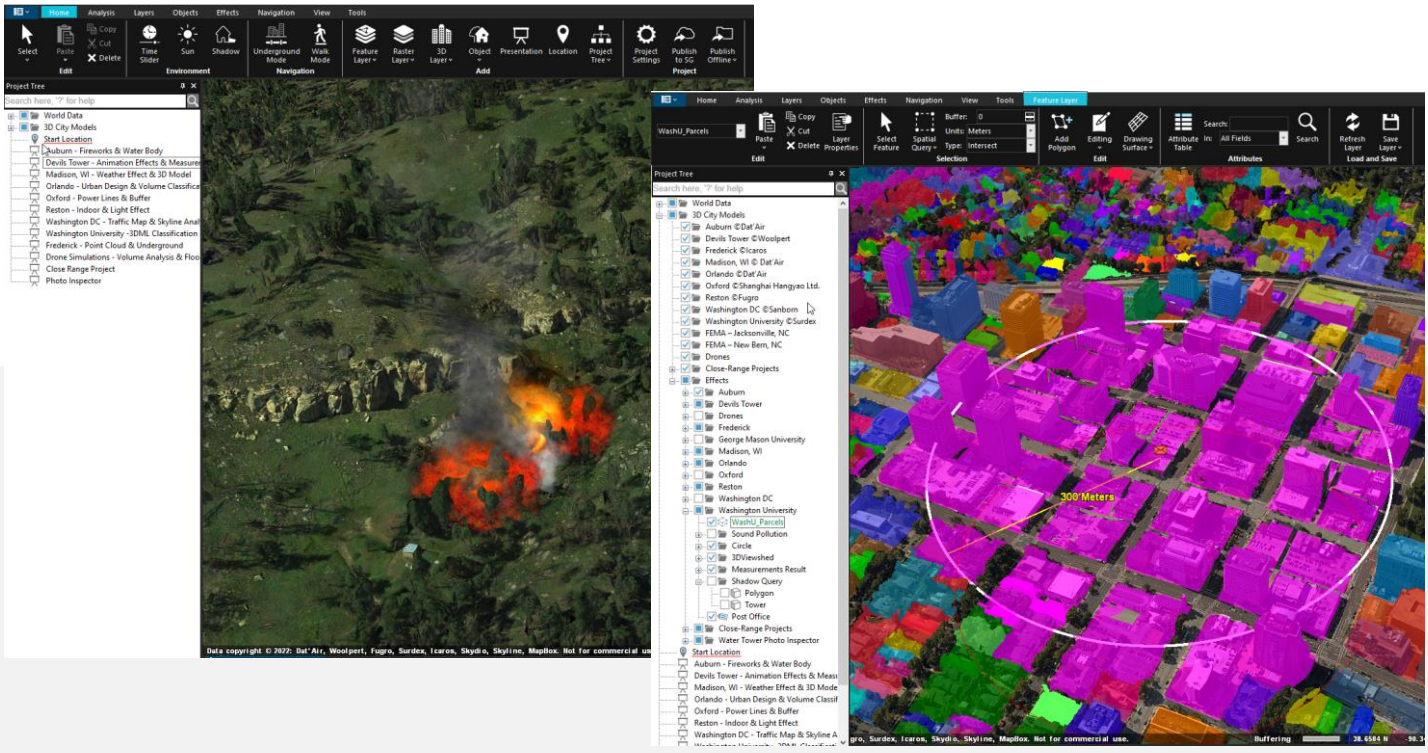
Robust feature layer viewing and editing is supported, including geometry editing, spatial queries, addition and deletion of features, attribute-based styling, and spatial operations such as merging, clipping and exploding features and exporting of selected features to a new file.

Advanced Drawing Tools

Versatile and configurable drawing tools bring to life your 3D GIS visualizations and simulations, with roads, traffic lights, powerlines, pipelines, fences, walls, and more. Advanced particle system engine enables you to create vibrant visual effects that realistically simulate weather elements, light, water, and fire effects.

Share Your Data

Easily share your 3D visualizations in presentations with customized flight routes. Projects and layers can be optimized and published directly from TerraExplorer Pro to the cloud server. Through a single publishing operation, your data is made available to all TerraExplorer & standard geospatial clients.



Use with Your Existing Technology

TerraExplorer is designed with interoperability and flexibility at its core, allowing you to build and share geospatial projects quickly and easily. TerraExplorer supports a wide range of read and write formats including:

- Imagery/elevation layers in Tiff, JPEG, OGC WMS/WMTS, MrSID, ECW, IMG…
- 3D mesh layers in 3DML, 3D Tiles, OSGB and I3S/SLPK
- Point cloud layers in LAS/LAZ
- 3D mesh layers in 3DML, 3D Tiles, OSGB and I3S/SLPK

Analyze the 3D World

Increase understanding and improve decision making with a complete set of powerful tools for all forms of 3D World measurement and analysis

Distance	Flood	Terrain Profile	Line of Sight
Area	Volume	Shadow Queries	Viewshed
Contour	Mesh Compare	Cross Section	Viewshed on Route
Slope	Image Compare	Elevation Difference	Threat Dome

TerraExplorer Viewer

Navigate through high resolution 3D world environments created by fusing aerial and satellite photography, terrain elevation data and other 2D/3D information layers

TerraExplorer Plus

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

TerraExplorer Pro

Adds publishing capabilities, conversion tools, optimization of model files for improved display performance, and uploading of data to SkylineGlobe cloud

TerraExplorer Mixed Reality - Extension

Uncover the potential of augmented reality (AR) and mixed reality (MR) visualization for collaborative decision making. Powered by HoloLens cutting-edge technology, Skyline TerraExplorer's 3D view can now be brought to life as a stunning hologram, that can be viewed simultaneously by up to four users in the HoloLens 2 immersive headsets. With support for head tracking and intuitive controls, users can effortlessly explore and analyze their 3D environment, for more informed tactical planning and strategic execution.

3D Visualization

Bring TerraExplorer's 3D view to life as a stunning hologram, viewed in the HoloLens 2 immersive headsets. View terrain overlaid with imagery and elevation, 3D mesh, BIM, CAD, Lidar point cloud, feature layers, and custom data. The hologram is displayed on a virtual table whose dimensions can be customized and whose location is determined simply by the placement of a QR code.

Powerful Analysis

Mixed reality provides a comprehensive & tangible understanding of the 3D model. TerraExplorer's measurement and analysis tools, such as viewshed, shadow, and distance calculations in a three-dimensional space, enable users to precisely assess and interact with the terrain, uncovering detailed insights into geographical features & environmental impacts.

Additional Solutions

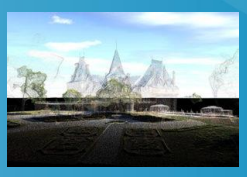
Skyline also offers an Innovative augmented reality (AR) battle table / wall integrated with Skyline's powerful 3D GIS viewer. This solution allows multiple team members to enter and walk through full-sized holographic models. Both simultaneous viewing of multiple overlays and split views for each user are supported.

Collaborative Interaction

TerraExplorer HoloLens mixed reality allows up to four users to collaboratively explore, interact with and analyze a 3D holographic scene. This collaborative environment is perfect for decision-making and training, providing an immersive and interactive experience for all involved.

With support for head tracking and intuitive controls, users can effortlessly navigate their 3D geospatial data layers

3D Mesh

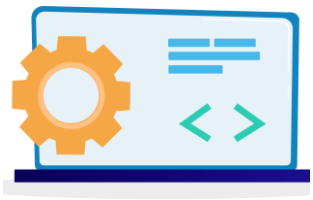


Point Cloud

Imagery

Elevation

Features



HoloLens Developer Program

Skyline's HDP program offers:

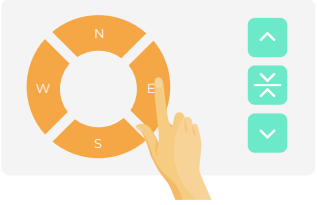
- Access to early development phases.
- Consultations with experts to tailor the HDP to your needs.
- Latest updates for both HoloLens and TerraExplorer Desktop

Flexible Package Solutions

Choose between an all-in-one Complete Kit or the Software Only version. The all-in-one kit includes all the hardware and software required to build a multi-user holographic environment, ensuring everything is pre-configured and ready for deployment.

Analyze the 3D World

- Distance
- Contour
- Volume
- Terrain Profile
- Area
- Slope
- Viewshed
- Shadow



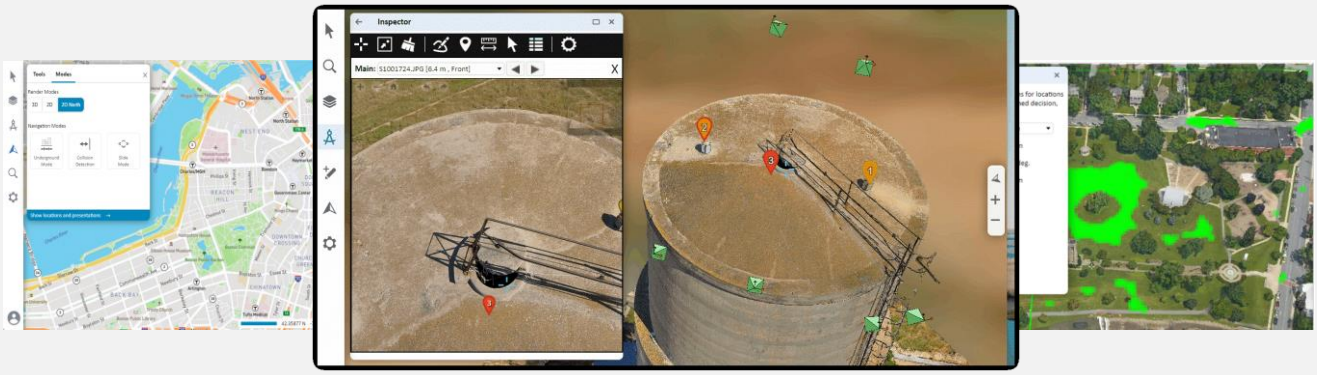
Virtual Control Panel

The HoloLens virtual control panel enables smooth navigation, using simple pinching gestures or direct touch to activate its buttons. Its three tabs: Navigate, Locations, and Presentations, support smooth movement through the environment, easy location selection, and straightforward access to and activation of TerraExplorer presentations.

TerraExplorer Fusion

TerraExplorer Fusion is a powerful 3D geospatial web viewer for exploring, analyzing, and editing high-resolution, stunningly realistic 3D content right in your web browser. TerraExplorer Fusion enables you to view layers and objects from SkylineGlobe Server and other GIS data servers, perform powerful measurements and analysis operations, and dynamically explore the 3D World via presentations which merge a custom flight path with distinct displays of the project.

Available in two versions —Viewer and Plus—TerraExplorer Fusion caters to varying needs. Plus offers advanced analysis tools, as well as enhanced integration with SkylineGlobe Server, enabling efficient layer loading, feature layer editing, and direct project publishing on the server.



Explore and Visualize

View terrain overlaid with imagery and elevation, 3D mesh, BIM, CAD, Lidar point cloud, and feature (vector) layers.

Measure and Analyze

Increase understanding and improve decision making with a set of powerful tools for 3D World measurement and analysis.

Create, Edit and Share

With TerraExplorer Fusion Plus, you can load any layer type from SkylineGlobe Server: 3DML, elevation, feature, imagery, or point cloud. Feature layers can be edited, and all modifications automatically saved to server.

Present to Others

Dynamically explore the 3D World via presentations included in projects published from TerraExplorer Desktop to SkylineGlobe Server. These presentations merge a custom flight path with distinct displays of the project.

Work Seamlessly with TerraExplorer Data

Consume data that was created and directly published from TerraExplorer Pro to Skyline Globe Server. No additional programming or processing is needed to load a project or layer into TerraExplorer Fusion. Based on TerraExplorer Desktop source code compiled to WebAssembly, TerraExplorer Fusion supports nearly all the layers and objects available in the Desktop version and uses the same API for seamless code sharing.

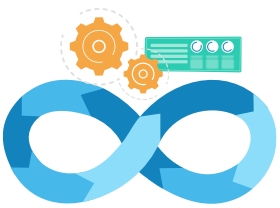
Data Security

Layer access can easily be restricted to the users, groups, and sites that you want, by setting desired view and access in SkylineGlobe Server. Users will only see and be able to load from SkylineGlobe Server the layers that are available to them, based on their login.

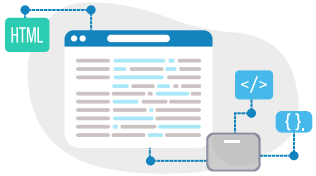
Analyze the 3D World

- Distance
- Contour
- Volume
- Terrain Profile
- Area
- Slope
- Viewshed
- Shadow
- Clear Path
- Inspector
- High & Low
- Cross Section

Customize and Integrate

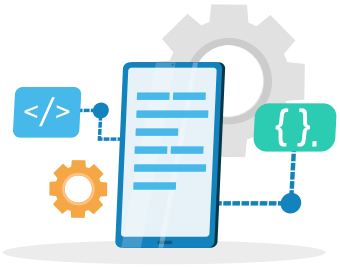


Utilizing TerraExplorer Fusion (TEF) as a foundation, you can leverage the application framework and functionality, thus reducing the amount of programming required for your customized solution. Create custom configurations, localize GUI texts, customize and expand TEF capabilities with HTML tools that directly call SGWorld interfaces, or embed the TEF window in your custom HTML.



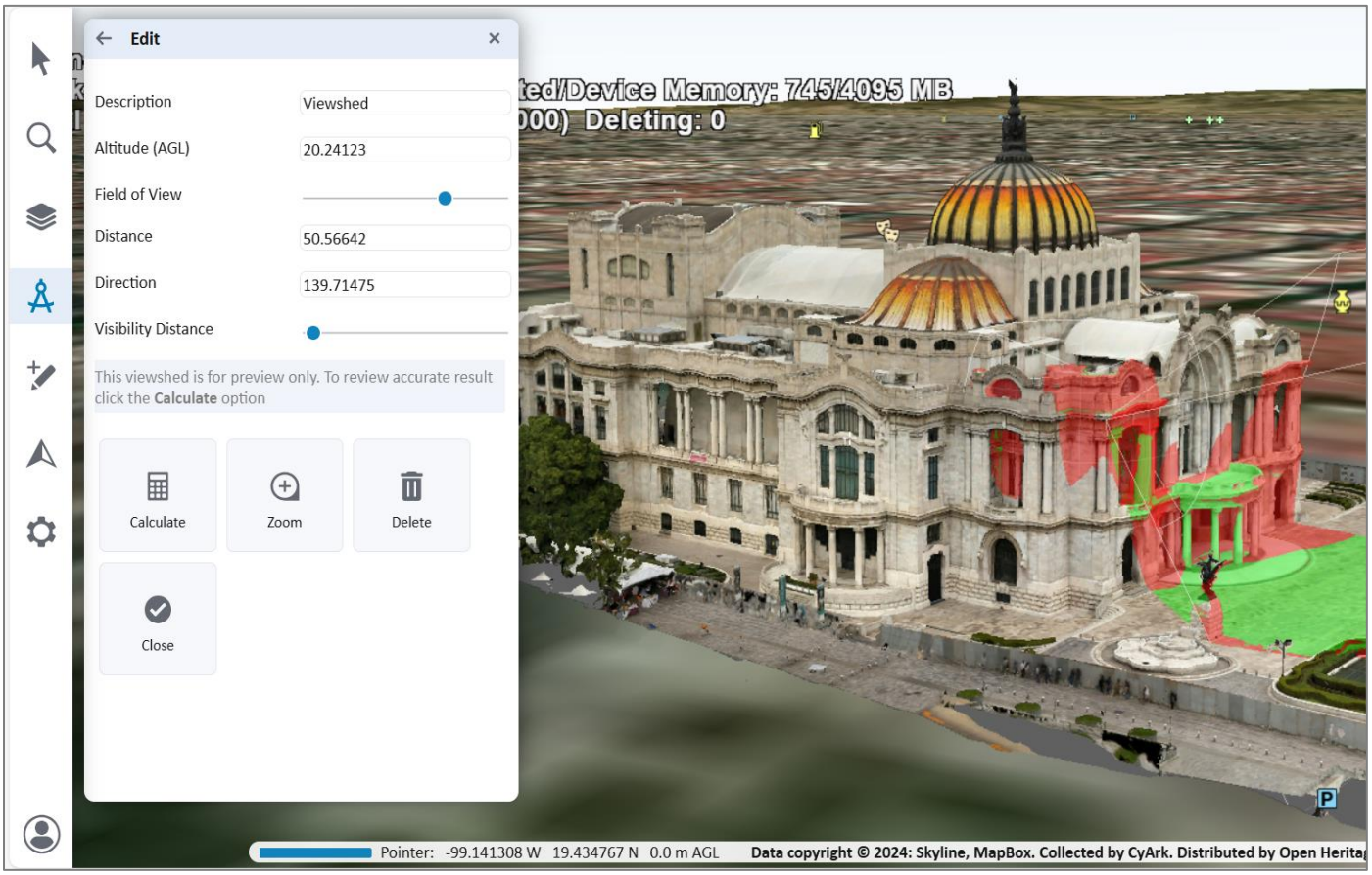
For Developers

TerraExplorer's rich application programming interface (API) allows you to easily develop powerful, customized 3D applications or integrate TerraExplorer capabilities in OEM applications.



Android Development Kit

Skyline offers a comprehensive Android development kit for developers looking to integrate the TerraExplorer 3D map into their Android applications. This kit equips developers with the tools to create apps that support both online and offline functionalities, allowing seamless access to data from the SkylineGlobe Server, other GIS data servers, or locally stored data on the device. The API offers most of the functionality available in TerraExplorer Desktop, optimized for mobile use, including powerful analysis tools and support for various layer and object types.



TerraBuilder

TerraBuilder provides 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 directly from TerraBuilder to SkylineGlobe Server for serving to remote TerraExplorer and WMS/WMTS clients.

Load

Load imagery and elevation layers in a wide range of data formats. TerraBuilder uses multi-core and multi-computer processing to support massive data set publishing while maintaining high performance.

Manipulate

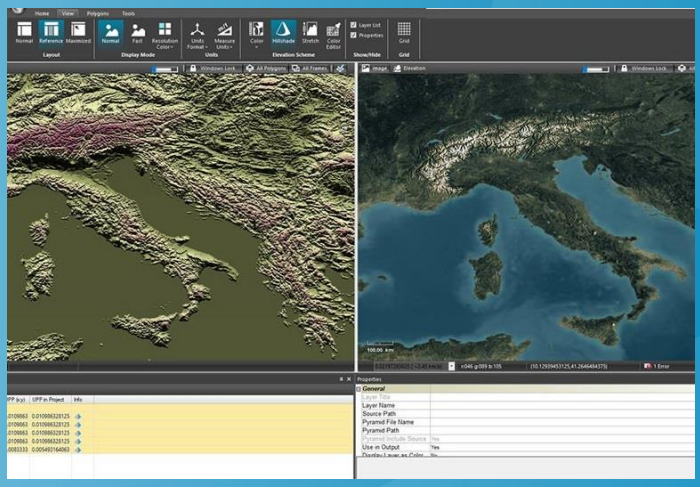
Powerful tools to crop, adjust, replace, resize, and reposition your photos, images, and digital elevation model to ensure maximum precision in the 3D terrain database result.

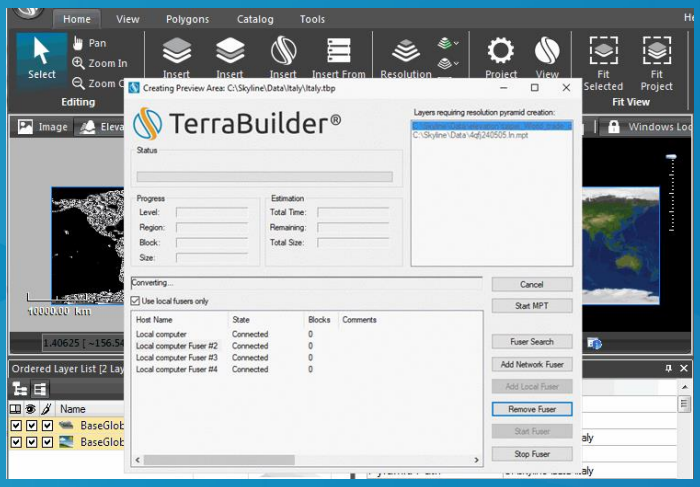
Create

Merge all adjusted layers into a geographically accurate, multi-resolution terrain database. Optimized imagery and elevation formats can be generated for use by the on-the-fly, server-side terrain generator.

Publish

Publish the terrain database (MPT) to SkylineGlobe Server, Skyline's private cloud solution. The published MPT is available for use by TerraExplorer & standard geospatial clients, or as layers for a TerraBuilder project.





On-Demand, Server-Side Terrain Generator

For projects whose source data is constantly being updated or modified, terrain databases defined by the TerraBuilder project file (TBP) can be served to clients, using SkylineGlobe Server's DirectConnect Service.

Streamlined Workflow

Upload and publish geospatial layers to the cloud server directly from TerraBuilder. The published MPT is available for use by TerraExplorer desktop, mobile and web clients and standard geospatial clients such as WMS/WMTS, or as layers for a TerraBuilder project.

High Performance

Multi-core & multi-computer processing supported to accelerate massive data set publishing. Use of network fusers dramatically reduces processing time.

Resolution Pyramids for Rapid Display

TerraBuilder creates a series of increasingly reduced resolution representations (pyramid), for each raster layer, to enable rapid display of the raster at various resolutions.

Scalability and Elasticity

Share the workload of massive 3D database creation between several computers and processors on your local network.

Robust Tools for Manipulating Your Data

TerraBuilder provides a range of editing tools with which to manipulate the imported raster files, enabling maximum precision in the 3D terrain database result.

Extensive plugin support allows you to load your data in the file format or database/server you need

- Tiff (.tif, .itiff)
- ERDAS Imagine (.img)
- MrSID (.sid)
- ER-Mapper JPEG2000 (.jp2, .j2k, .jpc)
- Oracle Spatial Databasel
- ECW Image Web Server
- ArcSDE Raster Server (.sde)

Skyline Cloud Services

Skyline offers a suite of software solutions, computing, storage, and streaming services to help you optimize your 2D and 3D geospatial data production and hosting. Opt for our fully automated 3D photogrammetry and data hosting/streaming, based on Amazon Web Services (AWS) infrastructure. Alternatively, select our premium, custom 3D reconstruction services, available at our US production center.

PhotoMesh Production

PhotoMesh processing services can produce 2D, 3D and multi-spectral outputs. Generate dense point clouds with detailed color information, true orthophotos, and 3D mesh models in a range of formats for compatibility with most standard GIS tools and software. Whether you require manual expertise or automated convenience, our services are designed to deliver the highest quality 3D and 2D data products.

SkylineGlobe Server Hosting

Based on SkylineGlobe Server, SkylineCloud Hosting provides a fully managed service to upload, store, convert and stream nearly unlimited 2D and 3D spatial data. SkylineCloud is built on top of the Amazon Web Services (AWS) infrastructure to provide reliable and fully scalable computing, storage and streaming resources.

PRODUCTION SERVICES

Fully Automated Photogrammetry

Fully automated service to run PhotoMesh projects, delivering rapid production for even the most complex data. Using REST API, the service manages the entire PhotoMesh production process, from data ingestion to final storage in customer-specified cloud environments (AWS, Google Cloud, Azure, etc.). We offer customizable packages scalable to thousands of fuser machines, ensuring adaptability for all project sizes.

Premium, Custom 3D Reconstruction

Our team excels in massive projects, unique camera systems, photogrammetry plus LiDAR, combined aerial, drone, and terrestrial data, and more. No project is too complex. We let you focus on capture while we manage the intricate photogrammetry. Partner with Skyline for your initial venture and get outstanding results as well as a template that will guide you in processing future projects independently.

HOSTING SERVICES

Store and Secure

Customers can store masses of 2D and 3D geospatial data for their end users in a secure, access-controlled environment. Each customer has a private virtual site that completely isolates their users' data and allows management/administration of the data layers and site users.

Reliable and Scalable

SkylineCloud is built on top of the Amazon Web Services (AWS) infrastructure to provide reliable and fully scalable computing, storage and streaming resources. SkylineCloud offers global coverage using AWS's Global Accelerator and smart caching mechanism to speed up streaming performance.