Skyline® it's your world™

TerraGate®

Version 6.6.1

Datasheet

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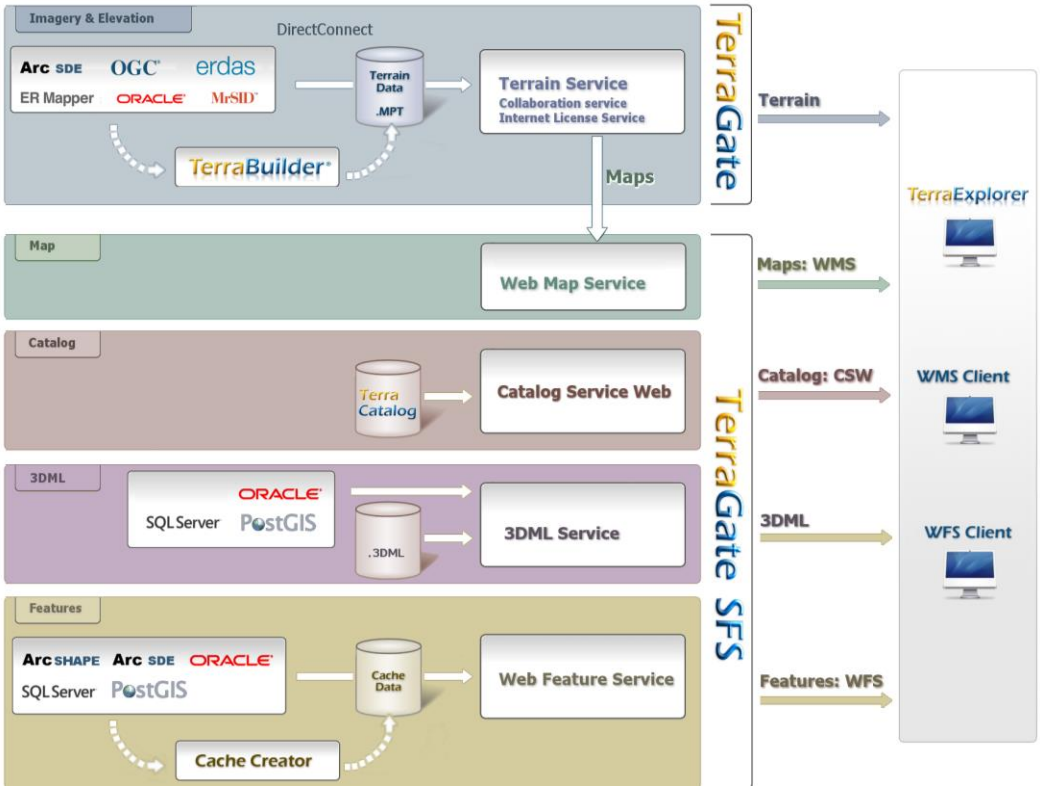
OVERVIEW

TerraGate supports the client-server data delivery requirements of Skyline's 3D visualization applications, enabling massive amounts of data to be efficiently streamed to thousands of concurrent users. TerraGate's powerful network server technology delivers 3D geographic, mesh, map, and feature data to clients across the web, through a suite of services including:

- **Terrain Service**: Streams 3D terrain geographic data to TerraExplorer and WMS clients.
- **Web Feature Service (WFS)**: Streams feature layers to TerraExplorer and WFS clients.
- **3D Mesh Layer Service (3DML)**: Streams fully textured 3D city models merged in 3D Mesh Layer (3DML) databases to TerraExplorer clients.

These services are among the range of services provided by the two components which comprise the TerraGate server technology: TerraGate Terrain Streaming Server Component and TerraGate Spatial Framework Services (SFS) Component. Each of these components exposes different TerraGate services (as outlined below) and has its own management tool from which the user can configure and monitor these services:

- TerraGate Terrain Streaming Server Component provides the following services:
  - **TerraGate Terrain Service** - Streams 3D geographic data from terrain databases (MPT) or directly from the original sources through the DirectConnect extension.
  - **TerraGate Internet License Service** - Provides advanced SkylineGlobe Viewer API functionality to authorized TerraExplorer Viewers that are embedded in SkylineGlobe web applications.
  - **TerraGate Collaboration Service** - Hosts TerraExplorer Collaboration sessions to which multiple users can connect and work together in the 3D environment.
- TerraGate Spatial Framework Services (SFS) Component provides the following services:
  - **Web Feature Service (WFS) -** Streams feature layers from databases or pre-cached layers to TerraExplorer or OGC WFS clients, providing remote clients with read-write access to edit and save changes to the data source.
  - **Web Map Service (WMS/WMTS) -** Streams Skyline terrain databases (MPT) and raster layers to any OGC WMS client. Web Map Tile Service (WMTS) serves georeferenced map tiles (for increased speed and reduced bandwidth requirements).
  - **3DML Service –** Streams 3D Mesh Layer (3DML) databases created from PhotoMesh city models together with classification layers, individually modeled layers, and BIM datasets, to remote TerraExplorer clients.
  - **Catalog Service: Web (CSW) -** Provides web interface to TerraCatalog, a catalog database that stores, organizes and manages connections to raster, feature, and 3DML layers.



TerraGate Architecture

TerraGate suite is compliant with the following OpenGIS Implementation Specifications:

- OpenGIS® Web Feature Service (WFS) Implementation Specification
- OpenGIS® Web Feature Service Transactions (WFS-T) Implementation Specification
- OpenGIS® Web Map Service (WMS) Implementation Specification
- OpenGIS® Web Map Tiling Service (WMTS) Implementation Specification
- OpenGIS® Catalog Service: Web (CSW) Implementation Specification

PRODUCT MAIN FEATURES

Terrain Service

- 3D data streaming over private networks or the Internet.
- Serves massive terrain databases (MPT files) created by TerraBuilder.
- Serves unprocessed, fused terrain project (TBP) to remote TEP and WMS clients using TerraGate DirectConnect.
- Optimized for low-bandwidth conditions.
- Designed for easy scalability.
- Uses TCP/IP protocols. Enable SSL (Secure Socket Layer) protocol.

- Works with firewalls and proxy servers.
- Takes full advantage of multi-processor server hardware.
- Efficient handling of massive data sets.
- Terrain data size limited only by disk media.
- Managed through the TerraGate Manager tool.
- Distributed TerraGate Network enables remote TerraExplorer users to fly on a single project managed by dispersed TerraGate servers.

Internet License Service

- Provides SkylineGlobe Viewer API functionality to authorized TerraExplorer Viewers that are embedded in SkylineGlobe web applications.

Collaboration Service

- Provides hosting services for collaboration sessions between TerraExplorer users.

Web Feature Service

- Manages and streams layers of features, including polylines, polygons and points.
- Streams from shapefiles, SQLite files, the Oracle database, SQL server database, PostGIS and ArcSDE servers.
- Provides OGC Web Feature Service (WFS) interface to other applications.
- Creates a cache on the server for high-performance streamed data.
- Allows data cache to be pre-configured for an entire layer or created dynamically per request. Using a cache helps the SFS reduce loads from slower data sources such as ArcSDE or Oracle.
- Dynamic cache – Cache is created gradually in response to user requests for sections of data.
- Scalable to serve out data to a large number of users (SFS Cluster).
- Auto-refresh mechanism can be set to active when a layer is updated.
- Ability to mark each cache tile data with an expiration time.
- Stores each layer's cache in three different detail levels for better optimization.
- Optimized to handle a high number of requests per server.
- Web-based management system to define the data sources, layers, and cache settings. Efficient handling of massive databases. No size limitation.
- Supports advanced queries from TerraExplorer and other WFS clients.
- Divides query results into several replies to enable queries on large data sets
- Read-write access allows editing of data source (WFS-T).

Web Map Service WMS/WMTS

- Provides OGC Web Map Service (WMS) interface to TerraGate terrain databases.

- Provides OGC Web Map Service (WMS/WMTS) interface to TerraGate terrain databases and raster layers.
- WMTS serves locally stored, pre-rendered tiles that do not require image manipulation or geo-processing.
- Outputs Imagery and Elevation layers.
- Outputs raster data in JPEG and PNG formats.
- Scalable to serve out data to a large number of users (SFS Cluster).
- Optimized to handle a high number of requests per server.
- Web-based management system to define the data sources and layers.
- Efficient handling of massive databases. No size limitation.

3D Mesh Layer Service

- Delivers multi-resolution and stream-optimized 3D Mesh Layers databases (3DML), to remote TerraExplorer clients.
- Streams from 3DML folders containing 3DML files and from the Oracle Spatial, SQL, and PostgreSQL servers.

Web Catalog Service

- Uses OGC Catalog Service: Web (CSW) protocol.
- Delivers published TerraCatalog layers to remote applications.
- Remote users can query the Catalog Service by text or geographic properties.
- Raster, feature, and 3DML data are served to the client by their respective services.
- “Publish” property determines which layers are exposed to the client.
- Customizable filter limits the catalog items exposed to the client.
- Service managed using the Skyline TerraCatalog database.

TERRAIN SERVICE

The TerraGate Terrain Service is a powerful network data server technology designed to stream 3D geographic data in real-time. The Terrain Service client-server model is optimized to handle thousands of concurrent users accessing virtually unlimited sized databases in low-bandwidth situations, giving each user uninterrupted viewing. TerraGate achieves this by allowing the client to quickly receive low-resolution scenes around the current location, and then requesting high-resolution information based on the user's current speed and direction, while allowing for real-time changes in navigation.

The Terrain Service provides the platform for launching applications created with Terra development and editing tools. In conjunction with **TerraBuilder, TerraDeveloper, and TerraExplorer Pro, th**e Terrain Service makes the digital Earth accessible, and enables a geo-referenced backdrop for clients' web-based applications.

The Terrain Service differs significantly from video streaming technology in that it works seamlessly across variable bandwidths on the Internet and is not affected by latency or breaks in connectivity. Once