

# Sharing Data Via Geospatial Web Services

## **Solutions Paper**

## Sharing Data via Geospatial Web Services

Consumers of geospatial data want to swiftly retrieve exactly what they need from any dataset, when they need it. They must also consume this data into the various desktop, Internet and 3D virtual globe applications without being hindered by file format conflicts. Additionally, organizations must enable rapid distribution of this geospatial data to the consuming network of users. These organizations need to deliver the data in varying complexities, while ensuring that the data can be immediately absorbed into various applications potentially used by the consumer.

Answering the demand for real-time, interoperable solutions for data sharing, the industry has responded with the development of geospatial web services. Geospatial web services deliver web-based access to quality raster, vector and terrain data, available in varying degrees of format and complexity. Also available are highly-specialized services based on individual needs, enabling unique processes such as transformation of geographic coordinates, querying catalogs, editing vectors and much more.

In streaming data via geospatial web services, actual datasets remain in one place while specific bits of information varying in complexity are streamed directly to requesting individuals across vast networks. For consumers, this means that data quality is increased as geospatial web services provide immediate access to the most current data stores. Moreover, data distributed via web services require no format translation, ensuring direct and hassle-free delivery into various applications on client machines (note: client applications must be able to consume web services). Organizations benefit from data residing in one place; data is no longer duplicated, and out-of date across various organizations. Furthermore, data ownership remains protected while data sharing is optimized. For both, the general flow of information across networks is exponentially improved, as data and services can be distributed and accessed at varying levels of complexity and function (e.g. via WMS, WCS, WFS-T and more).

### ERDAS TITAN

ERDAS TITAN is based on geospatial web services. ERDAS TITAN is a dynamic solution for real-time sharing of geospatial data, web services and location-based content in a single, secure environment. ERDAS TITAN offers a solution in which data may reside locally—either with individuals or at organizations—and consumers are able to retrieve that data via streaming various and sophisticated geospatial web services. ERDAS TITAN also provides permission-based data distribution and access to individuals and groups within an organization. Ultimately, ERDAS TITAN is a geospatial data bridge, enabling consumption of data into a variety of client applications, including desktop, Internet and 3D virtual globes.

### Organizations Sharing Data & the GeoHub

Industry organizations are responsible for authoring and sharing geospatial data across departments, to clients, to other organizations and, in many cases, to the general public. Amongst an organization's customers lay a myriad of different desktop, Internet and 3D virtual globe applications. The challenge is to quickly and efficiently deliver a vast array of data to numerous individuals working with various client applications.

To deliver data to many without draining internal resources, an organization must implement a solution for secure, permission-based data distribution to users both inside and outside the organization. For this requirement, an ERDAS TITAN GeoHub provides organizations with the ability to participate as a secure community within an ERDAS TITAN network. By implementing a GeoHub, users within organizations may share data privately with other users, within defined workgroups, or with an entire organization.

Within GeoHub communities, both internal and external participants “subscribe” to join the community, and the GeoHub Administrator assigns each user rights or permissions appropriate to that user’s role. Some subscribers (such as the general public accessing a governmental data store) may only have the right to access or “consume” data but not to publish; others could have the ability to publish privately to other users (such as sharing between co-workers) or within particular groups; and still others may be given permission to publish data to the entire organization.

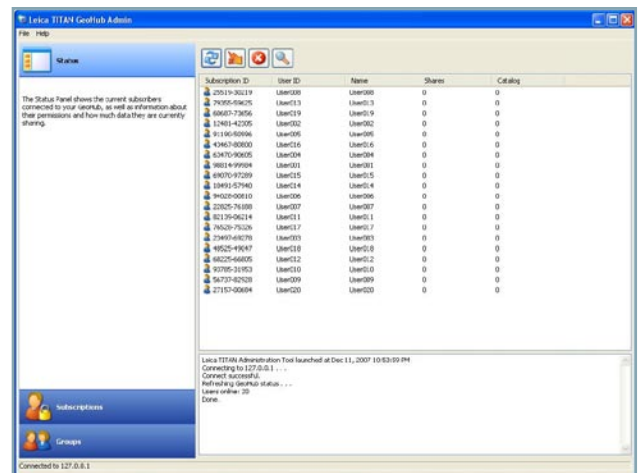
In an ERDAS TITAN network, all communication, data indexing, access and streaming is conducted through GeoHubs, which are caching proxy servers. Caching requests for datasets is useful as requests are repetitive and made in a uniform manor (meaning, all users make the same type of requests). GeoHubs maintain temporary local copies of frequently requested data, increasing the performance on re-fetching the data. This maximizes efficiency by reducing the need for an organization to continually upload data for distribution. Similarly, accessing cached data downstream reduces fetch time for consumers.

### Publishing & Consuming Data via the Geospatial Instant Messenger (GeoIM)

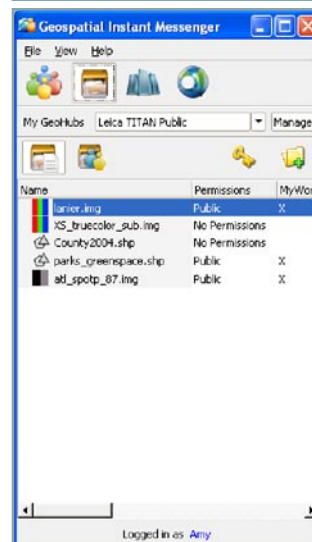
The Geospatial Instant Messenger is a component of the ERDAS TITAN Client, a software application that supports data publishing and access, and also real-time communication among network participants. Participants sharing data within a GeoHub organization utilize the GeoIM to publish data either publicly or privately to individuals and groups. Users consuming data also use the GeoIM to discover, access and ultimately retrieve (stream) these geospatial data and web services published by others. Furthermore, the GeoIM also supports consumption of web services, including OGC compliant WMS, WCS and ECWP. The data and web services published and consumed via the GeoIM can be directly streamed into, or “consumed” by, a variety of desktop, Internet and 3-D virtual globe applications, including the ERDAS TITAN Viewer.

### Consuming Data into Various Client Applications

For consumption of data into various desktop, Internet and 3D virtual globe applications, it is simply a matter of fulfilling HTTP requests to get data into applications such as Google Earth and Microsoft Virtual Earth 2D and 3D.



GeoHub Admin Panel



Local data shared in the Geospatial Instant Messenger

Using the Geospatial Instant Messenger, a user simply clicks to load the data into the following applications:

- **WMS Link** Geospatial data published using the Geospatial Instant Messenger also automatically creates an OGC compliant Web Map Service (WMS). WMS server capability is embedded in the ERDAS TITAN Client and running on the local machine. The dataset(s) published may then be consumed directly by any desktop application with the ability to read (consume) a WMS (this includes OGC Web Client Applications, ERDAS IMAGINE®, ArcMap, uDig, Quantum GIS, Manifold, GeoMedia, Autodesk, etc.)
- **Google Earth** Geospatial data published using the GeoIM may be consumed in Google Earth. When a request is made, a KML is created on the machine sharing the data. More specifically, super overlays are created for rasters and regionated KML's are created for vectors. The KML is then passed through a GeoHub, which subsequently serves it to the requesting user.
- **Microsoft Virtual Earth 2D and 3D** Geospatial data published using the GeoIM can be consumed in Microsoft Virtual Earth 2D and 3D. When a request is made for shared data, ERDAS TITAN facilitates that data to be streamed into either Microsoft Virtual Earth 2D or 3D.
- **ERDAS TITAN Viewer** Geospatial data published using the GeoIM may be consumed in the ERDAS TITAN Viewer. Geospatial data is streamed using a custom protocol based on WMS into the Viewer. Users may also create and share a MyWorld — a geographically enabled personal space — where they upload data, set permissions and share content with other network users. With a MyWorld, a user customizes and shares a 'geospatial profile' in a 3D virtual globe, subsequently allowing other users the ability to enter, navigate and explore with permission-based access. This space may include both geospatial data and interesting content like photos and ancillary information. The Viewer also accepts KML and KMZ files via drag and drop from a user's hard drive.

For all of the above streaming processes, data travels through the GeoHub and caches there as well as caching locally, enabling rapid access to requested datasets when re-fetched.

## Future

Accessing and utilizing geographic information via the Internet continues to grow in sophistication. As this space rapidly evolves, specifications for existing geospatial web services continue to be refined, innovative new web services will be implemented. ERDAS TITAN will continue to broaden support for data consumption into various desktop, Internet and 3D virtual globe applications. ERDAS TITAN will also continue increasing support, in both publishing and consumption, for a growing assortment of geospatial web services.