

DATA SHARING FOR INCIDENT MANAGEMENT

ERDAS TITAN CREATES ON-THE-FLY MASHUPS FOR INCIDENT RESPONDERS

Effective incident management – whether for day-to-day incidents such as traffic management or more broadly for disaster response – requires the sharing and communication of information across agencies and technology platforms by both people at the scene of an incident and those managing a response from a remote location. As the leader in imagery technology, it is no surprise that ERDAS is taking the lead to provide a web-based solution for rapidly sharing both imagery and vector data. ERDAS TITAN provides a groundbreaking tool for establishing and maintaining secure, collaborative networks, and then enabling users on those networks to create on-the-fly mashups to inform plans, exercises and responses. This article illustrates how ERDAS TITAN supports the incident management function by providing data sharing functionalities for accessing, manipulating, and sharing information quickly, a key necessity of incident response.

Background

In Europe, the focus of incident management has been specific to road and traffic incidents, whereas in the United States the focus is more widely applied across small and large scale hazards, as outlined in the National Response Framework. Whether for small or large events, incident management workflow requirements necessitate communicating and analyzing information to inform a response. The benefits of using advanced geospatial technology for this use case include the ability to capture, convey, and share a map depicting:

- Real time characteristics of an incident from on-the-ground;
- Most recent imagery of an incident and its vicinity from the air;
- Other necessary data sources representing the infrastructure within

and around an incident;

- Alternative routes to, out of, and around the incident;
- Situational awareness.

The benefits of current technology for displaying geo-referenced data, capturing and rectifying imagery, and collecting and converting geospatial data for incident management are limited by the barriers to interoperability and data sharing – barriers that ERDAS TITAN helps remove.

What is ERDAS TITAN?

Essentially, ERDAS TITAN is:

- an online network for securely sharing geospatial information,
- a work space for bringing multiple disparate data sets into a single view that may be shared real time across remote users,
- a means to publish data with permissions to a network of users, immediately from the field,
- a means to consume data into a variety of geospatial applications without the hassle of format translation or file download, and
- a communication tool for sharing real time geospatial information and situational awareness.

ERDAS TITAN enables users and organizations to publish, access, discover and ultimately consume geospatial data, web services and location-based content, all in one online, dynamic, collaborative network. This "data sharing solution" has two major elements: (1) an ERDAS TITAN GeoHub which establishes, authenticates and administers the connections of all of the users on the network and (2) the ERDAS TITAN Client, which enables publishing activities and data access control for individual users on the Network (see below). ERDAS TITAN is a *geospatial data bridge*, providing access to multiple public and private data resources, and enabling that data to be viewed in a variety of desktop, internet and 3D virtual globe applications in use on the desktop.

The ERDAS TITAN Client is comprised of the Geospatial Instant Messenger (GeoIM) and Viewer (a 3D globe). The GeoIM is the heavy-lifting component of the Client experience, where data are published, permissions are set, data is discovered, accessed and retrieved, and users may chat using an instant messenger.

In the ERDAS TITAN Viewer, a variety of geospatial data and location-based content (including photos, screenshots, notations and more) can be amassed and, with the click of a button, can be shared with others on the ERDAS TITAN Network. Users may add their own local data plus data from others, and publish an interactive 3D presentation space called a "MyWorld". Other users may then switch to and participate in this MyWorld, and also overlay their own data or data from others. Ultimately, the data in one's MyWorld

may be utilized as a foundation by another user, who adds their own data to the mix to create and save yet another unique MyWorld. This is a great means to achieve collaboration in making mashups. The utility of this functionality for incident management is enormous, as it enables users to instantaneously share and interface data into a common work view that may be viewed and used by others for analysis and decision making.

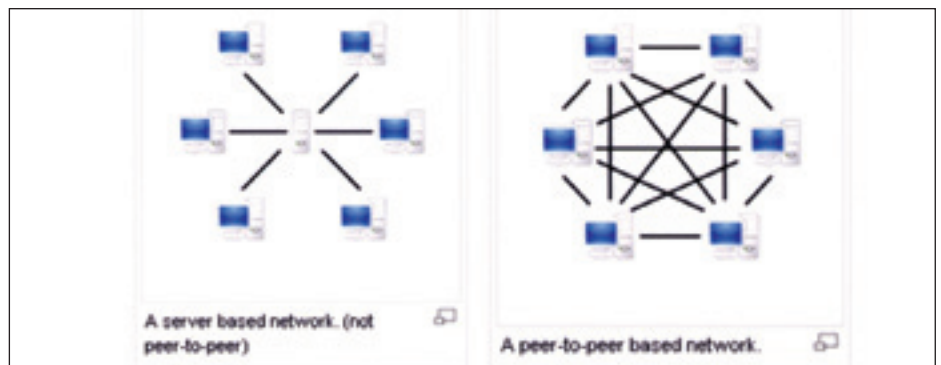
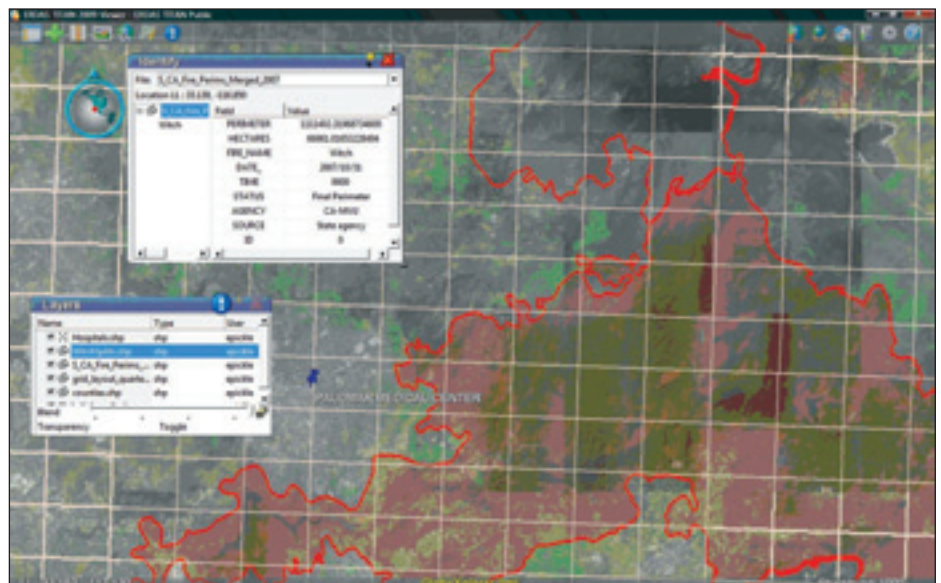
How ERDAS TITAN Works

ERDAS has established a global network (the ERDAS TITAN Network), within which organizations can establish their own secure, permission-based networks via GeoHubs. Data is published via ERDAS TITAN Clients; the data is cataloged on a GeoHub, and immediately may be discovered and accessed by other participants in the ERDAS TITAN Network (e.g. MCH GeoPoints providing critical facilities data for the US). An organization joining the ERDAS TITAN Network implements a GeoHub and then establishes individual subscriber limitations for users that will participate on their GeoHub, including a user's ability to publish and set permissions on data, volume limits

and the like. Subscribers may then publish data from ERDAS TITAN Clients based on the limitations imposed in their profile by the GeoHub. Although the ERDAS TITAN user's experience resembles a Peer to Peer (P2P) network experience (sharing, discovering, accessing data within a network of users), by definition it is not. ERDAS TITAN Clients rely on a proxy server – an ERDAS TITAN GeoHub – as a middleman for all communicating, indexing, accessing and data streaming. ERDAS TITAN GeoHubs process requests, index, stream and cache data, but do not host any data. Instead, data is maintained locally and the GeoHub acts as a relay mechanism, processing requests and streaming data between users.

Interoperability via ERDAS TITAN

During incidents of even moderate severity it is likely that multiple individuals or organizations may need to contribute information to a common operating picture. Therefore it's important that data arriving in differing formats can be easily integrated, and that data consumers are able to rapidly view the data in desktop, virtual globe or web clients they have at their disposal. The Geospatial Instant



A GeoHub is a server-based network, like the picture on the left. Clients communicate and share data through a proxy server and never communicate directly. The picture on the right depicts a P2P Network.



FAST: Drag and Drop to Publish!

- Much faster than standard file-transfer modes
- Even huge images can be quickly published, viewed and utilized by others
- Users don't need to download to view!

Data In

Geospatial Data
Geospatial Web Services
Location Based Content

Data Out

Desktop, Internet,
3D Virtual Globe
applications

Messenger (GeoIM) represents a substantial leap forward in this regard, as it supports interoperable data publishing and access. Data published using the GeoIM are transformed via a translation layer and automatically output as a Web Map Service (WMS), KML or tiled URL request. These formats are then easily ingested into a variety of geospatial applications including Google Earth, IMAGINE, GeoMedia, ArcMap, MapInfo, Microsoft Virtual Earth, and more. The GeoIM also supports consumption of OGC WMS, OGC WCS, ECWP and streaming into a variety of geospatial applications.

Support for Incident Management Workflows and Use Cases

Some of the key recommendations following 9/11 and Hurricane Katrina involve technology workflows. For example, the reliance by first responders on hard maps during these disasters was logistically problematic and presented significant barriers to speedy and effective decision making. The sharing of paper maps during a disaster is not uncommon and most contingencies should

include a back up of essential hard copy maps; however, the necessity of geo information and mobile computing to support disaster response activity in the field is apparent. Recommended contingencies now include mobile devices, web portals that can integrate multiple sources of information for easy access and applications for displaying and querying information, as well as devices and applications that can be used for collecting new information at the scene of a disaster and can be shared to others in the field including the operations centers.

Recent US disasters have also illustrated how map mashups generated by local newspapers, websites or members of the public have provided key information to the public – often more quickly and effectively than “official” government sources. Whether it is the locations of shelters, open/closed facilities, or some other information, the ability to quickly combine real-time data and publish them to a wide audience is a powerful application in an emergency. Unfortunately, some level of technical expertise is required to get data, “mash them up” and publish them to

the web using current technologies.

ERDAS TITAN provides this capability in an even more robust form. Users of any level of experience can discover and access files of virtually any format, and then combine and post them as MyWorlds – their own “User Defined Operating Pictures.” Other users can then instantly view these mashups and enhance them with their own data or data shared by others, dynamically building the most appropriate and effective picture to operate from.

Using ERDAS TITAN, data may be shared in a centralized or decentralized manner. Standard repository data are readily accessible as well as new data shared by individual users directly from desktops and laptops. Users who publish data from the field as shapefiles, geo-referenced images, etc. can share their data *instantly* with permissions to the entire Network and without having to pass data up through a central server.

With a laptop, persons in the field at the site of incident can use ERDAS TITAN to discover data, create mashups and electronically draw onto that mashup to display new information regarding an incident, for example the extent of a fire line or flood waters. That person can instantly share this mashup with others through ERDAS TITAN. New data captured with GPS devices and converted to shape file or other ERDAS TITAN ingestible formats can be instantly published and shared via the ERDAS TITAN Network. Similarly, data captured through airborne technologies could be instantly published onto the ERDAS TITAN Network.

ERDAS TITAN saves a tremendous amount of time as there is no need to download or physically move data between users – the data are simply streamed and available for viewing immediately. The inclusion of an instant messenger enables collaborators to share information as rapidly as they exchange data views, with no breaks to change the mode of communications.

Information sharing is essential to incident management. Web-based geospatial technologies that support this use case enable rapid access to current data with minimal transaction and enhanced ease of use. The ERDAS TITAN Network combined with the collaborative tools built into ERDAS TITAN technology provides a fantastic medium for sharing and accessing geospatial information, a drag-and-drop workspace for creating on-the-ground “mashups” of an incident, and the ability to share that workspace for remote collaboration. This technology dramatically supports the emergency use case for ready access to current data to create a meaningful depiction of an incident for an effective response.

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