Incident Management Software Interoperability Challenges and Solutions: White Paper

Kristen Lovejoy, PhD
Buffalo Computer Graphics, Inc.
4185 Bayview Road
Blasdell, NY 14219
716-822-8668
klovejoy@bcgeng.com
www.bcgeng.com

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Introduction

The hurricane heading towards your community does not care about state lines or international borders. Wild fires will not contain themselves within your jurisdictional boundaries. You will face disasters where your team's ability to respond will not just depend on their skill and training, but also on their ability to coordinate with your neighboring communities. If the tools you use during a response cannot work together, then how can your teams?

Interoperability is the key to large scale multi-jurisdictional responses. This paper will review some of the challenges BCG customers have faced with both external and internal interoperability challenges and how DLAN was able to meet these challenges. Specifically the paper will go over system to system, mapping, mass communication, and authentication or security challenges.

System to System

When multiple jurisdictions need to work together during a response, multiple incident management systems also need to work together. All DLAN systems are interoperable with each other, allowing ticket and data fields to be directly sent from system to system. DLAN can exchange information with any other system that utilizes common industry standard protocols for communication and information exchange such as CAP, EDXL, and IPAWS. DLAN also has a built-in XML data transform engine that allows BCG to do custom integrations and message interoperability quickly and with less expense than many other solutions can offer.

For a State level customer BCG created a custom integration with a competitor's product. The State utilized DLAN, but wanted to also be able to communicate with one of their FEMA Regions, which utilized a different software product. BCG was able to create a custom API to allow DLAN data to be mapped directly to the other systems forms and vice versa. This allowed the State to collaborate with the Region during response efforts without needing to duplicate data entries or access multiple systems. Once the customization was built, it became available to all DLAN customers so they could also benefit from it.

Although some may believe that charging additional fees to allow outside stakeholders to access and share data makes good business sense, it does not improve emergency response times or make it easy for multiple stakeholders to collaborate with each other during large response efforts. BCG's DLAN software includes multiple methods to integrate with different solutions, even our competitors' solutions, for free. When a custom integration method is needed, BCG has the expertise necessary to create affordable solutions, which in most cases can then be utilized by other DLAN customers as part of the core product.

Mini-Case Study: Regional Logistics Program EDXL-RM Interoperability Simulation

BCG showcased its ability to communicate with other systems during the EDXL-RM Interoperability Simulation sponsored by the Regional Logistics Program (New York, New Jersey, Connecticut, and Pennsylvania) and hosted by the New York City Office of Emergency Management. The demonstration showcased how DLAN could communicate with E-Team ^{TM}, the software developed by NC4 and utilized by New Jersey and some NY Counties. The demonstration used DLAN's standard EDXL-RM interoperability channel to send messages between the two systems.

Mapping

When is a long list of mapping resources available to the incident management community, however reviewing multiple maps is not only time consuming, but also does not present responders with the full operating picture. Being able to view all of the information available in one place not only saves time, but could also save lives.

DLAN's GIS Premium module supports the display of data from most common GIS formats out-of-the-box, without the need to pay for access to third-party GIS platforms. It can also display internal information such as open tasks and assets.

External data can come from public/freely available sources or private sources. Any publically available source using the listed interoperability methods can be integrated into the solution for free. Many public service agencies provide their data in one of the included formats. Below is a list of data sources that can be shown as layers in DLAN without any additional cost:

- NWS:
  - Quantitative Precipitation Forecast (QPF) – Expected precipitation totals
  - River Gauges (Observed and Forecasted)
  - Current Temperature
  - Wind Speed
  - Tropical Weather

- FEMA:
  - Shelter Data
  - Recovery Centers
  - Disaster Declarations
- Power Authorities:
  - Real time outage data

Most privately available sources can be integrated for just the cost of the service with no additional fees from BCG. For example, if your organization has access to Aeris Weather data, GIS Premium can include layers for High Resolution Radar (current and future), Storm Cells, and Lightning Strike Density. Many

GIS DATA SOURCES

EXTERNAL SOURCES

- Aloha Plume
- CAD data via Email or custom API
- CSV
- ESRI ArcGIS services
- ESRI Online services
- Excel
- KML
- MASAS
- Shape Files
- Text Files

DLAN SOURCES

- Asset Tracking
- Phonebook Premium
- Route Analysis
- Streaming Video
- Ticket Manager
- Weather

GIS departments also host their data in one of these formats, allowing organizations to view their internal GIS information within DLAN.

DLAN is not just a set of disjointed dashboards, but a fully unified solution. DLAN has the ability to overlay its own internal data alongside external data. Information from multiple areas of the DLAN system can be easily displayed as layers in GIS Premium. This includes but is not limited to incident data, tickets, assets, phonebook data, streaming video sources, and route analysis information.

For example, while monitoring a tropical weather system an agency might want to overlay the following sources on their GIS Premium:

- Flood plain data
- CIKR (Critical Infrastructure)
- Schools / Daycare Centers / hospitals
- Current vs. forecasted river / stream heights
- Rainfall projections
- Tropical system advisory data (path, strength, wind field)
- Looping Radar
- Shelter Information
- Power Outage Information
- Agencies Contacts
- Staged / Available Assets
- Current Requests / Offers / Reports

Once the data is in the system, DLAN's GIS Premium tools allow users to markup the map, buffer on a given feature or area and share that data with other systems, such as Google Earth. For example, a user can select a real-time power outage and buffer to see which hospitals, schools, and special needs patients are affected and then export that data into a KML or CSV file to share with other systems.
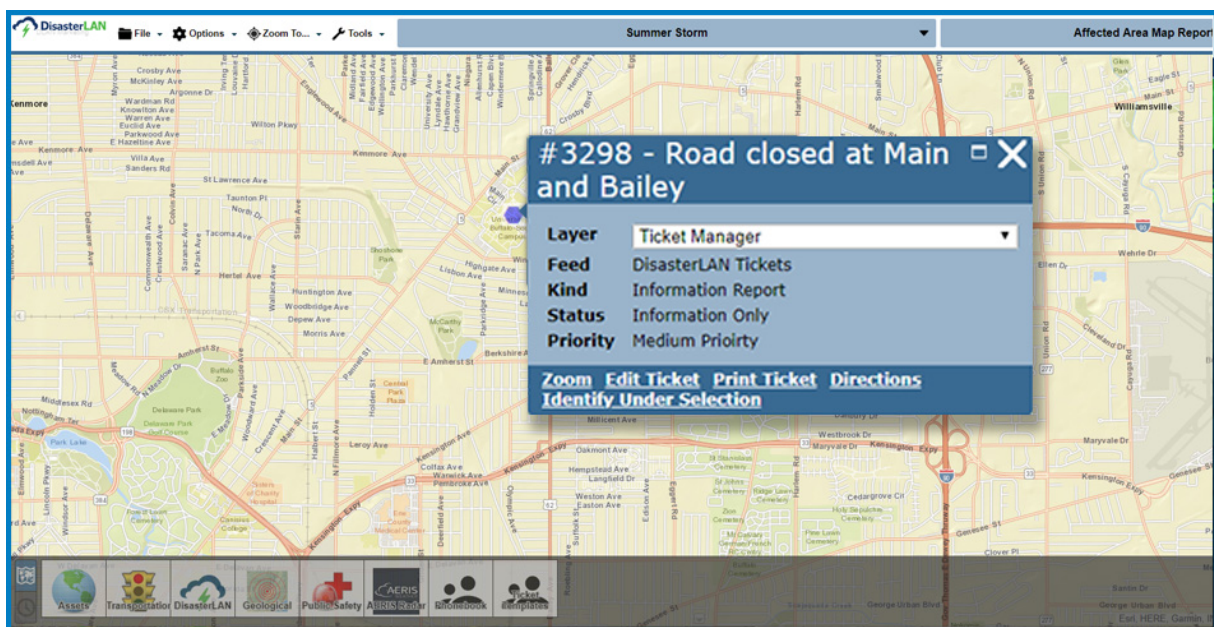
DLAN allows users to view all of these sources, in one place. The ability to access GIS data from publically available, internal organizational, private, and DLAN specific sources allows DLAN to fuse together all of this information and display it on a single platform. All of the information is updated in real-time, allowing staff to focus on their mission critical tasks instead of on reviewing multiple sources or entering information into multiple systems. With DLAN your team always has the most up-to-date information, all in one unified platform.

Mini-Case Study: Gotham Shield

BCG recently supported multiple customers during the multi-day multi-agency FEMA led Operation Gotham Shield / Ardent Sentry exercise. During this exercise the New York State Division of Military and Naval Affairs (DMNA) was able to successfully utilize one of DLAN's newest features, the ArcGIS Sync Tool, which was created for this exercise and is now available to all DLAN customers with GIS Premium. DLAN's ArcGIS Sync tool allows users to take any Ticket Manager or Watch Command report and instantly convert it to a feature layer service on ArcGIS online. This means that tickets tracking shelters, damages, donations, resources, road closures, and other work items can be sent to ArcGIS online in real-time as they change in DLAN. Any information included on that report (including any geographic data from addresses, coordinates, points, lines, and polygons) can then be instantly shared on ArcGIS online as layers in Public Dashboards, third party Common Operational Picture (COP) viewers, and other types of systems.

Authentication

When the big one hits, the last thing responders should be worried about is their incident management software password. DLAN makes it easy by providing both easy password recovery and integrating with external authentication systems to both simplify and shorten the login process.

As an example, BCG recently set up a unique authentication system for the City of Toronto. The City has users from multiple units within their infrastructure, each of which has their own LDAP directory, and many maintained by different IT groups. The City wanted DLAN to support authentication queries from any of their LDAP sources.

To accomplish this DLAN uses the directory for the Authentication phase. Authorization and Auditing phases of AAA are controlled by the application. Users can login from any of the subdomains, with their own credentials, and DLAN is able to process the request.

DLAN provides for multiple layers of security and access control throughout every level of the system. The permissions structure in DLAN is tiered and can be configured to have granular security permission, broad security permissions, or any range in between. DLAN accomplishes this flexible and intuitive security structure by implementing administrator defined security groups which are separate from user accounts and roles. These security groups are composed of several individual security permissions.
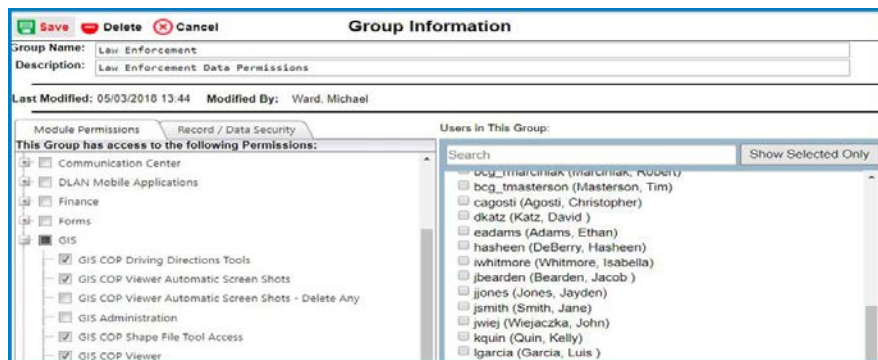
For the City of Toronto case, each subdomain can have its own default security settings within DLAN. Valid users can be specified in LDAP groups or organizational units (OU). DLAN user accounts can be pre-synced based on an OU or group, or created on demand when the user logs in. Pre-synced accounts can have their DLAN permissions tweaked before the user logs in, on demand using the default security profile associated with the particular LDAP connection.

LDAP users can be individually disabled within DLAN, allowing someone who has LDAP permission to access the system to be removed from DLAN without changing the LDAP side. Password management and recovery for LDAP users is handled through Toronto's existing infrastructure, not DLAN.

This case study illustrates how DLAN can be integrated into current security processes to simplify the end user experience, while maintaining a secure environment.

Conclusion

Interoperability cannot be an afterthought when it comes to incident management solutions. When every second counts you need to be able quickly share information with both external partners and internal systems.

BCG is not just a software vendor, it is an engineering firm with decades of experience in custom engineering projects. Unlike many solutions in the market, DLAN is interoperable by design; it follows NIEM and NIST guidelines with common protocols and standards for meaningful information exchange available out-of-the-box without requiring external servers or third party plug-ins. Interoperability is built throughout DLAN including GIS mapping format support, communication protocols support, import/export capabilities, data format support, browser support, and mobile device support.

BCG works with our customers to create solutions that meet all of their interoperability and integration needs because we know that when lives are on the line, blaming the other company's system is not an option. We work to be emergency management partners with our customers, and as your partner we will do everything we can to get all the information you need from any available source into one unified system for improved situational awareness.