



COMCARE Editorial for Disaster Resource 2006-2007 GUIDE

LEADING THE PATH TOWARDS INTEROPERABILITY

The lack of a national interoperable communications infrastructure is a critical homeland security and emergency response problem. Hurricane Katrina brought to light the fact that the president, the Secretary of Homeland Security, governors, or EOCs cannot send or receive secure emergency messages or share data to most of the 100,000 emergency agencies in our country or those in a particular state. Our emergency responders need communications tools that provide first class, all-hazards incident management and response nationwide.

Regionally, interoperable first responder voice communications has received a good deal of attention at all levels of government. Interoperable, shared data among local and state agencies and other external entities, for public safety, criminal justice, and emergency response is the next challenge. Properly protecting the public with modern emergency communications requires all media (i.e. including data) linkages between organizations, not just radio communications with staff in the field. Local and state emergency managers need their new electronic tools to be tied electronically into the applications of the other emergency response agencies.

Today, there are many challenges to interoperable communications including the lack of a coordinated system, the lack of connections to networks and the lack of shared (and sharing support) applications. If an emergency were to occur today, agencies would be contacted one by one through voice calls or customized interfaces. This inefficient and time-consuming process causes each agency to absorb its own technology customization costs and results in incompatibility and rapidly outmoded technologies. The solution is not for the federal government to buy a new "national emergency network" or to achieve "interoperability" by buying a single software tool for all emergency agencies to use. Nor does the solution need to be a multi-billion dollar, decade-long challenge.

COMCARE is a national advocacy organization of over 100 organizations dedicated to advancing emergency response. The International Association of Emergency Managers is an active member and sits on our Board. Advocating the use of both voice *and* data interoperability, COMCARE is working towards an "all-hazards" approach to communicating across jurisdictional and professional lines.

In designing a data interoperability environment, COMCARE and its members advocate practitioner-based processes and consensus agreement across all the emergency domains. There are several architectural layers that must be in place to achieve effective data interoperability in a locality, state or region, and the country. The following sections describe each layer in more detail.

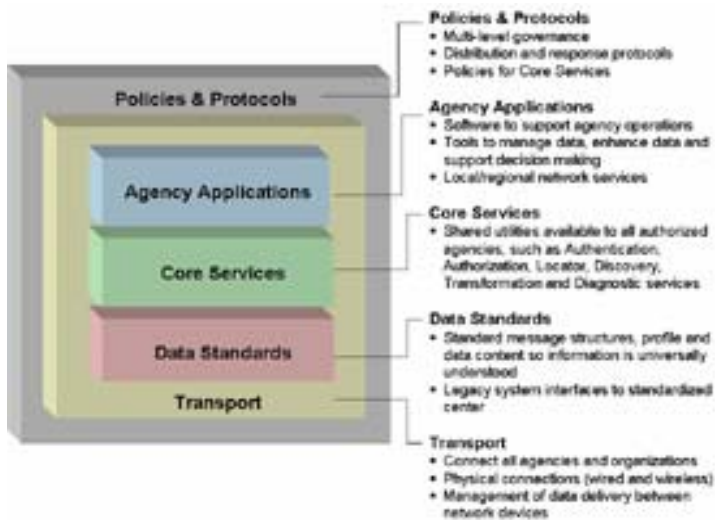


Figure 1. Architectural layers for achieving interoperability.

Transport

Transport represents the physical networks over which voice and data travel through private public safety radio systems and telephone for voice or the public Internet for data. The latter has the advantage of being available to almost any agency immediately at a low cost. However, many localities and states have developed their own private IP networks (often for non-emergency purposes that could be used by emergency agencies as well). These have the advantage of providing better performance and security. The transport layer also manages the end-to-end delivery of messages and determines how data is transferred between network devices. It manages user sessions and dialogues and controls the establishment and termination of logic links between users. In addition to voice communications, all agencies need redundant broadband connections, and access to broadband wireless.

Standards

Standards create a common language that enables data sharing between thousands of individual agency proprietary systems used today. Common standards allow data communication among the disparate systems already in use, along with new applications as they are introduced into the system. This is done by having the owner of each system build a single interface for all such purposes at the point (or points) where that system meets the outside world". Standards include common data elements (terms, dictionaries), message sets ("sentences"), and service interaction profiles (how agency applications do "handshakes" with each other).

Standards have to be national (or international). National standards mean local and state technology choices will expand and prices should improve, as seen following the experience of the private sector with the commercial computer industry. There has been some excellent work on standards within specific domains (e.g. the Global Justice work), but there needs to be a focus on shared standards across all emergency professions. It is equally important that representatives from the different emergency response professions collaborate during the national standards development process. The OASIS Common Alerting Protocol and the Emergency Data Exchange Language (EDXL) project are excellent examples of this; IAEM and COMCARE have been deeply involved in both.

It is sometimes suggested that a solution to interoperability is to require all agencies to use the same software tools. While that can allow multiple agencies to see the same information, it is not real interoperability. Most agencies will not be willing to let someone else make their application selection decisions for them, nor will they be comfortable or efficient using tools that they don't use on a daily basis – “just another screen”. The costly alternatives are to develop “one-off” individual interfaces to each source of data, or to acquire complicated and expensive systems that sit between agencies and translate each agency's data language into the others.

Core Services

When an emergency response agency determines that data is necessary to improve emergency response efforts, that agency must first know what data it needs, where to get it, how its system can use it, who will provide it, and if the data can be trusted. These are some of the issues being solved through core services.

Core services are common shared tools, services, and resources offered through a collective effort of the emergency response community – because it is more efficient and effective than each agency or domain doing the function themselves. They enable interoperability and are available for use by authorized emergency entities. Only a few core services prototypes exist. They could include, but are not limited to: security, network management and diagnostics, agency locator service (like COMCARE's EPAD agency registry), identity management and access control (right management), data rights management, and authentication. By using these, agencies do not have to spend their limited funds creating and maintaining these functions on their own (and convincing corresponding agencies to trust their functions).

Core services require both electronic tools and new institutional processes to develop the rules and policies needed to govern information sharing enabled by this framework. Short of core services, we expect to see a variety of shared services where a group of agencies or a single domain shares some particular application or applications. These might include a shared local data router, a shared map service, transformation services, and/or information discovery registries.

Agency Applications

There are numerous emergency applications including complex Computer Aided Dispatch Systems (CAD), web-based emergency management tools, local and statewide GIS systems, hospital capacity reporting systems, records management systems, alerting tools, and other applications. Some are owned by single agencies; some are networks owned by a collection of agencies (e.g. the law enforcement network NLETS owned by state law enforcement). Each has a unique functionality; agencies should be encouraged to purchase the tools that are best suited for them, rather than having common tools imposed on them. However, it is critical that these applications all have the ability to send and receive XML messages (and IP voice messages) to other applications in standardized formats at the interface point where they connect to outside systems. As agencies look to the future, they need to require vendors to provide this capability. It should not matter to a 9-1-1 CAD system that it is receiving data from an emergency management tool about a flood, a telematics message from OnStar, a bio-terrorism alert from CDC, or data about a 9-1-1 call from a wireless company. The same data interface should be used, and vendors should build to it as a matter of course. Vendors will benefit because they will not have to create multiple one-off interfaces.

Other sets of applications and services compete to deliver information between these agency-based applications. These can range from traditional ones that provide telephone, radio, or data connections between disparate parties (such as NLETS), to sophisticated shared systems between multiple domains which enrich incident messages with associated data from multiple sources (e.g. “chlorine spill? Here are the treatment instructions.”)The same interface rules need to apply to them.

Policies and Protocols

It is important to separate technical capabilities from policy rules governing their use. We need a system that connects any agency to every other agency. Indeed, agency needs to include many private sector entities. But that does not mean that any agency should be allowed to send or receive any message or have access to all data.

While achieving data interoperability technically, it is also important to develop the policies and protocols that determine the rights and roles of agencies and management rules. Does a hospital have the same privileges as the county DOT or the towing company? Who has access to what data and can send what messages? In general, data owners should be able to decide these answers. Agencies should be able to decide what incidents they hear about, what data they get and how. Local agencies should be able to decide local information use and response protocols. Some of these policies (and the decision making bodies) are already in place today, whether they are officially written policies or not. The local, state and federal law enforcement communities are most advanced in this regard. Most other emergency agencies are not because sharing emergency information between them has not been done before. All of these policies and protocols need to be addressed in terms of electronic communication and then enforced through the appropriate Core Services tools. These tools must be designed to provide enormous flexibility on information handling since there is no “one size fits all.”

Conclusion

The framework enables the integration of data providers to data collectors (often parties are both during an event). It provides an approach for all-hazards emergency messaging, whether regarding mass emergencies or single events, about patient tracking or resource management, and whether an agency needs to contact other agencies, private entities or the public. It is adaptable for use by a wide range of organizations and improves operational efficiency so the focus is on public protection, on emergency response, not on the administrative tasks of data entry, looking up contact information or filing paper records. We hope to demonstrate such an open system through the efforts of the many national emergency organizational partners in the National Emergency and Alerting Response Systems (NEARS) project (www.nears.us).

Through this framework, agency systems as well as other discipline-specific systems can be integrated across the entire emergency response enterprise – without any specific organization presuming to be “in charge” of the whole enterprise. Real time data can be collected for all types of hazards, improving the ability to detect trends and threats. Agencies will know immediately when an emergency event occurs. Responders will receive timely information allowing them to provide more effective response — and to reduce injuries and save lives in the process.

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If you have questions about interoperability or would like to learn more about COMCARE, its projects, and its membership opportunities, please email us at info@comcare.org or visit our website at www.comcare.org.