ICTs for disaster response – services and applications

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NEW and OLD THREATS, NEW CHALLENGES... NEED NEW APPROACHES...

- The need to effectively undertake action in the field of security and disaster response has been emphasized by a series of events caused by terrorist activity, such as in New York, Madrid, and London, or by natural disasters, such as the hurricanes, tsunamis, and earthquakes,...

In this new environment, Governments are straining to take all necessary actions to protect their citizens and critical infrastructures by investing in mission critical networks, applications, and design expertise.
MAJOR INCIDENTS AND CRISSES REQUIRE AUTOMATIC, INMEDIATE and COORDINATED RESPONSE

IP/MPLS NETWORK
- A step towards network convergence
- Reliable, flexible, scalable, manageable
- Better bandwidth usage, integrated network, simplified operations and maintenance, reduced OPEX
- An enabler for highly available voice, video, and data services
- Improves safety and efficiency

LTE TECHNOLOGY
- Higher throughput,
- Reduced latency,
- Better quality of service
- All IP

SPECIFIC PORTION OF SPECTRUM IN THE 700 MHz BAND
- Best propagation that gives great coverage with the best capacity given by LTE
**PUBLIC SAFETY DATA** APPLICATIONS

**Broadband**
- Full-duplex video conferencing
- Near-real-time video streaming
- Bulk file transfer
- e-mail
- Web
- Push-to-talk, VoIP
- Device status/telemetry
- Remote database access
- Automatic database transactions
- Geolocation
- Instant messaging

**Medium**
- "see what I see"

**Low**
- Narrowband

BROADBAND WIRELESS (LTE): INCIDENT, DAY-to-DAY AND PLANNED OPERATIONS

Real-Time Situational Awareness
- Video
- Images
- Messaging

Remote Office
- Evidence Collection
- Remote Form Entry
- Access to Databases

Next-Gen 911/190
- Images, Text Videos

Multi-Agency, Multi-Jurisdictional Response
- Team Coordination

Medical Telemetry
- Streaming Data

Enhanced Officer & Public Safety

Increased Street Time

Life-saving Information

Full Inter-operability

LTE: An Essential Tool for Public Safety and Emergency Situations
ONE OF THE BIGGEST GOVERNMENT CONCERNS

- To provide SAFETY ALERTS
- To protect the CITIZENS
Broadcast SMS – the way to inform responsibly

Alert Gateway*

Immediate alert sent to SPECIFIC geographical LOCATION

Broadcast Message Center (BMC)

Wireless Network

Broadcast Area

Broadcast Area

ALCATEL-LUCENT — INTERNAL PROPRIETARY — USE PURSUANT TO COMPANY INSTRUCTION
AT THE SPEED OF IDEAS
STRATEGIC NETWORKS
5 Key Take-Aways

1. **Broadband**: High Speed Data will be the most important trend in the coming years in Homeland Security: Homeland Security Agents need more information and need to get that data as quickly as possible to help them do their job more efficiently and safely.

2. **Network Transformation**: IP/MPLS networks enable the transport of any type of information (HUMINT, SIGINT, COMINT, ELINT, IMINT, status reports, unit positions, logistic situations, etc.) with the required levels of priority, security and reliability. These networks allow Machine-to-Machine, Person-to-Person, Machine-to-Person collaboration.

3. **Interoperability**: Providing high-quality information that is delivered at the right time to the appropriate end-user, anytime, anywhere, be they part of forces, command centers, allies or civilian agencies, NGOs, etc. The increased use of standards-based systems facilitates interoperability between different systems, different agencies, and different vendors.


5. **Open Approach**: Open standards, open architectures and COTS systems introduce opportunities for common solutions, often more cost effectively.
IP/MPLS: NETWORK TRANSFORMATION

Why Change?
✓ The network needs to quickly adapt to new services
✓ Need to enable “Ethernet Backhaul” by creating a native transport network
✓ New technology can enhance officer response and citizen safety

Moving from...
• Voice over TDM circuits
• Limited video, voice and data collaboration
• Low-speed data collection and LMR over TDM circuits.
• Limited VPN services
• Limited QoS implementation.
• Best effort IP, reliable TDM.

To...
• Voice over IP with rich features and functionalities
• Full and instantaneous video, voice and data collaboration tools
• Data collections and LMR circuits using IP/Ethernet
• Rich and scalable VPN services
• IP/MPLS network with sophisticated QoS implementation supporting multiple services
4G - LTE

Carrier Size Flexibility

Higher Throughput (Mbps)

HSPA (5MHz) 65 ms
HSPA+ (5MHz) 50 ms
LTE MIMO 2x2 (20MHz) 10 ms
LTE MIMO 4x4 (20MHz) 10 ms

Frequency Flexibility

OFDM Flat IP MIMO

2.6GHz

1.4MHz 3MHz 5MHz 10MHz 20MHz

FDD & TDD

700MHz
LTE - INFORMATION SHARING EFFICIENCY

Use case: When there is a need to see to identify

- Broadband (LTE) provides
- High throughput for very fast transfer of pictures

<table>
<thead>
<tr>
<th>Transfer delay</th>
<th>High res picture (2MB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TETRA Packet Data</td>
<td>~114 minutes</td>
</tr>
<tr>
<td>TEDS (50 kHz)</td>
<td>~3 minutes 40 seconds</td>
</tr>
<tr>
<td>LTE (2x5 MHz)</td>
<td>~3 seconds</td>
</tr>
<tr>
<td>LTE (2x10 MHz)</td>
<td>~1.5 seconds</td>
</tr>
</tbody>
</table>

A picture is worth 2,000 words!
It can be transmitted in real time with LTE
PUBLIC SAFETY BANDS OPTIONS IN THE 700 MHZ SPECTRUM
AT THE SPEED OF IDEAS™