Modern Public Safety and Security

Luc Imbert
Public Safety and Security Lead EMEAR

Innovate Together
National Security Customers

Police + First Responders (Blue lights) – MoI – MoJ - Prisons
Urban Security
Incident manage crises
Critical Infrastructure
Border Protection
Airports & Naval ports security
Mass Events

Defense
NATO
Intelligent Services
Special Services
HERKULES Project at a Glance

• Largest Public Private Partnership in Europe

• 7.4 BN € contract over 10 years

• Complete administrative & logistics Communications (Voice, Data, Video) for German Armed Forces including Business Applications (SAP „mil“)

• 1500 Sites, 260.000 Voice user, 140.000 PC, 4 DC

• Service led Sales

• Borderless Architecture Framework for Transformation of Bundeswehr‘s Communication
TITAAN – the Royal Netherlands Army
JCSE – US Air Force (SC2IP)

IP Technology Reduces Footprint

Circuit Based Tech Control & Telephony Switch

EOIP Solution

- 250 Cubic Ft
- 1.1 Tons
- $1.9M
- 9 Pax

- 12 Cubic Ft
- 290 lbs
- $270K
- 3 Pax
Air Force – AWACS Upgrade

Cisco’s ISR
IP drives the convergence of Safety and Security Systems

- Step 1: Is there something specific in the core?
- Step 2: New collaborative way of working?
- Step 3: Can we add physical security systems on the network?
- Step 4: What about Emergency Mobile Communication Services?
- Step 5: Further Mobile? IRIS
How to implement a mission critical core?
New applications require core intensive use

**Detection**

**Discover Applications**
- NBAR
- SCE
- QoS
- MSI/MSP

**Measure performance**
- Flexible Netflow
- NAM
- Performance Agent
- IP SLA
- Perf-mon/Mediatrace/IPSLA VO

**Baseline and monitoring**
- SCE
- WAAS CM
- NAM
- Collab Manager

**Optimization**

**Applications Optimization**
- Compression, Caching & Protocol optimization

**Network Optimization**
- WAAS
- WAAS SRE
- WAAS Mobile Metadata

**Scalability**

**Quickly deploy apps**
- UCS Express
- SRE
- WAAS Virtual Blade

**Network Agility**
- PFR

**Applications Agility & Cloud**
- Webex Node
- UCS Express
- VDS
Mission Critical requires security
What does GET VPN offer?

- Provides large scale any-to-any connectivity.
- Native routing without tunnel overlay.
- Optimal for QoS & Multicast support.
- Flexible span of control between enterprise & service provider.
- Centralised policy distribution.
- Transport agnostic: Private WAN, FR/ATM, IP, MPLS
Video in Police Stations, Court of Justice & Prisons
Police - AVR

Control room

Interrogation room
VTS Politie Nederland

- Standardized interview process
- Central Recording
- Remote attendance and availability
Justice - Telehoren

Prison side

Court room side

Tools
North Wales Police
Incident Collaboration

Business Need

- Decrease crime and fear of crime
- Reduce costs
- Engage with citizens in their community instead of waiting for calls in the station
- Faster dissemination of critical messages
- Support green initiatives

The Solution

- Substituted virtual video meetings for meetings requiring travel
- Seeing the other person with videoconferencing instead of just hearing their voice led to more productive conversations
- Cisco Unity enabled officers on the street to access voicemail messages from their smart phones

Results

- Saved US$100,000 (£58,695) from lower leasing and maintenance costs
- Eliminated 30 hours weekly in travel time in one district, for USD 68,000 (£39,913) savings in six months
- Enables the 1,600 officers an estimated 2 extra hours of visibility per officer each week
- Reduced carbon emissions by 2.8 tons in six months
Physical Security
An exploration area
Cisco Connected Physical Security Solution

### IP Cameras
- Standard Definition and High Definition IP Cameras
  - Box, dome, PTZ
  - Wi-Fi
  - Indoor and outdoor
  - Onboard analytics
  - Medianet

### Video Surveillance
- Video Surveillance Manager
  - Forensic search
  - Bulk camera UPG
  - Health dashboard
  - Open standards

### Access Control
- Physical Access Manager
  - Biometrics
  - Mapping
  - Web services API
  - High availability
  - Integrated video

### Notification and Response
- IPICS
  - Dispatch console
  - Mobile client
  - Rich media
  - High availability
  - PTT to IP phone

---

**Open API**
- TelePresence
- VTG-ORA
- PMBU—Logical/Physical Access
- Cisco Integration
- S+CC
- Digital Media
- VTG—Access Control via IP Phone

**Medianet**
- Media Trace
- Auto Discovery
- Auto Configuration
- Media Monitoring

**IP Network**
- Security
- Health Monitoring
- Quality of Service
- Auto Updates
- Authentication
Cisco Physical Security: Video Surveillance, Access Control, Incident Response

- **Threat Detection**
  - Cisco IP Cameras
  - Third-Party Sensors
  - Third-Party Analog and IP Cameras
  - Cisco Access Control

- **Threat Monitoring**
  - Safety and Security
  - Physical Access Manager Multiservices Platform
  - Cisco Integrated Services Router Video Media Management and Storage

- **Threat Response**
  - Desktop
  - Radios, Mobile Phones, IP Phones
  - Digital Signage

**Network as the Platform**
Cisco End-to-End Advantage with Medianet

Phase 1
Auto Switchport Configuration

Phase 2
VSM Auto Camera Discovery

Phase 3
End-to-End Video Monitoring

Plug and Play

Simplify Network IP Video Surveillance Solutions
Improved End-to-End Video Management
ASFINAG
Securing Austrians Highway Tunnels

Business Need

- Initial state: Island of networks for each part of the motorway and tunnels (different vendors/contracts)
- Required state: One system that provides a converged network for telephony (including radio), HD video streams (2,500 cams), traffic control systems, fire alarm, ventilation, signalling, electronic guides, acoustics, emergency phones, etc.

The Solution

- Countrywide MPLS backbone, Cisco IPICS for radio interoperability
- Radio coverage solution for >100 tunnels using LMR capability in Cisco® ISR 2811 (IPICS), replacing legacy Siemens multiplexers
- IP integration of SOS telephones in tunnels/on roads

Benefits

- Increased safety due to communication between ASFINAG road maintenance teams and emergency responders
- Cost-effective interoperability between PTT radio systems and other mobile devices (replacing two fully equipped 19” racks in every of the nine command & control centres)
- ASFINAG committed to investing EUR 1.1 billion by 2014 to improve safety in Austria’s 160 road tunnels
- ASFINAG aims to achieve 2M€ savings in three years
Safety and Security Mobile Networks Evolution
Emergency Services Has Started to Follow and is Transitioning to a More Data Dominant Environment

- Gartner believes that the trend towards a more data-centric set of business and operational services in the Emergency Services arena will follow that in the wider commercial market.
- In this wider sector, data traffic has increased x39 time in the past 3 years with only a 40% market penetration of 3G.
- The current TETRA network is unsuitable to hosting most data-centric applications and services that will be expected by an increasingly sophisticated set of user communities.
Market trend with Safety into BroadBand

- Safety LTE licenses in the US and Middle-East
- Hybrid Networking in Europe -Tetra+3G commercial networks- then potentially LTE licenses as well

Communication solutions

- Data radio infrastructure
  - Short term
    - MVNO solution (TETRA 1.925GHz)
    - Proprietary

Safet Radio Broadband Evolution

Summary of Congressional action

- Middle Class Tax Relief and Jobs Creation Act of 2012
  - Title VI is all about radio spectrum, policies, and public safety broadband
  - Adopted by House & Senate February 17, 2012
  - To be signed by President Obama week of Feb. 20
- D block (10 MHz) added to existing public safety broadband allocation to support 2 x 10 MHz FDD LTE network
  - D block = 758-763 MHz & 788-793 MHz
  - Existing = 763-768 MHz & 793-798 MHz
- Partially funded ($7b) with strong emphasis on generating revenues from network use (user fees; leasing capacity)
- Single national architecture; oversight by NTIA (Commerce) with significant state role in build out and operation
We are talking about walkie-talkies going Broadband!

Analog LMR Voice
Dispersed isolated systems

Digital nation wide
Multi agency LMR system

Hybrid TETRA
and 3G/ LTE hybrid
system

LTE (IP)based system with
LMR voice service
and data services and or
coexistence
with existing critical voice
Data tangible usage pushing the entire story

- ANPR (License Plate Reader) Video camera with analytics working in conjunction with the remote data base (Stolen car, Fugitives databases, etc.) needs to be automated and connected.

- All the public safety apps accessible from the car are currently located on a rugged server accessed (wire) by a light terminal at the front of the car: Automate the deployment, management, SW & content updates:
  - Driving licenses checks
  - ID checks
  - Etc.

- Video-recording: being able to access the video of the police activity on the fly as well as central recording

- Green box: Manage environment related information from the driver behaviour.

- Black box: Similar to planes – obj: reduce number of accidents by monitoring driving behaviours

- Wifi connectivity around the car for wireless tablets, etc.

- Dematerialization of police processes (enabled by digital certificates loaded in policemen badges)
What is specific to Public Safety?

- **Size**: Mobile SPs handle 1M to 20M users, Safety networks require same level of functional assets for 200 to 2k subs.

- **Flexibility**: Physical redundancy is key in public safety, network design will require much more distributed functions than Mobile SP networks.

- **Vendors & SIs**: Tetra Vendors will have a bigger System Integrator role, providing Safety Services, Applications and Network design based on Commercial Off The Shelf LTE technology.

- **Public Safety “Service Providers” Organizations**: MoIs or independent public organizations, sometimes SPs affiliates. They understand critical voice. They start with data. Same situation as Mobile SP 12 years ago.

- **Market Winning Strategy**: maintain existing ecosystems to address technology disruption and empower existing players with data understanding and management capabilities
The two disruption in future Security Communication Systems

Not any more a dedicated network play

• But collaboration with “best effort” commercial networks.

Not any more a dedicated technology play

• But dedicated design and architectures based on a Commercial Off The Shelf Technology
• And complementary assets with best effort technologies
Emergency Communication evolution steps

- The Emergency Service Provider Organization (ESPO) provides wholesale data on top of critical voice
- Be the one stop shop for Emergency end-users for voice and data
- Secure handhelds and provide mobile routers for vehicles

- The ESPO owns its GGSN provides advanced data management on top of critical voice
- Offer secure Wi-Fi connectivity through SP Wi-Fi and/or Private end-user Wi-Fi
- Secure handhelds and provide mobile routers for vehicles

- The ESPO owns its SGSN, GGSN, HLR/HSS provides advanced data management on top of critical voice with own SIM Cards over 3G/4G/Wi-Fi
- Offer full national roaming
- Secure handhelds and provide mobile routers for vehicles

- The ESPO offers 3G/4G/Wi-Fi
- Offers full national roaming
- Deploys or Connect dedicated LTE “pockets”
- Secure handhelds and provide mobile routers for vehicles

APN management, connected devices and connected fleets

MVNO role for Broadband, advanced data management, Wi-Fi.

Safety LTE + Full MVNO

Full MVNO role, advanced roaming including 4G.
Emergency Services Evolution
Phase 1 – Leveraging Existing Commercial 3G/4G Services

Legacy RAN Transport

UTRAN/E-UTRAN

EPC or S/GGSN

Data Agg (Cisco ISG)

AAA

PCRF

Tetra Switch

ESPO Core

Legacy Safety Radio

Commercial 3G/4G

Cisco 819
Emergency Services Evolution
Phase 2 – Moving to MVNO Model for More Control

Legacy Safety Radio

Commercial 3G/4G

Cisco 819

Legacy RAN Transport

UTRAN/E-UTRAN

SGW or S/GGSN

AAA

PCRF

MPC

(Tetra Switch)

ESPO Core

(Cisco GGSN/PGW)
Emergency Services Evolution
Phase 3 – Deploying Private 4G/LTE coverage

- Legacy Safety Radio
- Commercial 3G/4G
- Macro Femto
- Legacy RAN Transport
- UTRAN/E-UTRAN
- SGW or S/GGSN
- Dedicated E-UTRAN
- Local EPC
- MPC (Cisco S/GGSN and EPC)
- AAA
- PCRF
- Tetra Switch
- VOIP GW "IMS"
- ESPO Core
Emergency Services Evolution
Final Phase—Full Heterogeneous Network play

Note*: Cisco offers combined WiFi/Femto solution
### Cisco ideally positioned to lead on 3 GTM levels

<table>
<thead>
<tr>
<th>What</th>
<th>What for</th>
<th>To whom</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE Core For Safety</td>
<td>Vendors and Systems integrators will buy an LTE Mobile Packet Core off the shelf. They are the ultimate customers for solution integration and MPC Sales.</td>
<td></td>
</tr>
<tr>
<td>MVNO Infra &amp; Mobile Routers</td>
<td>This MVNO infrastructure will provide today already data to emergency services and a smooth evolution from critical voice only into a Voice and Data integrated Safety network. The Emergency SP Organizations need smooth migration/integration scenarios Cisco can provide.</td>
<td></td>
</tr>
<tr>
<td>Mobile Routers</td>
<td>End customers have Broadband requirements for set of applications on top of handheld devices. This is the area for the connected vehicle strategy with Mobile routers.</td>
<td></td>
</tr>
</tbody>
</table>
Challenges

- “To deliver mobile voice and data communications services to the emergency services, other public safety organisations and potentially other public sector bodies”
- Manage integration and coexistence with existing Tetra network and services
- Allow smooth evolution into a future proof voice and data technology framework

Solution

- Provide Cisco view on a hybrid move: submitted!
- Provide Mobile Packet Core to Safety LTE SIs
- Provide Transition Infrastructure to existing voice players
- Provide Broadband CPEs for vehicles

Benefits

- £500M pa spend today by emergency services
- Core of 300,000 users in 3 emergency services
- More than 300 organisations as potential customers
- Bring integrated communication capability within existing/reduced framework size
Further Mobile?
IRIS
Cisco’s IRIS technology demonstrator payload launched on Intelsat 14 satellite in November 2009 routes among three transponders (2 Ku and 1 C Band)

Extensive testing conducted with the US DOD, NATO and commercial operators showing excellent results

Routing on orbit allows the satellite to be a node in an integrated space-ground network; benefits include:

- Bandwidth on demand
- Reduced latency (no double hops)
- Dial tone on the satellite for direct connections
- Reduced CAPEX and OPEX
- Fully reprogrammable system through software uploads

Cisco is working with partners to make routing on orbit an integral part of flexible and resilient global networks
Improving Communications Effectiveness and Reducing Costs with Internet Routing in Space: A DoD Joint Technology Capabilities Demonstration
IP drives the convergence of Safety and Security Systems

- Step 1: Is there something specific in the core?
  Core should take care of security and performance together

- Step 2: New collaborative way of working?
  Video and advanced collaboration brings more security and efficiency

- Step 3: Can we add physical security systems on the network?
  Physical security systems are being connected and offer convergence applications

- Step 4: What about Emergency Mobile Communication Services?
  Mobile Security systems are entering a new era with Broadband needs

- Step 5: Further Mobile? IRIS
  IP will even optimize cost and availability of Sat Comms
Thank you.