APCO ETF 2017 – Raleigh, NC

Lessons Learned from ESInet Deployments

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Who We Are

- Comtech Telecommunications Corp. (formerly TeleCommunication Systems, Inc.)

- Process about half of U.S. E9-1-1 cellular, VoIP and NG9-1-1 calls (~250,000+/day)

- A leading NG9-1-1 solution provider with ~40% market share in Next Generation Core Services

- A leader in national Text to 9-1-1 services

What We Do

- Deployed first NG9-1-1 solution in 2006
- Focus on NGCS and related services
- NGCS Deployment Options
  - Software as a Service (SaaS) / Hosted
  - In-network / Managed Service
  - Hybrid

Areas You Need to Know About

- Communication Service Provider (CSP) Ingress

- Location-Based Routing

- Data Migration

- Security: Distributed Denial of Service (DDoS)/Telephony Denial of Service (TDoS)
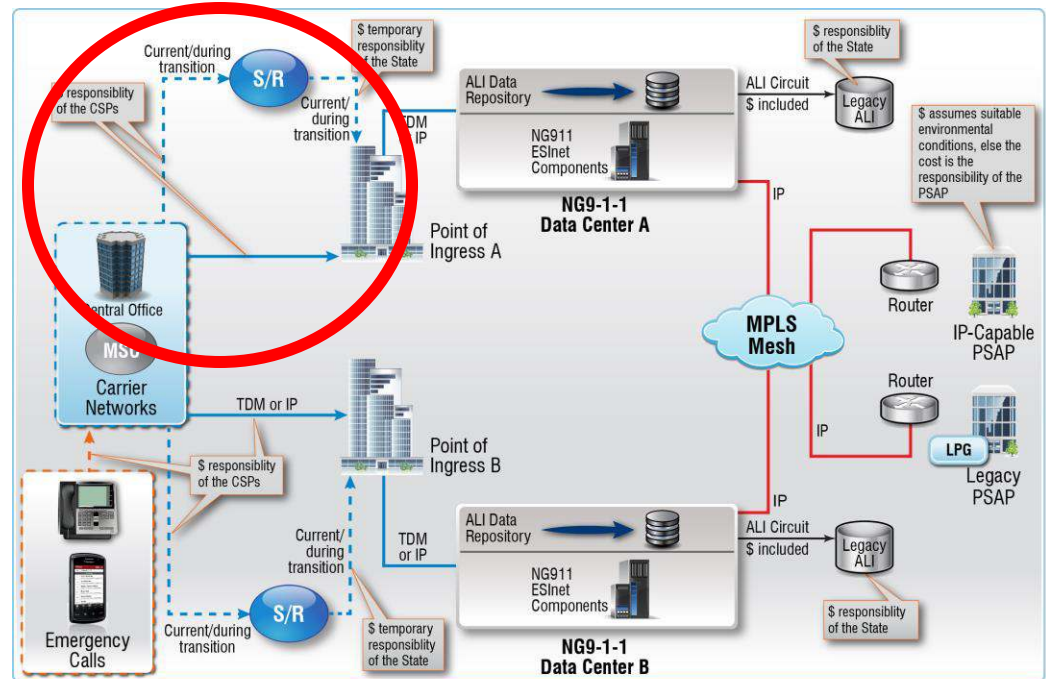
How We Describe a NG9-1-1 Solution

- CSPs
- NGCS Applications
- ESInet Transport
- PSAP Connections
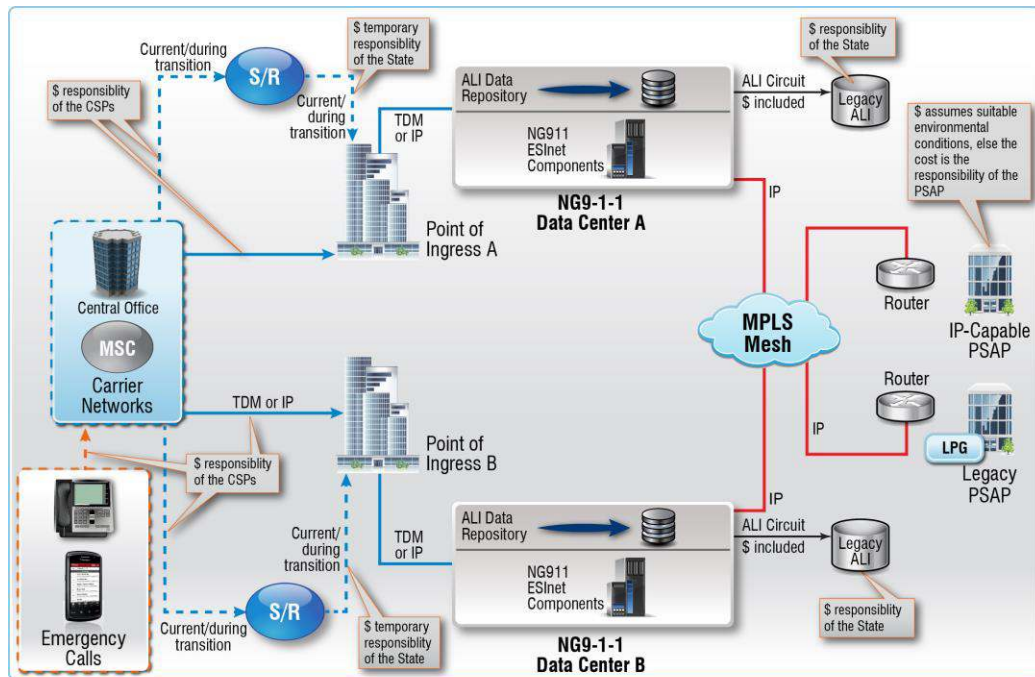
CSP Ingress

- CSP trunks

- Points of Interconnect (POIs)

- Inter-Tandem Trunks (ITTs)

- Long Migration Timeline

CSP Ingress – Lessons Learned

- Be prepared to support SS7/ISUP
- Points of interconnection need to be local
- Inter-tandem trunks drive additional costs
- Be prepared for lengthy delays
  - Letter of Agency (LOA) and/or Interconnect Agreement (ICA) process

Location-Based Routing

- Two meanings
  - Emergency Call Routing Function (ECRF)/Location Validation Function (LVF)
 - Location at time of call
- GIS data readiness
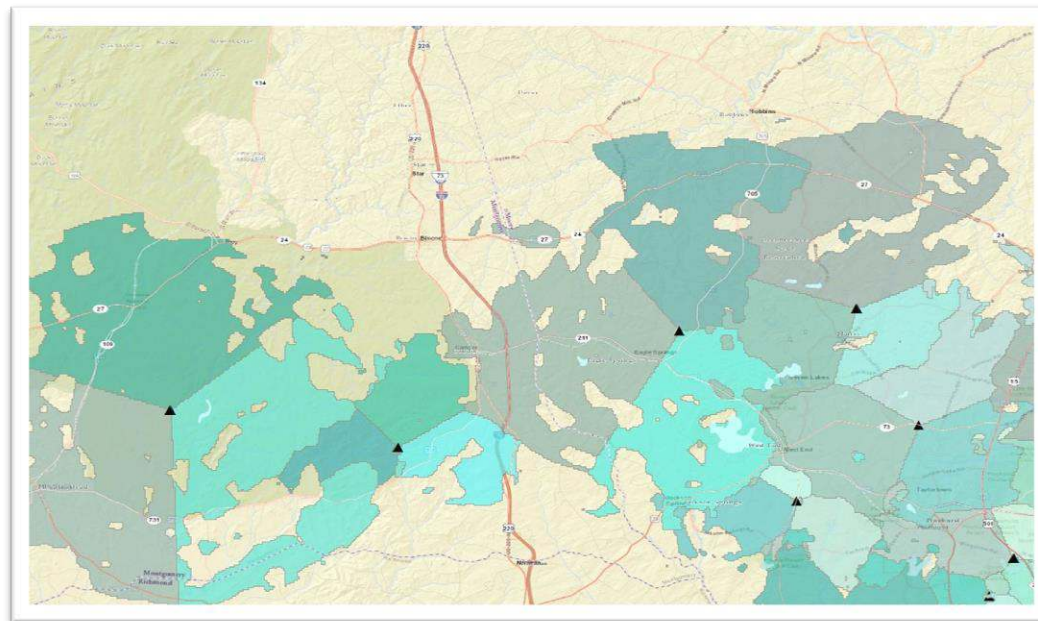
Location-Based Routing – Lessons Learned

- The term means two different things

- ECRF/LVF helps routing, but doesn't solve the transfer problem

- Location at time of call is dependent on carrier network delivery

- Apps instead?

Data Migration

- Sometimes "forgotten" aspect

- Bundled with selective routing?

- Access to data from legacy provider
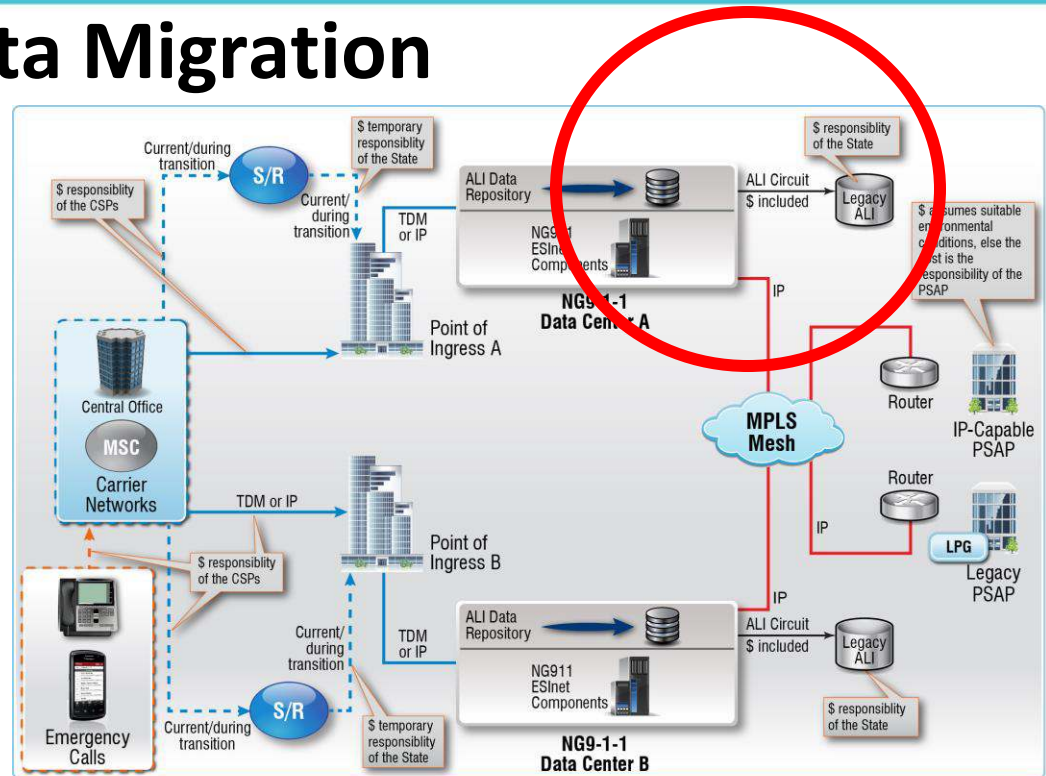
Data Migration – Lessons Learned

- Don't forget about your data!

- If it's a bundled service with selective routing, both have to move

- Usually safest (in our view) to move it last

Security

- Denial of Service Attacks
  - TDoS
  - DDoS
- White/Black Listings?

Young Hacker "Accidentally" Generates a TDoS Attack Against 911 ...
voipsecurityblog.typepad.com/.../young-hacker-accidentally-generates-a-tdos-attack-a... ▼
Nov 2, 2016 - See the article below about a young hacker who "accidentally" or so he says, generated a Telephony Denial of Service (**TDoS**) **attack** against ...

Teenage Hacker Arrested For Disrupting 911 Service With DDoS Attack
thehackernews.com/2016/10/hacking-**911**-service.html ▼
Oct 29, 2016 - 18-year-old teenager hacker, Meetkumar Hiteshbhai Desai, arrested for disrupting **911** emergency system with **ddos attack**.

'911' Can Be Hacked Through TDoS Attack - HackRead
https://www.hackread.com/**911**-can-be-hacked-**tdos-attack**/ ▼
Sep 10, 2016 - **911**, the emergency telephone number for the North American Numbering Plan (NANP) can be hacked through a simple Telephone Denial of Service or **TDoS attack** — Did you see that coming? **911** is a famous emergency phone system that has saved plenty of lives over the years.

Security – Lessons Learned

- Industry-wide issue

- How to deny malicious calls without risking true emergency calls?

- Integration between CPE and NGCS providers is beneficial

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