

July 9, 2015

**Via electronic mail**

Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

Re: Ex Parte Communication--PS Docket Nos. 08-51, 13-75, 14-193

Dear Ms. Dortch:

On July 8, 2015, Tim Lorello, Senior Vice President, TeleCommunication Systems, Inc. ("TCS"), and the undersigned met in person, and Mark Lanphear, Senior Director of Business Development (TCS) by telephone, with David Simpson, Chief of the Public Safety and Homeland Security Bureau, David Furth, Deputy Chief, Tim May and Eric Schmidt, all of the Public Safety and Homeland Security Bureau (PSHSB) of the Federal Communications Commission (FCC). TCS' representatives discussed matters generally related to the treatment of Non-Service Initialized ("NSI") phones and 911 Governance.

TCS' representatives began by comparing NSI versus Service Initialized ("SI") phones. They noted that the calling patterns were almost identical. They further noted that some number of NSI wireless 911 calls are potentially legitimate based upon similarities to SI wireless 911 calls.

With regard to 911 Governance TCS's representatives reviewed the following five principles that governance initiatives should look to address:

1. Need for Effective Monitoring
2. Need for Problem Resolution Collaboration
3. Alternate Network solutions
4. Quality processes
5. Cybersecurity Oversight

TCS noted that a number of independent networks have developed and that while the networks are good at monitoring themselves, the April 2014 outage demonstrated a lack of coordination and collaboration. TCS recommended that in order to address these issues, the FCC might encourage collaboration in the areas of monitoring and problem resolution. TCS

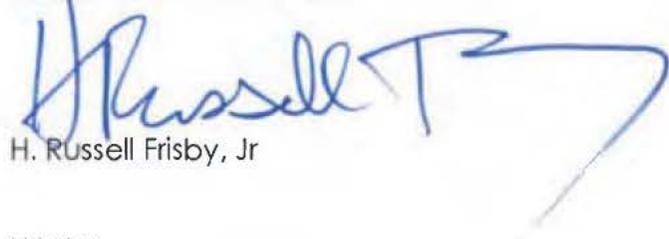
Marlene H. Dortch  
July 9, 2015  
Page 2

also recommended that the FCC encourage network providers to use quality processes as well as to develop alternate network options which could be invoked during crises. Finally TCS' representatives indicated that with so many IP-based connections, cybersecurity was critical.

Pursuant to Section 1.1206 of the Commission's rules, 47 C.F.R. § 1.1206, this letter and a copy of materials presented during this meeting are being electronically filed via ECFS with your office and a copy of this submission is being provided to the meeting attendees. Please direct any questions to the undersigned.

Sincerely,

Stinson Leonard Street LLP

A handwritten signature in blue ink, appearing to read "H. Russell Frisby, Jr.", with a large, sweeping flourish extending to the right.

H. Russell Frisby, Jr

HF:SLS

Attachment

cc: Adm. David Simpson  
David Furth  
Tim May  
Eric Schmidt



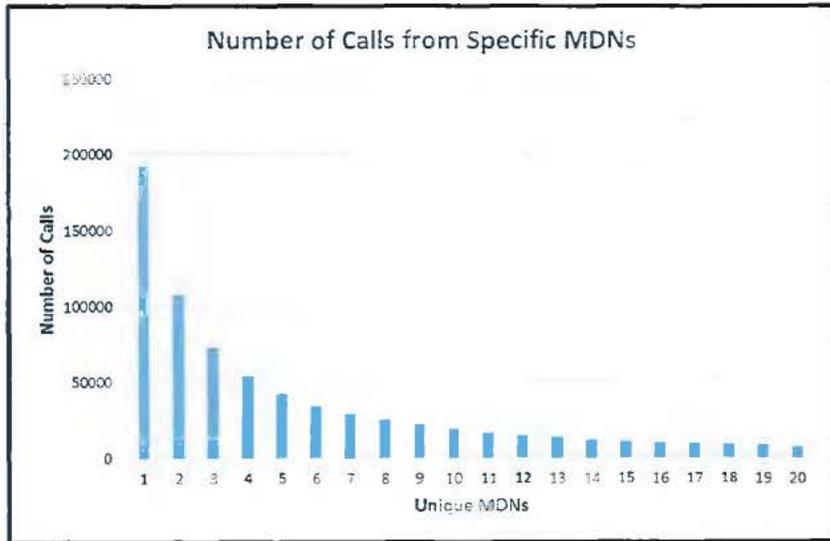
# Agenda

- **NSI Follow-up #1**
  - NSI vs. SI comparison
- **Five Principles of Governance**
  - Monitoring
  - Problem Resolution
  - Alternate Network Solutions
  - Quality Processes
  - Cybersecurity Oversight
- **Summary**

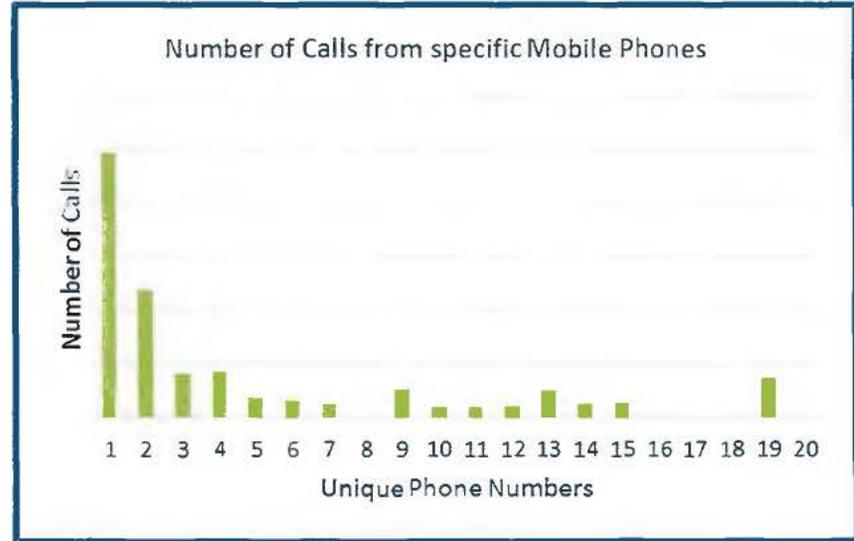
# NSI FOLLOW-UP #1



# NSI Analysis: Comparison of Calls from Unique Phones

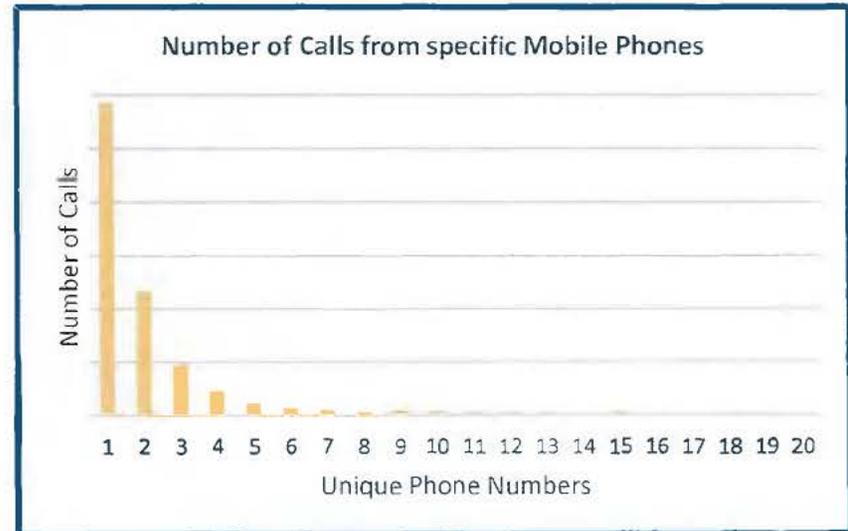


Source: TCS Wireless NSI 911 calls received May 1<sup>st</sup>, 2015 thru May 27<sup>th</sup>, 2015

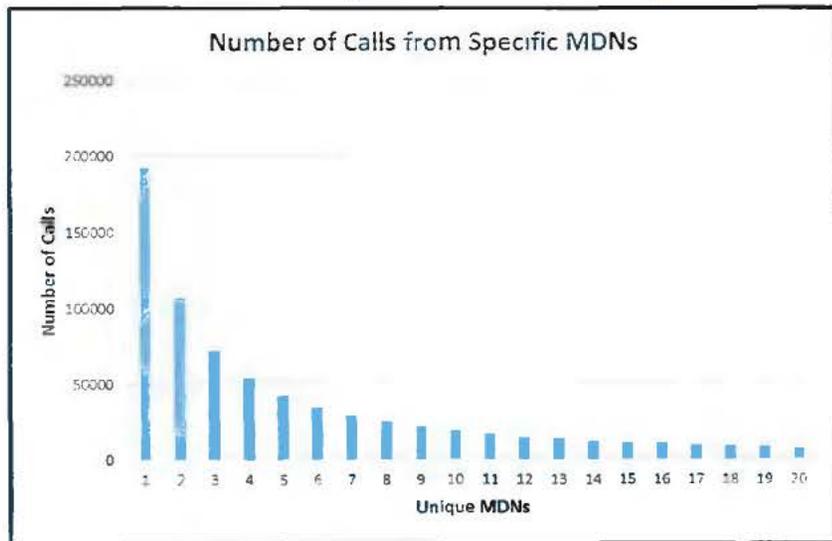


Source: TCS Wireless calls in DC received May, 2013

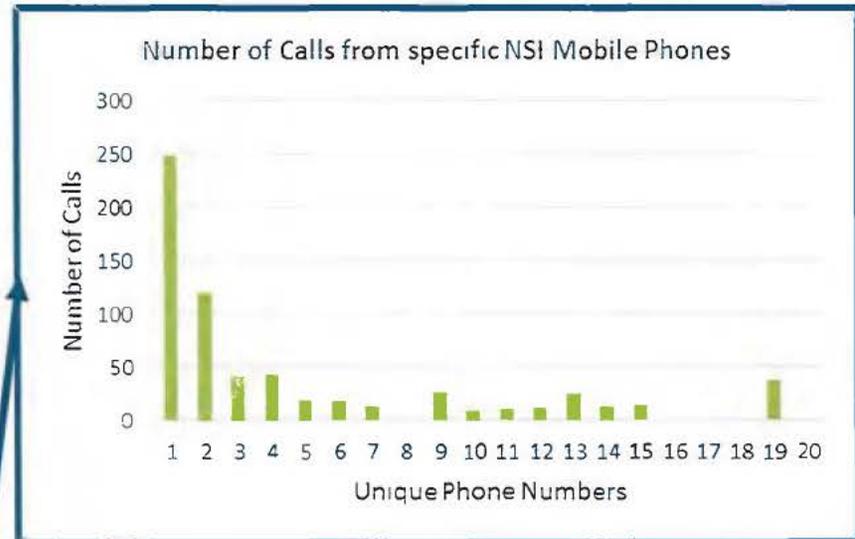
Can you tell which are NSI vs. SI phones?



# NSI Analysis: Comparison of NSI vs. SI Call Patterns



Source: TCS Wireless NSI 911 calls received May 1<sup>st</sup>, 2015 thru May 27<sup>th</sup>, 2015



Source: TCS Wireless calls in DC received May, 2013

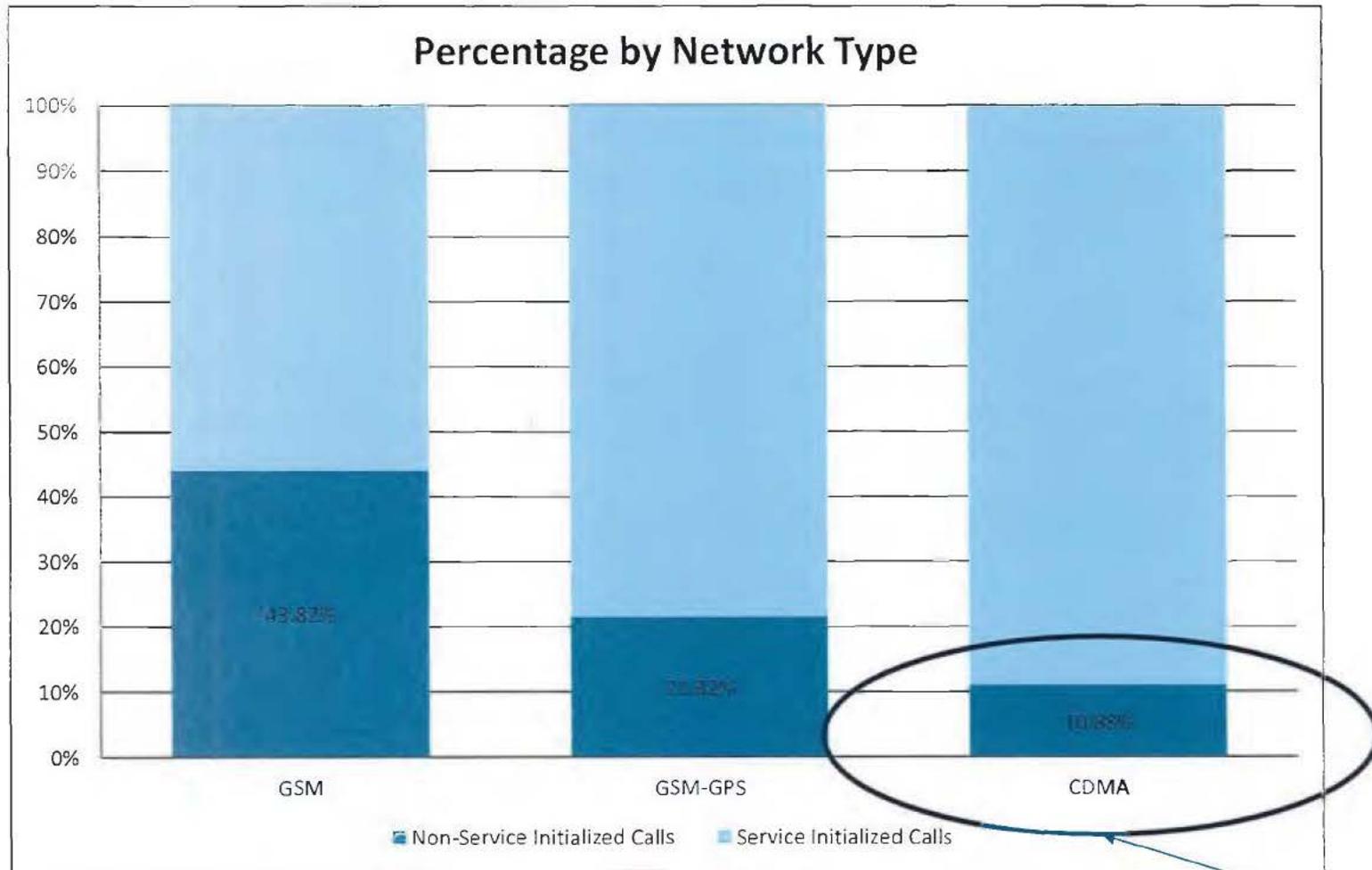
| Most "unwanted" |     |    |
|-----------------|-----|----|
| >10 calls       | 9   | 15 |
| >20 calls       | 3   | 5  |
| >50 calls       | 1   | 2  |
|                 | NSI | SI |

Non-Service Initialized  
6.8% of calls

Service Initialized  
93.2% of calls



# NSI Analysis: Network Type Affects NSI Percentage



Source: TCS Wireless NSI 911 calls received May, 2014 thru May, 2015

Previous data was CDMA



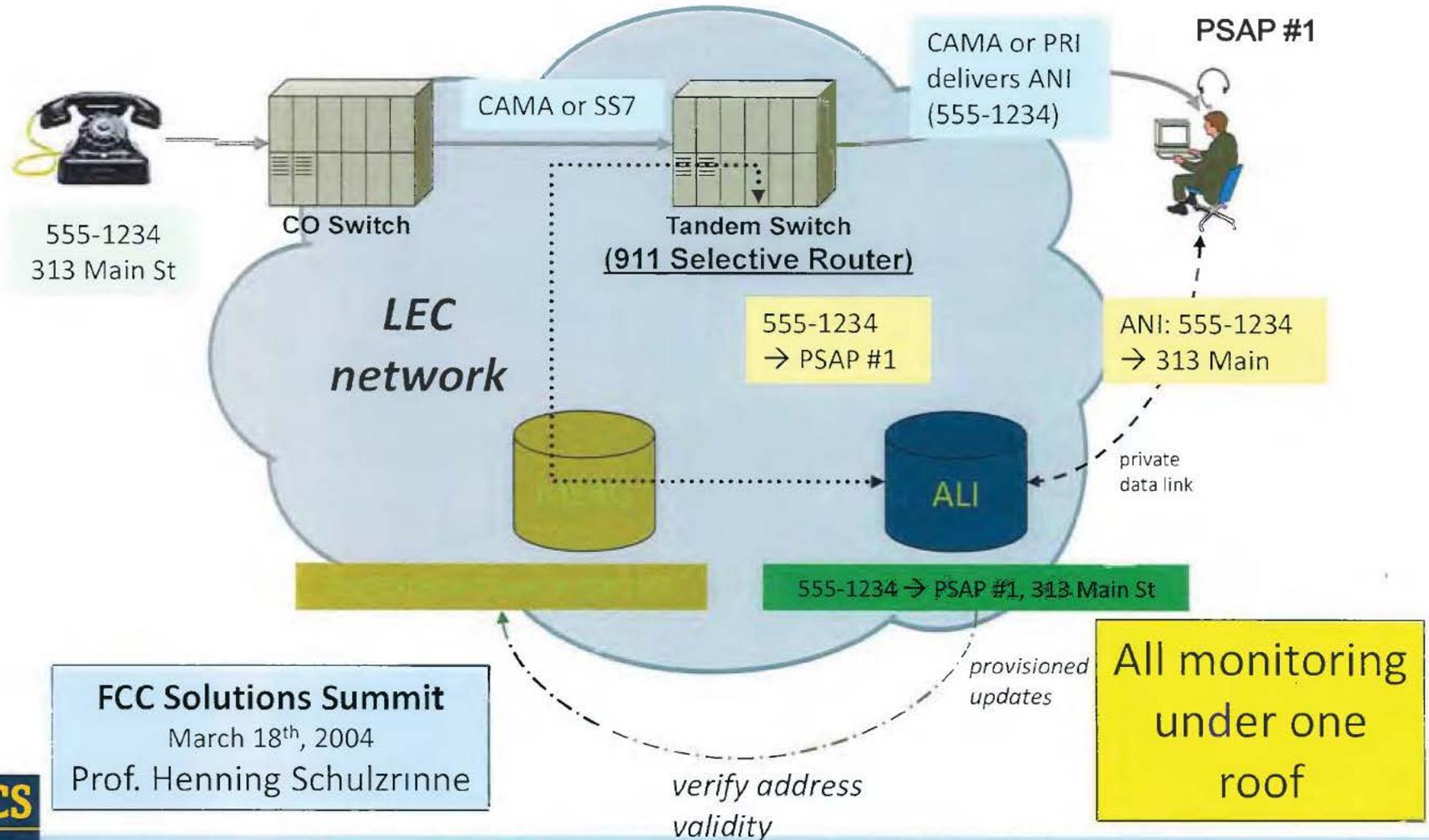
# GOVERNANCE



## **Five Principles of Governance**

- **Need for Effective Monitoring**
- **Need for Problem Resolution Collaboration**
- **Alternate Network Solutions**
- **Quality Processes**
- **Cybersecurity Oversight**

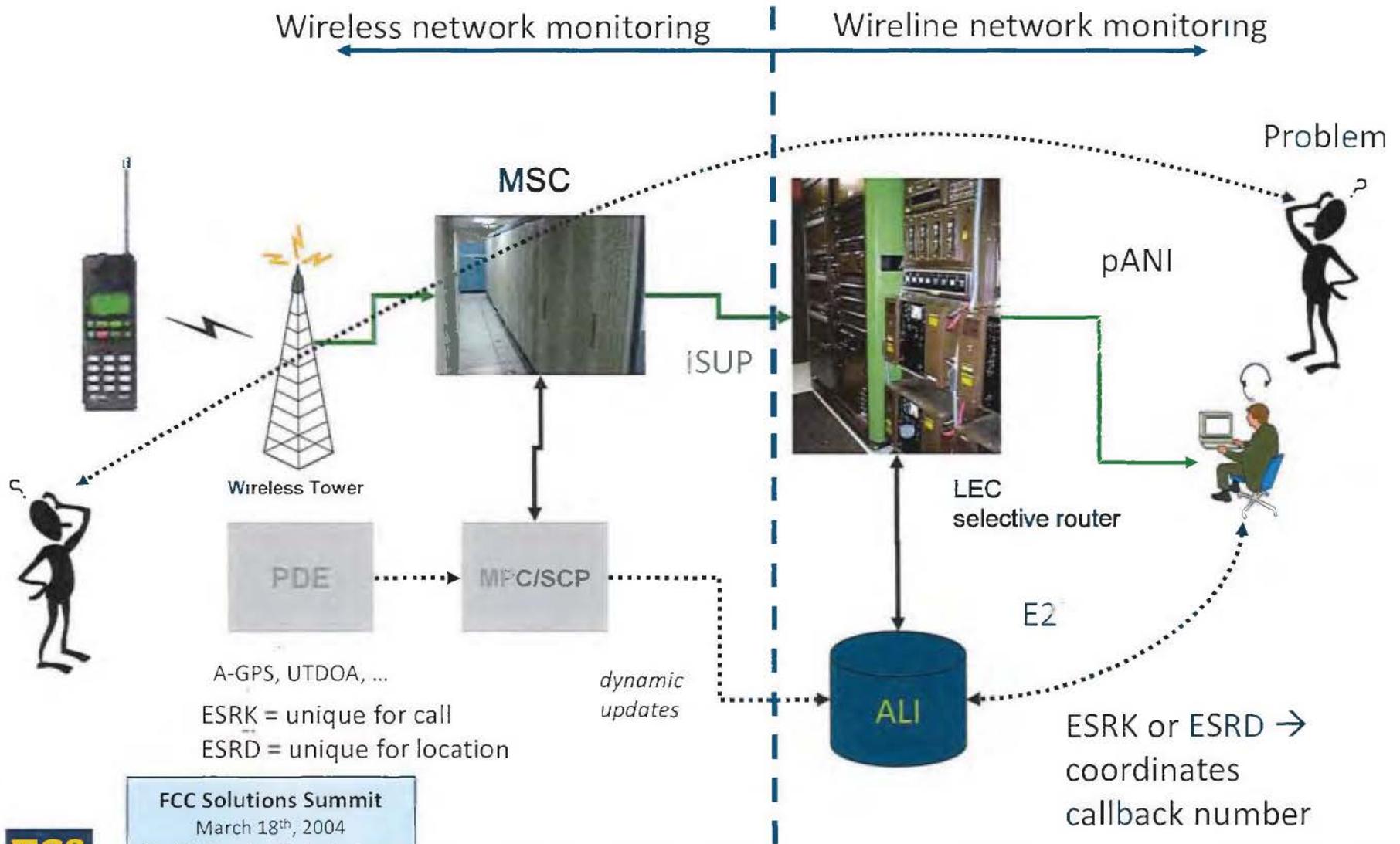
# Wireline E9-1-1: The "Good Ol' Days"



FCC Solutions Summit  
March 18<sup>th</sup>, 2004  
Prof. Henning Schulzrinne

TCS

# Wireless E911: The First Major Fracture of the Ecosystem

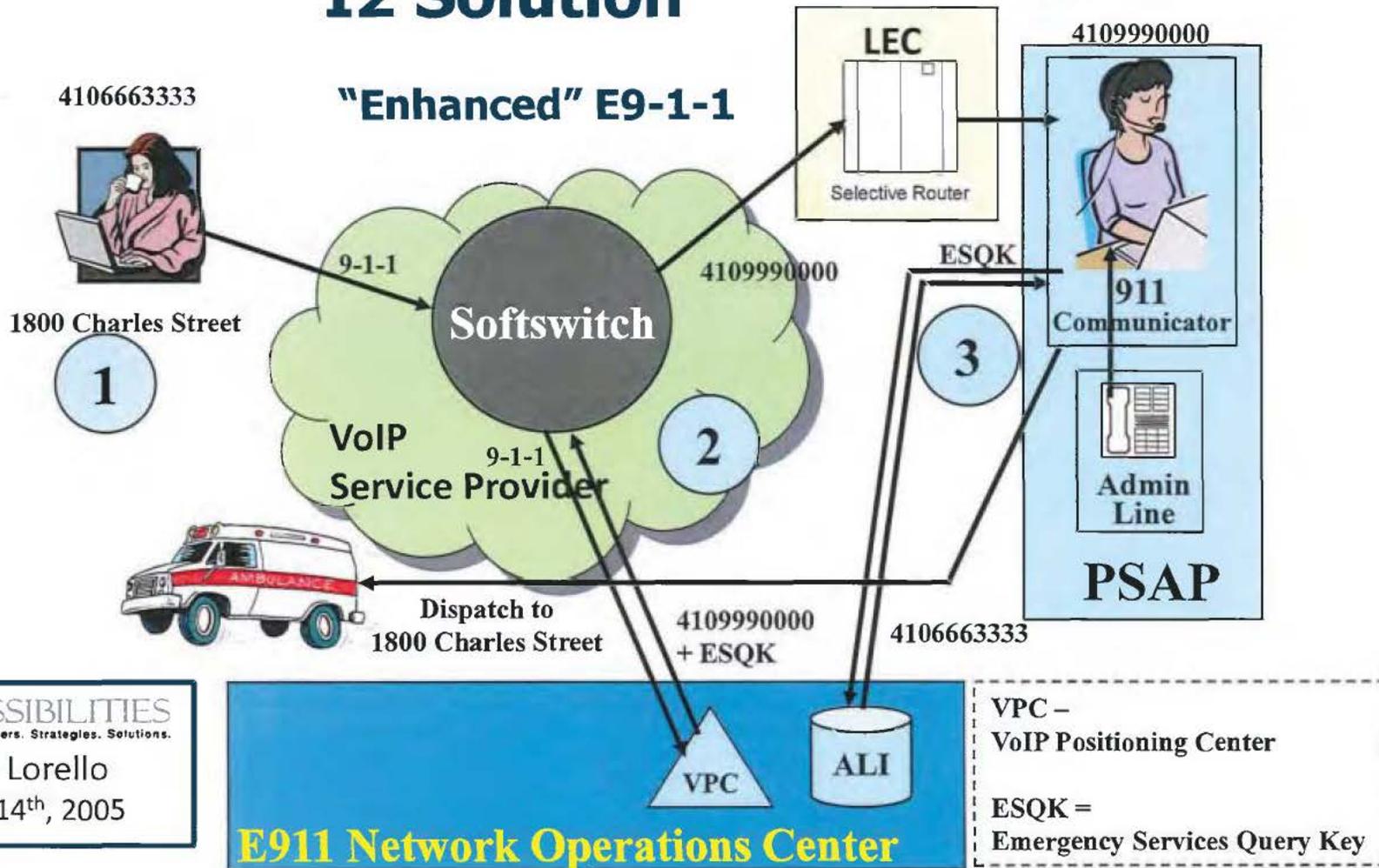


FCC Solutions Summit  
 March 18<sup>th</sup>, 2004  
 Prof. Henning Schulzrinne



# VoIP E911: The Next Major Fracture of the Ecosystem

## I2 Solution



**VoIP**POSSIBILITIES  
Answers. Strategies. Solutions.

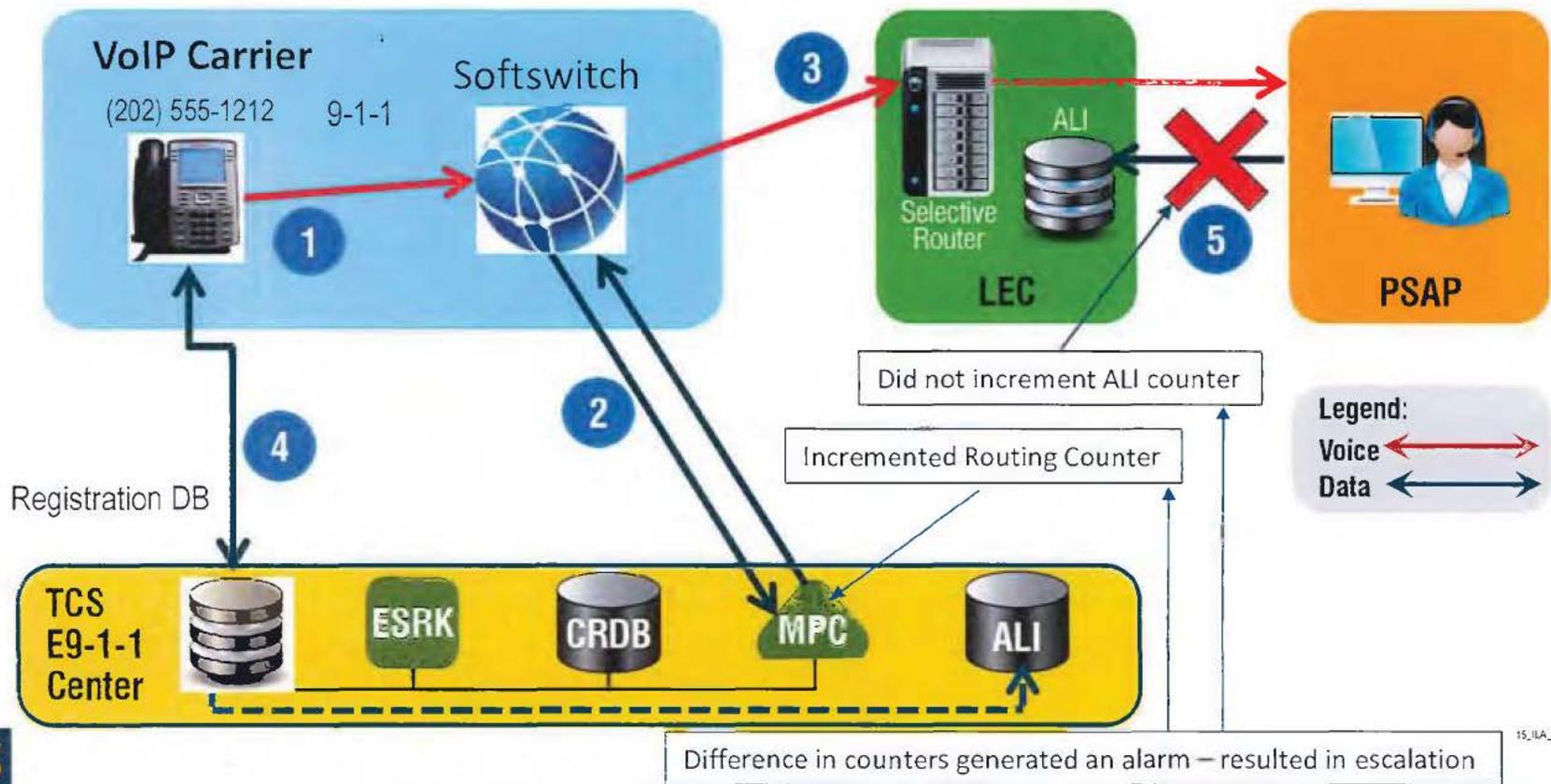
Tim Lorello  
April 14<sup>th</sup>, 2005

**TCS**



# April 2014 Outage: Monitoring Detected Problems

- 1: Person dials 9-1-1
- 2: Softswitch requests routing instructions
- 3: Softswitch routes call to nearest PSAP
- 4: E9-1-1 Center stages enhanced location
- 5: PSAP queries never came



15\_ILA\_P-01

# Need a More Effective Monitoring Approach

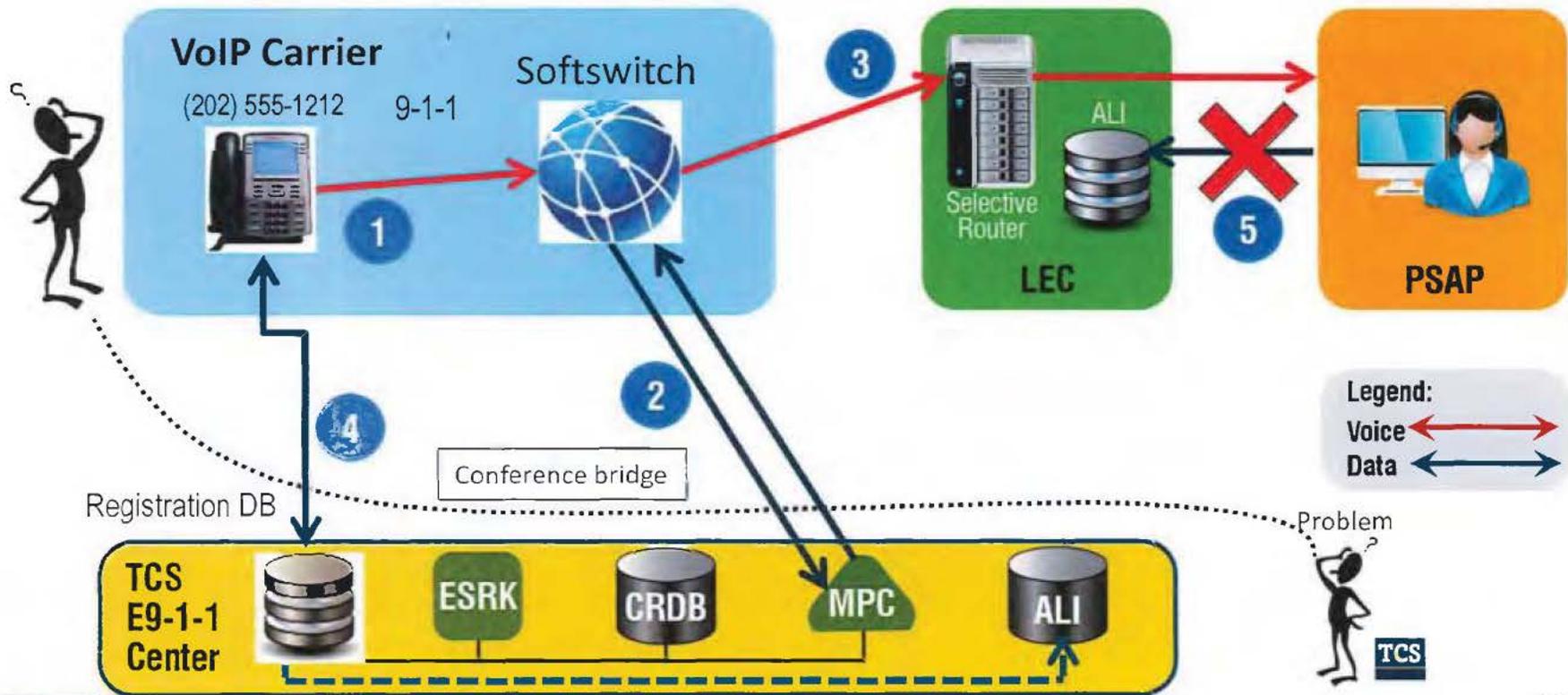
- **Independent networks are good at monitoring themselves**
  - Network providers follow best practices
    - Previous NRIC/CSRIC identified these practices
  - Network failures generate alarms
  - Network Operation Center (NOC) personnel address problems
- **April 2014 Outage demonstrated lack of coordination**
  - TCS detected routing/ALI request problems
  - NOC contacted customers to determine next actions
  - Interactions between networks not defined
- **FCC could encourage monitoring collaboration**
  - Initiate Best Practice studies in CSRIC V
  - Encourage mechanisms to allow independent networks to share info
    - Possibly pattern after cybersecurity sharing practices via 3<sup>rd</sup> parties

## Five Principles of Governance

- Need for Effective Monitoring
- Need for Problem Resolution Collaboration
- Alternate Network Solutions
- Quality Processes
- Cybersecurity Oversight

# Collaboration Exists Within Networks

- 1: Person dials 9-1-1
- 2: Softswitch requests routing instructions
- 3: Softswitch routes call to nearest PSAP
- 4: E9-1-1 Center stages enhanced location
- 5: PSAP queries never came



# Need for Problem Resolution Collaboration

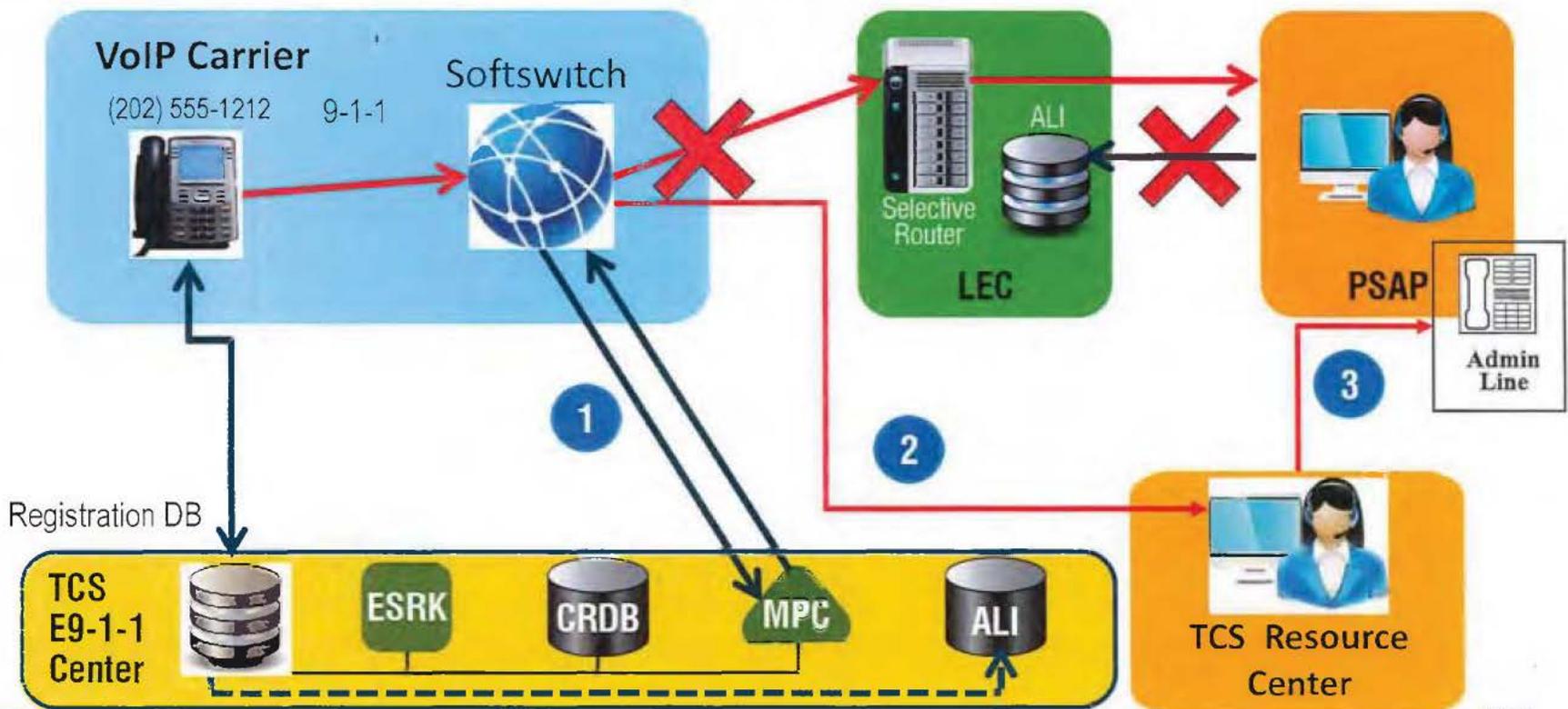
- **Independent networks have problem resolution procedures**
  - Network providers follow best practices
    - Previous NRIC/CSRIC identified these practices
  - TCS best practices include customer notification/collaboration
  - NOC personnel work problem resolution with customer
    - FCC notification support
    - Root Cause Analysis provided
- **April 2014 Outage Demonstrated Lack of Collaboration**
  - TCS had information on routing issues
  - NOC had no outlet to provide useful information on problems detected
- **FCC Could Encourage Problem Resolution Collaboration**
  - Initiate Best Practice studies in CSRIC V
  - Encourage mechanisms to allow collaborative problem resolution
    - Possibly pattern after internal network problem resolution solutions
    - 3<sup>rd</sup> party clearinghouse could facilitate information sharing and resolution approaches

## Five Principles of Governance

- Need for Effective Monitoring
- Need for Problem Resolution Collaboration
- **Alternate Network Solutions**
- **Quality Processes**
- **Cybersecurity Oversight**

# Alternate Routing During April 2014 Outage

- 1: Softswitch requests routing instructions
- 3: Softswitch routes call to TCS Resource Center
- 3: TCS Resource Center routes call to nearest PSAP's Admin Line



15\_ILA\_F-01

# Networks Must Provide Alternate Solutions

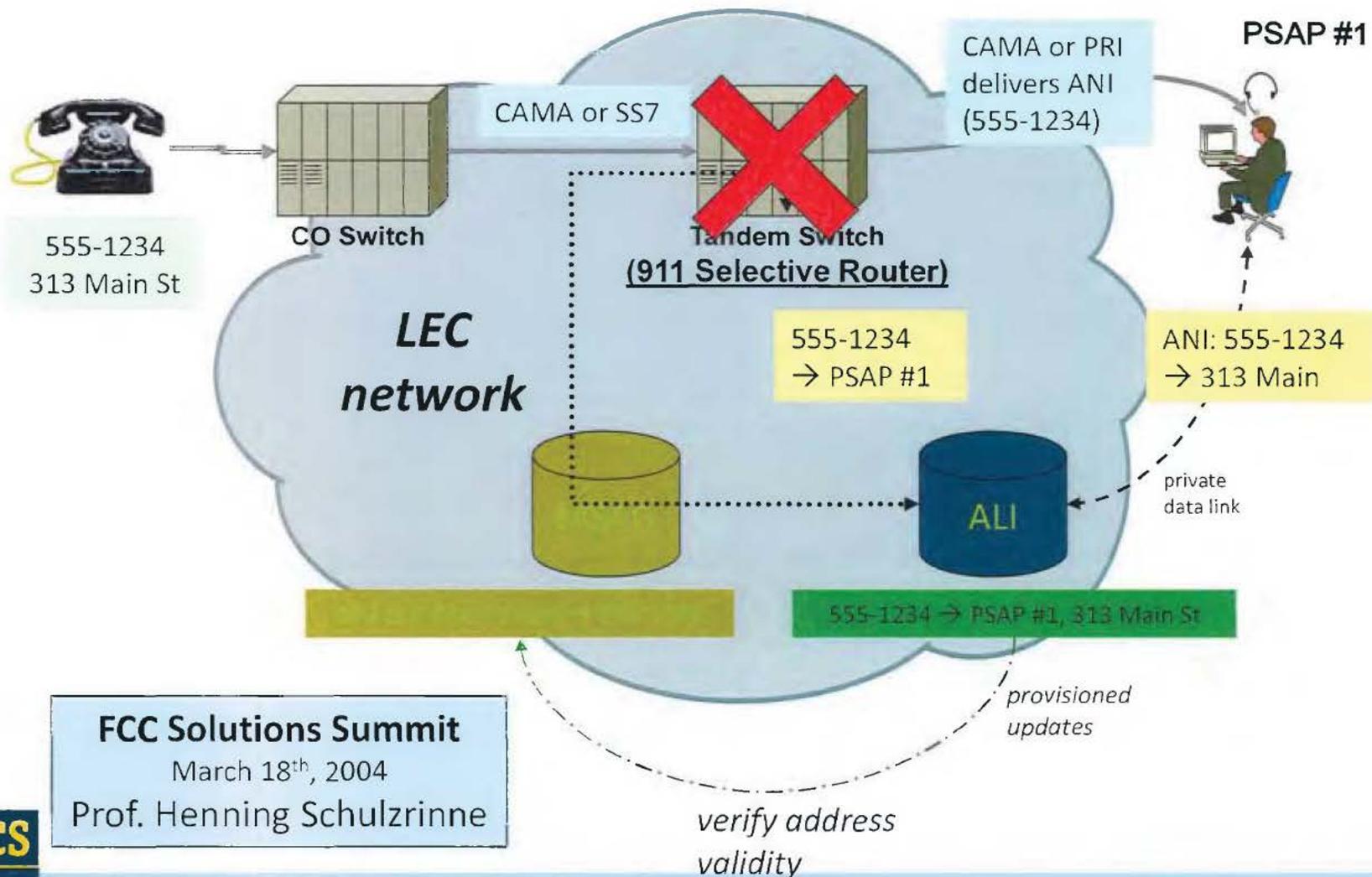
- **Independent networks can generate alternate solutions**
  - Network providers establish architectural resiliency
    - FCC Task Force for Optimal PSAP Architecture (TFOPA) could suggest alternatives
  - Networks invoke alternate solutions during crises
  - Focus is on rapid restoration while resolution analysis continues
  -
- **April 2014 Outage demonstrated alternatives can work**
  - TCS Resource Center served as an alternate routing option
- **FCC could encourage alternate network options**
  - Initiate Best Practice studies in CSRIC V
  - Have TFOPA suggest alternate network approaches
    - Investigate current practices
    - Collaborate with NENA to establish alternative network routing options

## Five Principles of Governance

- Need for Effective Monitoring
- Need for Problem Resolution Collaboration
- Alternate Network Solutions
- Quality Processes
- Cybersecurity Oversight

# An Architecture Limitation Caused the April 2014 Outage

How do you build quality into a network?



**FCC Solutions Summit**  
March 18<sup>th</sup>, 2004  
Prof. Henning Schulzrinne



# Quality Development Processes Improve Outcomes

- **ISO-9001: a quality system for product development & service management**
  - ISO 9001 establishes an 8-point quality system
    - Customer focus
    - Leadership
    - Involvement of people
    - Process approach
    - System approach to management
    - Continual improvement
    - Factual approach to decision-making
    - Mutually beneficial supplier relationships



- **TL9000, via the Quest Forum, provides telecomm-specific certifications**
  - Quality management system provides a systematic and repeatable framework
  -

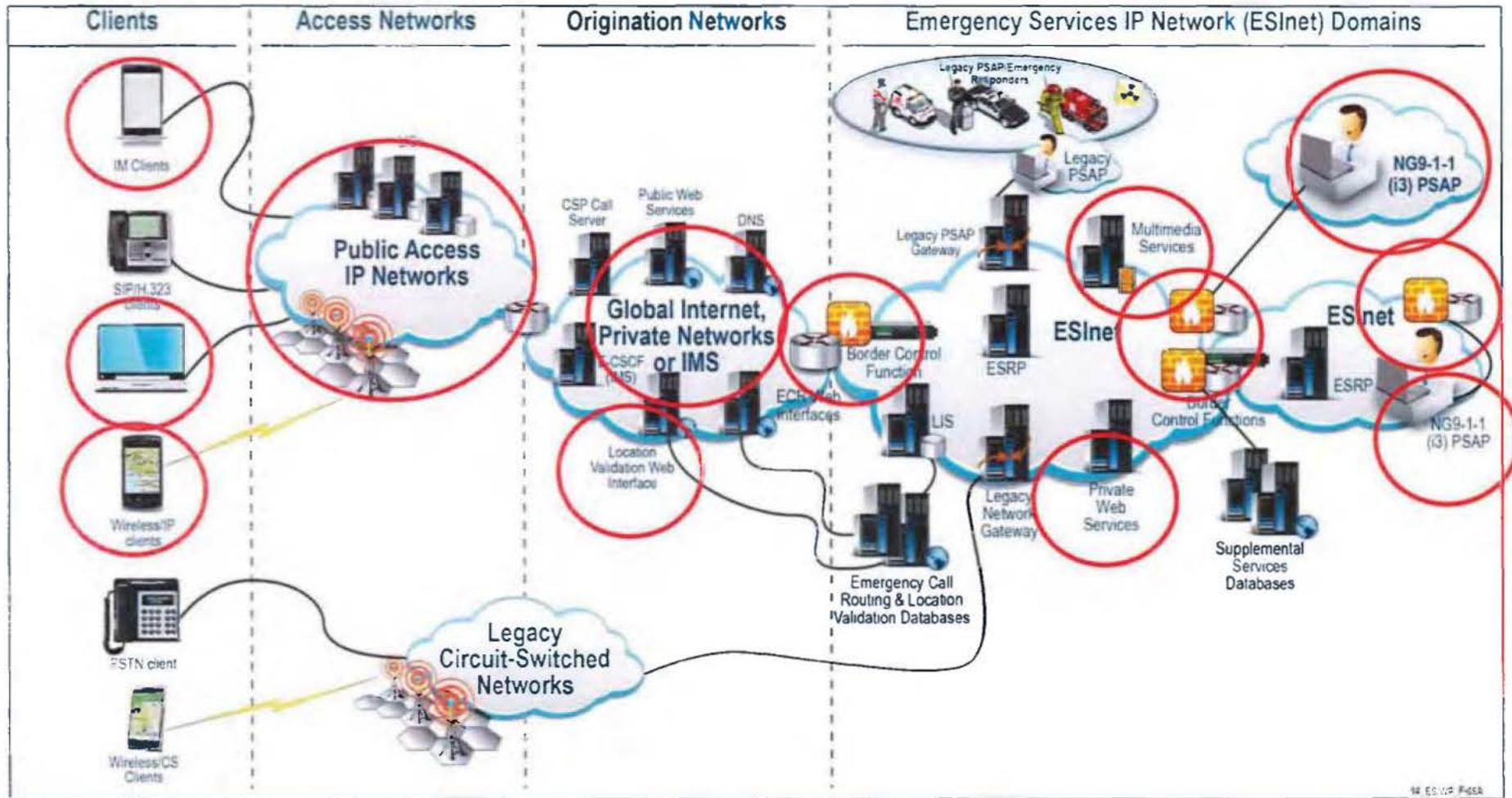


- **FCC could encourage use of quality management systems**  
NRIC/CSRIC have consistently generated best telecomm practices

## Five Principles of Governance

- Need for Effective Monitoring
- Need for Problem Resolution Collaboration
- Alternate Network Solutions
- Quality Processes
- **Cybersecurity Oversight**

# The 9-1-1 Ecosystem Is Moving to IP-Based systems



**With so many IP-based connections, Cybersecurity is critical!**

# Telecomm Networks Face a Daunting Cyber Threat

- **Networks have multiple interconnection points**
  - Firewalls and protocols must be established
  - Products should be cyber-tested
  - Personnel should be cyber-trained
- **Public Safety is ill-prepared for cybersecurity**
  - 80% of all PSAPs are fewer than 5 seats
- **Telecomm providers are ill-prepared for cybersecurity**
  - As of 2012, 756 ILECs reported to FCC
    - FCC Local Telephone Competition Report, 6/30/12
  - As of 2015, 788 registered CLECs
    - Local Search Association – 6/15/2015
- **Federal leadership will continue to be critical**
  - Initiating sharing and awareness efforts in CSRIC V
  - Funding may be necessary for smaller telecomm & public safety players

**“Hackers only need to get it right once; we need to get it right every time”**

*Chris Triolo, HP*

## **Five Principles of Governance**

- **Need for Effective Monitoring**
- **Need for Problem Resolution Collaboration**
- **Alternate Network Solutions**
- **Quality Processes**
- **Cybersecurity Oversight**

# Questions

 Timothy James Lorello  
Sr. Vice President  
410.280.1275 (o) | 410.703.3523 (m)



275 West Street  
Annapolis, MD 21401



[tlorello@telecomsys.com](mailto:tlorello@telecomsys.com)



[@telecomsys](https://twitter.com/telecomsys)



[www.telecomsys.com](http://www.telecomsys.com)