

# Solving the IP Telephony-911 Puzzle



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# 911 Considerations for End Users of IP-Enabled Services

- How will product be used?
  - Intended to be a replacement for existing telephony service or an additional service?
  - Dedicated location or remote usage?
- What type of vendor is being considered or selected?
  - Vonage-like IP service?
  - Cable-provided IP service?
- What level of reliability is required?
- What terms and conditions are contained in the contract for service? What other contract terms are necessary?

# How will IP service be used?

- Substitute or additional service?
- Dedicated or mobile?
  - Ability to travel with IP device is a problem for determining appropriate PSAP for call delivery
  - Many in industry compare IP 911 issues to wireless 911 problems
  - Often customer must provide location of device to IP provider
- Commercial, small business, or residential?
  - Provider may not allow service to be used in “commercial” settings

# Vendor Selection

- Vonage-Like IP Service
  - Customer must choose to activate 911 capability
  - Customer must provide location of device
  - Customer must provide PSAP with location and address information when calling 911 (this information is not transmitted with call)
  - Customer agrees to inform household residents and guests of limitations of 911 service
  - 911 service is not available in power outage or broadband connection outage
  - Liability for problems may be limited

# Vendor Selection

- Cable-Provided IP Service
  - Cable companies often partner with a LEC to provide 911 services
  - Location and address where service originally provided is transmitted with call
  - Customer must notify company if device is moved to new location
  - 911 service is not available in power outage or broadband connection outage
  - Liability of IP provider and partner LEC may be limited

# Reliability Considerations

- IP service and 911 capability often not available in power or broadband outage
  - Minnesota AG notifies FCC of serious injury caused by Vonage's inoperable 911 service
- 911 selective routers may not be able to handle protocols such as SIP
  - Texas Case Study: Dallas 911 calls using Internet-based system improperly routed to Maryland
  - Additional element may be needed
  - IP equipment vendors may have solutions

# Contract Considerations

- Disclosures to consumers in contract for IP services
  - Consumer must activate 911 service and provide information to PSAP
- IP providers' liability may be limited
  - Liability generally limited in IP provider contracts and terms of service
  - Partner LECs' liability generally limited in tariffs and under general state law
- Employer/employee relationship may give rise to liability for enterprise customers

# 911 for IP May be Limited by History of 911 Services

- Created in the 1960s
- Not designed for competition
- Limited ability to transfer information (7 or 10 digits)
- Tied to ILEC rate centers
- Cannot easily relocate PSAP

# Dual Jurisdiction for 911 Services

## ➤ FCC

### ➤ Wireless Communications and Public Safety Act of 1999 (911 Act)

- FCC must encourage and facilitate the prompt development of a seamless, ubiquitous, and reliable end-to-end infrastructure for public safety
- Establishes "911" as the national emergency number to enable all citizens to reach emergency services whether wireline or wireless

### ➤ Ancillary Authority

- FCC has determined it has statutory authority under Sections 1, 4(i), and 251(e)(3) of the Communications Act to determine which entities are subject to its 911 rules

## ➤ States

- CPCN may be conditioned on offering 911

# Existing 911 Requirements

## ➤ FCC Rules

- Basic 911: Delivery of calls to appropriate PSAP
- Enhanced 911: Delivery of call-back number and location information
- PSAP dispatches the correct emergency responders or routes calls as necessary based on information provided

## ➤ State Rules

- Service and design criteria
- Performance requirements
- 911 plans

## ➤ Fees

- Paid to PSAPs by carriers on a per-subscriber basis

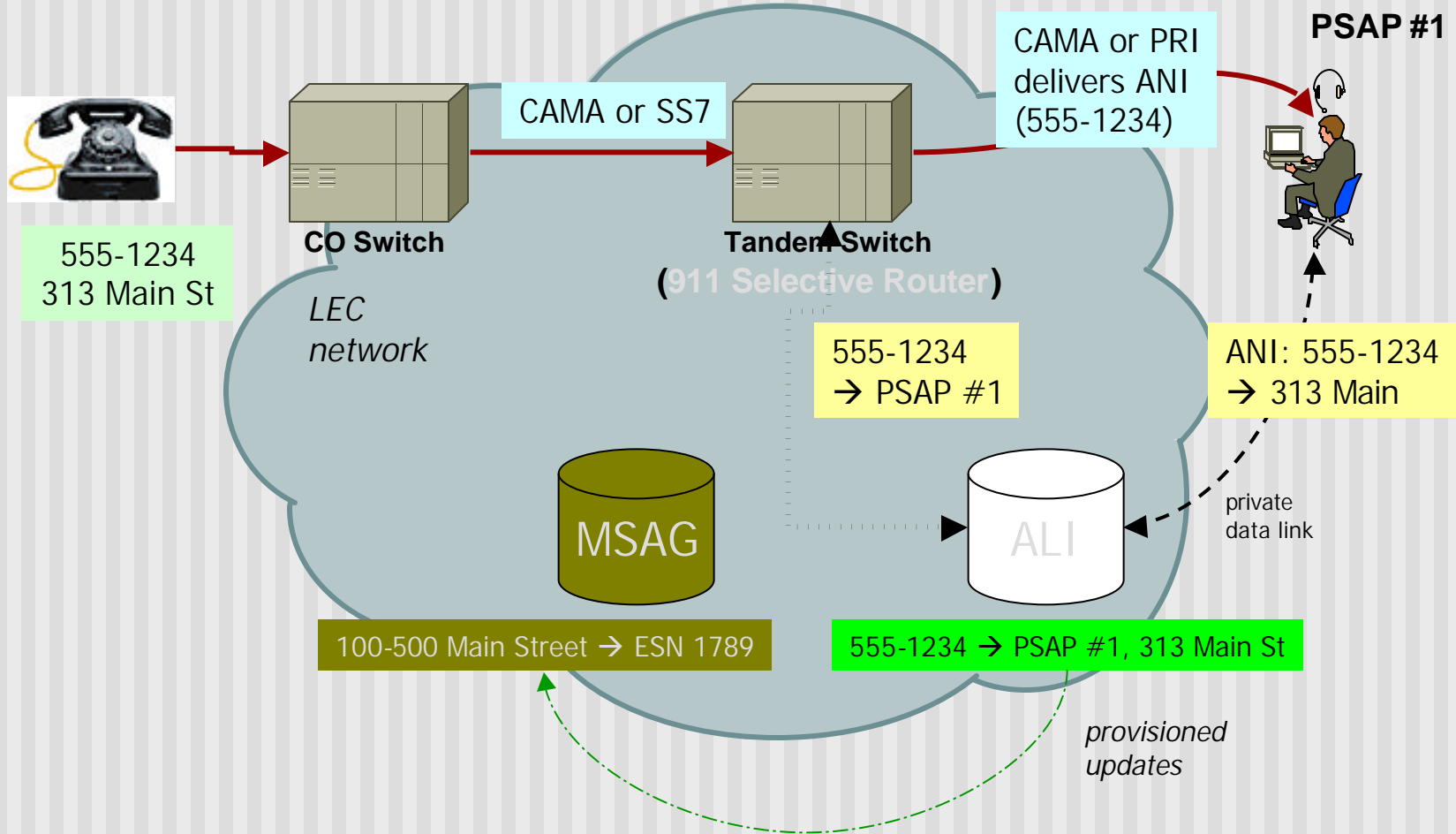
# Growth of IP-Enabled Services Brings 911 Issues to the Forefront

- The FCC is considering whether its 911 rules should apply to IP-enabled services
- The FCC uses four factors to determine whether an entity or service should comply with the 911 rules:
  - 1) The entity offers real-time, two-way switched voice service, interconnected with the PSTN, either on a stand-alone basis or packaged with other telecommunications services
  - 2) Customers using the service or device have a reasonable expectation of access to 911/E911 services
  - 3) The service competes with traditional local exchange service
  - 4) It is technically and operationally feasible for the service or device to support 911

# Alternatives to Regulation

- The FCC and Congress are considering alternatives to imposing 911 regulations on IP service providers:
  - NENA/VON Coalition
  - Technical solutions
  - Best practices/technical guidelines
  - Proposed VoIP legislation would require FCC to appoint an industry organization to develop 911 standards

# E911 for Wireline Services



(Prof. Henning Schulzrinne, Columbia University  
FCC Solutions Summit, March 18, 2004)

*verify address validity*

# Glossary

- **ALI** - Automatic Location Identification (ALI) - feature by which the address associated with the telephone number (ANI) is forwarded to the PSAP for display. ALI permits emergency service providers to identify the geographic location of the calling party.
- **ANI** - Automatic Numbering Information - allows PSAPs to call back a caller if the call is disconnected.
- **AVR** - Address Verification Request - form issued by carriers to refer and resolve address discrepancies with the E911 customer.
- **BRI** - Basic Rate Interface - ISDN interface composed of two B channels and one D-channel for circuit-switched communication of voice, video, and data. The B-channels carry voice or data, the D-channel is used for signaling.
- **CAMA** - Centralized Automatic Message Accounting - arrangement that provides for the recording of detailed billing information at a centralized location other than an end office, usually a tandem. CAMA equipment also may be associated with operator systems, etc. A CAMA trunk is a dedicated trunk that uses multi-frequency signaling and reverse-battery call supervision to transmit a caller's ANI or another number which is used to identify the caller's location.
- **E911** - Enhanced 911 - 911 service that includes the ability to provide automatic numbering information.
- **ELIN** - Emergency location identification number - phone number that routes the emergency call to the local PSAP, and which the PSAP can use to call back the emergency caller. The PSAP might need to call the number if the emergency call is cut off, or if the PSAP needs additional information after normally ending the emergency call.

# Glossary (cont'd)

- **ERL** - Emergency response location - area from which an emergency call is placed. This is not necessarily the location of the emergency. If an emergency caller is reporting a general emergency, the actual emergency might be in a different area.
- **ESN** - Emergency Service Number - number associated with the geographical area served by the same fire, police, and ambulance districts.
- **ISDN** - Integrated Services Digital Network - communications protocol that permits telephone networks to carry data, voice, and other source traffic.
- **MSAG** - Master Street Address Guide - all street data, including street names, address ranges and ESNs used to validate incoming telephone number data for provisioning of selective routing.
- **NENA** - National Emergency Number Association - professional association of 9-1-1 emergency number entities responsible for the planning, implementation, management, and administration of national emergency number issues.
- **PRI** - Primary Rate Interface - ISDN trunk type supporting 23 B-channels and 1 D-channel in North America (30 B channels and 1 D-channel in Europe). The B-channels carry voice and data, the D-channel is used for signaling.
- **SIP** - Session Initiation Protocol - signaling standard for creating, modifying, and terminating real-time multimedia sessions with one or more participants.
- **SR** - Selective Routing - standard feature that routes an E911 call from the E911 tandem to the designated PSAP based upon the address and assigned ESN of the pseudo-ANI telephone number record.

# Questions?

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