VoIP and E911

Presentation to

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Agenda

- Background of TCS and Intrado
- What is VoIP?
- FCC Mandates
- NENA i1 and i2 Solutions and their impact on dispatchers
- Technical Challenges of VoIP
- Regulatory and Funding Issues
- Open for Questions

Who are TCS and Intrado?

- Leaders in Phase 1 and Phase 2 E9-1-1 services for wireless carriers.
- A provider of E9-1-1 services for VoIP carriers.

What is VoIP?

- Verbal real-time e-mail
- High speed internet replaces old fashioned copper telephone wire.
- Media gateways interface with the PSTN
- Will eventually replace the PSTN as we know it
- Unregulated, untaxed, wild wild west technology until disasters motivated Congress and FCC to impose minimum 911 requirements.

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TCS

VoIP-Advantages

Cheap long distance

Out of area phone numbers

Encryption

VoIP Disadvantages

- Power outages
- Quality
- 911
  - 911 is the single biggest issue in the VoIP world today.
  - 911 gives credibility to this new technology
  - Failure of 911 threatens to destroy this industry

VoIP Terminology

- Static vs Nomadic vs Mobile
  - Static: Wireline replacement; never moves
  - Nomadic: VoIP phone can use any broadband port; used by many “road warriors”
  - Mobile: WiFi or WiMax
- i1, i2, i3
  - I1: 10-digit basic 911
  - I2: NENA solution for interim enhanced 911 (The next big thing; what we will talk about today)
  - I3: 100% IP future

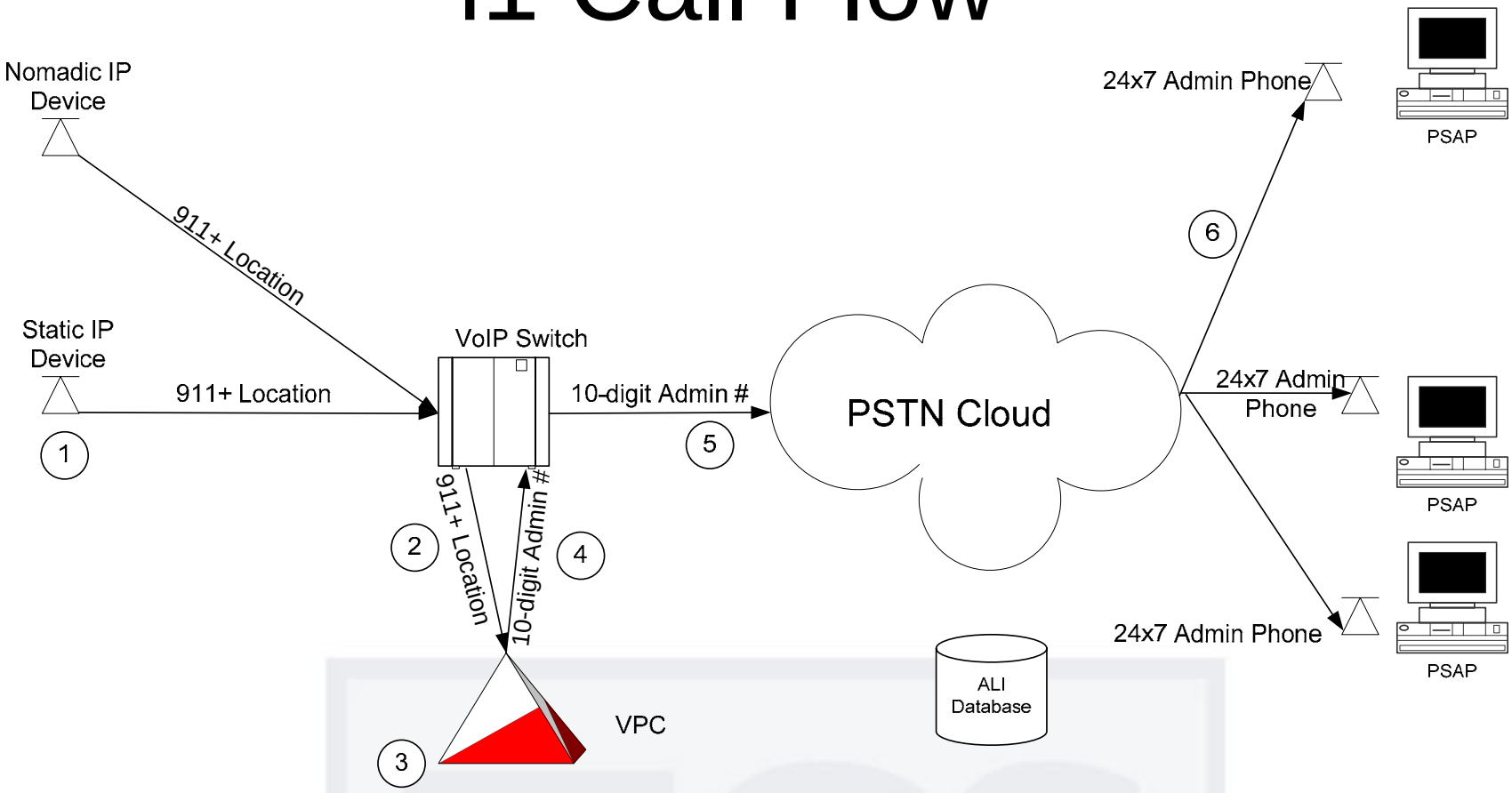
VoIP Static ALI

- VoIP Phone is provisioned in ALI exactly like landline phone.
- MSAG valid address
- Correct ESN responders
- Correct Class of Service
- Caller must update his own address when he relocates
- Updates can take up to 5 days
- Calls during the update interim will result in the wrong location data displayed to the PSAP

VoIP i1 “admin line”

- Call routes to a 10-digit phone number at the PSAP (not to dispatcher console)
- Phone may not be staffed 24x7
- Phone may have lower priority and/or accept non-emergency calls
- Phone might provide a recording (“dial 911”)
- No caller address or phone number (Basic 911 vs E911)

i1 Call Flow


Nomadic IP Device
911+ Location
Static IP Device
911+ Location
1
VoIP Switch
911+ Location
2
10-digit Admin #
4
10-digit Admin #
5
PSTN Cloud
3
VPC
ALI Database
6
24x7 Admin Phone
PSAP
24x7 Admin Phone
PSAP
24x7 Admin Phone
PSAP

Nomadic VoIP

- Move from Seattle to Denver and take your phone with you.
- Plug in your phone to any broadband connection
- You phone works as if it was in Seattle with same phone number.
- Callers never know the difference

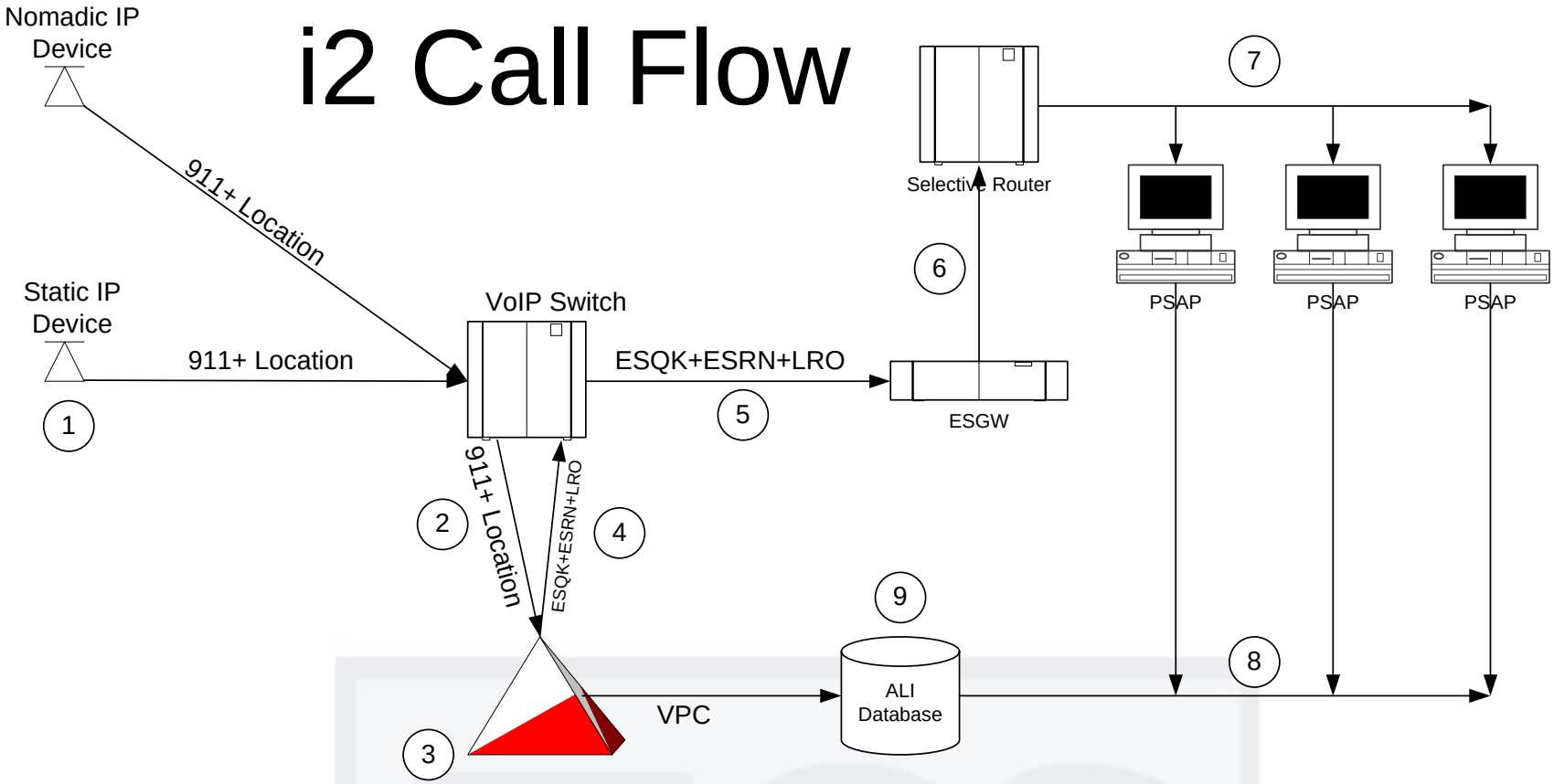
911 Problems with Nomadic and Mobile VoIP

- Call Routing
- Data Delivery
- Default Routing

VoIP i2 Dynamic Updates

- NENA Standard solution
- Based on wireless model
- MSAG validity is a major challenge
- Class of Service may be “WRLS” (being resolved by most LECs)
- Callers must update their own address when they relocate
- Updates are immediate; PSAP receives correct address if caller updates location

i2 Call Flow


Nomadic IP Device
911+ Location
Static IP Device
911+ Location
1
VoIP Switch
911+ Location
2
ESQK+ESRN+LRO
4
ESQK+ESRN+LRO
5
ESGW
6
Selective Router
7
PSAP
PSAP
PSAP
8
9
ALI Database
VPC
3

VoIP i2 Deployment Challenges
Call Routing

- Access to E911 Infrastructure
  - How to get access to Selective Router
- Out of area phone numbers not compatible with selective routers
  - Use ESQKs
  - How to acquire ESQKs
- Caller mobility-where is the caller and what PSAP should get the call?
  - PSAPs must provide boundary map info

VoIP E911 Challenges
Data Delivery

- I2 Requires dynamic updates like wireless
  - Use existing wireless ALI links
  - Some LECs cooperating; others not
  - PSAPs must create “VoIP” MSAG similar to “wireless” MSAG

Default Routing

Each VoIP carrier has one default call center for the entire earth.

- Wireline and wireless switches serve local areas and thus can default to a local PSAP, but a single VoIP switch can serve the entire known universe.
- Call takers determine proper PSAP and conduct “warm handoff” via 10-digit PSTN phone number.
- TCS and Intrado maintain database of 10-digit VoIP phone numbers per PSAP.
- Different default call center for different VPCs.

Default Routing

- Default Call Routing (Intrado)
  - Intrado owns and manages their own ECRC as a default call center.
  - Intrado staff are professional dispatchers; some are ENPs
  - Located in Longmont, Colorado.
- Default Call Routing (TCS)
  - TCS uses Northern Comm in Canada
  - APCO Trained, “real” PSAP currently serving responders in Toronto area.
  - Required per the Canadian CTRC, so we decided to use it for American default calls also.

Deployment Process

- Initial outreach
  - Request VoIP MSAG and boundary data
- TCS or Intrado completes provisioning with our customer and with the LEC
- Test with PSAP
  - Faster, less intrusive than wireless

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TCS

Questions?

Thank you for your time!