PUBLIC SAFETY COMMUNICATIONS IN A TIME OF TRANSITION

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FCC

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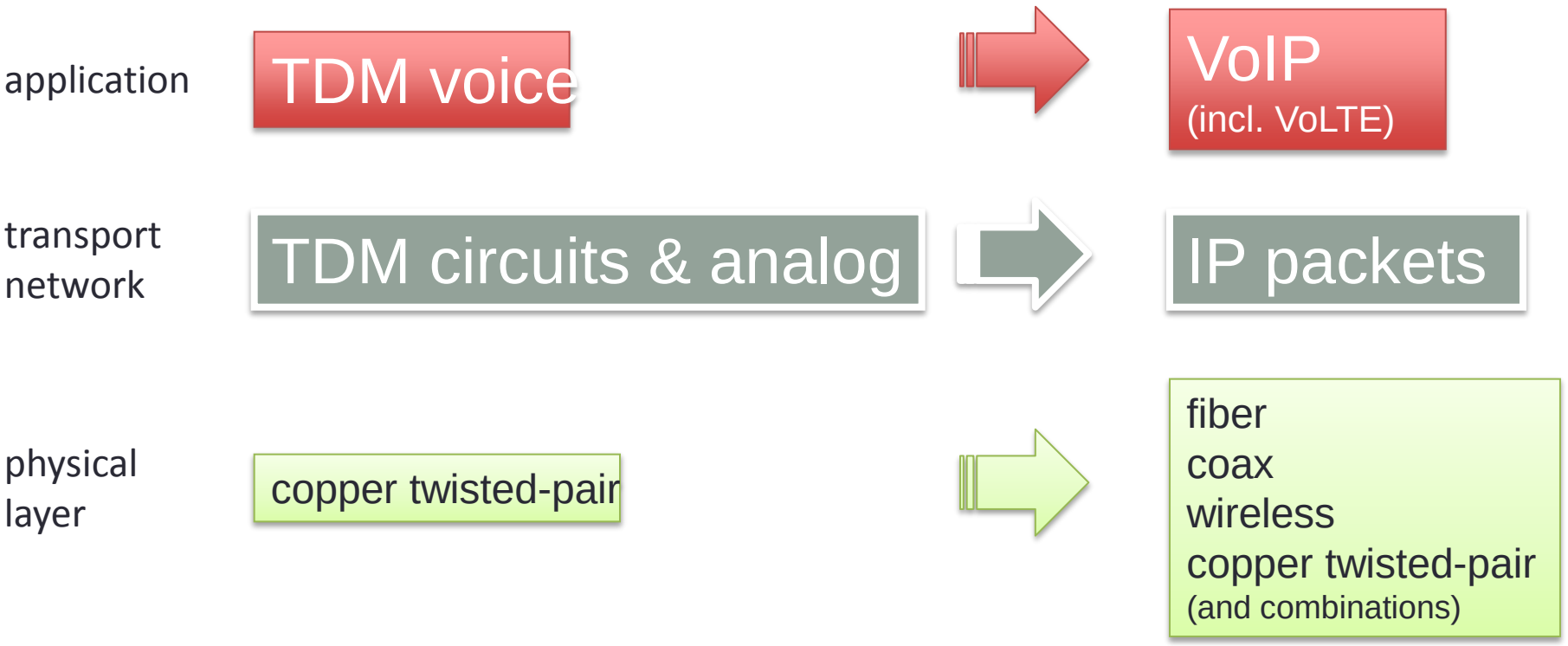
TECHNOLOGY TRANSITIONS

Technology Transitions



Switches are ageing

Nortel DMS-100

1979

http://www.phworld.org/switch/ntess.htm

CAMA trunks

Wednesday, Feb. 16, 2011

Montgomery's 911 troubles appear widespread

At least three Maryland counties report glitch; problem could be nationwide

by Erin Cunningham and Andrew Ujifusa | Staff Writers

Recently, the industry has observed some heavy call volumes that can result in *Wink Failures* of Selective Router (SR) to Public Safety Answering Point (PSAP) Centralized Automatic Message Accounting (CAMA)[2] trunks. These trunks transmit the caller's Automatic Number Identification (ANI) using Multi-Frequency (MF) digits based upon CAMA signaling standards. CAMA trunk technology, which was originally designed to provide a method for delivering the calling (originating) number from End Office to Toll Office, has widespread support across many platforms within the industry and has proven to be a highly reliable 9-1-1 standard. In the 9-1-1 context, the ANI digits that identify the 9-1-1 caller are relayed across the CAMA trunk to the PSAP. CAMA trunks utilize in-band signaling for call setup and, if the call setup is not successful due to a signaling failure, the SR can remove the CAMA trunk from service.

- Kentlands firehouse could come up for sale
- Community chorus to offer 'eclectic' performance Saturday

provides service to emergency dispatch centers.

Thousands of 911 calls have gone unanswered, said Jamie Barnett, chief of the Federal Communications

Tin Nguyen/The Gazette

David Rotenstein stands by a fence near his Silver Spring home that was nearly ignited Jan. 26 when a downed power line sparked a small fire in the grass. He and his neighbors were unable to reach 911 to report the emergency.

PUBLIC SAFETY CHALLENGES

Some public safety challenges

- Telephony denial-of-service attacks
- Transition in user behaviors and home capabilities
- Emergency alerting
  - good for “seek shelter now”
  - not so great for multi-day informational outreach
    - Sandy: “where can I find gas?” “which roads are passable?”
- Redundancy that isn’t
  - small number of selective routers or SIP proxies
- One “911” app per PSAP
  - innovate around slow 911 tech evolution
  - but fragmentation
- Indoor location determination

1980s home model

Typical “Millenials” apartment

Robocalling

For Release: 03/07/2013

FTC Cracks Down on Senders of Spam Text Messages Promoting "Free" Gift Cards

Defendants Were Responsible for More than 180 Million Spam Text Messages

TDOS

- Payday loan & false tax debt extortion
- “Pay or swamp phone lines”
- Hospitals, PSAPs, schools, …

KrebsonSecurity
In-depth security news and investigation

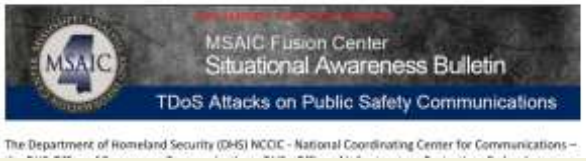
Posts Tagged: Telephony Denial of Service attack

A Little Sunshine / Latest Warnings / The Coming Storm — 37 Comments

1 APR 13 DHS Warns of ‘TDos’ Extortion Attacks on Public Emergency Networks

As if emergency responders weren’t already overloaded: Increasingly, extortionists are launching debilitating attacks designed to overwhelm the telephone networks of emergency communications centers and personnel, according to a confidential alert jointly issued by the **Department of Homeland Security** and the **FBI**.

The alert, a copy of which was obtained by KrebsOnSecurity, warns public safety answering points (PSAPs)



“Indirect” 911

screen

PSAP

OPPORTUNITIES

Opportunities

- Better indoor location
- More efficient operation
  - scale technology separately from call taking & first responders
  - human-human → human-machine & machine-machine
    - information filtering, routing and prioritization
    - building sensor integration (e.g., alarm panels, cameras)
- Simplified citizen interaction interface
- Improving monitoring & statistics
- 911: one-way, inbound only → include information dissemination

Indoor location

- 70% (est.) of wireless calls indoors
- GPS generally only works in woodframe single-family homes or near windows
- Does not provide floor or apartment/cubicle
- “Can deliver cronut coupons to within 10’, but not EMTs to the right store”
- ➔ Integrate multiple location technologies
  - rough for routing, backup and spoofing prevention
  - fine-grained for dispatch
  - not all technologies all the time
  - consider building infrastructure

Improving monitoring & statistics

- Old model:
  - largely local facilities & monitoring
  - limited on-going location accuracy testing
  - limited analysis
- Opportunity:
  - state-wide or regional network operations center
  - remote recovery
  - statistics
    - response time components
    - nature of calls
    - location accuracy

Integration of emergency handling into day-to-day operations

- Larger roles for fire marshals
  - location accuracy testing
  - 911 dialability in hotels & other semi-public buildings
- Integration of “commercial” technologies and emergency handling
  - e.g., use ad networks for delivering emergency
- Using delivery vehicles for location accuracy testing
- Is there a clear boundary between 311, 911 and information dissemination?
  - public safety as information hub

Conclusion

- Convergence: all services are IP, just with different physical layers
  - but transitions are slow
- Old assumptions no longer hold
  - home devices
  - citizen assumptions
- Bypass and innovate-around
- Opportunities for both better service & lower cost