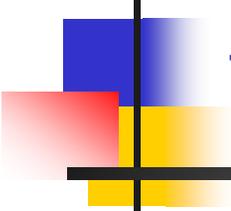




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# Telecommunications Industry Association

## **Roaming and Priority Access Technologies**

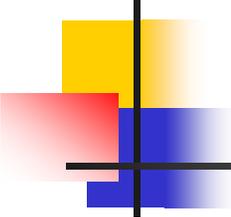
**May 6, 2010**



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## Who We Are

- Leading trade association in support of information and communications technology (ICT)
  - Approx. 500 member companies
- Shared goals with FCC
  - Technology neutrality
  - Deploy nationwide interoperable broadband public safety network
- Backbone of broadband industry
  - Supply products and services used in provision of broadband and broadband-enabled applications



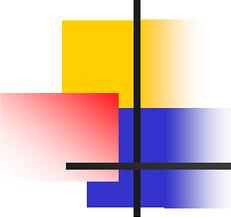
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# Roadmap

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- I. Public Safety Today.**
  
- II. Public Safety Broadband Technologies.**
  
- III. Open Discussion.**

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## I. Public Safety Today

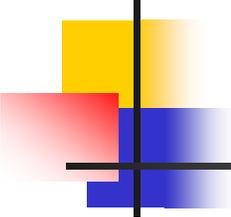
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- Roaming on private LMR networks
  - Calls are half duplex so next site accessed on next PTT when present PTT completed
  - Given short duration of talk time and large coverage from single LMR site, approach differs from “seamless handoff” used in cellular
  - Services (i.e. priority) are typically preserved
    - Dependent on available services at next radio site/system



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## A. WPA

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- To date, the only priority service precedent for a PS user on a public wireless network is Wireless Priority Service (WPS)
- Wireless Priority Service
  - Voluntary for public carriers to provide WPS
  - Exists for GSM and CDMA today
  - Top of queue capability
  - Gated function (1 in 4) to preserve public non-discriminatory access



## B. Land Mobile Radio Operations.

- LMR voice systems will be around for some time to come.
- Public safety LMRS has had priority, preemption, and roaming features for decades, developed further over time.

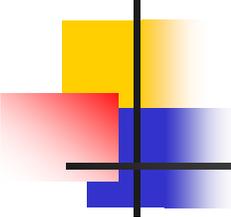
### Priority Access:

- Priority really only matters when resources are limited
- The priority level on the most congested network probably matters most
- “Confirmed Calls” ensure that talk-paths or channels are available on a network before granting user access
- LMR is designed to provide multiple levels of priority
- At a minimum, talkgroups have one of seven different levels of priorities
  - Priority is assigned to each talkgroup by system administrators for that network
  - Users can “Scan” to set their own priorities for receiving calls
  - Interoperability talkgroups between agencies may or may not have higher priority
  - Talkgroups can be “patched” together and patched talkgroups may have different priority levels
  - Talkgroups patched across networks will most likely have different priority levels
  - Confirmed calls with talkgroups on multiple networks can be complicated
  - Among calls of equal priority, recently used talkgroups have slightly higher levels of priority (continuity of conversation)
- Declared emergencies have the eighth, or highest priority



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## B. Land Mobile Radio Operations.

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### **Preemption:**

- Preemption allows higher priority calls to displace lower priority calls
- Trunked radio networks allow preemption at the network level
- Trunked radio networks can also allow preemption at the site level – with ruthless preemptions overriding a currently transmitting radio
- LMR Sites typically have between 3 and 20 talkpaths



## II. Public Safety Broadband Technologies

### Public Safety Users on Broadband, LTE Provides:

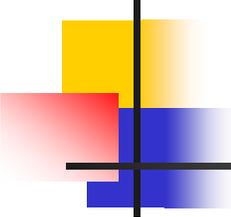
- Prioritization capabilities for users and devices (standard commercial user)
- Support for bearer resources with both guaranteed (streaming video) and non-guaranteed (web surfing) bit-rate user traffic
- Independent configuration for admission priority (who gets on the system) and scheduling priority (what type of application is being used) when resources are needed
- Defining when and if resources can be pre-empted
- An interface to allow applications to request Quality of Service
- QoS policies for users and devices



## II. Public Safety Broadband Technologies

### Public Safety Users on Broadband, WiMAX:

- Levels of Priority: The WiMAX ETS (Emergency Telecommunications Service) specification uses the (8-bit) Priority Indication field in the IEEE 802.16-2009 standard, which includes multiple levels for authority/authority and authority/public communications
- The specification enables flexible admission control and allocation/scheduling of resources for the allowed priority levels.
- Current and Future Roaming Capacity: Roaming is feasible today based on Release 1.0, 1.5 and 1.6 of the WiMAX specifications
- The WiMAX Forum has already published roaming guidelines based on these specifications. In the Release 2.0 of the specifications (expected by Q1-2011) additional capabilities such as MVNO scenarios are being addressed
- Priority treatment is applied in network entry, handover, paging, and ETS service invocation

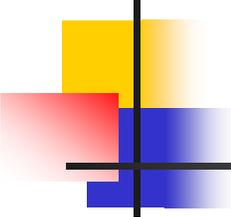
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## II. Public Safety Broadband Technologies

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### Public Safety Users on Broadband, WiMAX:

- Status of WiMAX Standards Addressing Priority Access & Roaming: The WiMAX specification dealing with priority access (ETS Phase 1), based on the IEEE 802.16-2009 standard, is currently in development and final ratification processes within the WiMAX Forum. These are considered WiMAX Forum proprietary documents until approved by the Board for external publication
- The ETS Phase 1 specification is expected to be made public by June 2010
- The WiMAX Forum is also working on an update to this specification (ETS Phase 2) to be based on the IEEE 802.16m standard. This specification is expected to be completed and published by March 2011

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### III. Open Discussion.

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- Priorities do not automatically provision across networks – so users might drop down as they roam from private to commercial
  - Consistent mapping of PS and commercial traffic priorities, and specific treatment of ARP, QCI, etc. in pre-emption/priority situations
  - Data may have different priorities also
    - Voice over IP may be a data service on commercial networks
- PS users will roam between PS exclusive BB networks and public BB networks (i.e. 700 MHz D Block)
  - PS exclusive networks will implement the full range of priority levels that may then need to be compressed into fewer levels on the public network to accommodate commercial user traffic
  - Should roaming be selectable between automatic, pre-emptive access for the most severe incidents or manually enabled, priority access operation for less severe incidents



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