ROADMAP DOMAIN: CORE

Priority/Preemption
Encryption
Security

CORE

Mission Critical Functions
Local Control
Reliability
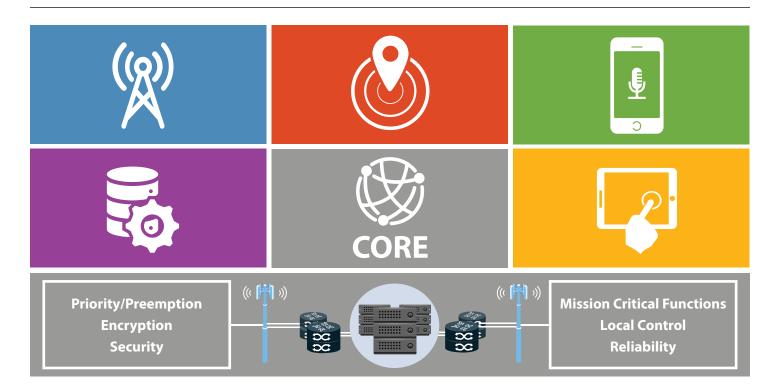
The Vision

The FirstNet Authority envisions the FirstNet Core will be technologically current and possess the necessary features and enablers to support mission critical services and applications at appropriate levels of availability, performance, and security to meet the public safety community's expectations.

Domain Overview

FirstNet is the only nationwide cellular network built specifically for the nation's first responder community. A part of FirstNet, the Core serves as the brain and nervous system of the network, separates public safety traffic from commercial traffic, and supports FirstNet functions, including quality of service, priority, and preemption (QPP). The FirstNet Core is the foundation for the delivery of advanced public safety features that are unique to the FirstNet service offering, including end-to-end encryption, continuous security monitoring, superior reliability and availability, local control, and mission critical services.

Roadmap Priorities for the FirstNet Core

The FirstNet Authority will prioritize the following areas in alignment with stakeholder contributions, evolving 3rd Generation Partnership Project (3GPP) standards, and the prioritized needs of other Roadmap domains.

- **Generational Updates (e.g., 4G/5G):** Evolve the core and radio access network consistent with 3GPP generational upgrades.
- **Priority and Preemption, including Uplift on 5G:** Advance QPP implementation in the network with new standards-based systems and features available in 5G.
- **Mission Critical Services Platforms and Enablers on 5G:** Implement standards-based systems and features providing mission critical services, such as mission critical push-to-talk (MCPTT), mission critical video (MCVideo), and mission critical data (MCData) on 5G.
- **Network Security on 5G:** Implement standards-based systems and features providing cybersecurity to public safety users on 5G in support of the network security requirements.

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Key Technologies and Solutions that Impact the FirstNet Core

The FirstNet Core acts as the network's central controller and orchestrates the following technologies:

- **Evolved Packet Core (EPC):** The standard 3GPP core architecture for 4G networks, which provides control and switching of data for the FirstNet LTE network, including user authentication, session and mobility management, network security, and QPP. On 5G, the EPC evolves to the 5G next-generation core, the standard 3GPP core network architecture in 5G networks.

- **Internet Protocol (IP) Multimedia Subsystem:** The standard 3GPP architecture for session initiation protocol-based services, including voice over LTE, rich communication services, and IP-based messaging.

- **Services Platforms and Enablers:** Standards-based servers supporting basic network services (e.g., telephony, messaging, location, presence), mission critical services (i.e., MCPTT, MCVideo, and MCData), proximity services, and evolved multimedia broadcast multicast services.

- **Application Servers:** Computing solutions providing network-integrated public safety applications, such as Identity, Credential, and Access Management and local control.

- **Operating and Business Support Systems:** Key functions in the core, providing administration of the end-to-end network, including but not limited to alarm monitoring, traffic measuring, billing, and subscriptions.

- **Radio Access Network:** Foundational network elements that interwork with the user equipment and the EPC, ensuring an end-to-end, all-IP evolved packet system (EPS). The core uses the EPS to implement access control, user authentication, security, session management, mobility management, and QPP.

Public Safety's Take on the FirstNet Core

- Availability, reliability, resiliency, and hardening are foundational elements to meeting public safety's operational requirements. Each of these items are, to one degree or another, enabled by FirstNet's distributed core architecture.

- Providing mission critical services (i.e., MCPTT, MCData, and MCVideo), strong cybersecurity, and priority services enhances public safety broadband communications.

- Maintaining competitive parity (e.g., network functionality, throughput, latency, wearables, phone number synchronization, international roaming) and staying current with the continued evolution of features, functions, and capabilities as specified in standards and as made available by technology providers ensures that FirstNet never lags behind offerings from commercial providers.

Key Takeaways from the FirstNet Authority's Analysis of Learnings from Stakeholders

- The FirstNet Core is an enabler to each of the Roadmap domains, and a continually evolving core will provide the means necessary to fulfill public safety's operational requirements both today and in the future.

- The FirstNet Authority needs to ensure that the FirstNet Core is equipped to enable advanced technological capabilities that support ongoing network operation and longevity.

- The FirstNet Authority is uniquely positioned to continue advocating for relevant standards that emphasize public safety's evolving operational and technical needs.

53
STATES AND TERRITORIES

406
ENGAGEMENTS

11,850
STAKEHOLDERS

Public safety engagements that addressed Core (October 1, 2019 – September 30, 2020)

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