Cisco Premium Mobile Broadband Solution for Service Providers

The success of smartphones and tablets has forced service providers to offer 4G LTE services to consumers to meet the demand for rich collaboration, video, and data over wireless broadband. Meanwhile, many enterprise organizations in specific industries — such as governments with mobile emergency response departments (fire, police, medical) — have long had their own, private mobile networks based on Land-Mobile Radio (LMR). These low frequency, high power signal networks were originally designed for voice. Now they are unable to handle the performance and quality of service (QoS) demands of rich media and data applications. They are also becoming obsolete based on limited functionality and a high cost of ownership. With the advent of the virtualized packet core and the Cisco® Premium Mobile Broadband (PMB) solution, service providers can now offer the equivalent of a private LTE network to meet the needs of their enterprise customers.

How Cisco PMB Works

A PMB network, also known as a private LTE network, is a 3G or 4G LTE wireless network serving a single enterprise within defined location. Key building blocks include the Cisco Virtualized Packet Core (VPC), Cisco ASR 5000 Series, enterprise and best-of-breed technology products provided by Cisco and its partners. The Cisco VPC is one of the Virtual Network Functions (VNFs) in the Evolved Programmable Network (EPN), which is defined in the catalog of virtualized functions and services in the Evolved Services Platform (ESP). The architecture of the Cisco PMB solution features a flat IP architecture, with reduced latency, higher data rates, and smooth interworking between 3GPP and non-3GPP networks. The EPN is managed by the Cisco Evolved Services Platform to help ensure that the PMB services are delivered as expected to provide a high Quality of Experience (QoE) for users in an orchestrated and automated fashion.

The Cisco PMB provides a complete mobile end-to-end network solution, including:

- User equipment (UE) at the access layer
- Aggregation, distribution, 3G and 4G mobile nodes
- Traffic optimization and traffic steering technologies
- Support for multiple radio access technologies (RAT), including unlicensed radios
- Support for non-3GPP IP access networks
- The ability to provide quad-play services (video, data, voice, mobility)

Figure 1 illustrates our holistic approach, highlighting areas in which Cisco offers components, and emphasizes the following key elements: mobile station (MS) and UE, transport network, Cisco Virtualized Packet Core (VPC), and service nodes.

**Figure 1. Cisco Premium Mobile Broadband Solution Framework**

- **Mobile station and UE:** These include third party components and Cisco UE and modules, including Session Initiation Protocol (SIP) and IP Interoperability and Collaboration Systems (IPICS) clients for voice services on Cisco IOS® Software and Android devices, and Cisco CPE such as the Cisco Integrated Services Router G2, Cisco 819 Integrated Services Router and Embedded Services Router (ESR) embedded nodes.

- **Transport Network:** There are two types of transport networks that can support PMB services. The first one is usually for a small network where the customer has specific requirements that need ad hoc designs or must use existing infrastructure. The second type uses Unified Mobile MPLS Transport (UMMT) system design. UMMT is a comprehensive Radio Access Network (RAN) backhaul solution that supports any-generation, multi-technology mobile service deployments, including 4G LTE.
• **Cisco VPC:** Cisco VPC combines all packet core services for 4G, 3G, and even Wi-Fi and small cell networks into a single solution. It provides those network functions as virtualized services so you can scale capacity and introduce new services much faster and more cost-effectively. The Cisco VPC uses the same proven Cisco StarOS software used in Cisco ASR 5000 Series platforms. It is designed to distribute and orchestrate packet core functions across physical and virtual resources. This allows an easy transition from physical to virtualized packet core services or the use of both simultaneously.

**Cisco PMB Solution Benefits**

• Increase revenue by providing new and innovative services with key LTE capabilities to enterprise customers that need private mobile network services.

• Reduce operating costs through flexible deployment options that support a central and distributed 4G LTE architecture based on the Cisco VPC, with multiple distribution models (including all-in-one, single node functionality per node, and with functionality parity using the same software release).

• Reach or expand into new markets in different vertical industry segments such as Public Safety, Utilities, Transportation, and the Military, by providing a feature-rich, dependable, cost-effective solution and rich CPE and application support.

**Why Cisco?**

As the clear leader in network virtualization, with more network elements and applications virtualized than all major network competitors combined and orchestrated elements across wide area network (WAN), data center, and access technologies, Cisco is heading service providers’ move to virtualization at their own pace. Cisco mobile packet core solutions lead the industry, lowering costs and allowing innovation for service providers around the globe. Today, Cisco packet core solutions serve more than one billion subscribers and about half of all the world’s LTE connections, according to Cisco estimates.

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