4G Network Migration
cdma2000™ to LTE Evolution

Motorola Confidential Proprietary
**cdma2000™ Leading the Industry with Innovation**

CDMA has continuously led the industry in innovation since the late 1980s. Today, cdma2000™ is an accepted standard for 3G networks. However, there was a time when the concept of basing an air interface on code-division, rather than traditional time-division technology, was revolutionary.

The first analog cellular systems were deployed in the early 1980s, and were the beginning of this new wireless era. By the late 80's, carriers realized that analog technology could not provide the capacity they would need as wireless technology continued to be readily adopted. It was also apparent that the IS-54 standard (U.S. TDMA), would not satisfy the projected capacity needs.

A digital satellite technology showed promise for more efficient use of spectrum. Instead of GSM and TDMA's time-division-based technology, this code-division-based system encoded multiple voice conversations on an assigned 1.25 MHz carrier. The technology was being used for fleet-tracking by a then little-known San Diego, U.S. company called QUALCOMM Inc. As CDMA began entering the marketplace it was vital to convince service providers of the realities of CDMA's efficiency, cost-effectiveness, and ease of implementation. It was critical to ensure that service providers understood CDMA's ability to increase system capacity and that the future was designed so that upgrades would be inexpensive and simple, allowing CDMA service providers to offer advanced features and services very quickly.

The first CDMA standard for mobile networks is referred to as Interim Standard 95A (IS 95A). The IS-95A standard was completed in 1993 and served as a digital wireless technology that could replace analog systems. IS-95B, is an upgrade to IS-95A. Both IS-95A and IS-95B are considered to be 2G technologies. 1X is the technology that follows IS-95. The term 1X is an abbreviation of 1xRTT (1x Radio Transmission Technology). 1X is considered to be 2.5G technology. EV-DO revision 0 is a data centric technology that allows service providers to take advantage of the performance characteristics of the technology to offer advanced data services. The standard, cdma2000™ High Rate Packet Data Air Interface, IS-856, was approved in August 2001. EV-DO Revision A (TIA-856-A) is the first in a series of planned upgrades for Release 0. The Revision A standard was approved in March 2004, with commercial services beginning at the end of 2006. EV-DO is considered to be 3G technology.

![Figure 1: cdma2000™ Technology Evolution](image-url)
Today more than 275 service providers worldwide have selected cdma2000™, and this number continues to grow. Within the past 3 years, over 100 service providers have selected cdma2000™. cdma2000™ services are available in 99 countries in every major market of the world, across all six continents.

Figure 2: Cdma2000™ Worldwide Deployments

The rapid growth of cdma2000™ subscribers is due to its ability to satisfy the diverse wireless communication needs of consumers, small businesses, and large enterprises by offering high-quality voice and a broad range of applications. There were more than 400 million cdma2000™ subscribers at the end of 3Q 2007. cdma2000™ is on an accelerated path to broadband with 83 million 1xEV-DO subscribers worldwide.

Motorola has led the way in cdma2000™ innovation, with a deep heritage in developing world-class CDMA systems for our global customers. Motorola CDMA solutions feature a robust, high quality portfolio of applications and services, with a solid roadmap and unique end-to-end capabilities.

1xEV-DO (Rev. 0/Rev. A) –Propelling the Industry into the next Decade

The greater use of data applications, the increased amount of data being transmitted by these applications, and consumer demand for increased responsiveness to data requests has driven the need for a network infrastructure capable of providing higher data throughput at higher quality levels. Service providers across the world have found that this demand can be effectively and economically filled by cdma2000™ 1xEV-DO technology. With 1xEV-DO, mobile data subscribers enjoy faster access to Internet, m-commerce and corporate intranets. The higher capacity of the 1xEV-DO system accommodates a larger number of users and had increased the revenue potential for service providers. The higher capacity also allows service providers to reduce their per-subscriber cost of operating their wireless data network. 1XEV-DO has been deployed in mobile telecommunications networks around the world since 2002.
1xEV-DO Revision A was approved by the 3GPP2 Technical Specification Group (TSG-C) in April 2004. 1xEV-DO Revision A is an enhanced version of 1xEV-DO Revision 0, which delivers up to 2.4 Mbps data speeds. 1xEV-DO Revision A supports peak data rates of 3.1 Mbps on the forward link and up to 1.8 Mbps on the reverse link. The high data rates on the reverse link and low data latency has enabled service providers to greatly enhanced the wireless user experience for not only business users, but also for consumers, who have enjoyed broadband Internet access, email, audio and video streaming, music downloads, and location-based services. The OFDM waveform has been introduced into cdma2000™ 1xEV-DO Revision A to offer high capacity multicast capabilities that will allow service providers to offer lower cost multicast services while maintaining a robust high speed mobile network.

Motorola is a worldwide leader in 1xEV-DO technologies (Rev. 0/Rev. A), providing integrated solutions that enable new services while leveraging service providers’ existing CDMA 1X networks to help protect existing investments. Motorola 1xEV-DO solutions have successfully been deployed globally since 2004.

**LTE as the Next Evolutionary Step**

Recent industry analyst figures show significant growth in the number of mobile data service subscribers and in data consumption; these factors combined will result in exponential growth of the amount of data that will soon be flowing through mobile networks. The migration to 4G networks will be influenced by a number of subscriber driven factors including their evolving appetite for more information, entertainment, and functionality, combined with the expectation for easy access, high speed, and media mobility.

Over the course of the next decade, it will become difficult to fulfill this rapidly growing demand on cdma2000™ legacy networks. As a direct result, cdma2000 service providers are inspired to investigate technology alternatives in order to maintain and grow profitability. LTE is the latest technology from the 3GPP standards group that brought the world GSM and UMTS which now account for over 85% of all worldwide mobile subscribers. LTE RAN (also referred to as Evolved UMTS Terrestrial Radio Access Network (E-UTRAN), is expected to substantially improve end-user throughputs, sector capacity and reduce user plane latency, bringing a significantly improved user experience with full mobility. With the emergence of Internet Protocol (IP) as the protocol of choice for carrying all types of traffic, LTE will provide support for IP-based traffic with end-to-end Quality of Service (QoS). Voice traffic will be supported mainly as Voice over IP (VoIP), enabling better integration with other multimedia services. Initial deployments of LTE are expected by 2010 with commercial availability on a larger scale expected 1-2 years later.

![Figure 3: DOrA vs LTE Performance - Average Throughput per Sector](image-url)
While there are several wider bandwidth OFDM solutions to be evaluated, it is expected that many traditional cdma2000 service providers will want to take advantage of the benefits of LTE and choose to migrate along the 3GPP standards path. Many service providers will find no significant technological advantages among the other 4G options and the decision to depart from the 3GPP2 standards will be based on pure economics: a desire to get on the same 4G standard and become part of the global wireless community. It should be noted that, although possible, it is not necessary nor advisable for cdma2000 Operators to first migrate to GSM or UMTS in order to deploy LTE. Motorola can offer a direct, well planned, transition path that evolves service providers from cdma2000 to LTE and make use of the existing CDMA network coverage with seamless hand-over between CDMA and LTE.

Into the next decade service providers’ focus will continue to be on providing a more diverse service mix, including entertainment content, business applications and access to corporate networks. LTE will revolutionize the way in which existing services are consumed, as well as enable the delivery of a whole new range of high-value services and applications, thereby addressing the trend of declining ARPU common to many mobile markets.

Traditional cdma2000 service providers will benefit from the global connectivity afforded by LTE. The 3GPP family of technologies (i.e. GSM and UMTS) has been a tremendously successful and has an unsurpassed installed base of both infrastructure and subscribers. Global roaming enabled solely by expensive dual-mode world phones with GSM and CDMA embedded in them have put many cdma2000 service providers at a competitive disadvantage as the majority of worldwide service providers have been able to leverage GSM/UMTS as a world standard.

Significant economies of scale are achievable through the adoption of a common access platform with true global scale. Compatibility with existing technologies will increase the competitive dynamics of the infrastructure market place thus driving down overall CapEx for Mobile Operators who will, in turn, be able to deliver advanced LTE services profitable.

Another potential option does exist; a path to UMB (Ultra Mobile Broadband). However, the prospects for widespread adoption of UMB is being hindered by the fact that few service providers have yet expressed interest to follow that path.

**Spectrum**

The availability of adequate spectrum resources will remain a major challenge to the deployment of LTE for cdma2000 service providers. LTE suits several FDD spectrum allocations particularly AWS and the impending 700 MHz auctions in the United States.

**Advanced Wireless Services (AWS)**

In September 2006 the U.S. FCC completed an auction of AWS licenses (“Auction No. 66”) in which the winning bidders won a total of 1,087 licenses. In the spirit of the U.S. government’s free-market policies, the FCC does not usually mandate that specific technologies be used in specific bands. Therefore, owners of AWS spectrum are free to use it for just about any 2G, 3G or 4G technology.

This spectrum uses 1.710-1.755 GHz for the uplink and 2.110-2.155 GHz for the downlink. 90 MHz of spectrum is divided into six frequency blocks A through F. Blocks A, B, and F are 20 megahertz each and blocks C, D, and E, are 10 megahertz each.

The FCC wanted to harmonize its “new” AWS spectrum as closely as possible with Europe’s UMTS 2100 band. However, the lower half of Europe’s UMTS 2100 band almost completely overlaps with the U.S PCS band, so complete harmonization wasn’t an option. Given the constraint the FCC harmonized AWS as much as possible with the rest of the world. The upper AWS band lines up with Europe’s UMTS 2100 base transmit band, and the lower AWS band aligns with Europe’s GSM 1800 mobile transmit band.

**700 MHz**

In the U.S. this commercial spectrum was auctioned in January-March/ 2008. This includes 62 MHz of spectrum broken into 4 blocks; Lower A (12 MHz), Lower B (12 MHz), Lower E (6 MHz unpaired) , Upper C (22 MHz), Upper D (10 MHz). These bands are highly prized chunks of spectrum and a tremendous resource: the low frequency is efficient and will allow for a network that doesn’t require a dense buildout and provides better in-building penetration than higher frequency bands.
The upper D block will come along with a Public/Private Partnership obligation. As part of the 700 MHz FCC decision, the winner of the commercial license will combine this asset with an additional 10 MHz of adjacent spectrum licensed to a national Public Safety Broadband Licensee (PSBL), creating a public-private partnership. In exchange for constructing and operating the shared network to Public Safety specifications, the D Block commercial licensee will gain access to spectrum, on a secondary basis, held by the PSBL to provide it with additional capacity to furnish non-priority communications services to commercial subscribers.

<table>
<thead>
<tr>
<th>Band</th>
<th>Uplink (MHz)</th>
<th>Downlink (MHz)</th>
<th>Carrier Bandwidth (MHz)</th>
<th>Comments</th>
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<tbody>
<tr>
<td>700 MHz</td>
<td>746-783</td>
<td>776-793</td>
<td>1.25 5 10 15 20</td>
<td>Digital Dividend U.S. commercial spectrum</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>auctioned in January/February 2008</td>
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**Other Candidate Bands**

Cellular 800: Refarm this spectrum in the U.S. after new 700 MHz and AWS spectrum is consumed. In Japan, reallocation of this spectrum is likely.

GSM 900: Refarm this spectrum as subscriber migration from GSM to UMTS takes place

GSM 1800: Interest from Americas, Asia Pac and some countries in EMEA, especially for the refarming of existing GSM spectrum.

UMTS Core Band 2.1 GHz: This is the core 3-3.5G band for EMEA and AsiaPac with deployments of networks in over 150 countries. Most service providers were awarded 2, 3 and in some limited instances 4 x 5 MHz carriers in this spectrum band. Most service providers are so far only used one band but with mobile data growth and subscriber migration to UMTS/HSPA, it is yet unclear if and how many carriers will be available in that band for LTE services in 2009-2010.

PCS 1900: Alternative to core band, which is not available in EMEA. Service providers may refarm this spectrum in the U.S after new 700 MHz and AWS spectrum is consumed.

**cdma2000™/LTE Architecture**

Migration/evolution of 3GPP2 service providers to EUTRAN/EPC involves the overlay of the EPC elements (MME, SGW, and PDN-GW) and the potential to use the EV-DO BTS frame to deploy the EUTRAN components (both the baseband and the radio head).
Functional Elements

A brief description of the functional elements that make up the EUTRAN/EPC is provided below:

• **eNodeB (eNB)** encompasses the bottom layers of the radio link between the user equipment (UE) and the network. It performs many functions including radio resource management, admission control, scheduling, enforcement of negotiated UL QoS, cell information broadcast, ciphering/deciphering of user and control plane data, and compression/decompression of DL/UL user plane packet headers.

• **Serving Gateway (SGW)** routes and forwards user data packets, while also acting as the mobility anchor for the user plane during inter-eNB handovers and as the anchor for mobility between LTE and other 3GPP technologies. It also performs replication of the user traffic in case of lawful interception.

• **Mobility Management Entity (MME)** is the key control-node for the LTE access-network. It is responsible for idle mode UE tracking and paging procedure including retransmissions. It terminates Non-Access Stratum (NAS) signaling used for bearer activation/deactivation process, user authenticating the user (by interacting with the HSS), and generation and allocation of temporary identities to UEs. Lawful interception of signaling is also supported by the MME.

• **Packet Data Network Gateway (PDN GW)** The PDN GW provides connectivity between the UE and external packet data networks (PDN) by being the point of exit and entry of traffic for the UE. A UE may have simultaneous connectivity with more than one PDN GW for accessing multiple PDNs. The PDN GW performs policy enforcement, packet filtering for each user, charging support, lawful Interception and packet screening. Another key role of the PDN GW is to act as the anchor for mobility between 3GPP and non-3GPP technologies such as WiMAX and 3GPP2 (CDMA 1X and EvDO).

Motorola has been very active in the development of LTE standards and has been pushing for an architecture in which all the radio-specific functions are at the eNB; cellular specific control functionality is contained in control-plane nodes, and CN user plane nodes can be based on generic IP routers. Such architecture will result in lower capital (CAPEX) and operational (OPEX) expenditure for service providers. The topics on which Motorola has made significant contributions on include:

• Flat RAN architecture
• Termination of RLC and PDCP protocol layers in the eNB
• Distributed radio resource management using direct eNB to eNB interaction
• Control-plane and user-plane separation resulting in the split between MME and Serving Gateway
• Enabling Serving Gateway sharing between service providers
• Use of IETF mobility protocols, specifically (proxy) Mobile IP, for mobility on the different interfaces
• Mobility solutions in active mode, including context transfer at RLC/PDCP layers, location of packet reordering function etc.

Motorola’s position on the LTE architecture has been motivated by maximizing reuse of components and network elements across different technologies. Our position has been driven by the desire to reuse generic routers and IETF-based mobility protocols and network elements, such as Home Agent (HA) and Foreign Agent (FA), as much as possible. Such re-use is expected to significantly reduce the CAPEX for service providers. Motorola has also been actively supporting mobility between 3GPP and non-3GPP networks, such as WiMAX, to enable seamless mobility of dual-mode devices across these technologies.

cdma 2000™/LTE Network Interaction

Migration/evolution of 3GPP2 service providers to EUTRAN/EPC involves updates to the 1x/DO-A network deployed today for seamless interworking of services between the two technologies.
These upgrades allow service providers to realize one of the key LTE capabilities: providing a common service environment for their subscribers while supporting different access technologies.

Upgrades to the DO-A network allow subscribers to use a common mobility anchor point between LTE and DO-A networks (PDN GW) thereby enabling HRPD-LTE handovers. This enables seamless support for services while supporting mobility between LTE and DO-A, a key requirement during the initial stages of LTE deployment. These DO-A upgrades impact the IP-BSC-DO and the PDSN. The IP-BSC-DO is upgraded to support a signaling interface to the LTE MME.

The PDSN is also upgraded to support a data forwarding interface to the LTE Serving Gateway. There are also new changes to support the LTE mobility protocols to the PDN GW. This enhanced PDSN is also known as the HRPD Serving Gateway (HSGW). Multi-mode terminals will be necessary to support the access technologies.

Interworking cdma2000 voice calls using 1xRTT with LTE VoIP is also possible using the Virtual Call Continuity (VCC) service. This service, originally developed for 1xRTT/DO-A handovers, is being extended for LTE and plans are underway to standardize this solution in 3GPP. An Interworking Function between the 1x BSC and the LTE MME will be required to interwork the signaling between the two access networks. Once this Interworking Function is deployed, service providers will have the capability of LTE VoIP call to 1xRTT call handover, providing seamless voice service.

**The Motorola Solution**

**Evolved Packet Core (EPC) Product Overview**

Motorola’s MME is a robust, highly scalable control plane processing engine based on A-TCA technology responsible for control plane processing. The platform technology is highly available and field proven in our WiMAX solution. Motorola will support a pooled MME architecture to add another level of availability as well as seamless and easy system expansion.

Both the Serving and PDN Gateway products are based on a common platform. They may be deployed separately or combined depending on the network configuration. The platform itself is designed and built for broadband networks.
Today’s cellular data networks support limited data throughput per subscriber and the applications are primarily non-real time. LTE is a wireless broadband network and the business models that make LTE attractive require high average throughput per subscriber.

The Gateway platforms must support high data throughputs, complex QoS, and other features that are typically found in wireline broadband networks today. Motorola’s Gateway product is designed to support these features in a cost effective fashion that will allow fully utilization of the LTE air interface.

**eNodeB Product Overview**

The Motorola LTE 4G wireless broadband technology delivers simultaneous improvement in key performance attributes while providing OPEX improvements to reduce the service providers cost of ownership.

The Motorola LTE eNodeB provides superior power efficiency to reduce the service providers OPEX. These techniques leverage Motorola’s RF heritage to deliver superior power amplifier technology. The LTE eNodeB advanced DPD techniques and Crest Factor Reduction to drive amplifier efficiencies. In addition, On Demand Power Amplifier (ODPA) is another innovation incorporated into the designs that turns off PA devices to conserve energy during off-peak /low utilization times. Overall, these technologies enable the eNB to significantly improve power consumption over conventional PA technology.

The modular design provides scalable cost effective expansion for capacity and enhanced network coverage. The eNodeB architecture consists of two building blocks – Baseband control unit (BCU) and RF heads. Each of the RF heads is connected to the BCU via a fiber connection supporting flexible deployment scenarios as required by LTE service providers globally. These include traditional frame based, remote radio heads, and tower top deployments. The base station must support modular architecture that separate the baseband/digital subsystem and the RF subsystem supporting several deployment scenarios.

**Figure 7: LTE EnodeB Configurations**

- **Traditional Frame**
  - Digital and RF Co-Located in a frame configuration

- **Remote Radio Head**
  - Roof-top / Pole / Wall Mounted Transceiver / PA
  - Tower Bottom Digital

- **Tower Top**
  - Integrated Transceiver / PA for Smart Antennas
  - Tower Bottom Digital

**Reduced Power Consumption/Power Amplifier Efficiency**

The Motorola LTE eNodeB provides superior power efficiency to reduce the service providers OPEX. These techniques leverage Motorola’s RF heritage to deliver superior power amplifier technology. The LTE eNodeB advanced DPD techniques and Crest Factor Reduction to drive amplifier efficiencies. In addition, On Demand Power Amplifier (ODPA) is another innovation incorporated into the designs that turns off PA devices to conserve energy during off-peak /low utilization times. Overall, these technologies enable the eNB to significantly improve power consumption over conventional PA technology.

**Remote Radio Heads**

The deployment of Remote Radio Heads (RRH) that connect via lossless fiber links to the BCU II dramatically reduces costs associated with site acquisition and site lease offering offers more rapid and more scaleable network deployment.

These components are designed to be outdoor/winterized mechanics and are located in close proximity to the antenna connector to reduce feeder loss and thus power requirements of the component. In addition, deploying remote heads close to the antenna further reduces the output power requirements of PA while delivering equivalent forward link power effectively reducing energy consumption.
**Frame Based Transceivers**

Transmit and Receiver RF components that are designed to be co-located with the digital/baseband processing units. The transceivers are designed to operate indoors and require sufficient power to overcome reduce feeder loss and address extended coverage scenarios.

**Tower Top Antennas**

Transmit and Receive RF components that are integrated at the top of the tower with the antenna panels. This configuration is ideally suited when reduced footprint and minimization of coax runs is desired particularly with the more complex antenna configurations, such as 4 TX x 4 RX or 4 TX x 8 RX configurations which are well suited for beamforming applications. These configurations are typically restricted in power due to weight, wind load at the tower. However, the beamforming capabilities provide additional directivity gains (6 – 10 dB link improvement).

**Upgrade of Current UBS to LTE**

Motorola will offer the ability to add LTE via a modular expansion of installed 1X or DO Universal Base Station (UBS), regardless of band. Initially both the user interface and backhaul will remain common. The Motorola’s solution will enable combining onto existing antennas for use on an existing band or allow the addition of a separate band within the same frame. LTE will be able to be added with no additional footprint and with reduced expansion, backhaul, training and antenna costs.

The Motorola LTE eNodeB will also support site co-location with non-Motorola equipment. This will be typically fashioned as an ‘overlay’ solution. However, Motorola will work closely with service providers to investigate the feasibility and provide recommendations a) to share existing antennas or minimize number of panels based on bands deployed, local zoning ordinances while minimizing service provider lease costs. In addition, other shared elements would be backhaul via external “customer provided” routing equipment, as well as power distribution. The following picture shows upgrade path – adding LTE in a separate band to an existing UBS frame.

![Figure 8: Upgrade of Motorola UBS to LTE](image)

**Antenna Sharing**

Whenever technically and commercially feasible, antennas should be shared between the existing 2G/3G equipment and the new 4G system. The goal is to reduce the service provider OPEX associated with running multiple technologies at the same site. Since each deployment scenario and requirements are different, Motorola will work with individual service providers based on specific needs.

**Synchronization of GPS**

In the case of upgrades to existing base stations with GPS already present, Motorola will support the ability to use the same GPS antenna as input into the LTE eNodeB. This will reduce the service providers site deployment cost. The exact feasibility will based on the equipment supported, signal quality based on the coax cable run, etc. However, it is expected that the Motorola LTE eNode will support the GPS synch signal from a co-located Motorola UBS site via the CDMA SSI card.
Evolution and Deployment Considerations

Motorola recognizes that the following four key issues are important to service providers as they consider migrating to EUTRAN/EPC: site acquisition, backhaul costs, ease of concurrent operation and minimization of management costs.

Site acquisition costs are a significant contributor to network costs. Motorola’s plans are for the eNodeBs to be offered in two configurations. One would be where the eNodeB can be co-hosted in the UBS platform and deployed in sites, or the other is where the eNodeB can be deployed by itself in sites where higher data traffic is expected. This minimizes the site acquisition costs and maximizes reuse.

Backhaul costs are a key OPEX contributor and the Motorola solutions minimizes this cost for the service provider. The CDMA EV-DO backhaul is IP based and the eNodeB also uses packet based backhaul. The all IP architecture for both Radio Access Technologies (RATs) allows the shared use of the backhaul, and the solution could also support aggregation of regional backhaul bandwidth, depending on the network configuration.

The ease of concurrent operation and minimization of management costs is another key theme from many service providers. Motorola’s IPBSC-DO network is managed with the Element Management System (EMH) that typically interfaces on the North Bound Interface (NBI)to the AEMS (Advanced Element Management System). The EUTRAN/EPC’s EMH is the MotoManager, and is designed to interface on the NBI to the AEMS as well. The AEMS provides a single management point to manage the entire Motorola provided RATs. For service providers who have not deployed the AEMS, the Motorola Network Management System could alternatively provide the single management point.

Motorola equipment will be deployed in an environment where CDMA networks are already deployed. Interworking with legacy CDMA systems will consider issues such as site planning including multi-RAT base sites, inter-RAT handover, and load balancing between RATs (to name a few), network deployment services, network optimization services and even managed services for operators.

End to End Ecosystem

The Motorola ecosystem includes support for full feature end to end systems supporting multiple radio access types beyond EUTRAN/EPC. This portfolio allows a “one stop shop” to our customers.

1. Multi-media Converged Core with a rich set of applications including Location Based Services, Video Blogging, On Demand Media Services, Push To eXperience and Multi Party Gaming.
2. Comprehensive Family of Fixed and Mobile Devices for 3GPP, 3GPP2 and non-3GPP/3GPP2 (WiFi, WiMAX)
3. Integrated Policy Management across multiple access technologies.
4. Network planning and optimization services for 3GPP, 3GPP2 and non-3GPP/3GPP2 networks (WiFi and WiMAX)
5. Service Orchestration, Service Brokers and Service Creation Environments using Service Delivery Platforms
6. OFDM based Backhaul – Solution specially designed for WiMAX and LTE networks with up to 300Mbps line of sight and non line of sights in both licensed and unlicensed spectrum
7. Rich media solutions giving the operators the ability to converge broadcasting, video on demand, innovative applications & advertisements solutions into their LTE offering
8. World Class Device Management Solutions - Based on the Motorola (Netopia) NBBS platform, Motorola’s solution includes remote provisioning, remote diagnostics, aligning TR-069 and OMA, across both fixed and wireless access technologies via a single easy to use Graphical User Interface (GUI).
9. Service Delivery / Integration - Motorola’s (Leapstone) platform is optimized for content aggregation, service creation, transactional purchases, billing / OSS, multi-media applications and web portals.
Conclusion

Motorola has led the way in cdma2000™ innovation, with a deep heritage in developing world-class CDMA systems for our global customers. By the end of the decade it will not be possible to fulfill the surging demand for advanced services on cdma2000™ legacy networks. It is expected that many traditional cdma2000™ service providers may want to take advantage of the benefits of LTE and choose to migrate along the 3GPP standards path. It is not necessary for cdma2000™ service providers to first migrate to GSM or UMTS in order to deploy LTE. Motorola can offer a direct, well planned, transition path that evolves Service providers from cdma2000™ to LTE.

Motorola's LTE solution presents a straightforward evolution to the world of mobile broadband for the 3GPP2 service provider. With the envisaged throughput and latency targets complimented by and emphasis on simplicity, spectrum flexibility, added capacity and lower cost per bit, LTE is destined to provide a greatly improved user experience, and delivery new revenue generating mobile services that will excite users.

To realize these goals Motorola is leveraging its extensive expertise in mobile broadband innovation, including OFDM technologies (wi4 WiMAX), cellular networking (EVDOrA, HSxPA), IMS ecosystem, collapsed IP architecture, standards development and , comprehensive services to deliver best-in-class LTE solutions. Leveraging the benefits of Motorola’s mobile broadband experience and proven expertise in OFDM network deployments, Motorola’s LTE end-to-end solution will provide a seamless and flexible path to LTE with a high degree of future proofing for the service provider. Following this path, Motorola’s 3GPP2 customers will be well positioned to provide the world’s most compelling mobile broadband services and applications.

For more information on Motorola LTE and CDMA to LTE migration, please talk to your Motorola representative.