



# The LTE Challenge

## for the Small-to- Midsize Mobile Network Operator

The next mobile generation is not just for Tier 1 carriers. How to tap into the business opportunities of LTE in Tier 2 and Tier 3 markets across the USA, without major capital investment.

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**GLOBECOMM**

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## Why LTE Matters

The mobile phone can hardly be called a phone anymore.

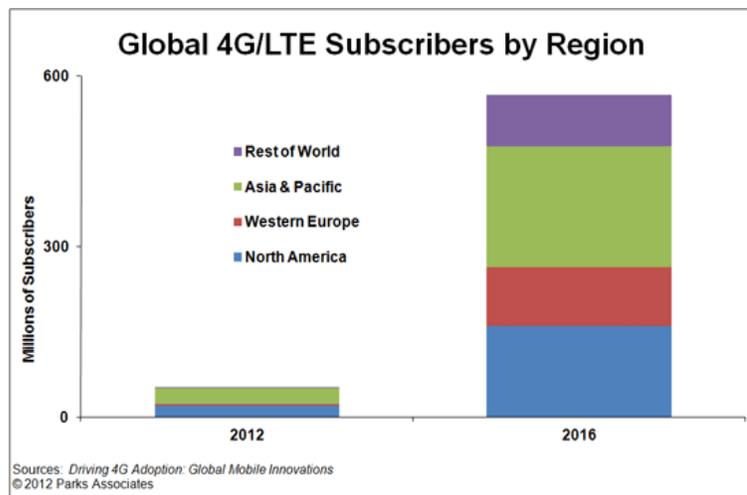
In 2012, mobile data traffic was nearly twelve times the size of the entire global Internet in 2000. Mobile data traffic grew 70% from 2011 to 2012, reaching 885 petabytes per month. Most striking of all was the fact that 1% of mobile data subscribers generated 16% of mobile data traffic in 2012, and 51% of that traffic was video.<sup>1</sup>



Making that possible is the smartphone: a mobile phone with advanced computing capability. In 2012, smartphones represented a mere 18% of global handsets in use – but they generated over 92% of total global handset traffic. That's because, in 2012, the typical smartphone produced 50 times more mobile data traffic (342 MB per month) than the typical basic-feature cell phone (6.8 MB per month of data traffic).<sup>2</sup>

There appears to be no end in sight to consumer appetite for mobile bandwidth. That is the reason that the industry's biggest carriers are investing massive amounts of money in 4<sup>th</sup> generation LTE (Long Term Evolution) networks. LTE was developed as a standard by 3GPP (the 3rd Generation Partnership Project) to provide bandwidth up to 10X the speed of 3G connections. First proposed as an international standard in 2004, it took only five years, until November 2009, for Alcatel-Lucent to complete the first live LTE data call using the 800 MHz spectrum band. The LTE specification now provides maximum downlink speeds of 100 Mbps and uplink speeds of 50 Mbps.

America's biggest mobile carrier, Verizon, told the 2013 Consumer Electronics show that almost 50% of its total data traffic now travels over LTE, up from 35% in October 2012. Worldwide, LTE deployments are expected to surge 219% in 2013 and 175% in 2015, when there will be 109 million global connections.



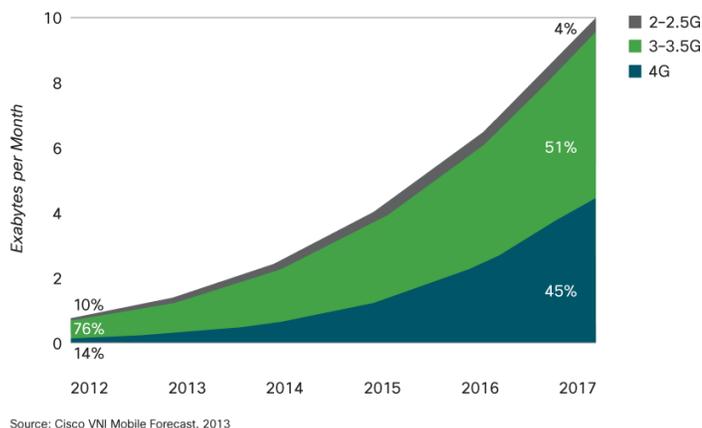
## More Than a Faster Connection

Consumers love 4G for the faster connection and seamless online experience it delivers. But for the mobile operator, 4G LTE is not just a faster version of 3G or 2G.



In 2009, as the LTE investment wave was just starting to roll, Sue Spradley, who headed North America for Nokia Siemens Networks, told *Forbes*, “It is critical to understand that LTE migration means an end-to-end evolution. People tend to only think about radio access, but it is really the tip of the iceberg of what is involved in 4G migration.”<sup>3</sup>

This quote exemplifies the challenge posed to network operators who need to rethink and redesign their networks from one end to the other. LTE is an all-IP standard, radically different from the circuit + packet-switching architecture of UMTS. Based on a single standard, the LTE architecture is simpler and offers meaningful operating cost advantages compared with 3G. That’s the good news. The bad news is that transitioning from one generation to the next is as complicated as any other major technology change, and the capital investment requirements can be steep. America’s giant Verizon Wireless, which had 2011 revenues of \$70 billion, estimates that it has invested \$80 billion in LTE since 2000.



This presents a challenge to the Tier 2 and Tier 3 mobile network operators that are the backbone of service in so many regions. Their customers want access to the applications and services enabled by the higher speeds of 4G LTE, and major competitors are eager to offer it, but the capex challenge can be daunting. Taking advantage of this situation, some of the giant US carriers are offering partnerships that allow smaller operators to ride on their bandwidth and gain access to their smartphones. It can be a very attractive offer, but it comes with a tradeoff. The smaller mobile operator gives up any possibility of maintaining control of its brand, its 4<sup>th</sup> generation network or its LTE destiny.

### A Better Way

Is there a better way? Is there a way for a Tier 2 or Tier 3 carrier – one with bandwidth suitable for LTE and a preference for being in control of its future – to deploy next-generation services in the markets it knows so well? In rural areas in particular, is there a way for carriers to use LTE to provide a last-mile broadband solution without the enormous investment required for optical fiber or high-quality copper cabling?

The answer to both questions is a resounding “yes.” It requires mobile carriers to think a bit differently – to stretch the boundaries of what is “my network” and “somebody else’s network” – but it can be done cost-effectively and quickly while keeping open future options for growth. Instead



of a business challenge, 4G can represent a serious money-making and brand-building opportunity for Tier 2 and Tier 3 mobile operators, by delivering a high-quality service and matching upfront investment to the real potential of the market.

## Virtualized LTE Packet Core

Globecomm has developed a Virtualized LTE Packet Core (Virtual LTE) solution that delivers next-generation services at a fraction of the cost of purchasing and installing the infrastructure on your own. The 4<sup>th</sup> generation services can be delivered in existing 2G/3G spectrum as well as “4G spectrum,” which has a huge impact on the deployment decision.

The Virtual LTE solution is a revolutionary departure from mobile technology deployment – but it uses the same proven technologies that the world’s leading vendors are installing and turning up every day. The difference is in the architecture. Conventional mobile deployments require installation of an expensive core in your Communications Center. With Virtual LTE, the boundaries of your Communications Center expand to include Globecomm’s Tier 1 infrastructure across the United States.

Mobile carriers have different business models. Some want to own and operate technology while others prefer to leave the technology to others and concentrate on subscriber acquisition and growth. Virtual LTE has been architected to span all of the possibilities. Virtual LTE also exploits the unique “service anywhere” advantage of IP-based communications, where packets traveling over distant fiber can deliver a quality of service indistinguishable from local infrastructure.

### Hosted Service

In a Hosted Service application, Globecomm provides both the Control Plane and User Plane elements as hosted assets from our Tier 1 Communications Center. We monitor and support all services 24x7 and the mobile operator pays only a single fee for monthly service.

### Managed Service

For mobile operators who prefer to own their own infrastructure – but who may not have the in-house expertise to manage the LTE transition – Globecomm provides a managed-service alternative. The operator can procure the Control Plane or User Plane elements. Globecomm provides installation, turn-up and ongoing management from our Communications Center.

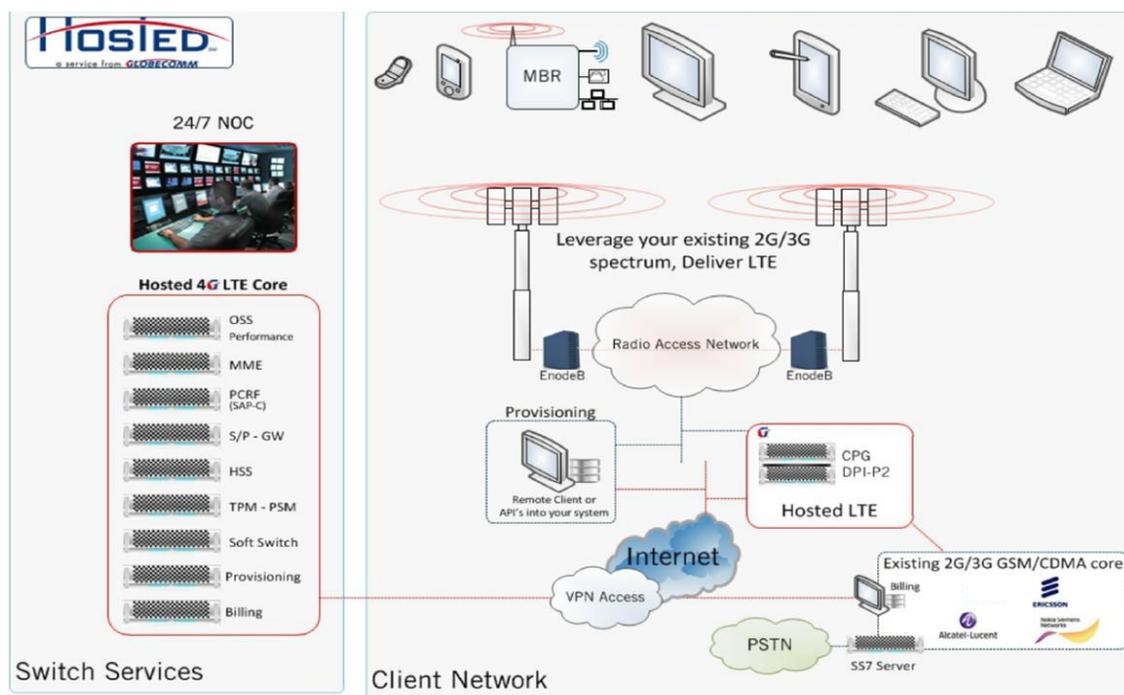


## Blended Service

It is not necessary, however, to choose between buying a hosted service and buying infrastructure. Through a blended service, the mobile operator can purchase a portion of the User or Control Plane, which is managed by Globecom, while Globecom also provides hosted services for the balance of the LTE infrastructure as well as 24x7 management. For example, the operator may own the User Plane elements (such as the CPG) outright, with Globecom providing hosted services for the Control Plane elements and management and support for both.

## System Design

Globecom's Virtual LTE service provides enhanced quality of service, data rate management and security through optional Deep Packet Inspection, with easy access management control through our Distributed Provisioning System.



### CONTROL PLANE ELEMENTS

- **Operational Support System (OSS)** – Allows carriers and operators to maintain network service inventory, provision their network, configure network components and manage faults.
- **Business Support System (BSS)** - Provides information to carriers and operators with data for billing and charging of services for subscribers, customer feature management, new product/service introduction and order activation.



- **Mobility Management Engine (MME)** - Manages the signaling for mobility and security for E-UTRAN elements, including the connection signaling for mobility control, location registration and User Element authentication.
- **Home Subscriber Server (HSS)** – Contains the database that provides information about subscribers and signaling collected through the MME.
- **Traffic & Policy Management (TPM)** - Manages and enforces the rules and policies between applications and devices. Policies that can be managed include: Quality of Service, traffic optimization, access control and managing bandwidth quota limitations.

#### USER PLANE ELEMENTS

- **Serving Gateway (S-GW)** – The Serving Gateway controls the point of service between the radio network and the E-UTRAN elements. It is the communication anchor point between User Entities on different eNodeB's, and between LTE and 2G/3G networks during roaming.
- **Packet Data Network Gateway (P-GW)** - Provides intercommunication to external IP networks for access to ISP (Internet) services. The S-GW and P-GW work together to provide the boundaries between operators.
- **Converged Packet Gateway (CPG)** – Combines S-GW and P-GW into one managed element
- **Deep Packet Inspection (DPI)** – Provides packet filtering and inspects data and header fields to identify possible threat risks due to viruses, spam, intrusion detection or some other custom criteria for protocol non-compliance. DPI filters can also be used to collect customer filter statistical information.
- **Service Aware Policy Controller (SAP-C)** – establishes the policies for Quality of Service control and determines the method for charging.
- **Soft Switch** – Low cost option for offering Voice over IP (VoIP) services via the LTE network.

## Bringing Competitive Services to Market

Globecomm developed Virtual LTE based on its experience as a hosted service provider to Tier 2 and 3 carriers in the United States and overseas. These companies face the same market pressures as much bigger operators to reduce churn by giving subscribers the advanced services they demand. But they have much greater capital, human resource and technology constraints. The Virtual LTE architecture aims to level the playing field in LTE by making possible:

- Rapid deployment of a low-cost solution
- Competitive services priced lower than the Tier 1 providers
- Dramatically reduced Cost Per Gross Add for new subscribers
- Fully-managed 4G LTE for any market size
- Innovative and cost-effective IP offload design



- Minimized data backhaul costs
- Scalable solutions from 20 Mbps to 40 Gbps of simultaneous throughput across the entire network

To learn more, call Globecomm's Wireless division at 1 (866) 499-0223, (631) 231-9800 or [info@globecomm.com](mailto:info@globecomm.com).

## About Globecomm

Globecomm is a leading global provider of managed network communication solutions. Employing our expertise in emerging communication technologies, we are able to offer a comprehensive suite of system integration, system products, and network services enabling a complete end-to-end solution for our customers. We believe our integrated approach – offering in-house design and engineering expertise combined with a world-class global network and our 24x7 network operating centers – provides a unique value to customers. As a network solution provider, we leverage our global network to provide customers managed access services to the Internet backbone, video content, the public switched telephone network or their corporate headquarters, or government offices. We currently have customers for which we are providing such services in the United States, Europe, South America, Africa, the Middle East, and Asia.



- We offer a wide range of hosted and managed communications services that leverage our global transmission capacity and our network of data center, content management and switching facilities.
- Our expert teams can also advise you on the best ways to meet your critical communications needs, while our specialized laboratories evaluate broadcast, IP and other technologies for customers.
- We can engineer and integrate individual systems or complex networks, and then support them through the lifecycle.
- Our engineering expertise has also produced a wide range of satellite and wireless terminal products ready for quick and cost-effective deployment.

Globecomm makes one vital commitment to our customers: that the solutions we provide will work, no matter what. Founded by engineers, Globecomm provides services and products supported by one of the industry's largest in-house engineering staffs. When we build components into our services and products, you can count on the fact that we have tested them exhaustively for reliability, compatibility and cost-effectiveness. That's why suppliers have come to rely on us for improvements to the products they provide.



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<sup>1</sup> Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012-2017, February 6, 2013 ([http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white\\_paper\\_c11-520862.html](http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html))

<sup>2</sup> “Smartphones Account for Half of all Mobile Phones, Dominate New Phone Purchases in the US,” Newswire, March 29, 2012 (<http://www.nielsen.com/us/en/newswire/2012/smartphones-account-for-half-of-all-mobile-phones-dominate-new-phone-purchases-in-the-us.html>)

<sup>3</sup> “LTE: The Future of Mobile Data” by Steven Hartley, Senior Analyst, Ovum & Julian Grivolos, Principal Analyst, Ovum, ForbesCustom.com, June 2009.

