

Advances in Regulatory Pricing and Costing in the Digital Economy: VoLTE Interconnection Issues

*Advances in Regulatory Pricing and Costing in the Digital Economy:
VoLTE Interconnection Issues
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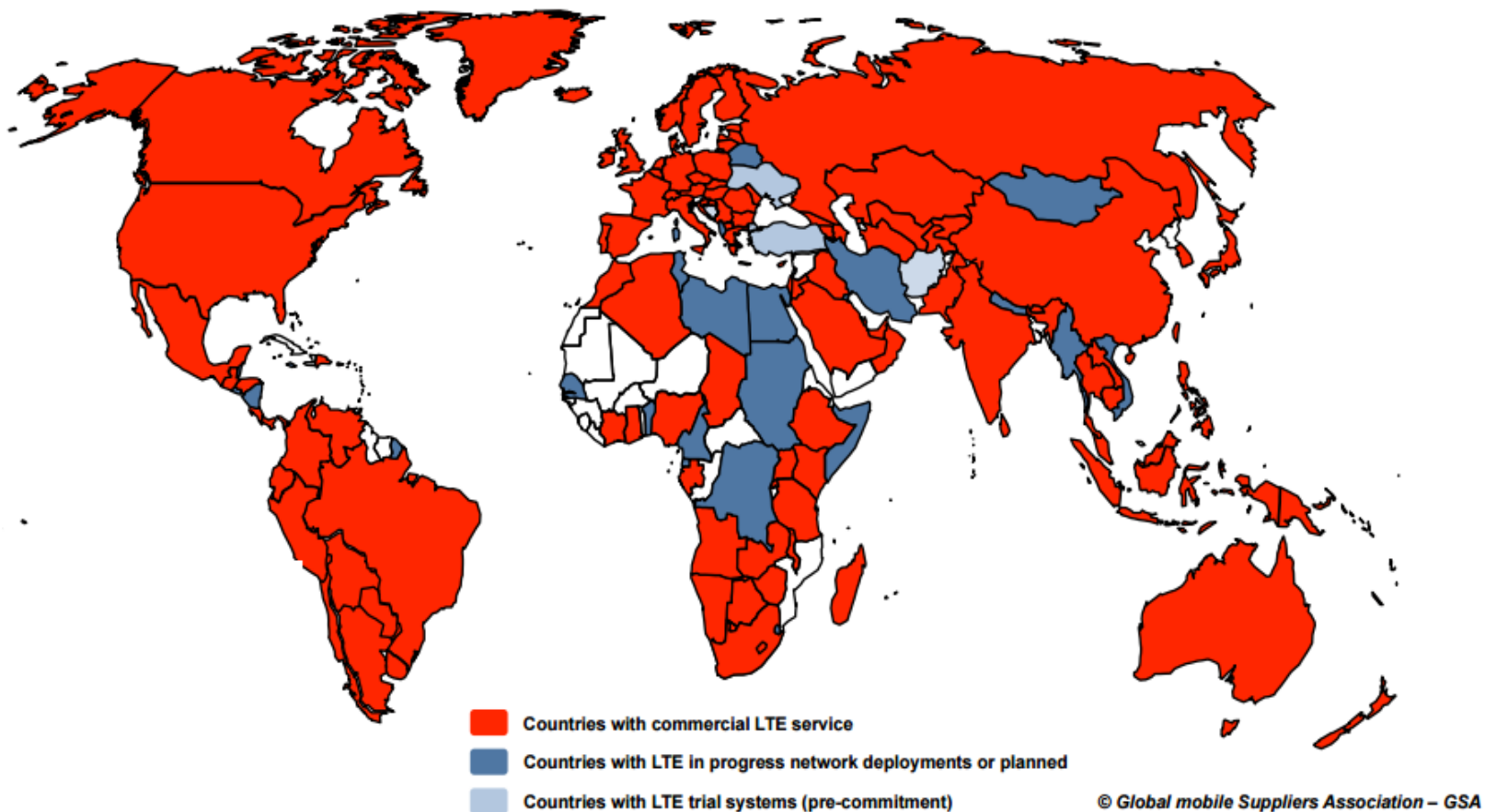
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State of Play with respect to LTE services

- LTE, commonly called 4G, is a wireless broadband technology designed to support roaming Internet access via cell phones and handheld devices
- LTE brings with it new capabilities to the cellular business, including the ability to:
 - ✓ **Expand carrier capacity**, meaning more subscribers can be added for a given spectrum assignment
 - ✓ Provide the **high data rates** needed by growing new applications (mainly video downloads to smartphones and other Internet access)
 - ✓ Make cellular connectivity **more reliable**
- By October 2016, there were 537 operators that had commercially launched LTE, LTE-Advanced or LTE-Advanced Pro networks in 170 countries.

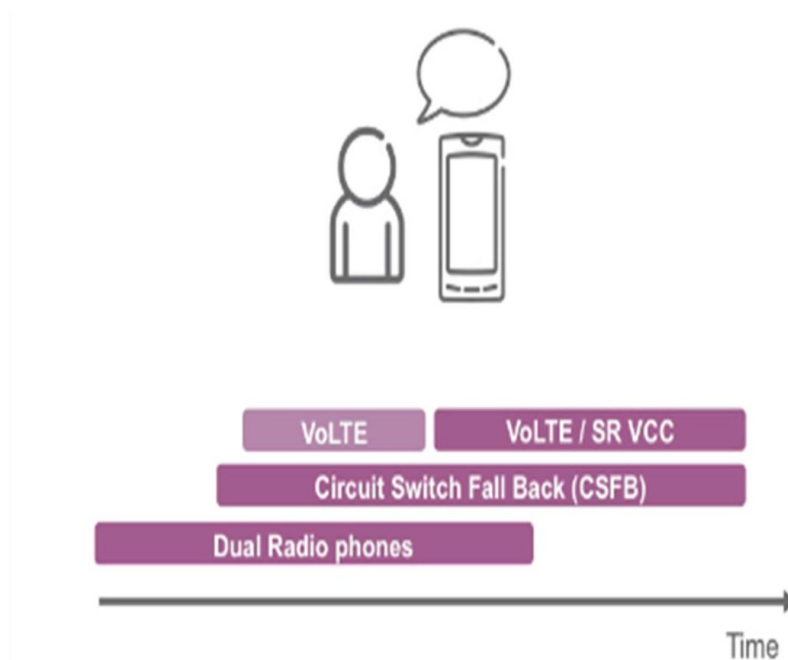
State of Play with respect to LTE services

Global LTE Deployment



Move to Voice Over LTE (VoLTE)

- VoLTE is a real-time voice service delivered as data over LTE. As it is based on the IP Multimedia Subsystem (IMS) network, there is no dependency on the legacy circuit-switched voice network.
- VoLTE is beginning to gain momentum globally, with more than 80 mobile operators having commercially launched VoLTE services by the end of 2016.

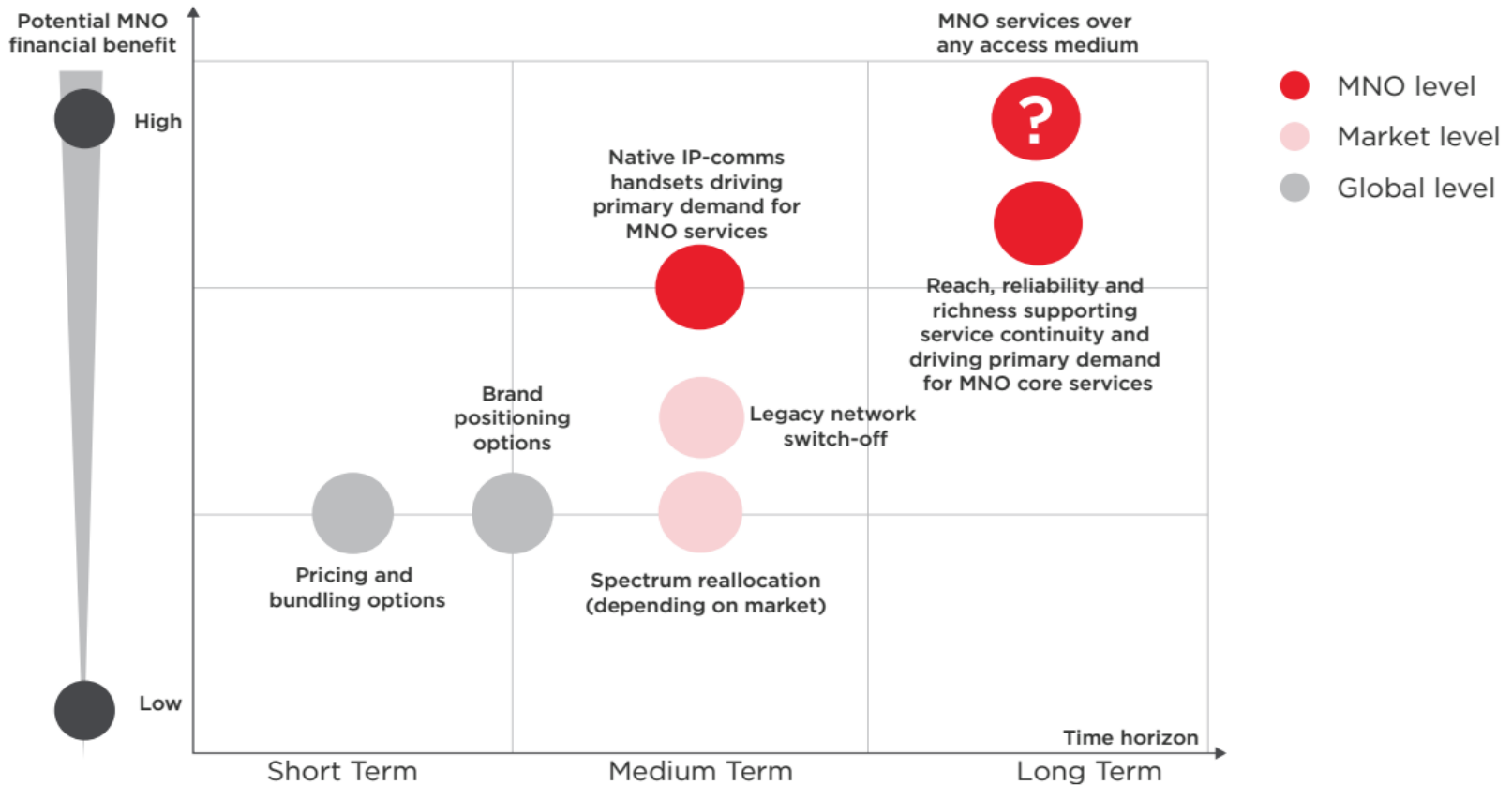


Move to Voice Over LTE (VoLTE)

- VoLTE brings a host of benefits, including:
 - ✓ High quality voice and video call for consumers
 - ✓ Brand positioning, legacy network switch-off, greater demand for MNO core services and the possibility of greater control over other access mediums for operators

Move to Voice Over LTE (VoLTE)

The different ways an MNO might expect to benefit from an IP-communications strategy



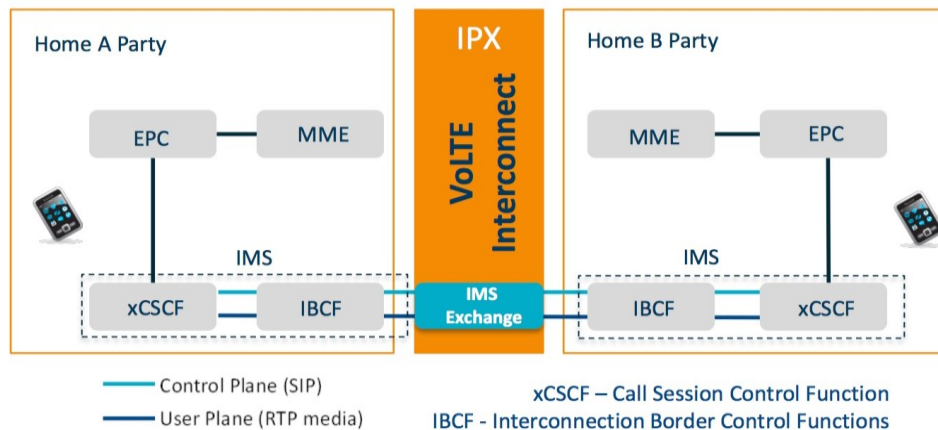
Source: GSMA Intelligence, 'Building the case for an IP-communications future, February 2015

An examination of VoLTE Interconnection Issues

- Although gaining in momentum due to its host of benefits for operators and consumers alike, **the value of VoLTE depends on how operators will provide the service across different carriers**
 - ✓ A lack of additional revenue generation by VoLTE interworking is often heard as a possible reason for inhibiting the uptake of VoLTE interconnection agreements
- In the short term, most operators seem content with downgrading VoLTE calls to circuit switched when interworking with other networks
- Notably, this process negates the key benefits of VoLTE such as very fast call setup, HD voice or video.

An examination of VoLTE Interconnection Issues

- While there are a host of issues associated with VoLTE interconnection, this presentation is focused on the associated regulatory issues



Advantages

- Faster call setup
- Higher quality voice and video calls, CoS (IPX)
- Efficient use of spectrum, releasing extra capacity for data
- Optimizes network and service management
- Simplifies service delivery
- Security based on IPX
- Support for GSMA IR-92/IR-94
- Leverages IMS core in the cloud
- Real-time diagnostics and analytics

Challenges

- Supported LTE infrastructure
 - Signaling protocol shift from SS7 to Diameter and SIP
- SIP Normalization
 - Working with the variations in standards IR.34
- Pre early call setup
- Bandwidth management
- Charging and Accounting
- Emergency and Priority calls
- Multimedia interworking between operators
- Voice transcoding

- Source: Syniverse, 'Making VoLTE Work', 7 April 2016

An examination of VoLTE Interconnection Issues

- Interconnection between public fixed and mobile telecommunications networks is highly regulated in most countries, while VoLTE interconnection is mostly not
- This is because the basic strategy of IP interconnection **differs fundamentally** from interconnection of legacy telephone networks, due to the underlying switching technology used.

Factor	PSTN-cellular networks	IP-based networks
Revenue stream	Caller triggers call using facilities provided or paid for by caller's carrier.	Traffic types varied and unclear which party triggers exchange.
Revenue stream	Call costs (and margin) paid for by call initiating subscriber.	Generated by subscriber access flat rates and advertising.
Traffic measurement	Symmetrical traffic with calls and minutes can be monitored and measured.	Asymmetric traffic. Measurement possible but not necessarily clear who should pay.
Parties	Only two carriers at each end of circuit established for duration of call.	Many carriers may be involved in handing off packets on best efforts basis.
Model	Framework developed by ITU on multilateral basis between countries with Calling Party Network Pays (CPNP) is preferred regime.	Model evolved from zero cost peering to commercial hierarchy of peers and clients with Sender Keeps All (SKA) emerging as preferred regime.
Technical interconnection	Carriers interconnect at agreed POIs.	Unregulated connection through peering or transit.
Routing	Calls routed on dialed number, circuit switched with end-to-end signaling.	Packets routed on IP header on best efforts basis through connectionless protocol.
Network characteristics	Intelligent network elements contained at the core.	Intelligent network elements contained at edge.

Exploring Peering/Sender-Keeps-All Regimes

- A peering interconnection arrangement is **settlement-free, or 'sender keeps all'**, meaning that neither party pays the other for the exchange of traffic
- These have largely developed **without any regulatory intervention**
- Peering arrangements are considered appropriate where traffic between networks is relatively balanced – as net payments between operators will therefore be close to zero
- All South Korean operators are VoLTE enabled and are fully domestically interconnected on a peering basis

Exploring Peering/Sender-Keeps-All Regimes

- In India, the Telecom Regulatory Authority of India (TRAI) is questioning the existing 'calling party pays' approach to terminating charges
- The TRAI argues that the sending-keeps-all method may be most appropriate, as:
 - ✓ Any attempt to set a uniform termination charge on the basis of cost per VoIP, VoLTE and IP-calls would be a **challenging task**
 - ✓ Setting additional interconnection charges on the basis of costs incurred would only work as a **disincentive or a hindrance to the deployment of IP-based and VoIP based networks**

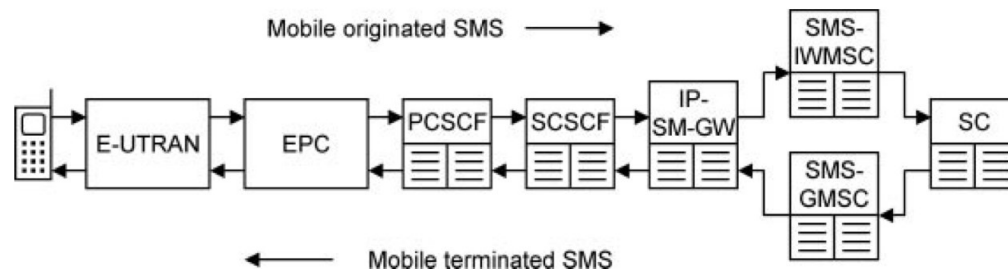


Is it the end of Traditional Cost Based Circuit Switched Costing Models for Termination Rates?

- Cost-based interconnection models based on circuit switched costs are either **depreciated or need to be replaced** because the modelling of a circuit switched call does not accord with an IP environment.
- This has resulted in global regulators either 'junking' their old legacy interconnection costing models and/or needing to invest in completely new (and very complex) transition and IP costing models.
 - ✓ While the **Australian Competition and Consumer Commission** (ACCC) used benchmarked interconnect rates rather than building a new model, it noted in its final decision on mobile terminating that it may review the regulated rates if there is a significant uptake of VoLTE services during the period of its determination
 - ✓ In contrast, **Ofcom in the United Kingdom** concluded in 2014 that VoLTE should be included in their 2014 MCT model, even though VoLTE was then at an early stage of development

Is it the end of Traditional Cost Based Circuit Switched Costing Models for Termination Rates?

- It is not only voice that is affected by the move to VoLTE – the IMS can deliver **SMS messages** over generic IP access technique.
- The new component is the IP short message gateway (IP-SM-GW), which acts as an interface between IMS and the network elements that handle SMS messages.
- It is likely that SMS over LTE will be able to be provided **at an even lower cost (close to zero)** than circuit switched termination
- This means that the regulated price (if it is regulated), may need to be reviewed sooner rather than later - depending on the penetration of SMS over LTE.



- Moving to VoLTE will have a number of implications for access regulation and pricing
- There are few precedents or exemplar models at this time
- However, it appears that:
 - ✓ Profound change to access regulation is required: VoLTE and IP based interconnection will result in fundamental rewriting of rules and pricing models; and
 - ✓ More work is needed: Regulators and operators need to undertake extensive review of technical, financial, roaming and regulatory aspects to explore implications, specifically
 - The need to adapt rules and pricing models for an IP interconnection model
 - Interconnect capacity (and any associated rules) between networks need to change to move away from E1s with multiple network points of connection (POI) to a small number of IP connection points

Questions

Thank You

**I am happy to answer
any questions...**