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HELPING MOBILE OPERATORS TO DELIVER AN ALL-IP WORLD

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Who is the GSMA?

The GSMA represents the interests of mobile operators worldwide.

Spanning more than 220 countries, the GSMA unites nearly 800 of the world's mobile operators, as well as more than 230 companies in the broader mobile ecosystem

Deliver

- Operator-led 'Vision 2020' strategy development
- Collaboration with 'lead' and 'participant' operators
- In-market support to create 'success stories'



Advocacy

- Stimulate global telecoms investment
- Demonstrate value of mobile telecoms connectivity
- Enhance dialogue between MNOs and governments
- Ministerial Programme platform for industry leaders



Mobile for Development

Ministerial Programme

GSMA Intelligence

Convene

- Enhance dialogue across the value chain
- Ecosystem collaboration and advocacy positions
- Engagement via global and regional platforms



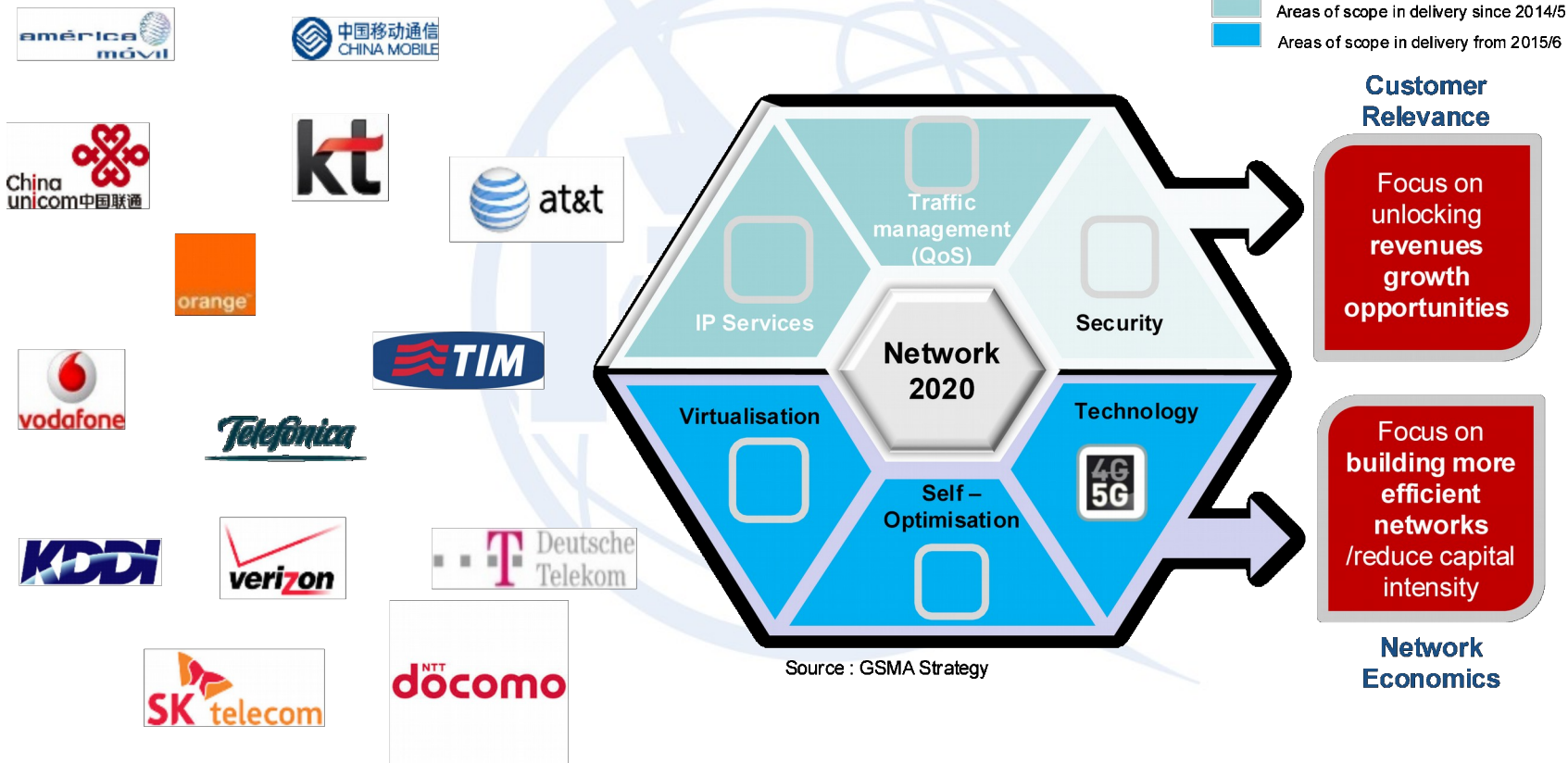
MOBILE WORLD CONGRESS



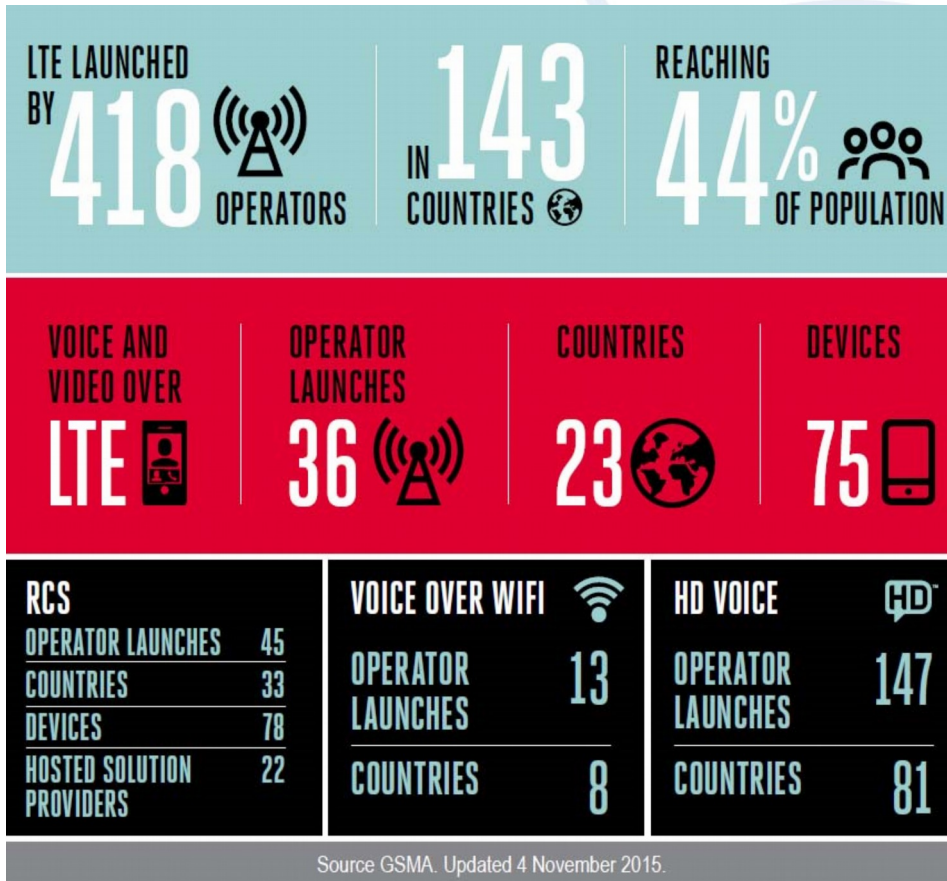
MOBILE ASIA EXPO
亚洲移动通信博览会



Network 2020 Programme



Some statistics



Knowledge: All-IP business guide



<http://www.gsma-all-ip-business-guide.com>

Resolution: IP Resolution Centre



<http://www.gsma.com/network2020/ip-communications-issues-registry>



IP Interconnection

Drivers for IP Interconnection

Reasons for migrating

1. Leverage the strategic value of IP Communications
2. Enable Enriched Calling to revolutionize the customer experience
3. >\$150bn Opportunity from spectrum re-farming
4. >\$90bn/annum in global productivity gains
5. Sweat the \$4.2bn/annum IMS investment

Reasons for inactivity

1. Little immediate revenue uplift
2. Risk of destabilizing working TDM interconnect regime
3. Procrastination

GSMA Support for Interconnection

- A rich knowledge base maintained by GSMA working groups in form of Permanent Reference Documents (PRD)
- Peer reviewed by industry experts
- Available also to non-members

<http://www.gsma.com/newsroom/gsmadocuments/>

Interconnection PRDs

IR.95 - SIP-SDP Inter-IMS NNI Profile

- Profiles the Network to Network interface describing:
 - Interconnect Architecture
 - Defines supplementary services across the NNI
 - Media codecs
 - Numbering Plan / URI format
 - DTMF Transmission
 - Early Media clarifications
 - SIP Methods and mandatory headers
 - SDP Examples / Example Message Flows

IR.34 - DNS and ENUM Guidelines for Service Providers and GRX and IPX Providers

- IR.34 describes the IPX network architecture and connectivity options (pure transport, service transit, service hub)
- Describes all technical requirements on IPX and on service providers including Routing, addressing, security, QoS
- Provides most common use cases such as Data roaming, MMS, IMS

Interconnection Troubleshooting

- NNI interoperability dependency on UNI: the better UNI interoperability becomes the easier it is to achieve NNI interoperability
- Lesson learned from the deployment of a fully interconnected system in Korea have been captured and shared with other members.
- Examples of issues addressed:
 - Codec negotiation, Early media, Announcements, call waiting service tones

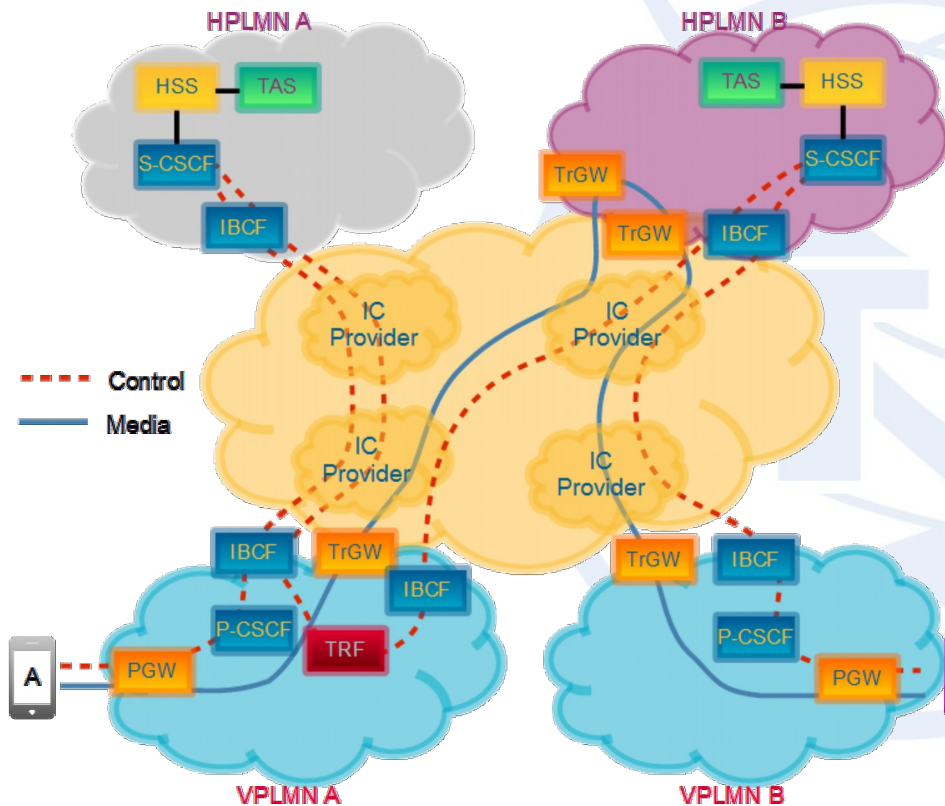


VoLTE Roaming

Roaming Models

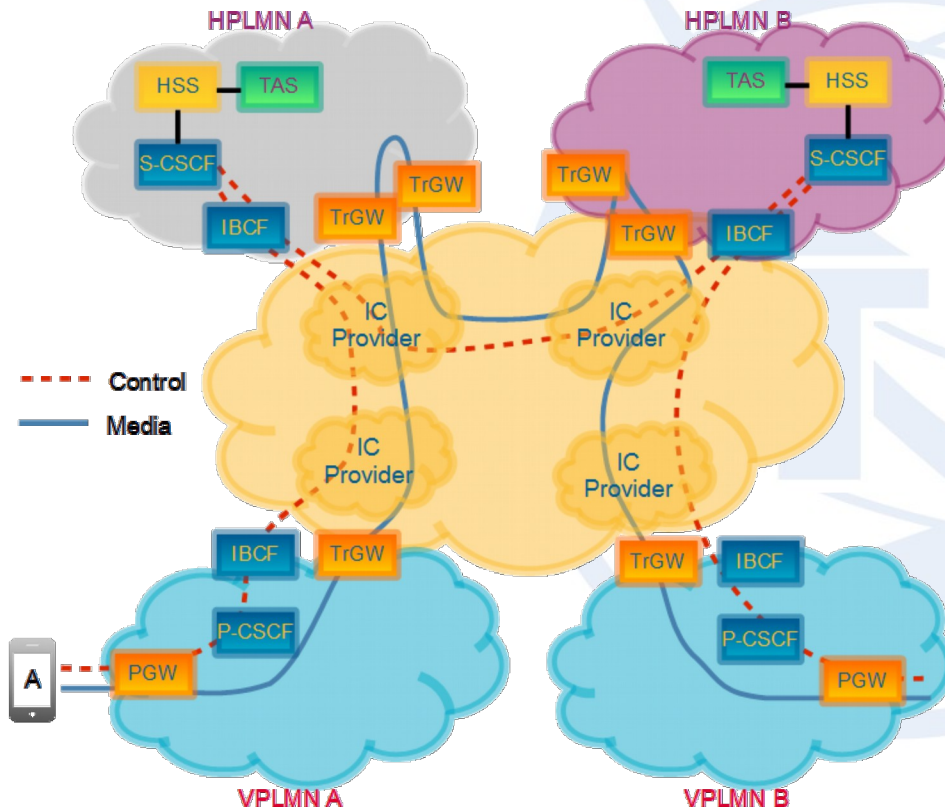
- Three roaming models are currently being discussed for VoLTE and other IMS-based services:
 - Local Breakout with routing by VPLMN (RAVEL)
 - Local Breakout with home routing
 - Home routing via S8
- The two LBO models are fully compatible and allow replication of existing business model
- The LBO models require IMS NNI to be deployed

Local Breakout with VPLMN Routing



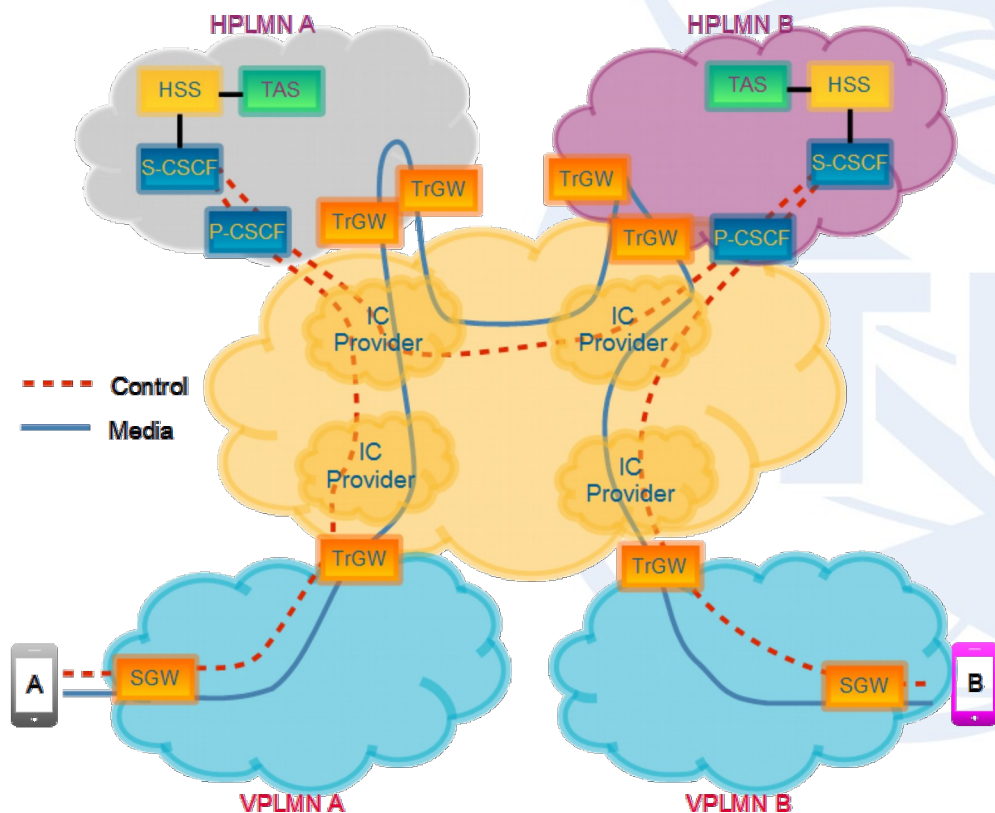
- Local breakout solution: UE connects to P-CSCF in VPLMN
- Call setup signalling looped back to VPLMN Transit and Routing Function (TRF)
- Routing to destination performed by VPLMN
- Media anchored in HPLMN of B-Party
- Emergency calls and regulatory requirements met

Local Breakout with Home Routing



- Local breakout solution: the UE connects to P-CSCF in VPLMN
- All calls are routed to HPLMN and then to the destination
- Minimal support required in VPLMN
- Sub-optimal media routing
- Emergency calls and regulatory requirements met

Home Routing Using S8



- UE always connects to the home P-CSCF
- No service awareness in VPLMN, but possible to allocate appropriate QoS
- Very little support required in VPLMN
- No need for IMS NNI
- Sub-optimal media routing
- Work ongoing for meeting regulatory requirements

Roaming PRDs

IR.65 - IMS Roaming and Interworking Guidelines

- Provides guidelines for voice roaming both Local Breakout and S8 Home Routing models are covered
 - S8HR will be updated in line with the developments in 3GPP
- Provides guidelines for interworking between two IMS networks
- Provides guidelines for interworking of several services (voice, video, RCS)

IR.88 - LTE and EPC Roaming Guidelines

- Based on the GPRS roaming guidelines PRD IR.33
- Covers technical requirements for new interfaces (e.g. S8) and protocols (e.g. DIAMETER)
- Covers interworking and coexistence with legacy networks
- Provides guidelines for SMS and Voice over LTE

Conclusions

- IP interconnection will soon become a necessity therefore it is more a question of **when** rather than **if** it will happen.
- Compared to country specific interconnection projects, international interconnection will benefit from collaborative sharing of experience between operators
- GSMA is already working with its members to accelerate international interconnection