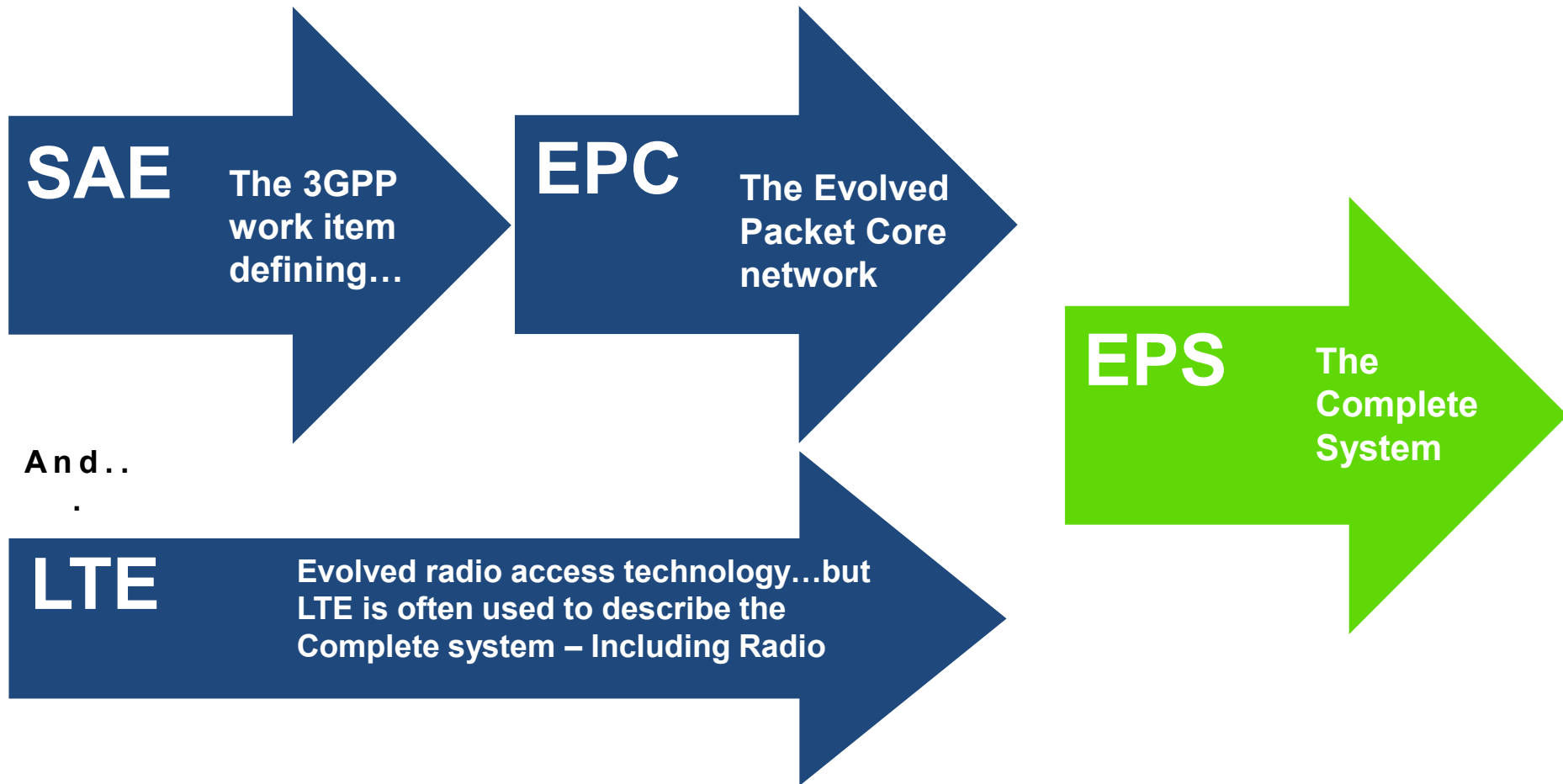




Next Generation Core Networks Summit 2011
**Standardisation and Developments
within SAE**

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3GPP Technical Officer

Terminology



TAKEAWAY: this presentation covers EPC aspects

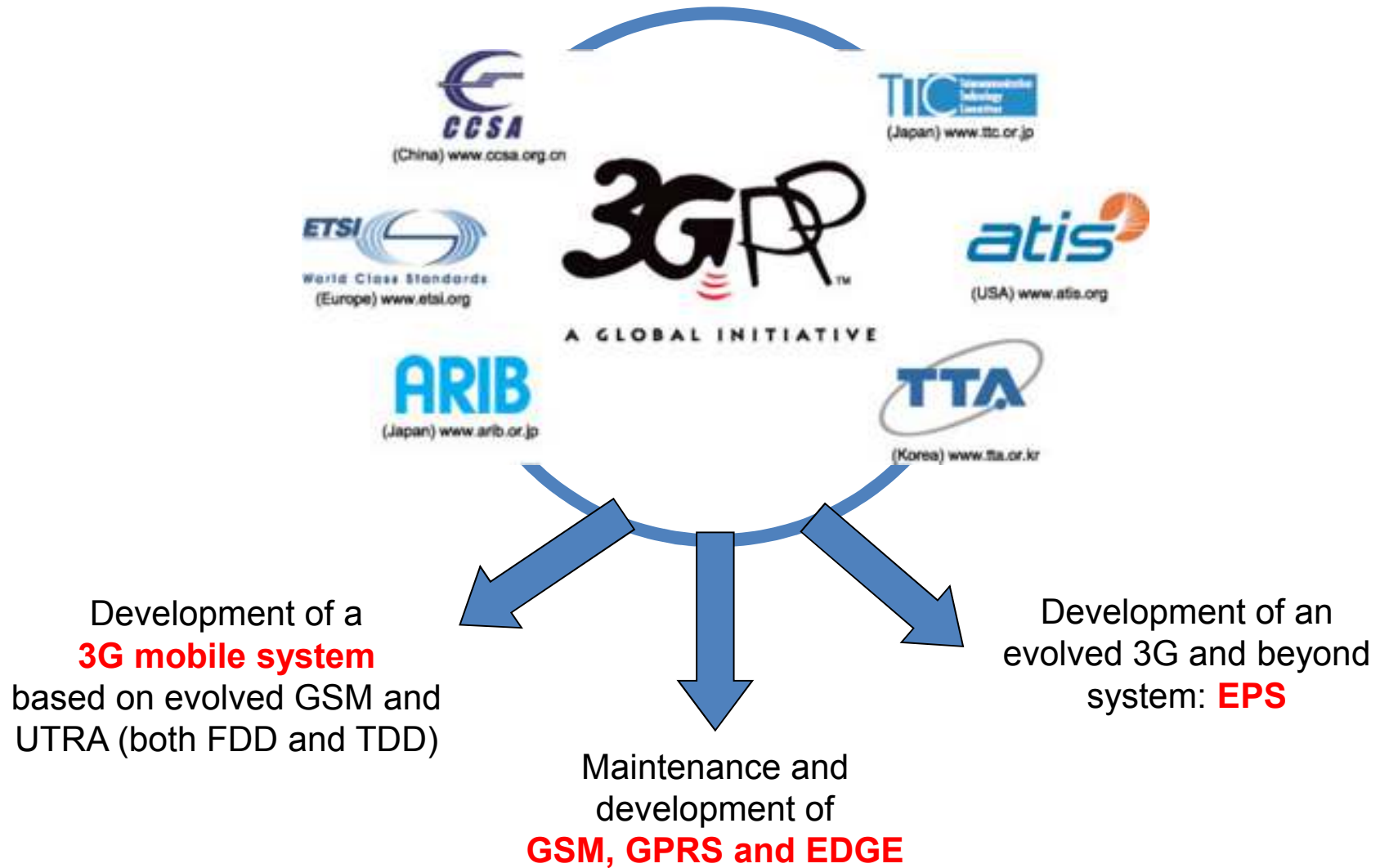
Topics of this presentation



- 📶 Overview of the standardisation work on SAE
- 📶 How is EPC different to current core networks?
- 📶 Standards and releases – Where are we now & where are we heading?

Overview of the standardisation work on SAE

The 3rd Generation Partnership Project



TAKEAWAY: This is an international effort

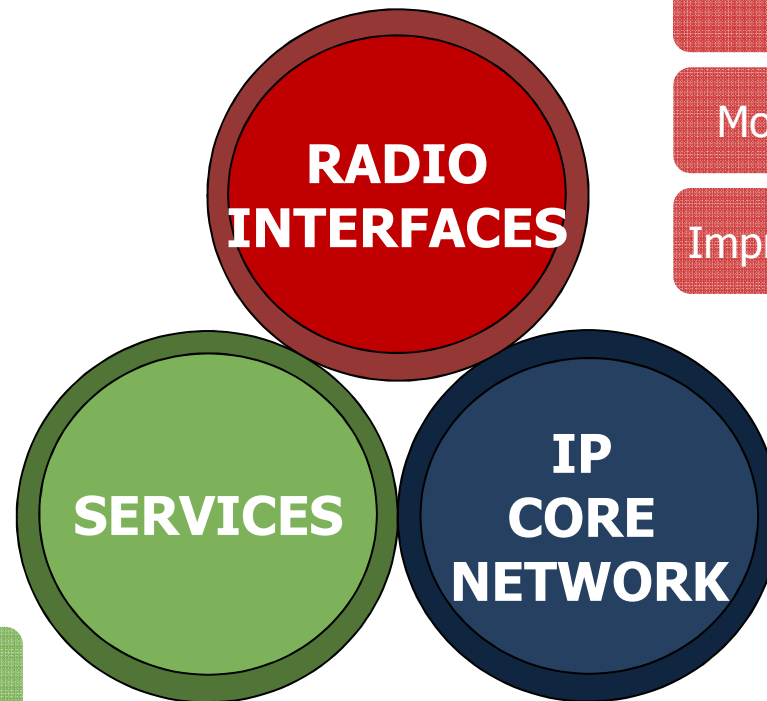
Technical Specification Groups

TSG Structure



TAKEAWAY: Work split across TSGs & their Working Groups

3GPP Evolution



Higher data throughput

Lower latency

More spectrum flexibility

Improved CAPEX and OPEX

All-IP network

Support of non-3GPP accesses

Improved security

Greater device diversity

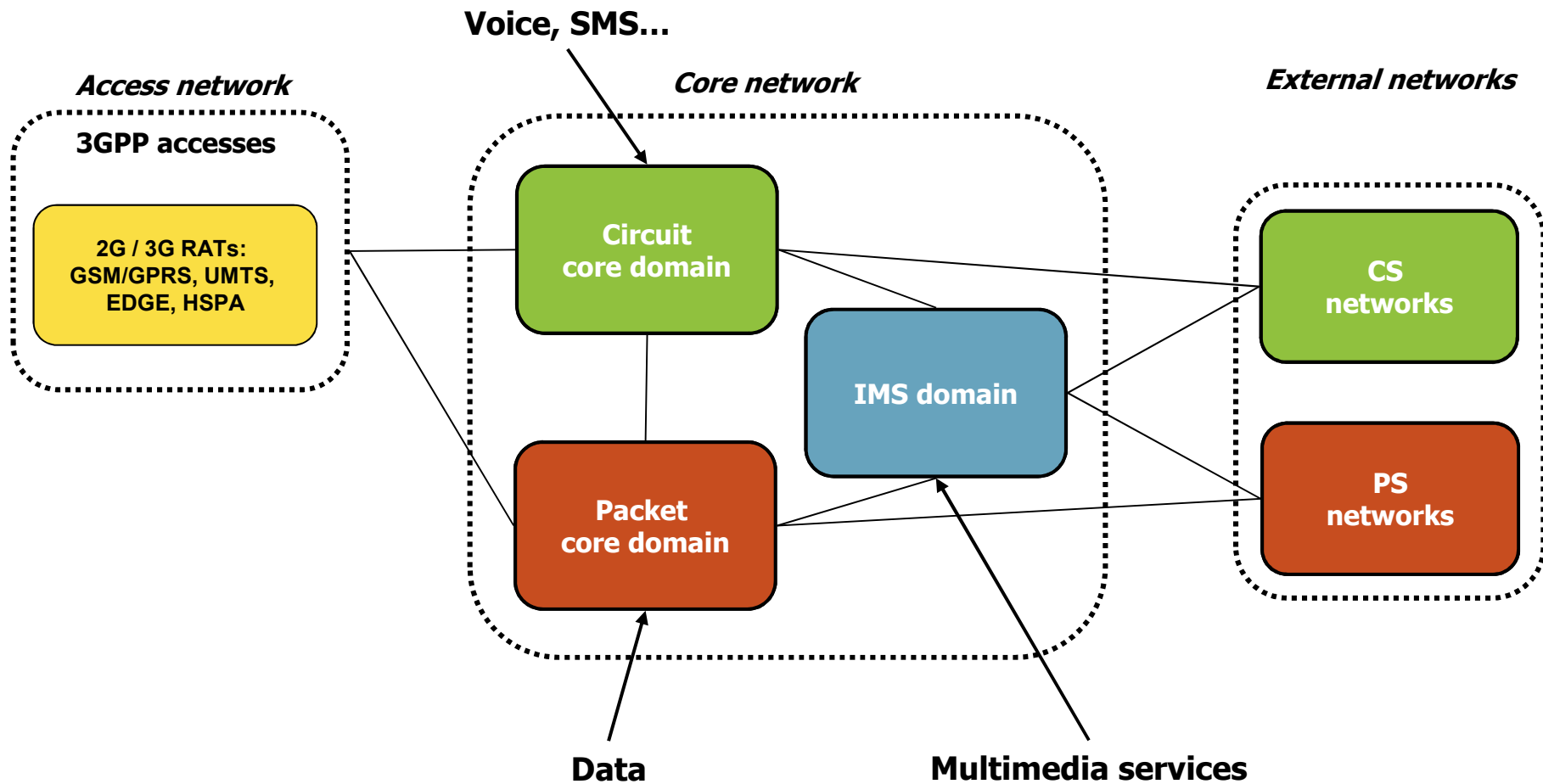
More IMS applications

Greater session continuity

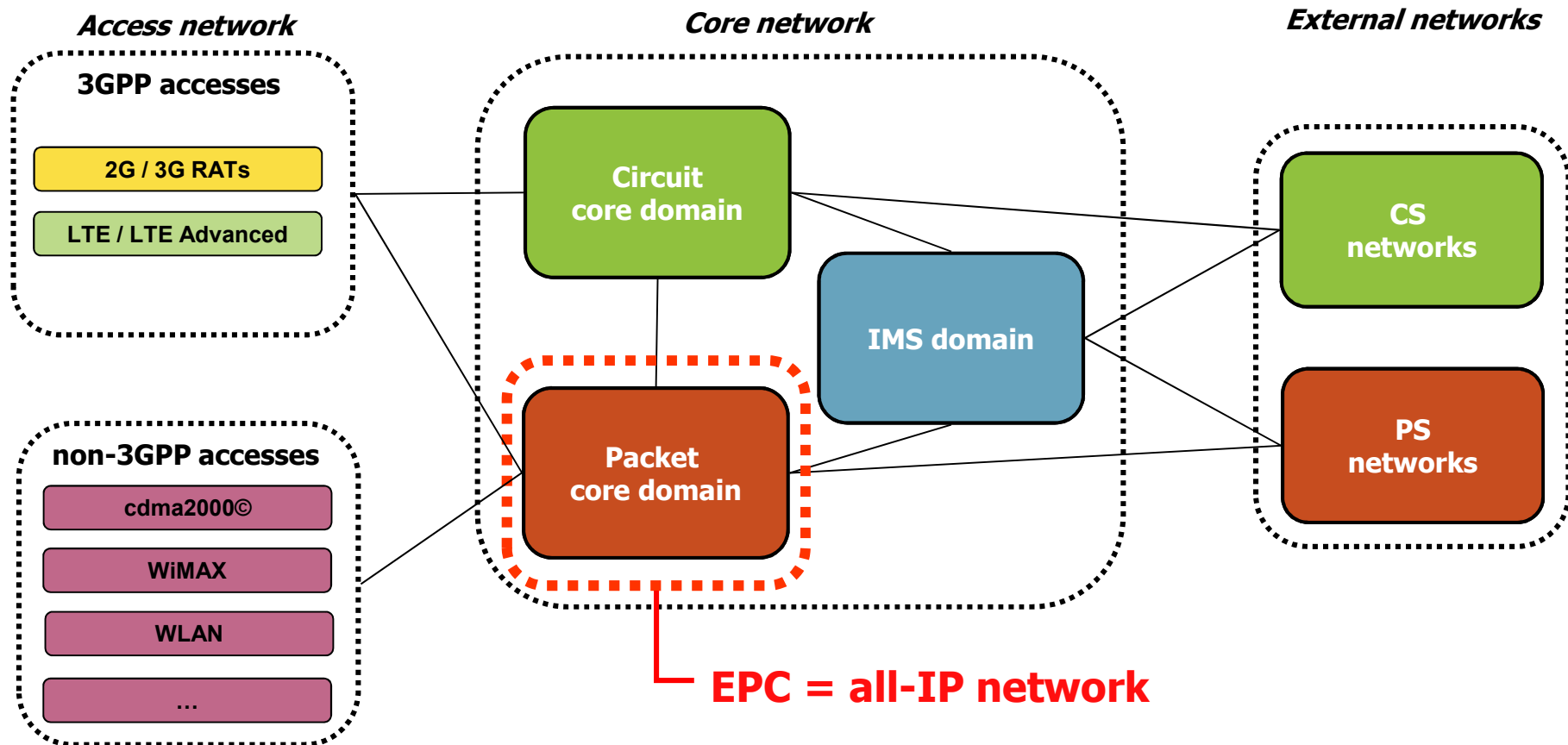
TAKEAWAY: Whole system approach

How is EPC different to current core networks?

2G/3G architecture domains



EPS architecture domains



An all-IP core network

📶 in 2G/3G, the CS domain handles the voice calls and SMS

📶 ... but in EPC, there is no CS domain anymore!

→ **How to provide those services in this all-IP network?**

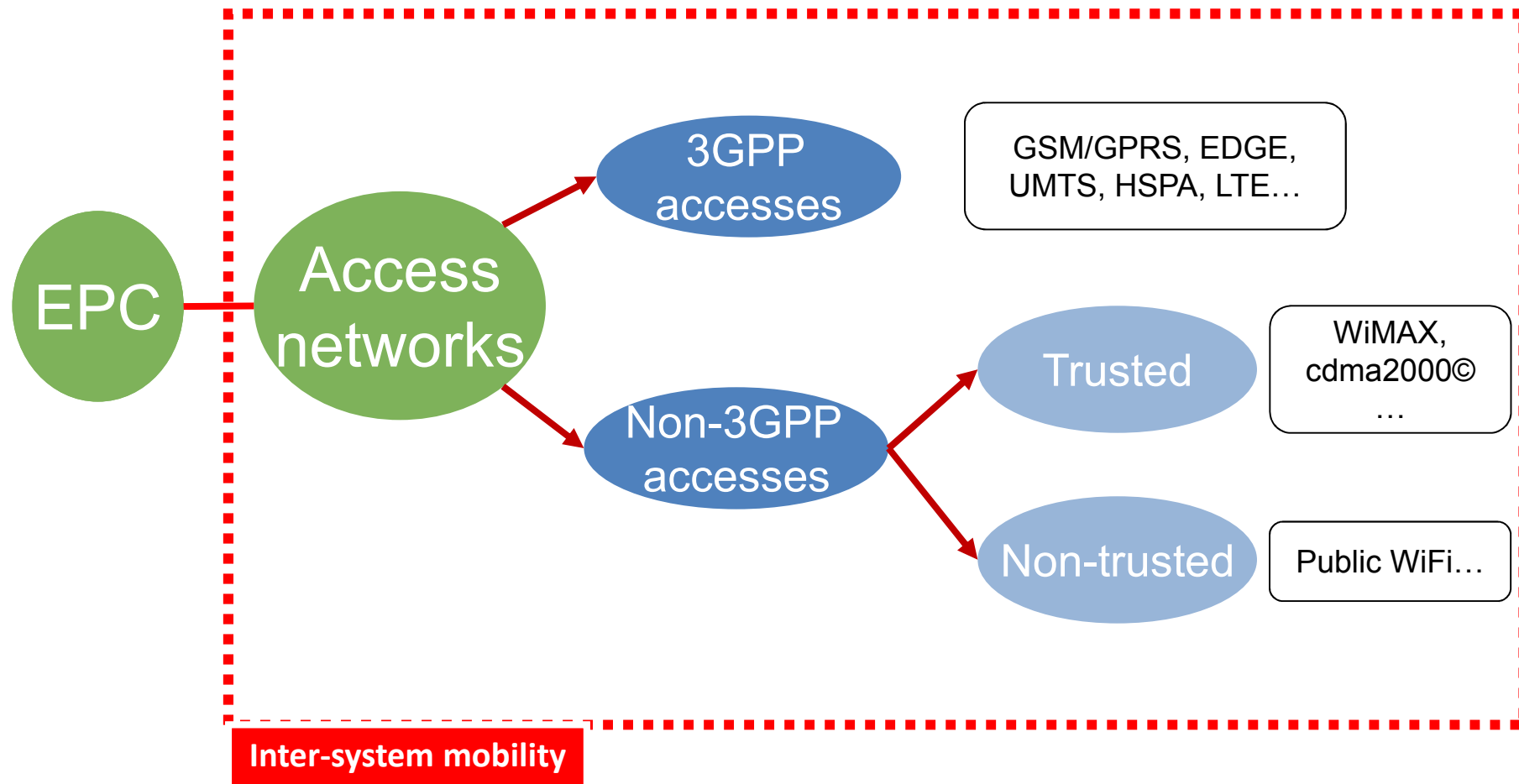
Solutions for voice

- CS fallback
- IMS: *3GPP MMTel / GSMA VoLTE*
- CS over PS
- Over the top VoIP

Solutions for SMS

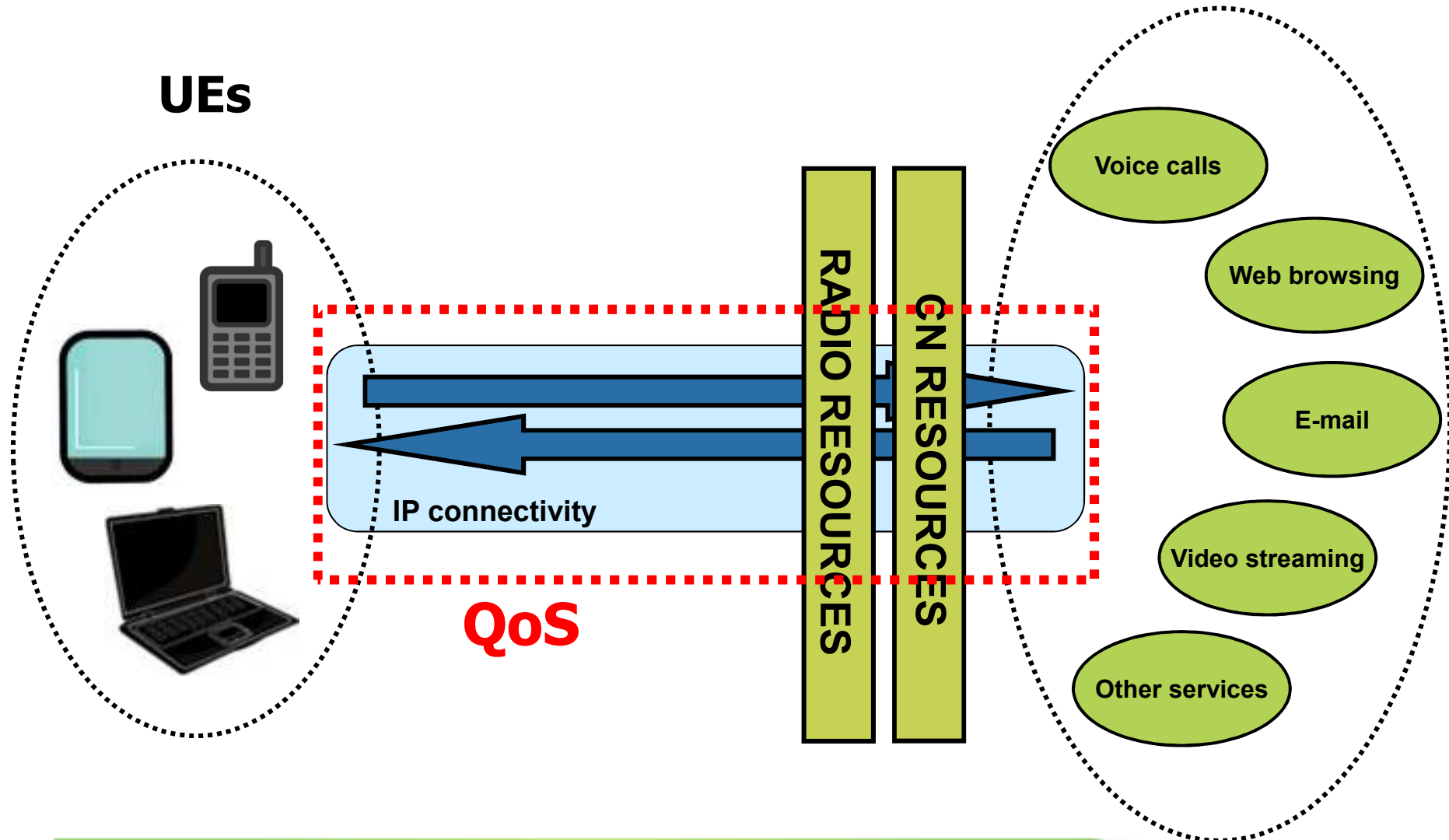
- SMS over SGs interface
- IMS
- CS over PS

Multiple access networks



TAKEAWAY: convergence facilitated by the EPC ; additional security for untrusted accesses

QoS in the EPS



TAKEAWAY: Diverse range of UE s and Services stretching Resources to the limit

QoS in the EPS

 Different services, different requirements in terms of:

- Service level: best effort or guaranteed service level
- Acceptable packet delays and loss rate

 Different QoS deployment models:

- User-based differentiation
- Service-based differentiation
- Or a combination of user / service-based

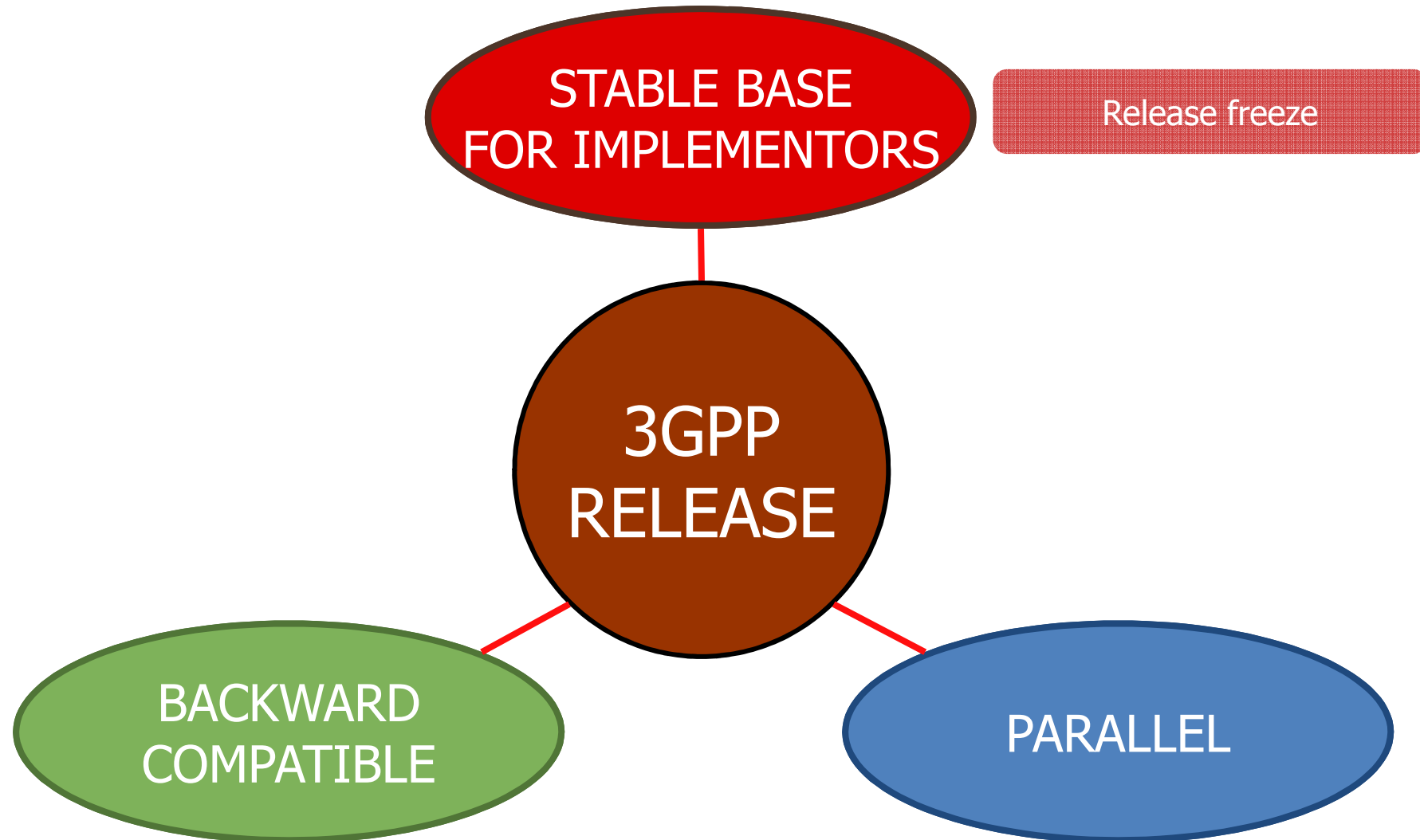
Differences between pre-EPS and EPS QoS



Pre-EPS QoS	EPS QoS
<p>📶 4 traffic classes: <i>conversational, streaming, interactive and background</i></p> <p>📶 13 individual QoS parameters: <i>Maximum bitrate, Delivery order, Maximum SDU size, SDU format information, SDU error ratio...</i></p>	<p>📶 9 QoS Classes Indexes (QCI) map to combinations of:</p> <ul style="list-style-type: none"> •GBR/non-GBR, and •predefined values for priority, packet delay budget and acceptable packet loss rate
<p>📶 Allocation and Retention Priority <i>3 priority values</i></p>	<p>📶 Allocation and Retention Priority <i>15 priority values</i></p>
<p>📶 No always-on bearer after attach</p> <p>📶 Bearer establishment initiated by the network or the UE</p>	<p>📶 Always-on IP connectivity <i>Default bearer / dedicated bearer</i></p> <p>📶 Bearer establishment initiated by the network</p>
<p><i>For more details: see 3GPP TS 23.107</i></p>	<p><i>For more details: see 3GPP TS 23.203</i></p>

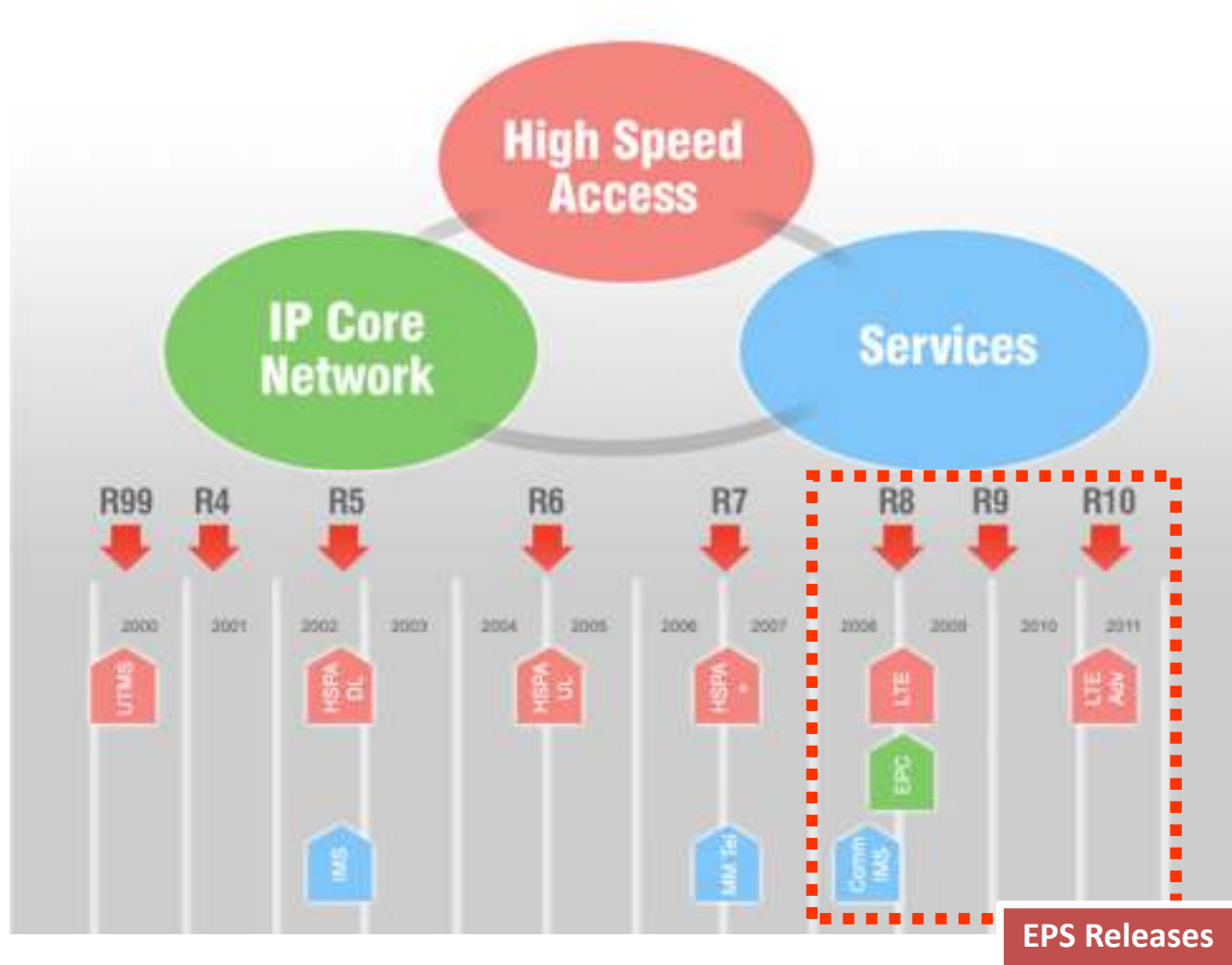
Standards – Where are we now & where are we heading?

3GPP releases



TAKEAWAY: A release is a consistent set of specifications and features provided within

Building on releases



TAKEAWAY: A new 3GPP Release slated every 1-2 years

Release 8

 First release of EPS (LTE and EPC)

 Frozen since December 2008

 SAE core work:

- High level functions and procedures common for all accesses
- Evolution of the GPRS core to support LTE access (TS 23.401)
- Support of non-3GPP accesses (TS 23.402)
- Inter-system mobility

 Some features:

- CS fallback
- Home NodeB / eNodeB
- Earthquake and Tsunami Warning System (ETWS)

Rel-9



 Frozen since December 2009

 Some features:

- IMS Emergency Calls over GPRS and EPS
- Public Warning System (PWS)
- Enhancements to Home NodeB / eNodeB

Rel-10



 Frozen since March 2011

 Some features:

- Network improvements for M2M (NIMTC)
- Local IP Access (LIPA) and Selected IP Traffic Offload (SIPTO)
- IP Flow Mobility and WLAN offload (IFOM)
- Multi Access PDN Connectivity (MAPCON)

 On the radio side:

- First release of LTE-Advanced, which was submitted to ITU-R as a candidate for IMT-Advanced 4G mobile technology

Rel-11 (future)

- 📶 Service requirements ("stage 1") are still being discussed. They will be frozen in September 2011.
- 📶 Architecture ("stage 2") and protocol design ("stage 3") will be frozen in March and September 2012 respectively.
- 📶 Some features and studies:
 - Further improvements for M2M
 - Study on Alternatives to E.164 for M2M
 - Simulation of USSD in IMS
 - QoS Control Based on Subscriber Spending Limits

Note: Summaries of all releases can be found at:

http://www.3gpp.org/ftp/Information/WORK_PLAN/Description_Releases/

Conclusions



- 📶 3GPP LTE & EPC are the major enabler for mobile broadband
- 📶 IMS, a companion to the EPC
- 📶 3GPP is open and transparent as Members define the content of Rel-11 and further releases

Thank You!



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