

End-to-End Wireless Mobile Networks Ways to Achieve the Vision



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3GPP SA ALL-IP Workshop, 7-9 Feb 00, Nice

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- Near term requirements
- Architectural principles at hand today
- Difference between CS domain and MM domain
- A view on planes and domains
- The domains and their usage
- The scope of All-IP
- The role of GPRS
- Options to go beyond UMTS R00
- Major milestones on the way towards the long-term vision
- Conclusions

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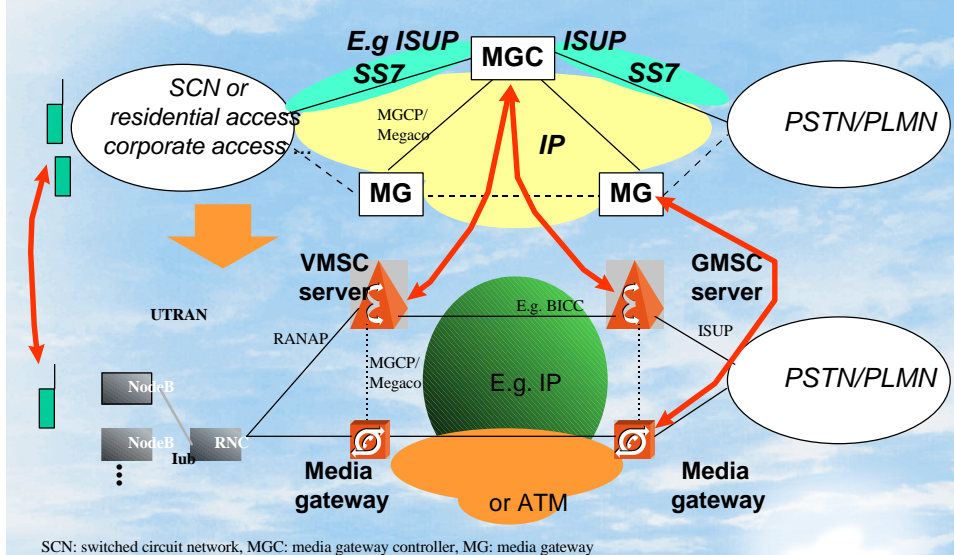
Near Term Requirements

- Soft evolution from legacy networks (GSM, GPRS)
- Making valuable UMTS R99 architecture
- Closing the gap between fixed network migration to IP and PLMN architecture evolution (GSM -> EDGE, UMTS R99, R00)
- Consolidate on only a few / single backbone infrastructure(s)
- Minimize additionally required investment in 2G infrastructure despite ongoing growth in 2G users.
 - Consolidate 2G and 3G core networks
- Rel 00: provide a solution with
 - appropriate time to market
 - reasonable complexity of standardization & development

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Architectural Principles at Hand Today

How the CS Domain is motivated



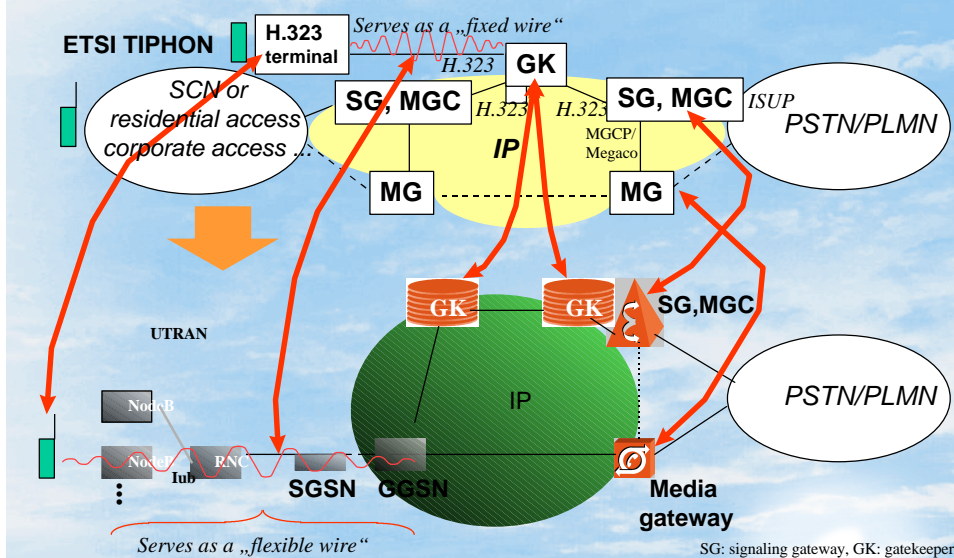
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Architectural Principles at Hand Today

How the Multimedia Domain is motivated



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Difference CS- /Multimedia-Domain

CS Domain	Multimedia Domain
<ul style="list-style-type: none"> Roaming & mob. management monolithic from PSTN gateway to radio access (MSC servers+HLR) 	<ul style="list-style-type: none"> Roaming & mob. management separated into: <ul style="list-style-type: none"> - global/network level roaming support CSCF, e.g. H.323 - edge network level mob. management GPRS
<ul style="list-style-type: none"> Roaming & mob. management based on GSM mechanisms 	<ul style="list-style-type: none"> Roaming & mob. management based on <ul style="list-style-type: none"> - GPRS mechanisms - new mechanisms (H.323, SIP) (e.g. cf. TIPHON)
<ul style="list-style-type: none"> Main change: <ul style="list-style-type: none"> consolidation on main transport technologies separation of call control from transport. 	<ul style="list-style-type: none"> Main change: overlay of multimedia call control + roaming support on packet infrastructure

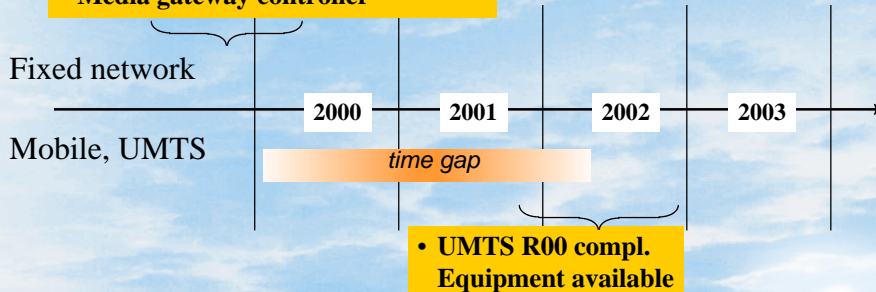
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The Time Gap Fixed/IP - UMTS R00

- The core principles of R00 reference architecture (CS domain, Multimedia Domain, media gateway, MG controller, CSCF) are introduced now for fixed network to IP migration

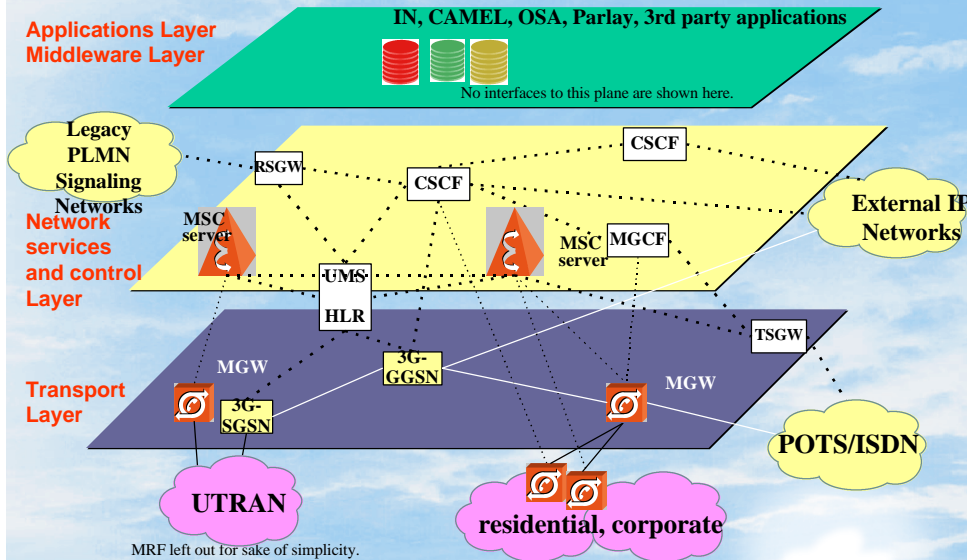
- Media gateways, MGCP, H.248
- Call feature server (incl. H.323/SIP)
- Telephony server
- Media gateway controller



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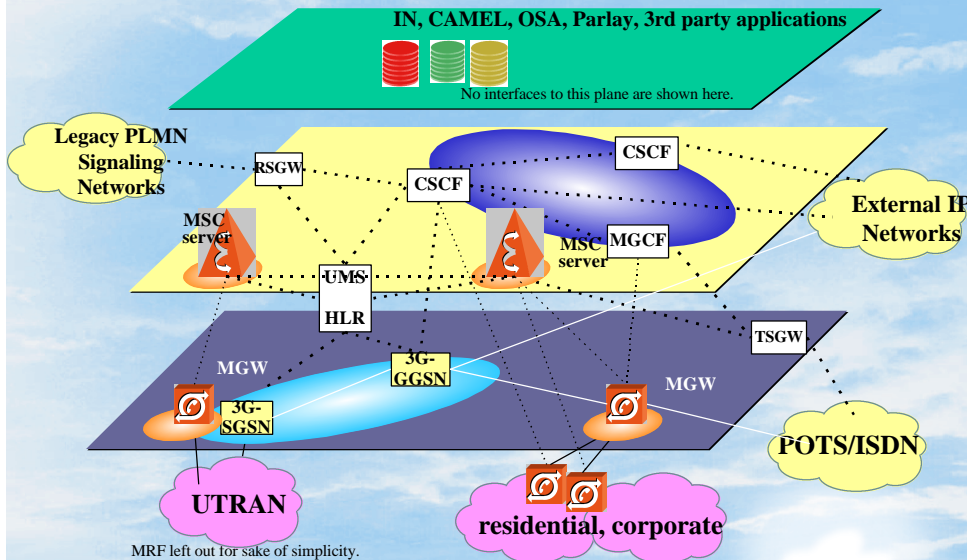
Our View of Planes



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Domains and Their Usage



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The Scope of „All-IP“ in Rel. 00 (I)

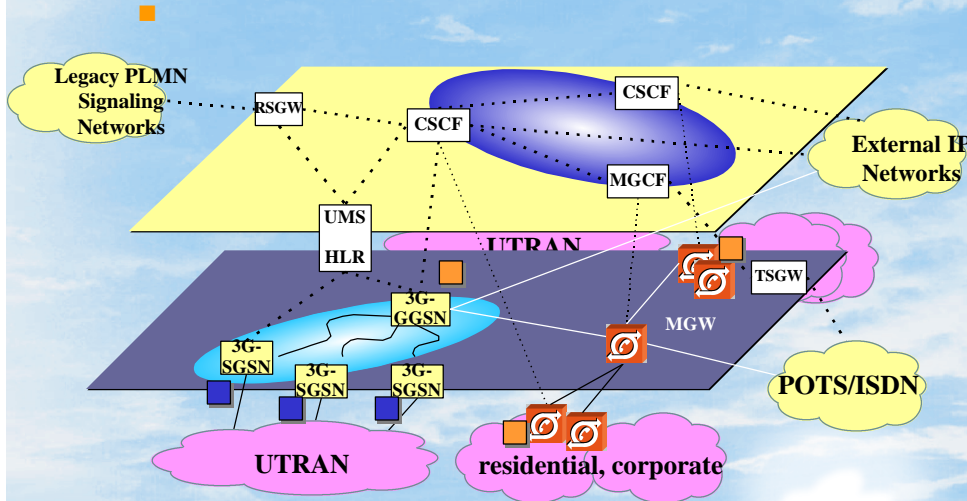
- IP based transport network consolidation
- IP + (H.323/SIP?) based multimedia call control layer.
To the extent feasible in 2000.
Note: Many issues still open (e.g. QoS, enhanced services, NNI)
Minimum set of requirements necessary to be defined, out of
 - basic call handling, roaming
 - APIs for 3rd party call control
 - Legal interception, surveillance
 - Advanced charging mechanisms, prepaid ...
 - Interoperability with PSTN, other multimedia call control
 - ...
-

The Scope of „All-IP“ in Rel. 00 (II)

- IP related mechanisms for authentication, authorization in multimedia domain
- IP based transport of legacy SS7 signaling possible
- Media interworking between access networks and IP/ATM core close to IETF models (cs domain)
- „IETF like“ interworking to PSTN (media gateway controller, media gateway)
- Reuse of R99 ps mobility management: could ease the job since extensions to H.323/SIP required, ongoing.

The Role of GPRS

GPRS services as a flexible wire from the visited point of attachment ■ to the RAN point of attachment ■.



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Options to go beyond UMTS R00 (I)

- Should H.323 be in the focus of Rel.00, more investigations into SIP and mobile wireless after Rel. 00.
- If H.323 is first used for telephony services on IP, SIP could offer means to construct more sophisticated Internet type of services
 - > better service differentiation, new revenue sources
 - > important: requirements on SIP evolution.
- Solving interoperation between different multimedia call control protocols
- Advanced charging, accounting, billing features for non-transparent multimedia call control (Note: H.323 in R'99 = transparent)
- Assume Rel.00 offers basic multimedia call control over IP: extensions required for 3rd party call control (-> OSA)
- More investigations into leveraging backend services
- Increasing reliability (e.g. H.323 GK, SIP)

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Options to go beyond UMTS R00 (II)

- Seamless service over heterogenous access networks
 - WLANs
 - Corporate wireless access
 - Residential access
 - 3G RANs
- More advanced interfacing between multimedia call control and network resource management (for QoS).
- Flexible means to control bearer resources and QoS of different network parts (core, RAN type 1, RAN type 2), QoS mappings, QoS handling over heterogenous access networks
- If importance of cs domain decreases, support of the most successful cs based legacy services in the IP multimedia domain

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Major Milestones on the Way towards the Long-term Vision

- A QoS solution for the case where IP network overdimensioning is not possible.
- Even overdimensioning possibly no solution for mission critical services (costs, non-predictable data volume, jitter, delay lost packets,...) -> End-to-end QoS solutions, policy solutions
- Carrier-grade, full featured IP multimedia control mechanisms
- Closer integration of wireline IP structures from network point of view
- Higher degree of seamless services over different access types
- Integration of, interworking with local mobility management solutions (e.g. IP based micro-mobility management solutions)

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Conclusions

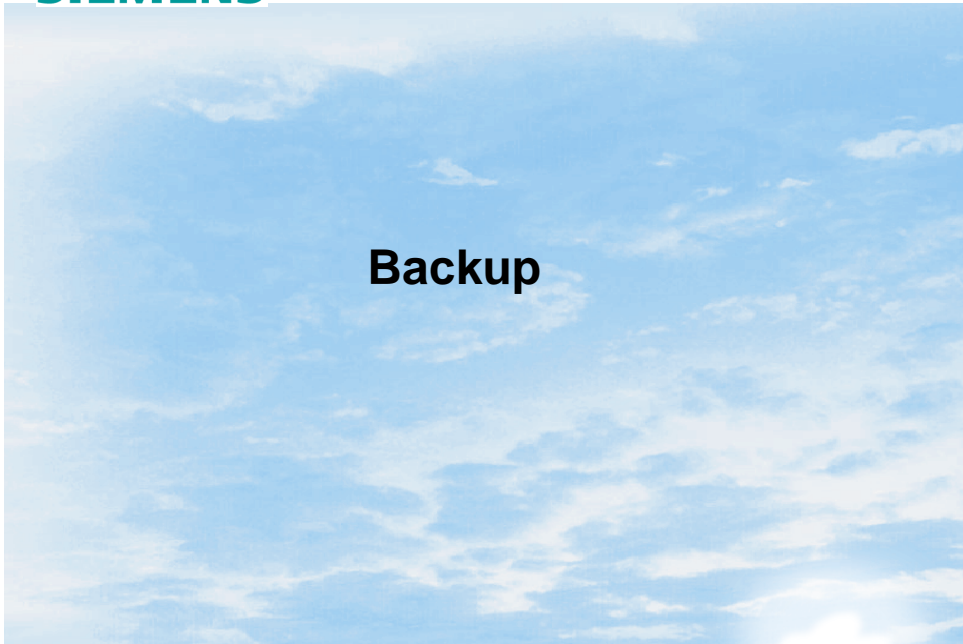
- The current UMTS R00 reference configuration is already challenging for 3GPP time schedule
- Several key issues need urgent consideration, a.o. addressing, location of functions, QoS management
- The basic domains (circuit switched bearer independent, multimedia overlay domain) are meeting the trend in fixed-IP migration

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Backup

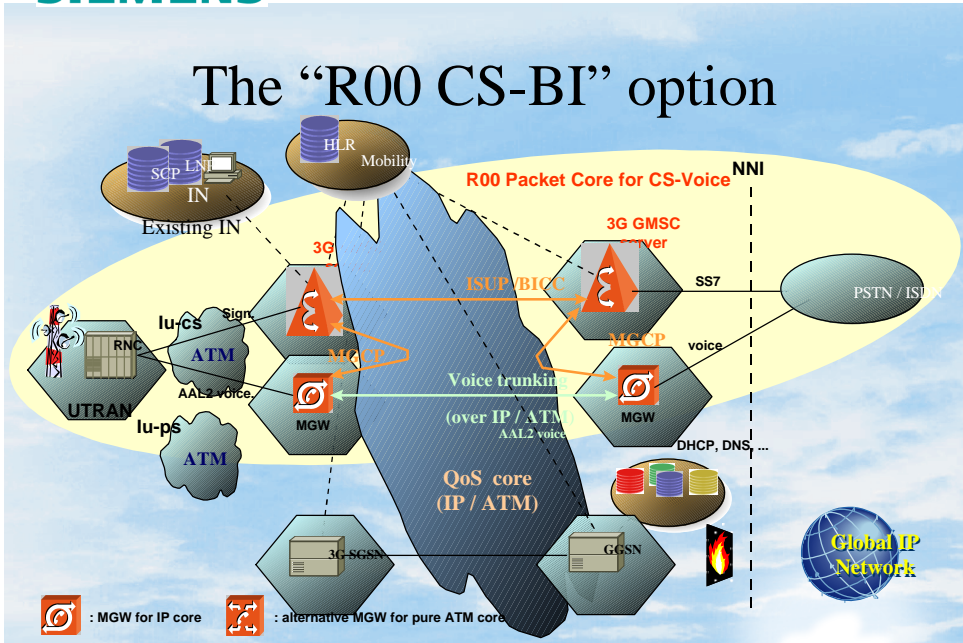


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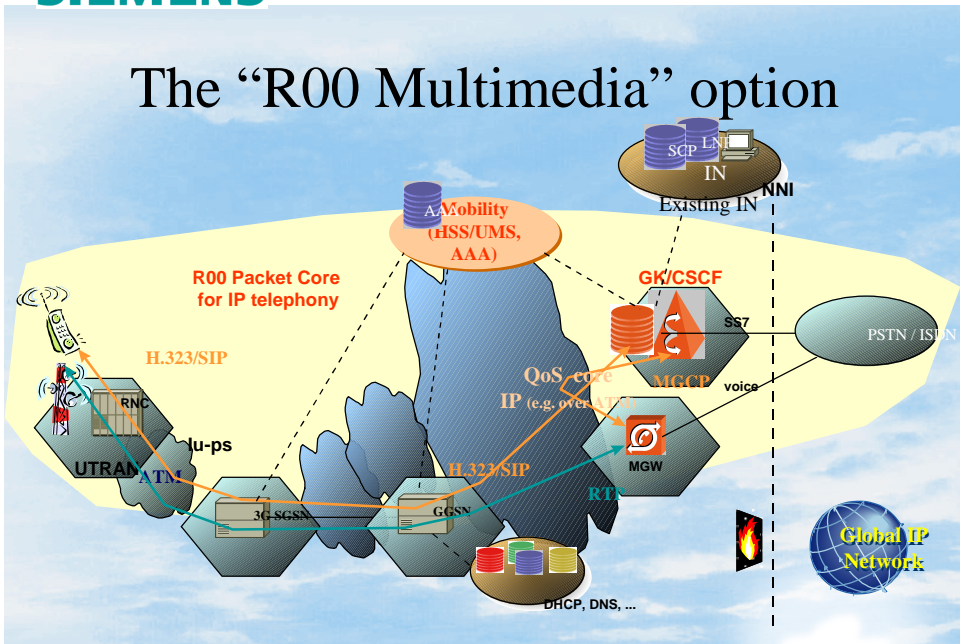
The "R00 CS-BI" option



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The "R00 Multimedia" option



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