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Regional Seminar for Africa on Fixed Mobile Convergence and Guidelines on the smooth transition of existing mobile networks to IMT-2000 for Developing Countries

Nairobi (Kenya), 9-12 May 2005

Session 1.2 "International Framework"

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN):

Towards Fixed-Mobile converged Next Generation Networks

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TISPAN_NGN Genesis

TISPAN: Telecommunication and Internet converged Services and Protocols for Advanced Networking focussing on Next Generation Networks

results from the combination, in September 2003, of :

- SPAN, formed as a Technical Body from the joining of SPS (Services, Protocols & Switching) and NA (Network Aspects)

SPAN = Services and Protocols for Advanced Networks

- TIPHON, formed in 1997 as an ETSI Project to study VoIP and subsequently extended to any Telecom (including Multimedia) services over IP

TIPHON = Telecommunications and Internet Protocol Harmonization Over Networks

Facilitating FMC through use of IMS in 3G Mobile networks and NGN

- ❑ Global standards cooperation on NGN
- ❑ NGN services & capabilities
- ❑ NGN architecture and capabilities
- ❑ Support of PSTN/ISDN service emulation
- ❑ IMS adaptations and issues for wired applications
- ❑ Ongoing ETSI TISPAN activities and workplan
- ❑ Conclusions and future initiatives

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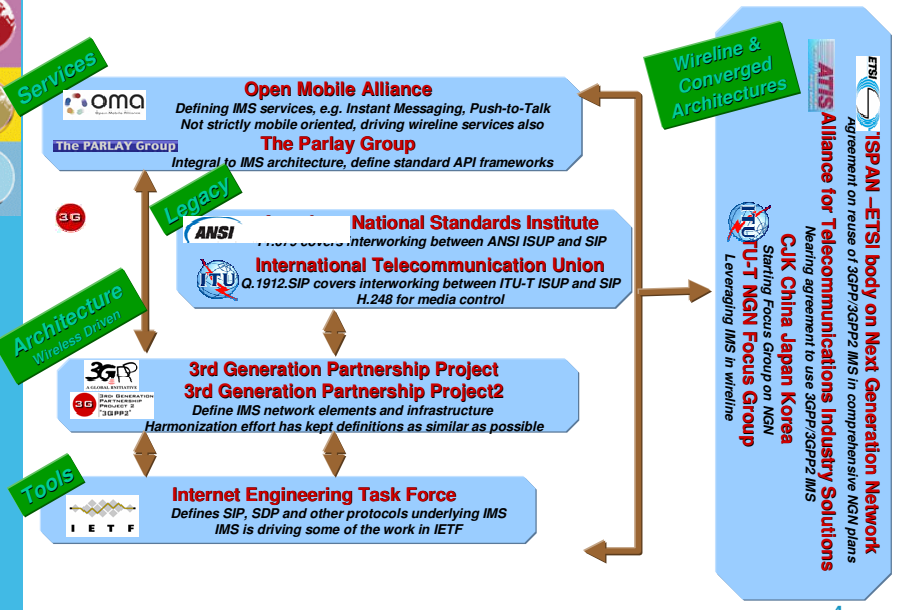
Global standards cooperation



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tispan_NGN services & capabilities

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The Next Generation Network will provide:

- A multi-service, multi-protocol, multi-access, IP based network - secure, reliable and trusted
  - Multi-services: delivered by a common QoS enabled core network.
  - Multi-access: several access networks; fixed and mobile terminals.
  - Strong emphasis on security on a managed IP network
- An enabler for Service Providers to offer
  - real-time and non real-time communication services
  - between peers or in a client-server configuration.
- Nomadicity and Mobility
  - of both users and devices
  - intra- and inter-Network Domains, eventually between Fixed and Mobile networks
- Regulatory compliance
  - Lawfull Intercept, Number portability, Emergency call….

"My communications services" always reachable, everywhere, using any terminal.

tispan_NGN Service Requirements

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- ❑Regulatory Services (according to the EU Framework directive)
  - Examples include: E112 Emergency Speech, Malicious Communication Identification and Anonymous Communication Rejection
- ❑Validated Location Information (according to EU directives)
- ❑Charging and Accounting (recently under consideration)
- ❑Solutions shall support the presence of NAT and Firewalls in the access network environment.
- ❑Solutions shall support the assignment of IP addresses to the end user equipment by the access network.
- ❑NGN IMS supports IDs for fixed lines as well as 3GPP IMS type user Identifiers
- ❑Presence, Instant Messaging Services

New generation services … without forgetting regulatory requirements

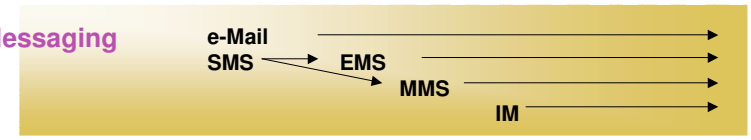
tispan_NGN Services Requirements

- TISPAN is defining a Telephony Service (PSTN/ISDN Emulation)
  - This is the same as the PSTN ISDN Telephony service over an IP infrastructure
  - This will enable use of the Existing ISDN Supplementary services
- TISPAN is defining a Voice Service (Simulation)
  - Similar but not identical to existing PSTN service
  - Including "important" "supplementary" services
  - Based on IMS capabilities for basic voice call.
  - If extensions needed, work in TISPAN (WI 03019); expected to be included in R7 3GPP IMS capabilities.
- Standard capabilities with the aim to make the service applicable for other IMS networks than TISPAN IMS, e.g. mobile networks to facilitate seamless fixed mobile convergence for Telephony over IP services

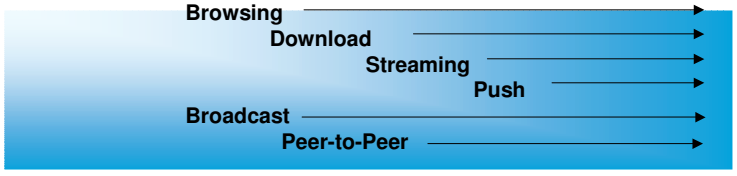
New generation services … without forgetting legacy (PSTN/ISDN emulated) services

NGN Wide range of services & Applications

Person-to-Person – Communication Services



Content-on-demand



tispan_ NGN architecture and capabilities

- Use "core" IMS as one of the NGN architecture components
  - xDSL-based access networks provide access to IMS and other subsystems (e.g.; streaming)
  - xDSL-based access networks as a new type of IP-Connectivity Access Network for the IMS
  - Supporting PSTN/ISDN simulation and multimedia services
- Complement IMS with other subsystems
  - A PSTN/ISDN Emulation subsystem specifically tailored to allow TDM equipment replacement
  - Other multimedia subsystems and applications
- IP connectivity is provided using two subsystems:
  - Network Attachment Subsystem (NASS)
  - Resource and Admission Control Subsystem (RACS)

A focussed and pragmatic approach
To provide multimedia services over IP networks
With emphasis on xDSL

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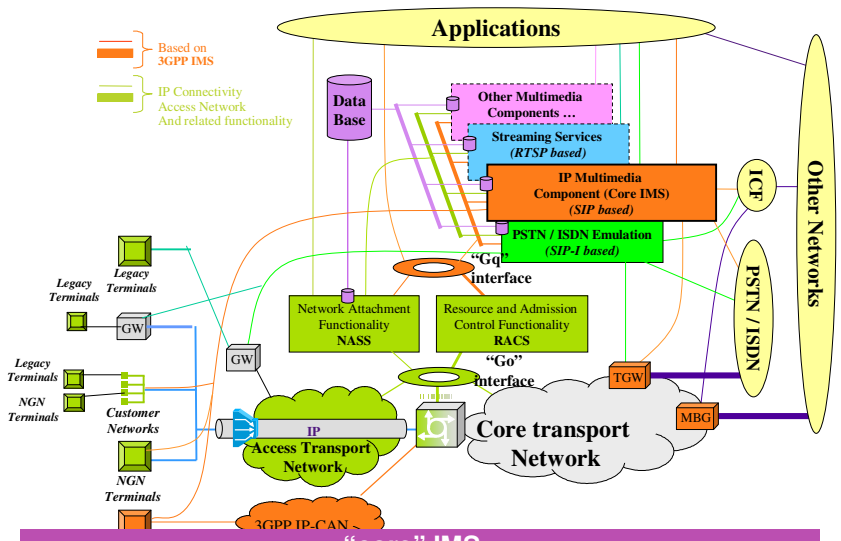
tispan _NGN detailed overview



"core" IMS :
The NGN subsystem for SIP based conversational services

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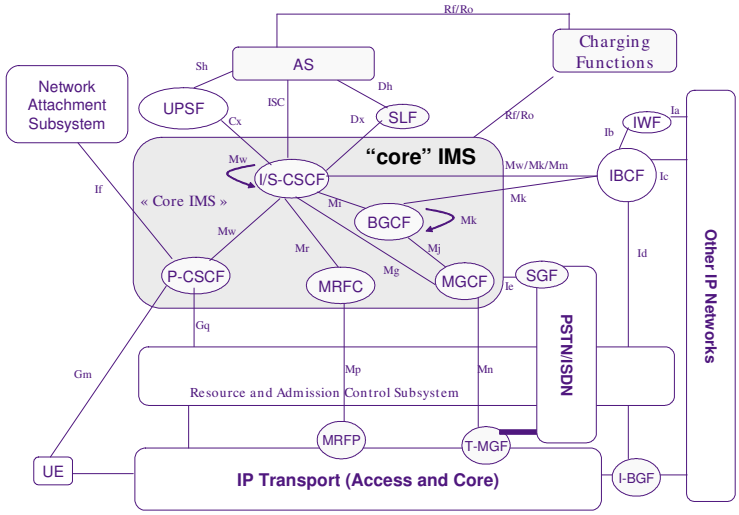
NGN IMS overview



ETSI-TISPAN is preparing "delta" endorsements to "core" IMS and add specific functionality for fixed access

3GPP Rel-6 and TISPAN_NGN R1: Architectural comparison

- **Network Attachment**
  - 3GPP: GPRS entities + HLR (PS part)
  - TISPAN: NASS entities
- **Resource Control**
  - 3GPP: PDF and GGSN
  - TISPAN: RACS entities + RCEF and BGF entities
- **MM (Multimedia) Session Control**
  - 3GPP: IMS (Rel-6)
  - TISPAN (R1) IMS (Rel-6/Rel-7)

A common core IMS for Fixed and Mobile networks

PSTN/ISDN service emulation

PSTN/ISDN service continuity in NGN:

- **PSTN/ISDN Simulation**
  - *"Provides PSTN/ISDN-like service capabilities using session control over IP interfaces and infrastructure"*
  - The provision of PSTN/ISDN-like services to advanced terminals (IP-phones) or IP-interfaces. There is no strict requirement to make all PSTN/ ISDN services available or identical, although end users expect to have access to the most popular ones, possibly with different ergonomics.

- **PSTN/ISDN Emulation**
  - *"Provides PSTN/ISDN service capabilities and interfaces using adaptation to an IP infrastructure"*
  - Emulates a PSTN/ISDN network from the point of view of legacy terminals (or interfaces) by an IP network, through a gateway. PSTN/ISDN services remain available and identical (i.e. with the same ergonomics), such that end users are unaware that they are not connected to a TDM-based PSTN/ISDN.

NGN will facilitate PSTN replacement and multimedia services

IMS adaptations and issues for fixed access applications

- TISPAN_NGN has a focussed approach in adapting 3G IMS as a key base component in the NGN architecture
  - It needs adaptions to support xDSL access (on-going)
  - Still a number of issues to be addressed (Identifiers, Security, IPv4/v6 interworking and transition …)
- A promising major step to enable smooth Fixed-Mobile convergence for Multimedia:
  - Consolidating the IMS and Service Platforms access & transport technology independence
  - Enabling seamless service interworking
  - An effective basis to support Nomadicity and Mobility features
- Still a number of challenges ahead
  - Resource optimization and transport technology evolution
  - Ensure QoS for real time services …
  - Identifiers, Security …

_NGN NGN Security Issues

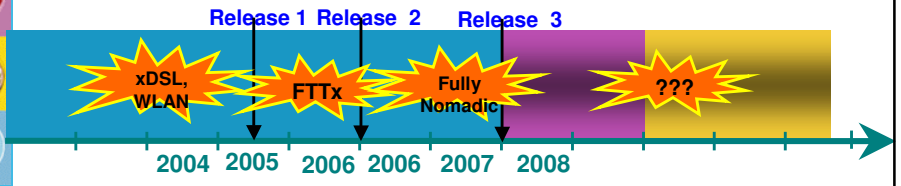
- TISPAN NGN/IMS security requirements differ from 3GPP IMS
- Security issues under study:
  - Security for supporting xDSL, WLAN, (cable?) scenarios,
  - Smooth NAT/FW traversal of NGN signaling and media protocols,
  - Authentication to NASS and IMS services
    - HW-based ISIM (UICC/USIM) and/or
    - SW-based ISIM authentication,
    - Non- ISIM based authentication
  - Key Management,
  - H.248 security for residential/access gateways,
  - Interworking of various security mechanisms,
  - Interdomain/Interconnection security,
  - Single-sign on,
  - Various, unique identities in the NGN environment
  - Lawful Interception …

Emergency communications
Status

- Requirements aligned with 3GPP (scope of Rel-7 ongoing work) where applicable
- Areas under consideration
  - Call routing several possible options
  - Location information of caller
  - Priority/preferential treatment of emergency calls
  - Authentication of identifiers
- Different regulatory environments need to be considered including possible conflicting requirements

Highly regulated requirements (under European directives)

tispan _Ongoing ETSI TISPAN activities and workplan



- Release 1 bringing Multimedia services
  - 0 Terminology, Strategy, QoS, Security, NNA & Identification, ENUM
  - 1 Requirements, General architecture, Early services and protocols
  - 2 Detailed architecture, Specific services and protocols, 3GPP interface endorsements, testing
  - 3 Operations Support Systems, Congestion control, NGN user data, Single sign-on, PSTN/ISDN emulation
- Release 2 optimizing access resources usage
  - According to user subscription profile and service use
  - Corporate users specific requirements …
- Release 3
  - Streaming? Full mobility? IP-TV?

Release 1: A tough task under significant market pressure

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tispan _Conclusions and initiatives

- A strong industry demand
  - For new generation Multimedia services on xDSL access
  - For preparing replacement of soon becoming obsolescent PSTN
- For a first Release of specifications by 2005
  - Giving main standards directions
  - With realistic and implementable solutions
- ETSI TISPAN proposing an architecture basis consisting of a range of subsystems:
  - Access network attachment Subsystem, Resource and admission control sub-system
  - Maximizing Fixeed and Mobile convergence, through adoption of 3G/UMTS IMS component for support of conversational services
- TISPAN collaborating with 3GPP to accommodate Wireline access network requirements by IMS
  - A second workshop with 3GPP in Washington end of March 05
  - To coordinate the IMS evolution and resolve issues
- TISPAN contributing to ITU-T on a global standard
  - ITU-T NGN Focus Group, SG4, SG 11, SG 13, SG 19, other SDOs

A significant step is being taken to enable the Multimedia Fixed-Mobile Convergence in TISPAN_NGN Release 1

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Summary TISPAN_NGN Release 1

- Tight time scale but can be achieved
- Supported by service provider and suppliers
- First phase (Release 1) mid year 2005
- Based on 3GPP R6-7 with extensions
- NGN offers Fixed mobile convergence
- Wireless and Wireline access networks
- Multi service capability
- Scalable network solutions
- Addresses Regulatory related requirements

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THANK YOU

Questions/Comments ?

ETSI TISPAN Portal: http://portal.etsi.org/Portal_Common/home.asp
Publicly open area: http://portal.etsi.org/docbox/TISPAN/Open/

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Acronyms (1)

API	Application Programming Interface
AS	Application Server
BGCF	Breakout Gateway Control Function
CAMEL	Customised Applications for Mobile Enhanced Logic
CSCF	Call Session Control Function
IMS	IP Multimedia Subsystem
IM SSF	IP Multimedia Service Switching Function
IP-CAN	IP- Connectivity Access Network
ISC	IP_multimedia_subsystem_Service_Control_interface
IWF	Inter-Working Function
GPRS	General Packet Radio Service
HLR	Home Location Register
HSS	Home Subscriber Server

Acronyms (2)

MRF	Media Resource Function
MG	Media Gateway
MGCF	Media Gateway Control Function
NASS	Network Attachment Sub-System
NA(P)T	Network Address (Port) Translation
OSA	Open Services Architecture
PDF	Policy Decision Function
SCS	Service Capability Server
QoS	Quality of Service
RACS	Resource and Admission Control Subsystem
UTRAN	UMTS Radio Access Network
SIP	Session Initiation Protocol
SLF	Subscription Locator Function
UMTS	Universal Mobile Telecom. System
UTRAN	Universal Telecom. Radio Access Net.
WLAN	Wireless Local Access Network