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NGN services: new concepts and NGN Open Service Environment

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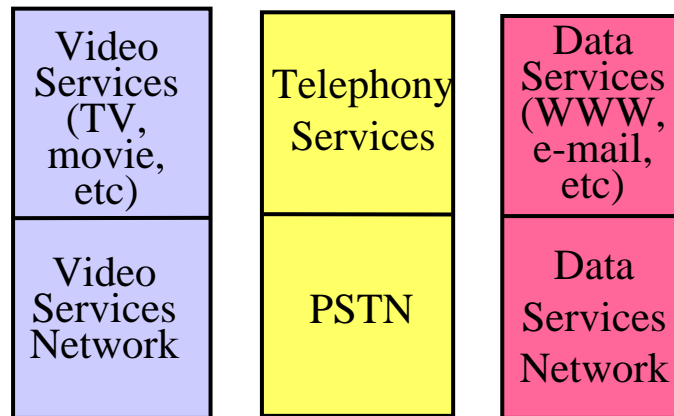
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Outline

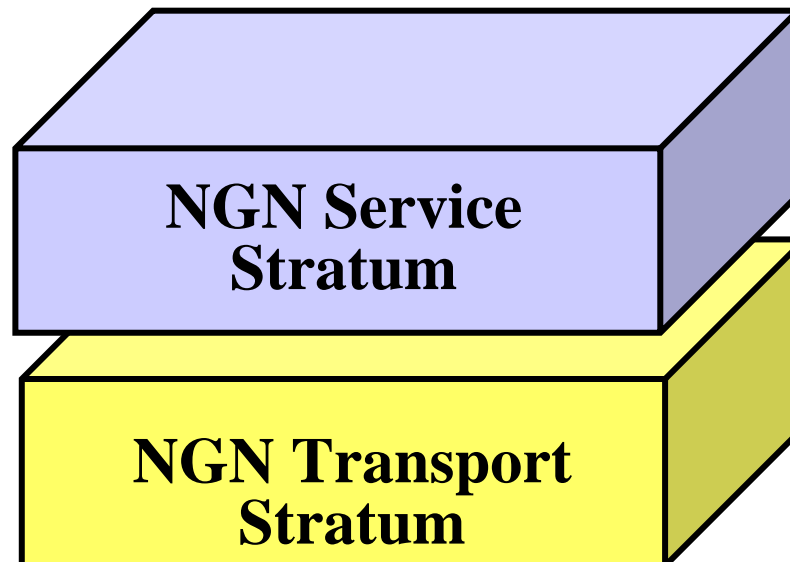
- o NGN Services standardisation
- o NGN Open Service Environment
- o Selected work items based on Q.2/13 activities
- o Future steps in the service area

NGN Convergence model (Y.2011 NGN general reference model)

Pre-NGN:
Vertically
Integrated
Networks



NGN:
Horizontally
Integrated
Networks



Next Generation Services

- o From today's networks
 - Services are typically “vertically integrated”
 - Services require specific infrastructure components for their delivery
- o to NGN : flexible service creation and provisioning
 - Horizontal Convergence: services are no more vertically integrated
 - Network functions are componentised
 - New paradigm of standard “CAPABILITIES” as service enabling toolkit
- o A new challenge for regulation
 - NGN moves the competition from lower layers to service layers
 - Leading to new sources of possible market power, bottlenecks
 - “Control Points” identification: major area of NGN regulators' work

The Service Shift as consequence of the NGN model

Service standardisation

Key objectives in NGN service standardisation

- o Not just a new voice network
- o *“Service level equal or better than in circuit-switched networks”*
- o Services specified in terms of required “capabilities”
- o Precise service definitions are not an objective like in legacy world
 - Public Interest Services are a special case

Services expected to be supported in NGN Release 1

- o Multimedia services
- o Data communication services
- o PSTN/ISDN Simulation services
- o PSTN/ISDN Emulation services
- o Public Interest Services
- o NGN is not intended to preclude access to the Internet

It's a Provider decision which services will be actually deployed

Multimedia services: expansion of the service features

- o Real-time Conversational Voice
- o Point-to-point interactive multimedia, e.g. real-time voice/text/video
- o Collaborative interactive communication, e.g. multimedia conferencing
- o Push to talk over NGN
- o Content delivery, e.g. Radio/Video streaming
- o Broadcast services (relying on Multicast), e.g. emergency community notification
- o Messaging, e.g. IM, SMS, MMS
- o Location-based services, e.g. tour guide service
- o Presence and general notification services
- o Push-based services, e.g. MMS notification Information services
- o Hosted and transit services for enterprises, e.g. IP Centrex
- o 3GPP Release 6/3GPP2 Release A OSA-based services

Source: NGN Release 1 Scope (Supp.1 to Y.2000 series)

PSTN/ISDN Emulation and Simulation

In evolution path to NGN, NGN Release 1 shall support:

- o legacy terminal equipment (e.g. PSTN/ISDN phones)
- o PSTN/ISDN-like capabilities

PSTN/ISDN Emulation

- o From the end user perspective, the NGN “appears” supporting the same types of services offered by the existing PSTN/ISDN
- o Legacy terminals are enabled to continue to use existing telecommunication services while connected to NGN

PSTN/ISDN Simulation

- o NGN terminals in an NGN network are enabled to use PSTN/ISDN-like service capabilities
- o But legacy terminals with terminal adaptations may be used too
- o Implemented over IP-based control infrastructure (e.g. using SIP)

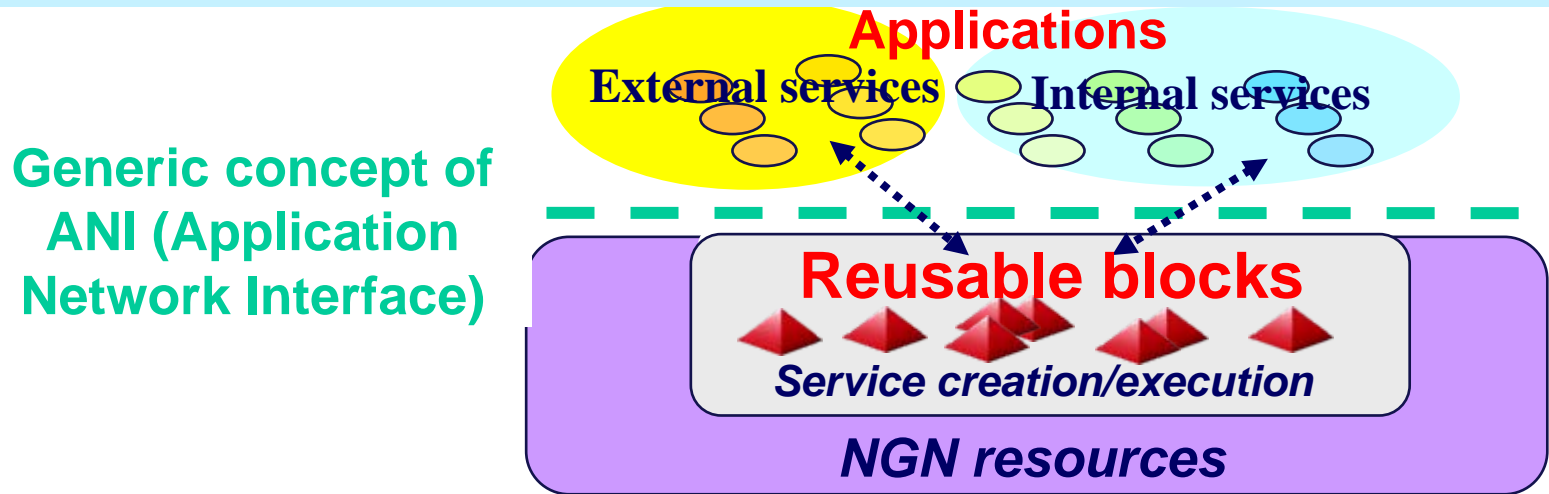
Evolution towards NGN preserving existing services

Regulatory and legal requirements: Public Interest Services

- o Emergency telecommunications (including Early Warning)
 - individual-to-authority, e.g. calls to Emergency SP
 - authority-to-authority, e.g. TDR
 - Authority-to-individual, community notification services
- o Support for users with disabilities
- o Lawful Interception
- o Service unbundling
- o Number portability
- o Network or Service Provider selection
- o Prevention of unsolicited bulk telecommunications
- o Malicious communication identification
- o User identifier presentation and privacy

NGN shall provide capabilities for support of Public Interest Services required by regulations or laws of national or regional administrations and international treaties

The concept of “Capabilities” as re-usable building blocks for services and applications



A reusable set of Capabilities

- Functional groups within a SP's network, reusable by other services
- Interworking of functions for service execution & management
- may be used by services within a SP's network or outside
- support of multiple and future business models
 - Third Party Access, Externalisation, underlying capabilities versus service creation/execution environment capabilities

Still much to do to make this a reality (standards for open service creation/execution, business fit implementations)

The list of NGN capabilities identified in Y.2201

- o Transport connectivity
- o Communication modes
- o Media resource management
- o Codecs
- o Access Networks and network attachment
- o User networks
- o Interconnection, Interoperability and Interworking
- o Routing
- o QoS
- o Accounting and Charging
- o Numbering, naming and addressing
- o Identification, authentication and authorization
- o Security
- o Mobility management
- o OAM
- o Survivability
- o Management
- o **Open Service Environment**
- o Profile management
- o Policy management
- o **Service enablers**
- o PSTN/ISDN emulation and simulation
- o Public Interest Services support
- o Critical infrastructure protection
- o Non disclosure of info across NNI
- o Inter-provider exchange of user-related information

Service enablers (as named in Y.2201)

Capabilities providing features for specific or advanced services, and/or enabling access to information provided by these capabilities

Main SDO sources for R1 service enablers: 3GPP (IMS) and OMA

- o Group management
- o Multicast support
- o Personal information management
- o Message handling
- o Presence
- o Location management
- o Push
- o Device management
- o Session handling
- o Web-based application support
- o Data synchronization

Drivers for advanced application scenarios

Mapping of services to service enablers (examples from Y.2201)

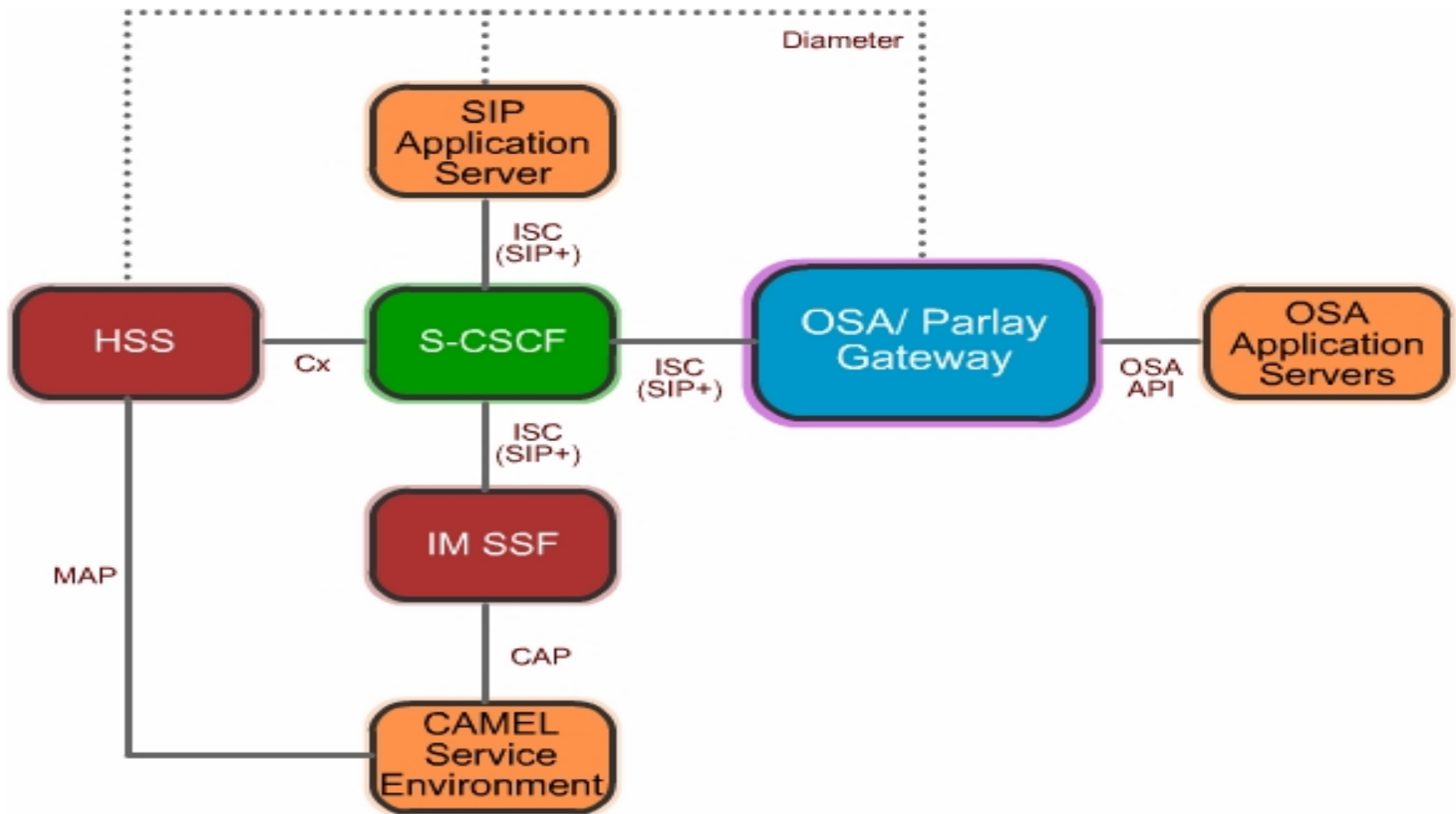
Services\Service Enablers	Presence	Location management	Group management	Message handling	Multicast support	Push	Session handling
Real-time Conversational Voice services							X
Real-time Text							X
Messaging services	X		X	X			X
Push to talk over NGN	X		X				X
Point to Point interactive multimedia services			X				X
Collaborative interactive communication services		X	X				X
Content Delivery Services		X				X	
Push-based Services		X				X	
Broadcast/Multicast Services					X		
Hosted and transit services for enterprises			X				X
Information Services	X	X				X	
Presence and general notification services	X	X	X				
3GPP Release 6 and 3GPP2 Release A OSA-based services	X	X	X	X	X	X	X
Data retrieval applications	X					X	
VPN services			X		X		

Towards an Open Service Environment in NGN

- “Open Service Environment” for flexible and agile service creation, execution and management
 - Leveraging new capabilities enabled by 3G & Internet technologies
 - Exposing capabilities via standard application network interfaces
 - Portability and re-usability of capabilities across networks
 - Flexible development of applications and capabilities by Service and Network Providers, as well as Third Party Providers
- NGN Release 1 should support the following classes of service creation environments :
 - IN-based service creation environment (INAP, CAMEL, WIN, ...)
 - IMS-based service creation environment
 - Open service creation environment (OSA/Parlay, Parlay X, OMA, ...)

A service framework for implementation of value added services taking advantage of network capabilities

Service creation environments (example)

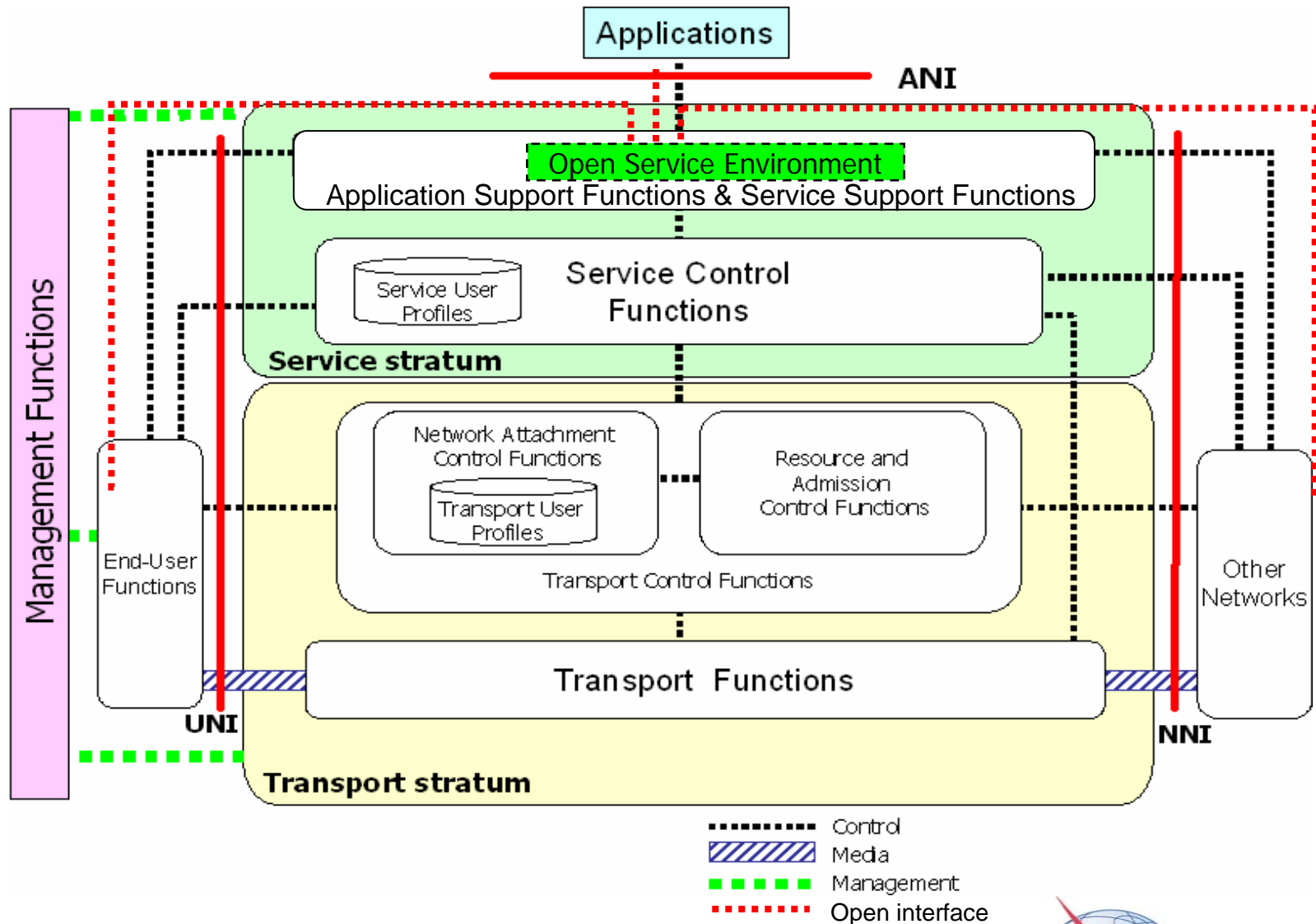


Source: 3GPP IMS and OSA/Parlay

Opening NGN: essential topic going forward

- o **How to open**
 - Service Oriented Architecture (SOA) as framework ?
 - Web Services as implementation tool set ?
- o **What to open (expose)**
 - Network capabilities <-> Applications ?
 - Network capabilities <-> Network capabilities ?
- o **Various related work items in ITU-T NGN GSI**
 - Open Service Environment capabilities, converged services
 - Web Services: deployment scenarios & other aspects (security)
 - OCAF model and components
- o **Relationship with other SDOs to be developed**
 - Architectures and capabilities for open service environment
 - Parlay/X, OMA, 3GPP, OASIS, W3C, WS-I, DMTF/TMF etc.
- o **A very active market**
 - Service Delivery Platforms, Middleware
 - Telecom and IT manufacturers, others

Open Service Environment in NGN Architecture



Service Requirements for Open Service Environment

- o NGN Open Service Environment
 - shall provide standard APIs for service providers, third party application providers and, potentially, end users
 - shall provide service level interoperability underlying different networks, operating systems and programming languages
 - shall support service independence from transport providers and manufacturers
 - shall support location, network and protocol transparency
 - shall provide capabilities for coordinating services and capabilities
 - shall provide secure access to open service environment capabilities
 - shall provide interworking with service creation environments

Open Service Environment Capabilities (Y.ngn-openenv)

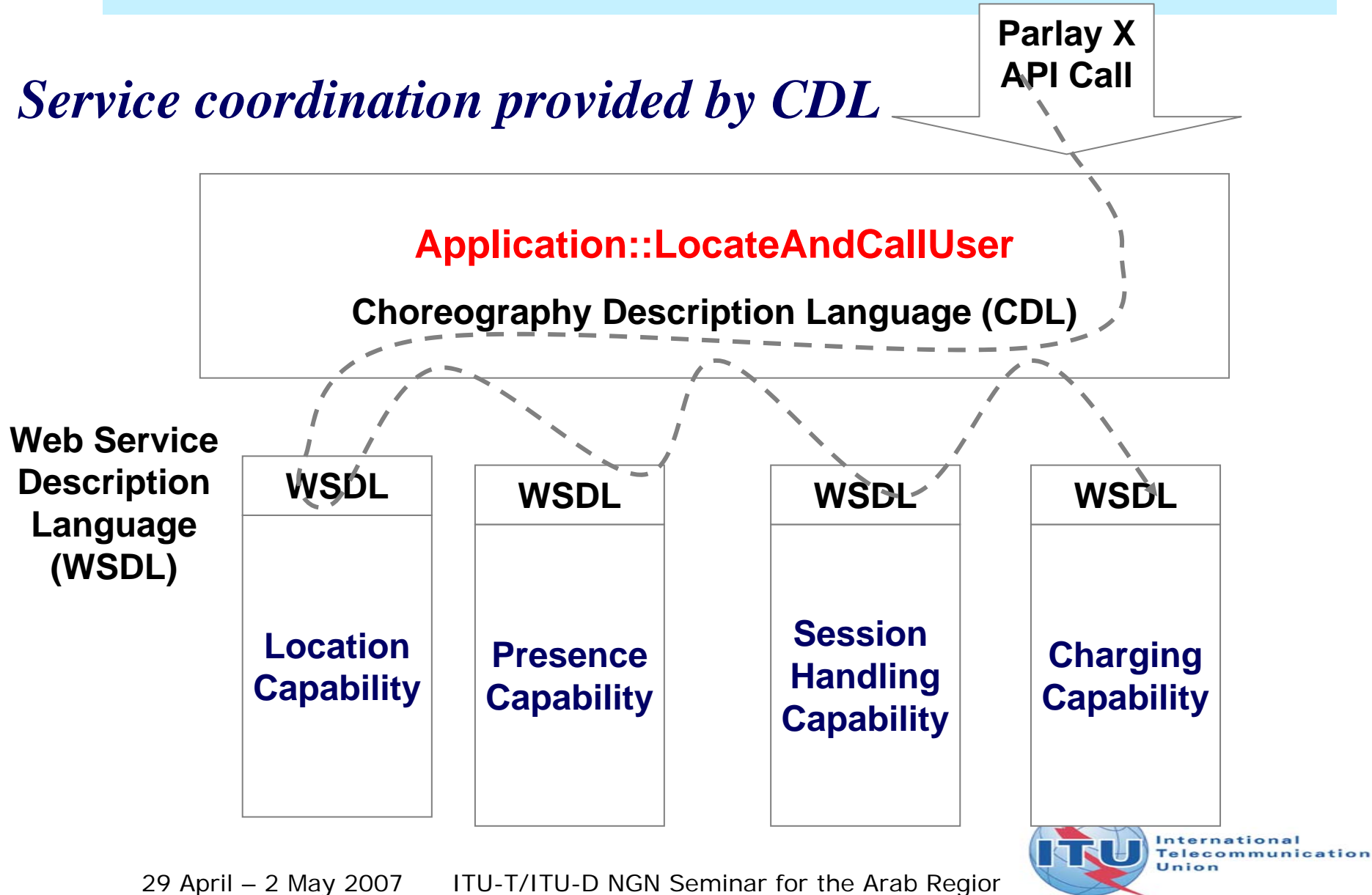
- **Service coordination**
 - Coordination with applications, tracking of capabilities, availability of capability state change information
- **Service discovery**
 - Scalable and secure User/Device-interest service discovery
- **Service registration**
 - Directory registration accessible by other capabilities & applications
- **Service composition**
 - Description logic for static or dynamic composition of services
- **Service management**
 - Management features (e.g. failure detection/recovery, replacement)
- **Development support**
 - Construction, trial, deployment and removal of applications
 - Component reusability, mixing-and-matching, life cycle support

Service Coordination

- Shall provide coordination of applications and services with capabilities
- Shall provide the tracking of NGN capabilities or service components from various service providers, and the relationship among these capabilities or service components
- Shall support the information on state change of capabilities or service components for applications and services

Service Coordination example (implemented via Web Services tool set)

Service coordination provided by CDL



Relationship with other standards work [1]

Ongoing work – Y.ngn-openenv

NGN capabilities	OSA/Parlay	OMA OSE	OASIS	W3C	OMG
Service Coordination		Policy enforcer	WS-Coordination 1.1 WS-Business Activity 1.1 WS-Atomic Transaction 1.1	Web Services Policy 1.5 – Framework Web Services Policy 1.5 – Attachment Web Services Policy 1.5 Namespace Web Services Policy 1.5 XML Schema	Current effort: - UPMS (SOA extension of UML) - BPDMExisting Standards: BPDME Existing Standards - UML - EDOC: component architecture - Enterprise Distributed Object Computing
Service Discovery	Discovery of framework and network service capability Features	Discovery Enabler	Universal Description, Discovery and Integration (UDDI) 3.0.2 ebXML Registry Information Model (RIM) v3.0 ebXML Registry Services and Protocols (RS) v3.0	Web Services Description Language (WSDL) 2.0	Current effort: - UPMS (SOA extension of UML) - BPDME Existing Standards: - RAS : Reusable Asset Specifications - RAS Description: Metamodel for describing and managing reusable assets
Service Management	Registering of network service capability features, Integrity Management	Execution Environment	Management Using Web Services (WSDM-MUWS) 1.0 Management Of Web Services (WSDM-MOWS) 1.0 WS-Notification WS-Brokered Notification	Service Modeling Language WS-Eventing	BPRI: Business Process Run time Interface Description: looking at runtime system, monitoring and measuring its and evaluating these measurements against what the expectations RAS: to publish the services

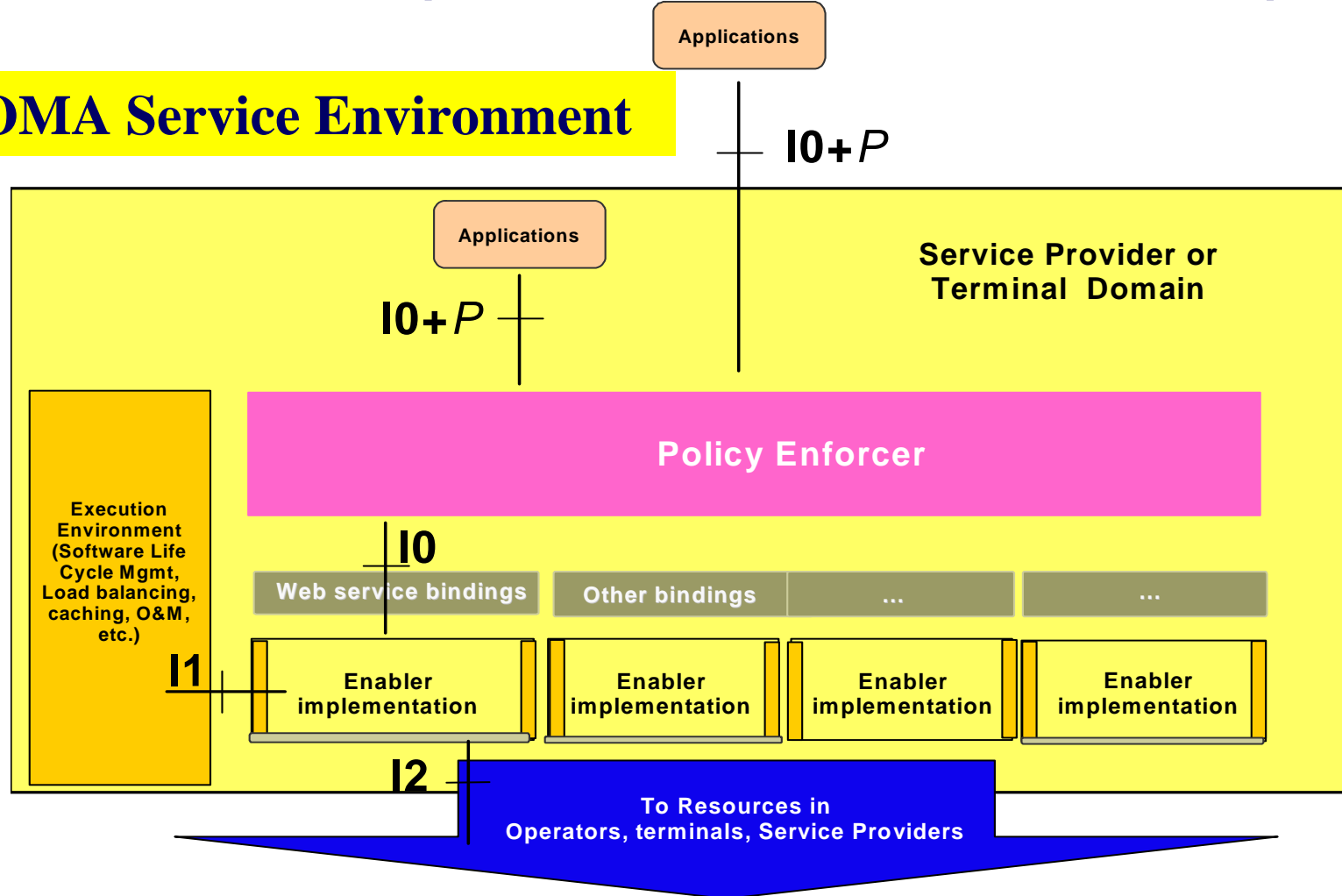
Relationship with other standards work [2]

Ongoing work – Y.ngn-openenv

NGN capabilities	OSA/Parlay	OMA OSE	OASIS	W3C	OMG
Service Composition			Business Process Execution Language for Web Services 2.0	Web Services Choreography Description Language 1.0	UPMS, BPMN, BPDM
Service Development Support		Execution Environment		Service Modeling Language	- UPMS, - BPMN, - BPDM Existing Standards - EDOC
Service Registration			ebXML Registry Information Model (RIM) v3.0 ebXML Registry Services and Protocols (RS) v3.0 Universal Description, Discovery and Integration (UDDI) 3.0.2		Existing Standards - RAS - MOF
Security	Authentication, Authorization	Security related Enablers	WS-Security 1.1 WS-Security: SOAP Message Security 1.1 WS-Security: Username Token Profile 1.1 WS-Security: SAML Token Profile 1.1 WS-Security: X.509 Certificate Token Profile 1.1 WS-Federation		None

Analysing the work of other SDOs for NGN Open Service Environment (example)

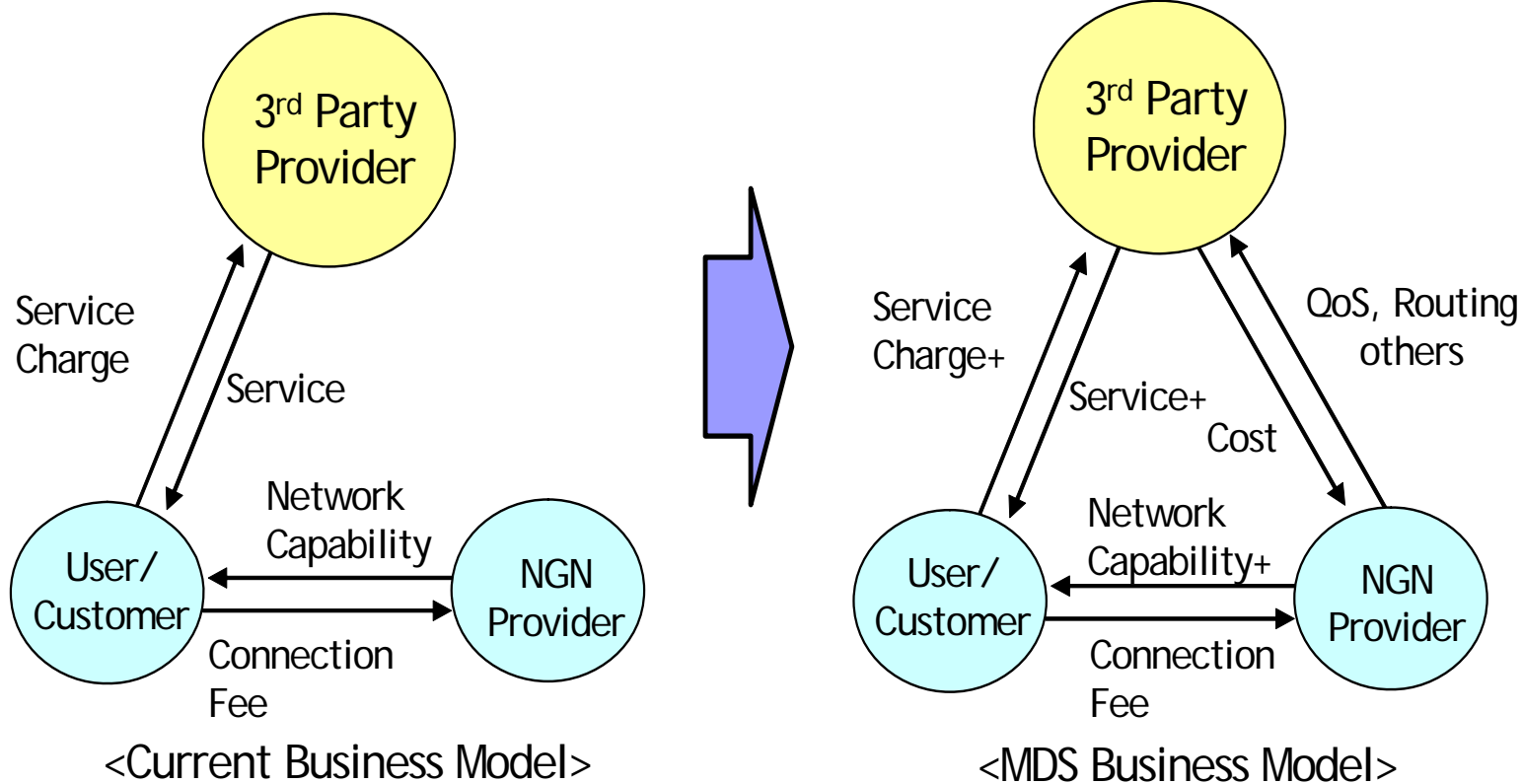
OMA Service Environment



Source: OMA OSE

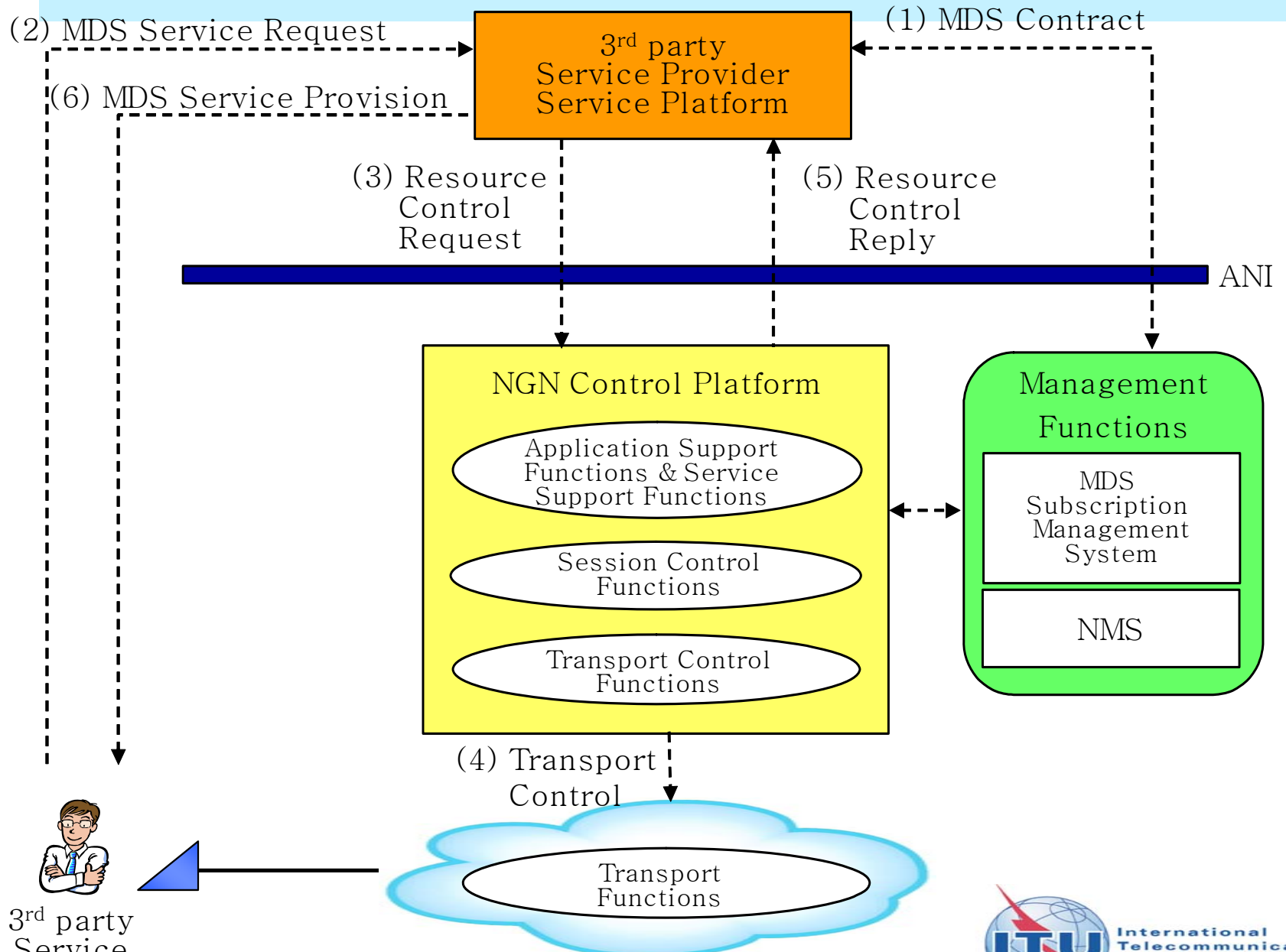
3rd party application scenarios: MDS (Managed Delivery Services) – Y.MDS-req

- Managed Delivery Services can be offered by 3rd Party Providers to their customers enhancing their offer with usage of capabilities provided by NGN Provider through ANI (Application Network Interface)



A win-win situation for both 3rd Party Provider and NGN Provider

MDS provisioning mechanisms



3rd party Service

Progress in Evolution to NGN

Generalities

- Principles and requirements for evolution to NGN (ongoing)
- Scenarios for PSTN/ISDN evolution to NGN: Y.2261
- PSTN/ISDN Emulation and Simulation generalities: Y.2262

PSTN/ISDN Emulation

- Two approaches: Call Server (Y.2271), IMS-based (ongoing)
- Emulation architecture (Y.2031)

PSTN/ISDN Simulation services

- Based on IMS capabilities (a.k.a. MMedia Telephony in ETSI and 3GPP)
- Y.2211 (stage 1) has identified additional service features
- Stages 2 and 3 to follow (Control, signalling, management, protocols)

IMS-based Real Time Conversational Multimedia Services versus Service Features

Service Features	PSTN/ISDN Simulation Services																U P T	C R B T	Mu lti CO NF	IP Ce ntr ex	C R T	
	O I P	O I R	T I P	T I R	M C I D	A C R	C D I V	H O L D	C B	C C B S	C W	M W I	C O N F	A O C	E C T	R C						
Authorization Code (AC)																		o				
Automatic Communication Back (ACB)											c											
Customized Announcement (CA)						o	o	o	o		o	o		o				o	c	o	o	
Customized Background Tone (CBT)																				o		
Communication Distribution (CDIST)																					o	
Communication Forwarding (CF)							c														c	
Communication Hold (HOLD)								c					o							c	c	
Communication Logging (CL)	o	o	o	o	c	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Customized Routing (CR)							o											c			o	
Customized ringing (CRG)																		o			c	c

Extract from Y.2211/Appendix A.1

29 April – 2 May 2007

ITU-T/ITU-D NGN Seminar for the Arab Region



Q2/13 mandate

“Requirements and implementation scenarios for emerging NGN services”

A very active working group

- o 37 contributions (*) in March meeting (one week)
- o 75 contributions (*) in April meeting (two weeks)

(*) TDs excluded

Liaisons established with various ITU-T SGs and other SDOs

- o SG2, SG3, SG4, SG11, SG19, IPTV FG, JCA N-ID etc.
- o ETSI TISPAN, ATIS (NGN, TMOC), ASTAP, 3GPP, OMA

Q2/13 work status (1)

Focus on NGN requirements, services and scenarios

- Y.2201(Y.NGN-R1-reqts): NGN Release 1 requirements
 - Decided (TAP) at April 2007 SG13 meeting
- Y.2211(Y.ngn-rtconv): IMS-based Real Time Conversational Multimedia services over NGN
 - Consented (AAP) at April 2007 SG13 meeting
- Y.NGN-R2-reqts : NGN Release 2 requirements -> target Q1/08
- Y.idserv-reqts : NGN service requirements and capabilities for network aspects of identification-based applications and services -> target Q4/07
- Y.MDS-req : Requirements of Managed Delivery Services -> target Q1/08

Q2/13 current work status (2)

Focus on NGN capabilities

- Y.ngn-account : Requirements and framework allowing accounting and charging capabilities in NGN
 - Consent expected at Sept 2007 NGN GSI meeting
- Y.ngn-openenv : Open Service Environment Capabilities for NGN applications and services -> target Q4/07-Q1/08
- Y.ngn-mcastsf : NGN Multicast Service Framework -> target Q4/07
- Y.ngn-vpn : VPN Service Capabilities in NGN mobile environment ->target Q1/08
- Y.mpls-mob : MPLS-based Mobility and QoS capabilities for NGN services -> target Q4/07
- Y.1315 : VPN functional decomposition (approved in Feb 2007)

Future steps on Services ... and Capabilities

- **Advances in Customer Networks**
 - Home Networking integration with NGN
- **More support on Corporate communications**
 - NGN services and scenarios (Business Trunking, Hosted services)
 - Integration with NGN (addressing, security, QoS, mobility, mgt.)
- **More services**
 - Extensions to R1 (simulation services) - in progress
 - Multicast-based services, more interactive entertainment (IPTV) -in progress
 - Identification-based services - in progress
 - Managed delivery services - in progress
 - Ubiquitous sensor networks
 - Grid applications
 - E-services (health, education, commerce, security, government)
 - Peer-to-peer services ?
- **Enhanced (R1) or new Capabilities will be required, e.g.**
 - Enhanced Resource and Admission Control for HN
 - Enhanced Addressing and Routing for Corporate communications
 - Digital Right Management for IPTV
 - Context-aware support for mobility
 - Policy-based accounting and charging

**Thank you for your
attention**