

# **ITU-D Regional Development Forum for the Asia Pacific Region**

**“NGN and Broadband, Opportunities and Challenges”  
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## **Towards an open service platform in NGN**

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## Outline

- o NGN capabilities
- o Towards an open service platform in NGN
- o ITU-T developments including collaboration with other Standards Development Organizations

## Next Generation Services

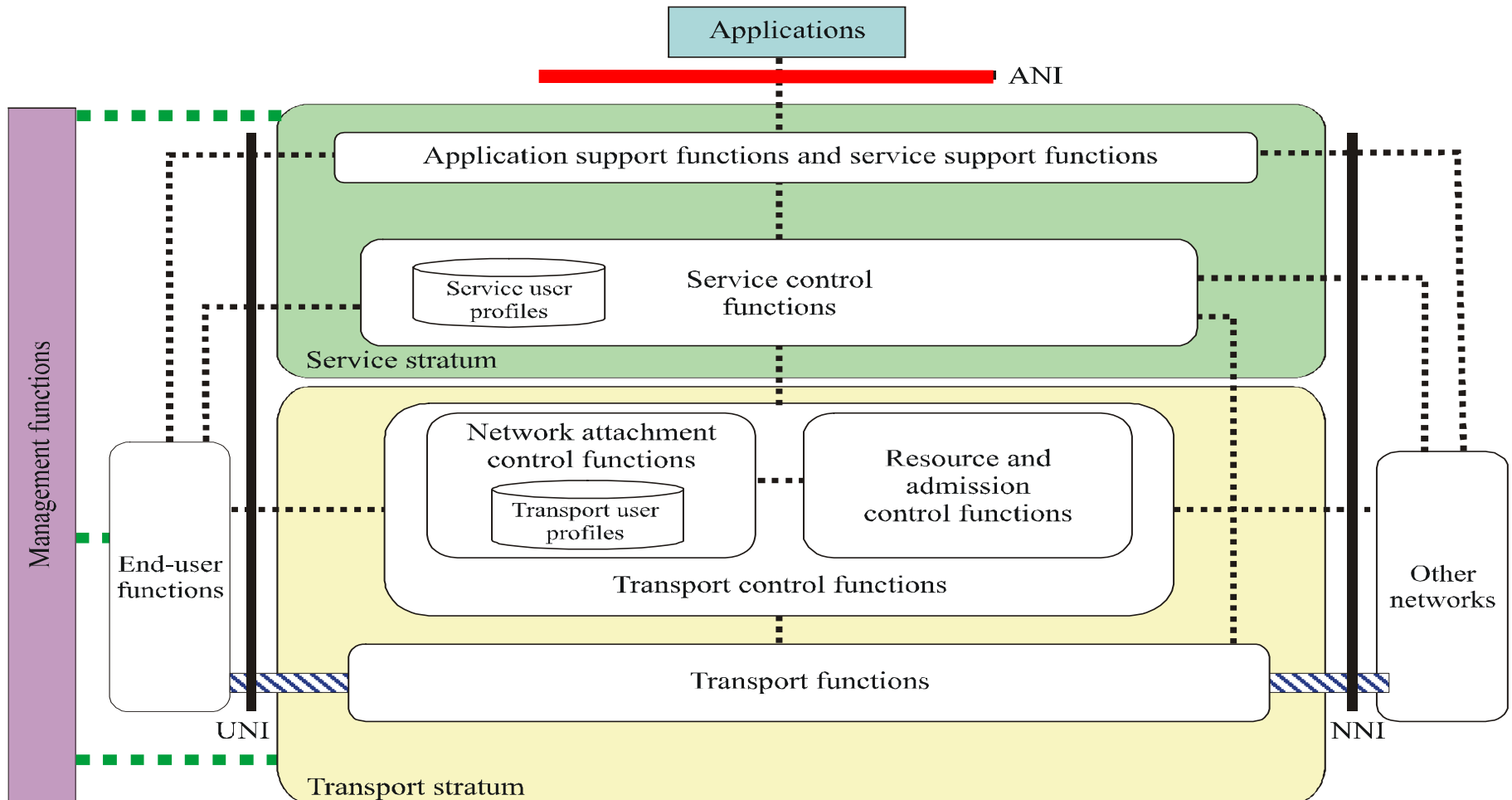
- o From today's networks
  - Services are typically “vertically integrated”
  - Services require specific infrastructure components for their delivery
- o to NGN : flexible service creation and provisioning
  - Horizontal Convergence: services are no more vertically integrated
  - **Network functions are componentised**
  - New paradigm: **standard “capabilities” as service enabling toolkit**
- o Key objectives in NGN service standardisation
  - Not just a new voice network
  - *“Service level equal or better than in circuit-switched networks”*
  - **Services specified in terms of required “capabilities”**
  - **Service definitions not an objective like in legacy world**
    - Public Interest Services are a special case

**Service Shift as consequence of NGN service vs transport stratum separation**

## Capabilities for NGN Rel.1 and Rel. 2 (Y.2201 Rev.1)

- o Transport connectivity
- o Communication modes
- o Multicast
- o Media resource management
- o Codecs
- o Access Networks, network attachment
- o User networks
- o Interconnection, Interoperability and Interworking
- o Numbering, naming, addressing
- o Identific., authentic., authoriz.
- o Security
- o Routing
- o QoS
- o OAM and Survivability
- o Accounting and Charging
- o Management
- o Mobility handling
- o Service enablers
- o Open service environment
- o Profile management
- o Policy management
- 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
- o Context awareness
- o Identity management
- o Content management
- o IPTV services support capabilities
- o Enterprise Networks support capabilities
- o IPV6 support capabilities

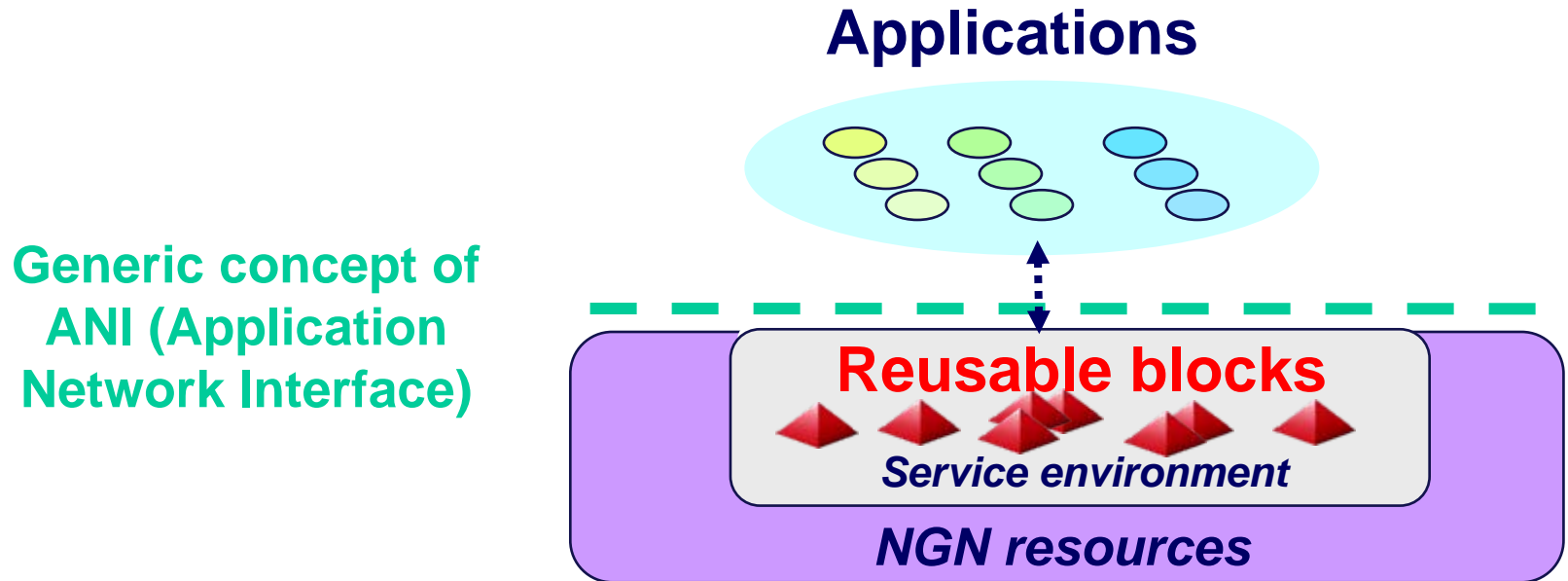
# Application Network Interface in NGN Release 1 Reference Architecture (Y.2012)



Y.2012(09-2006)\_F01

- ..... Control
- Media
- Management

# “Capabilities” as re-usable building blocks for applications/services



- o Reusable set of “Capabilities” for reduced service development costs
- o **(Open) service environment** for flexible and agile service creation, execution and management
  - **(Open) service platform concept**
  - “Rapid change” is key for satisfying the changing customer needs
  - New business opportunities via an environment integrating applications and telecom infrastructure

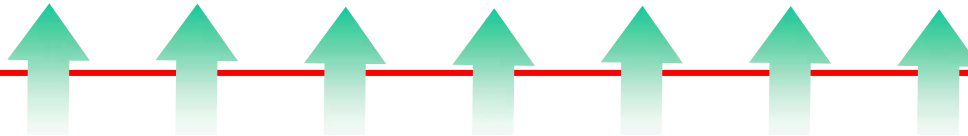
# Increased business opportunities with an open service platform



**End user created applications**

**3rd Party applications**

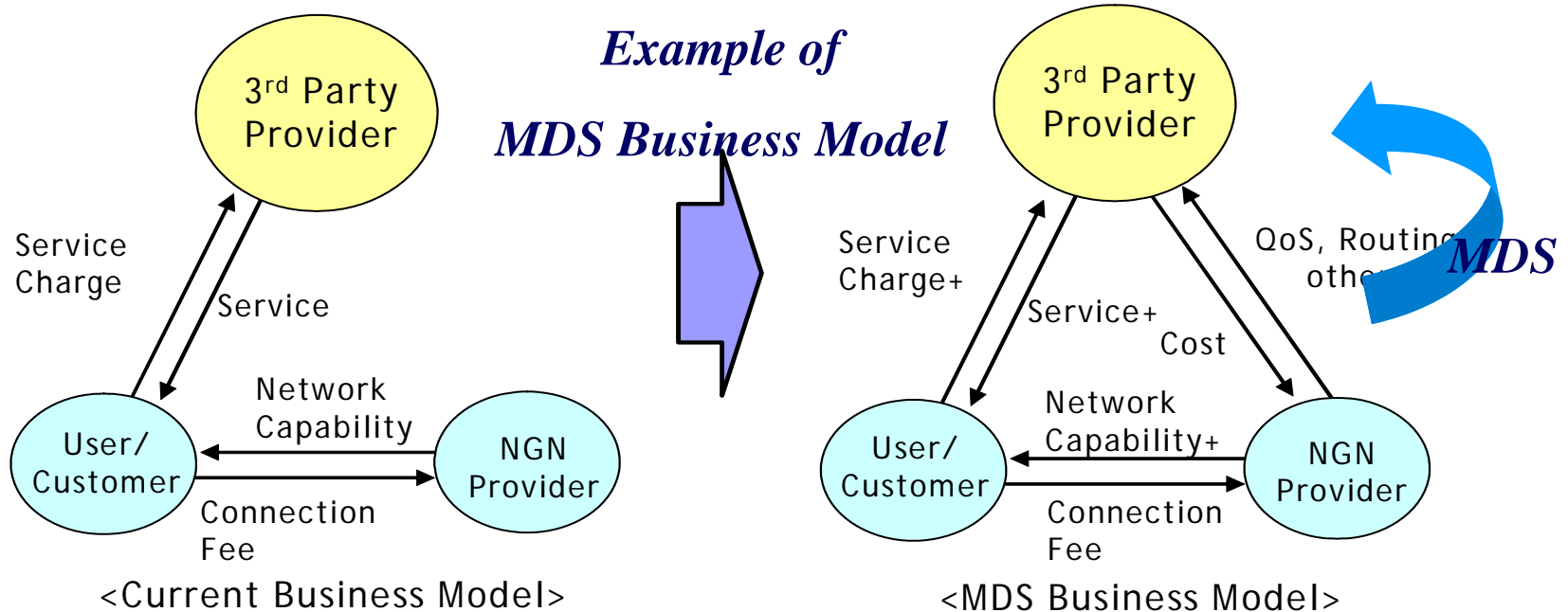
**NGN Provider services**



**NGN common building blocks**

# New business opportunities: the 3rd party scenarios of Managed Delivery Services (MDS) – Y.2212

- NGN dynamic features and comprehensive service delivery control capabilities are made available **via MDS through ANI** by the NGN Provider to 3rd Party Providers and their customers
- 3rd Party Providers can offer enhanced services to their customers



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

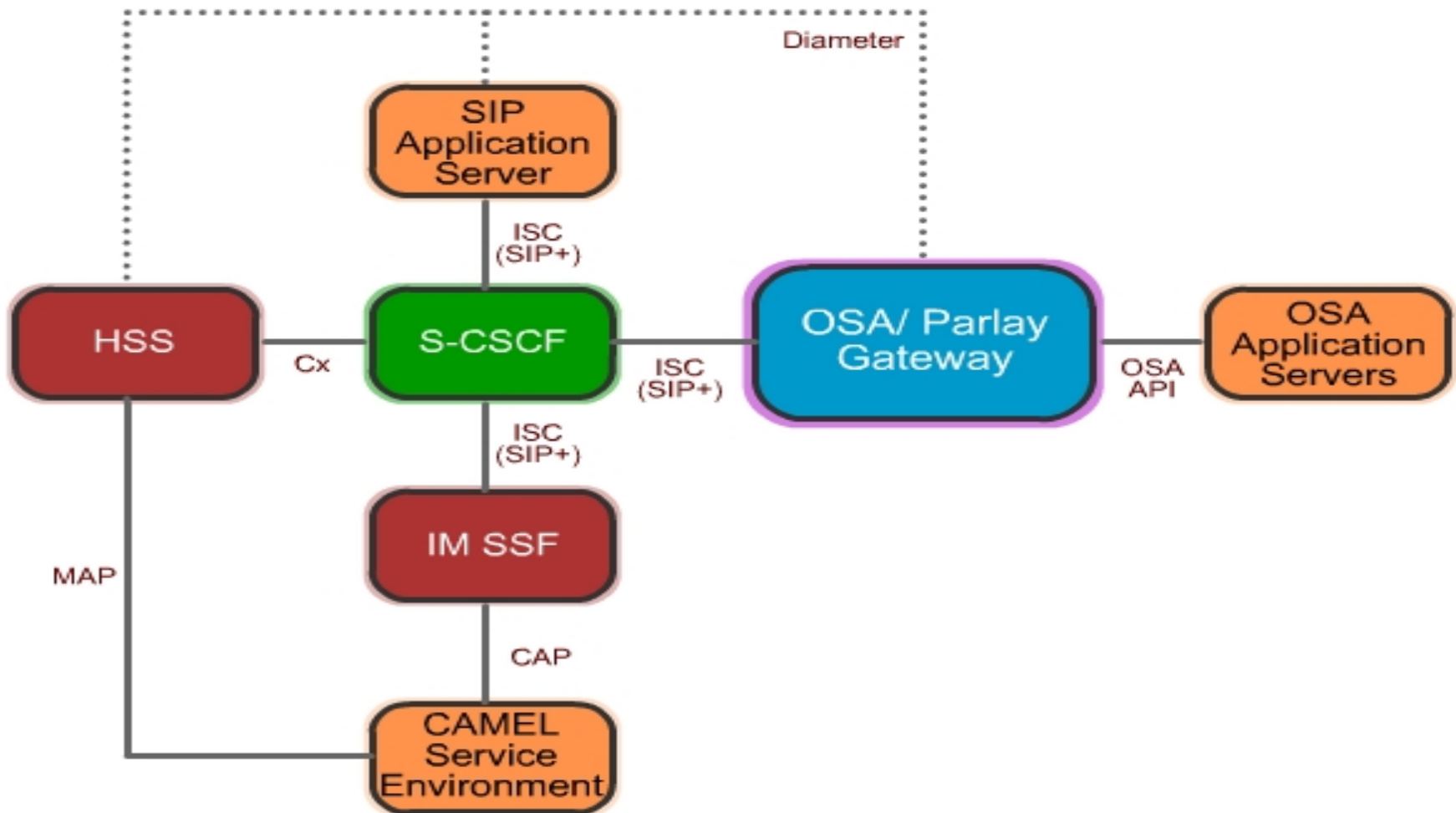


# Towards an open service environment in NGN

- o “Open service environment” key attributes
  - Exposure of capabilities via standard application network interfaces
  - Leveraging capabilities from different network domains (Internet/Web 2.0, Broadcast Networks, Mobile Networks etc.)
  - Portability and re-usability of capabilities across network domains (e.g. from the Internet to NGN, and from NGN to the Internet)
  - Flexible development of services (applications) and capabilities by NGN Providers as well as by Application Providers (and End Users)
- o Enabling interworking with other service creation environments (recommended for support in NGN Release 1):
  - IN-based service creation environment (INAP, CAMEL, WIN, ...)
  - IMS-based service creation environment
  - Open service creation environment (OSA/Parlay, OMA, ...)

**Framework for value added applications leveraging network capabilities (COMMUNICATIONS-ENABLED APPLICATIONS)**

## Other service creation environments - example



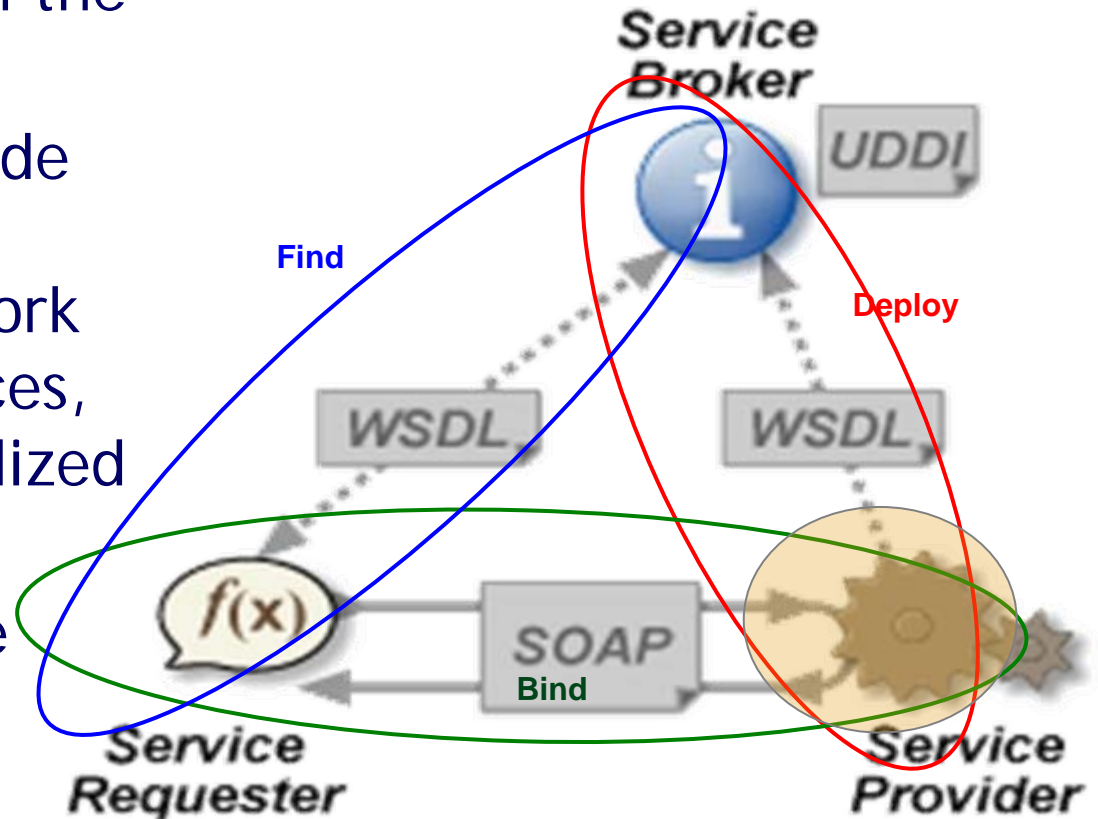
*Source: 3GPP IMS and OSA/Parlay*

# Approaches for an open service environment in NGN

- o How to open
  - Adopting a Service Oriented Architectures (SOA) framework from the Information Technology world, and enhance it as appropriate  Telecom SOA
  - Using enhanced Web Services (WS) as implementation tool set of the Telecom SOA framework
    - but other tools (e.g. REST) are not excluded
- o What to open (exposing via standard interfaces)
  - NGN capabilities to Applications
    -  Telecom APIs
  - NGN capabilities to other NGN capabilities

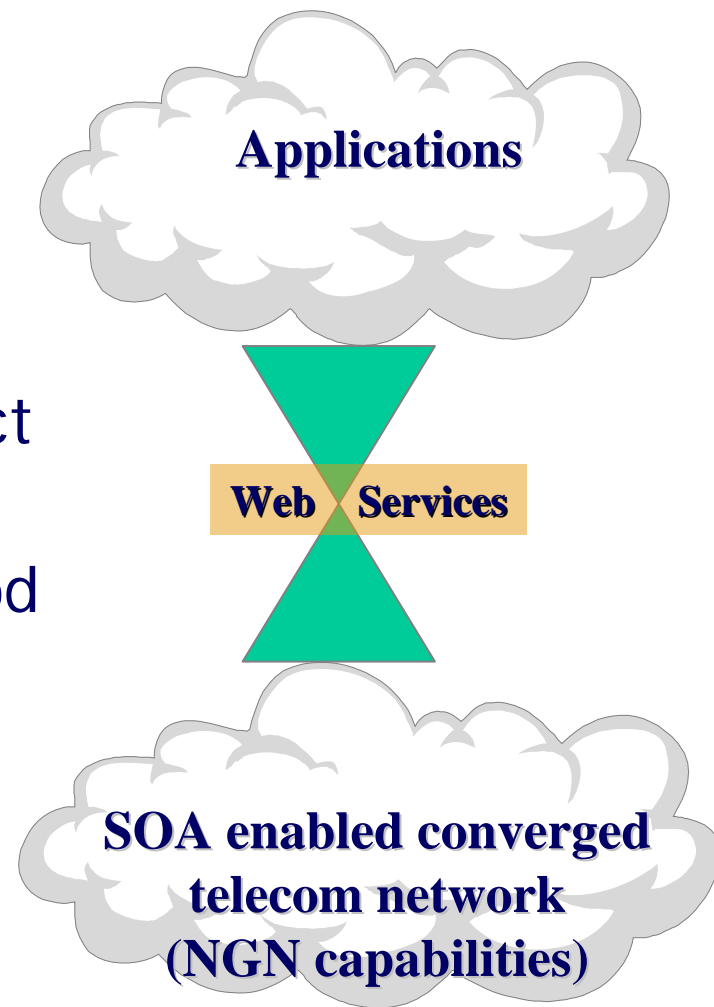
# Service Oriented Architectures (SOA)

- SOA framework was originally developed in the IT world
- SOA resources are made available to other participants in a network via independent services, accessed in a standardized way
- SOA systems comprise loosely joined, highly interoperable services



## Web Services (WS)

- WS are simple XML-based messages for machine-machine messaging, acting as XML-based APIs
- WS use standard Internet technologies to interact each other dynamically, open standards connect disparate platforms
- WS security model is well understood
- WS are loosely coupled, can be combined to form complex services
- Market success of WS based middleware (e.g. Google and eBay are major WS users)



## Telecom SOA and enhanced Web Services: new challenges for the development of standards

- o Key values of a SOA framework
  - Cross-platform and highly reusable
- o Most SOA implementations identify Web Services as the means for realizing a SOA
- o **But new requirements have to supported for a Telecom SOA**
- o **Web Services enhancements are required, e.g.**
  - Carrier grade reliability and performance
  - Service traceability
  - WS standards convergence and harmonization



**To a common set of Telecom APIs reusable  
across different NGN service platform  
implementations**

## Initial ITU-T work items in the NGN service platform area

ITU-T SG13 is increasing its activities in this area

- **Y.2234: Open service environment capabilities for NGN (Sep08)**
- Y.OSE-arch “OSE functional architecture for NGN” (launch in Jan09)
- **Y.NGN-SIDE-Req: Requirements for NGN Service Integration and Delivery Environment** (launch in May09)
- Y.2212: Requirements of Managed Delivery Services (Jan08)
- Y.2232: NGN convergence service model and scenario using WS (Feb08)
- Y.2235: Converged web-browsing service scenarios in NGN (Dec08)
- Deliverables based on past OCAF Focus Group activities (Dec06)
  - Y.2901/Y.2902 - Carrier grade open environment model/components

**Other ITU-T activities in Telecom SOA and WS include**

- M.3060: Principles for NGN management (March06) (ITU-T SG4)
- SOA/WS related security aspects (ITU-T SG17)
- Middleware aspects for IPTV and USN (ITU-T SG16)

## Y.2234 : NGN Open service environment (NGN OSE)

- o NGN OSE
  - requires the use of standard interfaces
  - opens the capabilities of the NGN to third parties
  - provides a SOA enabled environment
  - may be implemented via Web Services technologies
  
- o NGN OSE high level requirements
  - **to provide standard APIs** for application providers and developers, and potentially end users
  - **to provide service level interoperability** underlying different networks, operating systems and programming languages
  - **to support service independence** from NGN providers and manufacturers
  - **to support NGN OSE capabilities based on NGN providers' capabilities** [OSE capabilities based on application providers' capabilities not supported in this version of Y.2234]
  - **to support location, network and protocol transparency**
  - **to provide secure access** to NGN OSE capabilities satisfying the general NGN security requirements

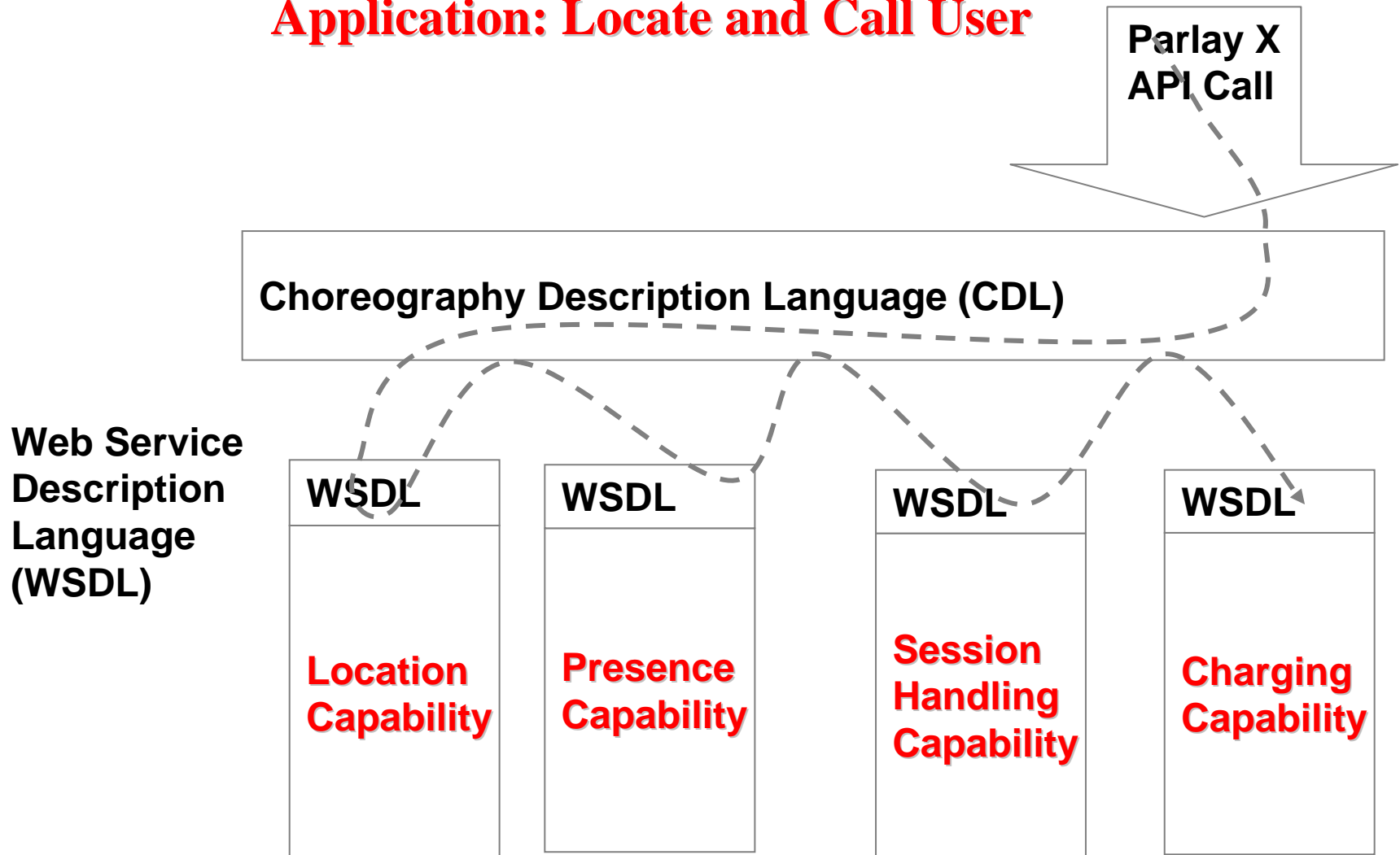


## Capabilities of NGN OSE

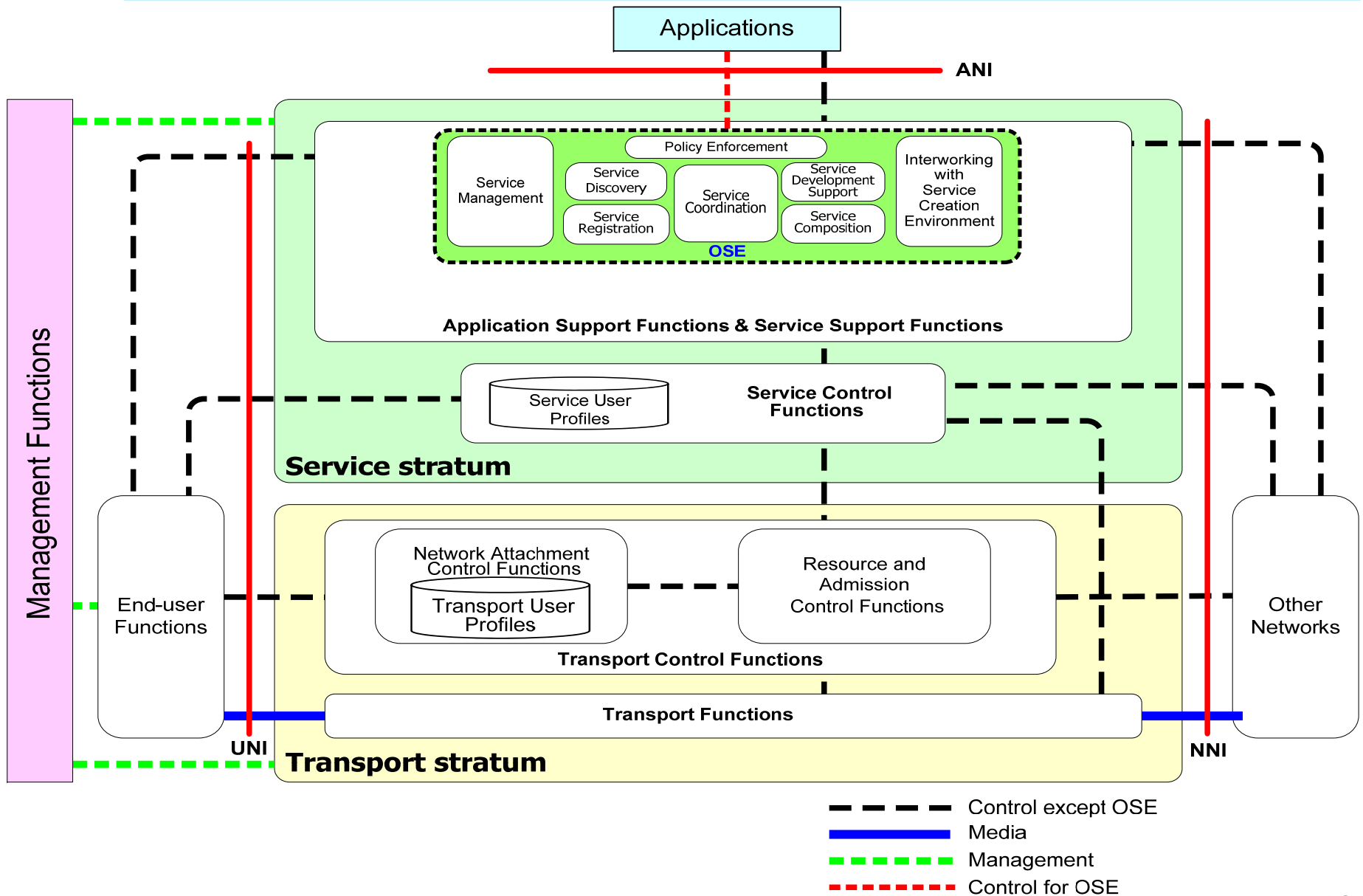
- **Registration** of capabilities and services(/applications)
- **Discovery** by users and devices of capabilities and services and other network information and resources of their interest
- **Coordination** of services with capabilities
- **Composition** for flexible composition of services
- **Management** of services and capabilities
- **Development support** for efficient service construction, trialing, deployment, removal
- **Policy enforcement** for resources protection and management, and service personalization
- **Interworking with other service creation environments**

# Example of "Composition" (implemented via Web Services)

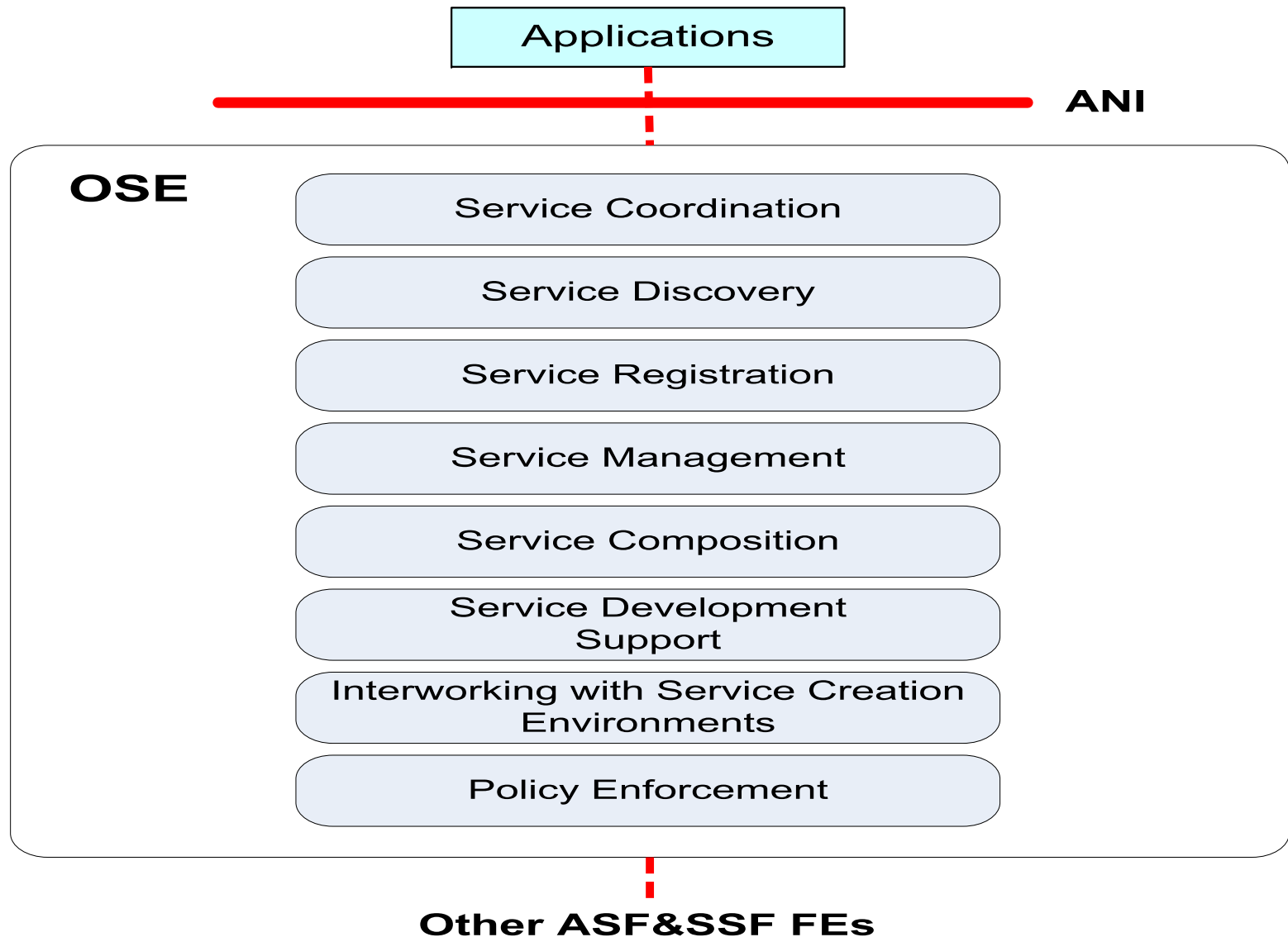
## Application: Locate and Call User



# NGN OSE positioning within the NGN Architecture



# Functional components of NGN OSE

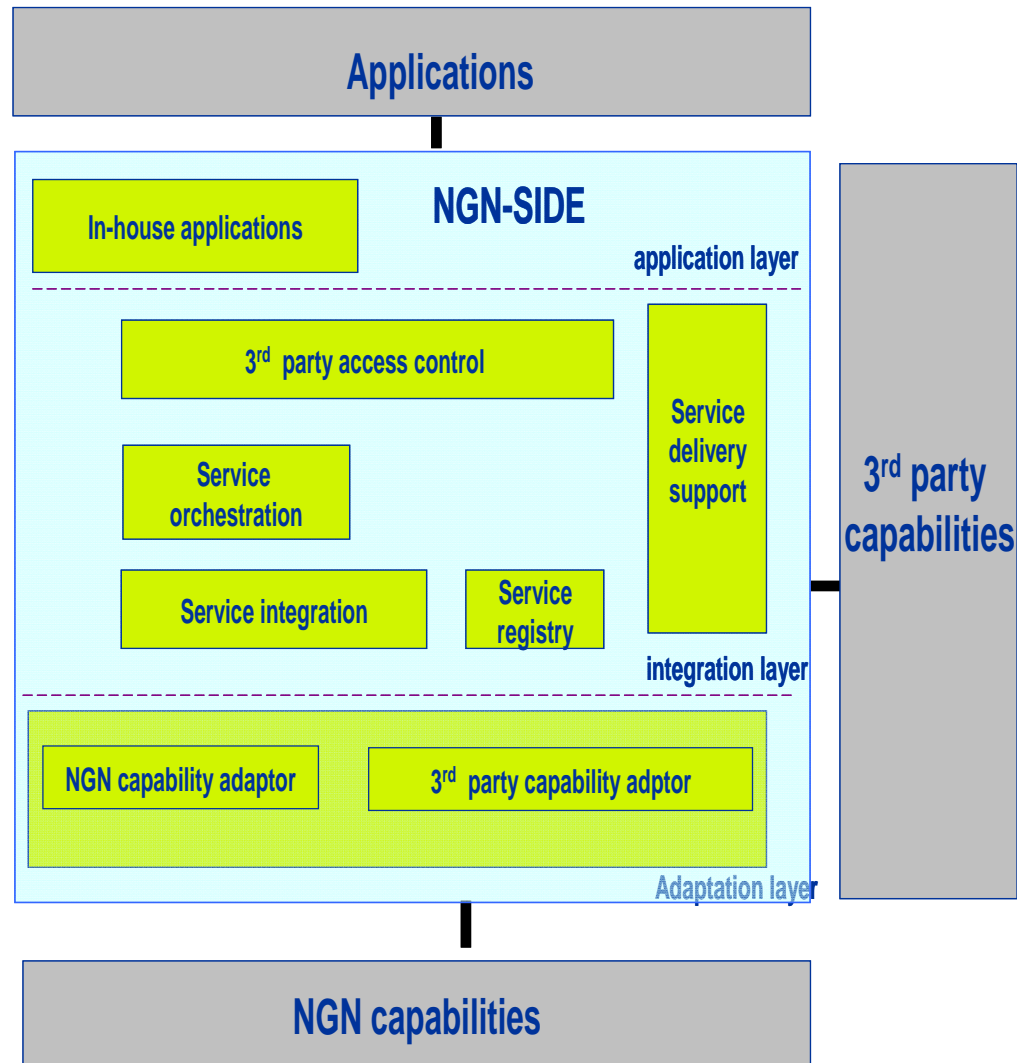


<b>Mapping of NGN OSE functional components into NGN ASF&amp;SSF functional entities [Y.2234]</b>		<b>[ITU-T Y.2012] ASF&amp;SSF FEs</b>				
		<b>APL-GW-FE</b>	<b>APL-SCM-FE</b>	<b>AS-FE</b>	<b>SS-FE</b>	<b>New FE currently not identified</b>
		serves as an interworking entity between the applications, and services and capabilities of the NGN (adapted from [ITU-T Y.2012])	manages interactions between multiple application services (or servers) [ITU-T Y.2012]	supports generic application server functions including hosting and executing services [ITU-T Y.2012]	provides access and interworking to a legacy IN SCP [ITU-T Y.2012]	
<b>O S E</b>	<b>Service discovery</b>	optional	not applicable	not applicable	not applicable	optional
	<b>Service management</b>	optional	not applicable	not applicable	not applicable	optional
	<b>Service registration</b>	optional	not applicable	not applicable	not applicable	optional
	<b>Service coordination</b>	not applicable	optional	not applicable	not applicable	optional
	<b>Service composition</b>	not applicable	optional	not applicable	not applicable	optional
	<b>Service development support</b>	optional	not applicable	not applicable	not applicable	optional
	<b>Interworking with service creation environments</b>	optional	not applicable	optional	optional	optional
	<b>Policy enforcement</b>	optional	optional	not applicable	not applicable	optional

# Requirements for NGN Service Integration and Delivery Environment (NGN-SIDE) – 1st draft from July 09 meeting

## Y.NGN-SIDE-Req content - draft

- NGN-SIDE capabilities
  - Generic capability set
  - Application-specific capability sets
  - Functional positioning (NGN architecture, NGN OSE)
- Requirements of NGN-SIDE capabilities
  - General requirements
  - Service interface requirements across ANI, NNI and UNI
  - Open service interface requirements within NGN-SIDE
- Appendixes
  - Application scenarios
  - Survey of API standardisation
  - Capabilities and APIs in relevant market SDPs



## NGN-SIDE functional framework - draft

## Collaboration with other Standards Development Organizations

- A number of SDOs, Forums and Consortia are involved in standards developments related to service infrastructure aspects, including
  - OMA (OMA Service (Provider) Environment, enablers, Parlay-X WS/APIs (inherited from Parlay Group))
  - TeleManagement Forum (Service Delivery Framework)
  - OASIS (Telecommunications Services Member Section, others)
  - IEEE (NGSON (Next Generation Service Overlay Network))
  - GSMA (OneAPI)
  - ATIS (SON (Service Oriented Networks))
- Convergence and harmonization of standards are essential
- ITU-T (SG13) has started collaboration with other organizations
  - OMA, OASIS, TMF, IEEE NGSON (via meetings and/or liaisons and/or mutual analysis of deliverables)
  - Plan to strengthen this collaboration based on the current increasing level of ITU-T activities in this area

## Conclusion

- Towards an open service platform in NGN
  - Service Oriented Architectures (SOA) as framework
  - Web Services (WS) as implementation tool set
- SOA and WS enable new business revenues within an integrated applications-telecommunication network environment
  - but bring new challenges to the development of standards (not fully discussed here)
- Increasing involvement of ITU-T in this area
  - NGN OSE and other recent developments
- Numerous other SDOs, Forums and Consortia also involved
  - convergence and harmonization of standards are essential
  - ITU-T has started collaboration with other SDOs in order to integrate relevant specifications within its NGN standardization framework

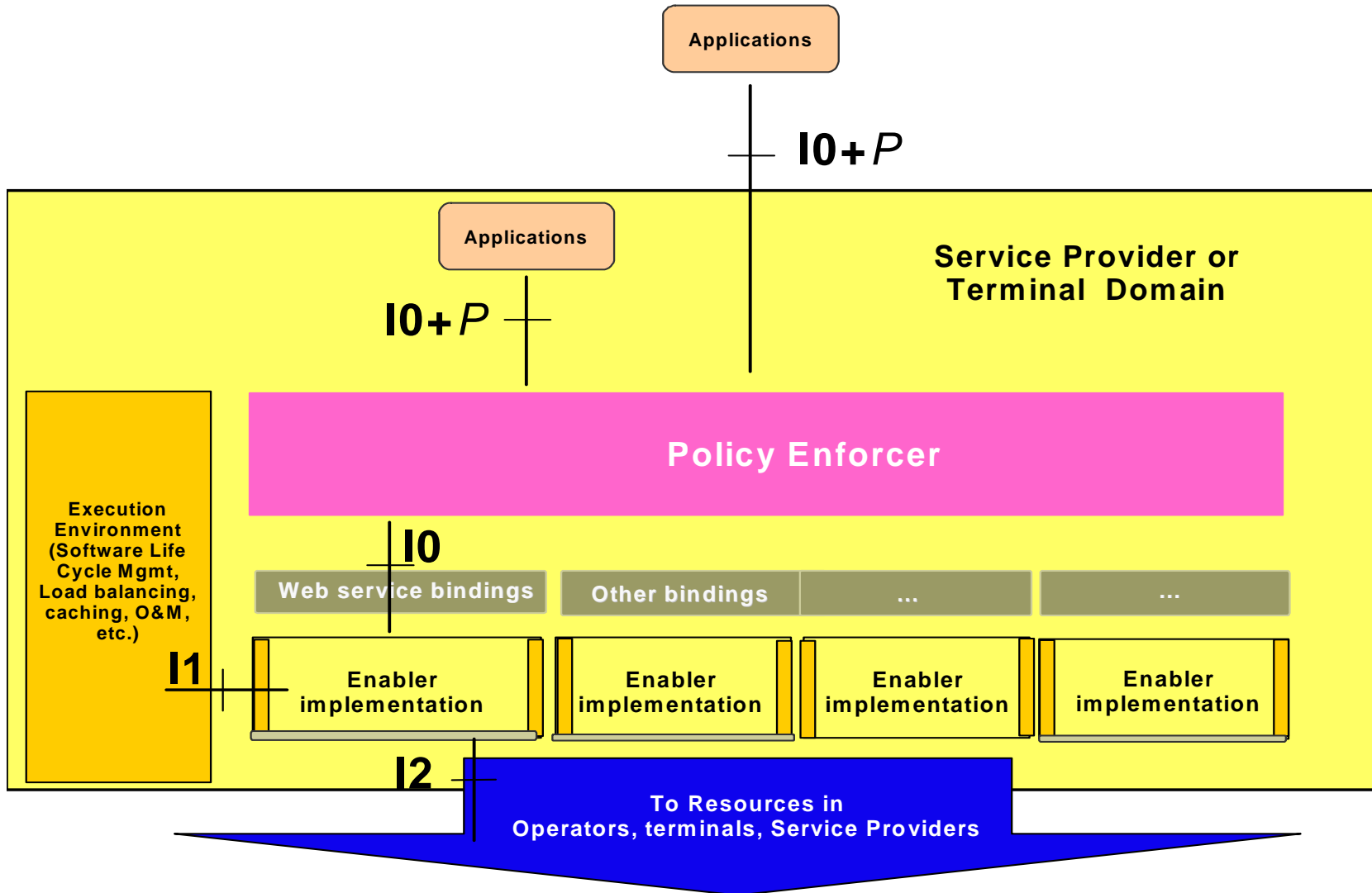


**Thank you for your  
attention**

**Questions ?**

# Backup slides

# Analysing the work of other SDOs for NGN OSE – the OMA Service Environment example



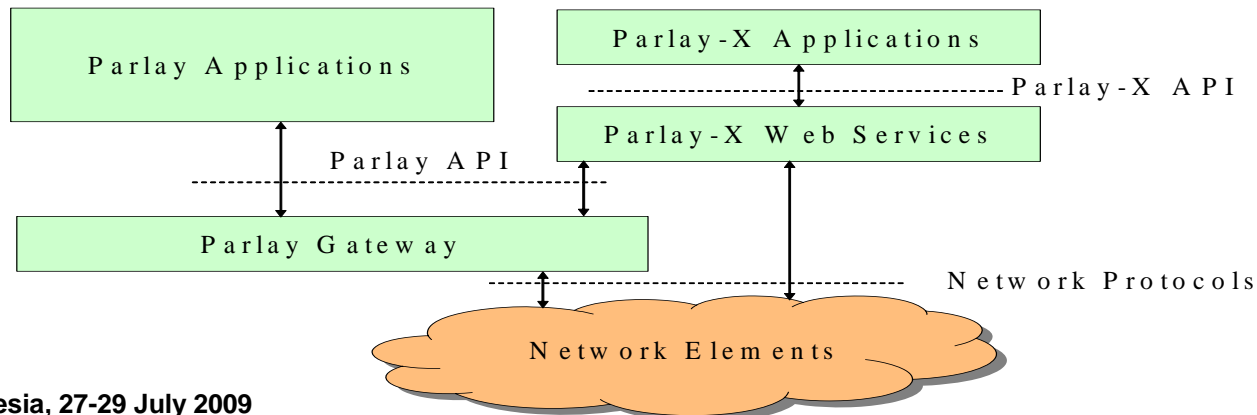
*Source: Open Mobile Alliance*

# Parlay-X Web Services/API specifications

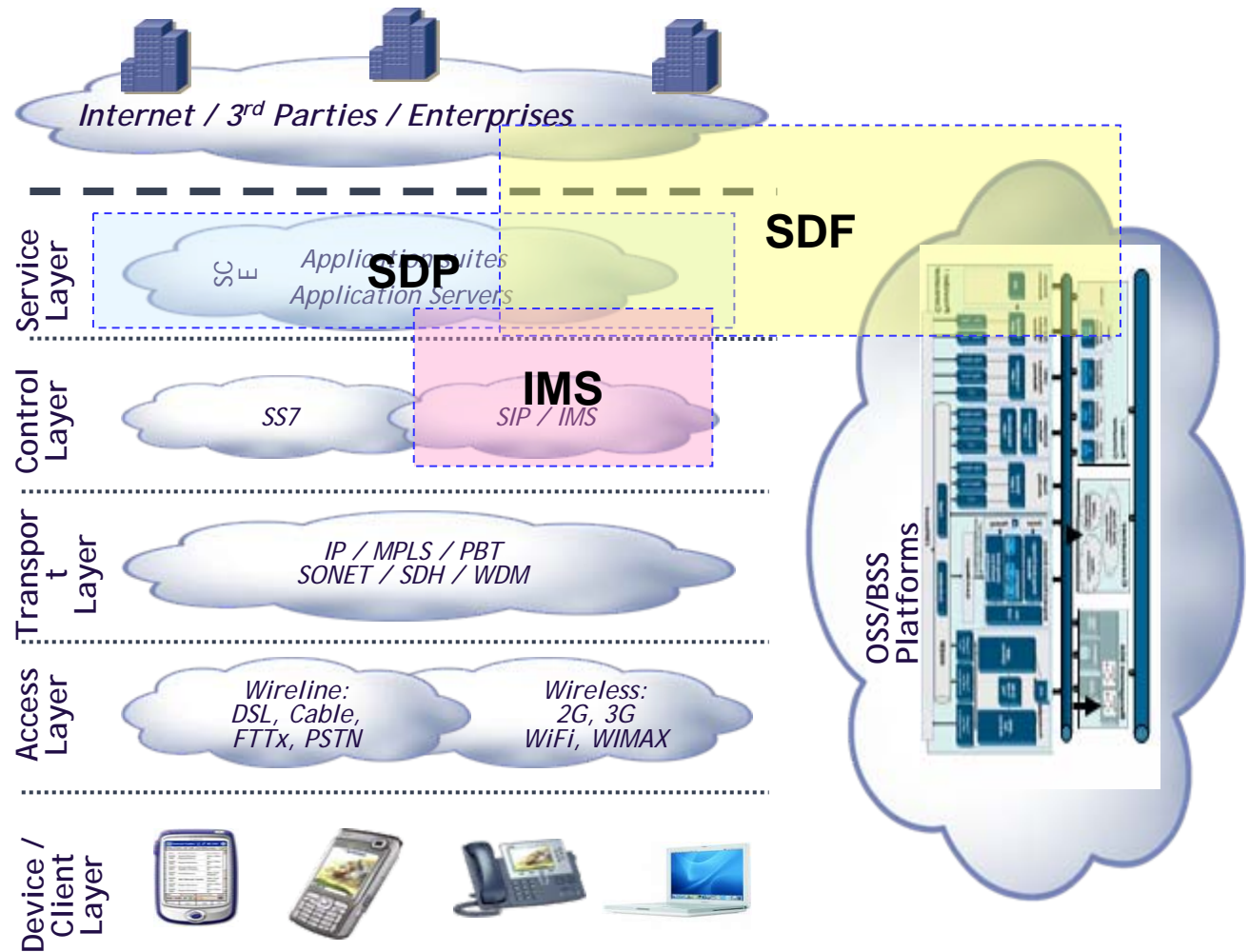
Parlay-X Web Services specifications provide simple, abstracted telecom Web Services based on use of network capabilities

- o Part 1: "Common"
- o Part 2: "Third party call"
- o Part 3: "Call Notification"
- o Part 4: "Short Messaging"
- o Part 5: "Multimedia Messaging"
- o Part 6: "Payment"
- o Part 7: "Account management"
- o Part 8: "Terminal Status"
- o Part 9: "Terminal location"
- o Part 10: "Call handling"
- o Part 11: "Audio call"
- o Part 12: "Multimedia conference"
- o Part 13: "Address list management"
- o Part 14: "Presence"
- o Part 15: "Message Broadcast"
- o Part 16: "Geocoding"
- o Part 17: "Application driven QoS"
- o Part 18: "Device Capabilities and Config"
- o Part 19: "Multimedia streaming control"
- o Part 20: "Multimedia multicast session management"
- o Part 21: "Content management"
- o Part 22: "Policy"

## Parlay-X Architecture



# TMF SDF: positioning and relationship with OSS/BSS



*Source: TeleManagement Forum*

Yogyakarta, Indonesia, 27-29 July 2009