Towards a SOA/WS enabled NGN Open Service Environment - ongoing developments in ITU-T SG13

Ditton Manor, 30 Sept 2008

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Outline

- NGN services and capabilities in ITU-T
- NGN Open service environment - ITU-T SG13
- Collaboration with other SDOs and future items
Capabilities for NGN Release 1 (Y.2201)

- Transport connectivity
- Communication modes
- Media resource management
- Codecs
- Access Networks, network attachment
- User networks
- Interconnection, Interoperability and Interworking
- Routing
- QoS
- Accounting and Charging
- Numbering, naming, addressing
- Identific., authentic., authoriz.
- Security
- Mobility management
- OAM
- Survivability
- Management
- Service enablers
- Open service environment
- Profile management
- Policy management
- PSTN/ISDN emulation and simulation
- Public Interest Services support
- Critical infrastructure protection
- Non disclosure of info across NNI
- Inter-provider exchange of user-related information
- Context awareness
- Identity management
- IPTV services support capabilities
- Enterprise Networks support capabilities
- IPV6 support capabilities

NGN Release 2
Towards an open service environment in NGN (NGN OSE)

- “Open service environment” for flexible and agile service creation, execution and management
  - Leveraging new capabilities enabled by 3G and Internet technologies
  - Exposure of capabilities via standard application network interfaces
  - Portability and re-usability of capabilities across networks
  - Flexible development of applications and capabilities by NGN Providers as well as by Application Providers

- Types of service creation environments recommended to be supported in NGN (Release 1):
  - IN-based service creation environment (INAP, CAMEL, WIN, ...)
  - IMS-based service creation environment
  - Open service creation environment (OSA/Parlay, OMA, ...)

A service framework for implementation of value added services taking advantage of network capabilities
3rd party scenarios and application interfaces: MDS (Managed Delivery Services) – Y.2212

- 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)

<table>
<thead>
<tr>
<th>Service Charge+</th>
<th>QoS, Routing others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service+</td>
<td>Cost</td>
</tr>
<tr>
<td>Network Capability+</td>
<td></td>
</tr>
<tr>
<td>Connection Fee</td>
<td></td>
</tr>
</tbody>
</table>

**<Current Business Model>**

**<MDS Business Model>**

A win-win situation for both 3rd Party Provider and NGN Provider
Initial work items on SOA and WS topics in ITU-T SG13

- **Y.2234**: Open service environment capabilities for NGN (approved on 12 Sept 2008)
- **Y.2212**: Requirements of Managed Delivery Services (Jan 08)
- **Y.2232**: NGN convergence service model and scenario using Web Services (Feb 08)
- **Y.2235**: Converged web-browsing service scenarios in NGN (consented on 12 Sept 2008)
- From previous work in the OCAF Focus Group (Dec 06)
  - **Y.2901/Y.2902**: Carrier grade open environment model/components

Other ongoing ITU-T activities are SOA/WS related, including in
- ITU-T SG4 (NGN management - M.3060)
- ITU-T SG17 (security aspects for SOA/WS)
- ITU-T SG16 (middleware aspects for IPTV)
The open service environment is required to:

- **provide standard APIs** for application providers and developers, and potentially end users.
- **provide service level interoperability** underlying different networks, operating systems and programming languages.
- **support service independence** from NGN providers and manufacturers.
- **support location, network and protocol transparency**.
- **support OSE capabilities based on NGN providers’ capabilities** [OSE capabilities based on application providers’ capabilities are not supported in this version].
- **provide capabilities for coordinating services** among themselves and services with applications.
- **provide the means to manage the registration of capabilities, services and applications**.
The open service environment is required to (con’t)

- support service discovery capabilities to allow users and devices to discover applications, services and other network information and resources of their interest
- provide service management capabilities
- provide service composition capabilities to flexibly compose services and capabilities
- offer an efficient development support environment which supports application construction, trialing, deployment, removal
- allow interworking with service creation environments
- provide secure access to open service environment capabilities satisfying the general NGN security requirements
- support policy enforcement capability for resources protection and management, and service personalization
NGN OSE functional positioning

Service stratum

Transport stratum

End-user Functions

Management Functions

Other Networks

Transport Control Functions

Network Attachment Control Functions

Transport User Profiles

Service User Profiles

Service Control Functions

Resource and Admission Control Functions

Network Attachment

Policy Enforcement

Interworking with Service Creation Environment

Service Development Support

Service Coordination

Service Registration

Service Discovery

Service Management

Applications

ANI

Control except OSE

Media

Management

Control for OSE

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Functional components of the NGN OSE functional group

OSE

- Service Coordination
- Service Discovery
- Service Registration
- Service Management
- Service Composition
- Service Development Support
- Interworking with Service Creation Environments
- Policy Enforcement

Applications

ANI

Other ASF&SSF FEs

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# Mapping of NGN OSE functional components into NGN ASF&SSF Functional Entities

*From Y.2234*

<table>
<thead>
<tr>
<th>Service</th>
<th>OSE</th>
<th>[ITU-T Y.2012] ASF&amp;SSF FE</th>
<th>New FE currently not identified</th>
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</thead>
<tbody>
<tr>
<td>Service discovery</td>
<td>optional</td>
<td>not applicable</td>
<td>not applicable</td>
</tr>
<tr>
<td>Service management</td>
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</tr>
<tr>
<td>Service registration</td>
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<td>not applicable</td>
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<tr>
<td>Service coordination</td>
<td>not applicable</td>
<td>optional</td>
<td>not applicable</td>
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<tr>
<td>Service composition</td>
<td>not applicable</td>
<td>optional</td>
<td>not applicable</td>
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<tr>
<td>Service development support</td>
<td>optional</td>
<td>not applicable</td>
<td>not applicable</td>
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<tr>
<td>Interworking with service creation environments</td>
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<td>not applicable</td>
<td>optional</td>
</tr>
<tr>
<td>Policy enforcement</td>
<td>optional</td>
<td>not applicable</td>
<td>not applicable</td>
</tr>
</tbody>
</table>
Relationship of ITU-T SG13 with other SDOs: collaboration has started

- NGN OSE capabilities
  - Require the use of standard interfaces
  - Open the NGN capabilities to third parties
  - Provide a SOA enabled environment
  - Web Services as an implementation technology for NGN OSE
- Many developments in other SDOs are (may be) relevant for ITU-T objectives
  - Parlay (OSA) -> OMA
  - OMA (OMA Service (Provider) Environment, enablers)
  - OASIS (SOA RM etc., Telecom Member Section)
  - TMF (SDF)
  - OMG, W3C, others (IEEE NGSON, OGF)
- Collaboration started with other SDOs
  - Initial joint meetings, liaisons, analysis of other SDOs’ documents
  - **Collaboration needs to continue and increase in intensity**
Future SOA/WS topics within ITU-T SG13: an informal and non-exhaustive list (*)

- Application network interface requirements (APIs for carriers and enterprises)
  - Key APIs
  - Building on relevant business cases (IPTV, USN, etc.)
- SOA framework for NGN
- Standard requirements and SOA/WS enabled capabilities of service delivery platforms for NGN
- SOA/WS enabled NGN (2.0) functional architecture and related service components (IMS, others)
- Middleware aspects
  - Application-specific middleware requirements versus NGN OSE
- Application scenarios
  - SOA based service composition and NGN OSE
  - 3rd party provider applications
  - Composition of NGN capabilities and Web 2.0/Internet capabilities
  - Composition of NGN services and legacy services

(*) this list doesn’t constitute an official SG13 item and, although based on discussions among active parties, only represents the author’s current view of critical future study items
Thank you for your attention

Questions ?
Backup slides
OSE functional requirements (1/4)

- Service Coordination is required to
  - Provide coordination of applications and services with capabilities
  - Provide the tracking of NGN capabilities or service components from various application providers, and the relationship between these capabilities or service components
  - Support the information on state change of capabilities or service components for applications and services

- Service Discovery is required to
  - Provide service discovery for physically distributed NGN services
  - Support a variety of discovering criteria
  - Use user and device profile information for discovering proper service
  - Allow users to discover user-interest services, device-interest services and network information
OSE functional requirements (2/4)

- Service Registration is required to
  - Provide service registration, including configuration, activation, publication and service deregistration
  - Provide a variety of service registration features (e.g. manual, autonomous) for NGN services
  - Support a variety of registration parameters, including mandatory and optional parameters

- Service Management requirements include
  - Provide monitoring function of registered services for availability, predicted response time
  - Provide managing function of QoS information about registered NGN services
  - Provide version management function to NGN services for interoperability
  - Provide notification service functions for updated services
  - Provide failure detection and recovering functions for unexpected failures
OSE functional requirements (3/4)

- **Service Composition is required to**
  - Provide composition language that describes interaction flow among NGN services
  - Support the composition of NGN services statically or dynamically

- **Service Development Support is required to**
  - Support services re-use and allow for services interchangeability
  - Support mixing-and-matching of services by management of interfaces and consistent semantics of shared data/schema across these services
  - Support the full life cycle of components, including installation, configuration, administration, publishing, versioning, maintenance and removal
  - Support delivery-agnostic application design to allow applications to be implemented without requiring re-design for each development scenario
  - Support tracking of dependencies among services
OSE functional requirements (4/4)

- Interworking with Service Creation Environments is required to
  - Support **open** service creation environment
  - Support **IP multimedia subsystem (IMS)**-based service creation environment
  - Support **Intelligent network (IN)**-based service creation environment

- Policy Enforcement is required to
  - Provide a **description language** to express various kinds of policy rules
  - Provide a **policy execution framework** to interpret and execute the policies
  - Protect services from unauthorized users’ requests and manage requests based on the policy rules
## Y.2234 Appendix: relevant developments in other SDOs [1/5]

<table>
<thead>
<tr>
<th>NGN capabilities</th>
<th>OSA/Parlay</th>
<th>OMA</th>
<th>OASIS</th>
<th>W3C</th>
<th>OMG</th>
<th>TMF</th>
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<tbody>
<tr>
<td>Service Discovery</td>
<td>Discovery of framework and network service capability features</td>
<td>OWSER (UDDI), OMA’s DPE, OMA’s GPM</td>
<td>Universal Description, Discovery and Integration (UDDI), ebXML Registry Information Model (RIM), ebXML Registry Services and Protocols (RS)</td>
<td>Web Services Description Language (WSDL)</td>
<td>Current effort: - UPMS (SOA extension of UML), - BPDM</td>
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<td>Existing Standards: - UML, - EDOC: component architecture, - Distributed Object Computing</td>
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Current effort:
- UPMS (SOA extension of UML)
- BPDM

Existing Standards:
- UML
- EDOC: component architecture
- Distributed Object Computing

TMF053 series: NGOSS Technology Neutral Architecture (TNA)
GB921 series: eTOM, business process framework
GB922 series: SID, shared information architecture
NGOSS Contract Metamodel (Work In Progress)
### Y.2234 Appendix: relevant developments in other SDOs [2/5]

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<tr>
<td>Service Composition</td>
<td>PEEM((Policy Evaluation, Enforcement and Management)</td>
<td>Business Process Execution Language for Web Services</td>
<td>BPR: Business Process Run time Interface</td>
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- **Service Delivery Framework (Work In Progress)**: a framework that supports and integrates all functions required for the lifecycle of a service delivered to Customer, across all stakeholders in a Service Provider environment. SDF unifies under a logical view service design, creation/composition, deployment, activation, provisioning, sale and campaign management, execution, operations, charging, billing and revenue management, retirement, monitoring and trouble resolution etc.
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<tr>
<td>Service Development Support</td>
<td>XDM, OSPE (OMA Service Provider Environment)</td>
<td>Service Modeling Language</td>
<td>Existing Standards</td>
<td>- UPMS, - BPMN, - BPDM</td>
<td>- EDOC</td>
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## Y.2234 Appendix: relevant developments in other SDOs [4/5]

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<th>TMF</th>
</tr>
</thead>
</table>
| Security         | Authentication, Authorization | SEC_CF (Security Common Function) | WS-Security
WS-Security: SOAP Message Security
WS-Security: Username Token Profile
WS-Security: SAML Token Profile
WS-Security: X.509 Certificate Token Profile
WS-Federation |                |                 |                                                                       |                             |     |     |
Some useful ITU-T links

- ITU-T Home page
  http://www.itu.int/ITU-T/
- ITU-T Recommendations
  http://www.itu.int/ITU-T/publications/recs.html
- ITU-T Lighthouse
  http://www.itu.int/ITU-T/lighthouse/index.phtml
- ITU-T Workshops
  http://www.itu.int/ITU-T/worksem/index.html