

Web Services Policy Considerations in Relation to NGN

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Abstract

Next Generation Networks (NGN) is a concept for defining and deploying converged networks for data, video and voice. NGN develops an open network architecture that defines overlay layers over a common network transport, based on packet technologies. NGN enables the sharing of a network by different services through various access mechanisms. This paper highlights some of the policy issues to consider when developing Policy based language and rules for web services.

1. Background

NGN is a concept for defining and deploying converged networks for data, video and voice. NGN is an extension of the IP Multimedia Subsystem (IMS) architecture that was introduced in 3GPP [4] Release 5 specifications. NGN develops an open network architecture that defines overlay layers over a common network transport, based on packet technologies. NGN concepts enable the sharing of a network by different services. NGN network provides a single connectivity layer that carries information from a source to a destination irrespective of the type of the service.

NGN allows the decoupling of services and networks. In NGN, the control layer is separate from the transport layer. The control layer provides open and programmable interfaces that are available for the application layer. NGN allows the provisioning of both existing and new services independently of the network and the access type.

In NGN, entities that control policy, sessions, media, resources, service delivery, and security are distributed over the infrastructure. Internetworking between the entities is defined over standard interfaces. Figure 1 illustrates the basic architecture of NGN [1].

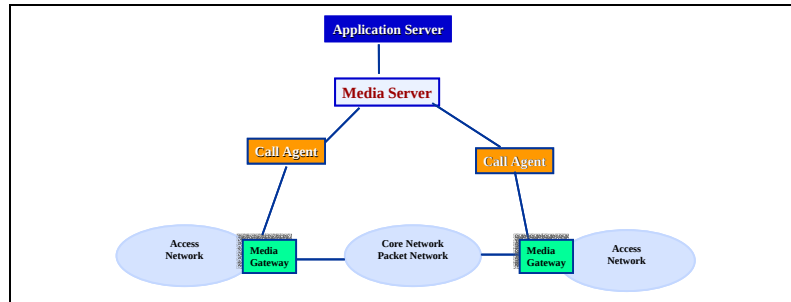


Figure 1: Basic NGN Architecture

The Media Gateway functions as a translator between media formats of the access network and the NGN packet network. The Media server provides functions to enable callers and applications to interact through telephony devices. The Application server hosts web-based applications that execute services that are offered by the network.

The Call Agent is responsible for interworking and handling of communications sessions. NGN services may execute on the Call Agent itself or on various Application Servers. The call Agent exposes an open standard API (such as JAIN, Parlay, OSA) to enable NGN services.

The Parlay group [2] has developed open APIs that enables 3rd party application developers access to network services (functions) such as Call Control, Presence, User Interaction, Content Based Charging and others. The Parlay X (see Figure 2) Web Services Specification from the Parlay group provides a web services interface to the Parlay X and main Parlay API's.

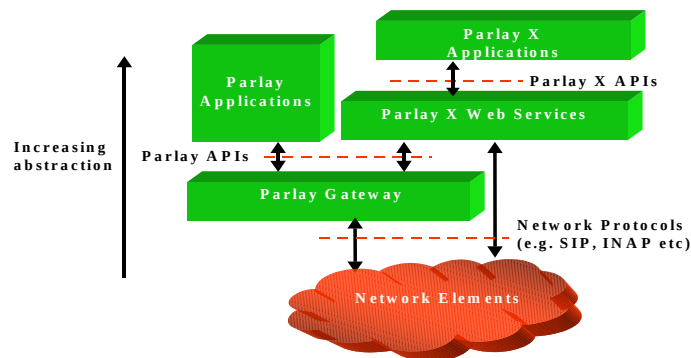


Figure 2: Parlay X Web Services, Parlay X APIs and Parlay APIs
(Source The Parlay Group: www.parlay.org)

2. Service Constructs and Terms

Figure 3 illustrates basic constructs and terms for service enabling.

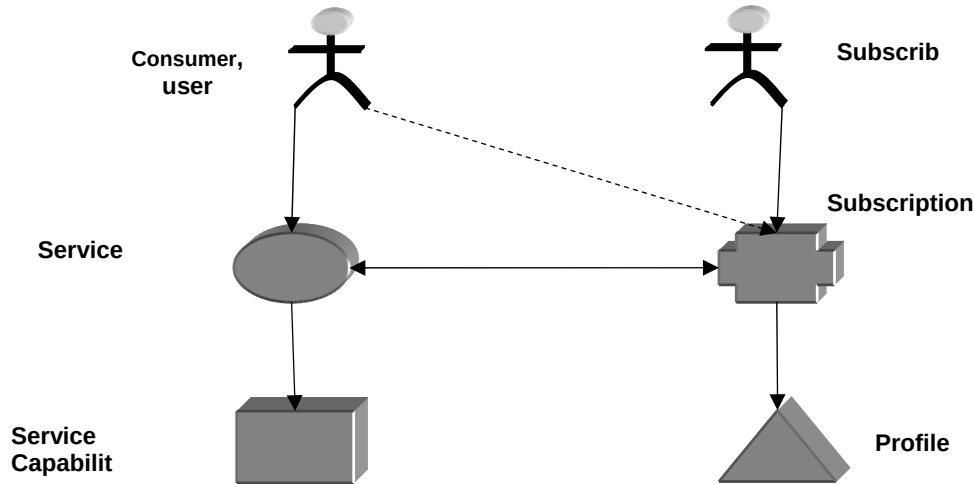


Figure 3: Basic Service Constructs

- Consumer (user): Entity that uses services provided by the system.
- Subscriber: Entity responsible for 'paying' for services – may not be the direct consumer.
- Profile: Information outlining privileges, preferences, and policies of Consumer &/or Subscriber.
- Subscription: Active capability controlling/detailing services and service capabilities available to Consumer.
- Service: A function or operation, which a service provider manages to a specific set of performance targets. May or may not be available to external Consumers, and may or may not have an associated usage fee
- Service Capability: A function or operation which is a property of the service provider's network, and which is reusable by other services. Zero or more of these functions may be bundled to enable the development, execution and management of services.

Figure 4 provides an IMS example of key service execution construct.

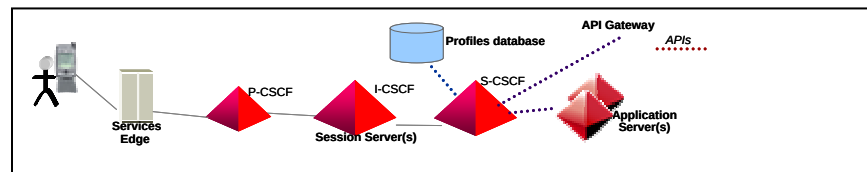


Figure 4: Service Execution Constructs

- Session Server: Executes SIP stateful proxy (back to back user agent) function, controls (SIP) sessions, service invocation, and billing.
3GPP/3GPP2 defined session servers: Call Session Control Function (CSCF) (P: proxy, I: interrogating, S: serving).
- Application Server (AS): Executes service logic, interacts with Session Servers and end users via SIP and/or APIs
- API Gateway: A special purpose Application Server which implements a secure and controlled network entry point for external services to access network based service capabilities, via software APIs.
- Profiles database: Databases and service engines for managing user profiles; subscription; Authentication, Authorization, Accounting (AAA); registration etc.
- Services Edge: Logical point of separation between access network and services domain. It serves as a point of dynamic (per session) policy control (e.g., QoS, CAC, ...) via standard protocols such as SOAP and DIAMETER.

Figure 5 provides the equivalent Web Services logical architecture.

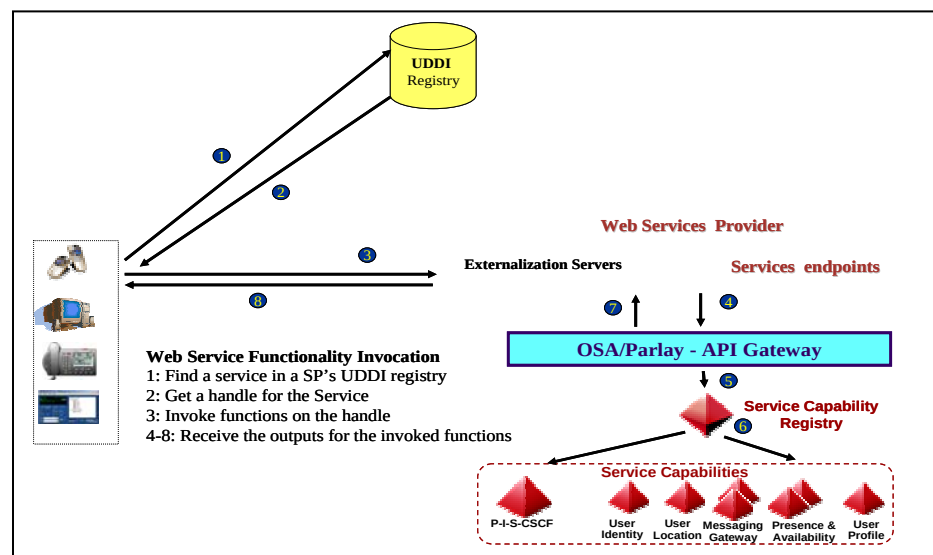


Figure 5: Web Services Access Logical Architecture

3. Policy Considerations

NGN enables 3rd party developers to incorporate network services through the use of common APIs. An application developer that uses NGN services should be able to consult policies regarding provisioning of the network service at the time of delivery.

Consulting the NGN network is important due to its support of multiple access mechanisms. Subscribers can use different devices to access similar services over different access networks (e.g. xDSL, WLAN, etc). Network providers may wish to modify the available services in different access networks. This implies that NGN networks may need to enforce policy decisions on a per access basis.

NGN network providers can combine service capabilities to create services to users. A user can invoke different services, using capabilities from many application servers. Services can originate from various sources. Policy control applies across service sets imply that mechanisms must exist for enabling federation between applications specific policies and network policies. In particular, there is a need for maintaining Service Level Agreements between various different entities. Policy brokers can be used to communicate policy decisions between application servers, networks and the subscriber [3]. Interfaces to policy brokers should be application agnostic.

The previous paragraphs highlighted some of the policy issues to consider in NGN networks. These issues have implications to application developers that will use web services technology to develop applications that takes advantage of an NGN network. As such, policy related work in web services must take into consideration the underlying network policy constraints and the need for having a flexible, extensible language to utilize services at the network layer.

References

1. Next Generation Networks (NGN) 2004 Project: <http://www.itu.int/ITU-T/studygroups/com13/ngn2004/index.html>
2. The Parlay group: <http://www.parlay.org/>
3. TISPAN NGN-release independent NGN requirements: <http://www.etsi.org/>
4. 3Gpp: <http://www.3gpp.org/>