NGN

Introduction

Today, telephony, the Internet, and the cellular mobile networks continue to be different domains, each has its own protocols and services.

NGN will be the foundation for the creation of a new range of multimedia applications that takes full advantage of the characteristics of the broadband network and the "always on" capability.

Existing Network Infrastructure and convergence toward the next generation network

Today's network is divided into:

- **The Public Switched Telephone Network,**
- **The packet Switched Networks(e.g. the Internet) and**
- **The Mobile networks.**

Convergence is the process of interconnection of traditional switched circuit networks (the PSTN and mobile networks) and packet-switched networks based on the Internet Protocol (IP) for routing.

NGN Definition

The term "Next Generation Networks" is wide-ranging and is interpreted variously by the broad variety of players involved in the communication business.

NGN ETSI's Definition

"NGN is a concept for defining and deploying networks, which, due to their formal separation into different layers and planes and use of open interfaces, offers service providers and operators a platform which can evolve in a step by step manner to create, deploy and manage innovative services."

NGN Architecture

- **A basic architecture was defined comprising Network Elements needed for the provision of traditional Telephony services.**
- **Each element has distinct roles within the network and is designed to integrate horizontally with other elements in the same layer, as well as vertically with the function-based elements of the other layers.**
- **The Next Generation Networks architecture is based on four layers: Access layer, Core layer, Control layer and Service layer.**

NGN layers

1-**Access layer** elements includes different Media Gateways that support connection to and from the access network with the core network.

2-**Core layer** is the network handling converged services based on IP.

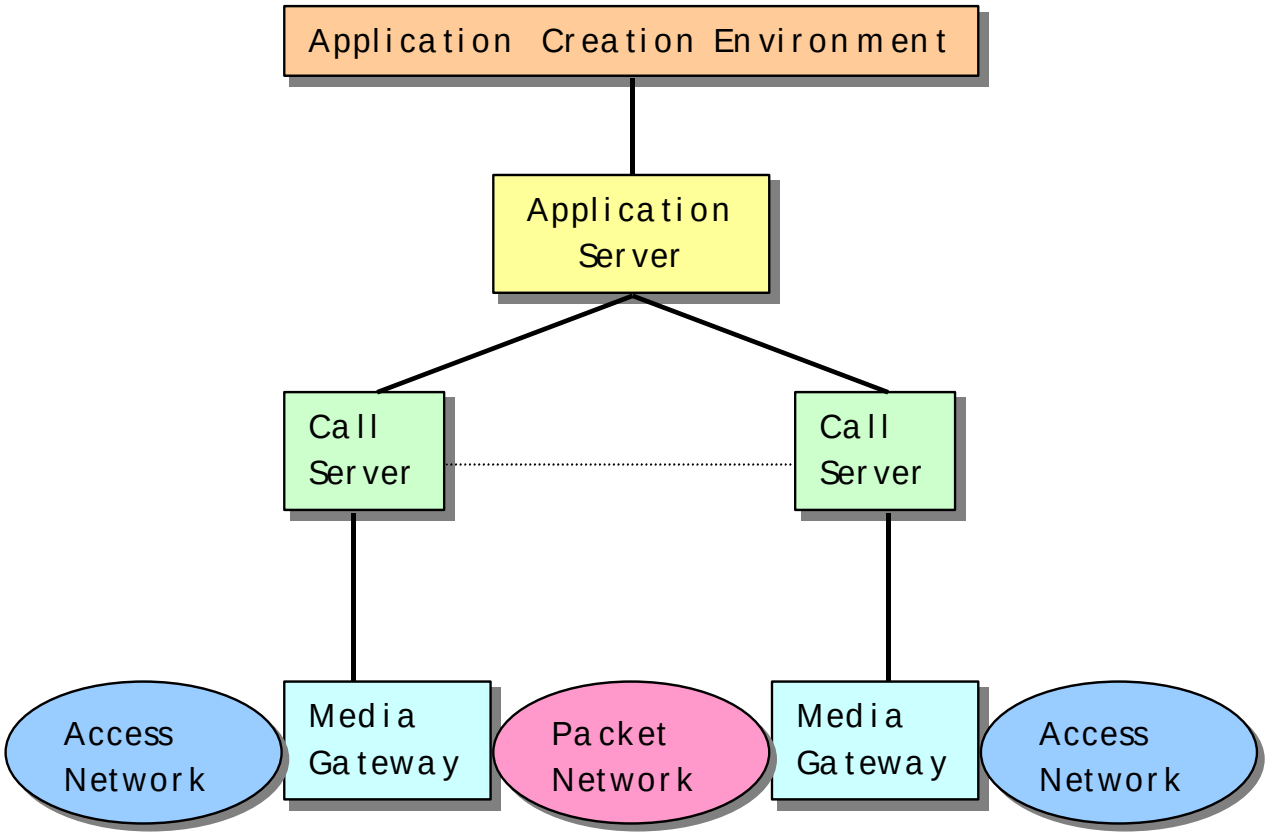
3-**Control layer** is the call server that provides call control functions and also provides the control of the Media Gateway.

4-**Service layer** is an IT platform that plays the role of an IN-SCE (Intelligent Network Service Creation Environment) extending their functionality in order to cover the new network scenarios

NGN Components

- The **Media Gateway**
- **The Call Server**
- **The application Server**
- **The Application Creation Environment**
- **The Packet Network**
- **The Access Networks**

NGN Architecture



NGN and Protocols

- **Next Generation Networks require new protocols to support converged networks.**
- **Requirements**

  Support for legacy PSTN interworking, Migration Plan from legacy to NGN, High availability, Lifeline services and Scalability
- **With so many protocols, which one to choose?**

  H.323,SIP(Session Initiation Protocol), MGCP(Media Gateway Control Protocol), SIGTRAN

NGN and Protocols

	H.323	SIP	MGCP/H.248/MEGACO
Standards body	ITU	IETF	MGCP/Megaco-IETF H.248
Architecture	Distributed	Distributed	Centralized
Current version	H.323v4	RFC2543-bis07	MGCP1.0,MEGACO, H.248
Call Control	Gatekeeper	Proxy/Redirect Server	Call Agent/Media Gateway Controller
Endpoints	Gateway, terminal	User agent	Media Gateway
Signaling transport	Transmission Control Protocol (TCP(Or User Datagram Protocol (UDP(	TCP or UDP	MGCP-UDP Megaco/H.248-both
Multimedia capable	Yes	Yes	Yes
DTMF-relay transport	H.245(signaling) or RFC 2833(media(	RFC 2833 (media) or INFO(signaling(	Signaling or RFC 2833(media(
Fax-relay transport	T.38	T.38	T.38
Supplemental services	Provided by endpoints or call control	Provided by endpoints or call control	Provided by call agent

Why should traditional telecommunications carriers care about NGN services ?

If the public network carriers want to prosper in the new millenium, they must find ways to add value to their transport services:

1-NGNs will allow carriers' networks to cost effectively support new suite of sophisticated services.

2-Help reduce costs by eliminating the inefficiencies of current service -specific, proprietary, and non reusable solutions.

Why should traditional telecommunications carriers care about NGN services ?

3-Reduce the time to market and life-cycle costs of offering new services.

4-NGNs will enable carriers to deploy advanced services, allowing them to remain competitive as well as expand their capabilities to enter new markets.

NGN Services

Several services that will be important drivers in the NGN environment are:

1-Voice Telephony: e.g.Call Waiting, Call Forwarding, 3-Way Calling

2-Voice Portal: provide callers with anywhere, anytime access to information like news, weather, stock quotes, and account balances using simple voice commands and any telephone,..

3-Data services: bandwidth-on-demand, connection reliability/resilient ,…

NGN Services (cont.)

4-Multimedia services: This allows customers to converse with each other while displaying visual information.

5-Virtual Private Networks: allow large, geographically dispersed organizations to combine their existing private networks with portions of the PSTN, thus providing subscribers with uniform dialing capabilities.

6-Public Network Computing: Provides public network-based computing services for businesses and consumers (e.g, to host a web page, store/maintain/backup data files, or run a computing application).

NGN Services (cont.)

7-Unified Messaging: Supports the delivery of voice mail, email, fax mail, and pages through common interfaces .

8-Information Brokering: Involves advertising, finding, and providing information to match consumers with providers.

9-E-Commerce: Allows consumers to purchase goods and services electronically over the network.

10-Call Center Services: A subscriber could place a call to a call center agent by clicking on a Web page.

11-Interactive gaming: Offers consumers a way to meet online and establish interactive gaming sessions.

NGN Services (cont.)

12-Distributed Virtual Reality: Refers to technologically generated reperesentations of real-word events, people, places,experiences, etc., in which the participants in and providers of the virtual experience are physically distributed.

13-Home Manager: These services could monitor and control home security systems, energy systems, home entertainment systems, and other home appliances.

NGN Migration Strategies

There are a number of different views as where to start first as there are no hard and fast guidelines as to what each step should be. Two different views are presented:

- Breaking the problem up into smaller pieces may indeed be one of the commercial solutions as each part can proceed under its own economic constraints and timeframe.
- Modernizing the control of existing voice switches and their signaling networks in a step-by-step approach to moving towards a NGN model.

NGN Migration Strategies

Key considerations in the evolution

It is important that these key benefits be delivered:

- **Investment protection**
- **Operational and capital costs savings**
- **Carrier grade reliability**
- **Scalability**
- **Improved product selection/choices**

Speed of innovation and introduction of services

Migration Strategies

- **EUROSCOM**
- **SIEMENS**
- **ALCATEL**
- **LUCENT**
- **ZTE**