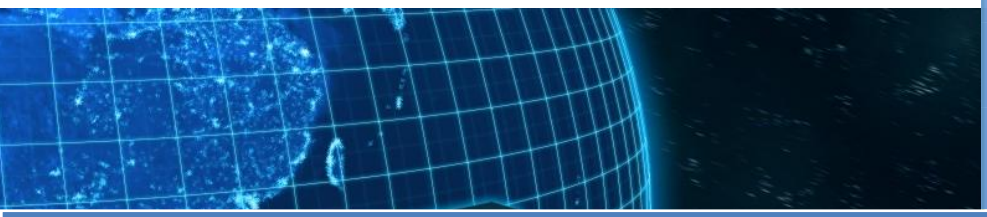
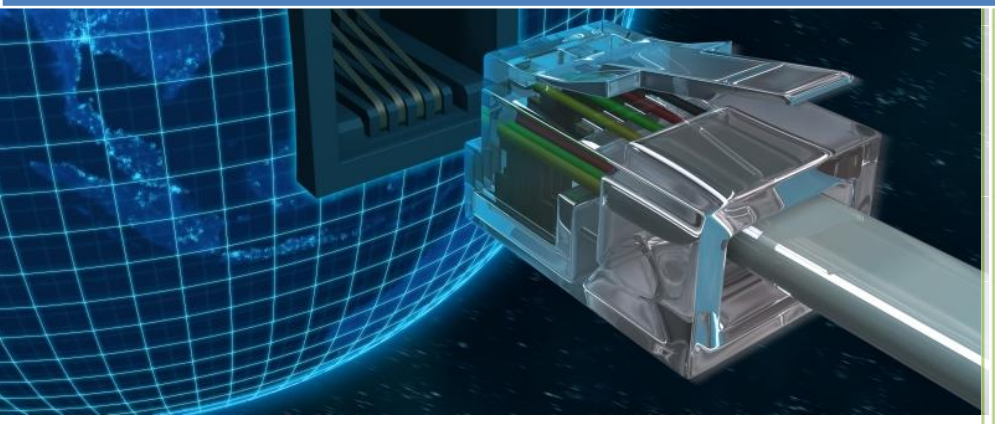


Next Generation Networks



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1.0 Introduction

A NGN is a packet-based network able to provide Telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

NGN can be thought of as a packet-based network where the packet switching and transport elements (e.g., routers, switches, and gateways) are logically and physically separated from the service/call control intelligence. This control intelligence is used to support *all* types of services over the packet-based transport network, including everything from basic voice telephony services to data, video, multimedia, advanced broadband, and management applications, which can be thought of as just another type of service that NGNs support. From a user's perspective, today's networks have come a long way in fulfilling their purpose of enabling people and their machines to communicate at a distance. However, a key critical success factor (among many) is focused telecommunications industry attention on NGN service concepts and how these concepts can be realized in an NGN environment, from the edges to the core of the network. This focus is lacking today, with most of the attention on specific NGN technology issues.

NGN Service Characteristics

The following is a summary of several service characteristics likely to be important in an NGN environment:

- Ubiquitous, real-time, multi-media communications - The only hope for dramatically

increased fidelity, akin to communicating in person, is high-speed access and transport for
any medium, anytime, anywhere, and in any volume.

- More "personal intelligence" distributed throughout the network - This includes applications that can access users' personal profiles (e.g., subscription information and personal preferences), learn from their behavior patterns, and perform specific functions on behalf of them (e.g., "intelligent agents" that notify them of specific events or that search for, sort, and filter specific content).
- More "network intelligence" distributed throughout the network - This includes applications that know about, allow access to, and control network services, content, and resources.

- More simplicity for users - This shields users from the complexity of information gathering, processing, customization, and transportation. It allows them to more easily access and use network services/content, including user interfaces that allows for natural
interactions between users and the network. It involves providing context-sensitive options/help/information, transparently managing interactions among multiple services,

providing different menus for novices vs. experienced users, and providing a unified environment for all forms of communication.

- Personal service customization and management - This involves the users' ability to
manage their personal profiles, self-provision network services, monitor usage and billing
information, customize their user interfaces and the presentation and behavior of their applications, and create and provision new applications.
- Intelligent information management - This helps users manage information overload by
giving them the ability to search for, sort, and filter content, manage messages or data of
any medium, and manage personal information (e.g., calendar, contact list, etc.).

❖ Specific NGN Services

Most of the initial NGNs profits may actually result from the bundling of traditional services. Thus, bundled traditional services will pay for the network, whereas emerging services will fuel the growth. Most traditional services relate to basic access/transport/routing/switching services, basic connectivity/resource and session control services, and various value-added services. NGNs will likely enable a much broader array of service types, including: Specialized resource services (e.g., provision and management of transcoders, multimedia multipoint conferencing bridges, media conversion units, voice recognition units, etc.)

- Processing and storage services
- Middleware services (e.g., naming, brokering, security, licensing, transactions, etc.)
- Application-specific services
- Content provision services
- Interworking services
- Management services to maintain, operate, and manage communications/computing networks and services.
- Public Network Computing (PNC)
- Distributed Virtual Reality
- Home Manager

NGN architecture principles

- A layered approach

- A transport layer,
  - including functional entities that do transport routing

- A service layer,
  - including functional entities that provide services

- A sub-system oriented approach,
  enabling: The addition of new subsystems over the time to cover new demands and service classes.
  - To import (and adapt) subsystems from other standardisation bodies.
  - Flexibility to adjust a subsystem architecture with no or limited impact on other subsystems.
- IP connectivity
  is provided using two subsystems:
  - Network Attachment SubSystem (NASS)
  - Resource and Admission Control Subsystem (RACS)
- First service-oriented subsystems
  - Include the 3GPP IMS, a PSTN/ISDN Simulation Subsystem
  - a PSTN/ISDN Emulation Subsystem (PES)
- Future service-oriented subsystems
  - A streaming subsystem
  - A TV Broadcasting subsystem