NEXT GENERATION NETWORKS: SERVICE AND PERSONAL MOBILITY

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Abstract: The concept of Next Generation Networks (NGN) is a relatively new one. for the purpose of defining and deploying networks that, due to their nature, formal division into different layers and planes, as well as the application of Open interfaces provide service providers and operators with a level of flexibility. platform with the ability to evolve in order to create, deploy, and manage services that are cutting-edge A generic model is presented in our paper. In NGN, mobility is defined as follows: Following that, we discuss our concept of Personal and service NGN architectures are supported by NGN service architecture. mobility. Following that, we discuss the rationale for a session initiation protocol. The Signaling Interchange Protocol (SIP) is used for service and user mobility. After that, we'll talk about the concept of a Virtual Home Environment. (VHE) and one of its components: The Personal Service for the user. Users' access to information is based on their physical and social environment (PSE).any network and with any device may provide customized services The terminal was used.

Keywords: NGN, SIP, VHE, PSE, and mobility

INTRODUCTION

The term "mobility" relates to the general concept of being on the move. According to the OSI model, mobility can be identified on the top level.

There are three distinct levels (see Figure 1):

1. Mobility of the terminal and the host

2. Personal/User mobility as well as

3. Mobility of services and applications

Terminal mobility enables users to travel from one physical location to another. while maintaining the same set of services from one place to another available. When viewed from the outside, the host always appears to be to be connected to its own personal network as a result, sessions are held. path is openly directed to the present attachment point of the Node on the move.

Personal mobility is defined as the ability to reroute communication for a specific purpose. across several devices by a single user,it is the concept of being able

To The user serves as the point of contact for all communication. By making use of a single we can create a level of identity for a person by implementing a level of Communication with the target endpoint is accomplished by indirection.

Personal mobility is a major driving force behind the integration of services. across heterogeneous devices connected to a variety of networks. Some Specific functions are employed to aid in the mobility of the user:

1. the identification of the user as a single individual,

2. authority for the user to have access to resources on that computer network,

3. This is a valid local identity for both the user and the host on that particular network,

4. storing information about a person's local identification in a computer sessions initiation from a central or distributed database, central or distributed databases well as towards the consumer through the usage of distributed databases.

Service mobility refers to the seamless movement of people and things across a network. During a service session, various networks and devices are utilized. Switching from a cell phone to an IP phone, for example, during the conversation). It enables people to have access to services. Regardless of the user's access point, i.e., the user sees what the server sees All endpoints provide the same set of services [1, 2].

2 According to the definitions of mobility provided above, mobility is defined as follows:

The most important factors are service and personal mobility. The characteristics of the NGN services architecture. In addition, the mission of the purpose of Next Generation Networks is to provide service and connectivity. personal mobility, for example, the capacity to gain access to personalised services from any end- device, at any time, and from any location. To In order to accomplish this, it is required to develop a new architecture. on all three levels of mobility will be able to provide help as previously described.

2. ARCHITECTURE OF NGN SERVICES

In this section, we outline our vision for the NGN service. architecture that can support service and individual mobility. The NGN services should be accessed from a variety of locations. Various types of terminals are used in different networks environments. It is necessary to make modifications to the service different types of terminals can be used without changing the **fundamentals** a service's ability to function.

The same level of service can be obtained. different ways in different terminals with different capabilities; as a result, it is necessary to keep the specific service

logic separate from the overall service logic at the heart of the service   The precise service logic or service that was provided. The terminal, which is used to communicate with the user, contains the user interface to gain access to the service a copy of the author's work.

Figure 2 depicts a network-centric service architecture, which is comprised of There are two major aspects to this: the service level and the access level. The services section contains the core service logic as well as services located on a server that is connected to the network In contrast, access is restricted. This component represents the specific service logic that may be found within the Weather or if the terminal can host the entire given service logic or, in the case of a very simple terminal, the access network carries out specialized service logic[3, 4].
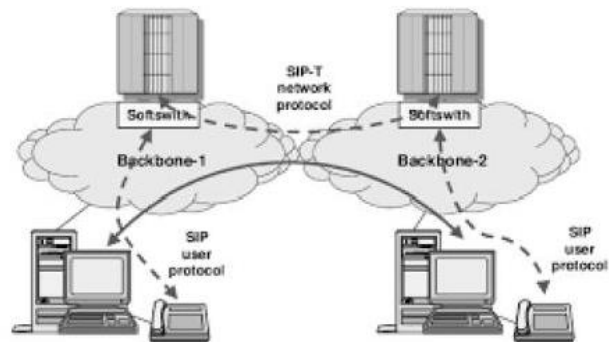

Figure 2. NGN services architecture

Fig. 2: A diagram of the relationship between the two figures. The architecture of NGN services Traditional fixed networks and mobile networks both offer a variety of services. Voice services that are reasonably comprehensive. However, even in this case When services are improved by the application of IN technology, they change. slowly, while the underlying paradigm remains virtually unchanged. Backbone-1 and Backbone-2 are the supporting structures of the body.
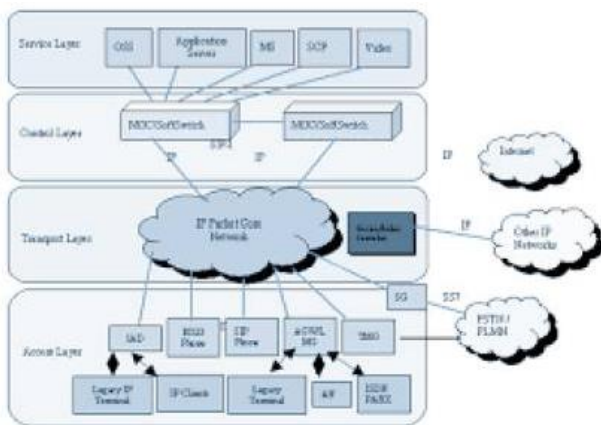
Figure 3. NGN functional architecture

Next-generation networks, which include 3G mobile networks, are being developed. will be able to overcome these restrictions by rearranging the network architecture (Figure 3) to distinguish between the provision of services and services provided by the network, to combine information, etc. telephone technologies, as well as the introduction of open protocols, such as protocol for the initiation of a session (SIP).

All these networks are included in this list. the elements required to suit the needs of a diverse group of users Expectations in terms of service delivery Additionally, they will be able to develop and provide innovative and successful added-value services in general, they have three major advantages when it comes to their capabilities

- in terms of service: bring the information and telecommunications systems together worlds „h shift intelligence away from the network core and into the network perimeter servers and terminals

- At the periphery of the network. There is no requirement for a state machine with triggers for the call and for the response service control [5]

3. SIGNATURE PROTOCOLS FOR USE IN THE SERVICE SUPPORT FOR MOBILITY IN NGN

When it comes to providing Service mobility, signaling is a critical enabler. Architecture. It enables the provision of new services in the Nonsignaling System No. 11 is unquestionably evolving, and new IP addresses are being added. Mechanisms that are founded on

principles are provided. Signaling is, without a doubt, the glue that holds everything together that allows for a seamless transition to the next generation of technology networks.

The SIP protocol has been selected as the foundation for the system. Because NGN can support session/ signaling management, Mobility for all, including terminal, personal, and service mobility applications. The following are some of the benefits of utilizing SIP with the purpose of promoting mobility: allowing consumers to rely on their equipment rather than on others than on the network for the purpose of facilitating mobility on an on an end to- end basis This means that mobile users will be able to roam across SIP settings with no need to be concerned whether they support mobility at the network layer Providing a method for route optimization and improved performance SIP signaling provides superior performance for real-time services communications for the purpose of address binding and registration Providing the ability to deal with mobility on a semantic level above IP terminals (for example, the movement of a media stream).Transferring from one terminal to another.

Supporting mobility with SIP now is a short-term solution. In addition to other approaches based on data, the application layer protocols for mobility at the network layer (e.g., mobile IP) Nonetheless, it has the potential to replace them in the long run [5, 6, 7].

3.1 The advantages of using SIP for NGN

communications SIP is a textual protocol for client/ server communication. architectures. Because of its simplicity, services can be provided grown quickly and with little effort The Hypertext Transfer Protocol (HTTP) is an example of this.

SIP is structured in such a way that extensions can be added to the protocol (HTTP).It is simple to include. In conjunction with other text-based applications, it has end- to-end protocols for the Internet world, and it is secure transparency. SIPT is a communication protocol that has been extended.

Soft switches are used to switch between two states. ISDN User Part (ISUP) messages are sent over the ISDN network. SIP can carry parameters in the form of MIME-type messages. Attachments with the MIME

(Multipurpose Internet Mail Extension) extension.

SIP involves more than just the traditional phone call process. Not only that, but it also involves not only the registration process, but also helps capabilities in the information domain, such as the presence of information a protocol for conducting business (SIMPLE). As a result,the use of SIP is discouraged.

The most important component in achieving consistency between the worlds of information and telephone are intertwined. SIP can transport the Simple Object Access Protocol (SOAP), allowing one endpoint to access programmes hosted on another endpoint. Example: A server application can launch a web browser application running on a SIP handset (for example, to change the ring tone) in the case of an incoming call). In a similar vein, accountancy.

Information pertaining to a prepaid card can be obtained from a prepaid card. The SIP application server communicates with a proxy server to control the duration ofa phone call. The launch of SIP services will be a major motivator for the industry be the integration of their services with web-based applications SIP services for telecommunications. The extensible Markup Language (XML) will be used to describe the web. Scripts in (XML) format. The ability to manipulate XML is provided to theoperator or user to develop and make use of an abstractionlayer to quickly and easily Service scripts must be defined. Several new services will be introduced soon.

future. The introduction of Microsoft Messenger signals the beginning of a new era in communications. Each desktop computer is now a SIP endpoint, and each web browser is a SIP endpoint. The developer is well-versedin XML and SIP Service technology. Environment for thecreation of new things (SCE). This represents a significant potential for the SIP sector, both in the business domain (SIP) and in the consumer domain (SIP).In theprivate branch exchange domain (PBX), as well as in the carrier domain (SIP),Proxies and soft switches are examples of such devices. These are compelling arguments in favour of employing. SIP services in both the enterprise and public Internet domains are availablenow. Today, and soon, in the IP mobile domains will beavailable.

It is estimated that the added value of these additional services to the network operator is that they boost either the subscriber base (new voice over) or the number of subscribers IP lines, new corporate virtual private networks), or the Internet Protocol (IP).The amount of network traffic (connectivity), or the value of the network (e.g., Quality of service management, location, charging, and physical presence are all important considerations management). It is not present in the cannibalizing voice or in the cannibalizing voice. leased line services at a lesser cost, even though there is a catch in most countries [5, 6], there is a market for best effort voice.

3.2 3G and NGN: A Comparison of HTTP and SIP Transmission Protocols services: When it comes to 2G mobile networks, communication services are provided. The control protocol is almost entirely responsible for this. In mobile networks such as NGN and 3G,since control flows might originate from two different sources in networks, setting up a connection can be accomplished using both SIP and HTTP. The currentprocess for setting up a simple connection is as follows:

The appearance and feel, as well as the technique and behaviour, of a mobile terminal is SIP is also expected tobe used for multimedia calls, making it the protocol ofchoice. The primary protocol.

Complex connectivity services, on the other hand, such as applications for multiparty managed conferences or training sessions, for example entailed more complicated control and a greater number of semantic implications.Control elements are defined as follows: In this instance, the most obvious approach is to make advantage of withSIP, web technology is used for the primary service control flow. Only the simplest point-to-point connectivity control is dealt with in this module. To operate a device, SIP and HTTP can be utilised separately. A service that provides connectivity. In addition, they can work togetherto control the operation of a service Furthermore, HTTPis a content transport protocol. An ordinary SIP-driven call can be transformed into an HTTP-enhanced SIP service.

As an illustration, consider the following:

When a web page is requested while the connection is

being established in a manner like that of the 2G Calling System. CLIP is a service that provides identification

presentation. It is, on the other hand The notion might be far broader in scope, encompassing all ofphases of a phone call (answering, connecting, releasing, presuming, etc.).

These phases have been determined pushing this web page now of the invitation can result in duplicate invitations [5]. HTTP-driven decisions about what to do and how to proceed.

3.3 Support for service mobility using SIP dependent on the location of the user services

There are a plethora of location-based services available. used as part of a mobile network that makes use of location-based information regarding the user's location This might be anything from the provision of appropriate transportation information to the end user.

Services, restaurants, and tourist information are all examples of what is available. It is also possible used to provide a subscriber¡¦s location to other parties, which can then be used to target them. The content could then be pushed. For example, a web might be used to accomplish this. Page, video clip, or instant message are all acceptable options. An Application Server is a piece of software that allows you to run applications on a computer embeds media within a SIP message so that itcan be played again later by use of the SIP-enabled handset It is possible to use location services. implementation is carried out at all stages of network conversion, from GSM to LTE. Release 5 of the UMTSsystem.

We will use an example of LBS (Location Base Services) to demonstrate this. programme that delivers material to the end user, such as web pages page describing local attractions (for example, a directory of services)providing him with services (such as taxis, restaurants, hotels, and so on). while he lands at a nearby location with click-to dial capabilities airport. When thissmartphone user wants to order a taxi, he or she will usethe app. He makes use of a directory service, which gives him with information based on the services of local taxi companies He makes use of the 'click-to-message' feature allowing for the transmission of an

instant message to the taxi company the act of calling for a cab right away or at a specific time. The cabbie the company then uses click-to-dial to chat with and confirm with thecustomer. A taxi is on its way to pick up the customer. At this stage, an application is being considered. The serveris used to integrate with mobility servers and other systems. The taxi company receives the location information automatically. The provision of this type ofservice necessitates the participation of the creation of an application that communicates with the user. Mobility servers are available, as well as a directory service. The After that, the application communicates with the Instant Message and third-party applications. Capabilities for Party Call Control, with signaling carried out via SIP[6] Messages are exchanged.

Figure 4 shows an example of a formalized An example of a SIP service that facilitates mobility Figure 4. An example of SIP service supporting mobility

4. VHE AND ITS ELEMENT PSE

The Virtual Home Environment (VHE) is introduced as a new type of computing environment. The Universal Mobile is based on a core notion. Tele communications System (Tele communications System) (UMTS). However, it appears to be it serves as the foundation for all Next Generation Networks because it aspires to ensurethat users may get access to customized services at any time network, with any terminal that is utilized, and from any location is possible. In addition, the VHE is defined as a fundamental notion for the capacity to move customized services between networks and terminals. This definition covers three critical issues aspects: Personalization of services, allowing users to make changes to their preferences providing their services in the most convenient manner for them The ability to move services between networks broadens the possibilities. thepremise of the system's application across the board boundaries between fixed, mobile, data, cable, satellite, and other technologies a variety of additional networks.

The ability to transfer services between terminals is the most important. The VHE user can see the visual part ofthe problem. The notion of the VHE system, as well

as its broad scope and diversity. The proliferation of networks, as well as the variety of terminals, heralds the arrival of a There are a variety of technical obstacles that must be considered account.

Provided via the serving network, as well as the terminal being used. The service set is determined by a collection of capabilities that are available that can be made available to the provided user, as well as the manner. The services contained within this service package are made available to the end user.

Users of the NGN will access a variety of services supplied by a variety of vendors. It is possible to associate network systems and user data with one another. service. VHE offers the following services at the application level:

Integration is required to provide global tailored services and emphasizes the need for service providers to handle user information details about the service as a result, one of the most significant components of the VHE is the Personal Service Environment (PSE) of the user (PSE).

The provision of a PSE to users is classified as a service by the VHE. Its primary role is to The PSE is essentially a combination of several factors. Information about services as well as on the customization of their delivery use. From the user's perspective, the PSE is a personalised experience. a service portfolio offered by a single source of services with new regulations that are allowing a greater variety of products to enter the market The service provider may be able to obtain these from competing actors. services from several VASPs (Value-Added Service Providers). The NGN user only sees his or her own PSE, which is provided by the network.

The service provider has complete control over the situation. The potential for many variations. The number of VASPs engaged in delivering these services continues to grow. The user does not see any difference. As a result, the services are more convenient to utilize .It enables the service provider to select the most appropriate VASP for the client and even update it without affecting the overall service. The subscription agreement between the user and the service provider.

Each user in his or her PSE has a list of all the services to which he or she has access.

He or she has access to and is storing information about his or her personal information. requirements for services (for example, what types of services are required). favoured, according on the time of day and the day of the week, and terminal types). The PSE also keeps track of the attributes and individual information. information that has been defined by the user and the service provider Hence, It can be divided logically into the following categories: Part of the user interface that contains information about the settings for example, menu structure, preferred access to information, and so forth language preferences, as well as network related preferences, as an example, the language used in public announcements section displaying a list of the services that have been subscribed to Examples include: prepaid, family pack, services portal, and sponsoring phone calls), as well as references to service choices (e.g.,favoured mode of access (voice or data), personal/family preferences. Directory do not disturb mode, incoming and outgoing calls are all included call screening lists, as well as differences in the time of day for each whether any of the services are applicable. A PSE facilitates a rich interaction between networked services by allowing them to communicate with one another. as well as their users A PSE is a notion that we have introduced in this article. Solution to many of the difficulties in the field of mediation services that are delivered through a network The PSE makes the most significant contribution in that it. By providing more options for networked services, it gives users more choice over their experiences. The facilitation of spontaneous collaboration amongst peers [8, 9] is discussed.

CONCLUSIONS

NGN is a paradigm for defining and building networks that are based on the Internet. because of their formal division into multiple layers, planes, and sections. The use of open interfaces provides service providers and operators with opportunities. a platform that may evolve in a step-by-step way to accommodate future needs Innovative services are developed, deployed, and managed. The architecture is centred on the decoupling of services and applications. Networks with numerous layers and planes are called multilayer networks. It makes things possible. skills develop, install, and maintain a wide range of applications services. The most crucial aspects are the service and personal

mobility. The characteristics of the NGN services architecture.

In this paper, we will discuss have defined a generic concept of mobility that can be applied across industries NGN is a service-oriented network that emphasises individual mobility. For example, the capacity to access services from any location at any time. any type of end-terminal Following that, we give our vision for the future. The NGN architecture is used to supportits services. Following that, we propose the use of the SIP signalling protocol for service and user communication. Support for mobility in the NGN.

Finally, we've talked about it. The Virtual Home Environment (VHE) concept and its applications element: the user's Personal Service Environment (PSE), which can be described as a foundation enabling users of the Next Generation Network to have access to Services that are customised in any network and with any device. The terminal was used.

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