A WAY TO ACCESS WIRELESS NETWORK

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ABSTRACT

A Wire-less Mesh Network (WMN) is a communication net-work made up of radio-nodes organized in a topology, which consists of mesh-clients, routers & gateways. The mesh-clients are laptops, mobile etc, those wire-less devices which are connected to the Internet by mesh-routers. The mesh-routers move or sends traffic to, coming from gateways which are connected with Internet. The coverage area of the radio nodes working as a single network is sometimes called a mesh cloud. Access to this mesh cloud is dependent on the radio nodes working in harmony with each other to create a radio network. A mesh network is reliable and offers redundancy. When one node can no longer operate, the rest of the nodes can still communicate with each other, directly or through one or more intermediate nodes. Wireless mesh networks can be implemented with various wireless technology including 802.11, 802.16, cellular technologies or combinations of more than one type. A wireless mesh network has some features which are similar to wireless ad-hoc network. It is often assumed that all nodes in a wireless mesh network are immobile but this is not necessary. Wire-less-Communications has an infra-structure which can be characterize by hetero-generous systems. Get access to number of services and applications for mobile users a unique architecture as a communication system has been setup with some important component of wire-less communication systems beyond 3-G. Weemphasizes the role of digital broadcast for future networking.

Keywords: Smart Mobile End Systems, Wireless Systems Beyond 3rd Generation, System Survey.

I. INTRODUCTION

The wire-less-communications in future will also be characterized by hetero-generous systems. The excessive amount of wire-less-communication systems is not only limited to tele-communications systems like:-

1. GSM,
2. IS-95, non-cellular systems like: - DVB.

Wire-less LAN increase the quality with quantity. To use the correct communication system in the appropriate situation, systems are missing that provide selective access to all currently available wireless communication systems. In this paper we present our server architecture that solves this problem in mobile end systems and is intended to be part of wire-less personal communication system beyond the 3rd-generation. In future system there will be still hetero-geneous as, current systems properties do not satisfy with all upcomingnew applications such as:- e-commerce, enhanced data transmission, ASPs, customized multimedia tele-communication services, CAT-V, power-line that provides their bearer services to enable value added applications. On other hand there

are wire-less communication systems in this area or field that serves a better facilities to the customers or are available at a better reception. In fact IMT-2000 complement on the existing wire-less system and does not change them .As IMT-2000 will open up some extra bandwidth from the radio (scarce)Freq. Spectrum. To be Advance upcoming systems must have to combine each and every infrastructure to give a smooth accessibility to wire-less application. We can say such type of infrastructure as"Wireless infrastructure", this is not only for cellular system, but also for broadcast systems etc. Our aim is to enhancing 3rd-generation wire-less communication systems.

This paper comes to blow with the fundamental characteristics of wire-less communication system and conclusion of this paper will be in a form of a structure which follows few step or concepts are:-

- We talk about some application framework with their relation with auto-mobile environment.
- We put some related research projects.
- A short over-view of 3rd-generation mobile communication systems
- Brief discussion about the Gate-way Architecture of communication which deal with wire-less system by illustrating their main components and functionality.

II. WHAT IS AN APPLICATION FRAMEWORK?

It is a Multi-Service, Multi-Media Mobility Application which can easily access to high–band-width communication services for mobile users. Let imagine we have subscribed a broadband application service any application like an e-newspaper. Our systems provide the updated information in a multi-media style with audio, video and allow us to request for further information. More advantages like access to email, fax, voice mail etc are now possible through asingle system and it is alsoaccessible every-where at any time via wire-less communication. These types of Framework cannot be realized today in the wireless world, in its full implementation. Not only the infrastructure is not capable enough for such a service today, but also a worldwide existence of one uniform infrastructure is questionable in future. An industry which gets a great benefit from this solution is automobile industry, as we all know that car is becoming more & more part of the global network.On the road, one will pass from different area havingdifferent communication on air is good or acceptable for local information services as it will provides traffic reports on phone or by email. The availability of communication does not vary with the location but vary with time.

III. ADVANCE MOBILE-COMMUNICATION-SYSTEMS

From 1st to 2nd-generation communication gives the transition from Ana-log to Digital, while 3rd-generation systems are driven by the fast rise of the Internet and increase seed for data transmission capabilities. In 2nd-generation systems few upgrades were done and enhanced by packet radio services such as"GPRS", air interface technologies"EDGE" to get efficient access to Internet. There is various importance of the Internet as it is the main controller ofthe entire packet. Broad-cast Networks besides the future mobile communication systems, another way of digitalization gives up a new service"digital broadcasting". Ana-log FM radio, TV soon will be replaced by digital counter-parts as Digital Audio Broad-cast and Digital Video Broad-cast. These systems will offer a mass media services in current format, also have the capability to transport any digital information. By this these digital broad-casting systems will be an interesting complement to 2nd and 3rd-generation-mobile-

communication-systems. Web page, digital audio, video clips, e-newspapers (A set of multimedia information units) can be composed and transmitted via networks. The insertion of information, periodic transmission cycles will increase the availability of the transported application services. Generally, multi-media data casting provides a possibility to bring advanced services to the users. The a-symmetric style of various applications, like the con-current access of users to popular web pages, the download of information, videos etc., enables the usage of broad-cast networks combined with a narrow-band return channel that complements the distribution networks and enhances the variety of supported services. A communication service is independent of wire-less access to the services and the applications from the systems which propose new server style. This server style resides within the system b/w the user terminals & the wire-less networks which are providing communication services. This is the way in which our system provides a gate-way b/w client requests and the communication service networks. We refer our system as 'server'. Our style is designed according to auto-mobile & systems, as we see the most interesting business here. Network Service independency gives a Platform to existing approaches which show the importance for NIS (Network Independent Service) provisioning for kind of mobile networks. Such type of concepts providessupport to the NI Provisioning of multimedia information & communication services in dedicated intelligent servers. The mobile users would have more beneficial to have a convergence layer close to the mobile terminals on the receiver side. The experts for service Assistance: - service access, proxy caching, profiling, network selection, location awareness, security should reside at the edge of network not in the network core, while it is the current user equipment & current location which determines the availability of network service.

IV. BASIC OR SIMPLE CONCEPT OF SERVER

Server is designed to support different types of service classes such as:-

1. IC (Information Casting)
2. IP (Information Push)
3. DR(Data Retrieval)
4. Access to data networks
5. Telecommunication Services.

To get the requirements in detail, the server design full-fills the few tasks such as:-

- Get access to different client communication device on one uniform, open interface in-car middle-war.

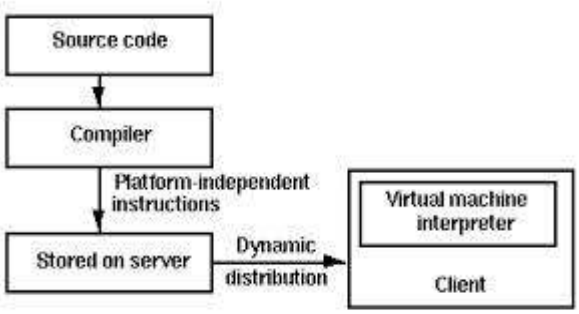

Fig:-1

- Mapping of the information &communication services given by the clients through wire-less network services which is currently available through the communication module of the server.

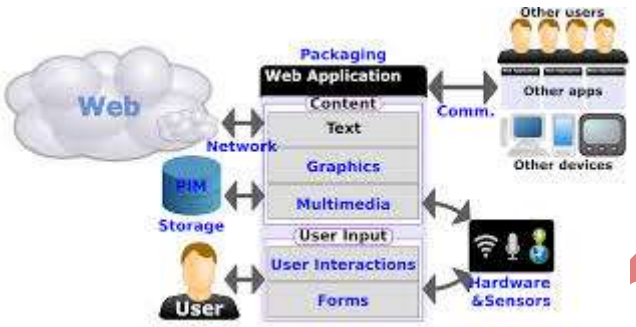

Fig:-2

- Getting a Combination of communication modules which provide the possibility to realize new services and applications also spanning several networks (service control).

Fig:-3

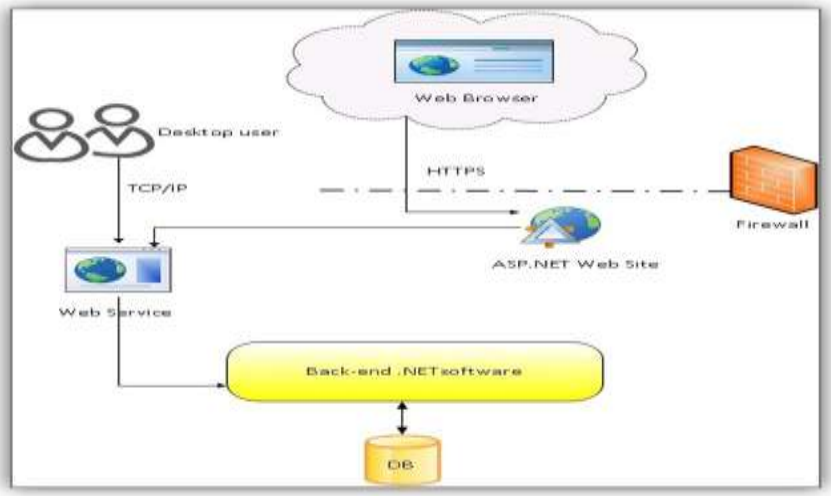

Fig. 4: Overall System View

It concludes that server system allows its clients to use application services, where the clients do not have to blow with the specific configurations of the communication modules. Server provides an open interface for the convergent use of application services over heterogeneous transmission systems. This general concept in Figure 1,shows the server system in a sample environment. The server acts as multi-functional communication gateway between the client and the heterogeneous wire-less infrastructure to connect client applications with the appropriate service providers.

Sever Functionality

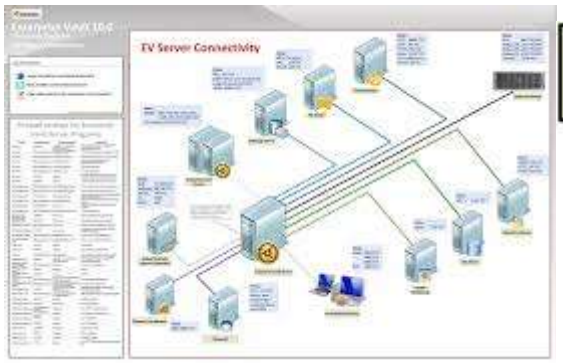

Fig:-5

Fig:-6

Fig:-6 illustrate the functionality of the server architecture and Fig:-5 its main system components. Client represents the customer's terminal which is fixed in the auto-mobile (Display, Hands Free Dialog System, vehicle platform) & also which can be brought by the customer (laptop, mobile phone, play station, mp3-player). Whereas the former systems may have a wire-line connection to the server, for the latter a wire-less connection would be beneficial. Independent of the physical connection we provide an open interface between the client and the server architecture for all application services. The server consists of a central unit for the Adaptive Mapping of requests, for distribution-oriented services as a storage component realizes a proxy cache to support local interaction functionality. As real-time conversation applications & services are handled by a switching unit that supports packet switching as well as connection switching. Finally the server components Address the different types of communication modules which means it is the communication modules that perform the adaptation of the server style requests to the different protocol stacks of the connected wire-less networks. The interfaces of the communication modules to their networks are network dependent. It also allows new communication modules to be integrated flexibly to the server style in a plug and play fashion. In principle the following communication paths controlled by the server are supported. The client can request communication services either from the proxy unit or from the switching unit. The proxy unit receives data via broadcast or multicast. For client requests an additional upstream channel can be used, e.g. GSM. These bi-directional communication modules are also used by the switching module to map conversation style services on appropriate networks. In addition the client can request other services from in-car equipment, e.g. GPS, that are not addressed here.

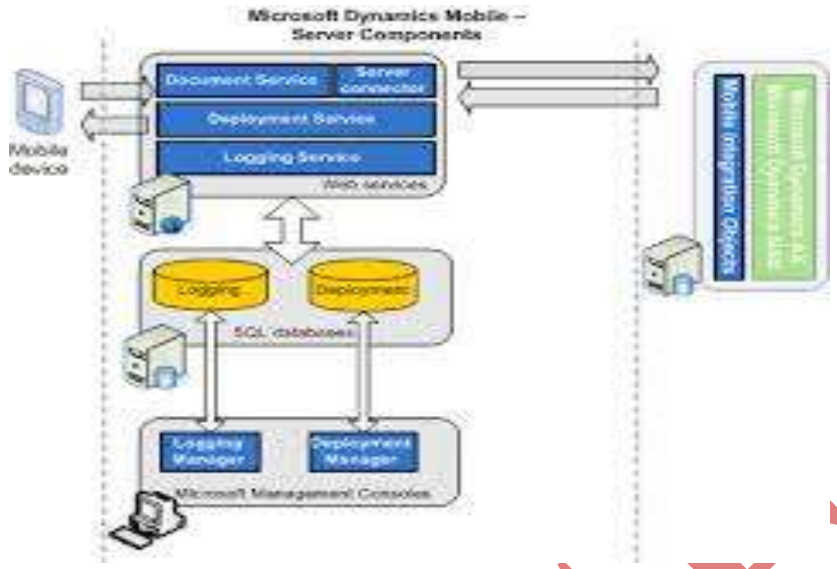

Fig. 3: Server Components

Also switching functionality is provided by the switching unit, if more than one communication module are involved or, if more than one client are connected to the server. For broadcast based services (retrieval and push control) a local caching is realized in a proxy component. The traditional store and forward concept (e.g. email) is enhanced to forward and store. The original message box of the user will be maintained within the core network. All messages are transmitted to the server message box immediately when they arrive. To ensure proper reception a narrowband return channel e.g. GPRS synchronizes the network and the server based message box. For conversion of data or display formats the storage units use conversion components (converters). This allows e.g. the conversion of a fax to the gif format or even the conversion of an email to speech. To enable location based services we include a GPS based location module within the server. Beneath common service capabilities the server also contains a data base for a user's personal profile. The profile can be set up manually or can be stored by clients, e.g. for their organizers that are connected to the server. The latter is especially useful for environments with frequently changing customers, e.g. rental cars. The control unit of the server configures the communication control units according to the personal user profile. This allows for example the automatic retrieval of information the user has configured in his profile

V. CONCLUSIONS

We have shown that the wireless communication infrastructure is and will be characterized by heterogeneity. In addition the availability of wireless network services varies with the location of a mobile user. This problem is especially important for automobile users having a high mobility spanning many countries with different standards. In addition to the traditional wireless infrastructure, wireless broadcast networks like DVB-T or DAB provide possibilities for data casting to enhance broadband mobile services. In order to cope with the heterogeneity of network services and standards intelligence in the end systems / at the network edge is required to map the user/client requests onto network services that are currently available. We have defined a server architecture to realize this functionality. Whereas our architecture is designed for an automobile environment it can be applied to other fields as well. In general our approach describes a "mobile communication gateway", which can be used in any situation where an intelligent solution is required for the interconnection of different

clients to networked applications over heterogeneous wireless networks. For example mobile offices could be set up easily with our system. Today such systems have to rely only on GSM, e.g. laptop connected to your mobile phone. Our adaptive selection mechanism guarantees availability of services independent of the location. Currently, we are working on an implementation of our concept based on integrating WLAN, GSM/GPRS, and DVB-T. Nevertheless, the presented concept implies some questions that require further study. One problem is how to solve billing for varying networks and changing users. Problems like the realization of a virtual SIM card are not solved yet. Another open question is addressing, which is strongly related to the availability of IP addresses for end systems e.g. in-car systems and end user equipment. Whereas our concept works fine for the adaptive selection of wireless networks for an application, the problem of vertical handover, i.e. maintaining an application across alternating networks, remains for further study.

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