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Review on GPRS Technology

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Abstract- The Web has become an essential conduit for interaction as well as for dissemination and storage of knowledge within the knowledge system.The huge increase in Internet activity has been partially facilitated by the growing amount of new services available by Internet providers and innovative customizable technologies.Usually, the output of Web applications in a mobile context is defined by limited bandwidth accessible, long communication set-up times and ineffective use of the uncommon air link ability.Thus, GPRS standardisation focused mainly on creating a service that overwhelms such limitations of a mobile web connection.As GPRS is already under progress there is actually no deployment available.Experiments are thus used to gain information into the efficiency of the GPRS for Web traffic.GPRS advantages include flexible radio use, fast set-up / access time, and broad throughput with numerous timeslots. GPRS also provides a seamless route for GSM migration to the next-generation cellular network. Specifically, the GPRS Internet Protocol backend system will begin to be used by a current generation.

Keywords- Architecture of GPRS, GSM, GPRS (General Packet Radio Service), Protocol of GPRS.

INTRODUCTION

In previous times, mobile networks were only used by a small proportion of GSM customers since current Global System for Mobile Communication networks do not accommodate ready access, data transfer rate and competitive rates. GSM providers must offer greater demand-stimulating facilities. GPRS is the answer.GPRS uses established GSM networks to deliver packet-switched end-to-end facilities.New radio networks are specified to support GPRS, and the distribution of such channels is flexible: one to eight timeslots can be assigned to a consumer, or multiple active participants can allocate a single timeslot, where the "uplink and downlink" are assigned differently[1].As a feature of traffic load and user preferences, the radio services can be exchanged efficiently between voice and mobile services. GPRS safety feature is similar to the current GSM technology, where a ciphering method is designed for packet data transmission.GPRS is a relatively affordable mobile data system relative to SMS and Circuit Switched Communication, enabling data to be transmitted faster and more efficiently.GSM sector is also an illustration of a strong-tech industry in which innovation transfer rates are high and where research and development and adjustment plays an important role[2]. GSM industry is selected throughout this analysis as it offers examples of good infrastructure development.The GPRS, which offers a packets-switched transmitter facility in a GSM channel, is the "European Telecommunications Standards Institute (ETSI)" specification for packet information in GSM networks.Through incorporating GPRS features to the current GSM system, providers could provide their customers with asset-efficient web access to other Internet protocol-based services, like the Web and organization intranets.The Global System for Mobile Communications (GSM) General Packet Radio Service (GPRS) is equipped for packet-switched data transfer and is a means of web access to wireless cellular networks, such as the Web.Packetized communication is objectively better adapted to busy traffic, as classic internet programs produce it.GPRS facilitates functions like the retrieval of information from cellular data servers and mobile locations, like WWW browsing, data transfer, mobile device access, e-mail exchanging, money and fund transactions, exchange of share market data, credit

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verification, ticket purchases, service reading and electronic surveillance, media, weather updates data, cab and fleet.GPRS technology, the performance of GPRS infrastructure development and the efficiency of GPRS-supported networks are very critical for GSM providers as these systems vary from traditional mobile phones.

GPRS:

GPRS is designed to accommodate efficiently a variety of applications varying from very regular transfers of low data amounts to occasional transmission of medium size data amounts. Because GPRS is packet switched, it allows frequency-based loading as opposed to GSM such as computer time loading.General Packet Radio Services (GPRS) is a packet-based wireless transmission platform that provides download speeds from “56 to 114 Kbps” for cell phone usage as well as uninterrupted internet speeds.The larger data levels help users to engage in videoconferencing and communicate utilizing handheld devices and desktop computers with interactive websites and related devices[3].GPRS relies on GSM and supports existing programs like circuit-switched cell phone links and SMS Service.By principle, GPRS packet-based facilities costs consumers less than circuit-switched services because sub networks are used on a mutual-use, as-packets-required system instead of one consumer at a time.GPRS supersedes cable connections, because this system has simplified access to a network of packets data such as the internet.GPRS uses the packet radio protocol to transmit user data packets over a standardized path between flexible GSM channels and existing packet communication channels.GPRS is an invention which multiple GPS radars use to monitor data up to date.When the GPS device registers the data, it could then be sent to another centralized location, e.g. a Computer or via a message, via GPRS.It is the invention of GPRS which takes into consideration the frequent updates accompanying structures of GPS. The Concept of GPRS is explained below in Fig. 1 Concept of GPRS.

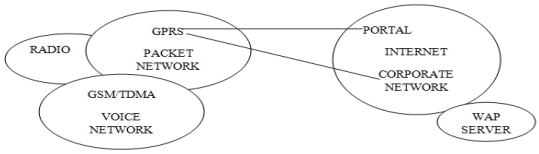

Fig.1: The Figure Portrays the Concept of GPRS

ARCHITECTURE OF GPRS

Since the current GSM system only offers circuit switching networks, two new service networks are established to facilitate packets transferring: "the GPRS Support Node (SGSN) service and the Gateway GPRS Support Node (GGSN) service."The “SGSN” is liable for the link between GPRS network and the “mobile station (MS)”.This supports the mobile station, while preserving the sense of flexibility.The HLR (Home Location Register) is supplemented with knowledge about GPRS users, for example.The “GPRS Supporting Support Node (SGSN)” is the counterpart of “MSC (Mobile Switching Center) GPRS”.The MS (Mobile Station) and the “BSS (Base Station System)” interact via the application Um[4].The BSS and the SGSN are linked to Frame Relay via the Gb interface.SGSNs / GGSNs are linked within the same GPRS channel via the "Gn Interface."If SGSN and GGSN are in various GPRS channels, they are connected through the Gp interface.The GGSN binds to external channels via the Gi interface. Using the new GSM interface, the MSC / VLR interacts with the BSS, and using Gs interface with the SGSN. The HLR attaches to SGSN with the “Gr interface” and to GGSN with the “Gc interface”.The "GSM Mobile Application Part (MAP)" protocols described in GSM is implemented by both "Gr and Gc".The new "GSM D interface" binds the "HLR and the VLR."Interfaces ", Gs, Gr, Gc, and D" are used for communication without the transfer of user information in GPRS.Note that GSM uses “A interface” for both communication and speech transmitting.Through GPRS, interfaces "Um, Gb, Gn, Gp and Gi" are used both for communicating and transmitting.Such role in the BSS transmits "Packet Data Units (PDUs) Logical Link Control (LLC) between the Um and Gb interfaces". This role in the SGSN transmits "PDUs (PDP) between interfaces Gb and Gn."The Gb / Gn relay feature attaches sequence digits, however, to PDP PDUs obtained from the "Sub-Network Dependent Convergence Protocol (SNDCP) and the Gi Reference point." The GPRS Architecture is shown below in Fig. 2 GPRS Architecture

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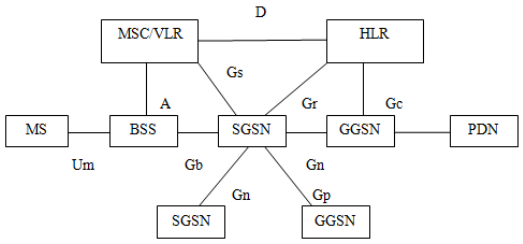

Fig.2: The Figure Portrays the GRPS Architecture

GPRS SIGNALLING PLANE

GPRS signalling plane comprises of protocols for controlling and maintaining the features of the transmitting plane.Different GPRS protocols involve "SNDCP, LLC, RLC, MAC, BSSGP, BSSAP+, and GTP among those parameters.""PLL, RFL, GMM / SM and MAP are GSM protocols (note that GMM / SM and MAP also have protocols unique to GPRS).""TCAP, SCCP, and MTP are layers SS7"[5]. In the BSS, this feature relays "packet data units (PDUs) of Logical Link Control (LLC)" between the Um and Gb interfaces.The Mobility Management states define an Mobility Management activities of Mobile Station. If the MS is not connected to GPRS mobility control, the State is IDLE. The condition is STANDBY if the MS is connected to the management of GPRS flexibility but has not received comprehensive localization details.The system is READY when cell-level location data for the Mobile Station has been identified.Note that an "IMSI and/or GPRS" can be appended to a "GPRS MS."The IMSI connection is the same as for a Global System for Mobile Communication Mobile Station. In GPRS attachment method, both the MS and the SGSN are transferred to the READY state, an MM background is generated in each MS and SGSN, and access control / ciphering can be done.An MS may have multiple allowed PDP meanings if many IP addresses are supported by the terminal.When the Mobile Station is removed from GPRS all PDP instances are disabled.Some of the two PDP states may have a PDP background: an “ACTIVE or an INACTIVE”.In the Packet Data Protocol context, a QoS profile is established to show the radio and networking resources needed to transmit the information[6]. The various QoS Attributes include Precedence class defines three preference transmitting rates. The packets with low requirements will be discarded during traffic.Precedence class defines three preference transmitting rates. The packets with low requirements will be discarded during traffic.Reliability class describes latent data loss, of out of-sequence distribution and damaged data error rates. There are five different types of performance. Reliability class 1 accepts GTP mode recognition, LLC frame style and RLC frame style, and it protects the LLC information. The GPRS Signalling Plane is shown below in Fig. 3 GPRS Signalling Plane

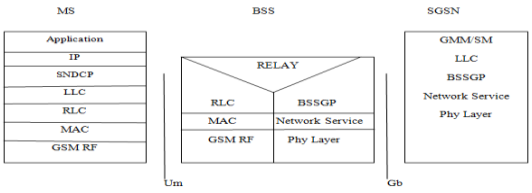

Fig.3: The Figure Portrays the GPRS Signalling Plane

BENEFITS OF GPRS

GPRS technology took Smartphone users out of the era of WAP and into the environment where the web was actually available on mobile devices; vast quantities of data can be transmitted over the web to and from mobile devices using GPRS.GPRS-enabled cell phones are used as portable Broadband connections for computers, where Internet connection is not widely available but the wireless network is accessible and GPRS can be a life changer.When linked to the laptop, most phones is used as a router, GPRS is a good backup choice, the interoperability aspect has decreased slightly, with the emergence of much higher data cards, which allow access to the computer[7].Users pay for the volume of data transmitted only and not for the length of the internet access, GPRS offers broadband connectivity from any place where the network antenna is located, allowing people to browse the internet on your computer or phone, in rural areas.Using GPRS technology, consumers are continuously connected to the web, as GPRS resources are available anywhere GSM service is accessible, and when other facilities such as 3 G or HSDPA are not accessible, anyone can access the internet.Although there is modern, improved technology, GPRS is better than the traditional WAP (Wireless Application Protocol) and standard GSM networks, GPRS data is transmitted at rates

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"from 9.6 kilobytes per second to 114 kbps."When you access the web through GPRS, it does not obstruct phone calls via the GSM channel, it lets you make or accept incoming calls while surfing the internet or uploading content.Interaction via GPRS is easier than through the standard GSM service. Text messaging facilities and cellular email services enable you to submit prolonged texts at lower rates via the GPRS link, as opposed to putting texts via SMS or short message services.One of the main benefits of such a modern packet-switched system is that consumers are often linked, always accessible, and can only be paid for the quantity of data transferred.Incoming calls can be made concurrently over GSM-IP when running a data connection-depending on the Category and Form handset[8].GPRS can support business users by make information available every time.Take an example an insurance provider employing a wide mobile work group.Financial advisors on the run could access policy details via their GPRS devices by phoning to a Web-based database.Modern principal disadvantage of GPRS is the lack of roaming providers.GPRS packet delivery provides a much more customer-friendly payment than circuit switched facilities do.For circuit switched utilities, payment is focused on contact span.This is inappropriate for burst-traffic systems.

APPLICATIONS

The various applications of GPRS are as follows-

Chat- Talk can be differentiated from basic information telecommunications services even though the source of the information is a talk user, while information services appear to be chatted from a Website.The "speed of information"- the amount of information exchanged per text generally lower in talk, where people are much more likely to express views than factual knowledge[9].Because of its compatibility with the Web, GPRS will encourage mobile phone users to actively participate in existing network instant messengers, instead of setting up their separate new mobile discussion groups.As the number of respondents is an important element assessing the importance of involvement in the mailing list, it would be beneficial to use GPRS herein.

Text and Visual Information- A broad range of content can be provided to cell phone users varying from stock prices, sporting results, climate, flight details, headlines, meditation notifications, game scores, videos, astrology, travel, position responsive utilities etc.Such knowledge does not always have to be textual- it may be charts or maps or any other visual input forms.The size of a brief message of 160 characters is adequate when it is statistical to present information, including a stock price or a sports rating or weather.As such, as beginning-users have GPRS compatible apps, GPRS will definitely be used subjective telecommunications services, but SMS will tend to be used to provide the most comprehensive telecommunications services.

Still Images-Still images such as portraits, videos, brochures, post cards and videos, you can transmit static Webpages over the cellular network as they are under established phone systems.For GPRS it will be acceptable to post content directly to a Website from a camera phone linked to a GPRS radio system, enabling almost actual-time mobile printing[10].

Moving Images- Over period, mobile contact becomes less verbal and more interactive in essence and in shape.The cellular market is moving from messages to symbols and image messages to images and designs to downloading text messages and movie clips, and on to viewing complete-blown movies via graphics rendering on a phone or tablet.There are many vertical market uses for transmitting moving pictures in a mobile world, like tracking parking spots or construction sites for invaders or criminals and transmitting photographs of casualties from an emergency to a clinic.

Web Browsing- Using Circuit Switched Information for web browsing was never a successful method for phone users. This takes a lot of time for information to come from the web network to the client due to the increased pace of Circuit Switched Data.

Collaborative Working- Mobile data enables paper exchange and mobile collaboration. It allows different employees to work together on the same report in different areas. Digital media applications that combine speech, script, images and photographs may even be considered.In any analytical thinking activity like fire prevention, battling to prepare the path of combat, medical procedures, advertisement copy environment,

design, reporting and so on, such sorts of techniques might be helpful.

Audio- Given many changes in the performance of voice calls on cellular networks such as Enhanced Full Rate (EFR), the performance of the calls is still not transmitted.There are situations where reporters or actual police personnel with compact qualified high definition video cameras and antennas record self-dictated conversations with individuals or news broadcasts, and need to return this knowledge to the radio or police station.

Vehicle Positioning- Each program combines global navigation systems that ask people where they're with phone semi-voice services that allow people tell various people where they are.The Global Positioning System (GPS) is a relatively cheap-to-use general "24-satellite system run by the US Defence department."Everyone with a GPS transmitter will obtain their location on the satellite and thus figure out what they are.

File Transfer- As this general term implies, file transfer programs include any method of uploading vast amounts of data over the cellular network.The information could be a briefing report for a visiting salesman, an equipment guide for a system technician or a text-reading word press plug-in like Adobe Reader.One of the online communication mechanisms like "FTP (File Transfer Protocol), telnet, web or Java" or from a private server or outdated network can be the origin for this data.

CONCLUSION

The paper gave a summary of GPRS. The GPRS design and its interfaces are described.Based on the analysis, GPRS advantages involve effective radio use, quick set-up / entry period and high throughout with numerous timeslots.GPRS uses the GSM network so that, through one plan, all circuit-switched and packet-switched networks intermingle.GPRS also offers a seamless transition from GSM to a cellular network of the newer generation.In particular, the GPRS IP backend channel can tend to be used by a next generation network.Even though GPRS is an unproven technology powered by the manufacturers of hardware rather than the consumers ' drive, it has created keen interest between providers.Due to the rapid growth of Web applications, information connectivity is considered to be a significant development for internet services. An advantage of GPRS is that access to information requires no dial-up broadband link.GPRS will help cellular functions such as the retrieval of data from cellular data centers and mobile workplaces, like WWW browsing, data transfer, mobile network access, e-mail transmitting, money and investment transfer, share market data transfer, credit card authentication, lottery purchases, service scanning and electronic surveillance.

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