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Dynamic IPSec VPN

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The need for other options when MPLS VPN is not available for connecting branch offices has led to introduction of Dynamic VPN protocol. With this VPN setup there is no need full mesh configuration of VPN tunnel on branch offices.

This seminar introduces the Dynamic IPsec VPN or DMVPN and provides a configuration example for DHCP spoke hosts.

The results of captured packets show that tunnels are built of dynamic bases without need for configuration. The DMVPN has other advantages including redundancy and high availability as well as auto encryption for on demand tunnels.

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Coordinated Multipoint Transmission and Reception

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This formal report provides the readers a well-explanation for the seminar of Coordinated Multipoint Transmission and Reception (CoMP). It gives the main concept of CoMP in a simple method to facilitate the difficulties of this topic. In addition, this report clearly demonstrates the basics of CoMP in the deep details with providing some figures for clarification. Finally, this formal report can be considered as a simple reference for novices in this seminar.

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4G Mobile Communications

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This formal report is provided to investigate the fourth generation technology and the challenges that this technology encounters as well as the major steps that led to the 4G. The demand of multimedia support, and not only speech oriented communication, played its role to push the service providers to take further steps to support and meet subscribers' needs. Therefore, the major step from second generation to the third generation and then to the fourth generation was able to support advanced services such as email, file transfers and video streaming. Finally, the report draws attention to the wide spread and the rolling out of the 4G technology in north America , Asia, Europe and Africa.

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Touch Screen Technology

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Nowadays, the manner in which using of interacting physically with electronic devices leads to change the focus of today`s technological research. Additionally, this change has resulted in having lots of great developments, containing the improvement of touch screen technology. Touch screens are electronic visual displays which are able to detect the existence and location of a touch within the display area, therefore, touch screens have the ability to display and receive information on the same screen. Moreover, since the prices for these panels have decreased gradually in the last few years, touch screen panels have become very popular. This report will indicate the three types of touch screen technology: resistive systems, capacitive systems, and infrared systems. This paper also will discuss, investigate, and compare these different technologies, concentrating on aspects of sustainability, the differences in application as well as the positive and negative qualities. Besides, this paper will include Apple touch screen as a great instance of the use of touch screen technology on today`s society.

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IPVv6 over Low-Power Wireless Personal Area Network

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IP for Smart Objects seeks to extend the use of IP networking into resource-constrained devices over a wide range of low-power link technologies – IEEE 802.15.4 represents one such link. Extending IP to low-power, wireless personal area networks (LoWPANs) was once considered impractical because these networks are highly constrained and must operate unattended for multiyear lifetimes on modest batteries. Many vendors embraced proprietary protocols, assuming that IP was too resource-intensive to be scaled down to operate on the microcontrollers and low-power wireless links used in LoWPAN settings. However, 6LoWPAN radically alters the calculation by introducing an adaptation layer that enables efficient IPv6 communication over IEEE 802.15.4 LoWPAN links. Security issues in 6LoWPan are discussed.

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Sky X Technology

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A satellite can be used to in the provision of a private network and internet over a long distance, but networking using a Transmission Control Protocol (TCP) over satellite is challenging due to the long latency, high bit error rate, and asymmetric bandwidth links. Moreover, the TCP performance is limited not by the satellite itself, but by the TCP's sliding window algorithm, data acknowledgement and retransmission algorithm, and slow start and congestion avoidance algorithms.

Using Sky X technology can overcome these issues. The Sky X technology increases the file transfer speed and web performance. It replaces the TCP over satellite with a high performance protocol, such as, Xpress Transport Protocol (XTP). In addition, the Sky X system is made up of Sky-X OEM (Original Equipment Manufacturer), Sky-X Client/Server and the Sky-X Gateway product. It is compatible with all TCP applications; therefor the end clients or users do not need any modifications.

The Sky X Client/Server and the Sky X Gateway systems use XTP which is a very good solution to be able to overcome the limitations that are associated with the used of TCP over satellite. However, this paper discusses the performance of TCP/IP and Sky X technology over satellite. It also focuses on the architecture, application, and merits of the Sky X technology.

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Session Initiation Protocol Trunking for Business Solutions

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Voice over Internet Protocol (VoIP) has been adopted by most of telecom providers within the last 10 years. Most of these telecom companies have been researched and developed technologies to provide such service to their business customers. Session Initiation Protocol (SIP) has been used to provide telephone and unified communication services using certain equipment that allow telephone lines trunking. SIP can been seen in different application in terms of voice service that allow other non-telecom organization to establish their own voice network with low cost resources. The idea is to discuss in the seminar is about the current solution used by EastLink in terms of providing business solutions to their customer. The discussion will include current technologies used and possible developments that can improve the service. The discussion will also include the new service the company launched recently which is wireless service and possibilities to have integration between the two services.

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IDS/IPS

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IPS and IDS both examine traffic looking for attacks but they are significantly different. IPS and IDS both detect malicious or unwanted traffic. They both do so as truly as possible, depending on the speed of the network. The difference between deployment of these system in networks in which IDS are out of band in system while IPS are in-line in the system, means it can pass through in between the devices. Both of them have own architecture and how to deploy in the network.

Moreover, IDPS technology attempts to monitor threats and stops them from progressing. Different types of IDPS technology depend on the types of attacks that they deal with and the methodologies that they use to block them. All these types have similar security capabilities and characteristics

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Data Center Virtualization

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Data centers are changing in architecture, application architectures, technologies and workload demands. These changes are causing the transformations in IT infrastructure in the past decade. Businesses rely on their data centers to support business operations and provide greater efficiency toward the users. However, with virtualization at the data center level, data centers can support more applications and implement them faster. Data center virtualization gives more benefits such as improved utilization and reduced floor and power requirements, also it add highly flexible services to the data centers with private and public cloud solutions. Therefore, data center virtualization should be a key component of every IT organization's strategy. This paper will discuss the benefits of Virtual Data Center and the data center evolution from VDC to cloud computing. By investigating some research including organizational sources and the views of experts involved in this field, it is clear that the current situation in data centers is in a transition toward the cloud computing.

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IEEE 802.11ac standard

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The 802.11ac is a complete evolution of the 802.11n. IEEE 802.11ac refers to a wireless known computer networking standard that is of 802.11. It is currently under development, and will be slated with providing very high-throughput networks in wireless local area on the given 5 GHz band. 802.11ac is known to build upon the revered success of the 802.11n that is now the considered predominant WLAN best standard in the whole market. 802.11n did bring many improvements in the data rates and also link efficiencies. This, however, was affected by the consumer and also commercial trends that have created total demand for a very new set of varied capabilities which are greatly addressed by the 802.11ac.

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WiMAX
(Worldwide Interoperability for Microwave Access)

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WiMAX, which stands for Worldwide Interoperability for Microwave Access has emerged as a promising wireless communication system that has the capability to provide broadband access with large-scale coverage than what it is provided by WiFi. Since its foundation in 2001, the evolution of WiMAX continues from 802.16 standard to 802.16d standard, which both support fixed wireless access and then to the new IEEE 802.16e in 2005 (Mobile WiMAX) standard, which in turns supports mobile devices. This paper first provides on how WiMAX is different from WiFi as another wireless broadband network in terms of technologies, but more importantly focuses on the IEEE 802.16 standards, network architecture, and security protocols of the IEEE 802.16 standard. There are common types of threats to IEEE 802.16 (WiMAX) network, which will be highlighted in this paper as well as discussing in, detail the various security protocols that are implemented by WiMAX to protect the network from such attacks. Furthermore, the information presented can provide a guideline for the design of a more secure and practical WiMAX network.

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Congestion Avoidance Protocols

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In the modern world of computer era everybody relies upon computer to communicate with the world. This has led to an enormous increase in the amount of data that flows between different users. This has led to a problem commonly known as congestion. Congestion happens at routers where there is large number of packets such that the router is unable to process or store all of them and it has to drop certain packets. Congestion can lead to drastic consequences if not handled properly. Imagine a real time video packet dropped while you are video conferencing or watching a live stream. So it is crucial to detect congestion and possibly avoid even before it happens. TCP has some standard mechanisms to prevent and rectify congestion.

Apart from TCP normal handling of congestion there are several other protocols that have been developed for handling congestion. The main objective is to deliver the packets to the destination without having to resend them and keep the network resources as efficient as possible.

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May 27, 2013

Quality of Service on Switches

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In this report I will describe the mechanism and working for Quality of Service (QoS) mainly for switches. The fundamental mechanisms of QoS remain unchanged. QoS is sometimes used as a quality measure, with many alternative definitions, rather than referring to the ability to reserve resources.

However, some changes have been necessary, due to changes in protocol semantics between Layer 2 and Layer 3. QoS varies by switch, the higher the level switch, the higher network application layer it works with. The number of queues differ, as well as the kind of information used to prioritize.

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May 27, 2013

Security of Wireless Local Area Network

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This report will be discussing about the security of wireless local area network (WLAN). Because of its convenient access and easy deployment, WLAN is used widely. However, those advantages bring difficulties to the design of the wireless network security. This report will introduce some security measures to fight against the threats to WLAN. Moreover, it will show how does the WEP protocol comprise which is used in 802.11 and analyzes the deficiencies of CCMP protocol which is used in 802.11i.

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Internet Protocol Television

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This report presents the details of IPTV (Internet Protocol Television). IPTV is a game-changing technology. For telecommunications providers to be successful with IPTV, they must differentiate their offerings from those of competitors. That means leveraging the interactivity delivered by the IP side of the equation — the wide range of software applications that enable social networking, gaming, e-commerce and even self-service customer support — along with the video signal. No matter which services telecommunications providers choose to offer, the customer experience is paramount. And the customer experience with IPTV is not just about the quality of the video; it's about the quality of the total experience, which includes the interactive services. The opportunity to deliver a quality customer experience, telecommunications providers must manage and monitor the IP software applications that provide the interactivity as well as the video, audio and the broadband network they traditionally manage — and the interaction between the two sides of the IPTV equation. Applications performance Management (apM) solutions can help telecommunications providers deliver IPTV services that meet customer expectations and drive profitability, such as viewer feedback and voting services, e-commerce and Voice-over-IP services integrated into triple play bundles, by monitoring and ensuring the quality of application-driven services. Benefits apM gives providers the deep insight they need to deliver quality IPTV services that meet customer expectations and drive revenue. With apM, providers can prevent problems or detect them before customers are impacted, protecting customer loyalty and profitability. When using apM technology, providers can trace transactions throughout their entire path, pinpoint potential problems before they occur, minimize system load with non-intrusive management software and deliver the right information to the right support person at the right time. All of these benefits combine to enable providers to deliver profitable iptV services that meet customer expectations.

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May 27, 2013

Passive Optical Networks

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This report deals with the Passive Optical Network and how and why it was developed. Study starts with the discussion how the technologies available these days are running out of bandwidth and data rate and how other cost effective technologies are emerging. This report talks about the Ethernet PON as well which is part of PON technology. It also throws some light on how EPON topology works in downstream and upstream. It also talks about principle operations of EPON network and its architecture. This study also discusses the round trip measurements in EPON. At the end the discussion concludes with EPON standard within 802.3ah objectives.

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IP Services (HSRP and VRRP)

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IP hosts can use many methods to decide which default router or default gateway to use DHCP, BOOTP, ICMP Router Discovery Protocol (IRDP), manual configuration, or even by running a routing protocol. The most typical methods—using DHCP or manual configuration—result in the host knowing a single IP address of its default gateway. Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), and Gateway Load Balancing Protocol (GLBP) represent a chronological list of some of the best tools for overcoming the issues related to a host knowing a single IP address as its path to get outside the subnet.

The goal of HSRP is to allow hosts to appear to use a single router and to maintain connectivity even if the actual first hop router they are using fails. Multiple routers participate in this protocol and in concert create the illusion of a single virtual router. The protocol insures that one and only one of the routers is forwarding packets on behalf of the virtual router. End hosts forward their packets to the virtual router.

VRRP provides a standardized protocol to perform almost the exact same function. The Cisco VRRP implementation has the same goals in mind as HSRP but with some differences.

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May 27, 2013

Simulation of Energy Efficient Routing Protocol

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In this project an energy aware and efficient open shortest (EE) path routing protocol is reconstructed and simulated with Matlab software against the traditional shortest pat first SPF (SP).

The original work introducing and demonstrating EE and proper LSAs in [1] has been done in event driven simulator of Opnet modeller. Authors of work in [1] have showed that it is possible to reduce the Co2 emission by routing network traffic through nodes and links powered by green energy source in trade of with traversing longer routes. The information about the source of energy powering up the network nodes and links is provided by smart grid. This project attempts to show the emission reduction through a set of simulations using the mathematical model in Matlab.

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May 27, 2013

IP Multicast in MPLS

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The Multicast VPN feature provides the ability to support the multicast feature over a Layer 3 VPN. As enterprises extend the reach of their multicast applications, service providers can accommodate these enterprises over their MPLS core network. IP multicast is used to stream video, voice, and data to an MPLS VPN network core. A VPN is network connectivity across a shared infrastructure, such as an Internet service provider (ISP). Its function is to provide the same policies and performance as a private network, at a reduced cost of ownership, thus creating many opportunities for cost savings through operations and infrastructure. Historically, IP in IP generic routing encapsulation (GRE) tunnels was the only way to connect through a service provider network. Although such tunneled networks tend to have scalability issues, they represent the only means of passing IP multicast traffic through a VPN. MPLS was derived from tag switching and various other vendor methods of IP-switching support enhancements in the scalability and performance of IP-routed networks by combining the intelligence of routing with the high performance of switching. MPLS is now used for VPNs, which is an appropriate combination because MPLS decouples information used for forwarding of the IP packet (the label) from the information carried in the IP header. A Multicast VPN allows an enterprise to transparently interconnect its private network across the network backbone of a service provider. The use of a Multicast VPN to interconnect an enterprise network in this way does not change the way that enterprise network is administered, nor does it change general enterprise connectivity. Because MPLS VPNs support only unicast traffic connectivity, deploying the Multicast VPN feature in conjunction with MPLS VPN allows service providers to offer both unicast and multicast connectivity to MPLS VPN customers.

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Metal and Obstacle Detection Using Bluetooth

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The project is about controlling the robot by using Android mobile i.e. we are sending the commands from our android mobile through Bluetooth, then the robot receives (acts as receiver) the signals, according to the commands being received from the mobile based on that the direction of the robot is controlled.

This project is designed around a Microcontroller AT89S52, which forms the control unit of the project. According to this project, an android mobile is used to transmit the control signals, which controls the direction of the robot. In the same way, Bluetooth, which is placed on the robot, receives the commands according to which the direction of the robot is controlled.

The Along with that we can also detect the land mines and collision avoidance with the obstacles in the path of the robot. This information from robot section is transmitted to the monitor section using Zigbee transceiver. In monitor section the Zigbee transceiver will receive the information and displays it on PC. The microcontroller plays important role in controlling the direction according to commands being received at the Receiver side i.e.. Robot section.

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Router Security Management

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You know that you can build a LAN by connecting devices with basic Layer 2 LAN switches. You can then use a router to route traffic between different networks based on Layer 3 IP addresses.

Router security is a critical element in any security deployment. Routers are definite targets for network attackers. If an attacker can compromise and access a router, it can be a potential aid to them. Knowing the roles that routers fulfill in the network helps you understand their vulnerabilities.

Routers fulfill the following roles:

- Advertise networks and filter who can use them.
- Provide access to network segments and subnetworks.

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Real Time Protocol

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This report describes the need for protocols specifically designed for real-time applications, their significant features and their desired characteristics. RTP provides end-to-end network transport functions suitable for applications transmitting real-time data, such as audio, video or simulation data, over multicast or unicast network services. It briefly introduces the RTP/RTCP protocols, the most widely used protocols for carrying real-time application data.

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Virtualization Performance Analysis over MPLS Network

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This report is to present “Virtual Servers Performance Analysis over MPLS Network”. It compacts with server's CPU and network performances under normal load and high load. It also enlightens the basics and performance of SAN from customer perspective and going through complexity at administrator's configuration and security perspectives. A part of report emphasis on benchmarking. Some part also briefly discusses open filer OS.

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May 27, 2013

IPV6 & Tunneling

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More Internet traffic is expected to be carried via tunnels as the Internet infrastructure migrates from IPv4, the current version of the Internet protocol, to the long-anticipated upgrade known as IPv6.Tunneling is a process of used for IPv4 networks to talk to IPv6 networks and vice-versa. Many current internet users do not have IPv6 dual-stack support, and thus cannot reach IPv6 sites directly. Instead, they must use IPv4 infrastructure to carry IPv6 packets. This is done using a technique known as *tunneling*, which encapsulates IPv6 packets within IPv4, in effect using IPv4 as a link layer for IPv6.

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May 27, 2013

Introduction to Software Defined Networking

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This report will discuss one of the latest trends in network engineering, and that is moving from a distributed model to centralized model of networking. The term coined for this new design paradigm is called software defined networking.

This new technology is taking the industry by storm, with all the major networking vendors being engaged in creating new and creative technologies to increase the value of networking hardware and pave the way for new network applications that were impossible to run with conventional networks.

The report will present a brief introduction to software defined networking, it will discuss one of the most important new protocols, used in the interfacing between the control plane and the data plane, called OpenFlow. It will also present the advantages of using software defined networking and list some of the vendors that already have networking hardware running on top of the SDN framework.

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Energy-balanced ZigBee Routing

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A mixed routing strategy of AODV and Tree Routing is designed in the ZigBee specification. But there is no method designed to balance these two Routing modes in order to achieve better performance. We realized the ZigBee protocol module in NS2. Simulations had been run to analyze the ZigBee network performance. According to the analysis, a strategy of ZigBee routing selection based on data services has been proposed. The simulation results show that such routing selection strategy has excellent network performance and low energy consumption. Additionally, the power control is not much considered in ZigBee Routing specification. But for the ad hoc wireless network application, power control is the most significant issue in ZigBee. So a power control strategy is proposed to improve the ZigBee routing, the simulation results show that this power control strategy will greatly balance the node energy, avoid that nodes use up all the battery power and die too early.

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Graduate Student Seminar Conference
May 27, 2013

Synthesis of Beam width of a Symmetric Array Antenna

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This report contains the characteristics of antennas and how these characteristics are being modified to get desired radiation patterns. And also deals with uniform array antennas in which we are using single element antennas combined to get a radiation pattern with maximum power utilization.

The various methods of synthesis like Schelkunoff polynomial method, Fourier transform method, Woodward Lawson method, Taylor line source method are being used to reduce the power dissipation. These methods were executed using mat lab with various number of antenna elements and the desired results are provided in this report.

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May 27, 2013

Browser Exploit Against SSL/TLS

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With the Increasing amount of Internet information the overall security of each individual computer is required for network security from password theft, network sniffing, intrusion detection and so forth. The developers of many SSL libraries are releasing patches for a vulnerability that could be exploited to recover plaintext information, such as browser authentication cookies, from encrypted communications.

This patching effort follows the discovery of new ways to attack SSL, TLS which uses cipher-block-chaining (CBC) mode encryption. The one particular type of attack that I to be explained here is the Beast Attack.

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May 27, 2013

Wireless Telemedicine Services Using Wimax Technology

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Wireless telemedicine services are used to increase the probability of survival rate in the emergency situation using WIMAX/IEEE 802.16 based technology. The IEEE 802.16 based broadband wireless access towards telemedicine services gives better solution under some simulation performance. The WiMAX technology provides high bandwidth over longer distance data transmission and high data rate up to 50 Mpbs. WiMAX supports telemedicine services with high secure in security and gives better quality of service with cost efficiency when compared to other wireless communication systems and traditional wired technologies. The WIMAX can be deployed in many areas such small clinics, drugstore, ambulance where they communicate to the health care centre in metropolitan area, WiMAX can also be deployed in the prehospital management service, with high speed connectivity and mobility support, medical staff can communicate with the medical experts in the hospitals. The IEEE 802.16 based broadband wireless access algorithm is designed for the telemedicine services. Thus the algorithm desire to achieve maximum utilization of radio resources.

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Graduate Student Seminar Conference
May 27, 2013

Green Framework For Future Heterogeneous Wireless Networks

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Energy-efficient communication has activated enormous concern in recent years as one of the main design goals of future wireless Heterogeneous Networks (HetNets). This has led to epitome shift of current operation from data oriented to energy-efficient oriented networks. The proposal of this paper states the framework for green communications in wireless HetNets. This framework is cognitive in holistic sense and concentrates on improving energy efficiency of the whole system. In particular, the proposal considers about a cyclic approach, named as energy-cognitive cycle, which helps in extending the classic cognitive cycle and enables dynamic selection of different available schemes for reducing the energy consumption in the network while satisfying the quality of service restraints.

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Seminar Report On Ad-Hoc Routing Protocols

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Routing is the process by which a router decides the path along which it can send a packet towards its destination. This is done based on the destination IP address and subnet mask in the packet, and is a major feature of packet switching (in contrast to circuit switching). Several such routing protocols such as RIP, OSPF, EIGRP (examples for Interior Gateway Routing) and BGP (Exterior Gateway Routing) etc. have been developed over the years. In case of wireless networks such as the IEEE 802.11 standards, we have an Access Point for a given Basic Service Area, which co-ordinates the communication among the nodes in that area. The commonality seen in these protocols (wireless or wired) is that they are implemented on a given, fixed network.

Sometimes in practical scenarios, the given infrastructure of the network will be uncertain. For example, consider the case where a communication system has to be implemented on a set of vehicles. Since these vehicles could be in a random location at any given time, the "network" of these vehicles won't have a fixed infrastructure, and each node may not know its neighbor at a given instant of time. These networks are termed "Ad Hoc Networks". As stated earlier, the nodes in an Ad Hoc network are unaware of the topology of the network, and hence have to discover it. This can be done by announcing their presence and listening to their neighbors. Unlike the Access Point in Wireless LANs, an Ad-hoc network has no such centralized system, and relies on peer-peer communication among its nodes.

An Ad-hoc routing protocol is used for the very purpose of communication in an Ad-hoc network. There are basically 2 types of such protocols. One is the Table Driven (Pro-active) routing, in which the routes are periodically distributed throughout the network. Examples include DSDV (Destination Sequenced Distance Vector). The other type is On Demand (Reactive) routing, in which the routes are found only when needed. Examples include AODV (Ad-hoc On Demand Distance vector routing) and DSR (Dynamic Source Routing).

In recent years, similar standards with respect to Ad-hoc routing have been developed. For example, we have VANETs (Vehicular Ad-hoc Networks) which is used for communication between vehicles and roadside equipment. Other applications include MANET (Mobile Ad-hoc Network) and iMANET (Internet based Mobile Ad-hoc Network) in which the mobile nodes and fixed internet gateways are linked.

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VOIP And Unified Communications

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VoIP (Voice over IP) and IP telephony in general has gained wide spread popularity amongst large corporations and consumers alike. For many, Internet Protocol (IP) is far more than a means to transport data, it's also a protocol that simplifies and seamlessly streamlines a wide range of business applications. Taking telephony which is the most palpable example; VoIP can also be said to be the underlying structure for more advanced unified communications applications including web and video conferencing.

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Client Server Computing

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In the 1970s and 1980s was the era of centralized computing, with IBM mainframe occupied over 70% of the world's computer business. Business transactions, activities and database retrieval, queries and maintenance were all performed by the omnipresent IBM mainframe. This led to a transition phase towards Client-Server Computing, a totally new concept and technology to re-engineer the entire business world. The main emphasis of Client-Server Architecture is to allow large application to be split into smaller tasks and to perform the tasks among host (server machine) and desktops (client machine) in the network. Client machine usually manages the front-end processes such as GUIs (Graphical User Interfaces), dispatch requests to server programs, validate data entered by the user and also manages the local resources that the user interacts with such as the monitor, keyboard, workstation, CPU and other peripherals. On the other hand, the server fulfills the client request by performing the service requested. After the server receives requests from clients, it executes database retrieval, updates and manages data integrity and dispatches responses to client requests. The goals of Client-Server Computing are to allow every networked workstation (Client) and host (Server) to be accessible, as needed by an application, and to allow all existing software and hardware components from various vendors to work together. When these two conditions are met, the environment can be successful and the benefits of client/server computing, such as cost savings, increased productivity, flexibility, and resource utilization, can be realized.

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Near Field Communication

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Basic goal of technology is to make life easy. Near field communication (NFC) is a standard for smartphones and similar devices to establish radio communication with each other by touching them or bringing them close. It is also known as technology for contact less short range communication

It uses magnetic field induction to enable communication between electronic devices based on Radio frequency Identification (RFID).

With the growing technology the number of short range application for NFC are increasing. NFC anticipated applications include contactless transactions, data exchange and simplified setup of complex communication like WIFI, make fast and secure purchases, shopping with electronic money also can be used as electronic keys.

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Transport Layer Security (TLS)

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Transport Layer Security (TLS) is a Cryptographic protocol used for providing secure communication over the internet. TLS works on the Application Layer of the OSI model. It is usually used in client-server model. When a Server and Client Communicates with one another, TLS protocol ensures that there is no message forgery, or eavesdropping on the message. The TLS Handshake Protocol lets the server and client authenticate one another while negotiating the encryption algorithm and cryptographic keys before the exchange of the data takes place. Usually the authentication of server is done while the client may remain unauthenticated. The TLS Record Protocol provides data confidentiality using symmetric key cryptography and data integrity using a keyed message authentication checksum (MAC).

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Bluetooth Security

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Bluetooth technology unplugs our digital peripherals and makes a cable clutter a thing of the past. In short, it is a wireless replacement for many of the cables we currently use to transmit voice and data signals. It is the result of the joint achievements of nine leading companies: 3COM, Lucent Technologies, IBM, Intel, Microsoft, Motorola, Nokia, Toshiba, and Ericsson, altogether known as the Blue Tooth Special Interest Group (SIG). The idea is to create a single wireless protocol to address the end-user problems arising from proliferation of various mobile devices.

Bluetooth is an open standard for short-range radio frequency communication. Bluetooth technology is used primarily to establish wireless personal area networks (WPANs), and it has been integrated into many types of business and consumer devices. This publication provides information on the security capabilities of Bluetooth technologies and gives recommendations to organizations employing Bluetooth technologies on securing them effectively.

The purpose of this paper is to give an overview of Bluetooth technology and security and how it was designed. At the end there is also a short discussion of its weaknesses on a general level.

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Smart Antenna

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One of the most rapidly developing areas of communications is “Smart Antenna” systems. This paper deals with the principle and working of smart antennas and the elegance of their applications in various fields such a 4G telephony system, best suitability of multi carrier modulations such as OFDMA etc.

This paper mainly concentrates on use of smart antennas in mobile communications that enhances the capabilities of the mobile and cellular system such a faster bit rate, multi-use interference, space division multiplexing (SDMA), increase in range, Multi path Mitigation, and reduction of errors due to multi path fading and with one great advantage that is a very high security. The signal that is been transmitted by a smart antenna cannot tracked or received any other antenna thus ensuring a very high security of the data transmitted. This paper also deals the required algorithms that are need for the beam forming in the antenna patters.

The applications of smart antennas such as in WI-FI transmitter, Discrete Multi-Tone modulation (DMT), OFDMA and TD-SCDMA is already in real world use is also incorporated in this paper.

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Data Security in Local Network Using Distributed Firewalls

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This report describes four main topics like conventional firewalls, distributed firewalls, security policies and policy implementation. In the first part, the very basic structure and working of conventional firewalls are explained. The chapter also cites at some drawbacks of conventional firewalls over the distributed firewalls.

In the second part, the more reliable distributed firewalls are discussed. The chapter includes structure and working of distributed firewalls. The major structural and behavioral differences of conventional and distributed firewalls are distinguished.

The next part focuses at the security policies. It shows how policies are developed for distributed firewalls. The chapter cites at the different techniques and components of the security policies.

The last forth chapter depicts the implementation of security policies. It shows the methodology of step by step logical implementation of policies. The implementation steps are represented with the flow chart.

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Security Protocols for Sensor Networks (SPINS)

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As sensor networks edge closer towards wide-spread deployment, security issues become a central concern. So far, much research has focused on making sensor networks feasible and useful, and has not concentrated on security. Security protocols for sensor networks present a suite of security building blocks which are optimized for resource constrained environments and wireless communication. SPIN has two secure building blocks: SNEP and µTESLA.
SNEP provides data confidentiality, two-party data authentication, and data freshness the important baseline security primitives. The most important mechanism and also very hard problem for sensor networks is to provide efficient broadcast authentication. µTESLA is a new protocol which provides authenticated broadcast for severely resource-constrained environments. The above protocols are implemented to show that they are practical even on minimal hardware: the performance of the protocol suite easily matches the data rate of our network. Additionally, we can also demonstrate that the suite can be used for building higher level protocols.

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" CAPTCHA "

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Captcha are short for Completely Automated Public Turing Test to tell Computers and Humans Apart. The purpose of Captcha is to block submissions from spam bots – automated scripts that harvest email addresses from publically available web forms. Captcha is used because of the fact it is difficult for the computers to extract the text from such as distorted image. With the Captcha the goal is to create the test which the humans can pass easily but machines can't.

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Data Center Management Using Voice Over IP (VOIP)

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In this seminar report based upon Data Center Management using VOICE OVER IP (VOIP) discuss about the technology in which IP telephony calls signal improves the efficiencies of overall systems via internet. An improved Data Center management is used to reliable the IP calls over the internet in lower cost and improving the quality of services (QOS). In proposed approach, data center management using voice over IP is applied to deliver the higher quality of service required for voice conversation should not be underestimated. By using the VOIP, the IP calls which enhances the quality of audio as well as video in lower bills and faster manner in the economic stability and its features.

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The MPEG-7 Visual Standard for Content Description

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The MPEG-7 Visual Standard under construction specifies content-based descriptors which allow users to measure resemblance in images or video based on visual criteria and it will be used to identify, filter or browse images/video based on visual content MPEG-7 which specifies color, texture and object shape features for this purpose.

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CRYPTOGRAPHY

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Internet is the essential medium of communication between people all around the globe. It is being integrated in all fields as the basic tool of interaction, from personal interest to commercial purpose. Moreover as commercial purpose come in to existence, it increases the necessity of security issue to deal with. Currently all kinds of commercial issues, Irrespective of small scale to large scale purposes, are relying on Internet. Many applications came into existence to perform them. Along with these applications, reliability issues follow.

There are many aspects to security, ranging from secure connections, payments to protecting passwords. An essential aspect to achieve reliability and security is cryptography. However, it is important to note that cryptography is not the complete solution to achieve security, it is one of the security aspect.

In this report, we will be discussing about Cryptography, concepts of cryptography and several cryptography methods. We will also discuss about some of the real time examples of cryptography applications

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OSPFv3 for IPv6

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In this report I will describe the modifications to OSPF to support version 6 of the Internet Protocol (IPv6). The fundamental mechanisms of OSPF (flooding, DR election, area support, SPF calculations, etc.) remain unchanged.

However, some changes have been necessary, either due to changes in protocol semantics between IPv4 and IPv6, or simply to handle the increased address size of IPv6.

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Shortest Path Bridging (IEEE 802.1aq Overview)

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Ethernet is a difficult and demanding taskmaster. We start from the position that for any networking technology of sufficient power, an elegant and self –consistent solution to a given connectivity problem exists. The success and longevity of Ethernet can be put down to the fact that it has been able to evolve to accommodate new requirements, both in its original LAN application space and in the increasing proportion of provider networking space. Shortest Path Bridging (SPB) is one of the most recent of these evolutionary steps, and we would like to establish at this early point both what is fundamental problem it solves and why the solution is useful. The short and sufficient answer is “elimination of the spanning tree protocol and its shortcoming, and its replacement by a superior routed technology, and without changing the service model. Replacement of spanning tree protocol by something substantially superior is a general “good” that applies to Ethernet networking in both enterprise and provider space.

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Free Space Optical Communication

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This report gives the details about free-space optical communication. FSO communication is mostly used in the areas where it is impossible to set a physical connection. FSO is very useful these days in the aircrafts for making them to communicate at short distances. To make a connection between two buildings through wireless network, FSO is functional at that part. The type of services provide by FSO, cost and speed is described in this report. This report also tells about the technologies used in this FSO and their architecture in detail. At the end of report, I have described some advantages and disadvantages for using this service.

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4G AND SECURITY

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In my report I will describe the basic functioning of fourth generation (4G) wireless network. The evolution from 3G to 4G is driven by services that offer much better quality (for e.g. sound and video), because of the greater bandwidth and better personalization. There is a rapid advancement in wireless communication technology providing the network services anytime and anywhere. 4G communications systems are being developed to solve various problems which the current communication systems (3G, 2.5G, and 2G) are facing. 4G is an intelligent technology that reduces number of different technologies to a single global standard.

4G systems not only support the next generation of mobile service, but also support the fixed wireless networks. My report will present an overall vision of the 4g features, framework, and integration of mobile communication. The features of 4G systems can be summarized into one word as integration. 4G systems are all about seamlessly integrating terminals, networks, and applications to satisfy increasing user demands.

The key concept is the integration of the 4G capabilities with all of the existing mobile technologies through advanced technologies. Being highly dynamic and the application adaptability are main features of 4G services which are of interest to users. These features means that services can be delivered and available to the personal preference of different users and support the users traffic, air interfaces, radio environment, and quality of service. Connection with the network applications can be transferred into various forms and levels correctly and efficiently. The dominant methods of access to this pool of information will be the mobile telephone, PDA, and laptop to seamlessly access the voice communication, high speed information services and entertainment broadcast services.

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DAKNET

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DakNet provides extraordinarily low-cost digital communication, letting remote villages leapfrog past the expense of traditional connectivity solutions and begin development of a full-coverage broadband wireless infrastructure. What is the basis for a progressive, market-driven migration from e-governance to universal broadband connectivity that local users will pay for? DakNet, an ad hoc network that uses wireless technology to provide asynchronous digital connectivity, is evidence that the marriage of wireless and asynchronous service may indeed be the beginning of a road to universal broadband connectivity. DakNet has been successfully deployed in remote parts of both India and Cambodia at a cost two orders of magnitude less than that of traditional landline solutions.

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Remote Access Trojan

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One of the most high profile threats to information integrity is the computer virus. Trojan horses on Windows operating systems have been around for a long time. With exemplars like SubSeven or Netbus they were never taken seriously and had been smiled at as toys for script children. This paper will show the evolution of these malwares and explain why they can become a real threat to system administrators in the near future. New possibilities for communication methods will be outlined and the weaknesses and strengths of these techniques will be compared to the traditional techniques. With this, some possible attack scenarios will be illustrated and approaches for prevention will be discussed. Indicating what already can be done to protect from such attacks and pointing out where new methods need to be developed.

Many systems have mechanisms for allowing programs written by users to be executed by users. If these programs are executed in a domain that provides the access rights of the executing user, the other users may misuse these rights. A text editor program, for example, may include code to search the file to be edited for certain keywords. If any are found, the entire file may be copied to a special area accessible to the creator of text editor. A code segment that misuses its environment is called a TROJAN HORSE.

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Fast Reroute Extensions to RSVP-TE for LSP Tunnels

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This document defines RSVP-TE extensions to establish backup label- switched path (LSP) tunnels for local repair of LSP tunnels. These mechanisms enable the re-direction of traffic onto backup LSP tunnels in 10s of milliseconds, in the event of a failure.
Two methods are defined here. The one-to-one backup method creates detour LSPs for each protected LSP at each potential point of local repair. The facility backup method creates a bypass tunnel to protect a potential failure point; by taking advantage of MPLS label stacking, this bypass tunnel can protect a set of LSPs that have similar backup constraints. Both methods can be used to protect links and nodes during network failure. The described behavior and extensions to RSVP allow nodes to implement either method or both and to interoperate in a mixed network.

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Ultra Wideband Technology

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Ultra-wide band technology is a technology used in wireless networking to achieve high bandwidth connections with low power utilization.

It possesses many unique features that makes it attractive in many applications, for example, ranging with high accuracy is possible, scales well in dense employments, cryptographic modulation is possible etc. UWB network uses high bandwidth of radio frequency spectrum for data transmission. This facilitates transferring more data in given time than other existing technologies like Wi-Fi or Bluetooth. UWB transfer data at the rate of 400-800 Mbps within 2 metres of radius. Short range and high speed data transfer makes it ideal for its application in range of Wireless Personal Area Network. (WPAN).

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Cloud Computing

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"Cloud" computing – a relatively recent term defines the paths ahead in computer science world. Being built on decades of research it utilizes all recent achievements in virtualization, distributed computing, utility computing, and networking. It implies a service oriented architecture through offering software's and platforms as services, reduced information technology overhead for the end-user, great flexibility, reduced total cost of ownership, on demand services and many other things.

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IPV6 And Tunneling

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More Internet traffic is expected to be carried via tunnels as the Internet infrastructure migrates from IPv4, the current version of the Internet protocol, to the long-anticipated upgrade known as IPv6.Tunneling is a process of used for IPv4 networks to talk to IPv6 networks and vice-versa. Many current internet users do not have IPv6 dual-stack support, and thus cannot reach IPv6 sites directly. Instead, they must use IPv4 infrastructure to carry IPv6 packets. This is done using a technique known as tunneling, which encapsulates IPv6 packets within IPv4, in effect using IPv4 as a link layer for IPv6.

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Smart Cards

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Smart Cards are secure portable storage devices used for several applications especially security related ones involving access to system's database either online or offline. For the future of smart card to be bright, it is important to look into several aspects and factors especially those resulted due to the rapid advancement in information and communication technology. This seminar report looks into current trends in smart card technology and highlights what is likely to happen in the future. Moreover, it addresses other aspects in order to identify the core concepts that are of interest to smart card developers and researchers. More emphasis is given to four key characteristics of smart cards: portability, security, open platform, and memory management, as they are believed to be at the heart of many smart card applications.

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Delay Tolerant Networks

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This report is discussing the Delay Tolerant Networks. Within last decade mobility increased in almost every part of life. The current networking assumptions like low error-rates and short round-trip times may lose their entitlement and will have to be replaced by more adequate definitions. A Delay Tolerant Network (DTN) is a sort of Ad- Hoc network with stronger and harder to fulfill restrictions. Not only random and unpredictable movement needs to be taken care of, as well facts like intermittent connectivity and possible no available end-to-end path need a serious amount of attention. This tutorial names the various challenges of such a network and presents a frame- work developed by the DTNRG. The main contribution of this tutorial is the classification of several routing algorithms and approaches. The classification is based on how the routing is collecting the therefore needed information. We distinguish between stateless, history-, location-, movement- and scheduling- based approaches and present some algorithms for each category.

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Wireless Sensor Networks

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In this report, classifications of the different wireless sensor networks are analyzed based on their applications in Chapter 2. A comparative study of traditional networks with WSN is provided. The different features essential for the designing of the WSN protocols and the factors based on which these feature are decided is discussed in Chapter 3. Finally in Chapter 4, the different MAC protocols of the WSN are discussed along with their advantages in detail.

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May 27, 2013

Quality of Service in IP Telephony

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As the Internet era progresses ,the quality of service has become extremely important. This in turn adds up extra functionality and extra cost for equipment in the network. In this report I have chosen voice transmission over IP network as a scope for service for the study of QoS issues. I wanted to see what is the difference in perceived quality of service in a network with conventional forwarding and a network using a layer 3 switching (IP-switching). Here we can see that quality is one of the prime factors involved in determining the reliability of a network and the reasons for choosing different networks vary from enterprise to enterprise, the design principles remain the same. QoS is required from every device to guarantee

high-quality voice calls. QoS policies are easily be made using the QPM tool and other tools such as classifying queuing and network provisioning, for rule-based policy guidance and robust QoS administration. Here we find that Voice requires 150-ms one-way, end-to-end (mouth-to-ear) delay; 30 ms of one-way jitter; and no more than 1 percent packet loss. It can be deduced that the Voice should receive

strict-priority servicing, and the amount of priority bandwidth assigned for it should take into account the VoIP codec; the packetization rate such as IP, UDP, and RTP headers (compressed or not); and Layer 2 overhead. In addition to this provisioning QoS for IP Telephony requires that a minimal amount of guaranteed bandwidth be allocated to Call-Signaling traffic.

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May 27, 2013

Network Address Translation

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Network Address Translation is a method by which IP addresses are mapped from one realm to another, in an attempt to provide transparent routing to hosts. Traditionally, NAT devices are used to connect an isolated address realm with private unregistered addresses to an external realm with globally unique registered addresses. This document attempts to describe the operation of NAT devices and the associated considerations in general, and to define the terminology used to identify various flavors of NAT.

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Radio Frequency Identification

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RFID is basically used for identification purposes. It is a small device that can identify or track the object wirelessly. RFID can be tracked from several meters away and we do not have to put the object precisely relative to scanner that is its biggest advantage. RFID is used in many areas like tracking inventory, identifying pets, medical records and many more. The concept is very simple we are putting one microchip with an antenna on the object which continuously transfers data using the radio waves and we can track the object using the reader which is also a device with one or more antennas. The device can be connected with the internet so they can be tracked and companies can even share the data. Since it is a very small chip and can be placed anywhere even in the human body and can read the information without consent it has also raised some privacy issues.

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The Basic Concepts of GMPLS

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There are many different types of networks in the world. It is a problem to merge them together to transmit the data between different networks, especially with the development of the optical networks. Generalized MPLS (GMPLS) is concerned with merging the MPLS and the transport networks, so that a uniform control plane can be applied to any transport technology (2006; Adrian Farrel, Igor Bryskin; GMPLS Architecture and Applications; page 52). The focus of GMPLS is on the control plane of these various layers since each of them can use physically diverse data or forwarding planes. The intention is to cover both the signaling and the routing part of that control plane, so that the different kinds of network can use the same control plane to communicate with each other. In this paper, the GMPLS will be described in 4 parts: GMPLS Signaling, GMPLS Routing, GMPLS Path Computation, and GMPLS Traffic Engineering.