Wireless broadband essay

Contents

Recognition

I am really thankful and grateful to Almighty Allah S. W. T in giving me forbearance and strength to finish this undertaking. In the procedure of carry throughing this undertaking, I was opportune plenty to work with people who had contributed greatly to the success of this undertaking. Their aid was non merely limited to their cognition and expertness, but besides in lending their invaluable energy.

First, I wish to show my extreme gratitude and grasp to my Concluding Year Project (FYP) supervisor Mr. Mardeni Roslee for his inspiring and priceless counsel throughout Part 1 and Part 2 on finishing my undertaking. I would wish to thank him for all the advice, encouragement, supports and everything that I had learn from him. Without him this FYP would hold been really hard.

A tower of regard and besides my sincere gratitude to my concluding twelvemonth undertaking moderator, Mr. Lo for his encouragement and his belief in me to finish this undertaking. With his encouragement after presentation of Part 1, my eager in finishing this undertaking becomes more and more.

High recognition to my undertaking spouse Nur Kamilia. Her preparedness to assist and discourse and portion thoughts and tonss of interaction helped me in assorted facets particularly in understanding the rules on doing this undertaking a success in several of facets. Thank you for being such a nice

company to work all the time. The part she gave has confirmed her deep committedness to scientific and proficient affairs, her professional capableness and most importantlyA her enthusiastic attack to work outing complex jobs.

I would wish to show my hearty grasp for my parents and my siblings for their priceless encouragement and supports in footings of interior strength and besides financials. Thank you to all who gave me the possibility to finish this undertaking.

Abstraction

The purpose of this concluding twelvemonth undertaking is to analyze of high velocity radio broadband web in Malaysia. The demand of this undertaking is to look into and research about radio broadband and to do comparings between chief radio broadband web suppliers in Malaysia. The undertaking consists of two major parts which are look intoing of jobs of service in radio broadband web and betterment and sweetening in radio broadband web in Malaysia. For betterment in radio broadband, research about the engineering been used by the radio engineering in Malaysia presents revealed. Analyze about the new engineering that been used by other states to be implement in Malaysia so that the radio engineering in Malaysia can be enhance. There are besides authorities programs in heightening broadband engineering in Malaysia. There are many wireless broadband suppliers in Malaysia and comparing among them will assist client to take what the best are and make the supplier better their services.

Chapter 1: Introduction

In this introductory chapter, the information and background about this undertaking and study are outlined.

1. 1 Introduction

The purpose of this concluding twelvemonth undertaking is to analyze about the high velocity radio broadband web in Malaysia. This undertaking consists of two major parts ; which are look intoing of jobs of service in radio broadband web and betterment and sweetening in radio broadband web in Malaysia. For each portion, is further divided into the devising of comparing between wireless broadband suppliers in Malaysia. The research portion requires the survey about the betterment and sweetening about the radio broadband engineering in Malaysia and the latest engineering that can be implement in Malaysia.

In this undertaking, for the comparing portion, focused on celebrated and large company of radio broadband supplier such as Celcom, DiGi, Telekom Malaysia and P1WiMAX in their engineering and jobs occur. Apart from this, we will cognize the best engineering in wireless broadband. The undertaking of the development of radio engineering throughout Malaysia should be position non merely from the supplier side but besides from the user point of position. Furthermore, user wants the best for them and the chief facet in heightening the radio engineering in Malaysia.

This concluding twelvemonth undertaking gave exposure in about all the engineering been used in implementing the radio engineering. Any related or utile cognition gained during formal survey was able to be applied during the

completion of this undertaking. Furthermore, this undertaking besides gave valuable experience throughout the research in seeking for the information.

This undertaking is really utile and meaningful every bit high velocity radio broadband has a really broad scope of user. The engineering is normally use to link people everyplace and one of the key of information. The advantages in utilizing wireless broadband over fixed line overseas telegram of these systems are wireless engineering non utilizing any overseas telegram so it is wireless and portable. It besides has premier public presentation depending on the engineering being used.

1. 2 Motivation

The writer has been motivated to compose this study for assorted reasons. Scientific research in the radio multimedia communicating field is turning fast. Futhermore, the design of different engineerings in wireless broadband engineering offering different public presentation will do the writer tidal bore to happen out the best for both users and suppliers.

The impressive development of nomadic webs and the potency of wireless multimedia communicating pose many inquiries to operators, makers and scientists working in the field. The hereafter scenario is unfastened to several options such as ideas, proposals and activities of the close hereafter could supply the reply to open points and dictate the better and improved tendencies of wireless world. Because of this, the writer is really enthusiasm to take part in the research to the Malaysia in heightening and developing the radio engineering.

Presents, the use of Internet is become indispensable in homo ‘ s life. Internet can assist us in making many undertakings in our day-to-day life. One can state that life mean nil without Internet market. However the browse activity will happen some jobs such as the coverage, velocity and other restriction. This phenomenon has inspired the writer to research the high velocity radio engineering that will convey benefit to the user. This research will assist both supplier and user in conveying wireless engineering to the farther phase.

1. 3 OBJECTIVES OF THE PROJECT

The chief aim of this undertaking is to analyze and research about the high velocity radio broadband web and to compare the chief radio broadband suppliers in Malaysia. The research will uncover the best supplier and engineering for the client to take. Therefore, in order to accomplish the mark, the aims listed below should be met.

First is to analyse on each engineering that been use to come out with the best technique to do this radio engineering better. Second, is to analyze the betterment and sweetening in radio broadband web in Malaysia and eventually, the most important portion of the undertaking is to do comparings between chief radio broadband web supplier in Malaysia by sing in many aspect such as their engineering, jobs and services.

1. 4 PROJECT DESCRIPTION

In this undertaking, a item research about radio broadband in Malaysia had been studied. For the betterment and sweetening in radio broadband portion, the chief end is to better and heighten the engineering of the radio.

The demand for this research is the wireless broadband engineering must necessitate both supplier and user satisfaction. Both suppliers and users want to better coverage, call quality, lower the cost, traffic direction and the services.

All of this can be achieve by utilizing better engineering such as HSDPA, iBursta„? , WiMAX and others so that the concluding merchandise will be easy to put in, best quality, low-cost and portable. The chief radio in Malaysia are DiGi, P1WiMAX, Celcom and Maxis. This supplier usage different engineering for “ last stat mi ” . So, comparing has been proceed between those engineerings so happen their pro and cons.

This study and undertaking is intended for usage by alumnus pupils nearing research activities in the radio communications country and by professional applied scientists and undertaking directors involve in radio design, taking for better and at consolidating their future vision of the radio multimedia universe.

Current Mobile and radio system and architectural constructs must germinate in order to get by with complex connectivity demands and besides users ‘ demand. Scientific research in this truly multidisciplinary field is turning fast. This undertaking will detect and uncover about the new engineerings, new architectural constructs and new challenges that are emerging.

1. 5 PROJECT ARRANGEMENT

This undertaking comprises of two major parts which are compare and research portion. For the comparing portion, it can be farther separated into

the client side and the supplier side. In order to fulfill both sides, study been made and interview been proceed. The information achieved from the company will be private and confidential similar to the personal information of the client. This is true informations from both side without any hesitate from them.

This undertaking was handled by two individuals. The individuals who are involved in this undertaking are the writer and spouse ; The writer is responsible in betterment and sweetening in radio broadband web in Malaysia while Nur Kamila Mohd Kamil is responsible in look intoing of jobs of service in wireless broadband network. Both of us will concentrate on comparing between the chief radio supplier is Malaysia.

1. 6 THE DEVELOPMENT AND THE PROGRESS OF THE PROJECT

1. 6. 1 Initial Phase

Initially, a complete and comprehensive literature reappraisal is done to derive as many information as possible, to guarantee a thorough apprehension before any planning or generating of thoughts is done to by and large get down the undertaking. The full literature reappraisal consists of a assortment of information obtained from the Internet, books, diaries that have information about radio broadband.

1. 6. 2 Development Phase

In this development phase, the full information gathered in the first phase is look intoing all the information collected at the first stage. At this phase besides we have done comparing the wired overseas telegram and besides wireless broadband by questioning Telekom Berhad. We administering study

to cognize client point of view. To collect more information, we besides interview other broadband supplier.

1. 6. 3 Final Phase

In this concluding phase, the procedure for this undertaking becomes more complicated and specific. It is because this concluding phase trades with compilation and analysing the information and information collected at the initial and development phase.

However, roll uping informations is still proceed in this phase as there are a batch of information and radio broadband is acquiring wider and the engineering are acquiring better twenty-four hours by twenty-four hours. That is why this phase is really of import in larning how to accommodate the engineerings that ne’er stop turning, which is priceless to any technology pupil.

1. 7 Chapter OVERVIEW

This study has been conceived to cover several traditionally detached chapters, there by offering the complete guideA to near issues related to the radio multimedia communicating web betterment and sweetening.

Chapter 1 screen *s* the aims that the writer wants to accomplish to guarantee the success of this undertaking and the overall thoughts related to the undertaking are explained in item.

Chapter 2 screens literature reappraisal on the improving and heightening the radio broadband and background of the major engineerings that been studied in finishing this undertaking. This chapter contains a brief overview of all the theory that was collected throughout the researched.

Chapter 3 screens methodology involved in this undertaking. The method to obtain all those consequences described.

Chapter 4 contains result from the analysing all the informations collected in this undertaking through research, interview and study. This consequence is described base on the theory researched earlier.

Chapter 5 contains the decision for the full undertaking and its accomplishments. Recommendations for future betterment is besides stated in this chapter.

Chapter 2: LITERATURE REVIEW

In this chapter 2, the study will provides the readers with all those technologiesA adopted in current wireless communicating systems and the writer besides presents some proposed the latest engineerings that already implement abroad to be done in Malaysia. This chapter will be devided into 2 parts ; betterment portion and sweetening part. Chapter 2 besides explained about the Malaysia ‘ s authorities program in developing broadband engineering and besides overview about the chief radio broadband suppliers in Malaysia.

2. 1 INTRODUCTION TO BROADBAND

Any type of transmittal technique that carries some information channels over a common wire refers to broadband. DSL service, combines separate voice and information channels over a individual telephone line, is one of the instance of broadband engineering. Broadband constitutes any signifier of high-velocity Internet entree utilizing this transmittal technique in place

networking. Voice fills the low terminal of the frequence spectrum and information fills the high terminal in DSL.

General broadband Internet engineerings are both DSL and overseas telegram modem. Devices that support both DSL and overseas telegram are broadband routers and broadband modems. Fiber (FTTH) and fixed radio are other types of place broadband. Can bear the web bandwidth at least 256Kbps for connexions in one way is a general guideline to run into the standards as a broadband Internet service.

The term broadband by and large refers to high-velocity Internet entree that faster than the typical dial-up entree and that is ever on. Broadband is dissimilar from dail-up where broadband service supplies higher-speed of informations transmittal. The transmittal “ grapevine ” will let excess content to be carried through it. On the other manus, broadband offers entree to the highest quality Internet services such as streaming media, VoIP (Internet phone) , bet oning, and synergistic services. Many of these current and newly-developing services require the passage of big sums of informations that may non be technically practical with dial-up service. Therefore, broadband service may be of all time more necessary to entree the full scope of services and chances that the Internet can offer. Broadband is ever on so there is no demand to reconnect to web after logging off. For this ground it does non barricade phone lines. Broadband has less hold in transmittal of content.

(hypertext transfer protocol: //www. broadband. gov/about_broadband. html)

2. 1. 1 Broadband in Malaysia

Malayan broadband users are turning in Numberss every day. According to an AC Nielsen study in 2009, Malaysians ranked 3rd in the planetary ranking of the Digital media consumers, who spend over 20 hours a hebdomad observation streamed or downloaded content from the Internet. It is undeniable that there is a turning demand from Malaysians for a better broadband service. The ground why broadband has become a necessity is because movingA to tne web-o-sphere is inevitable for any corporate entity today. The broadband and Internet opens up a host of concern chances, options and solutions leting market enlargement and growth. Broadband enable Malayan to communicate. They can pass on via electronic mail every bit good as other societal networking sites and the Internet sometimes maps as pupil ‘ s practical schoolroom and for pupil ‘ s class work.

Broadband service is an of import demand of companies. They could endure losingss as slow services would impede the online experience. As Malaysian are already in the IT universe, Malayan do n’t merely necessitate a broadband service, but need one that is better. As Malaysia is develops, the use of the internetA becomes even more critical as Malaysia has a high figure of users, Internet service suppliers should provide the best for the users. Broadband service is a necessity for the corporate universe every bit good as personal use. Internet is the built-in portion of the modern world. It is clip for Malayan to bask something that they need less hassle as engineerings have allowed room for betterment in the Internet service.
(daripade Malay mail paper)

2. 1. 1. 1A Malaysia National Broadband Initiative (NBI)

The National Broadband Initiative is the authorities ‘ s enterprise to supply broadband service to the whole state and highspeed broadband with high economic activities. The mark is to link 50 percentA of Malayan families to broadband by 2010. This measuring on family will futher be enhanced by consideringA other elements that would break reflect the usage of broadband by the citizen such as taking into history cellular nomadic incursion, Personal computer ownership, usage of cyberspace in Community Broadband Centres, office and school. Under the NBI, highspeedA broadband service will be 10Mbs and below. The epoch of slow Internet (dail-up) connectionA will be over and of class broadband will reassign people ‘ s lives.

The purpose is to contract the spread between the “ rich persons ” in urban countries, and “ have-nots ” in rural countries, frequently referred to as the digital divide. This instability in communicating entree can hold societal branchings if non reference at the state Al level. In Malaysia, the push to contract down the spread between the urban and rural has been entrusted to the Malayan Communications and Multimedia Commision (MCMC) . MCMC is mandated to work towards contracting the inequalities of entree that exist in underserved countries and populations. MCMC has overseen undertaking that have steadily reduced the figure of countries that were non served by telecommunications services.

2. 1. 1. 2A Rushing Up Malaysia ‘ s Tranformation

ICT and Internet are recognised as critical support services and platform in driving all other sectors in the societal economic growing of states along the lines of cognition based and Digital economy. As a logical follow-through of

the A A A A A A A A A A A A A ICT development for the state following earlier related enterprises in cybernation, upgrading and Digitalisation of the communications webs, the introductionA of the multimedia super corridor (MSC) in the 1996, the coming and the phenomenal take up the Internet and IP-based engineerings, the state has so stepped up with the debut of NBI in October 2004.

The scheme adopted under the NBI was to turn to the handiness of broadband as an engine of growing and demand to bridge the Digital divide with the aim of supplying just entree to communicating services.

More significantly, the citizen have entree to basic comfortss to basic comfortss through the Internet such as wellness and exigency services, schools, authorities andA local services and of courseA other consumer services.

Under NBI, rural communities will be connected to broadband services through the Community Broadband Centre located throughout the country. TheA competitory environment generated by the communications and multimedia industry has propelled the widespread adoptation of broadband through handiness of low-cost packageA and picks to the Malayan public hence increasing the connectivity of the citizen and range to market.

2. 1. 1. 3A Traveling Towards Innovation Economy

With broadband, Malaysian will hold entree to the Internet, information and services that can be capitalised to better socio-economic standing. Rural communities in the hard-to-reach topographic points particularly, can utilize broadband to garner utile information and entree to services at their

fingertips, without holding to travel far and wide. Broadband is expected to hold touchable impact on Malaysia ‘ s Gross Domestic Product (GDP) . It will increase national fight and foreign direct investings plus enable a knowledge-based and invention driven economy. NBI marks 50 per centums families to acquire broadband service by terminal of 2010. It is a authorities enterprise to supply substructure in line with the new economic theoretical account, aims to transform Malaysia into cognition based societyA bring forthing the high income economic system.

In overall term, it aims to better, the state ‘ s socio-economic standing globally. As the NBI will supply the service to the whole state, so every one will be entitled to the broadband service including those in the rural areas. This entree to knowledge could be extended to household members and communities which in bend will enrich the state.

With the NBI, economic invention can besides assist bridge the socio-economic gap. The broadband service, has leveraged the little medium endeavors and enterprisers (SMEs) to market their merchandises to much larger webs via the universe broad web. Although there are concerns usage Internet will expose the people to negative influences, but to control it, Internet besides provides the instruction and cognition at the fingertip.

Malaysia ‘ s authorities on its portion will take proactive action to forestall negative elements to stringent monitoring and enforcement of laws. Just every bit much as the state will acquire the economic benefits there are other facets that Malaysia can derive from the betterment and sweetening of

the broadband service too. The advantage of broadband service are illimitable.

2. 2 INTRODUCTION TO WIRELESS TECHNOLOGY

Wireless is really essential. Wireless networksis presentingA a web holding no wires asA wireless web can attach your laptop to a web utilizing wireless moving ridges and so you can travel your computing machine wherever easy. Wireless web has made a web really portable because of adaptative transition, digital transition, entree multiplexing and information compaction.

With wireless webs, you will see the privateness and personal computing machine security extra than earlier. Air is the medium for the radio web. A radio webs have offering roaming, really flexible, low cost and high criterion. There are different types of radio web such as radio LAN, radio MAN, and nomadic devices web.

2. 2. 1 Types of Wireless Networks and web use

Imagine the universe is wholly without wire. It must be astonishing and really comfy. Without utilizing any wires, a radio web able to two or more than two computers. Depends on the engineering which is utilizing, wireless networksutilizes spread-spectrum or OFDM. User able to go about within a broad coverage country and they still can be connected to the web with radio web. There are different types of radio networking such as broad country web, personal country web and local country web but the general one are of two which are WMAN (Wireless Metropolitan Area Network) and WLAN (Wireless Local Area Network) .

The use of radio networking greater than of all time bit by bit because it has influenced critical impact on the whole universe because of that its utilizations have well developed. Through radio webs, one can convey informations over the universe utilizing orbiters. As radio web usage to reassign and have informations quickly, wireless webs used in exigency services. It does n't count to be in a if you are at the office or abroad, the growing of radio web increasing develops in our day-to-day life to portion and direct informations quickly.

(hypertext transfer protocol: //www. freewimaxinfo. com/wireless-network. html

2. 3 IMPROVING THE HIGH-SPEED WIRELESS BROADBAND TECHNOLOGY

Normally, wideband of frequences is available to direct out information is called broadband refers to telecommunication in which a. Because a broad set of frequences is available, information can be multiplexed and sent on many different frequences or channels within the set at the same time, leting more information to be transmitted in a given sum of clip (much as more lanes on a main road allow more autos to go on it at the same clip) . Related footings arewideband (a equivalent word) , baseband (a one-channel set) , and narrowband (sometimes intending merely broad plenty to transport voice, or merely " non broadband " , and sometimes intending specifically between 50cpsand 64Kpbs) . [1]

Meanwhile wireless mean radio is a term used to depict telecommunications in which electromagnetic moving ridges (instead than some signifier of wire) carry the signal over portion or all of the communicating way. [2]

Wireless is better than wired overseas telegram because radio engineering is portable, has premier public presentation and flexible constellation and integrating.

Both supplier and user want to better the coverage. So that, the signal has good indoor incursion for residential and enterprise applications fast rollout and broad coverage. For the radio broadband company they want to better and accomplish better capacity which can back up sufficiently high figure of coincident users. Call quality is one of the factor that both user and supplier want to better so that it will hold low latency, high data-rate and high dependability and uptime. Generally user want to hold low-cost, differentiated duty bundles that suit different user demands plus low CPE (customer-provided equipment) monetary value. A A A A A Improving services is besides indispensable so that user has chance to replace bing fixed line voice services and upgrade anything sing their broadband without any complicated policy. Beside that, engineering is based on unfastened criterion to enable economic of graduated tables and broad adoption. The roadmap of the broadband besides must be good defined to heighten engineering or broadband services. Traffic direction must accomplish 80 % of the bandwidth for 80 % of the users (and non 20 % of the users) . Broadband should hold sufficient spectrum for large-scale deployment & A ; long-run growing.

Wireless broadband demands to present something that is low-cost by the user with low cost CPE, low entree monetary value, and attractive value-added services -broadband informations and voice. Broadband which is easy to put in, simple installing and no demand for phone lines (“ broadband on

the spell ”) plus best quality which has speedy connexion and systematically good performance. Finally user privation to has portability which has permeant coverage (including indoor) and ever connected.

2. 3. 1 WiMAX

Besides known as IEEE 802. 16, WiMAX is a wireless digital communications system that is intended for radio “ metropolitan country webs ” . In Malaysia, P1WiMAX is the company that use this engineering to implement wireless broadband. WiMAX can give broadband radio entree (BWA) up to 30 stat mis (50 kilometer) for fixed Stationss, and 3 – 10 stat mis (5 – 15 kilometer) for nomadic Stationss. On the contrary, the WiFi/802. 11 radio local country web criterion is limited in most instances to merely 100 – 300 pess (30 – 100m) .

The bandwidth and scope of WiMAX make it suited for linking Wi-Fi hot spots to the Internet, supplying a wireless option to overseas telegram and DSL for “ last stat mi ” broadband entree. Besides supplying informations, telecommunications and IPTV services (ternary drama) , WiMAX besides supplying a beginning of Internet connectivity as portion of a concern continuity program. That is, if a concern has both a fixed and a wireless Internet connexion, particularly from unrelated suppliers, they are improbable to be affected by the similar service outage. Finally WiMAX provides portable connectivity.

2. 3. 1. 1 WiMAX engineering

Expanding broadband radio entree over longer distance and to new locations, WiMAX (802. 16) is the new epoch of a broadband. In the radio universe, WiMAX cut downing the cost of conveying broadband to new

countries. WiMAX (802. 16) engineering provides wider scope and bandwidth than the other available or extroverted broadband radio engineerings such as Wireless Fidelity (Wi-Fi) . It offers a radio option to wired backhaul and last stat mi deployments that use overseas telegram modems, Data Over Cable Service Interface Specification (DOGS1S) , Digital Subscriber Line engineerings (DSL) , T-carrier and E-carrier (Tx/Ex) systems and Optical Carrier Level (OC-x) engineerings.

Based on the typical connexion to the public radio webs by utilizing optical fiber, microwave nexus, overseas telegram or any other high velocity connectivity, the backhaul of the WiMAX (802. 16) is created. Mesh webs, Point-to-Multi-Point (PMP) connectivity is besides used as a backhaul in a few instances. WiMAX (802. 16) should utilize Point-to-Point aerials as a backhaul sooner to fall in subscriber sites to each other and to basestations across long distance.

A Subscriber Station which is WiMAX CPE usually serves a edifice utilizing radio or wired LAN. With the usage of LOS Point-to-Multi-Point connectivity or Non-Line-of-Sight (NLOS) , a WiMAX basestation serves subscriber Stationss ; both connexions is referred to as the last kilometer communication. WiMAX (802. 16) recommended to utilize NLOS Point-to-Multi-Point aerial to link concern or residential endorsers to the WiMAX Basestation (BS) sooner.

WiMAX basestation equipment with a sector aerial and radio modem on top

WiMAX architecture

2. 3. 1. 2 Type of WiMAX and receiver

TheWiMAXfamily of criterions (802. 16) focal point on two types of use theoretical accounts which are afixed WiMAXusage theoretical account and amobile WiMAXusage theoretical account. Thefixed WiMAXserves the stationary and prosaic categories meanwhile amobile WiMAXnetwork entree system is one that can turn to the vehicular category.

Until now one of the of import limitations to the widespread credence of WiMAX has been the monetary value of WiMAX CPE (WiMAX Receiver) . This is non merely the monetary value of WiMAX receiver itself, but besides that of installing. The thought of a self-installed WiMAX CPE (WiMAX Receiver) has been hard for Broadband Wireless Access (BWA) from the beginning, but with the reaching of WiMAX engineering this issue seems to be acquiring resolved. In the yesteryear, BWA has been preponderantly Line Of Sight (LOS) , necessitating extremely skilled labor and a truck function to supply and put in a service to client.

WiMAX receiving system

2. 3. 1. 3 WiMAX design

Internal devices and a WiMAX tower are the contents of aWiMAX basestation. Some other and environmental issues bound the bounds of WiMAX scope to 6 stat mis or 10 kilometer. A WiMAX basestation can usually covers the country of about 30 stat mis or 50 kilometers radius. The WiMAX basestations would utilize the media entree control bed defines in the criterion and would apportion uplink and downlink bandwidth to endorsers

harmonizing to their demands on existent clip footing. Any wireless user under the coverage country would be able to acquire the WiMAX services

Basestation connectivity with Subscriber Stations

2. 3. 1. 4 WiMAX in future

Compare to the typical Wi-Fi hot musca volitanss, WiMAX technologycan make high speedwireless broadbandInternet services available to much larger countries. Greater than the physical distance restrictions of Wi-Fi hot musca volitanss or DSL, WiMAX engineering can besides be used to complect bing Wi-Fi webs.

WiMAX Technology can play a important function in assisting service suppliers to present converged services that can be accessed utilizing a wide scope of devices on a broad assortment of networks. WiMAX executions can supply a wireless scope of up to 30 stat mis or 50 kilometers.

By given different capablenesss while leting for seamless integrating at the proficient degree, 3G and WiMAX Technology solutions fit good together. To go extremely spectrally efficient, 3G engineerings have evolved over many old ages leting operators to take benefit of dearly-won spectrum dedicated to mobile services. 3G CDMA engineerings such as W-CDMA and CDMA 2000 1xEV-DO provide high through puts in low bandwidths as 5 MHz and 1. 25 MHz, severally.

2. 3. 1. 5 Dainty to WiMAX and security

WiMAX security, stableness and quality of service are some of factors involved in worsening the WiMAX engineering public presentation. In this subchapter writer is traveling to discourse the menaces involved in WiMAX.

WiMAX basestations andWiMAX Customer Premise Equipments are the content of theA WiMAX radio entree web. The WiMAX basestations provide web add-on to the WiMAX CPEs. AWiMAX Customer Premise Equipment (WiMAX CPE) selects the one which offers the h3est signal as a servingWiMAX basestation. At this point, aWiMAX basestationand a aggregation of servedWiMAX Customer Premise Equipments (WiMAX CPE ‘ s) play the function of system while the endorser plays the function of the user.

TheMedium Access Control (MAC) bed and physical bed are two of most of import beds of protocol architecture of WiMAX Technology. Common Part sub bed is the indispensable portion of WiMAX engineering layered architecture. MAC ProtocolData Units (PDUs) are constructed, connexions are established and bandwidth is managed in this bed. With the Convergence bed, the Common Part (CP) exchangesMACService Data Units (SDUs) . Tightly integrated with Common Part is the Privacy sub bed. With the Physical bed, the Security bomber bed exchanges MAC PDUs. The Convergence bed adapts units of informations of higher degree protocols to the MAC SDU format, and frailty versa. Sorts the incomingMACSDUs by the connexions to which they belong by The Convergence bed. Received and transmitted through cryptography and transition of wireless frequence signals, The Physical bed is a bipartisan function between MAC PDUs and Physical bed frames.

Type of dainties in WiMAX are Rouge Basestation, DoS (Denial of Service) Attacks, Data Link-Layer Threat, Application Layer Threat, Physical Layer

Threat, Threat, Authentication, Key, Theft, Water and eventually Black Hat Threat.

The primaryWiMAX securityconcerns from the point of position of an terminal user are privateness and informations unity. Users need warrant that no 1 can listen in on their Sessionss and that the information sent across the communicati

ng nexus is
non
tampered
and normally
achieved
through the
usage of
WiMAX web
encoding.

An importantWiMAX securityconsideration is forestalling unauthorised usage of the web services. From the service supplier ‘ s point of position, utilizing h3 hallmark and entree control methods. The service supplier ‘ s demand to forestall fraud should be sensible against the trouble that it may enforce on the user. The physical bed, and theprivacy bomber bed are the illustration of hallmark and entree control that can be implemented at assorted degrees of the web.

2. 3. 1. 6 Multiple-input multiple-output communications (MIMO) engineering on WiMAX

The usage of Multiple-input multiple-output communications (MIMO) engineering onWiMAX, which is the engineering trade name name for the execution of the standard IEEE 802. 16 is called WiMAX MIMO.

Multiple Input and Multiple Output or MIMO, refers to the engineering where there are multiple aerials at the nomadic device and multiple aerials at the basestation. Typical use of multiple aerial engineering includes laptops with

two aerials, cellular phones, every bit good as CPEdevices with multiple shooting aerial.

The 802. 16 specification besides supports the usage of four aerials. Three constellations are supported which are WiMAX four aerial manner 1, WiMAX four aerial manner 2 and eventually WiMAX four aerial Matrix C manner.

For WiMAX four aerial manner 1, with rate equal to 1, utilizing four aerials, informations is transmitted four times per symbol, where each clip the information is conjugated and/or inverted. This does non alter the information rate, but does give the signal more hardiness and avoids sudden additions in mistake rates. Meanwhile for WiMAX four aerial mode 1 with rate equal to 2, utilizing four aerial, the information rate is merely twofold, but increases in hardiness since the same information is transmitted twice every bit compared to merely one time with utilizing two antennas. Finally, the 3rd constellation that is merely available utilizing four aerial is Matrix C, where a different information spot is transmitted from the four aerials per symbol, which gives it four times the baseline information rate. hypertext transfer protocol: //www. freewimaxinfo. com

2. 3. 2 High-speed DOWNLINK PACKET ACCESS (HSDPA)

An enhanced 3G (3rd coevals) Mobile telephone communications protocol in theHSPA (High-Speed Packet Access) household, besides coined 3. 5G, turbo 3G or 3G+ , which allows webs based on Universal Mobile Telecommunications System (UMTS) to hold advanced capacity and informations transportation velocities is called High-Speed Downlink Packet Access (HSDPA) . Present HSDPA deployments can back up down-link

velocities of 14. 0, 7. 2, 3. 6 and 1. 8 Mbit/s. with HSPA+ , Further velocity additions are available, which offers velocities of until 42 Mbit/s downlink plus 84 Mbit/s with Release 9 of the 3GPP criterions. HSPAEvolved is the 2nd stage ofHSDPAis specified in the approaching 3GPP release 7.

Comparison of information rate within engineering

2. 3. 2. 1 HSDPA Technology

HARQ (Hybrid Automatic Repeat ReQuest) used the construct of " incremental redundancy " . With " incremental redundancy " retransmissions contain the relation to the original transmittal which is different cryptographies of the user informations. The user device saves it after a corrupted package is received. An error-free package can happen with the combination of the amount of the mistake transmittals, even if the retransmitted package (s) is itself spoiled. With subsequent retransmissions, user will unite it to make an error-free package as fast and expeditiously as possible.

With channel-dependent programming, the HS-DSCH downlink channel normally shared among users to take benefit of good channel conditions to to the full utilize of bing wireless conditions. To find for each user how much informations they should be attempted and for the following 2 MS frame, which users will be sent informations, The Node B uses this information geting from all user devices. High downlink signal quality is reported as excess informations can be transmitted to users. 500 times per 2nd sporadically transmittal for each user will be the mark of the downlink signal quality.

Network bandwidth and therefore the sum of the channelisation codification tree, due to HSDPA user are never-say-die by the web. In this portion, a trade-off between bandwidth allocated for HSDPA users and non-HSDPA information users. While the web is runing, it can be altered. As the allotment is “ semi-static ” , it can non be modified on a frame-by-frame footing.

One of the advantages that is the bettering the unit of ammunition trip clip for applications, diminishing on latency every bit good as better information rates. For the following 2 MS frame, which users will acquire the information is determine by Node B. Data may be sent to the users at the same clip, via different channelisation codification for a specified 2 MS frame. The highest figure of users to acquire the informations on a specified 2 MS frame is decided by the figure of allocated channelisation codifications wholly non similar with CDMA 1xEV-DO, where at a clip, informations is transmitted to merely one user.

In release 5 UMTS webs, HSDPA go on to be portion of the household. There are different advancements of HSDPA. In first-class wireless conditions the debut on 16QAM transition will do the information throughput rates better by approximately two-base hit of QPSK although QPSK is the initial transition strategy. Usually, 1. 8 Mbit/s extremum informations rates will be offered by QPSK with 5 Code allotment. 16QAM with 5 Codes will raise this to 3. 6 Mbit/s. In theory, 10. 8 Mbit/s will be the highest throughput in HSDPA. extra codifications for illustration 10 can be implemented to do these informations rates become better or widen the web capacity throughput significantly.

Now, HSDPA seem to hold enhancement on on the uplink with a new carrier of 384 kbit/s compare to the old upper limit carrier which was 128 kbit/s.

Comparison of HSDPA ‘ s velocity with other engineerings

Ending at the Node B, other physical channel beside the Signalling Control Channel is a rearward channel. The contrary channel will convey current channel quality of the user and acknowledgement information. So the sum is two new physical channels that are introduced, along with the HS-DSCH channel. To achieve peak informations rates of 14. 4 Mbps, stage one introduces new basic maps. In the Node-B, High Speed Medium Access protocol or MAC-hs, High Speed Downlink Shared Channels which is HS-DSCH and the adaptative transition QPSK 16QAM are late launch.

In the 2nd stage of HSDPA is expected to make informations rates of up to 28. 8 Mbps in 3GPP release 6 at this clip. Multiple Input Multiple Output (MIMO) and beamforming are the antenna array engineerings that will be introduced. in a beam to the user ‘ s way, beam forming will be focuss the familial power of an antenna. For increasing the power, one can understand what really is a beamforming and the get noted that transmittal power of the basestation sector will be the confining resources. Both at receiving and directing side, MIMO implemented multiple antennas. Air interface will be focused in the 3rd stage of HSDPA. With Orthogonal Frequency Division Multiplexing and advanced transition strategies, it will convey in a new Air Interface. Anywhere WCDMA is deployed, 3G protocol can go the proceeding of 3G although most states non offer it. Data rates of up to 50 Mbps in stage three of HSDPA.

In decision, with HSDPA installed in the cell phones or utilizing the HSDPA to utilize the radio engineering, users can see the advantages of greater information capacity. HSDPA offers the base to make the higher information capacity and high velocity for better servive of UMTS. An HSDPA characteristic besides supports t-mobile phones thereby increasing its efficiency. HSDPA entree can be instated in samsung phones, lg phones and phones of the similar quality.

(imranraf)

HSDPAA basestation architecture

2. 3. 3 iBursta„?

The iBursta„? system is a nomadic broadband Internet entree system. In offering a alone combination of high velocity, broad scope and high capacity, the iBurst engineering is a wide-area nomadic broadband technology. The engineering will provides stop users with broadband Internet entree service: Internet entree service comparable to DSL and cable. Besides, iBursta„? has a benefit of mobility where user can entree anyplace, anytime with the freedom to move. Users still can shoping eventhoughthey ‘ re in amoving vehicle. In Malaysia, IZZI Broadband company provide this engineering to market their broadband

Merely stopper it in, turn it on. iBursta„? is easy to obtain and use. In add-on, iBursta„? has high-speed connectivity. Nowadays, single connexion velocities of up to 1 Mbps and with protocol support for up to 16 Mbps, the connexion will up to 2 Mbps in the coming system release. Access through standard devices, the iBursta„? radio modem connects to standard IP-enabled devices like laptop and desktop Personal computers and PDAs. Open accessA is

available with iBursta„? engineering where users ‘ favourite Internet content, applications and services, including electronic mail, corporate VPNs, VoIP, picture cyclosis, online gambling, can be accessed by the user.

A seamless broadband Internet computer science and communications will be experienced with the iBursta„? system. Today, extremum informations rates are in surplus of 1 Mbps per user, with 2 Mbps coming in the hereafter. 16 Mbps per userA can be supported by the iBursta„? protocol itself. The iBursta„? system provides high-speed when entree to the Internet, practical private webs (VPNs) and other IP webs from the widest possible scope of devices, including laptop computing machines and PDAs. From the terminal user ‘ s position, users need non accommodate their computer science wonts, applications or devices to fit their entree method of the minute with the iBursta„? system. This is contrast to where the entree method forced the pick of a peculiar device for illustration, a cellular phone.

High information rates, monolithic capacity and minimum capital and operating disbursals are the consequence of the iBursta„? engineering. The iBursta„? system offers the most cost-efficient, spectrally efficient broadband Mobile entree web available from the nucleus web operator ‘ s position. Open informations networking criterions and equipment used in the wired backhaul and nucleus conveyance webs, supplying the operator with flexibleness in networking engineering and seller and device choice. The entree platform is designed to make a compelling sweeping concern chance for web operators and to transport the endorser traffic of many service suppliers. Today it is a direct extension of the wired broadband sweeping substructure employed by major operators. These operators are provided

with an extra agencies to deduce returns on that investing by the iBursta„? system.

The iBursta„? system enables entree to a new category of radio clients utilizing the same hardware, service and direction bases as for its wired clients, from the service supplier ‘ s position. Either through Point-to-Point Protocol (PPP) over Layer 2 Tunneling Protocol (L2TP) or via pre-terminated IP Sessionss, iBursta„? web Sessionss are able to present to serve providers. A To back up iBursta„? web endorsers, most medium- and large-scale service suppliers already have the necessary hardware and package. A user ‘ s experience is that of linking straight to the service supplier, when linking to a service supplier via the iBursta„? system. Customers have a direct relationship with their Service suppliers, including charge and stigmatization.

To back up the iBursta„? entree system, jobbers of wired entree already have the necessary wired substructure. Extends the wired broadband service architecture outlined above straight is the iBursta„? service architecture. Standard end-user service supplier tools can be used to end, manage and proviso the iBursta„? ‘ system ‘ s broadband radio users. Additionally, any end-user deviceA laptop, PDA and other appliances back uping the permeant PPP entree protocol and modem can be used for entree if equipped with an iBursta„? .

2. 3. 3. 1 Movable iBursta„? Basestation Platform

The best thing about iBursta„? engineering is the basestation can travel from one topographic point to another. It is called Cellular On Wheel (COW) and

it already implement in iBursta„? to give benefits to the user. This is because if there is unexpected job occur such as inundation, the COW and be transport to the other topographic point yet it still can have information and transmit the signal. So that the connexion with the afloat country will non be interrupt. So iBursta„? is the engineering that will give an easiness when there is any exigency happen.

It besides can be use in the military base as the military base is normally at the rural topographic point and with no other people remaining at that place where the signal is really hard to receive. So COW can be the solution as the basestation is transport signifier the chief metropolis to the rural topographic point by aeroplane or truck so that the rural topographic point will non be disconnected to the chief city. When the they want to travel the military base they can convey together the COW. This will cut down cost as they do non has to construct the new basestation when they move to other topographic point.

The span between the radio and wired parts of the web is called the iBursta„? basestation. The basestation is an entree collection device that aggregates the PPP session informations of the end-users that it is functioning, viewed from the wired web. It plays an correspondent function to a Digital Subscriber Line Access Multiplexer (DSLAM) in a DSL web in this sense. To pull off the iBursta„? basestation, both Simple Network Management Protocol (SNMP) and a command-line interface, entree the same implicit in direction and supervising data. The informations are comprised of industry-standard SNMP Management Information Bases (MIBs) .

An endeavor MIB is to command and supervise the iBursta„? wireless interface. This ensured highest possible spectral efficiency, and therefore lowest entree substructure costs for the iBursta„? nomadic broadband application. The characteristic of iBursta„? basestation are multi-mode backhaul (micro-cook, orbiter, fibre) , automotive, self-Powered. Besides, iBursta„? basestation besides have assortment of tower highs from 17m (50ft) to 60m (200 foot) with high top and air current burden opposition and it can defy 160 Km/h (90 miles per hour) winds in operation. iBursta„? basestation compatible with all roads. Other feature of iBursta„? basestation are it can run in less than 20 minute after reaching on siteower-top and the basestation is electronics capable. It has 40 + similar units in operation at cellular webs worldwide and several hundred towers in operation in armed forces and nomadic operations worldwide for communications and surveillance.

2. 3. 3. 2A iBursta„? service

By widening entree collection architectures to mobile broadband entree, iBursta„? system provides an end-to-end IP connexion for users. To back up iBursta„? terminal users, web and service suppliers can command bing equipment, tool and content bases best of the radio and wired universes will be experienced by the terminal user. The broadest scope of applications and end-user devices, coupled with the high information rates and freedom to travel will accomplish by user.

Upon a broad scope of lower-level services implemented in the web operator ‘ s and service suppliers ‘ , webs iBursta„? system are built. “ FCAPS ” for mistake, constellation, accounting, purveying and security refered to these

lower-level services. The “ Servicess ” subdivision of the present papers focuses on four key services which are charging, rolling, service degrees, security and IP address direction as provided by both the web operator and the service supplier.

Connection with independent downlink and uplink extremum rates subject to a certain degree of oversubscription is a basic end-user service offered in the initial execution of the iBursta„? system. Service of a service supplier ‘ s Gold degree might be 1 Mbps/345kbps (down/up) with 20x over-subscription, while 384 kbps/128 kbps (down/up) with 20x over-subscription is for the Silver degree of service might be as the illustration. To consequence the extremum uplink and downlink rate bounds specified in that user ‘ s RADIUS profile, the LNS ending a user ‘ s PPP session performs the necessary choking. DSL and overseas telegram services besides used this same impression of service. It provides important flexibleness to web and service operators in technology the trade-off between web capacity, service quality and service cost and the theoretical account is familiar to consumers.

The entree and conveyance web is engineered with one degree of over-subscription typically. This is done with a separate degree of over-subscription selected for the links between that web and the service supplier ‘ s equipment. The merchandise of those two Numberss will be the advertised degree of over-subscription. A (hypertext transfer protocol: //www. arraycomm. com/docs/iBursta„? Overview. pdf)

2. 3. 3. 3 IBursta„? advantages

Allows uninterrupted, high velocity and genuinely nomadic Internet connectivityon-the-go go the best about IBursta„? itself. Reduced spectrum demands, minimising up-front capital disbursals related to spectrum ownership and wireless elements in both basestations and user terminuss is one of the spectrally efficient systems other than decreased substructure demands, minimising capital and operating costs associated with basestation sites, interpreting into decreased costs per endorser and per covered population component. Spectrally efficient systems besides have high capacity, maximising the system throughput and end-user experience even under burden.

Profound consequence on radio system economic sciences is the basestation scope. By finding the figure of basestations required to cover an country, it will impact capital outgos. Operating outgos by finding the figure of sites and backhaul links connexions from the single basestations to the web nucleus that must be hired is besides affected. The coverage country of its basestations by about a factor of four higher than other systems offering comparable aggregative informations rates will be increased by iBursta„? system ‘ s adaptative aerial engineering. The consequence is a scalable wide-area broadband entree system with odd economic sciences, combined with the system ‘ s spectral efficiency. The terrain, edifice denseness, the type of subscriber device and aerial used, and so away affected The particulars of basestation scope in a given iBursta„? deployment. iBursta„? systems have demonstrated high user informations rates at scopes of 1-2 kilometer in the most ambitious instance like urban environment and over 12

kilometers in suburban environments with a desktop modem and little (indoor) spot aerial as practical mention points. Key constituent of the cost construction of wireless systems is a the acquisition of spectrum, and two cardinal characteristics of spectrum have great impact on that cost the spectral efficiency of the radio system and the type of spectrum required to implement the system. The iBursta„? system is particularly efficient in its usage of spectrum and requires far less of it per unit of delivered service than other engineerings, as mentioned earlier. A to the full capable and commercially feasible iBursta„? system can run in much less spectrum than other wireless engineerings require to supply the same sum of capacityA where it functioned small as 5 MHz of odd spectrum with a sum of 20 Mbps of net useable throughput per cell in that sum of spectrum (in the omni constellation, with up to 80 Mbps in a sectorized cell) .

Slide I explosion

2. 4 ENHANCEMENT OF HIGH-SPEED WIRELESS BROADBAND

If we go back to 1990, we see that there are nomadic wireless services in Malaysia that start to develop but functioning merely really limited figure of subscribers. Generally, all the services quickly enhanced to their maximal capacity and so it is besides moderately good estimation of subscriber numbers. These cellular systems had many flaws. Then the engineering develop to dail-up conection of cyberspace, Bluetooth, LAN, wireless-LAN and many more until make the latest engineering that been used by the high velocity radio broadband engineering supplier that writer had mentioned in the subchapter before. With the increasing of demands and outlooks for multimedia today, more and more information required to be communicated at faster speeds. Demands for triple-play applications consisting voice,

informations and voice have now shifted to quadruple-play to include mobility.

Enhancement of broadband is of import as citizen want to be connected to each other and broadband is the window to the universe of opportunities. Malaysians should non merely hold entree to basic communicating services but besides have entree to broadband and Internet services.

Malaysia need to heighten the broadband engineering therefore Malaysia has laid the foundation for broadband economy. The outgrowth of communicating in the sphere of information and communications engineerings has made it possible or big sums of information (high bandwidth) to be transportedA across world-wide webs in a really short period of clip. Therefore acknowledging the of import to better and heighten the broadband engineering as an engine of growing.

Now writer look into the engineerings that already been used abroad that are suited to be apply in Malaysia to heighten the high velocity radio broadband engineering in Malaysia. A

Network architecture in Malaysia since 1990-2000

Network architecture in Malaysia now

2. 4. 1 CANOPY TECHNOLOGY

Canopy webs has a batch of progress features which are, advanced engineering, simplified constellation, rapid deployment and outstanding cost-effectiveness. The writer want to propose this engineering to heighten the wi-fi Stremyx as The Canopy engineering is the fixed line radio and have better public presentation than Stremyx. By turn outing highspeed Internet

entree at low cost, or no cost, Canopy systems are assisting bring forth new economic chance for persons or even households, irrespective of their economic position. It will be a focal point for new concern by offering state-of-the-art broadband service. The productiveness of public plants sections are enhanced with ever-present high-velocity communications and they are assisting first respondents such as constabularies, firemans and EMTs arrive armed with the most powerful of arms with accurate, real-time information. Beside enabling authoritiess and their service supplier spouses to deploy their high-velocity webs at high velocity, Canopy radio webs are besides fast and simple to put in. As with fibre or overseas telegram webs, deployment times are from twenty-four hours to twenty-four hours.

Canopy solutions are assisting authoritiess and authorities bureaus wholewide universe to better function the people who depend on them for efficiency, safety and chance. In add-on, the system easy integrates with and complement bing webs because of a simple web design comparison to other engineerings.

900MHz, 5. 1, 2. 4, 5. 2, 5. 4, 5. 9 and 5. 7 GHz scope of spectrum picks can be chosen because Canopy radio broadband equipment is exist in a broad scope of spectrum picks. 10 Mbps is the natural information rate for The Canopy wirelesss. Point-to-Point Backhaul Unit (BU) is 7. 5Mbps comes from the effectual amount of both waies throughput of The Canopy system. As shipped, this is divided every bit ; 3. 75 Mbps in each way ; this ratio may be set from the constellation page. A sum of 6. 2 Mbps at each Access Point (AP) unit provided by multi-point systems. The sum is divided as 4. 7 Mbps on the downlink and 1. 5 Mbps on as shipped from the mill.

Compare virtually to any other connectivity option, start-up costs are more low-cost as Canopy avoid in-ground wire or run operating expense or put in microwave. With constitutional installing and deployment aid web constituents are streamlined. The system provides exceeding public presentation in LOS which is line of sight state of affairss and it is interference-tolerant with Canopy OFDM-based equipment, in NLOS (non-line of sight) , nLOS (near-line of sightand)