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Guided and unguided media ppt template pdf template

Å odived lanoiger osu :sepÅŠAaciIaP arret rirboc arap 51-01 reuqer :adagep aneueqP anrep rop 50,0 a odizuder yaleD arret ad amica sahlm 004,9 002,6 tibrO aid©Åm arret ad atibr*Å setil©ÅtaS OEM .JošÅapsee(ouciĀv uo augjĀ ,ra ed s©Åvarta aditimsnart ©Ā acit©Ångamortele adno a ,oif mes oiem o araP ,cte ,augjĀ ,solucĀev ,sotejbo ed soicĀfide ed arof meteller htapitlĀm gnidaF ed sadnO ,ocnarb odĀur omoc odicenhoc m©ĀbmaT ,junimil lanis od ašĀrof a eug adidem .Ā atnemua otcapmi O aidĀm e sovitisopsid ed acimr©Āt edadivita ad es-ratnavLeI,levĀtiveni ©Ā ocimr©Āt odĀur o ,adaug aidĀm a moc ecetnoca omoc laT ocimr©Āt odĀur .22 ofAssimsnart arap airĀssecen aicn*ĀtoP ofĀŠAerilĀ ritimsnart a aicn*ĀuqerF :seuĀŠĀaredisnoc siapiicnirp s*Ārt a odanoiclar ĩtĀse anetna ed oteĵorP sanetna ret EVED oif mes ametisis adaC socirt©Āle sianis me sa-etrevnoc e etnadnucric oiem od ra olep saditimsnart sadno ebecer ra ed ofĀŠĀpecer ed anetna ,ajes uo ,oiem o arap ra olep aditimsnart aigrene aidarrt e socirt©Āle sianis ebecer ofĀssimsnart ed anetna A ra olep soditimsnart sianis e socirt©Āle sianis ertne anetna ed ofĀšrevnoc ed ofĀŠĀnuF anetna a ©ĀĀ adaug ofĀm ofĀAssimsnart ed evahC .73 avitacifmgis siam ofĀŠĀaciIa ed lev*Ām ainofelet A zHG 003 zĤK 3 atelpmoc lanocieridimmo mumoc aicn*Āuqerf ed amag a odnairav ,sianoicerid sonem ofĀŠ sanetna sadnoorcim oidĀR 1 6 5 2102 oiaM 32 ,MTU .42 ofĀŠĀaminĀ .91 oif mes ametisis mu ed edadicapac ad ofĀŠĀazimixam an 1 oreoĀĀn etnatimil rotaf o ©Ā lanacoe ed aicn*Ārefroed ed ofĀŠteG sanetna ed sopit acifĀrĵoeg ofĀšrepsid retnĀM aigrene ed siewĀn rizuder rop odizuder uo odaienereC seralulec sametisis ed aicn*Āuqerf ed ofĀŠĀazilĀtuer ed acisĀĬb tenet ed otudorp rop acifĀrĵoeg ofĀšrepsid acoup moc aicn*Āuqerf ed sepĀŠĀuibirta rop odasuaC aicn*Āuqerf amsem an ĩtĀse oif mes ametisis on rossimsnart 1 ed siam odnaug srucC ocenerrefretĀ lennahocC ,ralulec enofolet rop siev*Ām sepĀŠĀAcinmucoc ed sepĀrdap ed ofĀŠĀĀreg atrauq a ©Ā G4 ,sepĀŠĀAcinmucocet saN G4 oif mes sederĀ and speed such as mobile voice, low speed data faster asrepsid e adivrosba ©Ā aigrene a ,roirepus e zHG 6 A ,zHG 6 ed oxiaĀ saicn*Āuqerf arap oneuqep ©Ā avuhc ad otcapmi O ,adatrospnartorea lanis ed ašĀrof amu ed aicn*Ātop ed edadised ed ofĀŠĀideM sianoicerid sanetna sopmeT otruc siaM rossimsnart ed aicn*Ātop ota siam ohnag ed sanetna :moc rasnepmOC ervil ošĀpsee ed adrep a roiam ,aicn*Āuqerf a roiam otnauQ ervil ošĀpsee ed adrep ed sacitsĀretcarac .41 rotpecer on lanis ed levĀn o atnemua enoZ lenserF omseM rotpecer on lanis ed levĀn o zuder enoZ lenserF dĀO ,ed sepĀĀxelferĀ oterid ohnimc o eug od ognol siam adno ed otnemirpmC 1 etnemataxe ©Ā aicnĀtsid a edno otnop adaC ,adno ed otnemirpmoc od edatem ©Ā laedi anetna ed ohnamat mU =)?(aicn*Āuqerf ed adno ed otnemirpmoc oa ofĀŠĀaleR anetnĀ .32 odnuges / sahlm 000,681 = zul ed edadicoleV .2 6002 ed otsoĝa ed 71 me odazilautA 5002 ed oiam ed 6 odasiver e detadpU6002 ed otsoĝa ed 71 me odazilautA 5002 ed oiam ed 6 odasiver e odazilautA aideM dediugtoN .4891 me metsyS lleB eht fo erutitsevidĀ .Ā uovel zev aus rop eug ,TšĀt ad laer ofĀŠĀitepmoc ariemirp a res a ICM a uovel ossi ,siev*Ām sovitisopsid sortuo arap e senohptrams arap ,BSU oif mes smedom moc spotpal arap ,olpmexer rop ,adnab-artlu lev*Ām tenretnĀ .Ā osseca ecenrof G4 ametisis O ? "Āuq o ofĀtĀe lenserF ed sanoZ ,oiem od sacitsĀretcarac sad edneped edādilaug A ,essap FR ed aigrene a eug etĀmrep adnia otnauqne ,etneibma od ol*Āġetorp arap anetna amu erbos arotetorp arutreboc reuġlaug emodaĀR ,essap FR ed aigrene a eug etĀmrep adnia otnauqne ,etneibma od ol*Āġetorp arap anetna amu erbos arotetorp arutreboc reuġlaug emodaĀR Bd 1 5,0 emodaĀR ed adrep ortemĀid ed 01 6 hsid ocilĀĀbarap roteller mu 6Ā mumoc siam amrof A lanoicerid etnematĀ sadnoorcim ed sanetnĀ ,71 ataxe ofĀŠĀazilacol a ranimreted ed mif a ,etil©Ātas ed sianis 4 3 ed asicorp OEG ed zev me OEM asu SPG o eug rop ,ataxe ofĀŠĀazilacol a ranimreted ed mif a ,etil©Ātas ed sianis 4 3 ed asicorp OEG ed zev me OEM asu SPG o eug rop SPG :ofĀŠĀaciIa meT meT ,adno ed otnemirpmoc od edatem ©Ā anetna ad laedi ohnamat mU odnuges / sahlm 000,681 = zul ed edadicoleV .01 avuhc ed satog ofĀŠĀazilĀtuer ortcepsE ? "sslerĀW" ortuo euQ 4 2102 ed oiam ed 32 ,MTU SSECCA LIVISIVNI SRETEMEĀIUQ SORCĀLĀCNI sodatsE aditimsnart etnemlarutan adahlitrapmoc azerutan aus ed asuac rop oif moc seder sa eug od sedadilĀbarelĀm siam odnet omoc sadatar ofĀŠ seder sĀ oif mes sorucrE oif mes ederĀ 3 2102 ed oiam ed 32 ,MTU .12 ofĀŠĀasnepmoc ed solucric ed s©Āvarta adainereĝ res edop ametisis on edadiraenil ofĀĀn amugĀ etsixe odnaug erroco eug aicn*Ātop ad ofĀŠĀĀnuF amu ©Ā odĀur O etnatluser aicn*Āuqerf ed suarg sessen sodarebiled sianis moc rĀrefretni edop etnatluser aicn*Āuqerf ed uarg mu ,uarg ad mu ,nad + a ĩsacin Āmrah(seratnemelpus saicn*Āuqerf sadizudorp ofĀs ,oiem omsem o mahlitrapmoc saicn*Āuqerf saud odnaug oiem omsem o mahlitrapmoc saicn*Āuqerf setnerefid ed sianis eug ermpes erroco ofĀŠĀaludomretni ad aicn*Ārefretni A ,VT ed salet san snegami sairĀv uo sot©ĀĀ stsoĝh- nad" alpĀitĀĀm ed olpmexe ortuo .D3 ofĀšivelet ,aicn*ĀreĀnocoeidiv ,ofĀŠĀinifed atla ed lev*Ām VT ,soĝoj ed sošĀivres ,PI ainofelet ,odareĀla lev*Ām osseca melcni sievĀšbecnoc sovitaĀĀpĀ sO ,sadnoorcim o eug amsem a ©Ā augjĀ alep ofĀŠĀrosba a ,otnatrop ,zHM 002,2 = zHG 22 ,roiretna edĀS eht eĤT oa setnererer satruc siam sĀĀv saxiab siam saicn*Āuqerf ,imoc asnepmoc zHG 8,5 @ (adrep ed ahim/Bd 70,0 ½Ā *Ā .Ā GOF ĳzHG 8,5 @ (adrep ed ahim/Bd 5,0 ed setrof savuhc setrof eroeven ed sotnemidepmi siapiicnirp so ,zHG 03 ed avuhc ad oxiaĀa sonem ;oin*Āġixo a odived zHG 06 a zHG 51 ed ocip ed ofĀŠĀauneta ad oxiaĀa sonem ,augjĀ ed ropav oa odlved zHG 22 @ ofĀŠĀauneta ed ocip ed serodilubirtmoc seroiaM oin*Āġixo ,augjĀ ed ropav ed sadno mevrosba acir©Āšomta ofĀŠĀrosba ed sacir©Āšomta sepĀŠĀidmocC ,s sadnoorcim ed etĀĀĀtas rop oidĀR ,adaug ofĀĀn aidĀm ed sametisis ed sopit areisomta ,ra = sodaug ofĀĀn soiem setimil mes ,otnatrop ,sianis retnoc uo ralortnoc arap oiem muĥnen - adaug ofĀĀn aidĀm me adaug ofĀĀn aidĀM ,retrocrep asicorp eug aicnĀtsid .Ā odived ocarf otium ©ĀĀ lanis o eurgrop ,etil©Ātas ed sametisis son otcapmi Wireless spectrum is limited – a great limit for wireless systems two sets of fundamental solutions: Space division - sculpting geography from smaller coverage 18. Some reflected waves travel to want to want One direct signal, multiple indirect signals, and ĀzĀĀĀ Waves arrive with different delays; result = phase differences Waves can either contribute to, or detract from, direct signal Also known as Rayleigh fading A practical application ĀzĀĀĀ car radio is perfectly clear. A wireless medium is also called an unguided medium. Transmission Impairments Analog signal impairments result in random modifications that degrade signal quality, and can cause errors Digital signal impairments result in bit errors Types of unguided media impairments: Free-space loss Absorption Atmospheric absorption Multipath Refraction Noise/Interference 6. This is the principle of a microwave. Microwave ĀzĀĀĀ Pros and Cons Cost savings Portability Reconfiguration flexibility Bandwidth Requires line-of-sight Susceptible to natural environmental conditions Regulatory licensing requirements Potential community environmental restrictions 27. AnimationThe higher the frequency, the easier to focus in a directional beam. 33. It is converted to heat. Satellite 1947 ĀzĀĀĀ Arthur Clarke (2001: A Space Odyssey) presented a paper suggesting the use of satellites for communications 1963 NASA launched 1st experimental satellite 1965 ĀzĀĀĀ 1st commercial satellite 2003 ĀzĀĀĀ space clutter: >250 communications satellites, total satellites exceed 700; plus 250,000 pieces of debris Satellite = microwave repeater/relay station Receives transmissions on uplink, retransmits them on downlink 28. Measured in Watts/meter 8. The impact of rain is small for frequencies below 6 GHz. At 6 GHz and higher, energy is absorbed and scattered by raindropsReferring to the previous slide, 22 GHz = 2,200 MHz. So, absorption by the water is the same as the microwave. 1 Guided and Unguided MediaAll types of communications need some kind of medium. Noise ĀzĀĀĀ unwanted electromagnetic energy inserted in the signals somewhere between transmission and reception Types of Noise: Thermal Noise Interference Interference noise 16. The absorption of the wave is reflected in the heat; hence the food becomes heated. When a wave is absorbed by the atmosphere, energy cannot disappear. It has greater impact on satellite systems, because the signal is very weak due to the distance it has to travel. Also known as white noise. Another example of multipath ghosts or various images on TV screens. A practical application radio car is perfectly clear. The absorption of the wave is reflected in the heat; hence the food is heated. What we see Noise List the shortcomings found in unguided transmission media Describe the shortcomings found in unguided transmission media List three main design considerations for antennas and describe their relationship Describe the features of terrestrial microwave, satellite and wireless radio transmission Distinguish between LEO, MEO and GEO satellite systems Describe what is done by VSAT Lesson Objectives At the end of this lesson, you should be able to: List the shortcomings found in unguided transmission media Describe the shortcomings found in unguided transmission media List three main design considerations for antennas and describe their relationship Describe the features of terrestrial microwave, satellite and wireless radio transmission Distinguish between LEO, MEO and GEO satellite systems Describe what is done by VSAT 4. However, other proportions also work well, total size. Satellite classes 31. Radio Pros and Cons Less sensitive to environmental attenuation Cost savings Portability Reconfiguration flexibility Bandwidth Requires vision line regulatory licensing requirements Potential community environmental restrictions Vulnerable to multipath interference 38. Refraction waves are folded as they pass through the atmosphere Signal speed increases with altitude Something .51 .51 saicnĀĀdnet me sepĀŠĀarrebĀ rasuac medop saciĀĀloroetem sepĀŠĀidnoc sa sam ,levĀšiverp main groups of transmission media, namely the guided medium and the wireless medium. Satellites ĀzĀĀĀ Pros and Cons Access to remote areas Covers large geographies Insensitive to topology Insensitive to distance-related costs High bandwidth Economic value increases with number of locations High initial cost Propagation delay Vulnerable to environmental interference Licensing requirements Vulnerable to space clutter Low security ĀzĀĀĀ requires encryption 36. Multipath Fading 11. The frequency of the microwave used is about 2,500 MHz. This equates to a wavelength of 4.7ĀzĀĀĀ. This led to MCI being the first real competitor to AT&T, which in turn ultimately led to Divestiture of the Bell System in 1984.In 1960s, Jack Goeken built a microwave system between Chicago and St. Louis to carry long distance telephony. It is a successor of the third generation (3G) standards. You stop at traffic light and static becomes terrible. 26. LEO Satellites Low earth orbit Closest to earth: 400 ĀzĀĀĀ 1,000 miles above earth Least amount of delay: 0.025 seconds/leg Least amount of power required; can be directed into user ĀzĀĀĀs handheld device Smallest footprint: requires approximately 60 to cover earth Functionality is new due to speed and small footprint ĀzĀĀĀ switching capability was needed and the system is very complex Jitter is a significant issue Applications: mobile voice, low-speed data, high-speed data 34. F1 = 1st Fresnel Zone. UTM, 23 May 2012 2 Guided and Unguided MediaFor the guided medium, there is a physical path (such as a cable) for electromagnetic wave propagation. Full forward just a couple of feet and static is eliminated. Cochannel Interference 20. Microwave First used by military in WWII Successful application led to civilian use ĀzĀĀĀ substitute for coaxial cable in late 1940s Generally operates at 1 GHz ĀzĀĀĀ 50 GHz Vulnerable to reflections, absorption, frequency reuse Highly directional beam Affected by weather Requires Free of obstruction, the distance between systems also depends on frequencies 2, 4, 6 GHz, the system towers can vary 45 miles; With Los restrictions, closer to 35 miles of 18, 23, 45 GHz Systems vary 1 to 5 miles in the 1960s, Jack Goeken built a microwave system between Chicago and St. Louis to carry long distance telephony. Impact of direction on antenna design the greater the frequency, the more fanciful to focus on a directional beam. Every point where the distance is exactly Āll for longer wavelength than the direct path F2 = 2nd zone of fresnel. Measured in the density of Watts/VEXDERER – Measurement of a signal force in the air: CENEGRATIVE SATT LITES TERRETRĀ GEOSANCRONA 22,300 Miles above Earth requires more energy adds the greatest delay: 0.25 sec/leg The position is constant in relation to the Earth – the same speed as Rotation that the Earth provides the largest footprint of all satans, through Saturdays can cover terrestrial applications: one the transmissions of form, international TV 32. Fresnel zones 13. Data transmissive 3. Stride characteristics of the -Ānu channel accepts the signal signal signal from the earth to another frequency amplifies the signal and the retransps of the signal to the distance of the Earth Āam impact on the system: it requires significant amount of Pottery of a significant amount of energy from the laser is measuring and the significant factor is always in a higher frequency than Downlink 30. Absorption waves can be absorbed by objects - editors, Ā Organial materials of hills absorb more than The needles of inorgaining pines, especially effective in the absorption of radio frequency emissions (800 MHz range) to 2.4 GHz, loss of 0.35 dB/meter of loss pays off with: higher gain antennas Notable of the smaller space between transmitter and oneuqep otium arutrebĀ ed lanimreT TASV .9 ,oiem mu ed s©Āvarta odatrospnart ©ĀĀ eug lanis mu me sadacifidoc ofĀŠ sepĀŠĀamrofni sa ,recepased edop ofĀĀn aigrene a ,arefsomta alep adivrosba ©ĀĀ adno amu odnaug ofĀssimsnart ed sohnimac son sotejbo sonem moc atruc siam ofĀsnetxe a ,©ĀĀ otsi .52 .7 adaug aidĀm an ofĀŠĀauneta A agoĀĀna ©ĀĀ ervil ošĀpsee ed adrep A adaug aidĀm an ofĀŠĀauneta A agoĀĀna ©ĀĀ ervil ošĀpsee ed adrep A ervil ošĀpsee ed adrep .92 etil©Ātas rop aicĀcifE ,serac*ĀšĀe e sarudrog ,saugjĀ rop odivrosba etnemĀicĀ ©ĀĀ adno ed otnemirpmoc etsE ,onrof od ortned saditimsnart ofĀŠ FR ed sadno sa .53 soicĀġen ed oedĀV ĳspbM 2 @ sknilnwod ecenrof CPcerid sehguH(agral adnab ed tenretnĀ .Ā osseca solucĀev ed otnemaertsar ed sametsiS :seuĀŠĀaciIaP ofĀŠĀalatsni adĀipĀR e ĩcĀĀF ,otsuc oxiaĀ ĩsonem uo sortem 6,0Ā aneueq otium anetna rop