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*Research Article*

# Wireless Network based- Cisco Systems Study

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**Abstract :**Building reliable networks that are able to function even when some parts of them are damaged or broken Expensive in Africa, but despite that these were all of our main drivers .The vehicles are in our head office equipped for VPN and Virtual Private Network equipment Even if some of its parts fail, which we have been testing periodically to avoid any surprises unbearable. As for the central stations, we have taken a decision not to install a backup router Rather, we kept these backup routers within the site as spare parts without 3 hours at worst (if - installed. We found that the service was interrupted for a period ranging between the call is cut off at one o'clock in the morning on the weekend, for example) is considered acceptable from a destination view customers. The equipment can be used by the technical support personnel on duty on holidays Back-up equipment (such as transmitting and receiving equipment and electrical supply units) within Dedicated emergency locker.The logical and physical network design was characterized by maximum flexibility, as was the structure of the network tunnels Certified in Nairobi for superior flexibility to meet customers' requirements that VPN private virtual For example, setting up customer connections in order to increase their capacity within the minimum hours of network activity Backup storage to another location. We were also able to sell multiple connections to separate each destination Therefore, we increase the return on our investments by providing more services to customers (such as monitoring by monitoring CCTV remote and video surveillance devices

**key words:** Wireless Network**,** Alvarion, Cisco Systems, server setup DHCP

## 1. Introduction

Surprisingly, the amount of wires used to just install a simple wireless connection between the two points A world you call "wireless networks". A wireless network point consists of several components They should be connected to each other using the appropriate wires. You will definitely need a PC Connected to the wired network, as well as a wireless router or bridge connected to the same network. Should Also (1), wireless transmitters and receivers may be connected to the antennas, and they may get in the way Also, amplifier, lightning arrester or any other device. Most equipment also needs to be connected Directly or by using an AC transformer with a power supply, either through the alternating current line All of these components use a variety of conductors, except for DC Great variety in wire types and thicknesses

Now multiply the amount of these wires and connectors by the number of points you want to connect to justify your question On the feasibility of calling this mess "wireless"! It gives the look shown on the next page An idea of the amount of wires and connections required to set up a wireless link between two points (2), that the shape does not follow a specific standard nor is it necessarily the best choice for network design It expresses the number of components and connections that you will need to deal with while installing projects Wireless networks.

The appropriate equipment should be selected by determining the project requirements, determining the available budget Verify the success of the project using available resources (including cutting costs Switch and continuous maintenance). It is essential to determine the size and scope of the project before taking any action Decisions regarding equipment purchases (3)


Figure.1: Wireless Network Component Connections

## 2. Selection of wireless network components

In a world rife with competition between equipment producers and with dwindling budgets and financial capabilities For consumers, the material cost (unfortunately) gets the most attention without Other important factors. The saying that you "will only get what you paid for" applies to The world of technology too, but it should not be considered an absolute reality. Despite the importance of the cost factor (4)When making any decision to purchase fittings, the value and specification feasibility must be studied You will get it for your money so that you can select options that suit your requirements and needs. Be sure to consider the following factors when comparing the wireless equipment you intend to use for Your network:

• harmonic. this equipment will work with the equipment of other manufacturers, that If This condition is not met., and important is this compatibility within this part of the network, when If she is 802.11) it will be able to b / g the studied equipment supports an open protocol (eg Most of it works with other equipment compliant with this protocol (5).

• Area of coverage. It is not related to the scope of a device's coverage, Not only the nature of this device, but it is also related to the type of antenna connected to this device, The nature of the topography of the land surface in the surrounding area, the characteristics and specifications of the equipment At the other end of the link and other factors. We advise you to avoid relying on values (6) The near-fanciful range of coverage that these equipment manufacturers claim to be concerned with transmission capacity The device plus the gain of the used antenna (while the antenna was included with the equipment). With this information, you can calculate the theoretical coverage area.

.Reception sensitivity. the sensitivity of the receiver is at a certain data transfer speed and the producer usually supplies this information (corresponding to at least the maximum and minimum speed). In addition, this value can be used to determine the quality of the equipment calculate the budget for the wireless link. As we saw in the previous chapter that the smaller these The value is the greater the reception sensitivity(7). Wireless network equipment manufacturers usually: throughput. Data transfer capacity of market the top speed of data transfer as the "speed" of their equipment. Remember that speed Data transfer to the transmitter and receiver (eg 54 Mbps) is never equivalent Actual data transfer capacity (which equals approximately 22 Mbps for a protocol 802.11). If you cannot get the capacity value of a device, you can g Calculate it roughly by dividing the "speed" of this device by two and then subtracting 20% from Quotient. We recommend testing if you are in doubt about a particular device Necessary to determine the data transfer capacity on a pilot unit before purchasing quantities Large device from a device whose capabilities and characteristics are unknown(8).

• Necessary accessories. Manufacturers do not usually include some necessary accessories To operate wireless network equipment in order to reduce the price of such equipment. You have to Ask the following questions before purchasing fittings, the equipment price include the feeder, But it does not DC electric, (Equipment prices usually include DC feeders Includes rates for Ethernet feeders. Also check the input voltage In the feeder, as most equipment comes with a system compatible feeder Electric current in the United States - 110 volts -)(9), the price also include braids, Adapters, wires, antennas and wireless network cards And in case you want to use The device is outside the building, inquire about the availability of a weatherproof box. It be able to easily replace the damaged items and request. Availability

• Availability Bulk item if needed, the estimated age of this product is in terms of Operating hours and manufacturer availability, Other factors. Make sure you have other necessary features to suit your specific requirements, the device, for example, have a connection to an external antenna, kind of connection is existence and the software used to operate this device limit the data transfer capacity for freedom, that (10) the costs of removing are this limitation, and the physical structure of the device is consumes of electric current , the device be provided with electric power . This provide Power Over Ethernet (POE) over Ethernet wires Display usage monitoring tools, NAT device encryption features, domain address translation Package or other which is essential in the design of the wireless network

**3. Alvarion**

One of the most important advantages of dealing with Alvarion's products is the excellent distribution network that Alvarion has set up throughout the world. I also enjoy Alvarion Also, the lion's share of Alvarion is one of the most important advantages of dealing with this company's products. You also have fun The global market for all types of wireless network equipment. The distributors and suppliers of this company are widespread And VL devices in all regions of the world. One of its main products for long distance connections is the group (11).Link Blaster ,Although the design of the VL Group Basically, it works as a point-to-multipoint system However, use a single-pair transmitter and receiver for point-to-multipoint communication One access will fulfill the purpose of connecting two points. Care should be taken in this case to use The antenna is more directive at the access point, unless additional points are expected to be connected On products operating at 24Mbps VL with this access point in the future. Set contain The second and another operate at 6 Mbps, and choosing one of these products depends on Available budget, required reliability and data transfer speed requirements .

The device may appear Link Blaster At first glance, it feels like a family memberRedline AN- 50Because(12) he is actually a member of this family. You have entered into a companyAlvarion Wholesale distribution agreement OEM with company Redline Immediately after launching a familyAN-50I invested Alvarion

To develop its new productLink Blaster. Apart from the differences in the shape of the outer shell and the antennas used between the model designed for indoor use and the one intended for outdoor use, the electronic components inside each of them are completely identical that Device sold.

It also produces equipment for wireless links between two points operating at a frequency of 2.4 GHz. The majority of these products rely on frequency-shifted distributed spectrum codingHopping Spread Spectrum (FHSS) (13)Which makes it a source of a lot of confusion Other equipment that encodes the distributed spectrum via direct relayDirect Sequence Spread Spectrum (DSSS). It is mounted on the same tower. You have to if you want to use TechniqueDSSSIn a distribution system, avoid relying on technologyFHSS.

**4. Rad Data Communications**

It is a family of products Rad Airmux Relatively new to the market and expected to be successful Distinctive. The transmitter and receiver work Airmux 200 , 48 Mbps speed . It uses network wires of CAT5 that is sold at a price that is the best of all solutions, Commercial. These units are small in size, which makes it easy to handle during installation Towers, but their primary problem is the lack of a local distribution network in the developing world Containing familyAirmux On two models, (14) one uses an internal antenna, while the other contains External antenna, Initial trials with this equipment in early 2005 showed a problem with the configuration Timing. This problem begins when the linkage distance is over 12 miles (or 19 km). And regardless of the type of antenna used. We do not recommend the use of these fittings for connectors. its distance is more than 19 km to fix this defect. Except for this problem it is a familyAirmux. It will provide very good performance, especially when taking into account its low price.

**5. Cisco Systems**

Enjoy wireless network solutions from Cisco It has two main advantages: The first is the existence Excellent network for worldwide distribution, technical support and training. It is spreading distributors and suppliersCisco ,Worldwide what constitutes an important advantage when purchasing equipment but more

important when network equipment breaks down and needs to be replaced quickly. The second feature is that These fixtures are mostly designed using open standards. Most installations are supportedCisco Standards

802.11 for wireless networks. a / b / g (15).

Our experience with this equipment has shown that its web-based setup tools are not easy These tools are available with many other products, except for the prices of these equipment It makes other open, non-commercial solutions a more attractive option.

**1-5 Professional equipment for lightning protection in Cisco Systems**

Of all the weather, lightning is the most enemy of wireless networking equipment. may be Lightning strikes damage wireless network equipment in two ways: direct hit or strike Inflammatory. Direct strikes occur when lightning strikes a tower or antenna The triggering strikes are caused by the lightning striking a place close to the tower site. Mind you imagine The arrester is negatively charged, since symmetric charges harden each other will cause an inhibitor The detonators this by moving the electrons within the wires away from the lightning bolt will generate a current in these Wire. The value of this current is several times that of a wireless network equipment carry around. Any of these strikes sabotage unprotected equipment(16) .

Protecting wireless networking equipment from the effects of lightning is not an easy task, and there is no one involved Safeguards to avoid lightning strikes, even when extra caution is exercised. except if Most of the methods used will help avoid both direct and inflammatory strikes. that Using more precautionary factors will help increase the level of protection. Make up the record The historical size of the lightning rod in the network installation area is the most important factor when determining the level of lightning Protection required.

Figure.2: A tower with a heavy copper ground wire

Start at the bottom of the tower, and remember that the base of the tower is usually buried underground. Should be done Install a loop made of heavy braided copper ground wire after casting the tower foundation and before Backfill the hole so that the tip of this wire extends above the ground, along with a leg the tower. Wire thickness should be equal to standard American Wire Gauge (AWG) at least (17). An additional grounding rod should also be inserted into the ground and connected via a cable A ground wire to the end of the wire protruding from the buried ring. it should be noted here that metals differ in their electrical conductivity properties, as some are considered The types of steel are more conductive than others, and how the steel used in making the towers is also affected Electric current depending on the type of materials used in its coating. Make up stainless , one of the worst conductors of electrical current (18) . The rust-resistant coating may cause galvanizing or The paint also weakens the conveyance of steel. Therefore a stranded ground wire is installed from the bottom of the tower To the above. This wire at the bottom of the tower should be securely connected to the two ends of the buried ring And backup grounding rod. A grounding rod with a pointed end must also be installed on top The top of the tower. The steeper the end of this bar, the more effective it is at protecting against lightning strikes. Complete Connect the stranded copper ground wire coming from the bottom of the tower securely to this rod. From It is very important to make sure that the wire is connected to the metal of the rod paying attention to removing any kind of wire Paint before

tightening. The outer surface of the joint can be painted after the installation has been completed Its parts to cover the wire and connections in order to protect the tower from rust or corrosion. The solution above provides a detailed explanation of a simple lightning protection system. Provides this solution Protection of the tower itself from direct lightning strikes as the main system is installed User to connect all other equipment (19).

Installing gas piping barriers at both ends of the wire provides optimum protection from the risk of knocks Inflammatory. The bulkheads installed at the top of the tower must be grounded directly with a wire Grounding the garage on this tower. As for the barriers near the bottom of the tower, they should be earthed Always using an electrically safe medium such as a plate or copper tube filled with water. From It is also necessary to ensure that the external barriers are protected from the effects of the elements. Be Most of the barriers designed for coaxial wires are protected from the influence of the elements when not available This protection is in barriers designed for wiring type network CAT5.

In the event that gas shields cannot be used when the wire used is coaxial, an amount can be saved Quite a bit of protection by connecting the external coaxial wire network to a connected wire With grounding bar on the tower. This will provide a path for the inductive currents Thus protecting the conductive core within the coaxial wire if the lightning bolt is rather weak What. Although this method is not up to the level of protection using gas barriers, but it is better Much no protection whatsoever (20).

**2-5 Setting up the automatic host server setup DHCP in Cisco Systems**

By now we should have a working access point that you can try by connecting to another computer To the wireless network and give this computer an Internet address IP , Located within the same The subnet domain of the wireless network port at the access point (24/ 10.0.0.0) Also, be sure to use the same encryption key WEP, that you entered while setting up the access point ,We will facilitate the task of connecting to the wireless network without the need to know the network addresses Sub-server used for automatic host setup DHCP. It gives addresses Internet automatically for wireless clients.

We will use a program for this purpose called dnsmasq , this program provides storage server functionality Temporary domain name translation queries caching DNS server , that add to services auto host setup DHCP, It has been specially developed to work with firewalls that performs network address translation NAT. The importance of setting up a cache server is important For network address translation queries DNS

In cases where the Internet connection is s slow to response satellite links VAST and telephone network connections dialup. this service provides the ability to answer domain name translation queries DNS , Locally, which will reduce the pressure on the Internet connection and make it appear faster noticeable from the user's point of view (21).

**3-5 Operating systems compatible with wireless networks in in Cisco Systems**

There are many open source operating systems that provide useful networking tools Wireless. These systems are designed to work with older personal computers or other devices Network equipment (as opposed to laptops or servers) specially designed to build Wireless networks. Here are some of the most popular of these projects:

- .**Freifunk** This program is based on a project Open WRT that Provides routing protocol support OLSR Within the access points that depend on the processor MIPS such as access points Linksys WRT54G / WRT54GS / WAP54G, Siemens SE505(22).
- **Metrix Pebble** It is a project to build an operating system based on GNU / Linux launched by Terry his project started as a miniature version of the Debian distribution system This includes wireless network support, firewalls, network management software and packet data routing tools.
- **monowall** t is a software package that performs the tasks of a firewall in addition to providing .m0nowall. This package is prepared from FreeBSD. OS-based access point services Through a web-based interface, all of these settings are saved in a single Due to its small size (less than 6MB) this package is an ideal option for .XML For ultra-compact, compact systems.

All of these distributions are designed to operate in equipment with limited storage capacity. You can in If using a large hard disk, install a complete operating system like Ubuntu or Debian And use this computer as an access point or router. System development will take a while t's okay to make sure you have all the necessary tools in place without having to install packages Non-essential software. Use any of these projects as a starting point for building your wireless network.

## 6. Conclusion

Attention should be given to fast wireless network projects to provide network connectivity The Internet is based on only bandwidth. Rather, it should focus on reliability, flexibility and impossibility Service outages We have depended on the reliability of our wireless network as a primary factor in our marketing activities. Inquiry requests This level of reliability is a major investment in building infrastructure as alternative sources of capacity This is in addition to an extreme attention to detail, such as wiring installation and laying. Are problems Installing and laying out wires is the most important source of service interruption for a customer, while no one has ever complained about it Launched wireless connectivity problems. We also benefited from obligating undertakers while doing By installing projects to link customer sites with very strict and precise specifications. Not surprising The result is that carefully managed client sites maintain their relevance for hundreds of days without being interrupted Sudden for a moment. We have taken control of as much of our network infrastructure as possible (The roofs of buildings, for example).

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