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To: OARTECH@LISTS.OAR.NET
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Introductions

Osteer recommendations:

Executive committee has recommended that OARtech move to the same executive structure as Osteer. 3 positions: secretary, vice chair, and chair. Elections will occur every other year for secretary and vice chair. The Vice chair would automatically move to chair after 2 years. The chair would attend the Osteer executive committee meetings.

Discussion from the floor: it may be hard to fill the positions because of the long commitment. Some feel that 2 years as vice chair and 2 years as chair is too long and not appropriate for this committee. What's happening is that network connectivity is becoming more important and mission critical. Schools are becoming more interested because of the amount that they are spending. All committees are being requested to review their charters and OARtech needs to be represented on executive committees, and would like to have symmetry to make the process run smoother. Osteer meets 3 times a year. The executive meeting meets the evening before.

Motion was carried with some opposition.

It was moved and approved that Patricia Vendt would serve another year as chair, Teresa Beamer would continue another year as secretary, and Tim Gruenhagen would be elected as vice chair for one year and will take over the chair position next year. Elections for secretary and vice chair would take place next year.

Cisco, Dana Daum

Aironet WLAN Products in the 350 series includes PCI cards, access points, bridges, and antennas. Data is transmitted at 11 Mbps over radio waves between the NIC and access point. The frequency is license-free band. Uses IEEE 802.11b standard Wi-Fi certification for interoperability. The NICS are available for all Windows OS, Linux and MacOS. There is a Telecommuter Base Station available that was designed with the WLAN Telecommuter. It has an embedded Modem and Ethernet NIC and could be used in the home with automatic

dialup to your ISP. There is a 30mW Cell size you get 11 Mbps DSS at 100-150 feet, 5.5 Mbps DSS 150-250m 2.5 Mbps DSS at 250-350 feet. Some sites have found that there is more problems with getting power to the access points than in getting cat 5 cable. Cisco has developed in-line power to the access point or bridge using the same pairs as the Ethernet. This feature is in the Access point 350 series.

Can the unit be put above ceiling tiles? The bridges can be gotten in a plenum rated and can be put in those types of locations. Most sites are mounting the access point below the ceiling and running cable to the antenna that is mounted on the ceiling. However, since you are using low voltage over the data lines, you can run it above the ceiling tiles. Bridges tend to be in a point to point environment. It is important to keep the cable between the bridge and the antenna as short as possible.

These units have hot standby features where you can have 2 units working in the same frequency, but only one is in active mode and the other running in standby mode and just monitoring the frequency. If the active unit goes down the standby unit will turn active. They can also do some load balancing. The units can be configured via a web, or telnet interface.

For load balancing the unit notifies the user's card to change channel. The access point can then control the use of the airwaves. In the load-balancing slide you said up to 3 access points working together, could one of those be a hot standby? Yes, you could set it up that way.

How you determine the area coverage for the access points? Basically you use 3 channels to cover your area (1, 6 and 11). Each channel cannot overlap itself. For areas that don't get covered, you may need to set up special antennas to cover the odd shaped areas (Different antennas can reshape the cells). You would need to do a site survey to determine where this might be needed.

How can you prevent someone from bringing in his or her own access points and interfering with the existing wireless? This is where you look at security. Are there whitepapers that address this? There are some available on Cisco's web site.

SSID (Service Set Identifier) is a commonly used way of grouping users. It broadcasts out and is not really a security feature. A Sniffer is now available for looking at the wireless and can see it. When you are trying to associate with 802.11, the client sends out a probe request that includes the SSID for that station. Most points use open authentication. You can use

Shared-Key Authentication, but it can be sniffed and your key can be determined from the sniffed responses. WEP/RC4 in 802.11 is used for security. There is some concern that it uses RC4.

Deployment issues: there is a lack of integrated User administration and lack of key management solutions. If you tie it to the mac address, the cards can be stolen, and mac addresses can be spoofed. Sniffers can read the air waves and determine any mac addresses working out there. Accounting and auditing is desirable to help track problems. The key is programmed into the card and the card gets stolen, then you have to change all the cards that use that key and there are problems with distributing those new keys.

There have been some attempts to make the 802.11 more secure, but all proposals have some limitations.

What is 802.1x? It is an IEEE standard in progress and is a post-based network access control method. Many of the features came from the dialup standards. The client is called a "supplicant" the access point is called the "authenticator". You have a database with authentication information (e.g. radius server), the access point and the client. The communication between the PC and the access point uses Extensible Authentication Protocol (EAP) to the access point, but radius to the database. Until, the access is verified with the radius server the client doesn't get access to the net. Currently, discussions on how to do this over 802.11 are being held. It uses per user per session authentication. Today's methods are per hardware instead of per session.

EAP is defined in the 802.1x draft and the request/identity portion is defined in the rfc2284 (based on a DHCP type of response). You can get the extensions for EAP for radius and can implement TLS. Once access is approved the user can turn on WEP encryption. This method centralizes your key management to the Radius/EAP server. The advantage of 802.1x is that it is open, extensible and standards based, user based id and dynamic keys, and centralized management.

What is the availability of this today? You can use this today with Cisco products. Since this is a draft it can change, but since it is implemented in software it won't be too hard to change. Cisco secure ACS (Radius server) v2.6 runs only on Windows 2000 system.

Cisco Lightweight Extensible Authentication protocol (LEAP) - Was developed for anything not Microsoft. In order to allow other systems to work with EAP. EAP has to be bound into the stack. LEAP is a separate process from the

operating system authentication and gets around not having EAP integrated into the stack.

There is a native "supplicant" in Win2k and WinCE. Other operating systems need LEAP. For more information see the following links:

802.1x Status

<http://www.manta.ieee.org/groups/802/1/pages/802.1x.html>

<http://grouper.ieee.org/groups/802/1/pages/802.1x.html>

Wi-Fi Certification

http://www.wi-fi.com/certified_products.asp

Whitepapers

http://www.cisco.com/warp/customer/cc/pd/witc/ao350ap/prodlit/a350w_ov.htm

http://www.cisco.com/warp/customer/cc/pd/witc/ao350ap/prodlit/1281_pp.htm

Cisco Aironet 350 Documentation

<http://www.cisco.com/warp/customer/cc/pd/witc/ao350ap/>

Radius

<http://www.ietf.org/rfc/rfc2138.txt>

<http://www.ietf.org/rfc/rfc2139.txt>

<http://www.ietf.org/rfc/rfc2548.txt>

<http://www.ietf.org/internet-drafts/draft-ietf-radius-radius-v2-06.txt>

<http://www.ietf.org/internet-drafts/draft-ietf-radius-accounting-v2-05.txt>

<http://www.ietf.org/internet-drafts/draft-ietf-radius-ext-07.txt>

<http://www.ietf.org/internet-drafts/draft-ietf-radius-tunnel-auth-09.txt>

<http://www.ietf.org/internet-drafts/draft-ietf-radius-tunnel-acct-05.txt>

EAP

<http://www.ietf.org/rfc/rfc2284.txt>

<http://www.ietf.org/rfc/rfc2716.txt>

What are the differences in the point to point? Many of the point to point issues are not mentioned in the 802.11 specifications. With the right antenna, you can get up to 22 miles, roughly line of site. You can do some tricks that allow bouncing off water, etc... Under ideal conditions what is the speed? 11 mbps shared pipe. Are there any restrictions on antenna elevation? None he was aware of. Conditions that can effect the signal include trees, heavy raindrops, ice, etc... conditions that might effect microwaves.

OARnet, Doug Gale

Organizational issue - OARnet is a sub organization of OSC, which has a governing board. Last summer a request was sent to the governing board to review the relationship and see if OARnet should be a sub group of OSC. The review said that OARnet should not be a sub-group. The governing board said that there will be no real change, and changed some management at OSC and requested that they write a strategic plan. Since this is no real change they will basically continue the current plans and day to day operations.

How does this relationship with OSC effect OARnet? All purchasing must be done via OSC, and budgeting is done (and sometimes changed by) OSC. It was noted that there is no attendance from OSC to the OARtech meetings.

Mission project summary - there were 3 barriers that they were trying to cross
1 - the financing - OSU will loan the money (the financial model used the basic assumption that Internet growth stops) based on a very conservative model. New projects will have the incremental cost of the new project.
2 - getting a signed contract that locks in the project - the final revision has been sent to Mission and they have sent it on to their lawyers. It has not come back from them yet.
3 - this is a big project that will require more funding from other groups (the OARnet piece is peanuts compared to the whole project). By having all the institutions supporting the bandwidth is where we provide value to the project. The project continues to look like the right thing to do. If we get the contract signed then they will begin looking at how to connect the pops to the campuses. These local loops will be locally driven.

Lunch (working)

How do we come up with better vehicles for transferring information between organizations? The current procedures are not working well and so would like to look at other ways of doing it. Doug held a brainstorming session for ideas of what sites would like to see:

Brainstorming items:

1. searching for your tickets in the trouble database
2. Web interface to ticket database
3. Some way to search for similar problems
4. Is it local, regional, or national problem- in English
5. Early warning
6. Readable by HelpDesk staff as well a network support staff
7. Scope of impact

8. Weather map type of report
9. Info on peering points
10. Must extend the reporting to QoS as well as outages (simple "it doesn't work")
11. Automated update process
12. No such thing as too much information
13. Automated voice response (weather radio)
14. State version of "Terry's Finger pointing tool" and database engine ("RSS file")

White Paper, Patty Vendt

Debbie Keller sent out an excel spreadsheet to OARtech list that shows the different bandwidth use. Bill will send out his wireless sections out to the list and his verbiage on Debbie's information to Debbie and Debbie can then send out her revision to the list. Then discussion will take place on the list the week of July 2. Approval will be asked that week. It will be a majority of those that respond as to whether the paper is approved.

Support Center, Jodi Santini

They are trying to get a secondary webmaster. They are increasing some of their staff training. They are also looking at training for working with video. OARnet will be NOC for I2 video.

Ruth Crites

Will be looking at charters for the various committees. Also looking at moving the H.323 service to production July 1st. It is a subscription service at \$80/month. It has been a very successful service.

Internet 2 SEGP, Linda Roos

The Sponsored Educational Group Participants (SEGP) group has been approved. Ohio is one of 9 states with SEGP. The sponsoring group is the Ohio I2 schools. A SEGP gets connectivity to Abilene, but do not become a voting member. All of the OARnet schools (except University of Toledo due to a Carnegie status). OARnet is the SEGP connector. Their mission is to use to the I2 to further the teaching/learning and provide a yearly report on your use. T1 SEGP fee is \$5000, DS3 6mb blocks is \$15000. The existing pricing is based on the cost of the current I2 connectivity costs of the current I2 consortium schools. DS3 can be segmented, the T1 is cost is based on the assumption that the site will get another T1 to run the I2 traffic.

August 21st and 23rd there will be an H.323 workshop for those interested in looking at this application over I2.

Clarification - you don't have to be SEGP to use the new H.323 subscription service.

Proxim wireless
R.B. Tangeman Co.

Proxim has been in business quite a while and focuses on wireless. Current home market of 70%. They see the trends going to smaller mobile devices with mobile users, application server type of computing. The product family have the "brains" in a rack mounted unit that can control 130 access points instead of putting the "brains" in the access points themselves. This reduces the size of the access points. The "brains" includes a power system and AP Controller. The power system can be where it is needed and does not need to be in the rack. This is not tied to one standard, but can support multiple standards with same box over the same network.

Their setup allows roaming across routers. If you move from one subnet to another you don't have to re-log in. Auto-configuration comes from the controller. All administration is web based and shows all the controllers and the access points connected to the controllers and the users connected to the access points. You can filter out new units by a pull down menu. You can control the mac addresses that have access to the wireless. Allows for automatic updating of the access points for updates. You can use the access points without the controller, but this would only work for a small implementation. As the implementation grows you add the controllers.

They support several protocols in addition to 802.11b (802.11a, OpenAir, Bluetooth, HiperLAN/2, 10mbps FH, etc....). Which allows you to use the right solution for your environment rather than taking one solution and modifying it to fit. 802.11b and Bluetooth do not currently work together very well because Bluetooth is a frequency hopping protocol.

Proxim will do training at no cost for you staff if you migrate to their product.

What OS do you support - there are drivers for all. There are not adapters for MACintosh, but you can get some from another vender. They currently do not have Linux drivers. Their 800 HelpDesk is available even if you haven't purchased their products.

Are there any Ethernet switch compatibility issues? None that they know of.

Are they currently looking at 802.1x? Yes, the protocol will be in the next version of the software.

OpenAir /wide band frequency 1.6Mbps - 10 meg throughput with frequency hopping. This gives you more frequencies for area coverage. It was developed for the home market and has been approved for 20Mbps. Siemon/Proxim work on Voice over IP. This would allow you at home to call out and only use part of your bandwidth. The port hopping technologies can also avoid the frequencies with a lot of interference. The frequency hopping is based on military grade security.

For point to point, and point to multi-point, you are looking at up to full duplex 100 mbps. At 5ghz 2 T1s for voice enterprise class network feature and optimized architecture for outdoor installs. The distance apart depends on the climate as to how far apart with a maximum of 7 miles. These have a very focused beam. You can piggy back units, up to 3 bridges, back to back to cover 21 miles. They highly recommend that you do a site survey to verify that an application will work in that environment.

Stratum MP as a throughput of 10mb and is optimized for multi-point operation. It uses a fair polling algorithm and has military grade security - 802.11b uses the same frequencies. Since it does frequency hopping, this product can not be sniffed as the sniffer can't listen on any one frequency to get the traffic.

University of Dayton's Implementation

Requirements:

They have 25% of students that don't live in university housing. The campus housing had 10-100mb connection, and they want to provide connectivity for those that have to live off campus. They decided to use wireless to cover these houses. They are not placing any hardware in the off campus houses.

Other requirements include:

- Implement a solution for anytime anywhere access for students
- Allow for migration to future technologies
- Must be simple to install, upgrade, maintain, and manage

Challenges:

3 or 4 stage project. Currently, in stage 1. Large campus and off-campus footprint. House built in 1900-1930 with approx. 6 students per residence.

Solution:

Proxim provided a lower cost architecture (remote access points are about 1/3

less the regular access points \$500 and controllers \$1200) and support for any radio standard. They are not sure it would work with Cisco's inline power switches. It is easily expandable, with centralized management. Client roaming does not require separate subnets.

What operating systems does their site survey software run on? 802.11b runs on Windows and Macintosh. OpenAir is available on windows only.

University of Dayton is also looking into point to point products to bring data to the arena.

Tomorrow: Wide Band frequency hopping incorporates DECT quality voice with bandwidth allocation capable of handling both voice and data.

If you have 1 or 2 people you want to trained, let University of Dayton know and they can attend a training session in August.

Meeting was Adjourned.