

OARtech Meeting

6/9/2010

OARnet Network Updates

Tony Eller - Network Engineer

(No slides available)

They have moved ITC to the Oarnet backbone and are moving eTech broadcasting to the Oarnet backbone. They are removing the eTech SONNET gear and so that eTech will be cleanly on the Oarnet backbone. Oarnet is in the middle of planning optical upgrades to the 40 channel mesh network switching on optical frequencies (12 degrees - can switch in 12 different directions). The new gear is Cisco based. Rings 0 and 4 will be done first.

Partner organizations are re-signing the MOUs necessary: OIT, State of Ohio and eTech. They are working with 3 agencies with BTOP proposals. They have requested grants as a consortium to extend into some areas and providing more redundancy, and are waiting for a response.

Oarnet Client Services Updates

TJ Sandors

(no slides)

Showed Oarnet client regions

87 members, a new member is Marshall University in West Virginia.

Working with MERIT on VMWare contracts and are involved with conferences and meetings.

Co-location is at full capacity and they are looking at new locations.

Emergency web hosting is now in production. This is a static web site that intercepted traffic can be sent to. They are looking at ways to allow the sites to redirect the traffic themselves. This allows the schools more control for when to make use of it.

Historical bandwidth - 2002 623 Mbs I1, 2006 had 2.5 G I1, today 8 G. They ve seen a 15-20% increase in the last year. Total bandwidth is 20G (subscriptions).

They are working to bring on several remote campuses. Franklin is doing some international and hoping to do some teaching via video conferencing on I2. Oarnet has a new web page maintainer. They are upgrading their remedy ticket system.

There was a reorganization of Board of Regents CIO Advisory (BOR-CIO). They are creating 3 subcommittees to report to the advisory board. Looking for volunteers:

1. Shared Services and IT efficiency
2. Technology and Security
3. Budget and Finance

There has been a new member structure passed for the I2 consortium to add a Health care category with Cleveland Clinic remote sites. They have maintained the SEGP rates - University of Dayton is back as a SEGP member.

VMWare update

View and Vsphere - If you are a current member you will get these automatically.

Maintenance renewals are coming up. If you don t renew, then Oarnet will have to terminate the maintenance. VMware Statewide Regional Meetings were hosted. There is an event coming and will be here at Scott Labs 9-1:00 June 24th.

We had a discussion on making the OARtech meetings travel. By doing this we are hoping to bring in those

that are interested in the regional areas. Presentations will be from the host and tours will be included in the meetings. There will be more discussion on the mailing list.

OARnet has a contract with Gartner, so if you have questions about some technology your client representative can help you out by providing the information to you.

OARnet - Chris Spears, Aaron Wise

Joint Techs workshop

(no slides)

Biannual conference for I2 will be held July 11-July 14. Non-I2 members can petition to attend. See the I2 website for more information. Registration fee increases from \$300 to \$325 on the 21st. 41 technical talks scheduled. In conjunction, there will be an IPv6 workshop after the Joint Techs on the 14th with the opportunity to configure IPv6 in a lab. Part of the I2 Advanced IP Workshops. Registration is open to non-I2 members \$450 for both workshops.

IPv6@OARnet is production on the backbone since 2/2008. Oberlin, OSU are early adopters. Connectivity is available via commodity and R&E peering. OARnet has /32 PI Block.2610:a8::/32

Owen DeLong

Hurricane Electric

(See slides at http://www.oar.net/about/oartech/presents/2010_0609_Essentials_of_IPv6.pdf)

11 /8 available before IANA is out of the IPv4. He will be surprised if it goes to December. IANA runs out first, RIR running out by 2012.

See slide 6 for a summary of the basic differences between IPv4 and IPv6.

Not putting a dent in the available address space. Since the address space so large they don't have to be stingy. The addresses are written as 4bits separated by : (e.g. 2001:db8:1234:9fef::1).

You will need to retrain your brain. IPv6 Restores the end to end model, NAT is unnecessary and not supported. When requesting addresses be generous on how many addresses you may need. Address configuration includes Stateless Autoconfig, Static, DHCP (needs work), DHCP-PD (NEW - Prefix Delegation allows the ISP to give out a group of addresses their subscribers).

IPv6 cannot talk to IPv4 only clients. Basic address Scopes include Link Local (only valid on directly attached subnets, usually have one on each interface running IPv6); Site Local (deprecated in favor of Unique Local Addresses (ULA)); ULA replaces IPv4 RFC1918, but with more theoretical uniqueness; and Global (all other addresses with valid global routing tables).

Stateless autoconfiguration is the easiest way to configure. No host configuration required. It Assumes all advertising routers are equal, rogue router advertisements (RA) can be transparent to users, so RA guard is required on switches to avoid this. DNS is the biggest glaring service missing.

Hosts use the MAC address to produce a link local address (LLA). If MAC is EUI-48 it is converted to EUI-64. Interfaces will be shutdown if a duplicate address is detected. ICMP6 router solicitations are sent to all routers in a multicast group. All multicast there is no broadcast. Router sends back advertisement to LLA unicast that includes lifetimes and preferences. The host resets the lifetime counters each time an RA is received. You have desired and valid lifetimes now.

IPv4 to IPv6 connectivity can be done with dual stack equipment. Translation routers are a myth right now. There are some ISPs doing Multiple layer NAT (carrier Grade NATs)

DHCPv6 - can assign prefixes other than /64, but you will probably have better experience if you use /64. Stateless autoconf cannot do this. You can assign addresses to hosts and provide additional information about servers. Not much vendor support yet.

Static addressing - same as ipv4, but longer - first 12 bits must be 0.

Privacy addresses - same as autoconfig except a random address for each flow and obfuscates the MAC address (on by default in Windows 7, WV, and Apple). You probably want to use this to prevent others from tracking your end stations.

IPv6 has full support for multiple addresses on each interface. IPSEC is a required part of any IPv6 implementation. It is not required to be used, even if it is required to be in the stack. IPSEC is considerably easier to configure in IPv6. Linux configurations are dependant on your distribution. See the slides for examples of Linux configurations.

There are 3 options using tunnels if you do not have a native connection. You can allow a tunnel to ipv6 in ipv4. (6in4, 6to4, Teredo)

6in4 - GRE is understood but you have to configure it yourself

6to4 - autoconfiguration. When it works, it is clean and good, but if doesn't work is hard to troubleshoot.

Teredo - autoconfiguration - enabled by default in Windows and is very hard to troubleshoot. It is there whether you want it or not, and it will penetrate firewalls whether you want it to or not. It creates a bi-directional path. You can get systems compromised via v6.

See the slides for examples of the various tunnels. Help with 6in4 can be found at <http://tunnelbroker.net>. Free brokers are available.

Routing - OSPFv3, BGP (BGP4 Address Family inet6), RA and RADVD, support from Quagga and others. In Linux ip6tables look a lot like iptables.

DNS - To forward DNS you just add AAAA. Reverse DNS is slightly more complicated. You have to put all the suppressed zeros back in and then separate by periods. Bind ships with IPv6 templates, and the zone configurations are the same as IPv4. The Zone configurations are identical except in the reverse zone you have ip6.arpa at the end. \$ORIGIN is your friend and can save you a lot of typing. Troubleshooting is the same as with IPv4. If you are using IPv4 and IPv6 together, it may be easier to troubleshoot Layers 1 and 2 with IPv4. Neighbor lookup does not use ARP. There are no broadcasts.

You will need staff training. Plan for more and allocate the time for it.

Oberlin has it on its web server. They are trying to break the student Teredos at the campus entry.

The critical step is to get the current services on dual stack. Those things that become IPv6 only will come later. You will have to train your helpdesk on the dual stack issues.

For DNS, NTP, etc, he recommends you use DHCP.

XP hosts must use IPv4 DNS (can do other IPv6 for other service, but cannot do DNS). There may be some issues on the airports in what you can configure and cannot configure:

www.getipv6.info is a good resource.

Don't forget about the IPv6 workshop for future training. Apple supports IPv6, but does not support DHCP on v6.

See slides for contact information.

Elections

Cal Frye is leaving as OARtech chair, and Kurt Eckert will move up to chair. We need to elect a secretary. Teresa Beamer was elected as Secretary. Scott McCullum, Sinclair was elected as Vice Chair.

Meeting adjourned at 12:10.

Teresa Beamer
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