




Network Setup and Demo

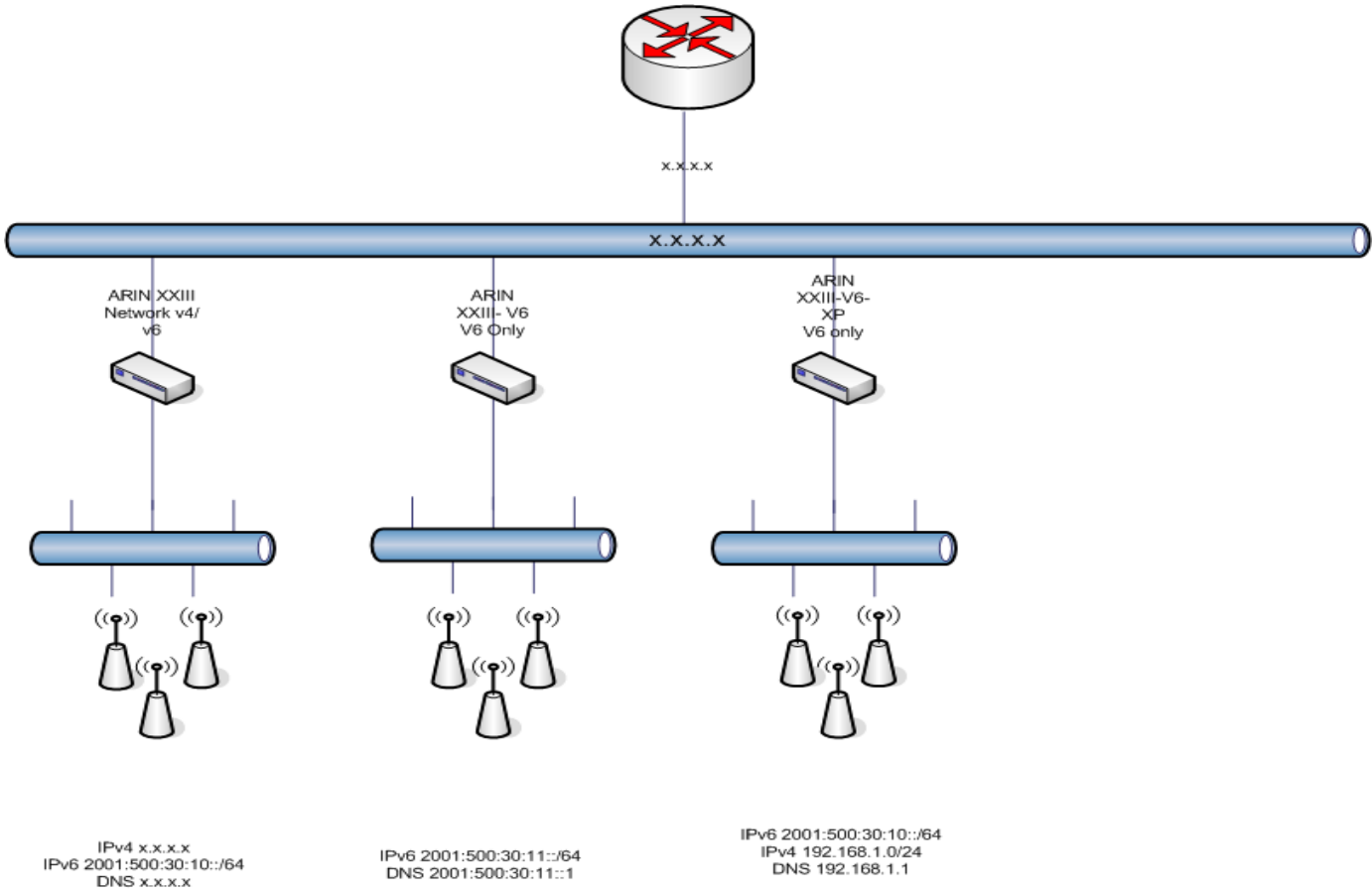
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Database Administrator

Networks

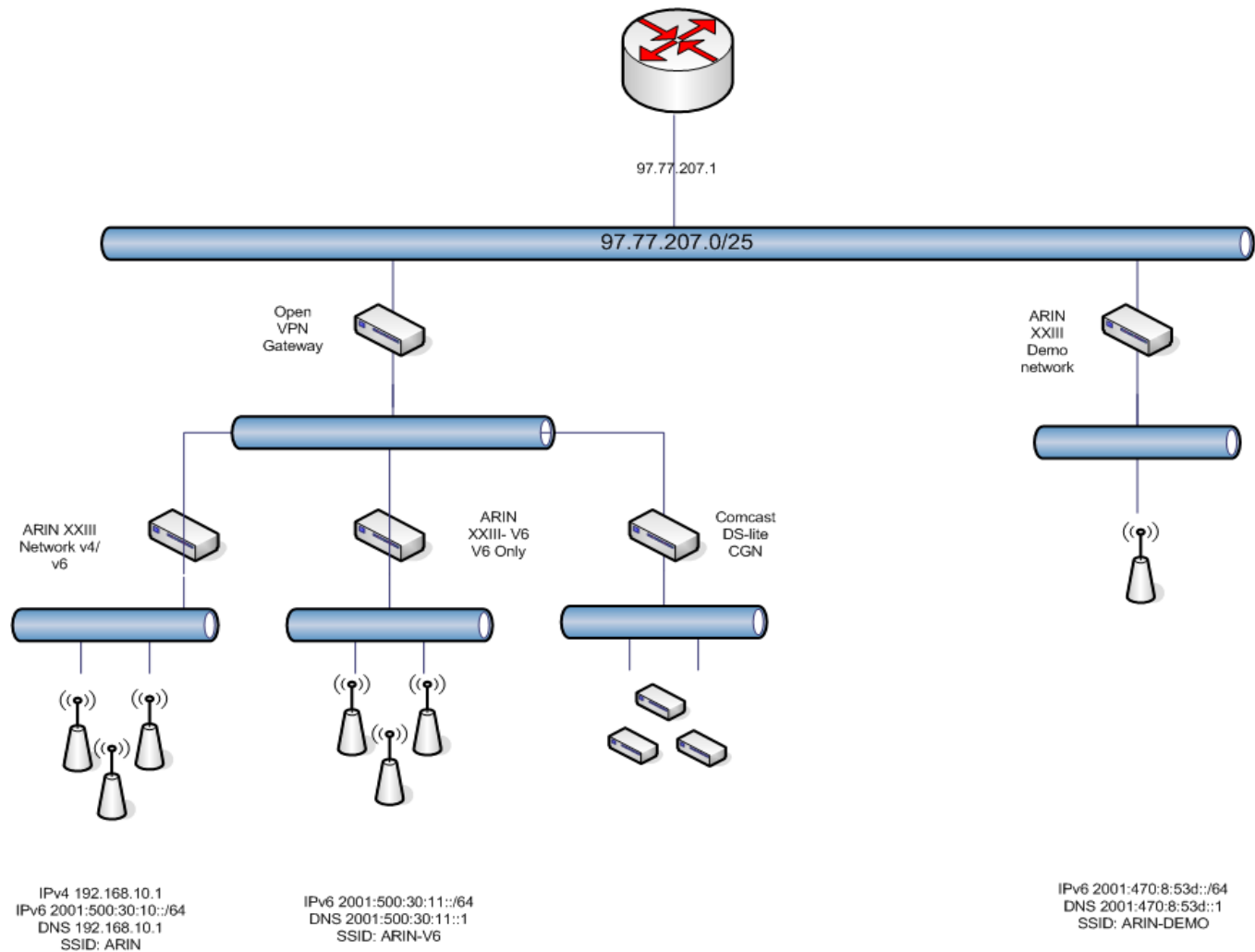
- Sponsor:  **TIME WARNER CABLE
Business Class**
- 3 Network segments
- Dual Stack
- IPv6 Only
- IPv6 Only Demonstration Network

ARIN XXI Network Diagram

Past Meeting Layout



ARIN XXIII Network Diagram



Primary Meeting Network

- **SSID ARIN**
- Dual Stack IPv4/IPv6
- IPv4 Provided by Sponsor
- IPv6 Direct Allocation 2001:500:30/48
- IPv6 Tunneled using OpenBSD and OpenVPN
- ARIN IPv6 connectivity provided by Equi6IX and OCCAID

IPv6 Only Networks

- **SSID ARIN-V6, ARIN-DEMO**
- IPv6 Tunneled
- napt, totd provide connectivity to IPv4 Internet
- ISC dhcpd for resolver configuration on supported platforms

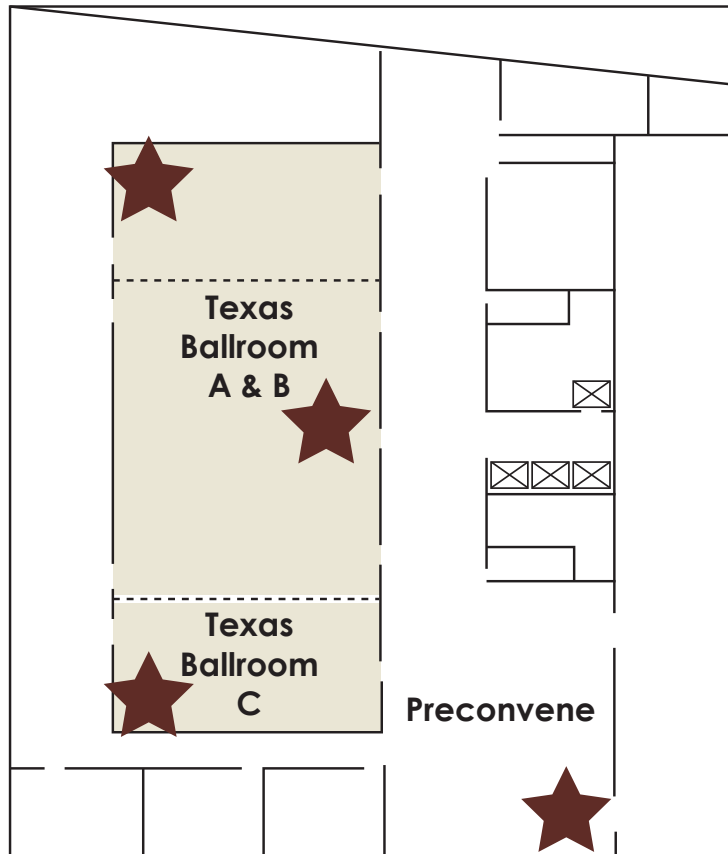
Wireless Network

- 7 Wireless Access Points(WAP) ★
- Each WAP supports Multiple SSID's
- Each WAP has Multiple vLAN's
- The WAP's plug into Cisco switches which supports vLAN tagging



Access Point Distribution

Second Floor



Third Floor



Demonstration Time

- **Hardware:** Soekris box, multi-Ethernet
- **Wireless:** Cisco 1200 Wireless Access Point
- **OS:** Linux(Centos 5.3) Most standard distributions would work.
- **Software:** napt(d(application gateway), tot(d(dns), radvd(v6 router advertisement daemon), ISC's dhcpd version 4.x(auto distributes name servers to some hosts)
- **Tunnel Broker:** Hurricane Electric(HE)

8 Steps to IPv6 only Network

Enable IPv6 forwarding

```
echo "1" > /proc/sys/net/ipv6/conf/all/forwarding
```

Setup the IPv6 Tunnel

```
ifconfig sit0 up
ifconfig sit0 inet6 tunnel ::216.66.22.2
#(your tunnel endpoint)
ifconfig sit1 up
ifconfig sit1 inet6 add 2001:470:8:53d::/64
route -A inet6 add ::/0 dev sit
```

Setup your IPv6 gw

```
ifconfig eth0 inet6 add 2001:470:8:53d::1/64
```

8 Steps Con't

Configure RADVD

edit radvd.conf

```
Interface eth1
{
    AdvSendAdvert on;
    AdvManagedFlag off;
    AdvOtherConfigFlag on;
    MinRtrAdvInterval 5;
    MaxRtrAdvInterval 15;
    prefix 2001:470:8:53d::/64
    {
        AdvOnLink on;
    AdvAutonomous on:
    };
};
```

8 Steps Con't

Configure dhcpd, ISC's dhcpd 4.x

edit dhcpd.conf and add the following:

```
default-lease-time 1800;  
max-lease-time 1800;  
ddns-update-style none;  
authoritative;  
log-facility local7;  
option dhcp6.name-servers 2001:470:8:53d::1;  
subnet6 2001:470:8:53d::/64 { }
```

-- start with:

```
dhcpd -6 -cf /usr/etc/dhcpd.conf
```

8 Steps Con't

Configure TOTd

```
;dns server to use for resolution
forwarder 24.93.41.125 port 53
;prefix to use for nat-pt hosts
prefix 2000:ffff::
;port to listen on
port 53
pidfile /var/run/totd.pid
totuser nobody
; 6to4 reverse lookup setting
stf
```

8 Steps Con't

Setup NAT/PT using the naptd-confmaker

Use the defaults

Make sure that the 'prefix' in nat-pt configuration matches the totd prefix of 2000:ffff

For an example of the configurator output, see this link:

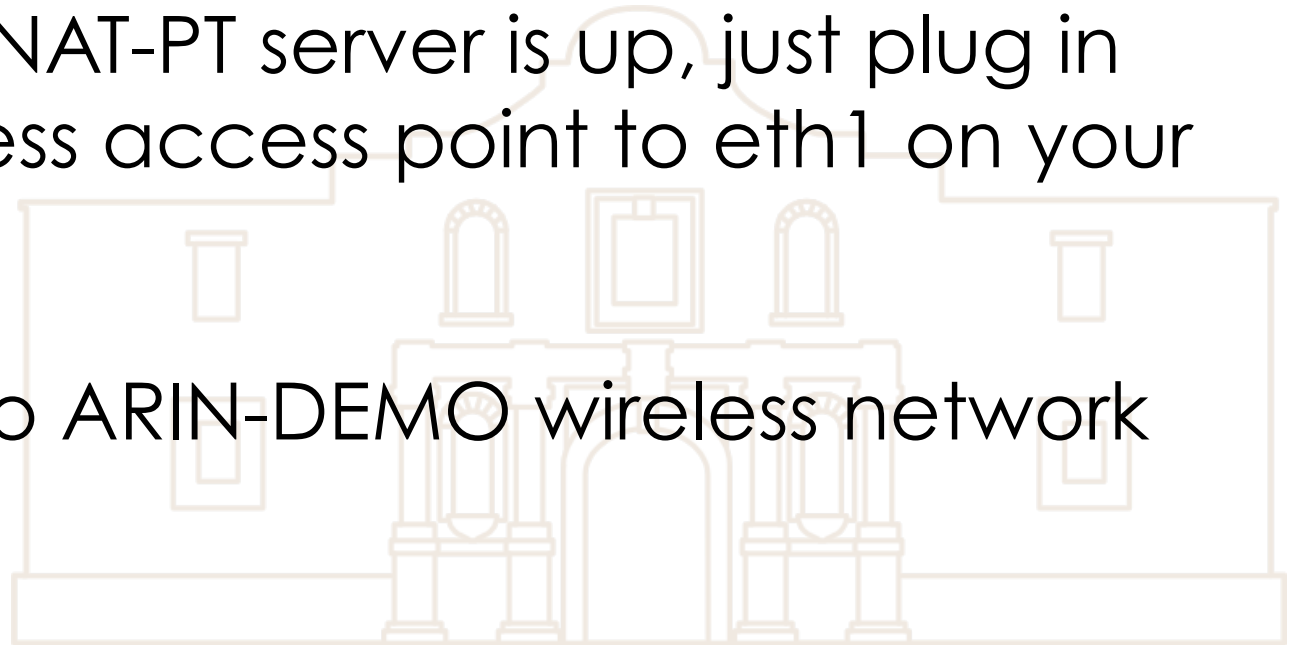
http://getipv6.info/index.php/lv6_at_ARIN_XXI/Network-Setup

Setup a few iptable and ip6table rules

```
/sbin/iptables -A INPUT -I lo -j ACCEPT
/sbin/iptables -A INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
/sbin/iptables -A INPUT -m state --state NEW -m tcp -p tcp --dport 22 -j
accept
/sbin/iptables -A INPUT -j drop
/sbin/ip6tables -A FORWARD -p icmpv6 --icmpv6-type destination-
unreachable -j drop
/sbin/ip6tables -A FORWARD -d 2000:ffff:: -j DROP
```

Time to play

- This was all accomplished using Linux, OS commands and freely available software
- Once the NAT-PT server is up, just plug in your Wireless access point to eth1 on your server
- Connect to ARIN-DEMO wireless network



Problems with IPv6 only

- Even with NAT-PT some applications will not work, SIP related applications. At least one SIP ALG is available but breaks the end to end security of the SIP protocol.
- Playing games with icmp messages
- All IPv4 traffic comes from one address

Questions?



Resources

SOEKRIS - <http://www.soekris.com>

CISCO - <http://www.cisco.com>

CentOS - <http://www.centos.org>

Nat/PT - <http://www.lucas tomicki.net/natptd.php>

Totd - <http://www.vermicelli.pasta.cs.uit.no/software/totd.html>

Dhcpd - <https://www.isc.org/software/dhcp>

Radvd - <http://www.litech.org/radvd>

HE (Hurricane Electric) - <http://www.he.net>