IPv6 - Address Assignment Considerations

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Overview

1. Static Configuration
2. Stateless Auto Configuration
3. DCHPv6

Warning

This talk is not on how to split your /32, /48, /56

Static Configuration (I)

- Necessary for Router Interfaces
- Recommended for Servers, Switches, Printers as well
  - Do you want your important services to change addresses when you replace the hardware and restoring the backup?
  - Yes there is DNS, but you'll have to update this.

Static Configuration (II)

IOS

```
interface FastEthernet0
!...
    ipv6 address 2001:DB8:FFFF:FFFF::1/64
```

Linux (Debian)

```
root#cat /etc/network/interfaces
...
iface eth0 inet6 static
  address 2001:DB8:FFFF:FFFF:0002:B387:786F:2
  netmask 64
  gateway 2001:DB8:FFFF:FFFF:0002:B387:786F:1
```

Stateless Auto Configuration (I)

With SLAC the Client

- selects an interface ID, e.g. it's Ethernet MAC
- generates a link-local address
- checks via DAD if Address is unique
- asks routers for prefix (via multicast)
- listens to prefix announcements during runtime

Stateless Auto Configuration (I)

SLAC is great for

- Client only networks
- Guest networks, e.g. in conferences, ...

DAD?

Duplicate Address Detection

- Client send a ICMP Message Type 135 to '::'
- If address is already in use there will be an answer to FF02::1

Stateless Auto Configuration (II)

Problems with SLAC:

- No automatic entry into DNS
- Announcing a DNS Server to the client via RA (RFC5007) is relatively new (read: might not be supported by your OS)
- Everybody gets an IPv6 address
- Answers to DAD request can be faked (e.g. http://freeworld.thc.org/thc-ipv6/)

Stateless Auto Configuration (III)

Why “Everybody gets an IPv6 address” might be a bad idea:

- Consider a large Server hosting company
  - Many Servers, many different Administrators
  - Most of these Administrators don’t no what they are doing
  - They might have a packet filter for IPv4
  - They most probably will have a default Linux setup with IPv6 enabled
  - **Congratulations:** You just created a nice back door into your customers setup

Stateless Auto Configuration (IV)

There are some ways to influence SLAC

IOS

```
router(config-if)#ipv6 nd ?
  advertisement-interval  Send an advertisement interval option in RA's
  dad                     Duplicate Address Detection
  managed-config-flag     Hosts should use DHCP for address config
  ns-interval             Set advertised NS retransmission interval
  nud                     Neighbor Unreachability Detection
  other-config-flag       Hosts should use DHCP for non-address config
  prefix                  Configure IPv6 Routing Prefix Advertisement
  ra                      Router Advertisement control
  reachable-time          Set advertised reachability time
```

To disable SLAC on the router you must use something like this:

```
ipv6 nd prefix 2001:db8::/64 no-autoconfig
```

DHCPv6 (I)

The same as in IPv4 but:

- different ports (Client: 546/UDP, Server/Relay: 547/UDP)
- no routing informations to the client
- can be used to only transfer additional informations to clients (read: no addresses)
- There is no default way to create a MAC - IPv6 binding (AFAIK)
- “Static” assignment is done by a setting a cookie on the client

DHCPv6 (II)

Client Config (ISC DHCP)

```
# Client configuration file example for DHCPv6

# The client side command to enable rapid-commit (2 packet
##send dhcp6.rapid-commit;

# name-servers and domain-search are requested by default.
# here is the way to request sip-servers-addresses too
also request dhcp6.sip-servers-addresses;

# Likely to be useful: the script path
script "/usr/local/etc/dhclient-script";
```

DHCPv6 (III)

Server Config (ISC DHCP)

```
default-lease-time 2592000;
preferred-lifetime 604800;
option dhcp6.name-servers 2001:db8:ffff:100:200:ff:fe00:3f3
option dhcp6.domain-search "test.example.com","example.com"
```

Literatur

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