

Understanding DHCPv6



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DHCPv6 Overview



Similar to DHCPv4

- Client-Server
- Provides client configuration information

Significant differences

- Two “flavors”, stateful and stateless
- Packet exchange has different names, may only use two packets
- Uses different UDP ports



IPv6 Review





Addresses are 128 bit

Autoassigned based on client MAC address

- EUI-64

Discovers default gateway

- Neighbor Discovery Protocol
- Uses Router Solicitation and Router Advertisement

Can optionally discover DNS servers

- Windows support is spotty



Why bother having DHCP
with IPv6?





Distribute additional options

- DNS domain name
- DNS server
- TFTP server address

Configure specific gateway per-subnet

Enterprise control



DHCP Compare and Contrast

DHCPv4

Uses IPv4

Server - UDP 67, client - UDP 68

Uses broadcast packets

Uses MAC address as ID

DHCPv6

Uses IPv6

Server - UDP 547, client - UDP 546

Uses multicast packets

Uses DHCPUIID (DHCP Unique ID)



DHCP Unique ID (DUID)

DUID-LLT

Link-Layer plus Time

DUID-EN

Enterprise Identifier

DUID-LL

Link-Layer

DUID-UUID

Unique Identifier



Stateless DHCPv6



Stateless DHCPv6

Set the “O flag” in the Router Advertisement

Client auto-configuration detects IP information

Stateless DHCPv6 server provides DNS and domain information only

Reduces load on centralized DHCP server



Stateless DHCPv6



Stateful DHCPv6



Stateful DHCPv6

Set the “M flag” in the Router Advertisement

DHCP Server provides all IP information

Uses four-packet exchange similar to DHCPv4

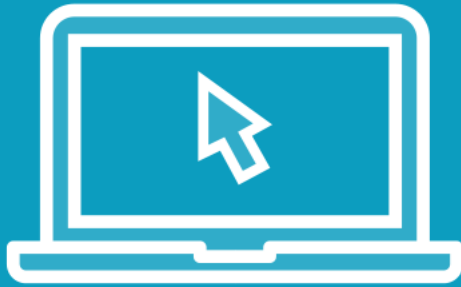
Recommend redundancy for DHCP server



Stateful DHCPv6



Demo



Examine DHCPv6 transaction

- Both stateless and stateful
- Available for download

Configure DHCPv6

- Windows Server
- Cisco router
- DHCP relay agent

