Practical Network Defense - Lab 10

IPv6 addressing of ACME co.'s network

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Contents

1 Introduction

DHCPv6 prefix delegation is used to assign a network address prefix and automate configuration and provisioning of the public routable addresses for the network.

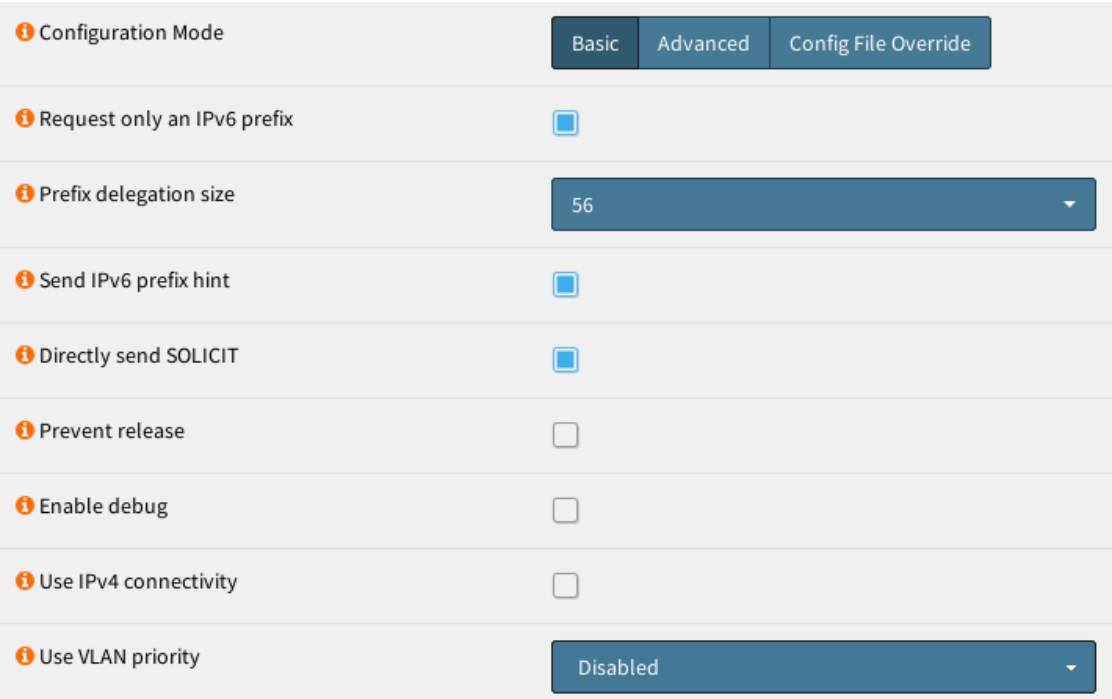
The router asks the ISP for a network prefix using DHCPv6. Once assigned, the ISP routes this network to the router, which starts advertising the new addresses to hosts in the network, either via SLAAC or using DHCPv6.

In this environment, only hosts in the DMZ need to receive a global IPv6 address.

2 Enabling IPv6 on the firewall

In *Interfaces* ▷ *WAN*, select *DHCPv6* in section *IPv6 Configuration Type*.

Compile the DHCPv6 configuration section like in the image. Since the ISP[1] does not spontaneously send Advertise packets, the client must manually ask for the DHCPv6 server with Solicit messages.



The firewall rules for DHCPv6 are automatically configured by OPNsense. Assuming that the prefix received from the ISP is static and the router does not reassign addresses, add a route allowing HTTP IPv6 traffic from the outside to the web sever.

[1]Since the assignment was carried out in the local environment, the ISP was impersonated by Dibbler.

3 Enabling IPv6 on the DMZ

The DHCPv6 server on DMZ interface must be configured with the prefix received on WAN: select *Track Interface* in *Interfaces* ▷ *DMZ*, section *IPv6 Configuration Type*.

Leave the just-appeared options (in the bottom of the page) unchanged, only selecting WAN in *IPv6 interface* if necessary.

The firewall rules for DHCPv6 are automatically configured by OPNsense. In addition, add IPv6 to the rules regarding web traffic from the proxy server.

4 Test of the solution

Since the assignment was carried out in a local environment, it made no sense to perform route tracing. Instead, since we had complete control over all network components, we started and stopped the DHCPv6 server and analysed the resulting traffic.

Since the option *Send IPv6 prefix hint* was checked, the main router did not ask for an arbitrary prefix but for the renewal of a specific one. When the server was active, the router received a positive reply (since there were no other clients, the prefix was always available).

Please find attached a successful RENEW/REPLY exchange and the output of `ifconfig em0`, which shows the main router's link-local IPv6 address.

5 Final remarks

While the proxy server can immediately start to navigate in IPv6, the web server may not receive incoming IPv6 traffic: since Zentyal, the authoritative DNS server, does not support type AAAA records, clients must already know the web server's IPv6 address.