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1. IPv6 DNS

1.1 Enabling IPv6 Specific Functions in Classic IPAM NameSurfer

To enable IPv6, go to user interface configuration file config/webui.conf in the NameSurfer directory /usr/local/namesurfer/config/webui.conf:

enable_ipv6 (true or false), default false

When true, users will see IPv6-specific menus on the zone pages such as "Add IPv6 host", "A6 record" field in Zone menu item.

1.1.1 RFC3152 Support

rfc3152_support entry (true/false, true by default)

When true, IPv6 reverse records are automatically created as ip6.arpa. Otherwise ip6.int is used.

If servers use resolvers that look up "ip6.int" only, the following problems would happen:

- IP addresses, instead of host names, will be recorded in log files.
- Host name based authentication will fail.
1.1.2 How to Create IPv6 DNS Records

After enabling IPv6 mode, you can see new entry "Add IPv6 host" in the forward zone menu. Create AAAA record by using this function.

While creating the AAAA record, it is also possible to create reverse record for IPv6 host automatically by selecting the check-box next to IPv6 address field.
Data will be automatically synchronized with IPv6 address block in IPAM.
1.1.3 Enabling Classic IPAM NameSurfer Hidden DNS Primary to listen IPv6

Go to `/usr/local/namesurfer/config/server.conf` file and type IPv6 address in `bind_addr6:` line.

Restart Classic IPAM NameSurfer to apply changes `/etc/init.d/namesurfer restart`.

1.2 IPv6 Reverse Zones

For IPv6 addresses (A6 records), reverse mappings are stored in the zone defined by prefix name.

Reverse zone is derived from the prefix name by adding the IP6 label in front of the prefix name. Reverse DNS lookups for IPv6 addresses use the special domain `ip6.arpa`.

An IPv6 address appears as a name in this domain as a sequence of nibbles in reverse order, represented as hexadecimal digits as subdomains. For example, the pointer domain name corresponding to the IPv6 address `2001:db8::567:89ab` is `b.a.9.8.7.6.5.0.0.0.0.0.0.0.0.0.0.0.0.0.0.8.b.d.0.1.0.2.ip6.arpa`.

1.2.1 Creating IPv6 Reverse Zones

To create IPv6 reverse zone, navigate to “Reverse zones” menu entry and click “Create zone”. Type IPv6 address and software will convert it into IPv6 Reverse zone name (available in Classic IPAM NameSurfer 6.6.2 and later).
1.3 Configuring Managed BIND to Listen IPv6

In the Classic IPAM NameSurfer WebUI, navigate to "Remote servers", select "localhost" server in the list. Click "Options", then "Add new entry" on the left side menu, enter one of the global options into User defined field and press OK.

`listen-on-v6 {any;};` turns on IPv6 for port 53 (default port)

`listen-on-v6 {none;};` turns off IPv6

`listen-on-v6 {2001:db8::/124;};` turns on IPv6 for port 53 for selected IP range

Multiple listen-on-v6 statements are allowed.

After that you will see a new line added to options, then click on the new "listen-on-v6" link and once there click on "add new entry". Write the ipv6 address or "any" into the input field and press OK.

After this you can verify the configuration by clicking "Preview configuration" on the left navigation, you should see something like this:
options {
    pid-file "/usr/local/namesurfer/run/named.pid";
    directory "/usr/local/namesurfer/named/namedb";
    listen-on-v6 {
        any;
    };
};
and then click "Check configuration" to verify for syntax errors. If the configuration file was successfully verified, click "Upload configuration".

Restart server to apply changes:

Navigate to "Remote servers" and click selected server's "Reload" button. The server will now start serving on IPv6 address. All communication with Classic IPAM NameSurfer will still take place using IPv4 unless specified otherwise.

1.4 Configuring FusionLayer DNS to use IPv6
The CentOS 6 operating system embedded in FusionLayer DNS software appliance includes support for IPv6 network interface, as does the BIND version included in the distribution. To enable IPv6 mode, please configure the following parameters as appropriate:

- Remote nameservers
- Master zone’s IPv6 address
- “listen-on-v6” option
- IPv6 reverse mapping

Detailed and updated list of supported options, as well as configuration examples, can be found from the online help facility in FusionLayer DNS software appliance, under BIND Manual (ARM).

If you need assistance in determining the appropriate configurations for your IPv6 network, please contact Fusionlayer Helpdesk for assistance.

**OBS!** Given the complexity of AAAA resource record syntax, we recommend running FusionLayer DNS as secondary only DNS server in IPv6 –enabled network environments, and automating the error-prone IPv6 zone and host (i.e. IPv6 DNS) management processes using Classic IPAM NameSurfer. For further details, please see Chapters 1, 2 and 3 of this document or contact Fusionlayer.

### 1.5 Communications between Classic IPAM NameSurfer and Remote Servers over IPv6

**OBS!** Please proceed as instructed by chapter 1.1.3 before performing the remote secondary configuration.

To enable IPv6 communication between Classic IPAM NameSurfer and remote servers, the following steps should be taken.

To use IPv6 address as default master address for all new remote servers, please edit “primary_addr” parameter in “/usr/local/namesurfer/config/server.conf” –file. Example:

```bash
# The IP address of this host (the host on which Classic IPAM NameSurfer primary name server runs). This address is used by the secondary name servers to perform zone transfers.
primary_addr: 2001:dddd:aaaa::
```

The address configured as “primary_addr” will be the default master address for all the new zone entries in remote servers’ configuration. Restart Classic IPAM NameSurfer to apply changes:

```
/etc/init.d/namesurfer restart
```

To set the IPv6 master address per server basis, you can navigate in Classic IPAM NameSurfer web UI to Remote Servers menu and click one of the secondary DNS servers.
Under “Server details” link there is an option to modify “Default master server IP”. OBS! Modifying this value affects only newly added zones, not the existing zones.
2. IPv6 IPAM

2.1 Creating IPv6 Blocks / Subnets

1. Go to "IP addresses" management page in web UI
2. Click "Add block"
3. Select "IPv6" from drop-down menu.
4. Type IPv6 network address and bitmask.

2.2 Managing IPv6 Blocks / Subnets

In general, IPv6 management functions are the same as for IPv4 address blocks. You can create hosts, split block into parts, delegate blocks, see usage statistics etc. When creating new block or host depending of the block size either a drop-down or input field is displayed (available in Classic IPAM NameSurfer 6.6.2 or later). Drop-down will list all the available block or host addresses but with large IPv6 blocks it may not be always convenient. In that case we provide an input field and "Random IP" tool (available in Classic IPAM NameSurfer 6.6.2 or later). Classic IPAM NameSurfer can select first or random free IPv6 address from the block.

Adding IPv6 host by using drop-down list of available addresses in the IPv6 block or "Random IP" tool. Reverse record can be created automatically.
### Parameters

- **Owner**: Default
- **Address**: 252.0.252.239:0:0:0:0
- **IPv6**: 252.0.252.239:0:0:0:0:0:0:1
- **DNS name(s)**: (Enter name for the record in the field, e.g. "www" or "www.example.com")

#### Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td><a href="mailto:admin@example.com">admin@example.com</a></td>
</tr>
<tr>
<td>Continent</td>
<td>Europe</td>
</tr>
<tr>
<td>Hardware</td>
<td>System default</td>
</tr>
<tr>
<td>ID</td>
<td>System default</td>
</tr>
<tr>
<td>Name</td>
<td>System default</td>
</tr>
<tr>
<td>OS</td>
<td>System default</td>
</tr>
<tr>
<td>Room</td>
<td>System default</td>
</tr>
<tr>
<td>Services</td>
<td>System default</td>
</tr>
<tr>
<td>Type</td>
<td>System default</td>
</tr>
<tr>
<td>VLAN</td>
<td>System default</td>
</tr>
</tbody>
</table>

**Add row**

**Create**

**Cancel**
3. IPv6 Access Restrictions

The group list page displays the currently defined Classic IPAM NameSurfer user - both end user and superuser (or administrator) – groups.

**Access to IP6 address range(s):** If the group has been given access to IP Addresses and/or access to DNS, the contents of corresponding textboxes define the set of IPv6 address ranges which the group members have access to. These ranges are used by both DNS and IP Addresses modules. Multiple address ranges may be entered by pressing the "OK" button after entering the first one. In addition to specifying ranges of addresses, the access restrictions may be entered as a prefix/bitmask pair. In such a case only the first text field (intended for entering the beginning of the range) may be used, and it must contain the address prefix and bitmask value separated by a slash (/) sign.

Example of a normal range: 0:0:0:0:0:0:0:0 – ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff

Example of a prefix range: 2000:aa10:0:0:0:0:0:0/32

**Allow A6 prefix:** If the group has been given access to IP Addresses and an A6 prefix is input into this textbox, the group members are allowed to create IPv6 addresses beginning with that prefix into A6 DNS records.

In our example we assign access to specified IPv6 address range for the users belong to "Helpdesk" group.

After login in as “Demo” user ("Helpdesk" group user) only selected address range is available.
<table>
<thead>
<tr>
<th>Host</th>
<th>Address</th>
<th>IPv#</th>
<th>Host type</th>
<th>DNS name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:10</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:11</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:12</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:13</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:14</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:15</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:16</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:17</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:18</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:19</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
<tr>
<td>Default</td>
<td>fd51:8e2b:7a98:8b05:0:0:0:20</td>
<td>IPv6</td>
<td></td>
<td>Add DNS name</td>
</tr>
</tbody>
</table>
4. IPv6 DHCP

4.1 Enabling IPv6 Mode in FusionLayer DHCP Server

In version 2.5 of FusionLayer DHCP Server, both IPv4/DHCPv4 and IPv6/DHCPv6 modes are supported. However, please note that both DHCPv4 and DHCPv6 functionality cannot be activated simultaneously. To provide both DHCPv4 and DHCPv6 service, please install dedicated FusionLayer DHCP Server for both.

The Operating mode page displays a toggle between these two modes only if you have the required version of the dhcpd package installed. IPv6/DHCPv6 support requires at least dhcpd version 4.2.1. The required RPM package is included the latest FusionLayer DHCP Server software appliance distribution (ISO image, version 2.5-1 and later) available at FusionLayer’s Software Delivery Portal. If you are already running FusionLayer DHCP Server 2 Series and do not wish to install new ISO image, you can download the RPM from Software Delivery Portal or request FusionLayer Helpdesk to send it to you.

Please remember to set up the network interface with IPv6 address before switching the operating mode.

4.2 Upgrading ISC DHCP to Version 4.x (for customers wishing to enable DHCPv6 in existing FusionLayer DHCP Server 2.1-x)

IPv6/DHCPv6 support in FusionLayer DHCP Server requires at least dhcpd version 4.1.1. The appropriate RPM package is provided by FusionLayer.

At the moment, two RPM packages are required:

- dhclient-4.x.x-x.i386.rpm
- dhcp-4.x.x-x.i386.rpm

RPM packages are copied to existing FusionLayer DHCP Server 2.1 (or newer) using for example SCP:
• `scp dhclient-4.x.x-x.nixu.i386.rpm dhcp-4.x.x-x.nixu.i386.rpm
  user@NixuDhcpServerAddress`

RPM packages are installed from FusionLayer DHCP Server's command-line with the following command:

• `yum localupdate dhcp-4.x.x-x.nixu.i386.rpm dhclient-4.x.x-x.nixu.i386.rpm`