Enabling IPv6 in Samba4

At SambaXP 2007, I demonstrated a version of Samba4 that had been hacked in order to enable IPv6. In this post, I describe how you can enable IPv6 in Samba4. This hack is restricted to enabling IPv6 for the server side of Samba4.

These instructions assume that you have already carried out a number of preparatory steps first. Specifically, your server needs to be configured with IPv6 and a working DNS server.

Instructions for downloading and compiling Samba4 can be found on the Samba website at http://www.samba.org/index.php/Samba4/HOWTO. The key points are reiterated here.

Step 1 - Download Samba4

1. Type the following command:

    ```
    svn co svn://svnanon.samba.org/samba/branches/SAMBA_4_0 samba4
    ```

    This command creates a copy of the Samba4 source code under the directory samba4.

Step 2 - Create the Configure Script

1. Since this is not a release version of Samba4 you must create a configure script. To create a configure script type the following.

    ```
    cd samba4/source
    ./autogen.sh
    ```

2. Next execute the configure script by typing:

    ```
    ./configure
    ```

Step 3 - Apply IPv6 Patch

1. I have supplied a patch (Samba4 IPv6 Server Patch) that you can apply to Samba4 (build 22997) to enable IPv6. This patch makes a number of minor changes.

    For each server, the patch changes the protocol used in socket calls from IPv4 to IPv6. In the LDAP, RPC, SMB and Web servers this involves replacing "ipv4" with "ipv6" in the arguments to the Samba4 socket functions. Here is an example from the web server source (the modified code is in bold).

    ```
    status = stream_setup_socket(task->event_ctx, model_ops,
                &web_stream_ops,
                "ipv6", address,
                &port, task);
    ```

    In the KDC server "ip" is used as an alias for "ipv4". So instead of replacing "ipv4" with "ipv6", "ip" is replaced with "ipv6".

    The above changes alone are not enough to make the KDC server listen on IPv6 interfaces. Additional modifications to kdc/kdc.c are required to ensure that the

kerberos server listens on all IPv6 interfaces. Thanks to Jelmer Vernooij for these changes.

Download the patch from the Erion www.ipv6consultancy.com web-site. Ensure that your current working directory is the samba4 directory. Then to apply the patch type the following commands:

```
patch –p0 < ipv6diff.txt
```

At this point the Samba4 source code is IPv6 enabled and ready to compile.

Step 4 - Compile Samba4

1. Type the following commands to build and install Samba4.

```
cd source
make proto all
make install
```

Step 5 - Provision Samba4

1. Now you must provision Samba4. To do this type the following command.

```
./setup/provision --realm=YOUR.REALM --domain=YOURDOMAIN  \
--adminpass=PASSWORD
```

Where YOUR.REALM is your domain's realm, YOURDOMAIN is your domain's NT domain name and PASSWORD is your Administrator's password.

2. The provision script creates a zone file that you must then use to configure your DNS server. This zone file does not include IPv6 addresses. You must modify the zone file so that it includes your server's IPv6 addresses as well as its IPv4 addresses.

To modify the zone file to support IPv6 you only need to add two lines. The zone file already contains two A records containing your server's IPv4 address. One A record is for the domain's domain name and the other one is for the server's domain name. Copy and paste each of these A records and modify the record type (A) to AAAA. Then change the IPv4 address in the AAAA lines to your server's IPv6 address. Remember to update the serial number if you have previously installed this zone file without adding the AAAA records.

For example, if the unmodified zone file contains the following two A records:

```
            IN A    192.168.89.100
;
fedora6s4   IN A    192.168.89.100
```

Then you must add the AAAA records to give something like the following.

```
                    IN A    192.168.89.100
                    IN AAAA 3000::1
;
fedora6s4           IN A    192.168.89.100
fedora6s4           IN AAAA 3000::1
```

Don't forget to use your own IPv4 and IPv6 addresses rather than the examples used here!

3. Once you have made these changes install the zone file and configure your DNS server. You must also configure your DNS server to listen on IPv6 as well as IPv4. In the case of the BIND DNS server you need to add the following line to the options section in order to enable IPv6:

```
listen-on-v6 port 53 {any;};
```

You should now start or reload your DNS server.

Step 6 - Starting Samba4.

1. By default Samba4 is installed under the directory /usr/local/samba. You need to add the directories /usr/local/samba/bin and /usr/local/samba/sbin to the start of your shell's PATH variable. Then start Samba4 by typing,

```
smbd –i –M single
```

Step 7 - Testing IPv6 Samba4 Services

1. You can verify that Samba4 is listening on IPv6 using the netstat command. The syntax of this command varies from platform to platform. On Linux you can type the following to list the IPv6 Samba4 listeners.

```
netstat --inet6 –anp |grep smb
```

Note that using the IPv6 API on a dual-stack server means that you also listen on IPv4 as well as IPv6 sockets. So IPv4 clients will be able to connect to your Samba4 server as well as IPv6 clients.

2. In order to test Samba4 over IPv6 you must use an IPv6 enabled client. IPv6 enabled clients include, the latest development version of the Linux CIFS client, Windows XP, Windows 2000, Windows Server 2003, Windows Vista and betas of Windows Longhorn Server. Only Windows Vista and Windows Longhorn Server can join an Active Directory domain over IPv6. Unfortunately, Windows Vista and Windows Longhorn Server cannot currently join an Active Directory domain served by Samba4. This means that at the time of writing you are restricted to only accessing SMB shares over IPv6.

You can test IPv6 network shares from the command line by mapping a network drive using net use.

First create a share on your Samba4 server. For this example we will call the Samba4 server fedora6s4.tree.com and the share TMP. In order for this to work your Windows Vista or Windows Longhorn Server must have IPv6 enabled and it must be configured to use your Samba4 server as its DNS server.

3. Next test IPv6 connectivity by typing:

```
ping –6 fedora6s4.tree.com.
```

Replace the server name with the name of your server. The -6 flag forces ping to use IPv6 rather than IPv4. Resolve any problems with name resolution or IPv6 connectivity prior to proceeding.

4. Open a command line window and type the following command:
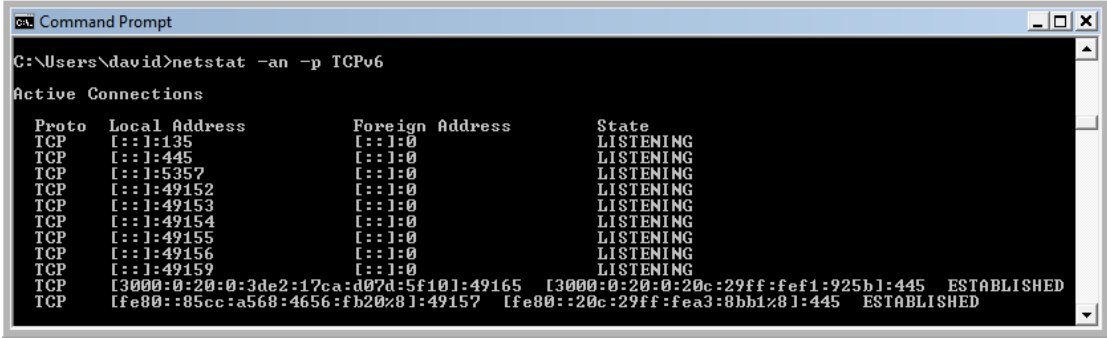
```
net use z: //fedora6s4.tree.com/tmp
```

Replace the server name and share name with the names of your Samba4 server and Samba4 share.

5. You can verify that the share is operating over IPv6 using the Windows netstat command. Type the following command:

```
netstat -an -p TCPv6
```

You should see something similar to that shown below:

Notice the TCP SMB connections have IPv6 endpoints.

6. Now you can use your Samba4 mapped drive over IPv6

Author: David Holder
Email: d a v i d (dot) h o l d e r (at) e r i o n (dot) c o (dot) u k
Date: 24/5/2007