ADTRAN

NetVanta Unified Communications Technical Note

Configuring Single Number Reach for the NetVanta Business Communications System

Overview

Single Number Reach (SNR) allows a user to have a single inbound DID number for both voice and fax calls. Users can also effectively extend this DID number to their mobile phone using features like Assisted Transfer (aka "Find-me/Follow-me") if they don't answer a call to their office extension, thereby providing a true single number that people can use to contact them regardless of where they are and the type of call that is being placed.

To implement SNR, the NetVanta 7000 must route these inbound DID calls directly to a UC attendant identity without ringing a telephone first. This means that the DID number provided by the carrier cannot be the same as the extension configured for these users' telephones. The UC service associated with this identity uses some logic to determine the type of media on the line, and then either transfers the call to the corresponding user's extension if no CNG tones are detected) or receives a fax if CNG tones are detected. Meanwhile, the caller or fax machine is largely unaware that this transaction is taking place behind the scenes.

This guide assumes that both the 7100 and UC software are both fully configured and already integrated together. For more information on configuring a Business Communication System please see TN 3554 NetVanta Business Communications System Configuration Guide (AOS version A5.02 or later).

This guide includes the following sections:

1. Caveats and Considerations

2. Configuring the NetVanta 7000

3. Configuring the NetVanta UC server

    o   Method 1: Custom PBA Service for Each SNR User

    o   Method 2: Generic PBA Service for All SNR Users

4. Testing and Verification

Caveats and Considerations

Please note the following caveats and considerations when implementing Single Number Reach with a Business Communications System:

- SNR is only supported with a PRI trunk connection to the PSTN. Although normal fax receiving and sending is supported with analog POTS trunks (and select SIP PSTN carriers) these types of trunks cannot be used for SNR purposes.

- Fax sending and receiving with BCS uses the T.38 protocol. The NetVanta 7000 supports a total of two simultaneous T.38 sessions; in other words, a total of two simultaneous inbound and outbound faxes. If higher fax densities are required then the NetVanta 7000 must be front-ended with an IP Business Gateway like the Total Access 900e which supports up to four T.38 sessions, or the NetVanta 6240 which supports either thirty or sixty T.38 sessions. Inbound fax transmissions must be routed directly to the UC server and vice-versa for outbound fax transmissions, bypassing the NetVanta 7000 unit entirely.

- Generic SNR implementations as outlined in Method 2: Creating a Generic PBA Service for All SNR Users require the Data Source Connector License.

Configuring the NetVanta 7000

The NetVanta 7000 must have several configurations enabled in order to support SNR. The following sections describe how to enable these configurations. This section also assumes that the NetVanta 7000 has the base configuration required for integration with NetVanta UC server.

Routing DIDs to UC Server

Single Number Reach is possible by routing inbound DID calls for users requiring SNR directly to the UC server instead of ringing the corresponding user's extension first. To route inbound DID calls directly to the UC server you need to add these DID numbers to the permit/accept lists for the BCS trunk group. In most cases the carrier will deliver the DID number over the PRI as a four digit number; in some cases the DID number is delivered as a ten digit number. You will need to know in which format the DID number is being delivered before you can continue.

The following steps describe how to set up permit/accept lists using the GUI:

1. Log into the 7100 administration GUI as admin.

2. Under *Voice > Trunks,* select *Trunk Groups* and select the BCS trunk group (the group containing the SIP trunk connected to the BCS application server).

3. Scroll down and select *Detailed View – Permit/Restriction Call Templates,* then click *Configure Advanced Templates*

4. For *Template*, enter the DID number for a user requiring SNR and enter a *Cost* of 0 and click *Add.* For example, if the user's DID number is 1201 then enter **1201** for *Template* and **0** for *Cost*.

If there is a contiguous range of DIDs that need SNR you can enter a pattern for the *Template* instead of a specific DID number. For example, if the range of DID numbers is 1201 through 1205 then for the *Template* value you would enter **120[1-5]**


5. Create additional Permit templates until all DID numbers requiring SNR have been accounted for.

Note: If the users' extension numbers have already been configured to be the exact same as the DID numbers – in other words, the 4 digit DID number is the same as the user's extension number on their telephone – then the carrier/provider will need to instead send 7 or 10 digits, or the users' extension numbers will have to be changed so that they do not match the DID numbers.

Enabling T.38 and Modem Passthrough on the PRI Trunk Account

The following steps describe how to enable T38 and Modem Pass-through on the PRI trunk account.

1. Log into the 7100 administration GUI as admin.

2. Under *Voice > Trunks,* select *Trunk Accounts* and select the PRI trunk account.

3. Scroll down to the *VoIP Settings* tab.

4. Check the box for **Modem Passthrough**

5. Check the box for **T38**

6. Click *Apply*
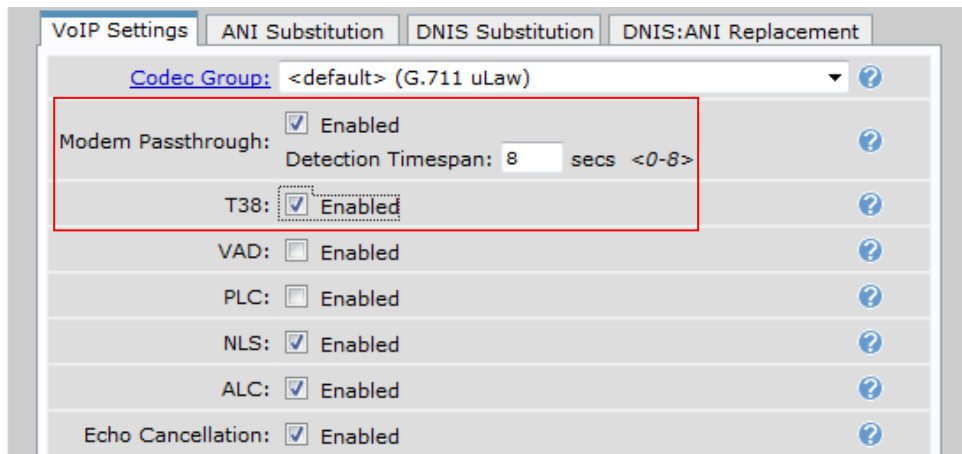
Verifying the Transfer Mode is set to Local

The BCS SIP Trunk Account must have the Transfer Mode set to *Local.* This is the default value so you should not have to modify the configuration for this particular setting.

The following steps describe how to verify that the BCS SIP Trunk Account is set to *Local* Transfer Mode.

1. Log into the 7100 administration GUI as admin.

2. Under *Voice > Trunks,* select *Trunk Accounts* and select the BCS trunk account.

3. Scroll down until you see the *Transfer Mode* drop-down list.
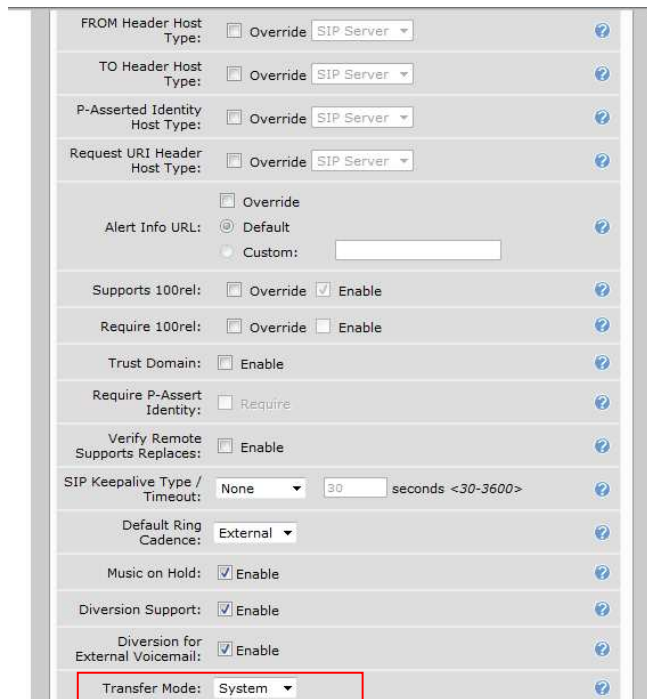
4. If **System** is selected, then the BCS Trunk Account is using the system-defined value for this setting. To verify the system-defined value:

a. Under *Voice > System Setup*, select *System Parameters*

b. Verify that *Transfer Mode* is set to **Local**.
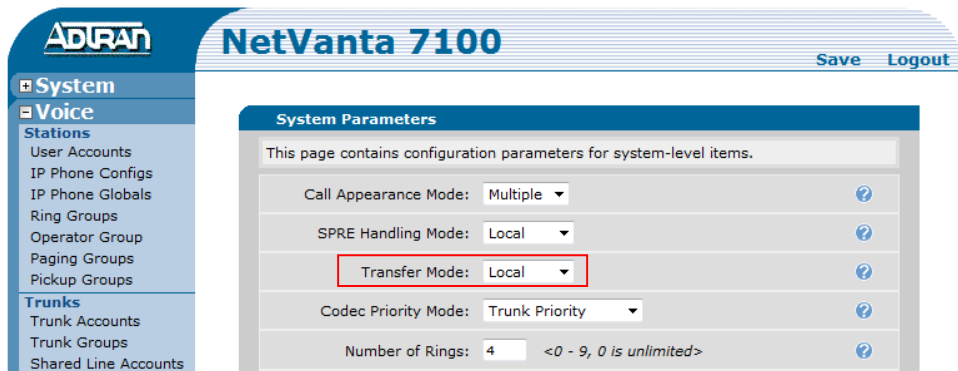
Enabling T30 CNG Detection (release A5.02)

Note: this step is only necessary if you are running version A5.02 or higher.

In pre-A5.02 versions of the NetVanta 7000 series firmware, the unit had fax-tone detection enabled by default. As of release A5.02 this value is no longer set by default and needs to be manually enabled. This cannot be accomplished using the GUI.

The following steps describe how to enable fax tone detection:

1. Open the CLI and log in as admin and enter enable mode.

2. Type *configure terminal*

3. Type *voice fax-tone t38 t30-cng*

4. Type *exit*

5. Type *write*

Configuring the NetVanta UC server

There are two methods that can be used to implement Single Number Reach for users. The first method involves creating a custom PBA service for each user requiring SNR. The second uses a more generic approach and leverages the power of the user data table to manage mappings between different DID numbers, user identities and fax identities. The following table will help you to decide which UC server configuration method to use:

Method 1: Creating a Custom PBA Service for Each SNR User	- Less initial work to set up - Good for small number of users that need SNR	- More long-term administrative overhead - Requires a PBA license for every user that needs SNR
Method 2: Creating a Generic PBA Service for All SNR Users	- Less long-term administrative overhead - Good for large number of users that need SNR - Does not require PBA licenses	- More initial work to set up - Requires Data Source Connector license

Method 1: Creating a Custom PBA Service for Each SNR User

With this method, each user requiring SNR is set to Personal Business Assistant mode and has a custom UC service associated with an attendant identity that handles calls for their specific DID number. The UC service associated with this attendant identity will be unique for each user since the elements will be configured with user-specific information.

The following steps describe how you would set up SNR for a user called Bob Myers:

1. Open UC Client as the admin.

2. Edit the user "Bob Myers" and set the *Answering Mode* to **Personal Business Assistant**.

3. Using the navigation pane on the left, select the *Services* section.

4. Create a new service by right-clicking in the contents pane on the right and selecting *New > Service...* and give the service an appropriate name like "Bob Myer's SNR Service".

5. The following screen shot depicts how to set up a custom SNR service for an individual user. In this case, the user is Bob Myers with a telephone at extension 202. Also note that the Receive Fax element is configured to save the fax to Bob Myers' mailbox specifically. You will also need to record an announcement for the Play Announcement element that instructs the caller that they should wait to be connected (e.g. "Thank you for calling. Please wait while we connect you to your party."). The audio needs to be approximately 10 seconds in length in order to provide ample time for UC server to listen for CNG tones before transferring the call to the user's extension. If CNG tones are detected during this period then the call is pulled back through the *Detect Remote Party* element and it proceeds through the "Fax machine" connection pin and begins to receive a fax.
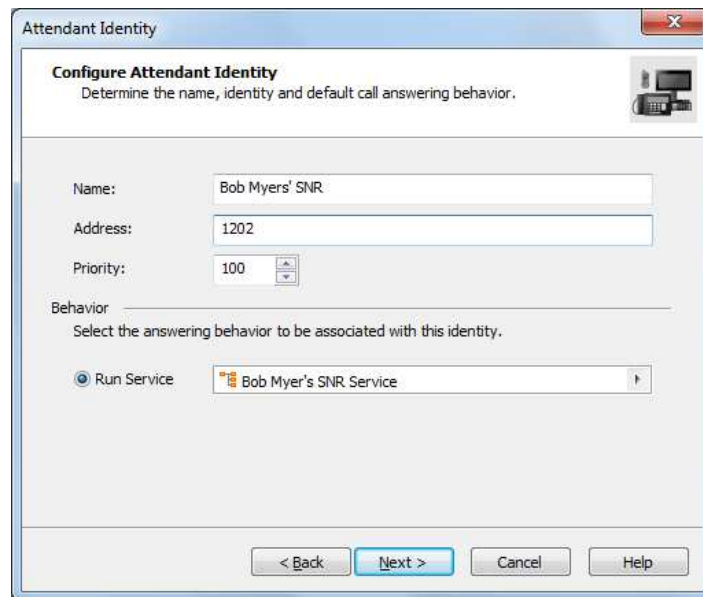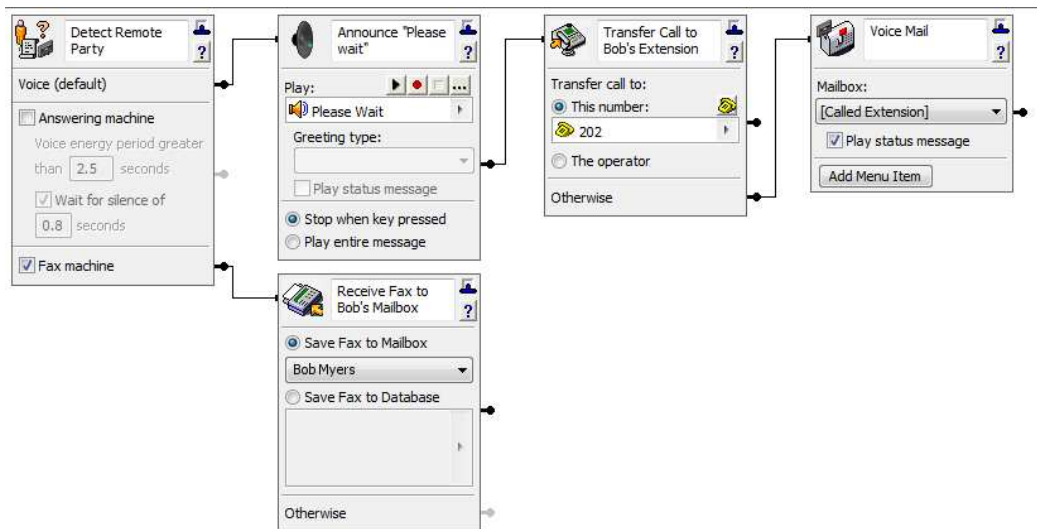
6. Save the service and close the editor.

7. In UC Client, using the navigation pane on the left, select *Administration* then select *Identities*.

8. Create a new identity by right-clicking in the contents pane on the right and selecting *New Identity...* and click *Next* to skip the Welcome page of the Identity Wizard.

9. Ensure that both the **NetVanta 7000 Series** is the selected communication system and **Bob Myers** is the selected user profile. Select the **Attendant Service** radio button and click *Next*.

10. In the next page of the Wizard, give the identity a meaningful name like "Bob Myers' SNR", set the address to Bob's DID number, and select the service that you just created for Bob using the selector button.
Note: The DID number will be either 4 or 10 digits long, depending on what number is provided by the carrier. In most cases, the DID number presented by the carrier will be the last 4 digits of the 10 digit

number. For example, if Bob's DID number is 2569631202 then the value for the address would be set to 1202.

11. Click *Next* then *Finish*.

## Method 2: Creating a Generic PBA Service for All SNR Users

With this method you create a single generic PBA service that works for all users' DID numbers. Since the service is generic it will need some way to map the called DID number to a user's telephone number and fax number. To accomplish this you will need to create a User Data Table with these mappings. For each user requiring SNR you will need to create an attendant identity for their specific DID number that uses the generic PBA service providing the SNR functionality.

The following steps describe how to set up the user data table that stores mappings from DID numbers to user extensions and fax identities.

1. Open UC Client as the admin.

2. Using the navigation pane on the left, select *Data Sources*.

3. Create a new user data table by right-clicking in the contents pane on the right and selecting *New > User Data…*

4. Give the data table a name like *SNR DB* or *Single Number Reach DB*. You may optionally set the description and instructions.

5. Click the *New* button two times to create two new fields in the data table.

6. Select the first field in the Name column and set it to **DID Number**. Change the *Data Type* to **Number**.

7. Select the second field in the Name column and set it to **Extension.** Change the *Data Type* to **Number**.

8. Click OK.

9. Right-click the new data table and select *Edit*

10. One at a time, add an entry for each user to the table by clicking *Add.*

11. Select the new row in the *DID* column and set the value for the user's DID number.
    Note: The DID number will be either 4 or 10 digits long, depending on what number is provided by the carrier. In most cases, the DID number presented by the carrier will be the last 4 digits of the 10 digit number. For example, if Bob's DID number is 2569631202 then the value for the DID should be set to **1202**.

12. Select the row in the *Extension* column and set the value for the user's extension number. This is the number that is assigned to this user's telephone. For example, **202**.
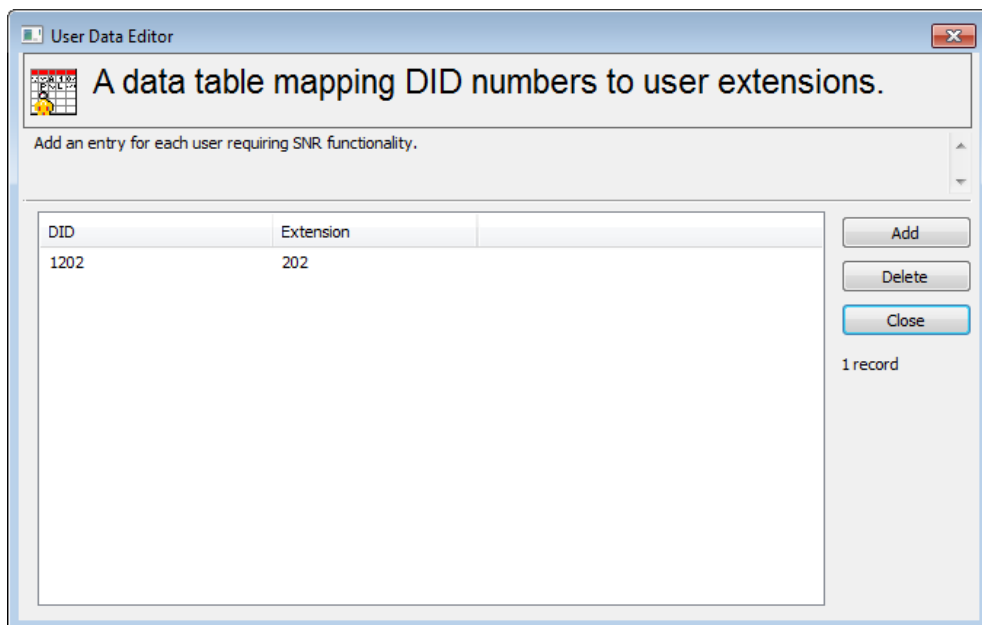
The following steps describe how to set up the generic SNR service and corresponding identities:

1. Using the navigation pane on the left, select the *Services* section.

2. Create a new service by right-clicking in the contents pane on the right and selecting *New > Service...* and give the service an appropriate name like "Single Number Reach".

3. The following screen shot depicts how to set up a generic SNR service for all users. The service makes use of the *Single Number Reach* user data table with the *Fetch Data* element which uses the *Called-Id Number* as the lookup value against the *DID* field in the table. Note that the *Transfer Call* element references the *Extension* field in the data table when a human voice is detected. You will need to record an announcement for the *Play Announcement* element that instructs the caller that they should wait to be connected (e.g. "Thank you for calling. Please wait while we connect you to your party."). The audio needs to be approximately 10 seconds in length in order to provide ample time for UC server to listen for CNG tones before transferring the call to the user's extension. If fax tones are detected during this

time then the call is pulled back through the *Detect Remote Party* element and it proceeds through the "Fax machine" connection pin. In this scenario the *Select Extension* element is then used to change the user profile context of the service to the user that owns the *Extension* field in the data table prior to receiving the fax.
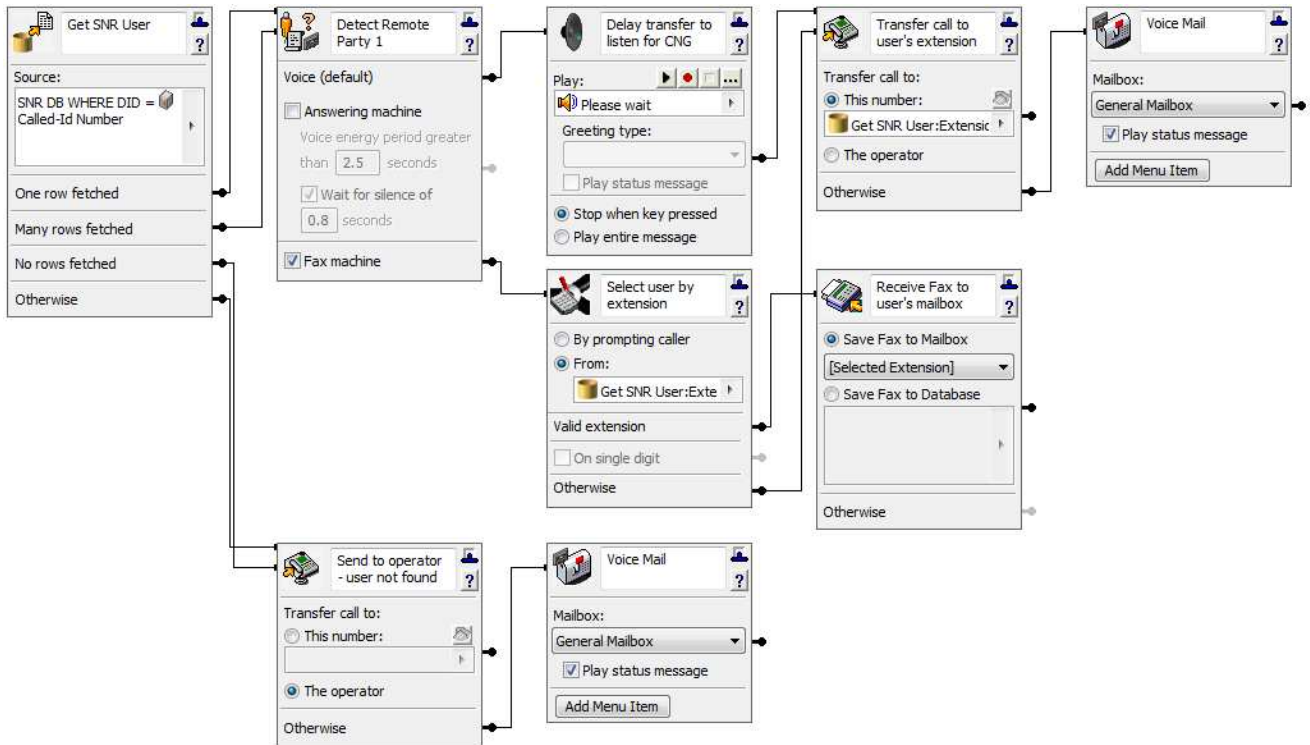
4. Save the service and close the editor.

Then, for each user requiring Single Number Reach functionality:

5. In UC Client, using the navigation pane on the left, select *Administration* then select *Identities*.

6. Create a new identity by right-clicking in the contents pane on the right and selecting *New Identity...* and click *Next* to skip the Welcome page of the Identity Wizard.

7. Ensure that both the **NetVanta 7000 Series** is the selected communication system and **Admin** is the selected user profile. Select the **Attendant Service** radio button and click *Next*.
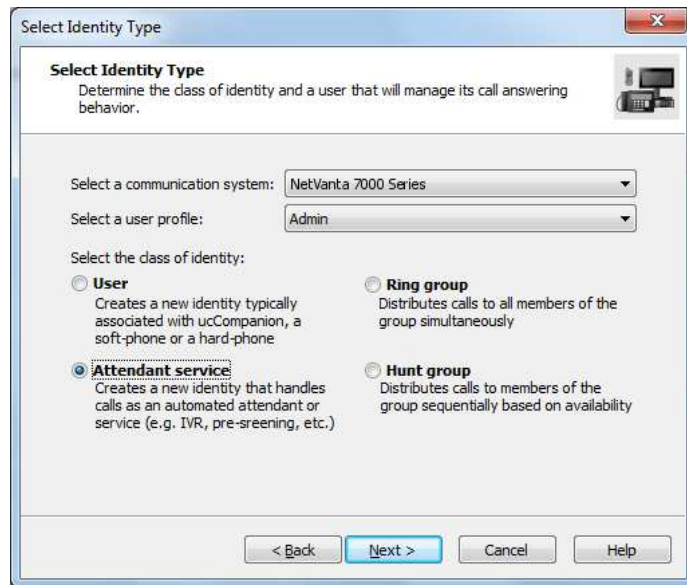
8. In the next page of the Wizard, give the identity a meaningful name like "Bob Myers' SNR", set the address to Bob's DID number, and select the generic SNR service that you just created using the selector button.

   Note: The DID number will be either 4 or 10 digits long, depending on what number is provided by the carrier. In most cases, the DID number presented by the carrier will be the last 4 digits of the 10 digit number. For example, if Bob's DID number is 2569631202 then the value for the address should be set to 1202.
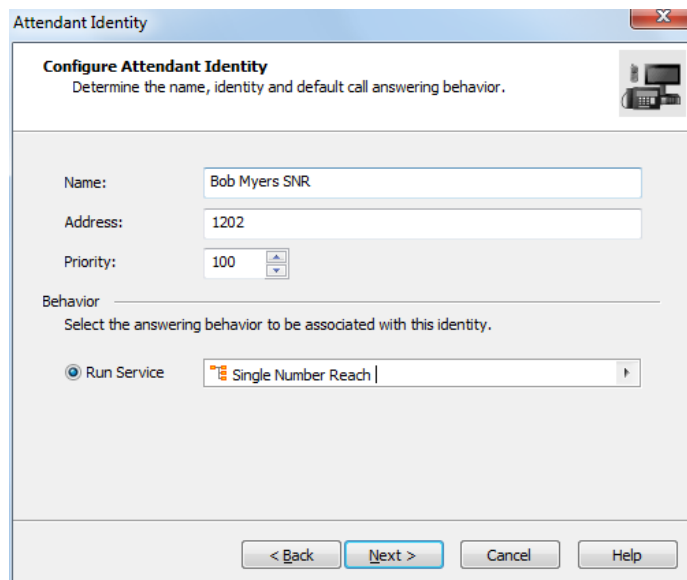
9. Click *Next* then *Finish*.

Testing and Verification

Test the new services and identities by calling a Single Number Reach DID number from an external telephone. When the call connects you should hear the announcement you configured in the service (e.g. "Please wait…"), then a few moments later you will be transferred to the corresponding user's extension. You must also test the new service by sending a fax to the same DID number from a real fax machine, ideally from somewhere outside of the corporate network from a real fax machine. The fax should be received and deposited into the corresponding user's mailbox.