This TSN describes how to set up NIC2 or NIC3 cards so that SES software can remotely program SES products over the Internet.

DISCLAIMER: SES offers this TSN for convenience only and cannot provide support or guarantee the relevance of the information contained in this TSN in any given situation. For 3rd party equipment questions, please contact the 3rd party manufacturer.

Overview

Typical home or business internet setups use a router to pass information amongst local Ethernet devices such as a PCs, printers and NIC cards and also provide connectivity for those devices to the internet when needed. As such, routers can be thought of as having two "sides": one being exposed to the internet and the other being shielded from the internet by the router. The internet side of the router has a fixed public/static IP address assigned by a local area Internet Service Provider (**ISP**). This assigned IP address is seen by other devices across the internet and is referred to as a "public" (or, when fixed in ***cellular*** routers, "static") IP address. Devices on the LAN side are not publicly "seen" over the internet unless the router is set to allow this.

All SES access control products (ACPs) have an available Ethernet card called a "NIC". The latest shipping version of this card is a "NIC3", but "NIC2" cards are everywhere. To program SES access controllers via Ethernet, the NIC must first be installed and connected to the LAN side of the router (see installation guide for NIC cards). Once connected, a PC connected on the same LAN should be able to program an ACP.

However, as a NIC card connected to a LAN cannot normally be "seen" from the public side of a router, programming through the NIC using a PC over the internet requires additional router setup. Although there are several methods to do this depending on the router, the simplest and most common method available is called "Port Forwarding", outlined in this TSN.

Port Forwarding

The steps below will be described on following pages to setup port forwarding:

1) Note the MAC address of the NIC card you wish to connect to over the internet
2) Identify the public IP address assigned to your router by the local ISP
3) Find the LAN address of your NIC using Lantronix CPR Manager software
4) Log into the router. To do this you will need to log into your router from a local PC using a web browser, the router's administration login access and any router documentation/instructions.
5) Reserve the IP address (if using DHCP)
6) Setup port forwarding
7) A PC on the internet running SES software

1) **Record the NIC card MAC address.** Look at the NIC card (NIC3 shown in image below).

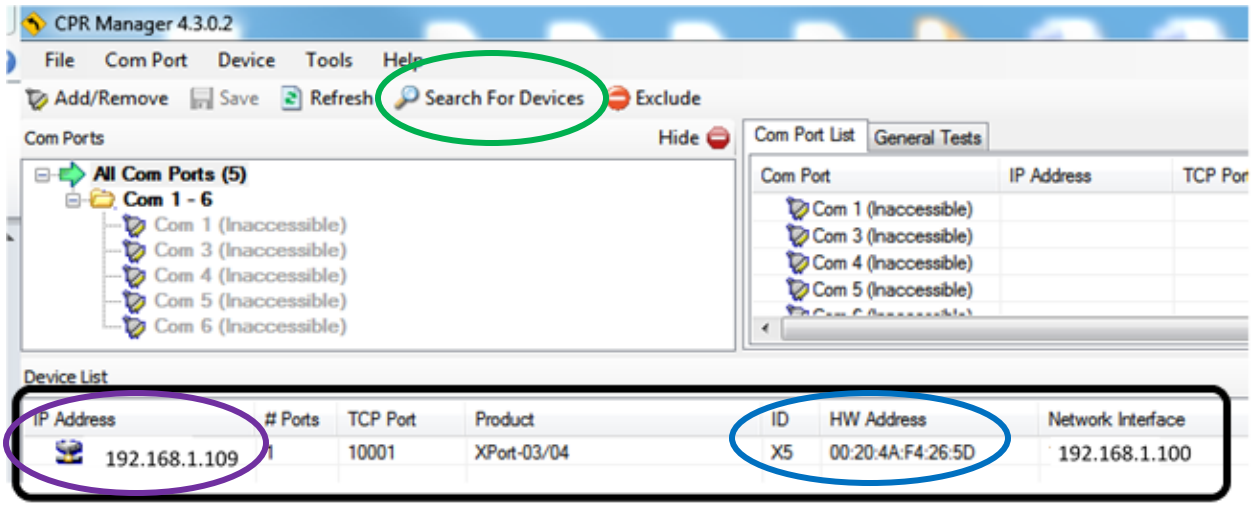
	Note down the MAC address for later reference (inside red oval).

2) **Identify the public IP address assigned to your router by the local ISP**
If the public IP address is unknown, go to http://whatismyip.org and record the IP address that is returned. It will look similar to this:

Your IP Address:
66.89.68.204

3) **Find the LAN address of your NIC**.
   a) Install the 3rd party CPR Manager software (provided on the SES USB or CD) onto your local PC. You can also download this software from: http://www.lantronix.com/ftp/cpr/Lantronix/4.3/4.3.0.3/Installers/SingleInstallFiles/setup_cpr_x86x64cd_4.3.0.3.exe
   Note that the version number may be different.

   b) Run CPR Manager and click on "Search For Devices" (green oval in image below). The software will scan to find all NIC cards connected on the LAN. After finishing the scan it will look similar to this:



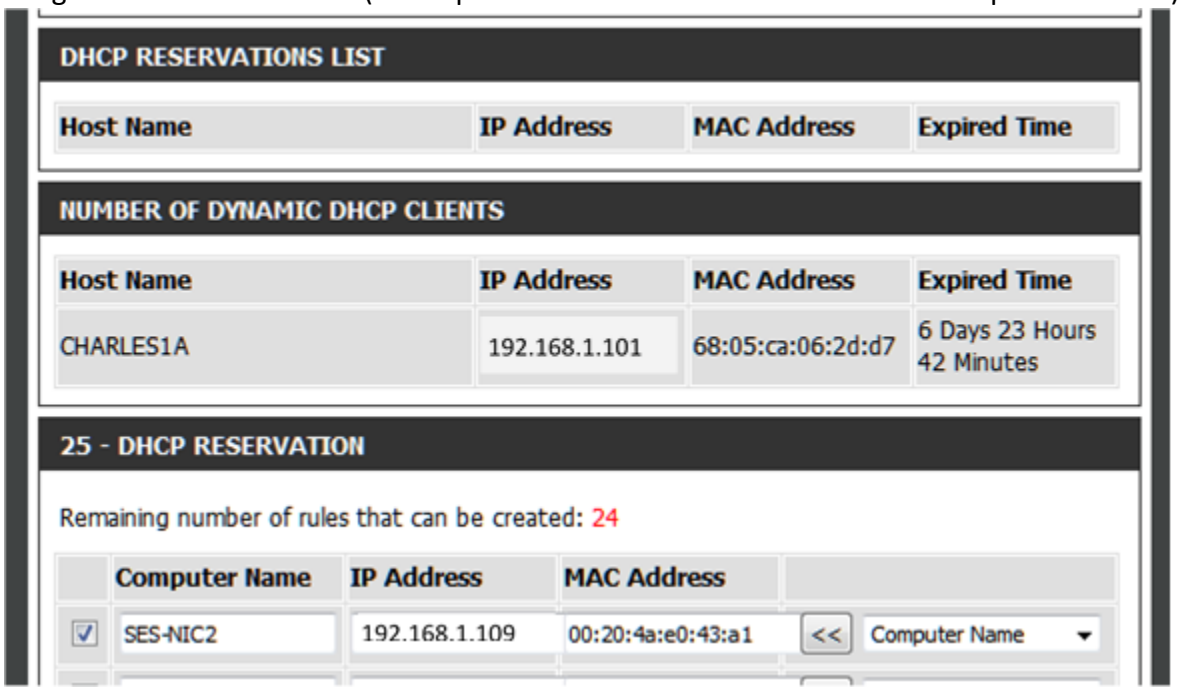
   c) Record the IP address (purple oval) and "HW Address" (this is the MAC address). In the example image above these are 192.168.1.109 and 00:20:4A:F4:26:5D respectively. The MAC address should match what was recorded from the NIC label in step 1. If more than one device is listed then you will need to select the MAC address (seen in step 1) from the list of displayed MAC addresses and then record the corresponding IP address.

The remaining instructions will vary depending on the router model, examples of which are provided for illustration and convenience only. ***Please contact your router manufacturer if you require technical support for your router***.

Here is a brief definition of common router terms to help you:
Service/Application: The name of the device/service.
External Port: Normally you would select a single port; for example 10001.
Internal Port: Normally you would select a single port; for example 10001.
Note: Normally, the External and Internal Port numbers are the same for basic setup.
Protocol: This is device dependent Set this to "TCP" or "Both", but ***not*** "UDP".
Device IP: - the LAN address of the SES NIC you are setting up (step 3c)

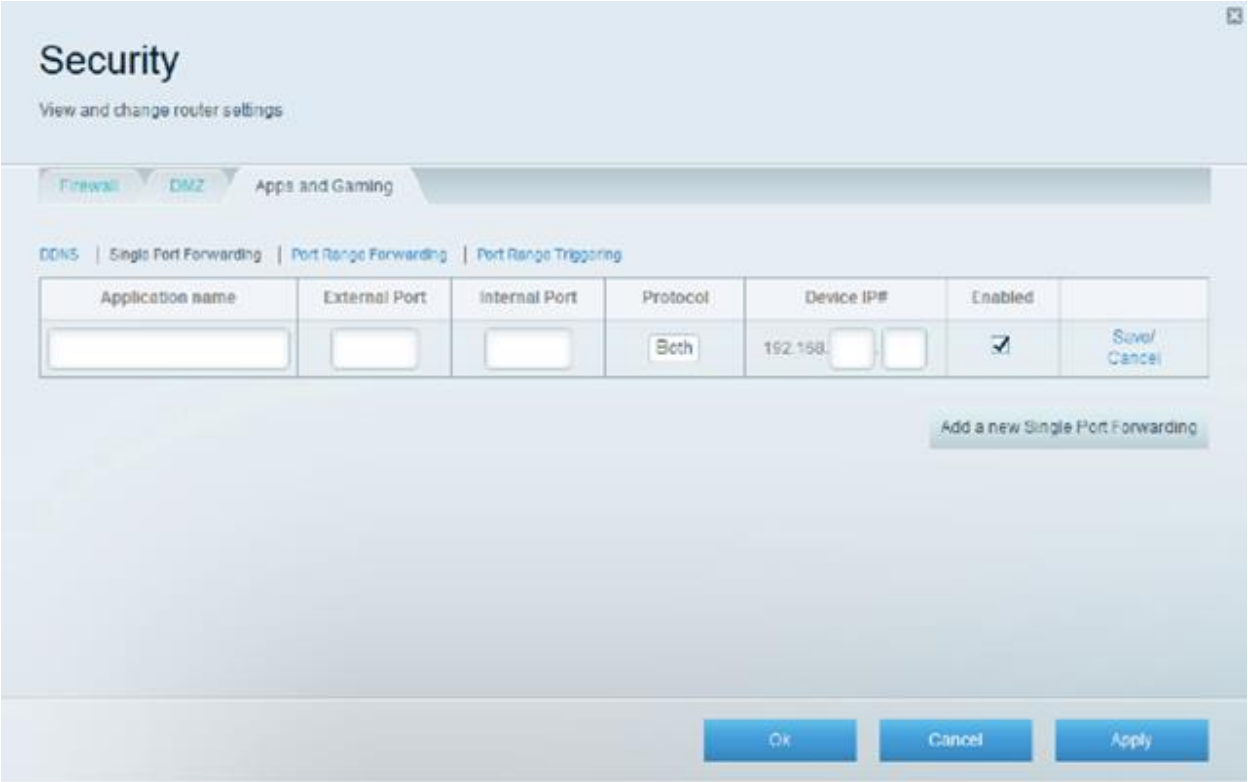
On the following pages, examples of different routers show how to set port 10001 to be 'Port Forwarded'. In some routers, a Port Forwarding rule will need to be created and enabled. "SES_NIC2" was the rule created for those examples.
Do not forget to save the settings.

4) Use a browser to log into the router as an administrator.
5) **Reserve the IP address** recorded from step 3. This keeps the IP address from changing if the router is rebooted or updated. Note that DHCP Reservation is not required if the NIC was assigned a static IP address (this topic is more advanced and outside the scope of this TSN).



In the example above (from a typical router administration page), the computer host (CHARLES1A) and the IP address (192.168.1.109) for an SES NIC2 are displayed. Depending on the router, you may have to save and update before continuing.

6) Go to the port forwarding section of your router and forward port 10001. Note that if you have configured the NIC to use a different port, you should forward that port number instead. The use of port forwarding prevents 'network traffic" on those specific ports from being blocked by the router firewall.
The Port Forwarding concept is shown below:



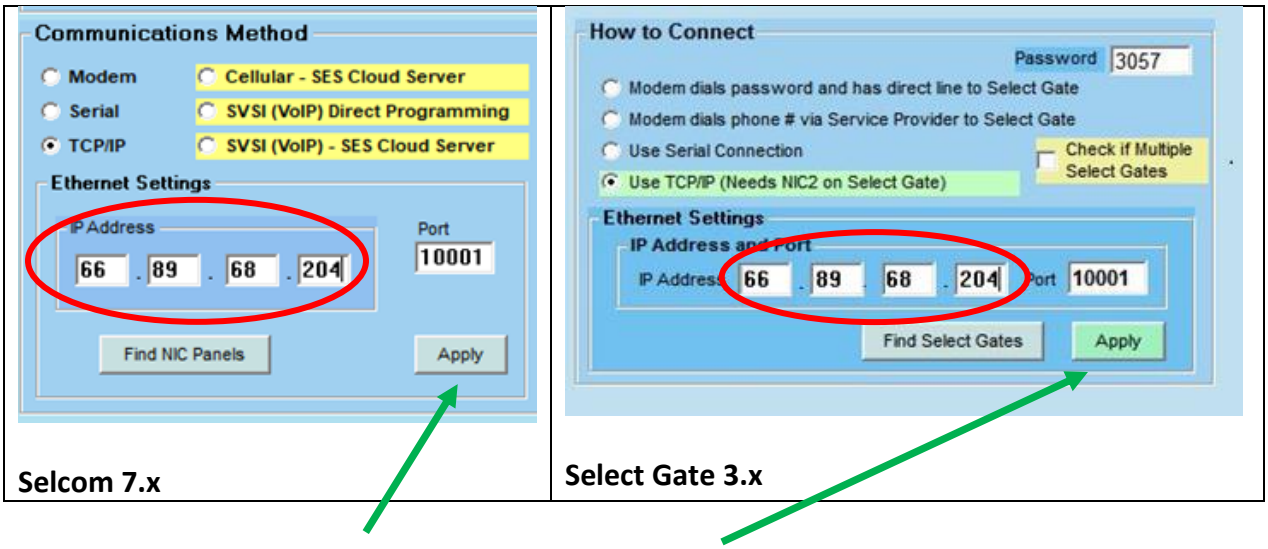
Port forwarding pages for common routers are shown at the end of this TSN

To review, you have:

- Determined external IP address (whatismyip.org)
- Used CPR Manager to determine internal (router) IP address and MAC address assigned by the router to the NIC2
- Performed a DHCP reservation for the device IP in the router
- Created a device rule (e.g. SES_NIC2) and port forwarded port 10001 in the router.

Once the router has been configured, test the configuration, using either Selcom Secured or Select Gate software as shown on the following pages.

7) Using SES software to test the router port forwarding setup.
   a) Open SES software (Selcom or Select Gate) and select your site.
   b) Edit the panel data screen (see images below)
   c) Add the static IP address you previously recorded. This is the IP address of your router assigned by the Internet Service Provider (ISP) (See step 1)

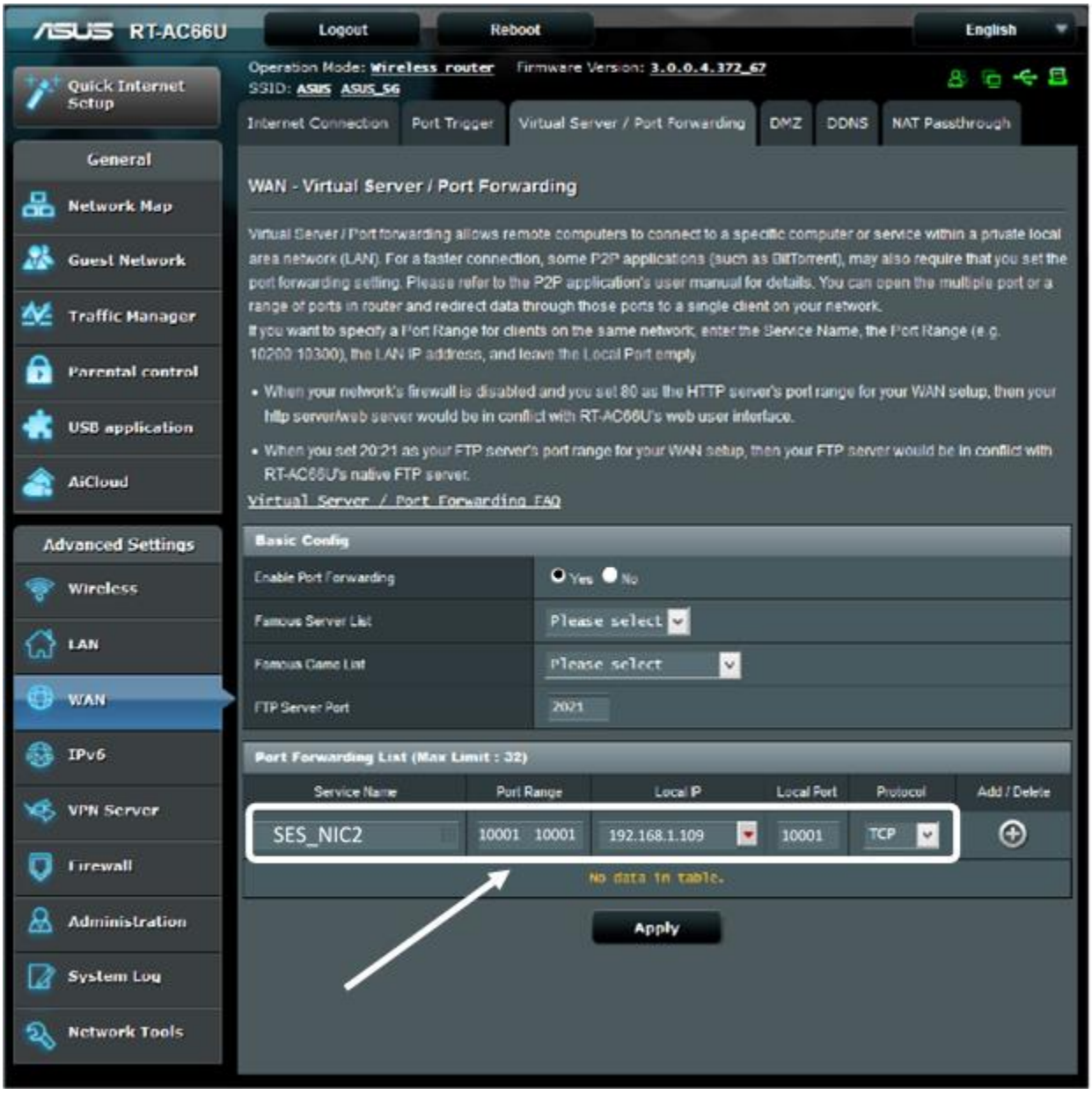


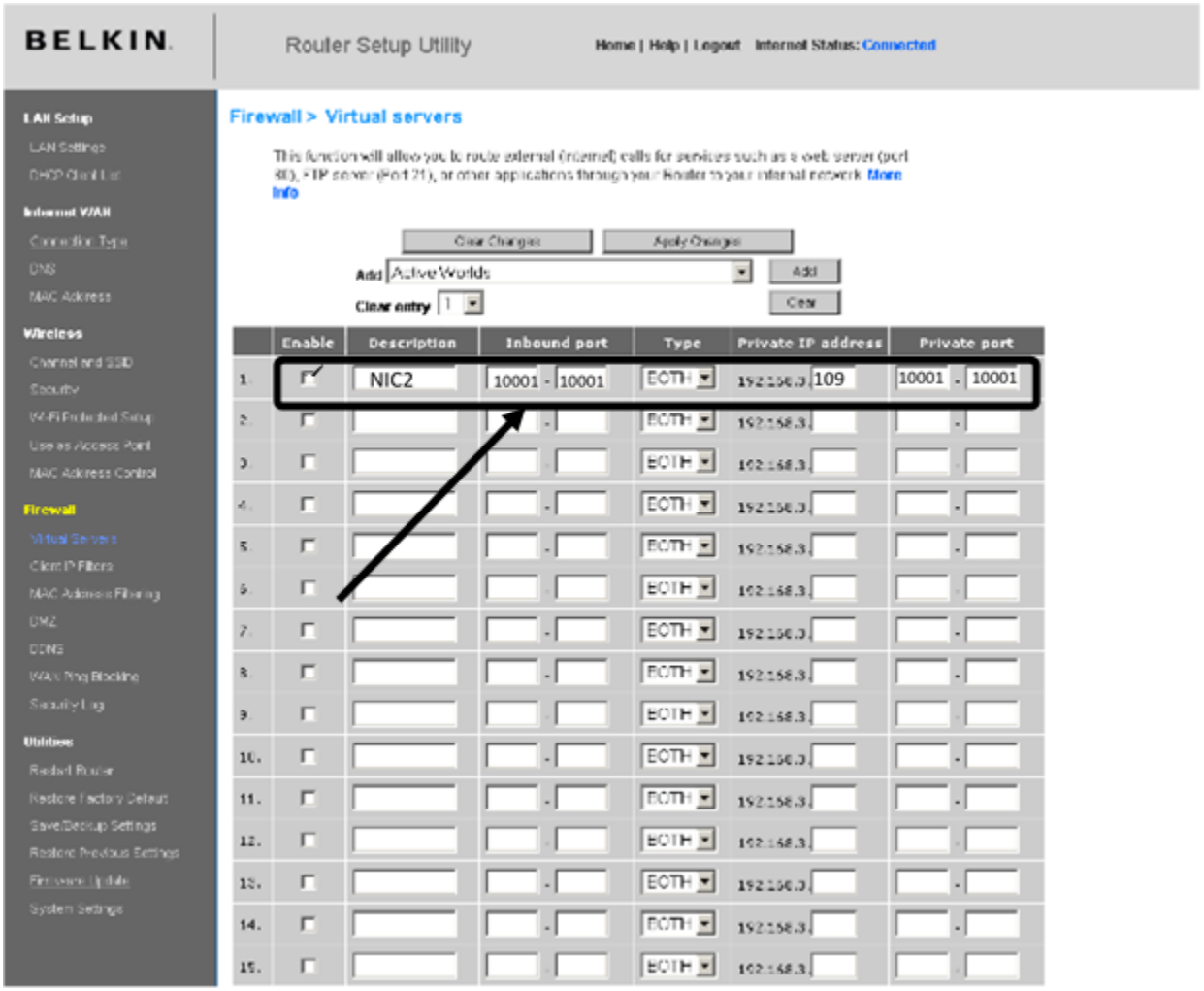
   d) Click the Apply button to save the settings.
   e) Selcom Secured 7 or Select Gate software should now be ready to communicate with the NIC, over the Internet. SES software will send TCP/IP traffic to the external IP address (ex. 66.89.68.204) on port 10001 and the router will port forward 10001 traffic to the reserved internal network IP address (ex. 192.168.1.109) and communications can now occur between SES software and the NIC on the SES panel.

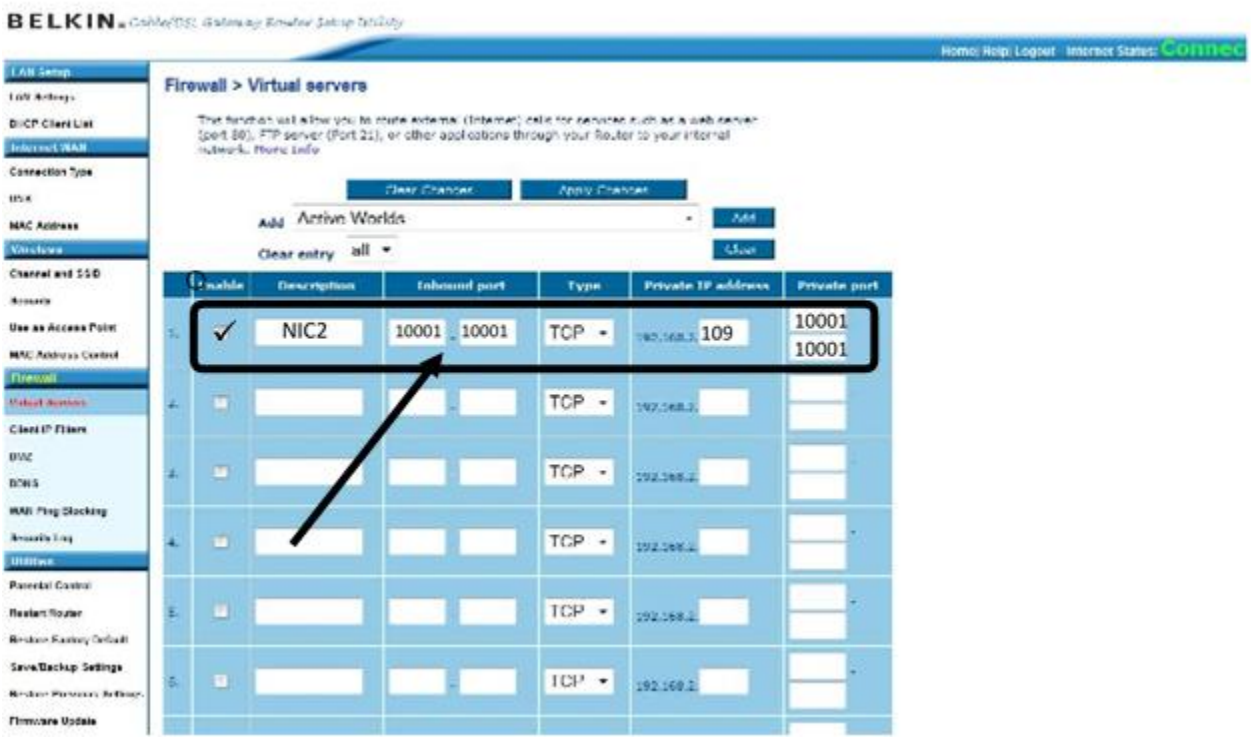
      If using Selcom Premium or Selcom Secured 7, correct operation can be verified using the “Send Test” task from the Automatic Interface page.

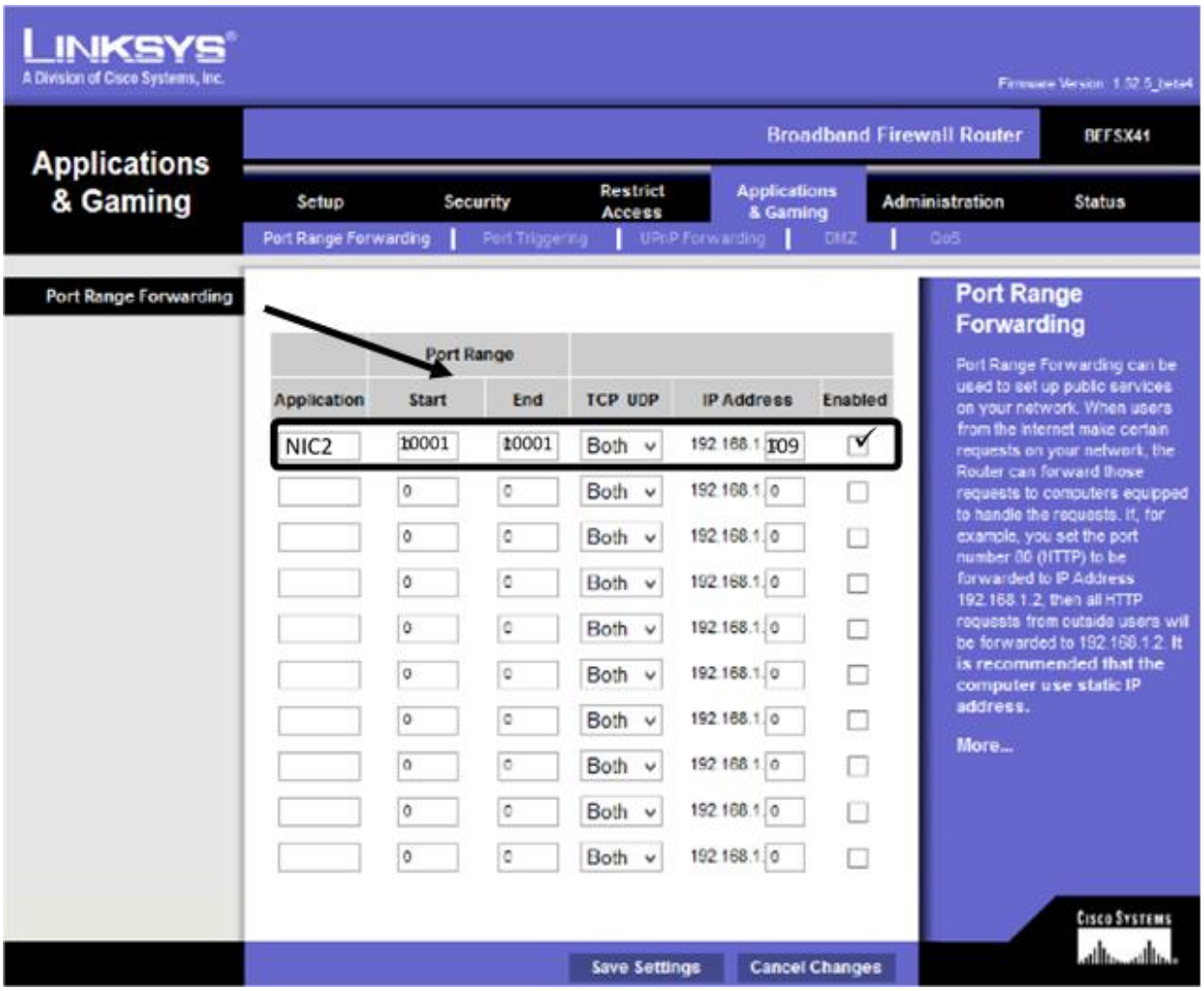
This procedure has for using a NIC on a single SES panel. If multiple panels are required to be used from a single location (external IP address) please refer to TSN-020.

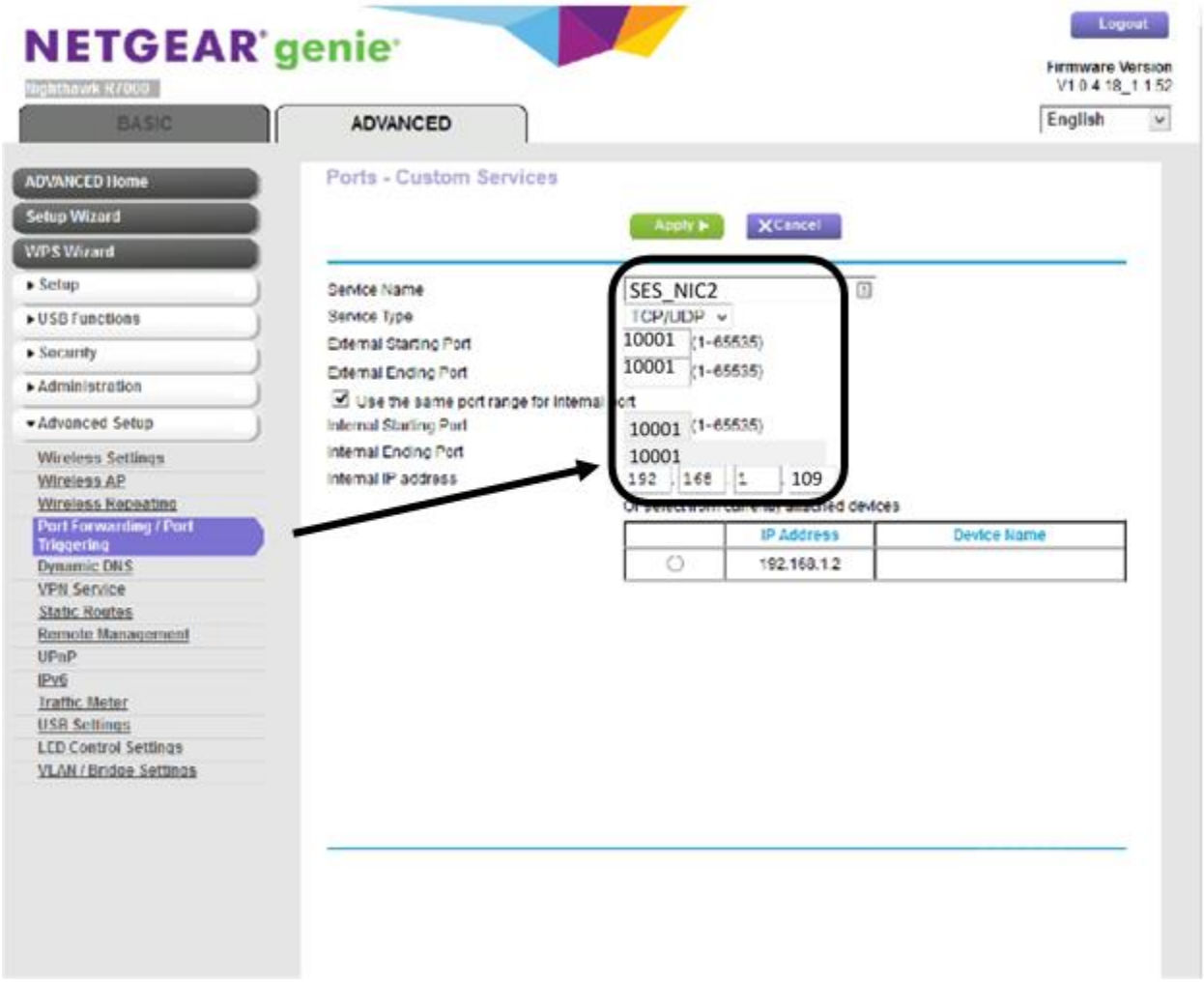
PORT FORWARDING PAGES FOR COMMON ROUTERS

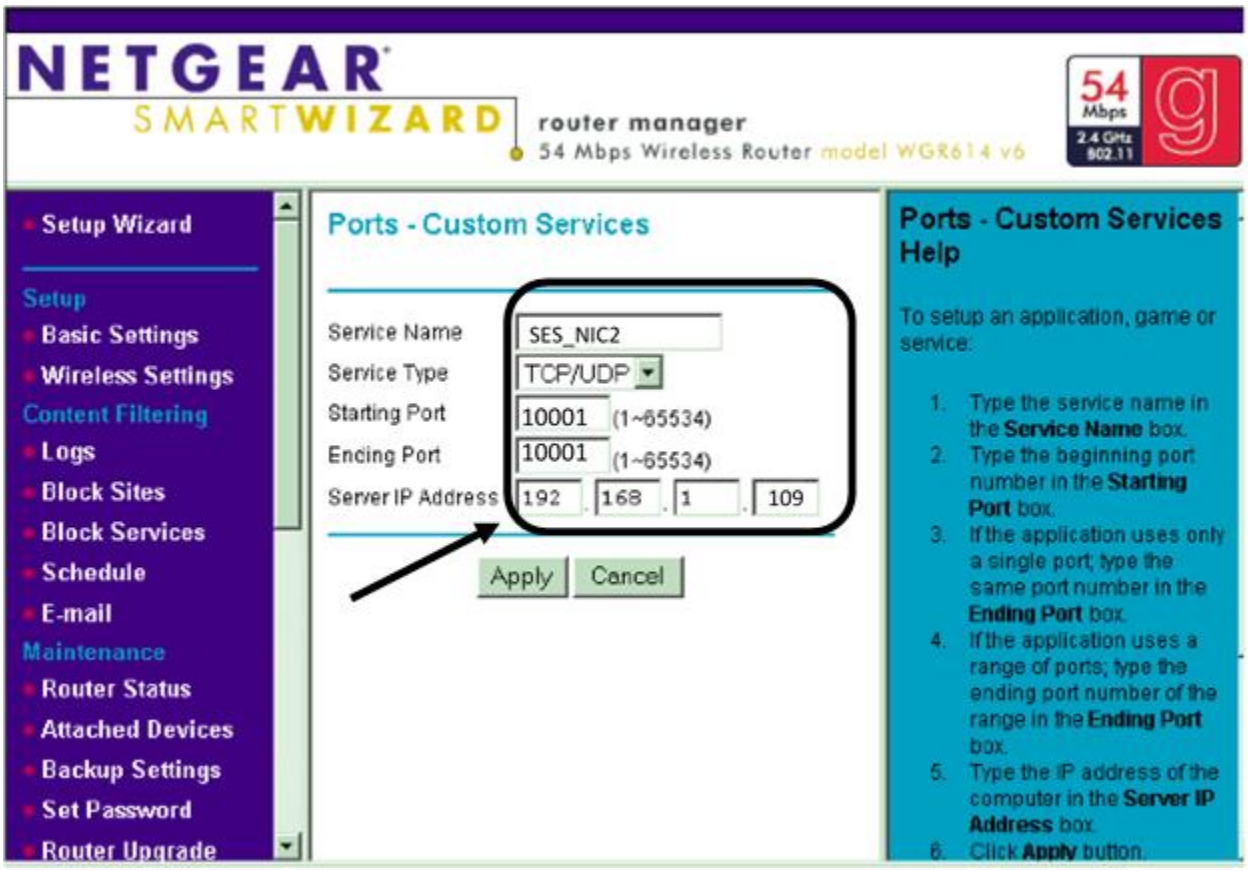



BELKIN
Router Setup Utility
Home | Help | Logout Internet Status: Connected
LAN Setup
LAN Settings
DHCP Client List
Internet WAN
Connection Type
DNS
MAC Address
Wireless
Channel and SSID
Security
Wi-Fi Protected Setup
Use as Access Point
MAC Address Control
Firewall
Virtual Servers
Client IP Filters
MAC Address Filtering
DMZ
DDNS
WAN Ping Blocking
Security Log
Utilities
Restart Router
Restore Factory Default
Save/Backup Settings
Restore Previous Settings
Firmware Update
System Settings
Firewall > Virtual servers
Clear Changes
Apply Changes
Add Active Worlds
Add
Clear entry 1
Clear
Enable
Description
Inbound port
Type
Private IP address
Private port
1. NIC2 10001 - 10001 BOTH 192.168.3.109 10001 - 10001
2. BOTH 192.168.3.
3. BOTH 192.168.3.
4. BOTH 192.168.3.
5. BOTH 192.168.3.
6. BOTH 192.168.3.
7. BOTH 192.168.3.
8. BOTH 192.168.3.
9. BOTH 192.168.3.
10. BOTH 192.168.3.
11. BOTH 192.168.3.
12. BOTH 192.168.3.
13. BOTH 192.168.3.
14. BOTH 192.168.3.
15. BOTH 192.168.3.


BELKIN
Home| Help| Logout Internet Status: Connec
Firewall > Virtual servers
Clear Changes
Apply Changes
Add Active Worlds
Add
Clear entry all
Clear
Enable
Description
Inbound port
Type
Private IP address
Private port
NIC2
10001 10001
TCP
109
10001
10001
Client IP Filters
DMZ
DDNS
WAN Ping Blocking
Parental Control
Restart Router
Save/Backup Settings
Firmware Update


LINKSYS
A Division of Cisco Systems, Inc.
Broadband Firewall Router
BEFSX41
Applications & Gaming
Setup
Security
Restrict Access
Applications & Gaming
Administration
Status
Port Range Forwarding
Port Triggering
UPnP Forwarding
DMZ
QoS
Port Range Forwarding
Port Range
Application
Start
End
TCP UDP
IP Address
Enabled
NIC2
10001
10001
Both
192.168.1.109
Port Range Forwarding
Port Range Forwarding can be used to set up public services on your network. When users from the Internet make certain requests on your network, the Router can forward those requests to computers equipped to handle the requests. If, for example, you set the port number 80 (HTTP) to be forwarded to IP Address 192.168.1.2, then all HTTP requests from outside users will be forwarded to 192.168.1.2. It is recommended that the computer use static IP address.
More...
Cisco Systems
Save Settings
Cancel Changes


NETGEAR genie
Logout
Firmware Version
V1.0.4.18_1.1.52
BASIC
ADVANCED
English
ADVANCED Home
Setup Wizard
WPS Wizard
Setup
USB Functions
Security
Administration
Advanced Setup
Wireless Settings
Wireless AP
Wireless Repeating
Port Forwarding / Port Triggering
Dynamic DNS
VPN Service
Static Routes
Remote Management
UPnP
IPv6
Traffic Meter
USB Settings
LCD Control Settings
VLAN / Bridge Settings
Ports - Custom Services
Apply
Cancel
Service Name
SES_NIC2
Service Type
TCP/UDP
External Starting Port
10001 (1-65535)
External Ending Port
10001 (1-65535)
Use the same port range for Internal Port
Internal Starting Port
10001 (1-65535)
Internal Ending Port
10001
Internal IP address
192 . 168 . 1 . 109
IP Address
Device Name
192.168.1.2


NETGEAR
SMARTWIZARD
router manager
54 Mbps Wireless Router model WGR614 v6
54 Mbps
2.4 GHz 802.11
Setup Wizard
Setup
Basic Settings
Wireless Settings
Content Filtering
Logs
Block Sites
Block Services
Schedule
E-mail
Maintenance
Router Status
Attached Devices
Backup Settings
Set Password
Router Upgrade
Ports - Custom Services
Service Name SES_NIC2
Service Type TCP/UDP
Starting Port 10001 (1~65534)
Ending Port 10001 (1~65534)
Server IP Address 192 . 168 . 1 . 109
Apply
Cancel
Ports - Custom Services Help
To setup an application, game or service:
1. Type the service name in the Service Name box.
2. Type the beginning port number in the Starting Port box.
3. If the application uses only a single port, type the same port number in the Ending Port box.
4. If the application uses a range of ports, type the ending port number of the range in the Ending Port box.
5. Type the IP address of the computer in the Server IP Address box.
6. Click Apply button.