



HCA Tech Note 106

Port Forwarding

Before you read this note hopefully you will have already read and followed the instructions in the Getting Started Guide for deploying client-server and being able to connect a client from the same machine that the server is running on and also from a different machine than the computer that is running the server but still on your internal network. Port forwarding is only needed when you are attempting to connect to the HCA Server from outside your network. Until you have client-server working on your internal network it isn't a good use of your time to proceed with attempting access from the outside.

To make use of the HCA Server and to use the mobile phone, tablet, and Windows applications from outside your network you must configure what is known as port forwarding.

When accessing the computer running the HCA Server on the internal network it is usually assigned an IP address something like 192.168.x.y. Where x is usually 0 or 1 and y is a number from 2 to 250. These are the usual numbers but what is used on your network depends upon how the network was configured.

Outside the firewall instead of that IP address, the connection is made to the IP address of your DSL or cable modem and to a port number. Port forwarding makes it possible for requests to arrive from outside the firewall and be directed to the device – the computer running the HCA Server – associated with that port.

If you have multiple routers in your system, you want to configure port forwarding on the one that connects the outside world to your network. For example, you may have a DSL or cable modem that brings internet access to your home and a wireless router as a wireless access point. The DSL or cable modem is where port forwarding must be configured.

Most routers have a firewall component that may also need to be configured. Some routers configure the firewall automatically when you configure port forwarding to allow a port through the firewall while in others you must configure the firewall separately.

Also, some routers have configuration that will block any “WAN to LAN” (from outside your network to inside your network) unless that is allowed. This may need to be set to allow access.

The bottom line is that there may be many steps necessary to get port forwarding correctly configured on your router to allow access to your network.

Unfortunately, this is where the story gets a bit hazy. Each router has a different method of setting up port forwarding and providing instructions for all routers is beyond the scope of these instructions.



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Do not underestimate the challenge of configuring port forwarding if you have not done it before. The router has a firewall that is designed to prevent exactly what you are trying to do. While it is always possible to configure the firewall and port forwarding to grant access to your network as needed, it can take a lot of effort. If you have not done this before you may need to find help in doing this.

As just one example, here is a screen image from a CenturyLink DSL modem. The HCA Server is using port 2000 and its internal IP address is 192.168.0.54.

Advanced Setup - Security

192.168.0.1/advancedsetup_advancedportforwarding.cgi

5. Click "Apply" to save your settings.

Apply

LAN IP	Protocol	Ports Forwarded	Remote Ports	Remote Defined	Edit
192.168.0.54	TCP	2000 - 2001	2000 - 2001	N/A	Remove
192.168.0.135	TCP	2102 - 2103	2102 - 2103	N/A	Remove
192.168.0.27	TCP	2016 - 2018	2016 - 2018	N/A	Remove

Connection Status: CenturyLink® DSL Connected

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One challenge in port forwarding is that you will configure the router to have the IP address of the computer running the HCA Server. That computer acquires its IP address from the router when it powers on (to be technical, from the DHCP Server which is probably your router). Most up-to-date routers are smart and each time that a device connects to your network when powered on it is assigned the same IP address. This is called *IP Reservations* and hopefully your router has that. Some routers must be configured to enable IP reservation in general or for specific MAC addresses. If your router has IP reservation or you can configure for it then you **do not** need to assign the computer running the HCA Server a static IP address.

If your router does not have IP Reservations then you must interact with Windows on the computer running the HCA Server to assign it a static IP address and make sure that that static address isn't one that your router



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may provide to another device (again to be technical, an address outside of the DHCP pool). You will need to know how to configure Windows networking and if you have not done it before you should find someone who knows how to configure Windows and networks. Or search online for something like “how to set a Static IP Windows 10” or for your version of Windows.

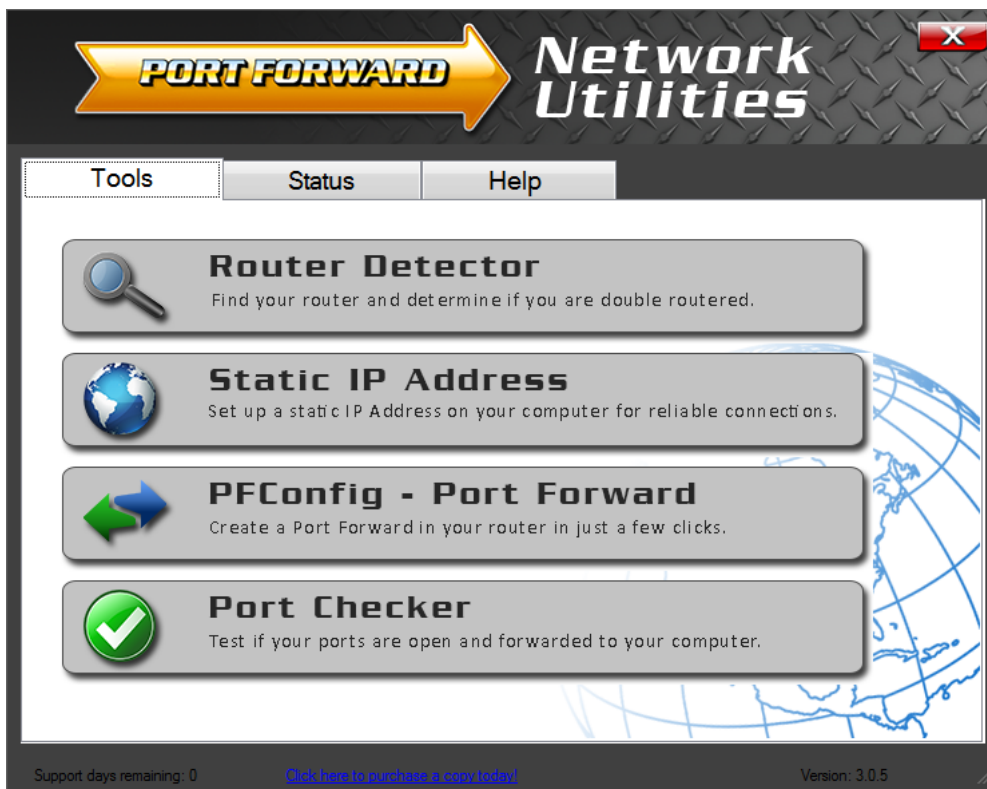
The best online help site for port forwarding is: <http://portforward.com/>

This is a good site but they try a bit too hard to sell their software and services. Using the free tools and information found there can help a lot without needing to purchase anything. We strongly urge you to use this site and the application you can download from it. It provides you a way to check your configuration of port forwarding and the firewall without using any HCA tools. Like getting a “second opinion”.

Follow this link and near the bottom of the page is a button labeled “Free Trial”.

<https://portforward.com/store/pfconfig.cgi>

After you install and start their application, a dialog appears for registration. You can skip that by pressing the “Trial” button. The main interface appears as:





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Press the “Port Checker” button and enter the port number the HCA Server is using (2000 unless you changed it) and then press the “Check Me” button.

The screenshot shows the PFPortChecker application window. The title bar reads "PFPortChecker by Portforward.com version 2.0.2". The interface includes a menu bar with "File" and "Options". On the left, there are four informational panels: "Instructions" (telling users to enter a port number and click "Check Me"), "Windows Firewall" (advising to allow firewall messages), "IP Address" (stating that all IP addresses will be tested), and "Firewall Logs" (providing the IP address 65.112.29.37). The main area contains a "Port Number To Check:" field with "2000" entered, a "Protocol:" section with "TCP" selected, and a "Check Me" button. A "Notes" box explains that TCP testing can detect forwarded ports to other devices, while UDP testing only works for ports forwarded to the computer. Below this, the "External IP Address:" is displayed as "Your external IP address is: 71.53.69.80". The "Port Check Result:" is "Your port is OPEN on another device!". A detailed note explains that this means a direct connection was established to another device on the network. At the bottom, there is a "Network Port Scanner" advertisement for GFI LanGuard and a link to "Open Port Check Tool Help".

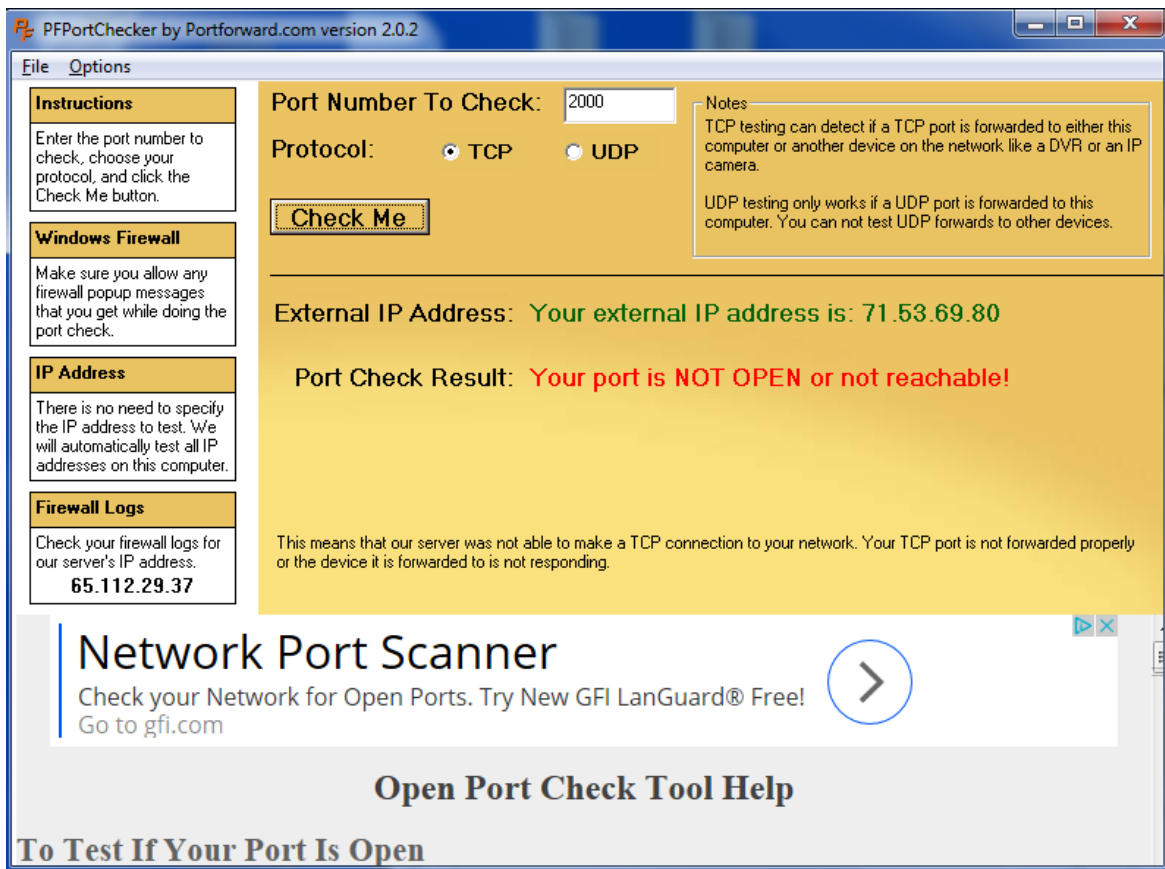
If you have configured everything correctly and if the HCA Server is running you should get a response like the one above saying that the port is open. If so, good job!

Big note: Make sure that you have opened a file in the server using the File – Open menu pick before trying the port check. We have made this mistake too many times to report. Until a file is opened the server doesn't allow connections to the port.



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A response that shows that something is blocking access to the HCA Server looks like this:



If it fails, these are areas to check:

- The correct HCA Server port. Make sure that the Port is set to 2000 or whatever you are using
- Port forwarding has been correctly configured in your router to the IP address of the computer running the HCA Server. Check that you configured the router with the IP address of that computer. If you don't know the IP address, on that computer start a CMD prompt and type IPConfig. It will show the IP address of the computer. Be careful that you take the correct address as different addresses will display for a wired and wireless connection if the computer has both.



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- Any firewall in the router has been properly configured. Some automatically configure it when you configure port forwarding. For others, you may need to do it separately.
- Your router is configured to allow port access in general. Some routers have an overall enable / disable of WAN (the outside world) to LAN (internal network) access so look for that.
- Some routers have a schedule that can be set that only allows access during some times of the day. Check that such a feature, if your router has one, isn't blocking access.

Again, this is the hardest part of setting up access to the HCA Server. It can be frustrating we know and it isn't easy for us either as we know that there is only limited support we can provide.

##end##