

# *Networking for the Gamer*

*v1.0*

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## Information un-related to networking:

A. How to install any game.exe as a Windows “service”  
(this enables you to run the game.exe with alternate security credentials (ie. Local System), monitor (stop/restart) and start the game.exe service at system boot)

**Following, is a collection of information I posted to the WiC (World in Conflict) forum. The information is helpful with regard to any/all gaming and has been split into the sections referenced by the table of contents above. I hope this information sheds some light on a few networking-issues that seem to be plaguing more and more gaming communities these days.**

**-- the Monk**

## *Port-forwarding with regard to gaming explained*

Port-forwarding is only required to HOST games behind a (NAT) device such as a router/firewall. If you are not planning to HOST game-servers you may skip this section in this guide.

Port-forwarding (also sometimes referred to as “Virtual Servers”) is significantly different from Port-triggering or as some routers put it “Special Applications”.

Port-forwarding = any data sent to the WAN IP (external ISP-assigned IP address of your router) will be “forwarded” to whichever computer you specify on your LAN.

Port-triggering = any out-going data going over a specified port will “trigger” / wake-up the router to allow in-coming traffic on certain other ports. This mode IS NOT REQUIRED / USED for hosting games.

For each game you wish to host, you will need to find the appropriate list of ports and protocols (ie. TCP, UDP) and forward those ports to the correct LAN IP address.

**Even though you may have now “forwarded” the correct ports to the correct LAN IP address you may still be experiencing “connection” issues when attempting to HOST servers. This is where the section below on NAT-filtering becomes important.**

## Network-address-translation (NAT) and gaming

The following section will explain NAT-filtering, and how it needs to be configured depending on the symptoms you are experiencing.

NAT (Strict) - Port AND Address-restricted NAT (the router/firewall insists that the packet return from both the same IP Address AND Port the packet was originally sent out to)

NAT (Moderate) - Port-restricted NAT (the router/firewall insists that the packet return from the same Port the packet was originally sent out to but doesn't care if the IP Address isn't the same)

NAT (OPEN) - Port AND Address independent NAT (the router/firewall doesn't care which Port OR IP Address the return packet comes from and simply forwards the data packet on to the internal IP you will have specified in your "port-forwarding")

### **NAT-FILTERING SETTINGS REQUIRED TO CONNECT TO SERVERS:**

**NAT (STRICT) CANNOT connect to any remote system that is NOT using NAT (OPEN) - so if your router/firewall is performing STRICT NAT you can ONLY connect to NAT-OPEN-end servers.**

**NAT (MODERATE) CAN connect to remote systems that are NAT (OPEN) AND NAT (MODERATE) - so if your router/firewall is set to MODERATE NAT you shouldn't have any connection problems.**

**NAT (OPEN) CAN connect to ALL remote systems that are NAT (OPEN) AND NAT (MODERATE).**

There. That takes care of the CONNECTING-TO SERVERS etc. part.

## **NAT-FILTERING SETTINGS REQUIRED TO HOST SERVERS:**

These settings apply whether you are player-hosting or dedicated server hosting.

**NAT (STRICT) CANNOT usually be "connected" to by others, although with the proper ports forwarded it WILL show up in the server list.**

**NAT (MODERATE) along with the necessary ports forwarded CAN be seen in the list AND connected to by people with NAT-OPEN, and SOME NAT-MODERATE (if the client ALSO has the correct ports forwarded), but CANNOT be connected to by NAT-STRICT.**

**NAT (OPEN) hosted servers can in ALWAYS be connected to by NAT-OPEN clients and NAT-MODERATE clients. Some NAT-STRICT clients (if they have "expensive" granular firewalls/routers WILL also be able to connect however they may experience connection-loss at times).**

Some SOHO (D-link, Netgear, Linksys, etc.) routers have an option called "GAMING MODE". Although I am not sure (each make & model is different) to which level enabling of this "gaming mode" relaxes your NAT-filtering (ie. Moderate or Open), it usually relaxes it enough so that in conjunction with the correct ports-forwarded you're able to HOST.

## **Cascading NAT/firewalls**

### **Cascading-NAT:**

Some people have (without being aware of it) created a "multiple-NAT" situation for themselves. Before attempting to HOST any game please make sure you know whether or not your DSL/cable

modem is functioning as a router besides being a modem. If so, there is no need for a separate router. If you need extra “ports” for multiple computers but your DSL/cable modem is already functioning as a router, invest in a network switch instead of a second router.

If you were unaware of your DSL-modem also being a router and have since installed a separate router you have now created a cascading-NAT scenario (double-nat) which requires special attention.

1. Please put the “external” IP of your separate router into the DMZ of your DSL-modem.
2. Now configure all necessary port-forwarding on your router (D-link, Linksys, Netgear, etc.)
3. Then address the NAT-Filtering as described above.
4. Now your “cascading-NAT” setup should be configured correctly

### **Multiple Firewalls:**

There is never a need for multiple software FIREWALLS. Your “properly-configured” router at the network edge is usually more than sufficient to stop all “un-solicited” traffic from entering your network. The only other “firewall” I ever recommend running is a “correctly-configured” windows firewall. As with most things, keeping it “simple” is best.

The Windows firewall (when used correctly) is the best way to protect your system without breaking things (in fact unless your router is horribly mis-configured there isn't even a reason to run a software "firewall" at all). Keep in mind, every software program that you install to "inspect" data traveling through your network

adapters "costs overhead" the end result of which can/will cause any number of problems.

Network traffic is really a very simple concept. It's like driving to work on the freeways in the morning! Firewalls can be the toll-booths in this example. How many toll-booths separating different toll-highways would be too many? I'm sure you get the picture. :)

### **Security Risks Associated with Gaming:**

OPEN-NAT is less secure than MODERATE, which in turn is less secure than STRICT. The security risks of "relaxed-NAT" only really become an issue if you're initiating non-server-related connections from behind the now OPEN-NAT, because the router will now accept connections back to the "open" (forwarded ports) and NOT insist that the connection on the remote system originate from the SAME port AND IP the out-going connection was sent to.

It's the same with port-forwarding. Ports should only be "forwarded" (open) when you are hosting/playing (any) a game that requires forwarding. Leaving ports forwarded all the time is similar in risk to leaving your NAT in a "relaxed" state even when not expressly needed.

The reason I am going to all this trouble to provide a deeper understanding of NAT configurations, is my concern for security and the fact that I am loathe to suggest to anyone to ever use the DMZ on the only hardware device between them and the internet.

Even OPEN-NAT is still NAT. DMZ's are different because when your system is in the DMZ an attacker can "see" the status of your "doors" (your 65000+ ports) and attack the "listening" ones without the hassle of circumventing a filter (most software

firewalls only do an "adequate" job at best and that at the cost of network-transport "overhead").

Would it be prudent to not leave your NAT relaxed and your ports forwarded? Yes, just as it's prudent to not open e-mail from an unknown source, browse unknown websites, and open shady attachments.

### Using "bypass firewall" in game-settings or .INI files

Some games allow you to set an option somewhere either in the in-game options or for dedicated servers in an .INI file, which effectively attempt to "bypass" your firewall.

These options should only be used if you are NOT able to complete the tasks (ie. Port-forwarding, relaxing NAT, etc.) as I've described them above. When I say "not able" I mean you are in a college dorm and don't have access to the router/firewall or your ISP is blocking something and is un-willing to un-block it.

If you have done everything as I've described make sure you **do not** enable some sort of "bypass firewall", "enable private IP", or the like. If you do that, you'll be creating a  $-1 + 1 = 0$  scenario in which you're canceling out what I've instructed you to do.

In short, the "bypass firewall" options are mainly provided as a last resort to resolve issues when one doesn't have "physical access" to network devices in order to configure them as described previously in this document.

## Information un-related to networking:

I should also mention that I actually run my servers game.exe as a windows "service" and am therefore able to run the game with alternate security credentials, start/stop it from the windows "services" list and have the game "service" monitored and automaticly re-started should it actually crash.

I run ALL of my dedicated servers for games in this way (I find many of them use less RAM and are far more stable when doing so).

here's what needs to be done for you to do what I've done to run any Game.exe as a windows "service" and therefore be able to start at system boot (if you desire), monitor it, run it with alternate security credentials (ie. local system), and be able to restart it!

Here's how,

1. Go to [[www.codeproject.com](http://www.codeproject.com)] and download a little app made by Xiangyang Liu called "XYNTServiceProject.zip"
2. Extract XYNTService.exe and XYNTService.ini from the .zip and place in your %systemroot%\gamepath folder. (folder which contains the game.exe)
3. I renamed the XYNTService.exe and XYNTService.ini to game\_Service.exe and game\_Service.ini respectively (I have more than one instance of this service for different apps)

4. Goto Start > Run > and enter "cmd" (without quotes) into the run field, then hit enter.

5. In the command prompt window navigate to your %systemroot%\gamepath folder.

cd\ <--hit ENTER after each command  
cd "\program files\wic" <--use quotes around the path  
dir <--to verify that the service .exe and .ini are there  
game\_service -i <--this installs the service to your "services" list in administrative tools.

6. Now we need to modify the service .ini file. Open the game\_service.ini using notepad. Here is my sample .ini

[Settings]

ServiceName=GAME\_dedicated <--the name under which it will show in the "services" list

CheckProcessSeconds = 120 <--how often to check if service still running

[Process0]

CommandLine = f:\games\game\game.exe <--all on one line

WorkingDir= f:\games\game\ <--path to game.exe

PauseStart= <-- not needed

PauseEnd= <-- not needed

UserInterface = Yes <-- wether or not you can see it in taskmanager

Restart = Yes <-- here's the restart command

WARNING!! the "CheckProcessSeconds=" value should NOT be set too low as you may not be able to down your server to make changes. I speak from experience!!! ;0

7. Now navigate to "Administrative Tools" > "Services" (alternatively run "services.msc" from the START > RUN field) and check the properties for the newly installed service "Game\_dedicated" (or whatever you called it in the .ini file value "ServiceName=") By default it will be set to start automatically. Here you may also change which credentials the service should run under. I've left mine at the default "local system" and the service runs fine. DO NOT change the "restart" settings here in the properties, that is what the .ini is for!

8. As soon as you right-click on the new service name and click "START" the service will start, which will in turn start your server!

I have tested and implemented all of the above on my various dedicated servers for various multi-player games.

To those who are averse to cli's and typing (averse to controlling their own destiny....hehe) a GUI to admin the above service can be found at the same website [[www.codeproject.com](http://www.codeproject.com)]

I have NOT used the GUI so please no questions related to the GUI (I'm sure it's self-explanatory anyway!)

## Appendix:

I have not much to write here except that I hope this information is helpful.

Please distribute the above information in its entirety. I (the\_Monk) take no responsibility for hardware failure/mis-configuration, data corruption/loss/theft or general computer system failure related in whole or in part to any/all of the information contained within this document.

Thank you,

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“the wise learn to Swim, by watching Fools drown” -- the Monk