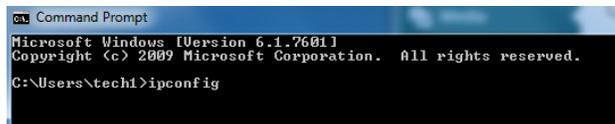


How to Set-up Your DVR/NVR on a Network

Ok, you wanna view your cameras over the Internet, but you don't know how? So, you opened this guide and now you're looking at it and you're like "What!?" There's a lot of info here but DON'T be intimidated. I am very thorough so this looks worse than it really is but just follow this step-by-step and you'll be fine. *NOTE: If you want to view this over your smartphone or iPad (like you've heard so much about), you have to set up your network first, so you've got no choice. The menu shots below are from a Dahua recorder, but the steps below should work for any system.

1) Get a basic understanding of how the network is laid out. If the DVR is behind multiple routers, ports must be forwarded through all routers.

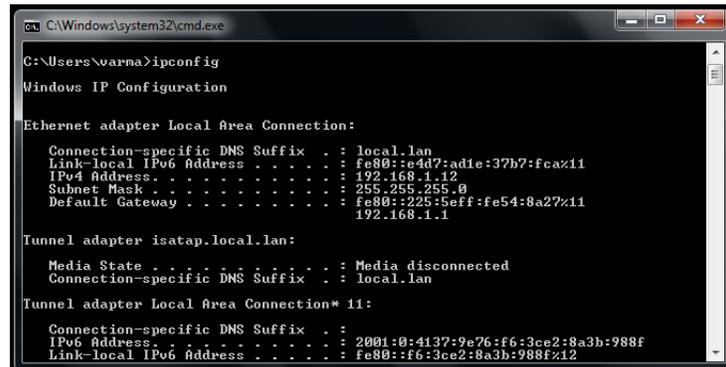
2) Find the **Gateway IP address** of the routing device that the DVR is attached to. If there is a Windows PC connected to the same network tier (router) as the DVR, running a **CMD prompt** from the start menu and typing the command **ipconfig** at the prompt will display the gateway information.



```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\techi>ipconfig
```

i. On a Apple Mac computer, pull down the apple menu in the top left corner and click on System Preferences. Next click on **Network** under **Internet and Network**. The address will appear next to the Router heading. Also note the **subnet mask**.



```
C:\Windows\system32\cmd.exe
C:\Users\varma>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : local.lan
    Link-local IPv6 Address . . . . . : fe80::e4d7:ad1e:37b7:fca%11
    IPv4 Address. . . . . : 192.168.1.12
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::2263eff:fe54:8a27%11
                                192.168.1.1

Tunnel adapter isatap.local.lan:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : local.lan

Tunnel adapter Local Area Connection* 11:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2001:0:4137:9e76:f6:3ce2:8a3b:988f
    Link-local IPv6 Address . . . . . : fe80::f6:3ce2:8a3b:988f%12
```

3) Take note of the DVR's IP address. Log into your DVR/NVR, right click and click on **Main Menu**.



4) From the Main Menu, click on **Network**.



From the **Network Menu** (with the **TCP/IP** tab highlighted) check if the DVR is set to **DHCP**. If so, disable it to allow the DVR to keep a static (non-changing) IP address. By default most DVR's are set statically at 192.168.1.108. If the gateway is different (i.e. 10.1.10.1), change the gateway IP address in the DVR to match the current network gateway (from the above steps) and also change the IP address to match the gateway (i.e. 10.1.10.108). When changing the IP address of the DVR, make sure that IP address is available by using the **ping** command in a **CMD prompt** (Windows) or **Terminal** (Mac). Also in more uncommon situations, the subnet mask may also be different and may need to be changed to match the network.



5) Take note of the DVR's **HTTP** and **TCP** ports found in **Network** and by clicking on **Connection**. The **HTTP port** is the web port used to view the DVR (or camera) on web browsers and the **TCP port** is the port used for mobile devices (DMSS) and VMS software (PSS). By default the HTTP

port is **80** and the **TCP** port is **37777**. If there is more than one DVR to be forwarded through the same network, the **IP Address, HTTP** and **TCP** ports must be different on each unit to differentiate them (i.e. 192.168.1.108 – 81 - 40001, 192.168.1.109 – 82 - 40002, etc.). Some ISPs do not allow for port 80 to be forwarded; in this case, the HTTP port should be changed on the DVR and forwarded instead.



6) Access the router by inputting the **Gateway IP address** noted in **step 2**, into a web browser. The router will usually ask for a username and password. If the log in information was changed from default, find out the credentials from the network administrator or internet service provider. Some of the more common default router log in combos are **admin/admin** and **admin/password**. Default router log in information can also be found on <http://www.routerpasswords.com>.

7) Once logged into the router, navigate to the Internet or Status section and find the IP address of the router. If the **WAN IP address** appears to look like a LAN IP (i.e. 192.168.x.x or 10.x.x.x), then another router is assigning this router an IP and the ports will need to be forwarded through both (see **Multiple Router Port Forwarding** section below for more details). Navigate to the **Advanced** section of the router and look for a **Gaming/Applications, Port Forwarding, Pinholes** or **Virtual Servers** menu. Sometimes the Port Forwarding menu can be located in the Firewall section of the router as well (below is an example of Linksys router and is for illustration only).

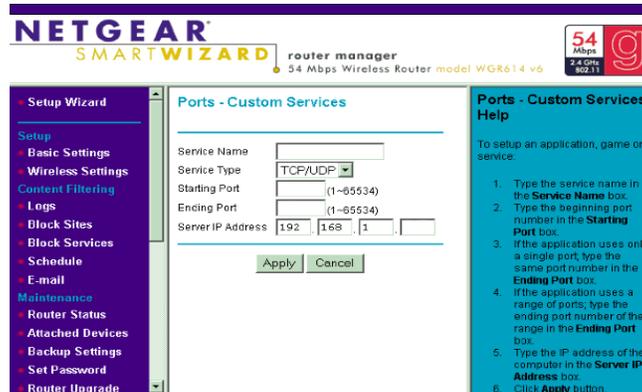


Port Range					
Application	Start	End	Protocol	IP Address	Enable
My DVR	5400	to 5400	Both	192.168.1.101	<input checked="" type="checkbox"/>
	0	to 0	Both	192.168.1.0	<input type="checkbox"/>
	0	to 0	Both	192.168.1.0	<input type="checkbox"/>

Every router brand and model is different, however there are **2** basic setups:

- i. The router allows for a set number of rules. In this case, select **Custom Ports** (rather than a preset port) if the option is available. For each rule, the router will usually ask for a private

(internal) and public (external) port range. Use the same port for all entries. The rule will also have a protocol setting; set it to **TCP**. Enter in the local (LAN) IP address of the DVR that corresponds to the port being forwarded. Make sure to save the port forwarding rules before navigating away from the menu (below is an example of Netgear router and is for illustration only).



ii. The router allows for port groups. In this case, a port group will have to be created and then assigned to an IP. When creating the group, name it something like "DVR http" or "DVR TCP". On some routers, multiple port ranges can be added to the same group. After creating (and saving) the group, assign the group to the **IP address of the DVR**. Save the port forwarding rules before navigating away from the menu.

8) After setting up the port forwarding rules, go to a website such as www.canyouseeme.org or www.yougetsignal.com/tools/open-ports/ to check and make sure that the ports are open. If the TCP port is open, but not the HTTP port, try changing the HTTP port to a number other than 80 or 8080 (i.e. 2000).



If both HTTP and TCP are not open, try the following steps:

i. Check the router for any firewall settings that could be blocking remote access. Every router make and model is different when it comes to firewall settings.

ii. Try setting up a **DMZ host**. To do so, navigate to the **Advanced** (or Firewall) section of the router and look for a **DMZ submenu**. From here, enter in the **local** (LAN) IP address of the DVR and save the settings. Sometimes the router will report that there are duplicate port forwarding rules, but this can be ignored. Test to see if the ports are open again. **NOTE:** The DMZ host only works for one device. The DMZ essentially opens all ports for that one device. Opening a DMZ presents a security vulnerability and the user may opt not to utilize this feature.

iii. If a DMZ host does not open up the ports, then double check to make sure that the router is not behind another router(s). If it is, check the **Multiple Router Port Forwarding** section below.

iv. If the previous step does not apply, the ISP may be blocking all port forwarding. Call the ISP to find out more information on why port forwarding is not working properly on the routing device. If a satellite internet service is being used, port forwarding may not work unless additional static IP addresses are purchased.

9) Once the correct ports are confirmed open, take note of the external IP address. The external IP address of the network can be found on www.ipchicken.com (or on any of the port checking sites linked previously). The external IP address can be used to view the device remotely or a DDNS can be setup.

Multiple Router Port Forwarding

1) After reviewing the previous section, and it is discovered that there are multiple routing devices, take the following steps:

i. Note the routing device that the DVR is currently attached to. Make sure that the computer used for network configuration is getting its network connection (IP address) from the same router. As in the previous section (steps 2-5), access to the router should be done by inputting the router's gateway IP address into a web browser.

ii. Log in to the router using the proper log-in credentials (see previous section **step 5**) and go to the **Status** or **Internet** menu of the router. Note the **Internet IP address** and **Default gateway** of the router. The IP address will be the dynamic IP address being issued by the router located above the current router in the network structure. The gateway address will be used to access the higher tier router.

iii. Forward the **HTTP** and **TCP** ports for the DVR's IP address as described in the previous section.

iv. Log in to the higher tier router using the Internet gateway address previously noted from **Step 2**.

v. Navigate to the **Status** or **Internet** menu of the higher tier router and inspect the **Internet IP address** and **default gateway**. Ensure that it has an address that is being assigned by the ISP either dynamically or statically. If it is another local IP address (i.e. 192.168.x.x or 10.x.x.x), then there may be a third router; this process will have to be repeated for each additional router.

vi. Repeat the port forwarding in **steps 6 and 7** from the previous section, however the ports must be forwarded for the Internet IP of the lower tier router (rather than the local IP address of the video recorder).

vii. Repeat **step 7** from the previous section to check to see if the ports are open.

viii. Repeat all steps from this section if there is any additional routers that the ports need to be forwarded through.