



Port Forwarding for CCTV

How to See Video Offsite

# KNOW BEFORE YOU GO

- Does Customer have Broadband
  - Is Broadband Cable or DSL
    - If Cable it is likely that ISP provides a router most often it is a wireless router. It is likely that the router authenticates with ISP based upon its MAC address so changing router may cause customer to lose ability to connect to internet.
    - Make sure customer has username and password information to log into router. Often found on a sticker on side of device.

# KNOW BEFORE YOU GO (2)

- If DSL does customer know PPOE authentication information. ( From ISP and cannot be guessed)
- DSL often provides a Modem/Router where device only has a single RJ-45 port.
- If Customer has login information for Modem/Router user can add a switch.
- IF ISP does not allow user configuration of device than device must be put into “Bridge” mode and a second router must be added so configuration can take place.

# KNOW BEFORE YOU GO (3)

- In case of DSL and Cable there must be an open port for NVR/DVR/Camera to connect.
- YOU MUST have a PC with you to configure router. This CANNOT be done via the DVR/NVR.
- You must have enough Ethernet cables to connect Devices simultaneously.

# KNOW BEFORE YOU GO (4)

- Know in advance how many ports need to be forwarded.
  - Some Devices only require one port such as the http port. Other devices require http and media port. Others can require http, media/rtsp and server ports.
  - Know if ports can be changed on CCTV device or if they are fixed.
  - Know if Router supports External/Public ports to be different from Internal/Private ports

# Understand Basics Of Computer Addressing and Subnets

- TCP/IPv4 are still most common used.
  - All address have been allocated but because of heavy use of private subnets most ISPs are still providing a v4 address.
- TCP/IPv6 provides enough address for every star in the universe to have 100 address.
- Understand difference between a Public and Private address.

## Understand Basics Of Computer Addressing and Subnets (2)

- Private address such as 192.xxx.xxx.xxx or 10.xxx.xxx.xxx can only be seen by devices who are part of the same network. Address of this type can only be seen when user is part of INTRANet or LAN.
- Public address such as 68.88.xxx.xxx can be seen from anywhere in the World (thus the term World Wide Web) and are part of INTERNet or WAN.

## Understand Basics Of Computer Addressing and Subnets (3)

- If Your IP camera has the IP address of 192.0.0.64 and your computer has the address of 192.168.1.101 you are not going to be able to view a live image.
- Likewise if your DVR is plugged into the router and has the address of 192.168.1.50 and your laptop is connected via a wireless connection and has the address of 192.168.2.100 you cannot see the images from the DVR. It is not uncommon for the wireless subnet to be different than the wired.



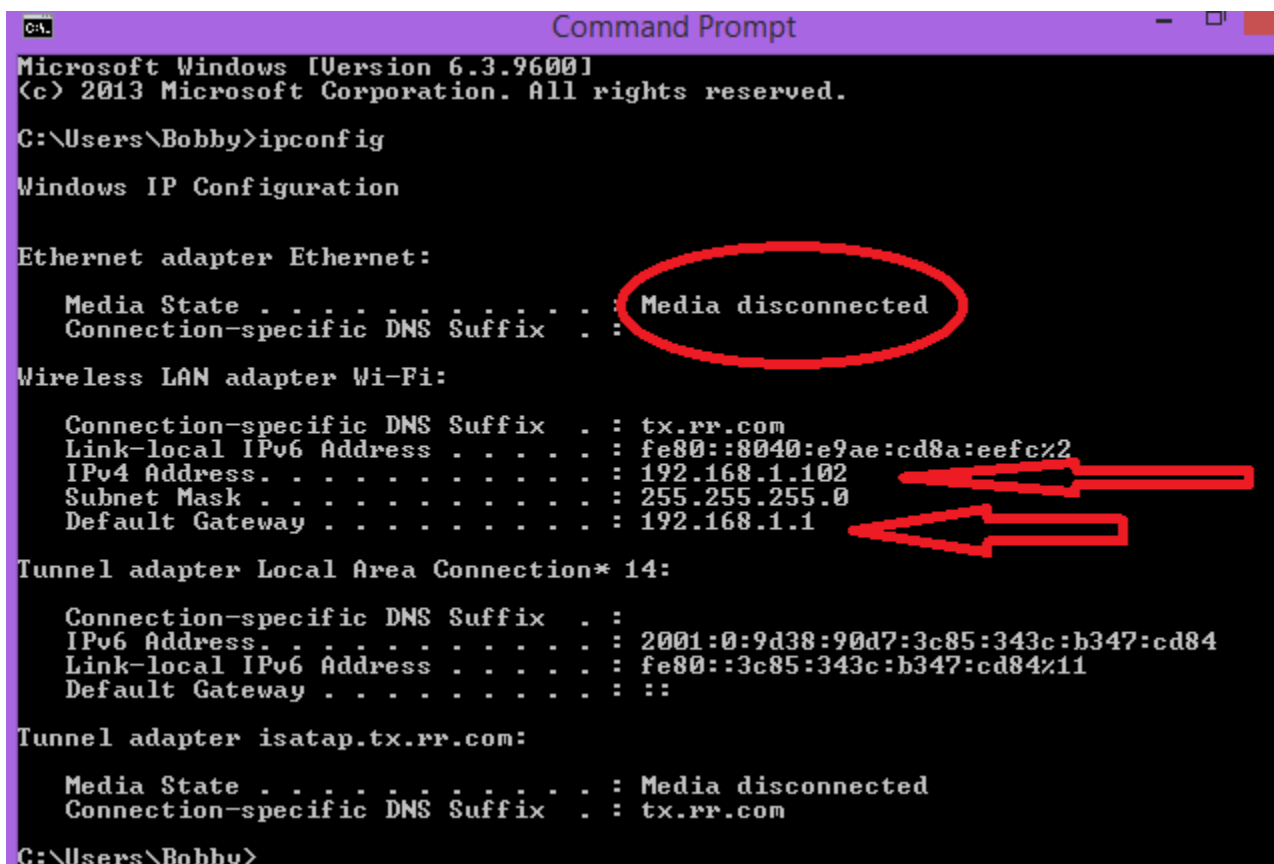
# DETERMINE IP ADDRESS OF COMPUTER

- Fastest way is by using “Command Prompt”
  - Windows XP go to START, click “run” type cmd or command and press enter
  - Windows 7/8 type “Command Prompt” into search window

```
Microsoft Windows [Version 6.3.9600]  
(c) 2013 Microsoft Corporation. All rights reserved.  
C:\Users\Bobby>
```

# DETERMINE IP ADDRESS OF COMPUTER (2)

- With Command Box open type command “IPCONFIG” which stands for IP configuration.



```
C:\Users\Bobby>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : tx.rr.com
    Link-local IPv6 Address . . . . . : fe80::8040:e9ae:cd8a:eefc%2
    IPv4 Address. . . . . : 192.168.1.102
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Tunnel adapter Local Area Connection* 14:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2001:0:9d38:90d7:3c85:343c:b347:cd84
    Link-local IPv6 Address . . . . . : fe80::3c85:343c:b347:cd84%11
    Default Gateway . . . . . : ::

Tunnel adapter isatap.tx.rr.com:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : tx.rr.com

C:\Users\Bobby>
```

# DETERMINE IP ADDRESS OF COMPUTER (3)

- Note that it shows that the wired Ethernet connection shows “Media Disconnect”
  - If you are using a wired connection and this message is displayed check cable
  - This message may also result if you are plugged into a switch and no router is available
  - If possible always use a wired Ethernet connection as wireless can add variables (like a different IP subnet than the wired connections) that must be accounted for when troubleshooting

## DETERMINE IP ADDRESS OF COMPUTER (4)

- Wireless connection shows TCP/IPv4 address of: 192.169.1.102 with a default gateway of 192.168.1.1
- Subnet mask will be 255.255.255.0 in 99% of the cases when IP address is 192.xxx.xxx.xxx as it is standard subnet mask for this subnet (Class C type)
- The Gateway address is the address of the router where the port forwarding must take place.

# Warning!

- For port forward to work you must be using router that is connected to the World Wide Web.
- Look for the WAN/Internet/Public address of router and make sure it is not an 192.xxx.xxx.xxx or 10.xxx.xxx.xxx address. If it has one of these private address for its Internet address there is another device on site doing the routing. You may therefore need to forward the desired ports in one router to the IP address of the second router to which the CCTV device is connected and then again in that router to the CCTV device.

# Warning! (2)

The screenshot shows the Linksys WRT54G router status page. The page is titled "Status" and "Wireless-G Broadband Router WRT54G". The firmware version is v4.20.6. The page is divided into sections: Router Information and Internet Configuration Type. The Router Information section lists: Firmware Version: v4.20.6, May. 26, 2005; Current Time: Thu, 26 Dec 2013 11:28:17; MAC Address: 00:14:BF:43:48:3D; Router Name: WRT54G; Host Name: ; Domain Name: tx.rr.com. The Internet Configuration Type section lists: Login Type: Automatic Configuration - DHCP; IP Address: 76.184.50.123; Subnet Mask: 255.255.240.0; Default Gateway: 76.184.48.1; DNS 1: 209.18.47.61; DNS 2: 209.18.47.62; DNS 3: ; MTU: 1500. There are two buttons at the bottom: DHCP Release and DHCP Renew. Annotations with arrows point to the IP Address and Login Type fields.

**LINKSYS**  
A Division of Cisco Systems, Inc. Firmware Version : v4.20.6

**Status** Wireless-G Broadband Router **WRT54G**

Setup **Wireless** Security Access Restrictions Applications & Gaming Administration Status

Router | Local Network | Wireless

**Router Information**

Firmware Version : v4.20.6, May. 26, 2005  
Current Time : Thu, 26 Dec 2013 11:28:17  
MAC Address : 00:14:BF:43:48:3D  
Router Name : WRT54G  
Host Name :  
Domain Name : tx.rr.com

**Internet**

Configuration Type

Login Type : Automatic Configuration - DHCP  
IP Address : 76.184.50.123  
Subnet Mask : 255.255.240.0  
Default Gateway : 76.184.48.1  
DNS 1 : 209.18.47.61  
DNS 2 : 209.18.47.62  
DNS 3 :  
MTU : 1500

DHCP Release DHCP Renew

This tells you if customer has a static IP address or if in this case they get a Dynamic public address.

This is the External address of this router. It is a Public address (not 192/10.xxx.xxx.xxx) so creating port forwards in this router will work.

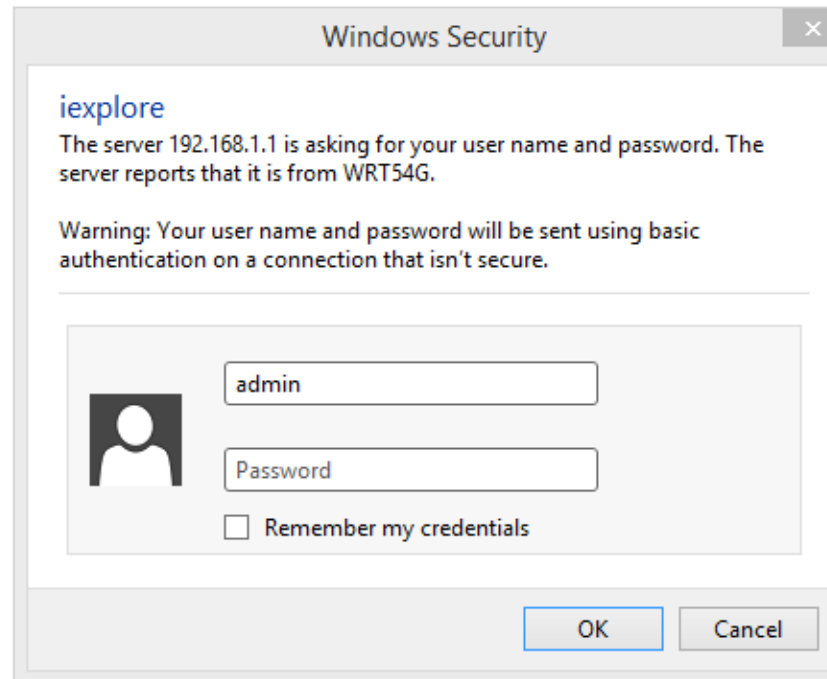
# Configure Router

- Open Browser (ie works more times than not though you can use Google/Firefox etc.)
- In URL bar type http:// and the gateway address. (in example it is 192.168.1.1)



# Configure Router (2)

- Most of the time a “challenge screen” will appear requiring you to enter user name and password. Some AT&T routers do not ask for username and password until an attempt is made to make a change.





# Configure Router (3)

- Where you go next can vary greatly. Some routers put port forwarding under “Applications and Gaming”. Others under Advanced Options/Pin Holes or Advanced Options/Port Forwarding. Refer to Router user Manual

LINKSYS®  
A Division of Cisco Systems, Inc. Firmware Version : v4.20.6

Wireless-G Broadband Router WRT54G

Applications & Gaming

Port Range Forward

Port Range					
Application	Start	End	Protocol	IP Address	Enable
Server	8000	to 8000	Both	192.168.1.55	<input checked="" type="checkbox"/>
RTSP	1080	to 1080	Both	192.168.1.55	<input checked="" type="checkbox"/>
Http	8008	to 8008	Both	192.168.1.55	<input checked="" type="checkbox"/>

Port Range Forwarding :  
Certain applications may require to open specific ports in order for it to function correctly. Examples of these applications include servers and certain online games. When a request for a certain port comes in from the Internet, the router will route the data to the computer you specify. Due to security concerns, you may want to limit port forwarding to only those ports you are using and

Save Settings Cancel Changes

CISCO SYSTEMS

# Configure Router (4)

- This shows using external (Public) ports that are different than the Internal (Private) Port. User on local network does not need to put :8008 at end of IP address in previous slide.

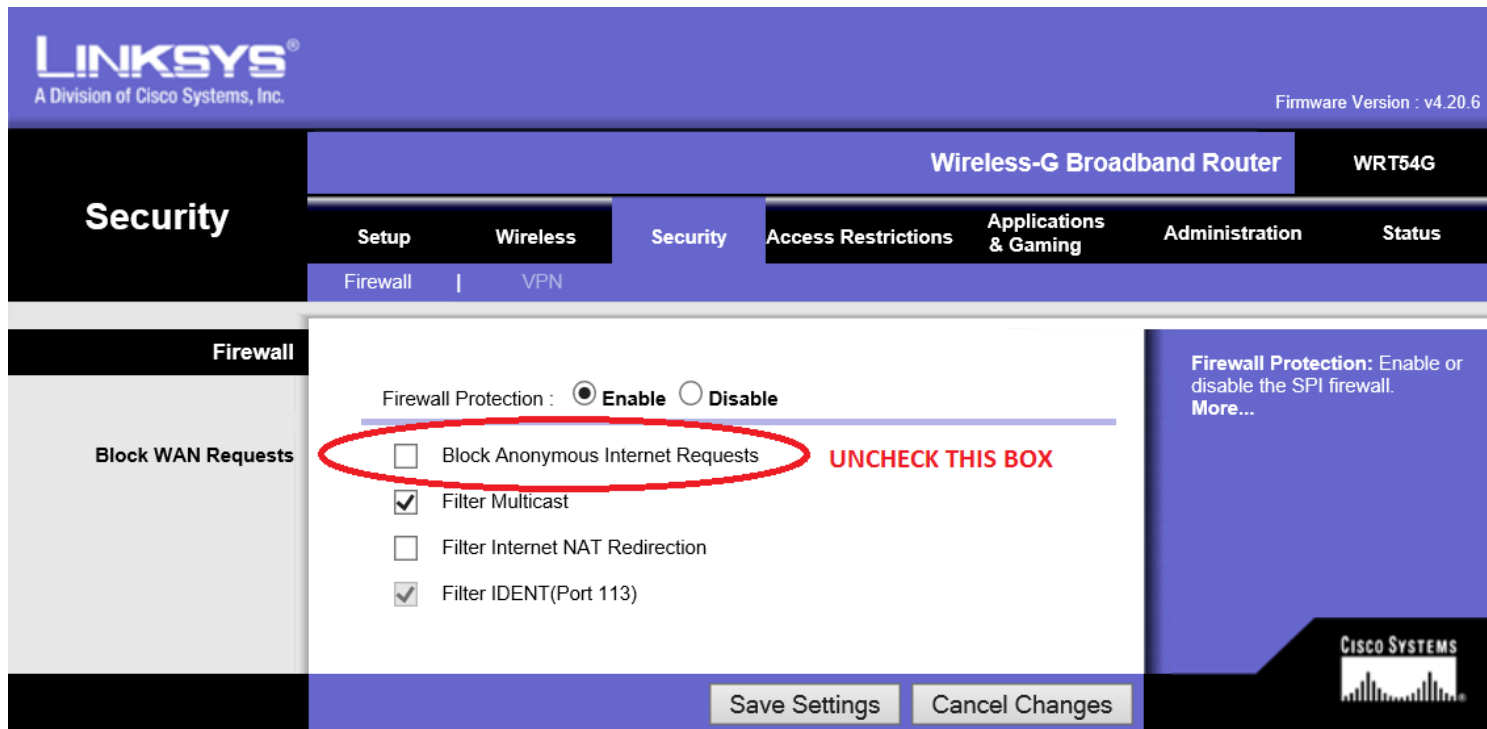
The screenshot displays the 'Applications & Gaming' configuration page on a router. The navigation bar includes 'Setup', 'Wireless', 'Security', 'Applications & Gaming', 'Administration', and 'Status'. Under 'Applications & Gaming', there are sub-links for 'Single Port Forwarding', 'Port Range Forwarding', 'Port Range Triggering', 'DMZ', 'IPv6 Firewall', and 'QoS'. The 'Single Port Forwarding' section is active, showing a list of applications and their corresponding port forwarding rules.

Application Name	External Port	Internal Port	Protocol	To IP Address	Enabled
None	---	---	---	192 . 168 . 1. 0	<input type="checkbox"/>
None	---	---	---	192 . 168 . 1. 0	<input type="checkbox"/>
DVR Media	1080	554	Both	192 . 168 . 1. 55	<input checked="" type="checkbox"/>
DVR HTTP	8008	80	Both	192 . 168 . 1. 55	<input checked="" type="checkbox"/>
DVR Sever	8000	8000	Both	192 . 168 . 1. 55	<input checked="" type="checkbox"/>

A 'Help...' link is visible on the right side of the page.

# Configure Router (5)

- Some Routers have security features which will prevent viewing of video from outside network. Linksys/Cisco for instance require this change within Security Settings



The screenshot shows the Linksys router's web interface. The top navigation bar includes the Linksys logo, the text 'A Division of Cisco Systems, Inc.', and the firmware version 'v4.20.6'. The main navigation menu is divided into 'Security' and 'Wireless-G Broadband Router WRT54G'. Under 'Security', there are sub-menus for 'Setup', 'Wireless', 'Security', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. The 'Security' sub-menu is further divided into 'Firewall' and 'VPN'. The 'Firewall' section is active, showing 'Firewall Protection' set to 'Enable' (radio button selected) and 'Disable' (radio button unselected). Below this, there is a section for 'Block WAN Requests' with several checkboxes: 'Block Anonymous Internet Requests' (unchecked and circled in red with the text 'UNCHECK THIS BOX'), 'Filter Multicast' (checked), 'Filter Internet NAT Redirection' (unchecked), and 'Filter IDENT(Port 113)' (checked). A 'Save Settings' button and a 'Cancel Changes' button are at the bottom. A sidebar on the right contains a note: 'Firewall Protection: Enable or disable the SPI firewall. More...'. The Cisco Systems logo is in the bottom right corner.

# Configure Router (6)

- The CCTV device to which you are forwarding needs to have a static address. You cannot have DHCP enabled on device.
- DHCP (Dynamic Host Communications Protocol) means the device is “set to obtain IP address automatically (computers are set this way by default).
- Which address is assign to which device is dependent which device boots faster. It is very likely that device will a different address causing ports to be forwarded to wrong device.

# Trouble Shooting

- If you can connect to the DVR/NVR/IP Camera across the network but do not get video than one of the ports may not be forwarded correctly.
- It may be necessary to reboot the device in order for network changes (like changing the RTSP port) to take affect

# Trouble Shooting (2)

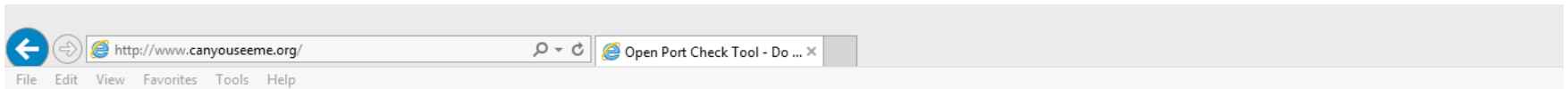
- If device can be seen locally but not remotely port may be block by ISP or Cellular provider. AT&T for instance frequently blocks ports below 1000 and in some areas below 2000. Making the RTSP port and HTTP port higher than 2000 may resolve problem.
- Forwarding a port does not “open” that port for remote viewing if ISP or Cellular company blocks it on their side.

# Verify Success

- To see if the port forward is successful attempt to use the public address to see the CCTV device.
  - Sites such as [www.canyouseeme.org](http://www.canyouseeme.org)
  - [www.whatismyip.com](http://www.whatismyip.com)
  - [www.speedtest.net](http://www.speedtest.net)
  - [www.portforward.com](http://www.portforward.com)display the public address being broadcast.

# Verify Success (2)

- Sites like Can You See me Can also help test if port is visible to outside world.



## CanYouSeeMe.org - Open Port Check Tool

This page will serve as a free utility for remotely verifying a port is open or closed on your router. It will be useful for users who wish to check to see if a server is running or a firewall or ISP is blocking certain ports or verify network security. If you want to do website hosting on your own or run your own ip camera behind your router it will also helpful.

[Analyze your Network](#)

[www.Paessler.com/network-analyzer](http://www.Paessler.com/network-analyzer)

Monitor network performance. Quick & easy setup. Download now!

Your IP: **76.184.50.123** Public Address

What Port?

← Port Check Tool

Common Ports	
FTP	21
SSH	22
Telnet	23
SMTP	25



# CONGRATULATIONS YOU HAVE DONE IT!!

- Remember if you are using WiFi at the site you need to use the LAN or local address
- If your phone is on 3/4G you can view using the Public address
- Call someone away from the site and have them attempt to log in.
- Set up two log ins on customers phone one for local and one for away.
- Remember that if http port other than 80 is forwarded it must be tacked onto the end of the public address: 76.11.151.30:8000

# QUESTIONS?

- Do not waste time setting up a port forward it should take 10 minutes or less if all information is known.
- Consider paying an IT specialist if you are unsure of situation
- Consider using a third party port forwarding configuration software. (Portforward.com has some manufactures integrated and for \$30 they will do it for you. HikVision is integrated).
- When in doubt, Reach out!

# ADDITIONAL INFORMATION

## DDNS

- DDNS stands for Dynamic Domain Name Service.
  - For 99% of home owners and 80+% of businesses the Public IP address they have is Dynamic, not static, and changes on a regular basis. How long you keep an Public address is know as the “lease period” The length of the lease can usually be obtained from the ISP. Some leases can be a few hours long and others may last until such time as the equipment is powered cycled even if that is months.

## ADDITIONAL INFORMATION

### DDNS (2)

- Many routers support services that will allow a user to create a name that will be associated with a changing Public IP address. Most (D-Link has their own server) use third part servers such as No-IP.com or DYNDNS.org which require users to go to those sites and create user accounts which are then added to the router configuration.

# ADDITIONAL INFORMATION

## DDNS (3)

The screenshot shows the Linksys WRT54G DDNS configuration page. The top navigation bar includes the Linksys logo, the text 'A Division of Cisco Systems, Inc.', and the firmware version 'v4.20.6'. The main navigation menu has 'Setup' selected, with sub-menus for 'Wireless', 'Security', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. The 'DDNS' sub-menu is active, showing options for 'Basic Setup', 'DDNS', 'MAC Address Clone', and 'Advanced Routing'. The DDNS configuration form includes a dropdown for 'DynDNS.org', input fields for 'User Name', 'Password', and 'Host Name', and a read-only field for 'Internet IP Address' with the value '76.184.50.123'. A 'Status' field is also present. A help box on the right explains DDNS service. At the bottom, there are 'Save Settings' and 'Cancel Changes' buttons, and the Cisco Systems logo.

LINKSYS®  
A Division of Cisco Systems, Inc. Firmware Version : v4.20.6

Wireless-G Broadband Router WRT54G

Setup Wireless Security Access Restrictions Applications & Gaming Administration Status

Basic Setup | DDNS | MAC Address Clone | Advanced Routing

DDNS

DDNS Service : DynDNS.org ▼

User Name :

Password :

Host Name :

Internet IP Address : 76.184.50.123

Status :

DDNS Service : DDNS allows you to access your network using domain names instead of IP addresses. The service manages changing IP address and updates your domain information dynamically. You must sign up for service through TZO.com or DynDNS.org. More...

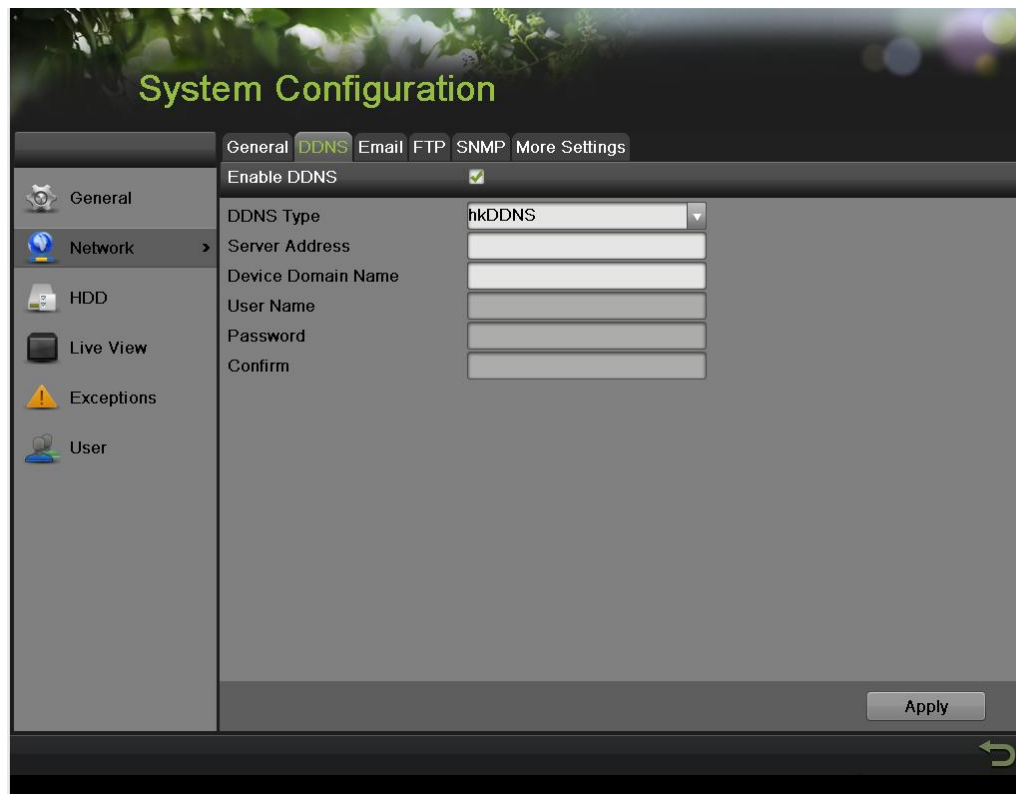
Save Settings Cancel Changes

CISCO SYSTEMS

This router supports DynDNS.org which is free and TZO.com which cost ~\$30/ year  
Free is nice but since no one is making money uptime is not guaranteed.

# ADDITIONAL INFORMATION

## DDNS (4)



Many CCTV manufactures have their own DDNS servers. Large companies like HikVision usually have better uptime records than those that rely upon others.

## ADDITIONAL INFORMATION

### DDNS (4)

- Create an account that is easy to remember
- Know correct path to find the server you created like [Hik-online.com/mydvr](http://Hik-online.com/mydvr)
- The username and password is information used to create DDNS account is not the same user name used to log into DVR Menu.
- Each IP camera can have a separate DDNS account.

# PORTFORWARD.com

Home

**PORT FORWARD**

**DOWNLOAD**

Home  
Routers  
Port Forwarding Guides  
Screenshot Database  
Router Passwords  
Request New Router  
Double Router Forwarding  
Ports  
Port List  
Ports By Publisher

Click here to go to list of routers

**The #1 Resource for Forwarding Ports**

Free guides to help you setup your port forwarding  
Port Forwarding Software to forward ports for you  
Free Software to test if your ports are forwarded  
Free Software to setup a static IP address  
Free Software to detect multiple routers  
And many more [networking](#) related guides...

Portforward.com contains guides to hundreds and hundreds of routers.



# PORTFORWARD.com (2)

- Home**
- Routers**
  - Port Forwarding Guides
  - Screenshot Database
  - Router Passwords
  - Request New Router
  - Double Router Forwarding
- Ports**
  - Port List
  - Ports By Publisher
  - Request New Application
- Guides**
  - General Networking
  - Port Forwarding
  - Double Router Forwarding
  - Firewall Setup
  - WiFi Network Setup
  - Static IP
  - Game Walkthroughs
  - Get Paid To Play Games
  - Portforward Minecraft
  - Utorrent Help
  - Windows 8 Overview
- Software**
  - PFConfig
  - PF Static IP
  - PF Port Checker
  - Double Router Detector
  - Screenshot Grabber
- Support**
  - How To Add A New Router

torrenting, and VOIP configurations.

Use these guides to help you learn how to forward ports for well known applications such as uTorrent and Minecraft, as well as any other application or program you would like.

## How To Get an Open NAT

**Open NAT** and **NAT Type Open** both mean having a **Forwarded Port**. If you need an open NAT, you're on the right path.

Start by selecting your **router manufacturer** from the list below.

A B C D E F G H  J K L M N O P Q R S T U V W X Z	
<b>100Fio Networks</b>	<b>A</b>
<b>1net1</b>	<b>Allied Data</b>
<b>2wire</b>	<b>Allied Telesyn</b>
<b>3BB</b>	<b>AllNet</b>
<b>3com</b>	<b>Alpha</b>
<b>A-Link</b>	<b>Ambit</b>
<b>Above Cable</b>	<b>Amped Wireless</b>
<b>Accton</b>	<b>Ansel</b>
<b>Acer</b>	<b>Aolynk</b>
<b>ACorp</b>	<b>AOpen</b>
<b>Actiontec</b>	<b>AP Router</b>
<b>Adaptec</b>	<b>Apple</b>
<b>ADDON</b>	<b>Arris</b>
<b>Advantek</b>	<b>Articonet</b>
<b>Aethra</b>	<b>Artnet</b>
<b>Aethra Starvoice</b>	<b>Asante</b>
	<b>Asmax</b>

Click on first letter of router to jump to that section of alphabetical list

# PORTFORWARD.com (3)

## Port forwarding the Westell Westell2100Wirespeed router.

You're almost there!

This is our guide list for the **Westell Westell2100Wirespeed**. Please select the program you are forwarding ports for from the list below.

If you do not feel like figuring out how to forward ports manually, we have a simple software solution called **PFCongig** that can forward your ports for you automatically. We offer complete support for [our product](#) and will help you get your ports forwarded.

If you do not see the program you are forwarding ports for, you can try checking out our **Default** [Guide](#) for this router, which is a generic guide that should help you get through the basics of getting an [open port](#) on your Westell2100Wirespeed.

Start d



Default

Guide

Once Router Model is found click on Default Guide and follow instructions. You will need to close the commercial that appears between this screen and the information.

# PORTFORWARD.com (4)

---

H  
Hexen II  
Hidden Source  
Hikvision DS-7204HVI-SH  
Hikvision iVMS-4200  
Homefront

Some Devices have been submitted for inclusion in list of items supported by PortForward.com. For a price the website guarantees that they can do the port forwarding for you. Usually around \$30. If you want to do it yourself they will tell you the ports that this device commonly needs to function and how to forward these ports on the selected router.