# Network Configuration Guide
# AP-9060/AP-16CO

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# Getting Started

## *Introduction*

Thank you for choosing ApexCCTV. We hope that this document will assist you in configuring your new AP-9060/AP-16CO for use on your network and via the internet. This document follows industry standard best practices, and while you do not need to follow every single step on this list, doing so will provide you with a reliable and secure connection to your AP-9060/AP-16CO.

## *Disclaimer*

This document requires a basic understanding of networking principles including, but not limited to, network address translation (NAT), transmission control protocol/internet protocol (TCP/IP), user datagram protocol (UDP), subnet and subnet mask configuration, dynamic host configuration protocol (DHCP), IP addresses, routing and router configuration, public vs. private networks, etc…

The basic knowledge described above is outside the scope of this document, and will be covered briefly or not at all, and only as it applies to an individual step you need to take in configuring your AP-9060/AP-16CO. Please find other resources in the "Additional Resources" section at the end of this document.

# Quick Setup Guide (Power Users Only)

The gist of setting up your AP-9060/AP-16CO for network use is very straightforward.

1) Configure your AP-9060/AP-16CO with an appropriate network address (use best practices).
2) Forward ports 80, 5000, 5001 through one or more routers, starting with your internet gateway.

# Planning

## *Equipment Needed*

1) Your network enabled AP-9060/AP-16CO from ApexCCTV, with working cameras connected.
2) The CD that came with your AP-9060/AP-16CO.
3) Your AP-9060/AP-16CO manual (may be on your CD)
4) A Television monitor, hooked up to the DVR.
5) A Network cable connecting your DVR to your network.
6) A router.
7) An additional PC on your network with Windows (Preferably XP) installed.

## *Gathering Information*

Before continuing, you will need to gather the following information. If you do not know or cannot find some of this information, please contact your network administrator or your internet service provider (ISP).

There is some specific network information you will need to have readily available before you start configuring your network and surveillance product. You can find much of this information (in Windows XP) by clicking Start → Accessories → Command Prompt. If there is no option under accessories for "Command Prompt," you can also click on Start → Run. A dialog box will appear:
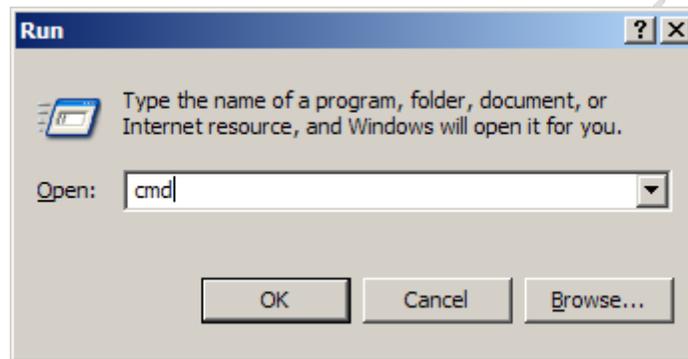


Type "cmd" in the dialog box and click the OK button to continue. A command prompt will appear that looks similar to this:
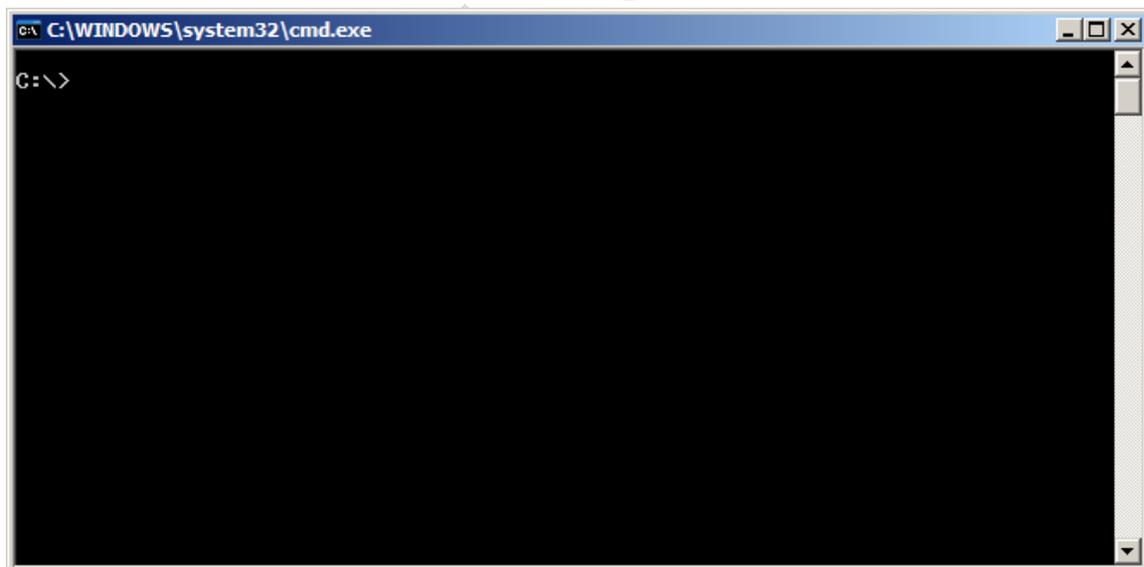


Once you have a command prompt up, type the following line and press the Enter key:

ipconfig /all

You should have some information similar to what is below on your screen:
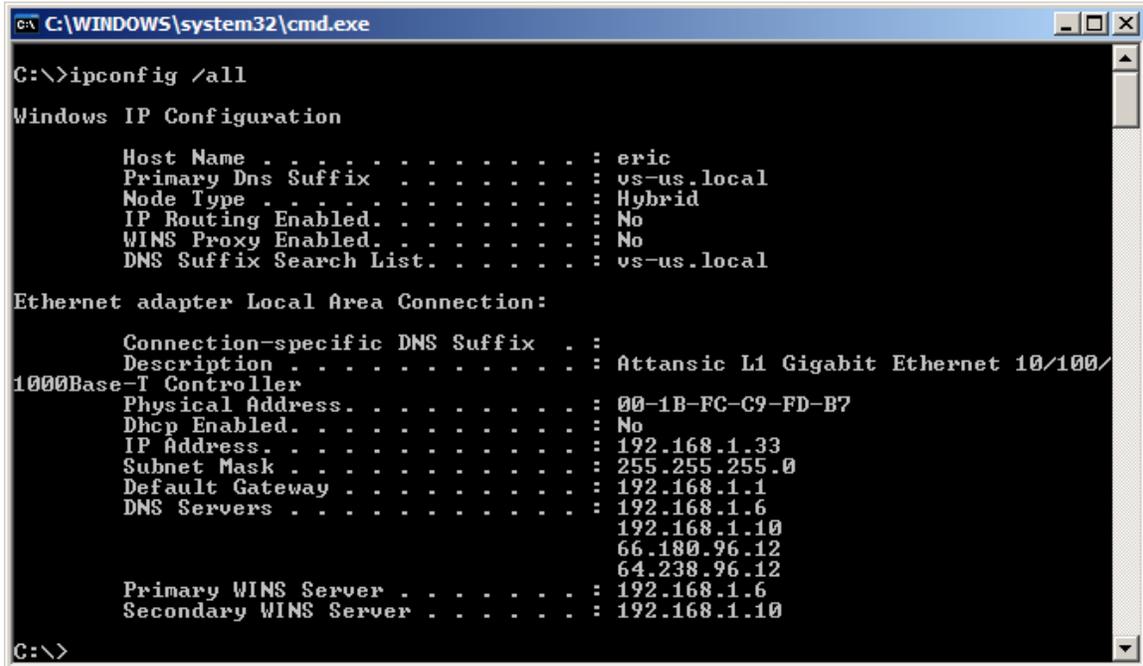
```
C:\WINDOWS\system32\cmd.exe                                          _ □ ×

C:\>ipconfig /all

Windows IP Configuration

        Host Name . . . . . . . . . . . . : eric
        Primary Dns Suffix  . . . . . . . : vs-us.local
        Node Type . . . . . . . . . . . . : Hybrid
        IP Routing Enabled. . . . . . . . : No
        WINS Proxy Enabled. . . . . . . . : No
        DNS Suffix Search List. . . . . . : vs-us.local

Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . :
        Description . . . . . . . . . . . : Attansic L1 Gigabit Ethernet 10/100/
1000Base-T Controller
        Physical Address. . . . . . . . . : 00-1B-FC-C9-FD-B7
        Dhcp Enabled. . . . . . . . . . . : No
        IP Address. . . . . . . . . . . . : 192.168.1.33
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.1.1
        DNS Servers . . . . . . . . . . . : 192.168.1.6
                                            192.168.1.10
                                            66.180.96.12
                                            64.238.96.12
        Primary WINS Server . . . . . . . : 192.168.1.6
        Secondary WINS Server . . . . . . : 192.168.1.10

C:\>
```

Please take special note of the Subnet mask, Default Gateway, and DNS Servers.

The complete list of information you will need is listed below. We recommend using the checklist on the following page as you gather information to be sure you will have everything you need before you begin. If you are unsure of how to find some of this information, there are tips for each item following the Information Gathering Checklist.

## Information Gathering Checklist

Your router's internal IP address

Your router's public IP address

Your router's username and password

Your network's DHCP range

Your network's DNS server addresses

Your network's subnet mask

Your AP-9060/AP-16CO's username and password

The IP Address you will give your AP-9060/AP-16CO

Existing forwarded ports or NAT entries from your router

## Your router's internal IP address

This is typically the same as the "default gateway" from the above information.

## Your router's public IP address

You can find this by visiting www.whatismyip.com.

## Your router's username and password

If you do not know this information, you will need to look in your router's manual or contact your network administrator or internet service provider. If you have not changed your router's default username and password, you can probably find it on the internet. Try looking at your router, jotting down its manufacturer and model number, and then doing a search on Google for the model number, plus "default username." For instance, if my router is a D-Link DFL-200, I would search for:

DFL-200 default username

You can also use find your Router's default guide on www.portforward.com.

Either of these will more likely than not help you find the login information you need.

## Your network's DHCP range

Most networks employ DHCP. Typically, your router doubles as your DHCP server. To find your network's DHCP range, you will need to log into your router (or other DHCP server) and find the page containing those settings. If you cannot find these settings, contact your network administrator or internet service provider.

## Your network's subnet Mask

A subnet mask (this is a VERY short simplification) is used to "subdivide" your network into segments. You should be able to find your network's subnet mask in the settings you saw earlier when you ran "ipconfig /all" from a command prompt. You can also find these under Control Panel → Network Connections → Local Area Connection (or your network adapter's name) → Properties → Internet Protocol (TCP/IP) Properties.

## The IP Address you will give your AP-9060/AP-16CO

You should first log into your router (or other DHCP server) and determine your DHCP range. You need to pick a valid static IP address that is outside your DHCP range. You should also (as a minimum) ping the IP address your have selected to make sure another network device it not occupying it. On windows XP:

Start → Accessories → Command Prompt → Type:

ping [IP Address]

If you get a valid response, you should choose another address.

### Your AP-9060/AP-16CO's password

You will need the administrative password for your AP-9060/AP-16CO so that you can log into it and make changes.  Your default user password is 111111.  If your defaults have been changed, you will need to get this information from within your organization.

### Existing port forward / NAT information

You need know your existing port forward and/or NAT settings before adding new ones in order to avoid conflicts.  **If you use point of sales software on your network you should call your vendor and make CERTAIN you have the settings and know how to avoid creating conflicts with them.**  Failing to do so could threaten your ability to create new transactions for a significant period of time.

## *Pitfalls to Avoid*

### IP Addresses in Your DHCP Range

DHCP servers are used for giving out temporary IP addresses to devices on your network that need them.  This means that the IP address of any DHCP on your network can and will change as these IP address leases expire.

Your DHCP server will have a range of IP addresses that it can use for this purpose.  If you set your AP-9060/AP-16CO's static IP address to be within this range, you are creating the possibility that another device will be will be given the same IP address by your DHCP server.  Should this occur, both of your devices will cease to function on your network until the problem is resolved.

A best practice is to set the static IP address of your AP-9060/AP-16CO to be outside of your DHCP server range, avoiding the possibility of this type of conflict.  For example, if your DHCP server's IP address range was 192.168.1.100 – 192.168.1.200, good IP addresses for your AP-9060/AP-16CO would be 192.168.1.50 or 192.168.1.250, but not 192.168.1.105.

### Dynamic IP Addresses

If you leave your AP-9060/AP-16CO set to acquire a dynamic IP address, its IP address is likely to change over time, nullifying the effects of any forwarded ports or NAT routes to your AP-9060/AP-16CO and breaking access to it from the internet.  If this occurs, you will have to re-configure your router to pass the correct ports to it again.

A best practice is to use static IP addresses that are outside your DHCP range for all AP-9060/AP-16COs that will have ports forwarded to them.

### Using Dynamic Public IP Addresses without Dynamic DNS

If your Internet Service Provider has given you a dynamic IP address with your internet connection, it is best, if possible, to acquire a static IP address from them.  This way, you can browse to your AP-9060/AP-16CO on the internet by simply using your public IP address.  For example, if your public IP address (from your information gathering

checklist) is 96.226.2.104, you would simply open Internet Explorer and enter http://96.226.2.104/ in your address bar to view your AP-9060/AP-16CO.

If you cannot acquire a static IP address, there are two possibilities.  First, if your public IP address changes and you can no longer view your AP-9060/AP-16CO, simply browse to www.whatismyip.com from within your network to see your new public IP address, and use that one until it changes again (usually several months).

If you do not like this option, you can use a dynamic DNS service.  This way, you can browse to a name, rather than address, such as http://mydvr.mydomain.com.  There are several of these services that offer free accounts.  We prefer www.dyndns.org, and wholeheartedly recommend them.  Their setup is easy and free, and they offer software that prevents your free account from expiring if your public IP address does not change often enough.  Please visit their site for more information.

# Configuration

## Configuring your AP-9060/AP-16CO

### User Accounts

**First and foremost, if you are exposing your DVR to the internet, as a best practice you should change your default password to protect yourself from malicious individuals.**

You should change your password every 90 days.

### Network Settings

Before beginning this section, please make sure your AP-9060/AP-16CO is connected to your network.

By now you should have determined the following settings to your AP-9060/AP-16CO.

IP Address
Subnet Mask
Default Gateway (or just Gateway)

Go to the DVR, press the stop button to stop recording, and press the "Menu" button.

Use the arrow keys to select the "Network" menu item, and press the "Enter" key to open the next menu.

Before making any other changes, change the "IP Mode" to "Static."

Using the information you wrote down in the "Gathering Information" section of this guide, update the "IP Addr," "Sub Net," and "Gateway" settings. Please be aware that this DVR DOES show the leading zeros for each octet of an IP address or subnet mask. Therefore, if you wrote down:

192.168.1.50

You would now enter:

192.168.001.050

These are equivalent.

Unless you have good reason to change them, leave the default video and command ports with their default values of 5000 and 5001, respectively.

Press the menu button two times to get back to your AP-9060/AP-16CO's main screen. It will take a moment for the settings to save and the menu to refresh, so be patient and don't press the button over and over.

## Configuring Your Router

### Checking For Conflicts

Be sure to look at any forwarded ports or NAT routes you already have configured. Make sure they do not conflict (use any of the same ports) as your AP-9060/AP-16CO. If they do, for any reason, you should change the conflicting default ports on your AP-9060/AP-16CO to something else, so that you will not be causing problems for both applications.

### Finalizing Your Setup

First, log into your Router with administrative privileges. Once you are logged in, locate the settings page/screen containing port forwarding (sometimes called application settings or triggers) or NAT configuration page. These settings are usually under the "Firewall" or "Advanced" section of your router configuration.

Using the appropriate page/screen in your router, make entries for port 80 (TCP) and ports 5001 and 5001 (TCP/UDP). Be sure your mappings point to the internal IP address you selected for your AP-9060/AP-16CO, and that you click any "activate" or "enable" check boxes for each entry.

## *Testing*

## Testing from your LAN (Internal)

Open internet explorer and browse to the IP address that you assigned to your AP-9060/AP-16CO.

You should be looking at the default screen for your AP-9060/AP-16CO.

Download and install the NetViewer software.

Run Netviewer.exe in the installation folder.

Click the icon of two PCs connected by a cable in the middle of the right-hand side of your screen.
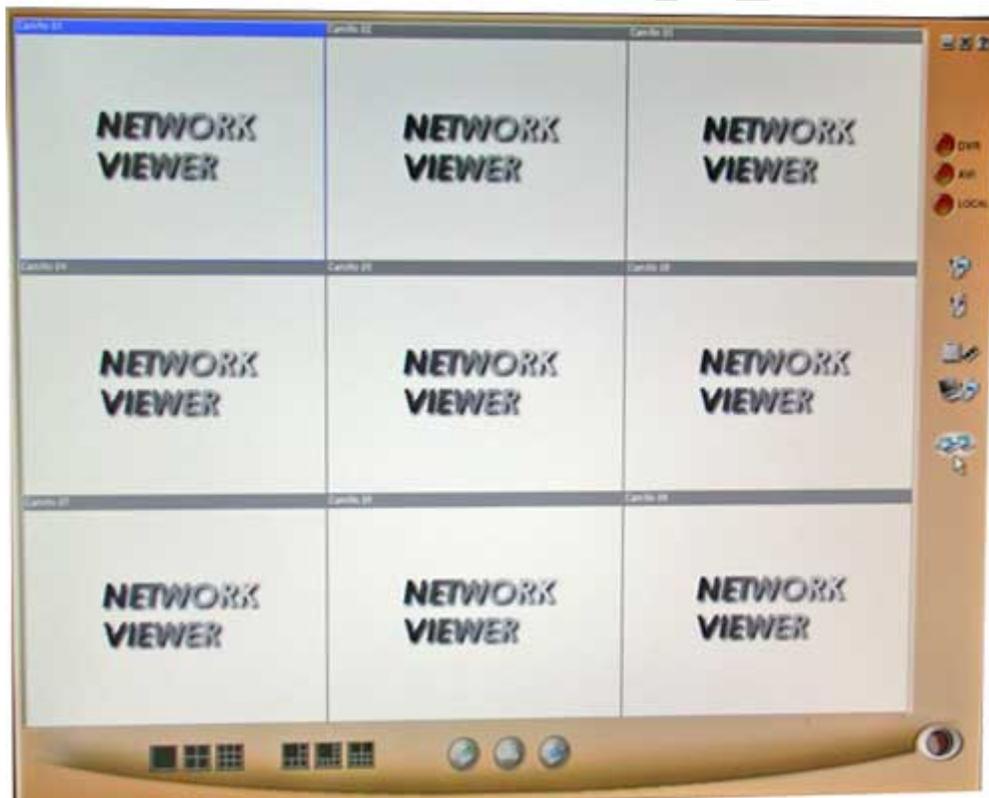


The network viewer connection screen opens.
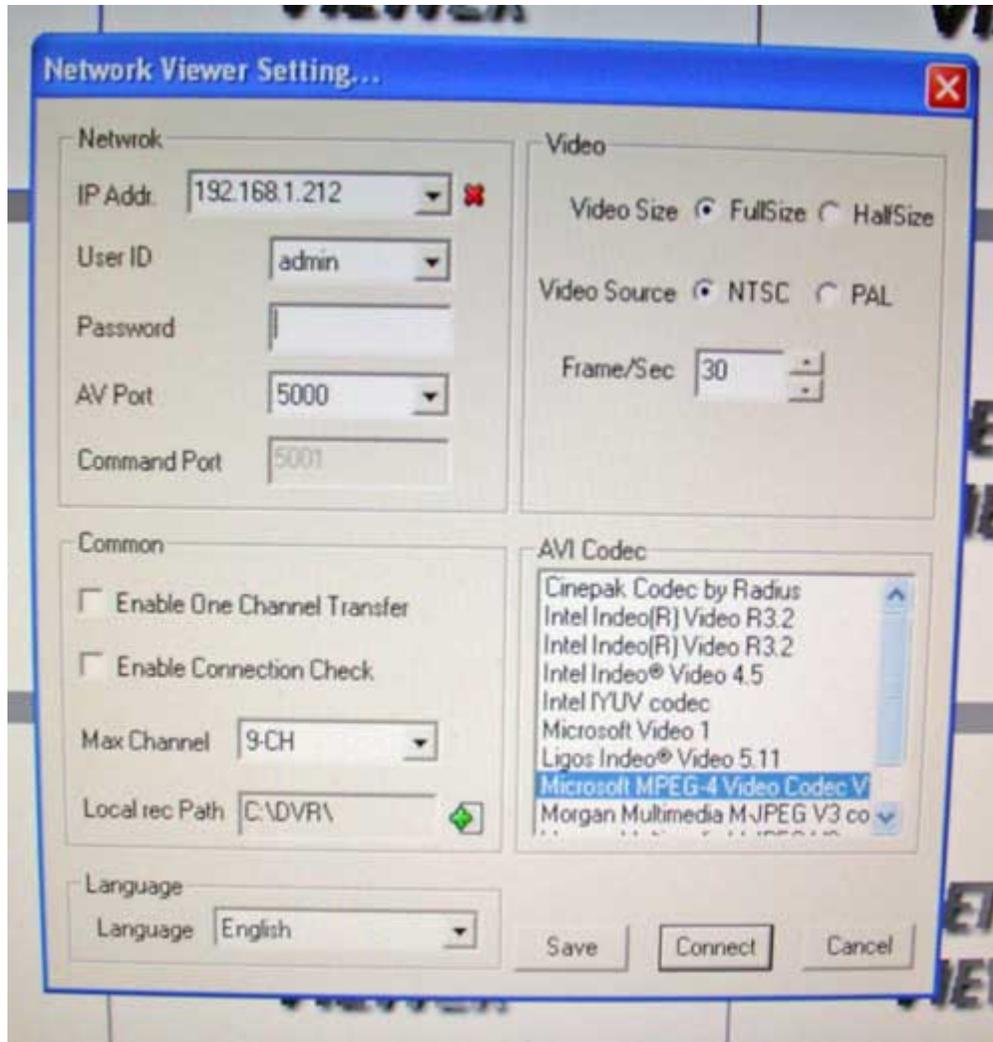
Enter the following information:

Internal IP address
UserID (admin)
Password (default is 1111)
AV Port: 5000
Max Channel (9 for AP-9060, 16 for AP-9016)
Video Size: Full Size
Video Source: NTSC
Frames/Sec: 30
AVI Codec: Whichever Codec you wish to use for saving video files to your PC.

Finally, click the connect button.

After a moment, you should begin to see your video feeds.  Congratulations!

## Testing from the WAN (Internet)

You should be able to substitute your public IP address for your internal one (see your information gathering checklist) from a PC outside your network (Viewing a AP-9060/AP-16CO at your office from home or vice-versa) and achieve the same result. For example, if your public IP address is 96.226.2.104 and your AP-9060/AP-16CO uses port 81 for its web server, you would browse to http://96.226.2.104:81.

# Additional Resources

## *Networking*

### Dynamic Host Configuration Protocol (DHCP)

http://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol
http://www.dhcp.org/
http://www.dhcp-handbook.com/dhcp_faq.html
http://www.webopedia.com/TERM/D/DHCP.html

### IP Addressing

http://en.wikipedia.org/wiki/IP_address
http://www.3com.com/other/pdfs/infra/corpinfo/en_US/501302.pdf
http://computer.howstuffworks.com/question549.htm
http://www.webopedia.com/TERM/I/IP_address.html

### Local Area Networks (LAN)

http://en.wikipedia.org/wiki/Local_area_network
http://compnetworking.about.com/cs/lanvlanwan/g/bldef_lan.htm
http://www.webopedia.com/TERM/L/local_area_network_LAN.html

### Network Address Translation (NAT)

http://en.wikipedia.org/wiki/Network_address_translation
http://computer.howstuffworks.com/nat.htm
http://www.webopedia.com/TERM/N/NAT.html

### Port Forwarding

http://www.portforward.com/
http://en.wikipedia.org/wiki/Port_forwarding
http://www.zeropaid.com/news/6160/Introduction+to+Port+Forwarding

### Ports

http://en.wikipedia.org/wiki/Computer_port_%28software%29
http://itmanagement.webopedia.com/TERM/P/port.html

### Routing / Router Configuration

http://en.wikipedia.org/wiki/Routing
http://cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/routing.htm
http://www.webopedia.com/TERM/R/routing.html

### Subnet / Subnet Masking

http://en.wikipedia.org/wiki/Subnetwork
http://www.networkcomputing.com/unixworld/tutorial/001.html
http://www.webopedia.com/TERM/S/subnet.html

### Transmission Control Protocol / Internet Protocol (TCP/IP)

http://en.wikipedia.org/wiki/Internet_protocol_suite
http://www.webopedia.com/TERM/T/TCP_IP.html

### User Datagram Protocol

http://en.wikipedia.org/wiki/User_Datagram_Protocol
http://www.webopedia.com/TERM/U/UDP.html

### Wide Area Networks (WAN)

http://en.wikipedia.org/wiki/Wide_area_network
http://www.webopedia.com/TERM/W/wide_area_network_WAN.html

## *Firewalls*

While firewall configuration is outside the scope of this document, various hardware and software firewalls can create configuration and remote access problems for various security AP-9060/AP-16COs.  The following information is provided in helps of providing starting points for troubleshooting firewall issues.  Links to many common software firewall AP-9060/AP-16COs and vendors are provided.

### General Information

http://en.wikipedia.org/wiki/Firewall_(networking)
http://www.howstuffworks.com/firewall.htm
http://www.webopedia.com/TERM/f/firewall.html

### Common Port Numbers

http://www.iana.org/assignments/port-numbers
http://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers
http://www.webopedia.com/quick_ref/portnumbers.asp

### Software Firewalls

BlackICE PC Protection
http://www.iss.net/

BullGuard Suite
http://www.bullguard.com/default.aspx

Comodo Personal Firewall
http://www.personalfirewall.comodo.com/

F-Secure Internet Security
http://www.f-secure.com/home_user/AP-9060/AP-16COs_a-z/fsis2007.html

Jetico Personal Firewall
http://www.jetico.com/

Kaspersky Internet Security
http://www.kaspersky.com/

LavaSoft Personal Firewall
http://www.lavasoftusa.com/AP-9060/AP-16COs/lavasoft_personal_firewall.php

McAfee Personal Firewall
http://us.mcafee.com/default.asp

Microsoft Windows Firewall
http://www.microsoft.com/windowsxp/using/security/internet/sp2_wfintro.mspx

NeT Firewall
http://www.ntkernel.com/w&p.php?id=18

Norman Personal Firewall
http://www.norman.com/AP-9060/AP-16COs_npf.shtml

OutpostPro Firewall
http://www.agnitum.com/

Panda Platinum Internet Security
http://us.pandasoftware.com/AP-9060/AP-16COs/platinum_is/

pcInternet Patrol
http://www.pcinternetpatrol.com/

Preventon
http://www.preventon.com/

PrivateFirewall
http://www.privacyware.com/features.html

Terminet
http://www.infotecs.biz/Soft/terminet.htm

Trend Micro PC-cillin Internet Security
http://www.trendmicro.com/en/AP-9060/AP-16COs/desktop/pc-cillin/evaluate/overview.htm

VisNetic Firewall
http://www.deerfield.com/AP-9060/AP-16COs/visnetic-firewall/

Webroot Personal Firewall
http://send.onenetworkdirect.net/z/11246/CD45178/