

# Reference Guide

## **Firebox X Core/Peak e-Series**

*with WatchGuard System Manager/Fireware v10.0*

## **Firebox X Edge e-Series v10.0**

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Revised: 2/1/2008



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# 1

## Internet Protocol Reference

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Internet Protocol (IP) sets the format of packets and the address pattern for sending data through the Internet. It operates as a postal system, and allows you to address a package and drop it into the system. But, there is no direct link between you and the recipient. In other words, there is no package.

Most networks mix IP with higher level protocols such as Transmission Control Protocol (TCP). TCP/IP makes a connection between two host servers. Then, they can send messages to each other. TCP/IP supplies the “packaging.”

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## Internet Protocol Header

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Internet Protocol (IP) is an Internet standard that enables the sending of datagrams — packets of information that include an address and instructions on how to send the datagram to its destination. IP prepends a header to each datagram. The IP header contains a minimum of 12 properties, and other optional properties.

Property	Size	Description
Version	4 bits	IP format number (Current version = 4)
IHL	4 bits	Header length in 32-bit words (Minimum = 5)
TOS	8 bits	Type of service sets routing priorities. It is usually not used because not many application layers can set it.
Tot_Len	16 bits	Total length of packet measured in octets. It is used to assemble fragments.
ID	16 bits	Packet ID, used to assemble fragments.
Flags	3 bits	Miscellaneous flags
Frag_Off	13 bits	Identifies fragment part for this packet.
TTL	8 bits	Time to live. It sets the maximum time the datagram remains alive in the system.
Protocol	8 bits	IP protocol number. Indicates which of TCP, UDP, ICMP, IGMP, or other Transport protocol is inside.
Check	16 bits	Checksum for the IP header
Sour_Addr	32 bits	Source IP address
Dest_Addr	32 bits	Destination IP address
Options	24 bits	IP Options (Present if IHL is 6)

---

## IP header number list

The IP Protocol header contains an 8-bit field that identifies the protocol for the transport layer for the datagram.

Keyword	Number	Protocol
	0	Reserved
ICMP	1	Internet Control Message
IGMP	2	Internet Group Management
GGP	3	Gateway-to-Gateway
IP	4	IP-within-IP (encapsulation)
ST	5	Stream
TCP	6	Transmission Control Protocol
UCL	7	UCL
EGP	8	Exterior Gateway Protocol
IGP	9	Any private interior gateway
BBN-RCC-MON	10	BBN RCC Monitoring
NVP-II	11	Network Voice Protocol
PUP	12	PUP
ARGUS	13	ARGUS
EMCON	14	EMCON
XNET	15	Cross Net Debugger
CHAOS	16	Chaos
UDP	17	User Datagram Protocol
MUX	18	Multiplexing
DCN-MEAS	19	DCN Measurement Subsystems
HMP	20	Host Monitoring
PRM	21	Packet Radio Measurement
XNS-IDP	22	XEROX NS IDP
TRUNK-1	23	Trunk-1
TRUNK-2	24	Trunk-2
LEAF-1	25	Leaf-1
LEAF-2	26	Leaf-2
RDP	27	Reliable Data Protocol
IRTP	28	Internet Reliable Transaction
ISO-TP4	29	ISO Transport Protocol Class 4
NETBLT	30	Bulk Data Transfer Protocol
MFE-NSP	31	MFE Network Services Protocol
MERIT-INP	32	MERIT Internodal Protocol
SEP	33	Sequential Exchange Protocol
3PC	34	Third Party Connect Protocol
IDPR	35	Inter-Domain Policy Routing Protocol

<b>Keyword</b>	<b>Number</b>	<b>Protocol</b>
XTP	36	XTP
DDP	37	Datagram Delivery Protocol
IDPR-CMTP	38	IDPR Control Message Transport Protocol
TP++	39	TP++ Transport Protocol
IL	40	IL Transport Protocol
SIP	41	Simple Internet Protocol
SDRP	42	Source Demand Routing Protocol
SIP-SR	43	SIP Source Route
SIP-FRAG	44	SIP Fragment
IDRP	45	Inter-Domain Routing Protocol
RSVP	46	Reservation Protocol
GRE	47	General Routing Encapsulation
MHRP	48	Mobile Host Routing Protocol
BNA	49	BNA
ESP	50	Encapsulated Security Payload
AH	51	Authentication Header
I-NLSP	52	Integrated Net Layer Security TUBA
SWIPE	53	IP with Encryption
NHRP	54	NBMA Next Hop Resolution Protocol
	55-60	Unassigned
	61	Any host internal protocol
CFTP	62	CFTP
	63	Any local network
SAT-EXPAK	64	SATNET and Backroom EXPAK
KRYPTOLAN	65	Kryptolan
RVD	66	MIT Remote Virtual Disk Protocol
IPPC	67	Internet Pluribus Packet Core
	68	Any distributed file system
SAT-MON	69	SATNET Monitoring
VISA	70	VISA Protocol
IPCV	71	Internet Packet Core Utility
CPNX	72	Computer Protocol Network Executive
CPHB	73	Computer Protocol Heart Beat
WSN	74	Wang Span Network
PVP	75	Packet Video Protocol
BR-SAT-MON	76	Backroom SATNET Monitoring
SUN-ND	77	SUN NDPROTOCOL-Temporary
WB-MON	78	WIDEBAND Monitoring
WB-EXPAK	79	WIDEBAND EXPAK

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Keyword	Number	Protocol
ISO-IP	80	ISO Internet Protocol
VMTP	81	VMTP
SECURE-VMTP	82	SECURE-VMTP
VINES	83	VINES
TTP	84	TTP
NSFNET-IGP	85	NSFNET-IGP
DGP	86	Dissimilar Gateway Protocol
TCF	87	TCF
IGRP	88	IGRP
OSPFIGP	89	OSPFIGP
SPRITE-RPC	90	Sprite RPC Protocol
LARP	91	Locus Address Resolution Protocol
MTP	92	Multicast Transport Protocol
AX.25	93	AX.25 Frames
IPIP	94	IP-within-IP Encapsulation Protocol
MICP	95	Mobile Internetworking Control Protocol
SCC-SP	96	Semaphore Communications Security Protocol
ETHERIP	97	Ethernet-within-IP Encapsulation
ENCAP	98	Encapsulation Header
	99	Any private encryption scheme
GMTP	100	GMTP
	101-254	Unassigned
	255	Reserved

## Internet Protocol Options

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Internet Protocol (IP) options are additions to the standard IP header that can be of different lengths. Enabling IP options can be dangerous. Hackers can use them to create routing that helps them get access to your network. Because most software applications make it very difficult to use IP options, they are not frequently used.

There are different types of IP options:

### *Security*

These options control the routing of IP packets that transmit sensitive data. Security options are not frequently supported.

### *Stream ID (SID)*

The stream ID option is not frequently supported.

### *Source Routing*

The loose source route option and the strict source route option enable the source of an Internet packet to give routing information. Source routing options can be very dangerous, because an attacker could use them to masquerade as a different user. But, loose source route option and the traceroute tool can also help debug some unusual routing problems.

### *Record Route*

The record route option was first used to do tests on the Internet. But, record route can record only ten IP addresses. On the current Internet, a typical connection can include 20 or 30 different routers, making the record route option out of date.

### *Time Stamp*

The time stamp option measures the time for a packet to make one full cycle (source --> destination --> source). Higher level time protocols or time stamp messages do this task better than the time stamp option.

## Transfer Protocols

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The Internet Protocol (IP) includes information kept in the transport layer. The transport layer has different protocols that tell how to transmit data between software applications: for example, UDP, TCP, ICMP, and others.

### UDP

User Datagram Protocol (UDP) is a datagram protocol that does not use connections. It is a very fast protocol, and it does not use much bandwidth or CPU. But, you cannot trust that datagrams will get to their destination. A software application that uses UDP must make sure that the full message gets to its destination in the correct sequence.

Characteristics of UDP include:

- Frequently used for services that include the exchange of small quantities of data where sending a datagram more than one time is not a problem.
- Used for services such as time synchronization in which a missing packet does not have an effect on continued operation. Many systems using UDP send packets again at a constant rate to tell other systems about unusual events.
- Frequently used on LANs. Because of its low system and bandwidth requirements, it gives a large performance advantage to Network File System (NFS) services users. Network File System is a popular TCP/IP service for supplying shared file systems over a network.
- Gives supports to broadcasts.

- Gives abstraction of ports. A connection is made of its source and destination ports and its source and destination IP addresses. In typical use, port numbers less than 1024 are saved for well-known services (destinations). The client side can use ports higher than 1023 for the source of the connection. But, this rule has many exceptions: NFS (port 2049) and Archie (port 1525) use server ports at numbers higher than 1024. Some services use the same source and destination port for server to server connections. Examples include DNS (53), NTP (123), syslog (514), and RIP (520).

## TCP

Transmission Control Protocol (TCP) enables two hosts to make a connection and send streams of data to each other. TCP makes sure that the data that is sent gets to its destination. It also makes sure that packets are put in the same sequence as when they were sent.

TCP manages connections with properties that control the condition of a connection. Three very important properties of TCP packets are the SYN, ACK, and FIN bits. The SYN bit is set only on the first packet sent in each direction for a given connection. The ACK bit is set when the other side gets the data. The FIN bit is set when the source or destination closes the connection.

## ICMP

The Internet Control Message Protocol (ICMP) is used most frequently to supply error information about other services. It operates by using the same method as UDP. That is, ICMP does not use connections and does not make sure that packets reach their destination. One dangerous ICMP packet is the ICMP redirect packet, which can change routing information on the devices that receive it.

## Other protocols

Most traffic on the Internet uses TCP, UDP, or ICMP protocols. Some other protocols are as follows:

*IGMP (Internet Group Multicast Protocol)*

A protocol used by a host on multicast access networks to notify a locally attached router to which group the router belongs.

*IPIP (IP-within-IP)*

An encapsulation protocol that is used to assemble virtual networks on the Internet.

*GGP (Gateway-Gateway Protocol)*

A routing protocol that is used between different systems.

*GR*

A protocol used for PPTP.

*ES*

An encryption protocol used for IPsec.

## Standard Ports and Random Ports

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UDP and TCP use encapsulation of information contained in the application layer. The software application procedures are specified by source and destination port numbers. These port numbers, together with the source and destination IP addresses, supply a unique connection on the Internet.

For example, you can have two telnet sessions from one host to a different host. Because telnet uses a well-known service port number of 23, something must be different between these two connections. The other port in these conditions is a port that is usually larger than 1023. The operating system on the client side assigns this port number automatically.

Random ports can cause problems if they match a well-known service on a port higher than 1023. If some client computer assigns a random port of 2049, no connection can be made. This type of problem frequently occurs with the X Window and Archie services.

Most operating systems assign port numbers between 1024 and 2100 so this problem does not occur frequently.

# 2

## MIME Content Types

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Software applications use content type headers to identify the type of data they receive. Content type headers tell the software application how to correctly identify and display video clips, images, sound, or other data. Usually, people are most familiar with the MIME content types used in email.

Some of the available proxy policies in your Firebox configuration can use content type headers to determine whether to allow or deny traffic. This chapter contains a list of many common MIME content types for your reference.

New, registered MIME content types appear regularly. We recommend frequent checks of an online source for the most current list. One source of current MIME types is:

[www.iana.org/assignments/media-types/](http://www.iana.org/assignments/media-types/)

Note that software applications can use incorrect content types, or content types that are not registered.

### Common MIME content types

Type	Subtype	Reference (where available)
application	*	
application	activemessage	Shapiro
application	andrew-inset	Borenstein
application	applefile	Falstrom
application	astound	
application	atomicmail	Borenstein
application	cals-1840	RFC 1895
application	commonground	Glazner
application	cybercash	Eastlake
application	dca-rft	Campbell
application	dec-dx	Campbell
application	eshop	Katz

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Type	Subtype	Reference (where available)
application	hyperstudio	Domino
application	iges	Parks
application	mac-binhex40	Falstrom
application	macwriteii	Lindner
application	marc	RFC 2220
application	mathematica	Van Nostern
application	ms-excel	
application	mspowerpoint	
application	msword	Lindner
application	news-message-id	RFC 1036, Spencer
application	news-transmission	RFC 1036, Spencer
application	octet-stream	RFC 2045, RFC 2046
application	oda	RFC 2045, RFC 2046
application	olescript	
application	pdf	RFC 3778
application	pgp-encrypted	RFC 3156
application	pgp-keys	RFC 3156
application	pgp-signature	RFC 3156
application	pkcs10	RFC 2311
application	pkcs7-mime	RFC 2311
application	pkcs7-signature	RFC 2311
application	postscript	RFC 2045, RFC 2046
application	prs.alvestrand.titrax-sheet	Alvestrand
application	prs.cww	Rungchavalnont
application	prs.nprend	Doggett
application	realnetworksupgrade	
application	remote-printing	RFC 1486, Rose
application	riscos	Smith
application	rtf	Lindner
application	set-payment	Korver
application	set-payment-initiation	Korver
application	set-registration	Korver
application	set-registration-initiation	Korver
application	sgml	RFC 1874
application	sgml-open-catalog	Grosso
application	slate	
application	vis5d	
application	vnd.3M.Post-it-Notes	O'Brien
application	vnd.FloGraphIt	Floersch

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Type	Subtype	Reference (where available)
application	vnd.acucobol	Lubin
application	vnd.anser-web-certificate-issue-initiation	Mori
application	vnd.answer-web-funds-transfer-initiation	Mori
application	vnd.audiograph	Slusanschi
application	vnd.businessobjects	Imoucha
application	vnd.claymore	Simpson
application	vnd.commerce-battelle	Applebaum
application	vnd.commonspace	Chandhok
application	vnd.cosmocaller	Dellutri
application	vnd.cybank	Helmee
application	vnd.dna	Searcy
application	vnd.dxr	Duffy
application	vnd.ecdis-update	Buettgenbach
application	vnd.ecowin.chart	Olsson
application	vnd.ecowin.filerequest	Olsson
application	vnd.ecowin.fileupdate	Olsson
application	vnd.ecowin.series	Olsson
application	vnd.ecowin.seriesrequest	Olsson
application	vnd.ecowin.seriesupdate	Olsson
application	vnd.enliven	Santinelli
application	vnd.epson.quickanime	Gu
application	vnd.epson.salt	Nagatomo
application	vnd.fdf	Zilles
application	vnd.ffsns	Holstage
application	vnd.framemaker	Wexler
application	vnd.fujitsu-oasys	Togashi
application	vnd.fujitsu-oasys2	Togashi
application	vnd.fujitsu-oasys3	Okudaira
application	vnd.fujitsu-oasysgp	Sugimoto
application	vnd.fujitsu-oasysprs	Ogita
application	vnd.fujixerox.docuworks	Taguchi
application	vnd.fut-misnet	Pruulmann
application	vnd.hp-HPGL	Pentecost
application	vnd.hp-PCL	Pentecost
application	vnd.hp-PCLXL	Pentecost
application	vnd.hp-hps	Aubrey
application	vnd.ibm.MiniPay	Herzberg
application	vnd.ibm.modcap	Hohensee
application	vnd.intercon.formnet	Gurak

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Type	Subtype	Reference (where available)
application	vnd.intertrust.digibox	Tomasello
application	vnd.intertrust.nncp	Tomasello
application	vnd.intu-qbo	Scratchley
application	vnd.is-xpr	Natarajan
application	vnd.japannet-directory-service	Fujii
application	vnd.japannet-jpnstore-wakeup	Yoshitake
application	vnd.japannet-payment-wakeup	Fujii
application	vnd.japannet-registration	Yoshitake
application	vnd.japannet-registration-wakeup	Fujii
application	vnd.japannet-setstore-wakeup	Yoshitake
application	vnd.japannet-verification	Yoshitake
application	vnd.japannet-verification-wakeup	Fujii
application	vnd.loan	Cole
application	vnd.lotus-1-2-3	Wattenberger
application	vnd.lotus-approach	Wattenberger
application	vnd.lotus-freelance	Wattenberger
application	vnd.lotus-organizer	Wattenberger
application	vnd.lotus-screencam	Wattenberger
application	vnd.lotus-wordpro	Wattenberger
application	vnd.meridian-slideshow	Wedel
application	vnd.mif	Wexler
application	vnd.minisoft-hp3000-save	Bartram
application	vnd.mitsubishi.misty-guard.trustweb	Tanaka
application	vnd.ms-artgalry	Slawson
application	vnd.ms-asf	Fleischman
application	vnd.ms-powerpoint	Gill
application	vnd.ms-project	Gill
application	vnd.ms-tnef	Gill
application	vnd.ms-works	Gill
application	vnd.ms.wms-hrd.asfv1	Gill
application	vnd.music-niff	Butler
application	vnd.musician	Adams
application	vnd.netfpx	Mutz
application	vnd.noblenet-directory	Solomon
application	vnd.noblenet-sealer	Solomon
application	vnd.noblenet-web	Solomon
application	vnd.novadigm.EDM	Swenson
application	vnd.novadigm.EDX	Swenson
application	vnd.novadigm.EXT	Swenson

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Type	Subtype	Reference (where available)
application	vnd.osa.netdeploy	Klos
application	vnd.powerbuilder6	Guy
application	vnd.powerbuilder6-s	Guy
application	vnd.publishare-delta-tree	Ben-Kiki
application	vnd.rapid	Szekely
application	vnd.rn-realplayer	
application	vnd.seemail	Webb
application	vnd.shana.informed.formdata	Selzler
application	vnd.shana.informed.formtemplate	Selzler
application	vnd.shana.informed.interchange	Selzler
application	vnd.shana.informed.package	Selzler
application	vnd.street-stream	Levitt
application	vnd.svd	Becker
application	vnd.swiftview-ics	Widener
application	vnd.truedoc	Chace
application	vnd.uplanet.alert	Martin
application	vnd.uplanet.alert-wbxml	Martin
application	vnd.uplanet.bearer-choi-wbxml	Martin
application	vnd.uplanet.bearer-choice	Martin
application	vnd.uplanet.cacheop	Martin
application	vnd.uplanet.cacheop-wbxml	Martin
application	vnd.uplanet.channel	Martin
application	vnd.uplanet.channel-wbxml	Martin
application	vnd.uplanet.list	Martin
application	vnd.uplanet.list-wbxml	Martin
application	vnd.uplanet.listcmd	Martin
application	vnd.uplanet.listcmd-wbxml	Martin
application	vnd.uplanet.signal	Martin
application	vnd.visio	Sandal
application	vnd.webturbo	Rehem
application	vnd.wrq-hp3000-labelled	Bartram
application	vnd.wt.stf	Wohler
application	vnd.xara	Matthewman
application	vnd.yellowriver-custom-menu	Yello
application	vnd.wita	
application	vnd.workperfect5.1	
application	write	
application	x-alpha-form	
application	x-asap	

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Type	Subtype	Reference (where available)
application	x-bcpio	
application	x-chat	
application	x-cpio	
application	x-sch	
application	x-cu-seemee	
application	x-demoshield	
application	x-director	
application	x-dvi	
application	x-framemaker	
application	x-gtar	
application	x-ica	
application	x-installshield	
application	x-javascript	
application	x-koan	
application	x-latex	
application	x-mif	
application	x-msaddr	
application	x-mms-framed	
application	x-mswallet	
application	x-net-install	
application	x-nokia-9000-add-on-software	
application	x-ns-proxy-autoconfig	
application	x-oleobject	
application	x-olescript	
application	x-p3d	
application	x-pcn	
application	x-pdf	
application	x-perl	
application	x-pn-realaudio	
application	x-pn-realmedia	
application	x-pointplus	
application	x-rad-powermedia	
application	x-sh	
application	x-shar	
application	x-shockwave-flash	
application	x-sprite	
application	x-stuffit	
application	x-tar	
application	x-tcl	

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Type	Subtype	Reference (where available)
application	x-tex	
application	x-texinfo	
application	x-troff	
application	x-troff-man	
application	x-troff-me	
application	x-troff-ms	
application	x-ustar	
application	x-wais-source	
application	x-watchguard-cloaked	
application	x-webbasic	
application	x-wintalk	
application	x-wls	
application	x-wms-LogStats	
application	x400-bp	
application	xml	RFC 3023
application	zip	Lindner
audio	*	
audio	32kadpcm	RFC 2421, RFC 2422
audio	basic	RFC 2045, RFC 2046
audio	echospeech	
audio	vnd.qcelp	
audio	voxware	
audio	x-aiff	
audio	x-mpeg	
audio	x-mpeg-2	
audio	x-wav	
chemical	*	
chemical	x-cdx	
chemical	x-cif	
chemical	x-chem3d	
chemical	x-cmdf	
chemical	x-cml	
chemical	x-daylight-smiles	
chemical	x-csml	
chemical	x-galactic-spc	
chemical	x-gaussian-input	
chemical	x-gaussian-cube	

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Type	Subtype	Reference (where available)
chemical	x-isostar	
chemical	x-jcamp-dx	
chemical	x-kinemage	
chemical	x-mdl-molfile	
chemical	x-mdl-rxnfile	
chemical	x-macmolecule	
chemical	x-macromode1-input	
chemical	x-mopac-input	
chemical	x-pdb	
chemical	x-xyz	
chemical	x-vmd	
drawing	*	
drawing	x-dwf	
graphics	*	
graphics	x-inventor	
image	*	
image	cgm	Francis
image	fif	
image	g3fax	
image	gif	RFC 2045, RFC 2046
image	ief	RFC 1314
image	jpeg	RFC 2045, RFC 2046
image	naplps	Ferber
image	png	Randers-Pehrson
image	prs.btif	Simon
image	tiff	
image	vnd.dwg	Moline
image	vnd.dxf	Moline
image	vnd.fastbidsheet	Becker
image	vnd.fpx	Spencer
image	vnd.net-fpx	Spencer
image	vnd.svf	Moline
image	vnd.xiff	S. Martin
image	wavelet	
image	x-cals	
image	x-cmu-raster	

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Type	Subtype	Reference (where available)
image	x-cmx	
image	x-dwg	
image	x-dxf	
image	x-mgx-dsf	
image	x-ms-bmp	
image	x-photo-cd	
image	x-pict	
image	x-png	
image	x-portable-anymap	
image	x-portable-bitmap	
image	x-portable-graymap	
image	x-portable-pixmap	
image	x-rgb	
image	x-svf	
image	x-xbitmap	
image	x-xwindowdump	
image	xpm	
message	*	
message	delivery-status	RFC 1894
message	disposition-notification	RFC 2298
message	external-body	RFC 2045, RFC 2046
message	http	RFC 2616
message	news	RFC 1036, H. Spencer
message	partial	RFC 2045, RFC 2046
message	rfc822	RFC 2045, RFC 2046
model	*	
model	iges	Parks
model	mesh	RFC 2077
model	vnd.dwf	Pratt
model	vrml	RFC 2077
multipart	*	
multipart	alternative	RFC 2045, RFC 2046
multipart	appledouble	Falstrom
multipart	byteranges	RFC 2068
multipart	digest	RFC 2045, RFC 2046
multipart	encrypted	RFC 1847

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Type	Subtype	Reference (where available)
multipart	form-data	RFC 2388
multipart	header-set	Crocker
multipart	mixed	RFC 2045, RFC 2046
multipart	parallel	RFC 2045, RFC 2046
multipart	related	RFC 2387
multipart	report	RFC 1982
multipart	signed	RFC 1847
multipart	voice-message	RFC 2421, RFC 2423
text	*	
text	css	RFC 2318
text	enriched	RFC 1896
text	html	RFC 2854
text	javascript	
text	plain	RFC 2046, RFC 3676
text	richtext	RFC 2045, RFC 2046
text	sgml	RFC 1874
text	tab-separated-values	Lindner
text	uri-list	RFC 2483
text	vbscript	
text	vnd.abc	Allen
text	vnd.fmiflexstor	Hurtta
text	vnd.in3d.3dml	Powers
text	vnd.in3d.spot	Powers
text	vnd.latex-z	Lubos
text	x-setext	
text	x-speech	
text	xml	RFC 3023
video	*	
video	mpeg	RFC 2045, RFC 2046
video	mpeg-2	
video	quicktime	Lindner
video	vdo	
video	vivo	Wolfe
video	vnd.motorola.video	McGinty
video	vnd.motorola.videop	McGinty
video	vnd.vivo	
video	x-ms-asf	

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Type	Subtype	Reference (where available)
video	x-msvideo	
video	x-sgi-movie	
workbook	*	
workbook	formulaone	
x-conference	x-cooltalk	
x-form	x-openscape	
x-model	x-mesh	
x-music	x-midi	
x-script	x-wfxclient	
x-world	*	
x-world	x-3dmf	
x-world	x-svr	
x-world	x-vream	
x-world	x-vrml	
x-world	x-vrt	
x-world	x-wvr	



# 3

## Services and Ports

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Well-known services are a mixture of port number and transport protocol for specified, standard software applications. This chapter contains tables that list service names, port number, protocol, and description.

### Ports Used by WSM and Fireware

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The WatchGuard Firebox, management station, and WatchGuard servers use specified ports during usual operations.

Port #	Protocol	Purpose
4100	TCP	Authentication service
4107	TCP	WatchGuard Log Server
4115		
4103	TCP	WatchGuard Firebox configuration and management
4105		
4117		
4118		
4110	TCP	WatchGuard Management Server
4112		
4113		
4109	TCP	Secure access to SOHO and Edge Fireboxes with a web browser
5003	TCP and UDP	WebBlocker

## Ports Used by Microsoft Products

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Many Firebox users want to create policies that specifically allow or block Microsoft applications. Here is a list of ports used by some Microsoft products.

Port #	Protocol	Purpose
137, 138	UDP	Browsing
67, 68	UDP	DHCP Lease
135	TCP	DHCP Manager
138	UDP	Directory Replication
139	TCP	
135	TCP	DNS Administration
53	UDP	DNS Resolution
139	TCP	Event Viewer
139	TCP	File Sharing
137, 138	UDP	Logon Sequence
139	TCP	
138	UDP	NetLogon
137, 138	UDP	Pass Through Validation
139	TCP	
139	TCP	Performance Monitor
1723	TCP	PPTP
47	IP	
137, 138	UDP	Printing
139	TCP	
139	TCP	Registry Editor
139	TCP	Server Manager
137, 138	UDP	Trusts
139	TCP	
139	TCP	User Manager
139	TCP	WinNT Diagnostics
137, 138	UDP	WinNT Secure Channel
139	TCP	
42	TCP	WINS Replication
135	TCP	WINS Manager
137	TCP	WINS Registration

Port(s)	Protocol	Purpose
135	TCP	Client/Server Communications
135	TCP	Exchange Administrator
143	TCP	IMAP
993	TCP	IMAP (SSL)
389	TCP	LDAP

Port(s)	Protocol	Purpose
636	TCP	LDAP (SSL)
102	TCP	MTA - X.400 over TCP/IP
110	TCP	POP3
995	TCP	POP3 (SSL)
135	TCP	RCP
25	TCP	SMTP
137	UDP	SMB
138	UDP	SMB
139	TCP	SMB
445	TCP/UDP	MS-DS (Directory Services)
119	TCP	NNTP
563	TCP	NNTP (SSL)

## Well-Known Services List

In addition to the ports used by services described above, WatchGuard supplies a list of well-known services. Because software companies regularly add new services, this is not a full list of all possible services. For more information, refer to:

[www.iana.org/assignments/port-numbers](http://www.iana.org/assignments/port-numbers)

Service Name	Port #	Protocol	Description
tcpmux	1	TCP/UDP	TCP Port Service Multiplexer
compressnet	2,3	TCP/UDP	Management Utility
rje	5	TCP/UDP	Remote Job Entry
echo	7	TCP/UDP	Echo
discard	9	TCP/UDP	Discard
systat	11	TCP/UDP	Active Users
daytime	13	TCP/UDP	Daytime
qotd	17	TCP/UDP	Quote of the Day
msp	18	TCP/UDP	Message Send Protocol
chargen	19	TCP/UDP	Character Generator
ftp-data	20	TCP/UDP	File Transfer [Default Data]
ftp	21	TCP/UDP	File Transfer [Control]
ssh	22	TCP/UDP	SSH Remote Login Protocol
telnet	23	TCP/UDP	Telnet
smtp	25	TCP/UDP	Simple Mail Transfer
nsw-fe	27	TCP/UDP	NSW User system FE
msg-icp	29	TCP/UDP	MSG ICP
msg-auth	31	TCP/UDP	MSG Authentication

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**Well-Known Services List**

<b>Service Name</b>	<b>Port #</b>	<b>Protocol</b>	<b>Description</b>
dsp	33	TCP/UDP	Display Support Protocol
time	37	TCP/UDP	Time
rap	38	TCP/UDP	Route Access Protocol
rlp	39	TCP/UDP	Resource Location Protocol
graphics	41	TCP/UDP	Graphics
nameserver	42	TCP/UDP	Host Name Server
nicname	43	TCP/UDP	whois
mpm-flags	44	TCP/UDP	MPM Flags
mpm	45	TCP/UDP	MPM
mpm-snd	46	TCP/UDP	MPM Send
ni-ftp	47	TCP/UDP	NI FTP
auditd	48	TCP/UDP	Digital Audit Daemon
tacacs	49	TCP/UDP	Login Host Protocol (TACACS)
re-mail-ck	50	TCP/UDP	Remote Mail Checking Protocol
la-maint	51	TCP/UDP	IMP Logical Address Maintenance
xns-time	52	TCP/UDP	XNS Time Protocol
domain	53	TCP/UDP	Domain Name Server
xns-ch	54	TCP/UDP	XNS Clearinghouse
isi-gl	55	TCP/UDP	ISI Graphics Language
xns-auth	56	TCP/UDP	XNS Authentication
xns-mail	58	TCP/UDP	XNS Mail
ni-mail	61	TCP/UDP	NI MAIL
acas	62	TCP/UDP	ACA Services
whois++	63	TCP/UDP	whois++
covia	64	TCP/UDP	Communications Integrator (CI)
tacacs-ds	65	TCP/UDP	TACACS-Database Service
sql*net	66	TCP/UDP	Oracle SQL*NET
bootps	67	TCP/UDP	Bootstrap Protocol Server
bootpc	68	TCP/UDP	Bootstrap Protocol Client
tftp	69	TCP/UDP	Trivial File Transfer
gopher	70	TCP/UDP	Gopher
netrjs-1	71	TCP/UDP	Remote Job Service
netrjs-2	72	TCP/UDP	Remote Job Service
netrjs-3	73	TCP/UDP	Remote Job Service
netrjs-4	74	TCP/UDP	Remote Job Service
deos	76	TCP/UDP	Distributed External Object Store
vettcp	78	TCP/UDP	vettcp
finger	79	TCP/UDP	Finger
www-http	80	TCP/UDP	World Wide Web HTTP

Service Name	Port #	Protocol	Description
hosts2-ns	81	TCP/UDP	HOSTS2 Name Server
xfer	82	TCP/UDP	XFER utility
mit-ml-dev	83	TCP/UDP	MIT ML device
ctf	84	TCP/UDP	Common Trace Facility
mit-ml-dev	85	TCP/UDP	MIT ML device
mfcobol	86	TCP/UDP	Micro Focus Cobol
kerberos	88	TCP/UDP	Kerberos
sug-mit-tug	89	TCP/UDP	SU/MIT Telnet gateway
dnsix	90	TCP/UDP	DNSIX Secure Application Token Map
mit-dov	91	TCP/UDP	MIT Dover Spooler
npp	92	TCP/UDP	Network Printing Protocol
dcp	93	TCP/UDP	Device Control Protocol
objcall	94	TCP/UDP	Tivoli Object Dispatcher
supdup	95	TCP/UDP	SUPDUP
dixie	96	TCP/UDP	DIXIE Protocol Specification
swift-rvf	97	TCP/UDP	Swift Remote Virtual File Protocol
tacnews	98	TCP/UDP	TAC News
metagram	99	TCP/UDP	Metagram Relay
newacct	100	TCP	[unauthorized use]
hostname	101	TCP/UDP	NIC Host Name Server
iso-tsap	102	TCP/UDP	ISO-TSAP
gppitnp	103	TCP/UDP	Genesis Point-to-Point Trans Net
acr-nema	104	TCP/UDP	ACR-NEMA Digital Imag. Comm. 300
cso	105	TCP/UDP	CCSO name server protocol
csnet-ns	105	TCP/UDP	Mailbox Name Nameserver
3com-tsmux	106	TCP/UDP	3COM-TSMUX
rtelnet	107	TCP/UDP	Remote Telnet Service
snagas	108	TCP/UDP	SNA Gateway Access Server
pop2	109	TCP/UDP	Post Office Protocol - Version 2
pop3	110	TCP/UDP	Post Office Protocol - Version 3
sunrpc	111	TCP/UDP	SUN Remote Procedure Call
mcidas	112	TCP/UDP	McIDAS Data Transmission Protocol
auth(ident)	113	TCP/UDP	Authentication Service
audionews	114	TCP/UDP	Audio News Multicast
sftp	115	TCP/UDP	Simple File Transfer Protocol
ansanotify	116	TCP/UDP	ANSA REX Notify
uucp-path	117	TCP/UDP	UUCP Path Service
sqlserv	118	TCP/UDP	SQL Services
nntp	119	TCP/UDP	Network News Transfer Protocol

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**Well-Known Services List**

<b>Service Name</b>	<b>Port #</b>	<b>Protocol</b>	<b>Description</b>
cfdpkt	120	TCP/UDP	CFDPTKT
erpc	121	TCP/UDP	Encore Expedited RPC
smakynet	122	TCP/UDP	SMAKYNET
ntp	123	TCP/UDP	Network Time Protocol
ansatrader	124	TCP/UDP	ANSA REX Trader
locus-map	125	TCP/UDP	Locus PC-Interface Net Map
unitary	126	TCP/UDP	Unisys Unitary Login
locus-con	127	TCP/UDP	Locus PC-Interface Conn Server
gss-xlicen	128	TCP/UDP	GSS X License Verification
pwdgen	129	TCP/UDP	Password Generator Protocol
cisco-fna	130	TCP/UDP	cisco FNATIVE
cisco-tna	131	TCP/UDP	cisco TNATIVE
cisco-sys	132	TCP/UDP	cisco SYSMAINT
statsrv	133	TCP/UDP	Statistics Service
ingres-net	134	TCP/UDP	INGRES-NET Service
epmap	135	TCP/UDP	DCE-RPC Endpoint resolution
profile	136	TCP/UDP	PROFILE naming system
netbios-ns	137	TCP/UDP	NETBIOS Name Service
netbios-dgm	138	TCP/UDP	NETBIOS Datagram Service
netbios-ssn	139	TCP/UDP	NETBIOS Session Service
imap	143	TCP/UDP	Internet Message Access Protocol
news	144	TCP/UDP	NewS
jargon	148	TCP/UDP	Jargon
sql-net	150	TCP/UDP	SQL-NET
bftp	152	TCP/UDP	Background File Transfer
sgmp	153	TCP/UDP	SGMP
sqlsrv	156	TCP/UDP	SQL Service
pcmail-srv	158	TCP/UDP	PCMail Server
sgmp-traps	160	TCP/UDP	SGMP-TRAPS
snmp	161	TCP/UDP	SNMP
snmptrap	162	TCP/UDP	SNMPTRAP
cmip-man	163	TCP/UDP	CMIP/TCP Manager
cmip-agent	164	TCP	CMIP/TCP Agent
smip-agent	164	UDP	CMIP/TCP Agent
namp	167	TCP/UDP	NAMP
rsvd	168	TCP/UDP	RSVD
send	169	TCP/UDP	SEND
xyplex-mux	173	TCP/UDP	Xyplex MUX
xdmcp	177	TCP/UDP	X Display Manager Control Protocol

Service Name	Port #	Protocol	Description
NextStep	178	TCP/UDP	NextStep Window Server
bgp	179	TCP/UDP	Border Gateway Protocol
unify	181	TCP/UDP	Unify
irc	194	TCP/UDP	Internet Relay Chat Protocol
at-rtmp	201	TCP/UDP	AppleTalk Routing Maintenance
at-nbp	202	TCP/UDP	AppleTalk Name Binding
at-3	203	TCP/UDP	AppleTalk Unused
at-echo	204	TCP/UDP	AppleTalk Echo
at-5	205	TCP/UDP	AppleTalk Unused
at-zis	206	TCP/UDP	AppleTalk Zone Information
at-7	207	TCP/UDP	AppleTalk Unused
at-8	208	TCP/UDP	AppleTalk Unused
qmtip	209	TCP/UDP	Quick Mail Transfer Protocol
z39.50	210	TCP/UDP	ANSI Z39.50 (WAIS)
ipx	213	TCP/UDP	IPX
imap3	220	TCP/UDP	Interactive Mail Access Protocol v3
fln-spx	221	TCP/UDP	Berkeley rlogind with SPX auth
rsh-spx	222	TCP/UDP	Berkeley rshd with SPX auth
backweb	371	UDP	BackWeb
ulistserv	372	TCP/UDP	Unix Listserv
netware-ip	396	TCP/UDP	Novell Netware over IP
biff	512	UDP	Used by mail system to notify users
exec	512	TCP	Remote process execution
login	513	TCP/UDP	Login Host Protocol
who	513	UDP	Maintains databases showing who's who
cmd	514	TCP	Like exec, but automatic
syslog	514	UDP	logging facilities
printer	515	TCP/UDP	Spooler
talk	517	TCP/UDP	Talk protocol
ntalk	518	TCP/UDP	another Talk
utime	519	TCP/UDP	Unixtime
router	520	UDP	RIP local routing process (on site)
timed	525	TCP/UDP	Timeserver
tempo	526	TCP/UDP	Newdate
courier	530	TCP/UDP	Rpc
conference	531	TCP/UDP	Chat
netnews	532	TCP/UDP	Readnews
netwall	533	TCP/UDP	For emergency broadcasts
uucp	540	TCP/UDP	Uucpd

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**Well-Known Services List**

<b>Service Name</b>	<b>Port #</b>	<b>Protocol</b>	<b>Description</b>
uucp-rlogin	541	TCP/UDP	Uucp-rlogin Stuart Lynne
klogin	543	TCP/UDP	Kerberos (v4/v5)
kshell	544	TCP/UDP	krcmd Kerberos (v4/v5)
dhcpv6-client	546	TCP/UDP	DHCPv6 Client
dhcpv6-server	547	TCP/UDP	DHCPv6 Server
cybercash	551	TCP/UDP	Cybercash
remotefs	556	TCP/UDP	Rfs server
9pfs	564	TCP/UDP	Plan 9 file service
whoami	565	TCP/UDP	Whoami
msn	569	TCP	Microsoft Network
doom	666	TCP/UDP	Doom Id Software
kerberos-adm	749	TCP/UDP	Kerberos administration
webster	765	TCP/UDP	Network dictionary
phonebook	767	TCP/UDP	Phone
socks	1080	TCP/UDP	Socks
hermes	1248	TCP/UDP	Hermes
lotusnote	1352	TCP/UDP	Lotus Notes
netware-csp	1366	TCP/UDP	Novell NetWare Comm Service Platform
novell-lu6.2	1416	TCP/UDP	Novell LU6.2
netopia	1419	UDP	Netopia Virtual Office
	8000	TCP	
ms-sql-s	1433	TCP/UDP	Microsoft-SQL-Server
ms-sql-m	1434	TCP/UDP	Microsoft-SQL-Monitor
winframe	1494	TCP	WinFrame
watcom-sql	1498	TCP/UDP	Watcom-SQL
ingreslock	1524	TCP/UDP	Ingres
groupwise	1677	TCP	GroupWise
nfs	2049	TCP/UDP	Network File Server
www-dev	2784	TCP/UDP	World Wide Web - development
Squid	3128	TCP/UDP	Web proxy/caching service -- frequently scanned for vulnerabilities
ccmail	3264	TCP/UDP	Cc:mail/lotus
ICQ	2109	TCP	Used for chat
	4000	UDP	
Firstclass	3000	TCP	FirstClass (ftp channel on 510 TCP)
	30004		
compuserve	4144	TCP	CompuServe Online
rfe	5002	TCP/UDP	Radio free ethernet
aol	5190	TCP	America Online
x11	6000	TCP/UDP	X Window System (through 6063)
font-service	7100	TCP/UDP	X Font Service

<b>Service Name</b>	<b>Port #</b>	<b>Protocol</b>	<b>Description</b>
nas	8000	TCP/UDP	NCD Network Audio Server
iphone	6670	TCP	for connecting to the phone server
iphone	22555	UDP	for audio
iphone	25793	TCP	for the address server, in 4.x and 5.0
iphone	1490	TCP	for the conference engine in 4.x and 5.0



# 4

## WebBlocker Content

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WatchGuard WebBlocker, together with the HTTP proxy and the HTTPS proxy, supplies web site filtering for the content of the web pages your users open in their browsers. WebBlocker uses a URL database created and controlled by SurfControl.

### Searching for Blocked Sites

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To see whether WebBlocker is blocking a web site as part of a category block, go to WatchGuard Test-a-Site on the SurfControl web site.

- 1 Open a web browser and go to:  
<http://mtas.surfcontrol.com/mtas/WatchGuardTest-a-Site.asp>
- 2 Type the URL or IP address of the site to check.
- 3 Click **Test Site**.

The search engine tells you whether the site is on the SurfControl list. You can also request that the URL be added to the SurfControl list.

## WebBlocker Categories

The WebBlocker database contains 11 groups of categories with 54 individual categories. A web site is added to a category when the contents of the web site meet the correct criteria. Web sites that give opinion or educational material about the subject matter of the category are not included. For example, the illegal drugs category denies sites that tell how to use marijuana. It does not deny sites with information about the historical use of marijuana.

Group	Category	Description of Content
Adult	Adult/Sexually Explicit	<ul style="list-style-type: none"> <li>Sexually oriented or erotic full or partial nudity</li> <li>Depictions or images of sexual acts, including inanimate objects used in a sexual manner</li> <li>Erotic stories and textual descriptions of sex acts</li> <li>Sexually exploitive or sexually violent text or graphic</li> <li>Bondage, fetishes, genital piercing</li> <li>Adult products including sex toys, CD-ROMs, and videos</li> <li>Adult services including videoconferencing, escort services, and strip clubs</li> <li>Explicit cartoons and animation</li> </ul>
	Alcohol & Tobacco	<ul style="list-style-type: none"> <li>Recipes, instructions, or kits for manufacturing or growing illicit substances, including alcohol, for purposes other than industrial usage</li> <li>Glamorizing, encouraging, or instructing on the use of, or masking the use of, alcohol, tobacco, illegal drugs, or other substances that are illegal to minors</li> <li>Alcohol and tobacco manufacturers' commercial Web sites</li> <li>Information on "legal highs": glue sniffing, misuse of prescription drugs, or abuse of other legal substances</li> <li>Distributing alcohol, illegal drugs, or tobacco free or for a charge</li> <li>Displaying, selling, or detailing use of drug paraphernalia</li> </ul> <p>Note: SurfControl does not include sites that discuss medicinal drug use, industrial use, or public debate on the issue of legalizing certain drugs. SurfControl also does not include sites sponsored by a public or private agency that provide educational information on drug use.</p>
	Gambling	<ul style="list-style-type: none"> <li>Online gambling or lottery web sites that invite the use of real money</li> <li>Virtual casinos and offshore gambling ventures</li> <li>Virtual sports leagues, sports picks, and betting pools</li> </ul>
	Intimate Apparel & Swimwear	<ul style="list-style-type: none"> <li>Lingerie, negligee, or swimwear modeling</li> <li>Model fan pages; fitness models/sports celebrities</li> <li>Fashion or glamour magazines online; clothing catalogs</li> <li>Beauty and cosmetics</li> <li>Modeling information and agencies</li> </ul>
	Sex Education	<ul style="list-style-type: none"> <li>Pictures or text advocating the proper use of contraceptives, including condom use, the correct way to wear a condom, and how to put a condom in place</li> <li>Sites related to discussion about the use of the Pill, IUDs, and other types of contraceptives</li> <li>Discussion sites on how to talk to your partner about diseases, pregnancy, and respecting boundaries</li> </ul> <p>Note: Not included in this category are commercial sites that sell sexual paraphernalia. These sites are filtered through the Adult category.</p>

Group	Category	Description of Content
Crime	Tasteless & Offensive	<ul style="list-style-type: none"> <li>Offensive or violent language, including through jokes, comics, or satire</li> <li>Excessive use of profanity or obscene gesticulation</li> </ul>
	Criminal Activity	<p>Advocating, instructing, or giving advice on performing illegal acts, such as:</p> <ul style="list-style-type: none"> <li>Phone service theft</li> <li>Evading law enforcement</li> <li>Lock-picking</li> <li>Fraud</li> <li>Plagiarism/cheating</li> <li>Burglary techniques</li> </ul>
	Hacking	<ul style="list-style-type: none"> <li>Promotion, instruction, or advice on the questionable or illegal use of equipment and/or software for purpose of hacking passwords, creating viruses, or gaining access to other computers and/or computerized communication systems</li> <li>Sites that provide instruction or work-arounds for our filtering software</li> <li>Cracked software</li> <li>Pirated software download sites</li> <li>Multimedia download sites</li> </ul>
	Intolerance & Hate	<ul style="list-style-type: none"> <li>Advocating or inciting degradation of or attacks on specified populations or institutions based on associations such as religion, race, nationality, gender, age, disability, or sexual orientation</li> <li>Promoting a political or social agenda that is supremacist in nature or exclusionary of others based on their race, religion, nationality, gender, age, disability, or sexual orientation</li> <li>Holocaust revisionist/denial sites</li> <li>Coercion or recruitment for membership in a gang* or cult**</li> <li>Militancy, extremist</li> </ul> <p>Note: SurfControl does not include news, historical, or press incidents that may include the above criteria in this category (except in graphic examples).</p> <p>*A gang is defined as a group whose primary activities are the commission of felonious criminal acts, which has a common name or identifying sign or symbol, and whose members individually or collectively engage in criminal activity in the name of the group.</p> <p>**A cult is defined as a group whose followers have been deceptively and manipulatively recruited and retained through undue influence such that followers' personalities and behavior are altered. Leadership is all-powerful, ideology is totalistic, the will of the individual is subordinate to the group, and the group is outside society.</p>
	Violence	<ul style="list-style-type: none"> <li>Portraying, describing, or advocating physical assault against humans, animals, or institutions</li> <li>Depictions of torture, mutilation, gore, or horrific death</li> <li>Advocating suicide or self-mutilation</li> <li>Instructions, recipes, or kits for making bombs or other harmful or destructive devices</li> <li>Excessive use of profanity or obscene gesticulation</li> </ul> <p>Note: We do not block news, historical, or press incidents that may include the above criteria (except in graphic examples).</p>

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Group	Category	Description of Content
	Weapons	<ul style="list-style-type: none"> <li>Online purchasing or ordering information, including lists of prices and dealer locations</li> <li>Any page or site predominantly containing, or providing links to, content related to the sale of guns, weapons, ammunition, or poisonous substances</li> <li>Displaying or detailing the use of guns, weapons, ammunition or poisonous substances</li> </ul> <p>Note: Weapons are defined as something (as a club, knife, or gun) used to injure, defeat, or destroy.</p>
	Spyware	<ul style="list-style-type: none"> <li>Sites that provide or promote information gathering or tracking that is unknown to, or without the explicit consent of, the end user or the organization</li> <li>Sites that carry malicious executables or viruses</li> <li>3rd party monitoring and other unsolicited commercial software</li> <li>Spyware and Malware "Phone Home" destinations</li> </ul>
	Phishing & Fraud	<ul style="list-style-type: none"> <li>Phishing</li> <li>Phone service theft advice</li> <li>Plagiarism &amp; chating, including the sale of research papers</li> </ul>
	Illegal Drugs	<ul style="list-style-type: none"> <li>Recipes, instructions, or kits for manufacturing or growing illicit substances for purposes other than industrial usage</li> <li>Glamorizing, encouraging, or instructing in the use of or masking the use of alcohol, tobacco, illegal drugs, or other substances that are illegal to minors</li> <li>Information on "legal highs": glue sniffing, misuse of prescription drugs, or abuse of other legal substances</li> <li>Distributing illegal drugs free or for a charge</li> <li>Displaying, selling, or detailing the use of drug paraphernalia</li> </ul>
	Entertainment	Entertainment
	Entertainment	<ul style="list-style-type: none"> <li>Television, movies, music, and video programming guides</li> <li>Comics, jokes, movie, video, or sound clips</li> <li>Discussion forums on television, movies, music, and videos</li> <li>Online magazines and reviews on the entertainment industry</li> <li>Circuses, theatre, variety magazines, and radio</li> <li>Broadcasting firms and technologies (satellite, cable, etc.)</li> <li>Book reviews and promotions, publishing houses, comic books, and poetry</li> <li>Jokes, comedians, any site designed to be funny or satirical</li> <li>Online museums, galleries, artist sites (including sculpture, photography, etc.)</li> <li>Celebrity fan sites</li> <li>Horoscopes</li> <li>City Guides</li> </ul>
	Games	<ul style="list-style-type: none"> <li>Game playing or downloading; game hosting or contest hosting</li> <li>Tips and advice on games or obtaining cheat codes ("cheatz")</li> <li>Journals and magazines dedicated to game playing</li> </ul>
	Hobbies & Recreation	<ul style="list-style-type: none"> <li>Recreational pastimes such as collecting, gardening, or kit airplanes</li> <li>Outdoor recreational activities such as hiking, camping, or rock climbing</li> <li>Tips or trends focused on a specific art, craft, or technique</li> <li>Online publications on a specific pastime or recreational activity</li> <li>Online clubs, associations, or forums dedicated to a hobby</li> </ul>
	Kids' Sites	<ul style="list-style-type: none"> <li>Child-centered sites and sites published by children</li> </ul>

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Group	Category	Description of Content
Personal	Sports	<ul style="list-style-type: none"> <li>Team or conference web sites</li> <li>National, international, college, or professional scores and schedules</li> <li>Sports-related online magazines or newsletters</li> </ul>
	Streaming Media	<ul style="list-style-type: none"> <li>Streaming media files or events (any live or archived audio or video file)</li> <li>Internet TV and radio</li> </ul>
	Travel	<ul style="list-style-type: none"> <li>Airlines and flight booking agencies</li> <li>Accommodation information</li> <li>Travel package listings</li> <li>City guides and tourist information</li> <li>Weather bureaus</li> <li>Car rentals</li> </ul>
	Arts	<ul style="list-style-type: none"> <li>Museums, galleries, artist sites (including sculpture, photography, etc.)</li> <li>Performing arts (theatre, vaudeville, opera, symphonies, etc.)</li> <li>Dance companies, studios, and training</li> <li>Book reviews and promotions, variety magazines, and poetry</li> </ul>
	Education	<ul style="list-style-type: none"> <li>Educational institutions, including pre-, elementary, secondary, and high schools; universities</li> <li>Educational sites: pre-, elementary, secondary, and high schools; universities</li> <li>Distance education and trade schools</li> <li>Online teacher resources (lesson plans, etc.)</li> <li>Topic-specific search engines (e.g. anthropology)</li> </ul>
	Society & Culture	<ul style="list-style-type: none"> <li>Home life and family-related topics, including parenting tips, gay/lesbian/bisexual (non-pornographic sites), weddings, births, and funerals</li> <li>Foreign cultures, socio-cultural information</li> </ul>
	Job Search & Career Development	<ul style="list-style-type: none"> <li>Employment agencies, contractors, job listings, career information</li> <li>Career searches, career-networking groups</li> </ul>
	Personals & Dating	<ul style="list-style-type: none"> <li>Singles listings, matchmaking and dating services</li> <li>Advice for dating or relationships; romance tips and suggestions</li> </ul>
	Religion	<ul style="list-style-type: none"> <li>Churches, synagogues, and other houses of worship</li> <li>Any faith or religious beliefs, including non-traditional religions such as Wicca and witchcraft</li> </ul>
	Philanthropic & Professional Orgs.	<ul style="list-style-type: none"> <li>Philanthropic and charity organizations</li> <li>Environmental organizations</li> <li>Professional associations</li> <li>Labor unions</li> <li>Social organizations</li> </ul>
Shopping	Fashion & Beauty	<ul style="list-style-type: none"> <li>Fashion or glamour magazines online</li> <li>Beauty and cosmetics</li> </ul>
	Advertisements	<ul style="list-style-type: none"> <li>Banner ad servers</li> </ul>
	Food & Drink	<ul style="list-style-type: none"> <li>Recipes, cooking instruction and tips, food products, and wine advisors</li> <li>Restaurants, cafes, eateries, pubs, and bars</li> <li>Food/drink magazines and reviews</li> <li>Manufacturers and distillers</li> </ul>

<b>Group</b>	<b>Category</b>	<b>Description of Content</b>
	Motor Vehicles	<ul style="list-style-type: none"> <li>• Car reviews, vehicle purchasing or sales tips, parts catalogs</li> <li>• Auto trading, photos, discussion of vehicles including motorcycles, boats, cars, trucks, and RVs</li> <li>• Journals and magazines on vehicle modification, repair, and customization</li> <li>• Online automotive enthusiast clubs</li> </ul>
	Real Estate	<ul style="list-style-type: none"> <li>• Home, apartment, and land listings</li> <li>• Rental or relocation services</li> <li>• Tips on buying or selling a home</li> <li>• Real estate agents</li> <li>• Home improvement</li> </ul>
	Shopping	<ul style="list-style-type: none"> <li>• Internet malls and online auctions</li> <li>• Department stores, retail stores, company catalogs online</li> <li>• Online downloadable product warehouses; specialty items for sale</li> <li>• Freebies, shareware, and software downloads</li> <li>• Freebies or merchandise giveaways</li> </ul>
Computers	Chat	Web-based chat
	Computing & Internet	<ul style="list-style-type: none"> <li>• Reviews, information, computer buyer's guides, computer parts and accessories, and software</li> <li>• Computer/software/Internet companies, industry news, and magazines</li> <li>• Sites that design and/or maintain web pages including individual web designers</li> <li>• Design and/or maintain web pages including web designers</li> <li>• Personal storage or backup</li> <li>• Pay-to-surf sites</li> </ul>
	Hosting Sites	<ul style="list-style-type: none"> <li>• Web sites that host business and individual web pages</li> </ul>
	Proxies & Translators	<ul style="list-style-type: none"> <li>• Remote proxies or anonymous surfing</li> <li>• Peer-to-peer sharing</li> </ul>
	Web-based Email	<ul style="list-style-type: none"> <li>• Web-based e-mail accounts</li> </ul>
	Downloads	<ul style="list-style-type: none"> <li>• Downloadable (non-streaming) movie, video, or sound clips</li> <li>• Downloadable PDA software, including themes and graphics</li> <li>• Freeware and shareware sites</li> <li>• Personal storage or backup</li> <li>• Clip art, fonts, and animated gif pages</li> </ul>
	Ringtones/ Mobile Phone Downloads	<ul style="list-style-type: none"> <li>• Providers of mobile phone downloads, including: <ul style="list-style-type: none"> <li>- Ringtones,</li> <li>- Logos</li> <li>- Backgrounds</li> <li>- Screensavers</li> <li>- Games</li> </ul> </li> </ul>
	Peer-to-Peer	<ul style="list-style-type: none"> <li>• Peer-to-peer file sharing clients</li> <li>• Peer-to-peer file sharing servers</li> </ul>

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Group	Category	Description of Content
	Spam URLs	<ul style="list-style-type: none"> <li>• URLs found in spam, including these topics: <ul style="list-style-type: none"> <li>- Computing</li> <li>- Finance &amp; Stocks</li> <li>- Entertainment</li> <li>- Games</li> <li>- Health &amp; Medicine</li> <li>- Humor &amp; Novelties</li> <li>- Personal &amp; Dating</li> <li>- Products &amp; Services</li> <li>- Shopping</li> <li>- Travel</li> </ul> </li> </ul>
	Infrastructure	<ul style="list-style-type: none"> <li>• Content delivery networks</li> <li>• XML Reference Schemas</li> <li>• Web analytics and statistics services</li> <li>• Transaction servers</li> <li>• Corporate image servers</li> </ul>
	News	<ul style="list-style-type: none"> <li>• Newspapers online</li> <li>• Headline news sites, newswire services, and personalized news services</li> <li>• Weather sites</li> </ul>
	Blogs & Forums	<ul style="list-style-type: none"> <li>• Weblogs (blog) sites</li> <li>• Newsgroups</li> <li>• Opinion or discussion forums</li> </ul>
Search	Photo Searches	<ul style="list-style-type: none"> <li>• Sites that provide resources for photo and image searches</li> </ul>
	Search Engines	<ul style="list-style-type: none"> <li>• General search engines (Yahoo, AltaVista, Google, AOL)</li> </ul>
Research	Finance & Investment	<ul style="list-style-type: none"> <li>• Stock quotes, stock tickers, and fund rates</li> <li>• Online stock or equity trading</li> <li>• Investing advice or contacts for trading securities</li> <li>• Money management/investment services or firms</li> <li>• General finances and companies that advise thereof</li> <li>• Accountants, actuaries, banks, mortgages, and general insurance companies</li> </ul>
	Government	<ul style="list-style-type: none"> <li>• Government services such as taxation, armed forces, customs bureaus, and emergency services</li> <li>• Local government sites</li> <li>• Political debate, canvassing, election information, and results</li> <li>• Local, national, and international political sites</li> </ul>
	Health & Medicine	<ul style="list-style-type: none"> <li>• General health such as fitness and well-being</li> <li>• Alternative and complementary therapies</li> <li>• Medical information about ailments, conditions, and drugs</li> <li>• Medical reference</li> <li>• Hospital, medical insurance</li> <li>• Dentistry, optometry, and other medical-related sites</li> <li>• General psychiatry and mental well-being sites</li> <li>• Promoting self-healing of physical and mental abuses, ailments, and addictions</li> <li>• Psychology, self-help books, and organizations</li> </ul>
	Reference	<ul style="list-style-type: none"> <li>• Personal, professional, or educational reference</li> <li>• Online dictionaries, maps, and language translation sites</li> <li>• Census, almanacs, and library catalogues</li> <li>• Topic-specific search engines</li> </ul>

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<b>Group</b>	<b>Category</b>	<b>Description of Content</b>
	Politics	<ul style="list-style-type: none"><li>• Political parties</li><li>• Political debate, canvassing, election information and results</li><li>• Conspiracy theorists &amp; alternative government views that are not hate-based</li></ul>
	Business	<ul style="list-style-type: none"><li>• General business corporate web sites</li><li>• International and multi-national large general business corporate sites</li><li>• Business Associations</li><li>• Basic business sites, such as FedEx, that enable organizations to manage their necessary daily business tasks.</li></ul>
Other		<ul style="list-style-type: none"><li>• Sites that are not included in the defined categories</li></ul>
Uncategorized		<ul style="list-style-type: none"><li>• Sites that are not categorized</li></ul>

# 5

## Types of Policies in Firewall

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This chapter gives a list of the pre-defined policies included with your Firebox management software, their protocols, and their ports. It also gives special information about circumstances that could have an effect on the security of some policies.

In this chapter, policies are divided into two groups—policies that are controlled by a packet filter and policies that are controlled by a proxy.

### Packet Filter Policies

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Packet filter policies examine the source and destination headers of each packet. Packets are allowed or denied based on if the headers appear to come from and go to trusted addresses.

#### Any

Use an Any policy only to allow all traffic between two specified trusted IP or network addresses. An Any policy opens a “hole” through the Firebox, and allows all traffic to flow freely between specified hosts. We recommend that the Any policy be used only for traffic through a VPN.

The Any policy is different from other policies. For example, if you allow FTP only to a specified host, all other FTP sessions to other hosts are denied by that policy (unless you have also configured other FTP policies). The Any policy does not deny like other policies.

You also cannot use an Any policy unless specified IP addresses, network addresses, host aliases, group names, or user names are used in the **From** or **To** lists. If not, the Any policy does not operate.

#### Characteristics

- Internet Protocol(s): Any
- Port Number(s): Any port

## Archie

Archie is a search protocol used to find files on FTP servers. We recommend that you use the available web interfaces to Archie. Search the Internet to find a current list of Archie servers.

External hosts can be spoofed. The Firebox cannot make sure that these packets were sent from the correct location. You can configure your Firebox to add the source IP address to the Blocked Sites list when an incoming archie connection is denied. You can use all of the usual log options with archie.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 1525

## auth

The Authentication Server protocol (AUTH) is now called the Identification Protocol (IDENT). Refer to IDENT for more information about this policy.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 113

## BGP

Border Gateway Protocol (BGP) is the routing protocol used across most of the Internet. It is a highly configurable protocol that can add redundancy to links to and from the Internet for LANs. We recommend that you use this service only if you have enabled and configured BGP in the dynamic routing processes in the Fireware® configuration.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 179

## Citrix

Citrix, or Independent Computing Architecture (ICA), is an application protocol used by Citrix software applications such as Winframe and Metaframe Presentation Server (MPS). Winframe gives access to a Windows computer from different types of clients that use TCP port 1494. Citrix MPS 3.0 uses ICA with Session Reliability over TCP port 2598. If you use Citrix MPS, you must add a custom policy for TCP port 2598. If you add the Citrix policy, you could put your network security at risk because it allows remote access to computers through the firewall without authentication. The threat to a Winframe or MPS server includes denial-of-service attacks. We recommend that you use VPN options to give more security for ICA connections. You can use all of the usual log options with WinFrame.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 1494

## Clarent-Command

Clarent Corporation supplies IP telephone technology to mainstream carriers and service providers. Clarent products allow voice-over-IP between Clarent gateways across the Internet. This policy gives support to the Clarent v3.0 product and later.

Clarent products use two sets of ports, one for gateway-to-gateway communications (UDP ports 4040, 4045, and 5010) and one for gateway-to-command center communications (UDP ports 5001 and 5002). Use the Clarent-command policy for the gateway-to-command center communications.

Allow incoming connections only from specified external gateways to your gateway or command center.

Clarent also gives support for the use of PCAnywhere for management. Refer to the PCAnywhere policy notes for more information.

The Clarent-command policy could put network security at risk because it allows traffic inside the firewall based only on network address. This is not a trusted method of authentication. In addition, your Clarent server could receive denial-of-service attacks in this configuration. Where possible, we recommend that you use VPN options to give more security for Clarent-command connections.

### Characteristics:

- Internet Protocol(s): UDP
- Port Numbers(s): 5001, 5002

## Clarent-Gateway

Clarent Corporation supplies IP telephone technology to mainstream carriers and service providers. Clarent products allow voice-over-IP between Clarent gateways across the Internet. This policy gives support to the Clarent v3.0 product and later.

Clarent products use two sets of ports, one for gateway-to-gateway communications (UDP ports 4040, 4045, and 5010) and one for gateway-to-command center communications (UDP ports 5001 and 5002). Use the Clarent-command policy for the gateway-to-command center communications.

Allow incoming connections only from specified external gateways to your gateway or command center.

Clarent also gives support for the use of PCAnywhere for management. Refer to the PCAnywhere policy notes for more information.

The Clarent-gateway policy could put network security at risk because it allows traffic inside the firewall based only on network address. This is not a trusted method of authentication. In addition, your Clarent server could receive denial-of-service attacks in this configuration. Where possible, we recommend that you use VPN options to give more security for Clarent-gateway connections.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 4040, 4045, 5010

## **CU-SeeMe**

CU-SeeMe is a software application used to do video conferencing through the Internet. For CU-SeeMe to operate through the Firebox, you must make sure that you are not on a network that uses outgoing dynamic NAT.

The CU-SeeMe protocol makes you configure this policy for traffic going in to and out of your network. The CU-SeeMe policy uses the correct ports to allow the use of CU-SeeMe versions 2.X and 3.X. CU-SeeMe Version 2.X operates on UDP port 7648. Version 3.X operates on UDP port 7648, UDP port 24032 (for H.323 conferences), and TCP port 7648 (video conference directories).

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Port Numbers(s): TCP 7648, UDP 7648, UDP 24032

## **DHCP-Server or DHCP-Client**

Dynamic Host Configuration Protocol (DHCP) gives a way to allocate dynamic IP addresses to devices on a network.

### **Characteristics**

- Internet Protocol(s): TCP
- DHCP-Server Port Number(s): 67
- DHCP-Client Port Number(s): 68

## **DNS**

Domain Name Service (DNS) matches host names to IP addresses. A DNS policy is enabled in the default configuration. The DNS policy allows UDP DNS traffic, as well as TCP zone transfers, to occur as specified. All of the usual log options can be used with DNS.

### **Characteristics**

- Internet Protocol(s): TCP (for server-server zone transfers), UDP (for client-server lookups)
- Port Number(s): TCP 53, UDP 53

## **Entrust**

The Entrust Authority Public Key distribution application protocol passes public keys to a trusted third-party organization for verification.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 709, 710

## finger

finger is an application protocol used to get information about users on a given host. It is easy for a hacker to use this information against you. We do not recommend that you put finger servers on the trusted interface.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 79

## FTP

File Transfer Protocol (FTP) is used to move files across the Internet. An FTP packet filter will not apply the FTP proxy rule set to any traffic. To proxy FTP traffic, use the FTP proxy policy. We recommend that incoming FTP be allowed only to public FTP servers located behind the Firebox.

External hosts can be spoofed. WatchGuard cannot verify that these packets were actually sent from the correct location. You can configure the Firebox to add the source IP address to the Blocked Sites list whenever an FTP connection to a computer protected by the Firebox is denied. The packet filter and proxy policy included in WatchGuard Policy Manager both handle the data channel for active and passive FTP sessions. All of the usual log options can be used with FTP.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 21

## Gopher

Gopher is a data-retrieval protocol developed at the University of Minnesota. Gopher is not frequently used, as most users use HTML.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 70, but servers can be configured to use other ports

## GRE

Generic Routing Encapsulation Protocol (GRE) is used together with Point-to-Point Tunneling Protocol (PPTP) to create virtual private networks (VPNs) between clients or between clients and servers.

### Characteristics

- Internet Protocol(s): GRE

## HBCI

The Home Banking Computer Interface (HBCI) is a standard created for bank customers and manufacturers of banking products.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 3000

## HTTP

An HTTP packet filter will not apply the HTTP proxy rule set to any traffic. To proxy HTTP traffic, use the HTTP proxy policy. We recommend that HTTP be allowed only to public HTTP servers located behind the Firebox.

External hosts can be spoofed. WatchGuard cannot verify that these packets were actually sent from the correct location. You can configure the Firebox to add the source IP address to the Blocked Sites list whenever an HTTP connection to a computer protected by the Firebox is denied. All of the usual log options can be used with HTTP.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 80

## HTTPS

HTTPS is a secure and encrypted version of the HTTP protocol. The client and the web server set up an encrypted session on TCP port 443. Because this session is encrypted, the proxy cannot examine packet contents using a proxy. This policy uses a packet filter to examine the connection.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 443

## IDENT

The Identification Protocol (IDENT) is a protocol used to match TCP connections to a user name. It is used most frequently by large public SMTP and FTP servers. It is used for logs, but you cannot trust the information it gives, as attackers can change their servers to have them send back incorrect information. IDENT uses false information to hide internal user information.

When you use incoming static NAT with SMTP, you might see packets that come from the remote mail server being denied with destination port 113. In these cases, you can add an IDENT policy to Policy Manager. Configure IDENT to allow incoming connections to: **Firebox**. This enables outgoing mail messages from behind the Firebox to the few SMTP servers on the Internet that use IDENT.

If you are not using dynamic NAT, allow IDENT to the IP address of your email server.

We recommend that IDENT policies be allowed to and from the Firebox, but know that hackers can use IDENT to collect user names.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 113

## IGMP

The Internet Group Management Protocol (IGMP) is the standard for IP multicasting on the Internet. It is used to control host memberships in multicast groups on a single network.

### Characteristics

- Internet Protocol(s): IGMP

## IMAP

Internet Mail Access Protocol (IMAP) is an application layer protocol for getting email or bulletin board messages on a remote email server as if the messages were local. You can access email stored on an IMAP server from many locations (such as home, work, or laptop) without moving messages.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 143

## IPSec

Internet Protocol Security (IPSec) is a framework for a set of protocols for security at the network or packet layer of network communications. It is a VPN tunneling protocol with encryption.

### Characteristics

- Internet Protocol(s): UDP, encapsulated security payload (ESP), authentication header (AH)
- Port Number(s): UDP 4500

## **IRC**

Internet Relay Chat (IRC) is a system for Internet chatting. To use IRC you must have an IRC client and Internet access. The IRC client is a software application on your computer that sends and receives messages to and from an IRC server. The IRC server makes sure that all messages are sent to all users in the chat session.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 6667

## **Intel-Video-Phone**

Intel Video Phone is a real-time multimedia application based on H.323. H.323 is an international standard for conferencing over TCP/IP networks. This policy does not filter for dangerous content. It does not support QoS or RSVP protocol, and it does not support NAT.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 522, 1720

## **Kerberos-v4 and Kerberos-v5**

The Kerberos network authentication protocol is an authentication system developed by the Massachusetts Institute of Technology (MIT). Kerberos enables two computers to exchange private information across an open network using authentication for security.

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Kerberos v 4 Port Numbers(s): UDP 750
- Kerberos v 5 Port Number(s): TCP 88, UDP 88

## **L2TP**

Layer 2 Tunneling Protocol (L2TP) is an extension to the PPP protocol that enables ISPs to operate virtual private networks.

### **Characteristics**

- Internet Protocol(s): UDP
- Port Number(s): 1701

## LDAP

Lightweight Directory Access Protocol (LDAP) is an open-standard protocol for using online directory services. The protocol operates with Internet transport protocols, such as TCP. You can use LDAP to access stand-alone directory servers or X.500 directories.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 389

## LDAP-SSL

Lightweight Directory Access Protocol over TLS/SSL (LDAP-SSL) is used with Windows 2000 to give more security when you access Active Directory.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 636

## Lotus Notes

Lotus Notes is a client/server platform for conferencing, databases, and email. It is also used to create and use documents. This policy enables the proprietary Lotus Notes protocol. Because the protocol uses encapsulation and tunneling, and gives access to internal data, we do not recommend the Lotus Notes policy for addresses out of your trusted networks.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 1352, UDP 1352

## MS-SQL-Monitor

Microsoft SQL Monitor is used to monitor Microsoft SQL databases.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 1434, UDP 1434

## MS-SQL-Server

Microsoft SQL Server is usually used to make a remote connection to a Microsoft SQL database.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 1433, UDP 1433

## **MS-Win-Media**

Microsoft Windows Media Server is a proprietary protocol developed by Microsoft to supply unicast streams. It enables bidirectional connections that enable users to go forward, go back, or pause the playback of unicast streams.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 80, 1755

## **NetMeeting**

NetMeeting is a product developed by Microsoft Corporation that enables groups to teleconference across the Internet. It is included with Microsoft's Internet Explorer web browser. This policy is based on the H.323 protocol and does not filter for dangerous content. It does not support QoS or RSVP protocol, and it does not support NAT.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 389, 1720

## **NFS**

The Network File System (NFS) protocol is a client server software application created by Sun Microsystems to allow all network users to get access to shared files kept on computers of different types.

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 2049, UDP 2049

## **NNTP**

Network News Transfer Protocol (NNTP) is used to transmit Usenet news articles.

The best procedure to use NNTP is to set internal hosts to internal news servers and external hosts to news feeds. In most conditions, NNTP must be enabled in two directions. If you operate a public newsgroup, you must allow NNTP connections from all external hosts. WatchGuard cannot make sure that these packets were sent from the correct location.

You can configure the Firebox to add the source IP address to the Blocked Sites list when an incoming NNTP connection is denied. All of the usual log options can be used with NNTP.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 119

## NTP

Network Time Protocol (NTP) is a protocol built on TCP/IP that controls local timekeeping. It synchronizes computer clocks with other clocks located on the Internet.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 123 , UDP 123

## OSPF

Open Shortest Path First (OSPF) is a routing protocol developed for IP networks based on the link-state algorithm. OSPF is quickly replacing the use of RIP on the Internet because it gives smaller, more frequent updates to routing tables and makes networks more stable.

### Characteristics

- Internet Protocol(s): OSPF
- Port Number(s): Any port

## pcAnywhere

pcAnywhere is a software application used to get remote access to Windows computers. To enable this protocol, add the PCAnywhere policy. Then, allow access from the hosts on the Internet that must get access to internal pcAnywhere servers, and to the internal pcAnywhere servers.

pcAnywhere is not a very secure policy and can put network security at risk, because it allows traffic through the firewall without authentication. Also, your pcAnywhere server can receive denial-of-service attacks. We recommend that you use VPN options to give more security.

### Characteristics

- Internet Protocol(s): UDP, TCP
- Port Number(s): UDP 22, TCP 5631, UDP 5632, TCP 65301

## Ping

You can use ping to confirm if a host can be found and is operating on the network. To find DOS-based or Windows-based traceroute packets, configure a ping policy.

Outgoing ping is a good tool for troubleshooting. We do not recommend you allow ping connections to your trusted network.

### Characteristics

- Internet Protocol(s): ICMP (type: 8, code: 255)

## POP2 and POP3

POP2 and POP3 (Post Office Protocol) are email transport protocols, usually used to get a user's email from a POP server.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 109 (POP2), and 110 (POP3)

## PPTP

PPTP is a VPN tunnel protocol with encryption. It uses one TCP port (for negotiation and authentication of a VPN connection) and one IP protocol (for data transfer) to connect the two peers in a VPN.

Configure the PPTP policy to allow access from Internet hosts to an internal network PPTP server. PPTP cannot get access to hosts' static NAT because NAT cannot forward IP protocols. Because this policy enables a tunnel to the PPTP server and the Firebox cannot examine packets in the tunnel, use of this policy must be controlled. Be sure to use the most current version of PPTP.

### Characteristics

- Transport Protocol(s): TCP
- Internet Protocol(s): GRE
- PPTP Negotiation Port Number(s): 1723

## RADIUS and RADIUS-RFC

The Remote Authentication Dial-In User Service (RADIUS) supplies remote users with secure access to corporate networks. RADIUS is a client-server system that keeps authentication information for users, remote access servers, and VPN gateways in a central user database that is available to all servers. Authentication for the network occurs from one location. RADIUS uses an authentication key that identifies an authentication request to the RADIUS client.

In RFC 2865, the server port used by RADIUS changed from port 1645 to 1812. Make sure you select the policy that matches your implementation.

### Characteristics

- Internet Protocol(s): UDP
- RADIUS policy Port Number(s): UDP 1645
- RADIUS-RFC policy Port Number(s): UDP 1812

## RADIUS-Accounting and RADIUS-Acct-RFC

The Remote Authentication Dial-In User Service (RADIUS) Accounting policy supplies accounting information to administrators of networks that use RADIUS authentication. RADIUS is a client-server system that keeps authentication information for users, remote access servers, and VPN gateways in a central user database that is available to all servers. The RADIUS server is also notified when the authenticated session starts and stops. This information can be helpful for accounting.

In RFC 2866, the server port used by RADIUS changed from port 1646 to 1813. Make sure you select the policy that matches your implementation.

### Characteristics

- Internet Protocol(s): UDP
- RADIUS-Accounting policy Port Number(s): UDP1646
- RADIUS-ACCT-RFC policy Port Number(s): UDP 1813

## RDP

The Microsoft Remote Desktop Protocol (RDP) supplies remote display and input abilities over network connections for Windows software applications that operate on a server.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 3389

## RIP

Routing Information Protocol (RIP) is a link state routing protocol developed in the early years of routing. Its limitations make it inappropriate for use in the Internet, but it can be useful in small networks. We recommend that you use this service only if you have enabled and configured RIP in the dynamic routing processes in the Firewall configuration.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 520

## RSH

Remote Shell (RSH) is used access the command line of a remote host computer. Because it is not encrypted, we do not recommend you allow any RSH connections to computers protected by the Firebox without the use of a VPN.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 514

## RealPlayerG2

Media streaming protocol v7 and v8.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 80, 554

## Rlogin

Remote login (RLogin) is a UNIX command that allows an approved user to log in to other UNIX computers on a network. After the login, the user can do all the operations the host has approved, such as read, edit, or delete files. Because it does not use encryption, we recommend you do not allow Rlogin connections to computers protected by the Firebox.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 513

## SecurID

RSA SecurID Two-Factor Authentication give more security to the user authentication procedure. Created by Security Dynamics Technologies, Inc., it uses SecurID tokens to generate codes and ACE/Server software to corroborate the codes.

### Characteristics

- Internet Protocol(s): TCP and UDP
- Port Number(s): TCP 5510, UDP 5500

## SMB (Windows Networking)

Windows uses Server Message Block (SMB) to share files, computers, printers, and other network resources.

If you set up replication, you can see many attempts to use the port mapper service on port 135. When this fails, SMB begins to use port 42. Refer to the RFC for DCE for more instructions.



*SMB through the Firebox is not secure and we do not recommend it, unless used through a VPN connection. These configuration settings are to be used only if there is no other alternative, and policy settings must specify internal and external hosts.*

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 139, TCP 445, UDP 137, UDP 138, UDP 445

## SMTP

The SMTP packet filter policy allows SMTP traffic (email) without using the SMTP proxy.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 25

## SNMP

Simple Network Management Protocol (SNMP) is used to collect information about and to configure remote computers. This can be dangerous. Many Internet attacks use SNMP. Because SNMP can cause changes in a network if enabled, carefully review alternatives and record logs for all connections.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 161

## SNMP-Trap

Simple Network Management Protocol (SNMP) traps are notification messages that an SNMP agent (for example, a router) sends to a network management station. These messages usually report an important event that must be examined.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 162

## SQL\*Net

Oracle uses one port for its SQL\*Net software. By default, this port is 1526/TCP or port 1521/TCP. Or, edit the `tnsnames.ora` file to change the port. To allow SQL\*Net through the Firebox, set up a policy for the port that your SQL\*Net server uses, with a protocol of *TCP*, and a client port of *ignore*. Then set up incoming access from the allowed external hosts to the SQL\*Net server.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 1521, 1526

## SQL-Server

The SQL-Server policy is used to give access to SYBASE Central and SQL Advantage software.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 10000

## SSH

Secure Shell (ssh) is a free application protocol that allows remote login, command control, and the movement of files between computers. It gives strong authentication and secure (encrypted) connections. We recommend the use of ssh because it is more secure than more vulnerable protocols such as telnet, rssh, and rlogin.

UNIX versions are available from [www.ssh.com](http://www.ssh.com), and information on versions for Windows can be found at F-Secure (<http://www.f-secure.com>).

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 22

## SSL-VPN

This is the built-in policy template for SSL-VPN.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 443

## SunRPC

Sun Remote Procedure Call (Sun RPC) was developed by Sun Microsystems for connections between clients and servers in the Sun network file system.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 111, UDP 111

## Syslog

Syslog is a policy used to record operating system events on UNIX hosts. Syslog data is usually enabled on a firewall to collect data from a host outside the firewall.

The Syslog port is blocked in the default Firebox configuration. To allow one log host to collect logs from more than one Firebox:

- Remove port 514 from the Blocked Ports list
- Add the WatchGuard® Logging policy to Policy Manager



*It is usually not secure to allow syslog traffic through the Firebox. It is possible for hackers to fill syslogs with log entries. If the syslog is full, it is more difficult to see an attack. Also, the disk frequently fills up and the attack is not recorded.*

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 514

## TACACS

TACACS user authentication is a system that uses user accounts to authenticate users into a dial-up modem pool. This removes the need to keep copies of accounts on a UNIX system. TACACS does not support TACACS+ or RADIUS.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 49

## TACACS+

TACACS+ user authentication is a system that uses user accounts to authenticate users into a dial-up modem pool. This eliminates the need to keep copies of accounts on a UNIX system. TACACS+ supports RADIUS.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 49

## TCP

This policy serves as the default policy for all TCP connections, and other policies override it. TCP connections that do not match your specified policies do not complete unless you also configure TCP-UDP, TCP, or the TCP Proxy. This policy does not enable FTP, which operates only with an FTP policy.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 0 (Any)

## TCP-UDP

This policy serves as the default policy for all TCP and UDP connections, and other policies override it. Connections that do not match specified policies in Policy Manager do not complete unless TCP-UDP, TCP and UDP, or the TCP Proxy are also configured in Policy Manager. This policy does not enable active mode FTP, which operates only with an FTP policy.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 0 (Any), UDP 0 (Any)

## Telnet

The telnet policy is used to log in to a remote computer. It is almost the same as dial-up access, but the connection is made across a network.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 23

## Timbuktu

Timbuktu Pro is remote control and file transfer software used to get access to Windows computers. The protocol uses TCP port 1417 and UDP port 407. Add the Timbuktu policy and allow access from the hosts on the Internet that must get access to internal Timbuktu servers, and to the internal Timbuktu servers.

Timbuktu is not a very secure software application and can put network security at risk. It allows traffic inside the firewall without authentication. In addition, the Timbuktu server can receive denial-of-service attacks. We recommend that you use VPN options for more security.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 1417, UDP 407

## Time

The Time policy is almost the same as NTP. It is used to synchronize clocks between hosts on a network. Time is usually less accurate and less efficient than NTP across a WAN. We recommend that you use NTP.

### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 37, UDP 37

## Traceroute

Traceroute is a software application that creates maps of networks. It is used for network troubleshooting, network route troubleshooting, and finding the Internet service provider of a site. The WatchGuard Traceroute policy controls UNIX-based, UDP-style Traceroute only. For a DOS-based or Windows-based Traceroute packet filter, use the Ping policy. For more information about the Ping policy, see "Ping" on page 49.

Traceroute uses ICMP and UDP packets to create paths across networks. It uses the UDP TTL field to send back packets from each router and computer between a source and a destination. If you allow traceroute to computers protected by your Firebox®, this can enable a hacker to create a map of your private network.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): 33401-65535

## UDP

This policy serves as the default policy for all UDP connections, and other policies override it. UDP connections that do not match specified policies in Policy Manager do not complete unless UDP, TCP-UDP, or the TCP Proxy are also configured in Policy Manager.

- Internet Protocol(s): UDP
- Port Number(s): 0 (Any)

## UUCP

Unix-to-Unix Copy (UUCP) is a UNIX tool and protocol that enables one computer to send files to another computer. This tool is not used frequently, as users more often use FTP, SMTP, and NNTP to transfer files.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 540

## WAIS

Wide Area Information Services (WAIS) is a protocol you can use to find documents on the Internet. Thinking Machines Incorporated first developed WAIS. Some web sites use WAIS to look for searchable indices, but it is not used frequently.

WAIS is created on the ANSI Z39.50 search protocol, and the words Z39.50 and WAIS refer to the same technology.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 210, but servers can be (and frequently are) configured on other ports, much like HTTP servers

## WinFrame

Citrix ICA is a protocol used by Citrix for its software applications, which includes the Winframe product. Winframe gives access to Windows from different types of clients. Citrix uses TCP port 1494 for its ICA protocol. Citrix MPS 3.0 uses Session Reliability by default. This changes the ICA protocol to use TCP 2598. If you use Citrix MPS, you must add a policy for TCP port 2598.

A WinFrame policy could put your network security at risk because it allows traffic through the firewall without authentication. In addition, your Winframe server can receive denial-of-service attacks. We recommend that you use VPN options to give more security for ICA connections. You can use all of the usual log options with WinFrame.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 1494

## WG-Auth

The WatchGuard Authentication policy allows users to authenticate to the Firebox.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 4100

## **WG-Firebox-Mgmt**

The WatchGuard Firebox Management policy allows configuration and monitoring connections to be made to the Firebox. We recommend that you allow this policy only to the management station. The policy is usually set up on the trusted interface.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 4103, 4105, 4117, 4118

## **WG-Logging**

The WatchGuard Logging policy is necessary only if a second Firebox must access a Log Server on the trusted interface of a Firebox. If there is only one Firebox, this policy is not necessary.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 4107, 4115

## **WG-Mgmt-Server**

When you use the WatchGuard Management Server Setup wizard to configure a Management Server, the wizard automatically adds this policy to the gateway Firebox. It controls incoming connections to the Management Server.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 4110, 4112, 4113

## **WG-SmallOffice-Mgmt**

The WatchGuard Small Office Management policy allows you to make a secure connection to SOHO and Firebox X Edge devices from WatchGuard System Manager.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): TCP 4109

## **WG-WebBlocker**

The WatchGuard WebBlocker policy allows connections to the WebBlocker Server.

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 5003, UDP 5003

## WHOIS

The WHOIS protocol gives information about the administrator of web sites and networks. It is frequently used to find the administrator of a different web site.

To filter WHOIS traffic, add a WHOIS policy that allows connections to the WHOIS server (such as rs.internic.net).

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 43

## X11

The X Windows System Protocol has components that are used to create graphic desktops, which include windows, colors, displays, and screens. X11 also supplies a flow of events that show the interaction between a user and a computer input device (such as a mouse, keyboard, and so on).

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 6000-6063

## Proxy Policies

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This section reviews the proxy policies supplied by the WatchGuard® System Manager. A proxy policy opens packets, strips out forbidden data types in the packet content, and assembles the packets again using the source and destination headers of the proxy.

You configure and activate proxies the same way you add packet filter policies.

### DNS-proxy

Domain Name Service (DNS) matches host names to IP addresses. The DNS proxy policy examines the contents of DNS packets to help protect your DNS servers from hackers. It puts limits on the type of operations allowed in a DNS query and can look for specified patterns in query names.

#### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 53, UDP 53

### FTP-proxy

File Transfer Protocol (FTP) is used to send files from one computer to a different computer over a TCP/IP network. The FTP client is usually a computer. The FTP server can be a resource that keeps files on the same network or on a different network. The FTP client can be in one of two modes for data transfer: active or passive. In active mode, the server starts a connection to the client on source port 20. In passive mode, the client uses a previously negotiated port to connect to the server. The Firewall FTP proxy monitors and scans these FTP connections between your users and the FTP servers they connect to.

#### Characteristics

- Internet Protocol(s): TCP
- Port Number: 21

### H323-proxy

If you use Voice-over-IP (VoIP) in your organization, you can add an H.323 proxy policy to open the ports necessary to enable VoIP through your Firebox. This proxy policy has been created to work in a NAT environment to maintain security for privately addressed conferencing equipment behind the Firebox.

H.323 is used commonly on older videoconferencing equipment and voice installations. With H.323, the key component of call management is known as the "GateKeeper." The H.323 proxy supports only peer-to-peer connections.

#### Characteristics

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 1720, UDP 1719

## HTTP-proxy

Hyper Text Transfer Protocol (HTTP) is a request/response protocol between clients and servers. The HTTP client is usually a web browser. The HTTP server is a remote resource that keeps or creates HTML files, images, and other content. When the HTTP client starts a request, it establishes a Transmission Control Protocol (TCP) connection on port 80. An HTTP server listens for requests on port 80. When it receives the request from the client, the server replies with the requested file, an error message, or some other information.



*The WatchGuard policy "HTTP Proxy" is not the same as an HTTP caching proxy. An HTTP caching proxy controls the caching of Web data. If you use an external caching proxy, you must enable (by adding policies) any outgoing policies that are necessary for your organization. If you do not, outgoing TCP connections do not operate correctly.*

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 80 (but servers can operate on any port, a common alternative is 8080)

## HTTPS-proxy

HTTPS (Hypertext Transfer Protocol over Secure Socket Layer, or HTTP over SSL) is a request/response protocol between clients and servers used for secure communications and transactions. HTTPS is more secure than HTTP because HTTPS uses a digital certificate to encrypt and decrypt user page requests as well as the pages that are returned by the web server. The HTTPS client is usually a web browser. The HTTPS server is a remote resource that keeps or creates HTML files, images, and other content.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 443

## POP3-proxy

Post Office Protocol v.3 (POP3) is a protocol that moves email messages from an email server to an email client on a TCP connection on port 110. Most Internet-based email accounts use POP3. With POP3, an email client contacts the email server and checks for any new email messages. If it finds a new message, it downloads the email message to the local email client. After the message is received by the email client, the connection is closed.

### Characteristics

- Internet Protocol(s): TCP
- Port Number(s): 110

## **SIP-proxy**

If you use Voice-over-IP (VoIP) in your organization, you can add a SIP (Session Initiation Protocol) proxy policy to open the ports necessary to enable VoIP through your Firebox. These proxy policies have been created to work in a NAT environment to maintain security for privately-addressed conferencing equipment behind the Firebox.

SIP is a newer standard that is more common in hosted environments, where only endpoint devices such as phones are hosted at your business location and a VoIP provider manages the connectivity.

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 5060, UDP 5060

## **SMTP-proxy**

Simple Mail Transfer Protocol (SMTP) is the Internet standard protocol used to transmit and receive email messages. Usually SMTP servers are public servers. You use the SMTP proxy to control email messages and email content. The proxy scans SMTP messages for a number of filtered parameters, and compares them against the rules set in the proxy configuration.

When you use incoming static NAT with SMTP, you might see packets that come from the remote mail server being denied with destination port 113. In these cases, you can add an IDENT policy to Policy Manager. Configure IDENT to allow incoming connections to: **Firebox**. This enables outgoing mail messages from behind the Firebox to the few SMTP servers on the Internet that use IDENT.

If you do not want to use the SMTP proxy but want to use SMTP and have SMTP operate correctly, add a packet filter SMTP policy that uses TCP protocol and port 25.

### **Characteristics**

- Internet Protocol(s): TCP
- Port Number(s): 25

## **TCP-UDP-proxy**

The TCP-UDP proxy is included for these protocols on non-standard ports: HTTP, HTTPS, SIP, and FTP. For these protocols, the TCP-UDP proxy relays the traffic to the correct proxies for the protocols or allows you to allow or deny traffic. For other protocols, you can select to allow or deny traffic.

### **Characteristics**

- Internet Protocol(s): TCP, UDP
- Port Number(s): TCP 0 (Any), UDP 0 (Any)

## TFTP-proxy

Trivial File Transfer Protocol (TFTP) is a simple form of FTP that uses very small amounts of memory. It is used to transfer small files between hosts on the same network. Some manufacturers use the TFTP protocol to send periodic updates to VoIP equipment under management. If your equipment requires TFTP for updates, make sure you add a TFTP policy to your Firebox configuration to allow these connections.

### Characteristics

- Internet Protocol(s): UDP
- Port Number(s): UDP 69



# 6

## Resources

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Many resources are available to help you learn more about network security. This chapter gives different sources of information frequently used by the development and technical support teams at WatchGuard to learn more about network security. The editorial comments included in this chapter are supplied to help you decide which resources are most helpful to you. These comments are from the LiveSecurity editorial team. For more information like this, log in to the LiveSecurity site and look over the LiveSecurity archive at:

[www.watchguard.com/archive](http://www.watchguard.com/archive)

The types of resources included in this chapter are:

- Publishers
- Non-fiction books
- Fiction books
- White papers and requests for comments
- Mailing lists
- General information technology and security web sites
- White hat web sites
- Gray hat web sites
- Other useful web sites
- Dictionaries of computer terminology
- RSS feeds and blogs
- Podcasts

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## Publishers

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Some publishers focus on network security in their works.

### Syngress

Publishes almost exclusively about networks and network security.

[www.syngress.com/](http://www.syngress.com/)

### O'Reilly

Publishes many books on network security.

[www.oreilly.com/pub/topic/security](http://www.oreilly.com/pub/topic/security)

### No Starch

Publishes selectively on security, usually in-depth and with a quirky tone.

[www.nostarch.com](http://www.nostarch.com)

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## Books

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### Non-Fiction

Zwicky, Elizabeth D. et al; *Building Internet Firewalls*. Sebastopol: O'Reilly & Associates, 2000. ISBN 1565928717.

Cheswick, et al; *Firewalls and Internet Security: Repelling the Wily Hacker*. Reading, MA: Addison Wesley Longman, Inc., 2003. ISBN 020163466X.

Garfinkel and Spafford, Simson Garfinkel and Gene Spafford. *Practical Unix and Internet Security*. Sebastopol: O'Reilly & Associates, 2003. ISBN 0596003234.

Kozierok, Charles. *The TCP/IP Guide*. San Francisco: No Starch Press, 2005. ISBN 159327047x.

McClure, Stewart; Scambray, Joel; and Kurtz, George. *Hacking Exposed*. Fifth Edition. McGraw-Hill Publishing, 2005. ISBN 0072260815.

Schneier, Bruce. *Applied Cryptography*. Second Edition. New York: John Wiley & Sons, Inc., 1996. ISBN 0471117099.

Stevens, W. Richard. *TCP/IP Illustrated*. Reading MA: Addison Wesley Longman, Inc., 1994. ISBN 0201633469. (Note: This is a 3-volume set.)

Stoll, Cliff. *Cuckoo's Egg*. Pocket Books, 1995. ISBN 0671726889.

### Fiction

Mitnick, Kevin and Mullen, Timothy, et al. *Stealing the Network: How to Own a Continent*. Cambridge, MA: Elsevier/Syngress, 2004. ISBN 1931836051.

Mullen, Timothy and Russell, Ryan, et al. *Stealing the Network: How to Own an Identity*. Cambridge, MA: Elsevier/Syngress, 2005. ISBN 1597490067.

Russell, Ryan and Dubrawsky, Ido, et al. *Stealing the Network: How to Own the Box*. Cambridge, MA: Elsevier/Syngress, 2005. ISBN 1931836876.

Levy, Johnny and Russell, Ryan, et al. *Stealing the Network: How to Own a Shadow*. Cambridge, MA: Elsevier/Syngress, 2007. ISBN 1597490814.

Stephenson, Neal. *Cryptonomicon*. New York, NY: HarperCollins Publishers, 1999. ISBN 0060512806.

## Mailing Lists

*wg-users@watchguard.com*

WatchGuard sponsors a listserv for our customers. For more information, see the Technical Support chapter in the *User Guide*.

*firewall-wizards@nfr.net*

Firewall gurus from around the world discuss and answer all types of questions.

*Full Disclosure*

When Symantec bought Security Focus and its lists, suspicious security experts and network administrators fled. Where did they go? Largely to Full Disclosure. **Pros:** Cannot be biased by any vendor because it's completely unmoderated. First choice for posting latest discoveries by some big-name researchers. Black-hat hackers like to harass this list, inadvertently providing useful perspective on the "script kiddie" mindset. **Con:** Because it's unmoderated, this high-volume list will drown you in 20 irrelevant flame-war e-mails for every on-topic comment. **Net:** You get what you pay for, and this list is free. Try it briefly to familiarize yourself with it, but use Outlook rules to divert Full Disclosure e-mail messages to a folder you can read at leisure.

*VulnWatch and VulnDiscuss*

These lists are, respectively, moderated and unmoderated. **Pro:** You can not only get security advisories from vendors, you can also see what the rest of the IT community thinks and feels about them. **Con:** Fairly large volume of highly technical alerts difficult for newcomers to understand. **Net:** While you wouldn't want this as your only source of security news, it provides a solid source for confirmation and alternate opinions on security trends.

## General IT and Security Web Sites

First, a note to any intrepid beginner who is reading this: Not all of these sites are sponsored by good guys. Some of them post malicious code that hackers use. Do not download or execute anything you do not fully understand.

*WatchGuard Frequently Asked Questions*

[www.watchguard.com/support/faqs](http://www.watchguard.com/support/faqs)

*[www.cerias.purdue.edu/](http://www.cerias.purdue.edu/)*

The Center for Education and Research in Information Assurance and Security (CERIAS) is currently viewed as one of the world's largest centers for research and education in areas of information security that are crucial to the protection of critical computing and communication infrastructure. CERIAS is unique among such national centers in its multidisciplinary approach to the problems, ranging from purely technical issues (e.g., intrusion detection, network security, etc.) to ethical, legal, educational, communicational, linguistic, and economic issues, and the subtle interactions and dependencies among them.

*[www.gocsi.com](http://www.gocsi.com)*

The Computer Security Institute (CSI) is the world's leading membership organization specifically dedicated to serving and training the information, computer and network security professional. Since 1974, CSI has been providing education and aggressively advocating the critical importance of protecting information assets.

*[www.cerias.purdue.edu/homes/spaf/](http://www.cerias.purdue.edu/homes/spaf/)*

Dr. Eugene Spafford is a professor of computer sciences and electrical and computer engineering at Purdue University, where he has served on the faculty since 1987. He serves on a number of advisory and editorial boards, and is internationally-known for his writing, research, and speaking on issues of security and ethics. Spafford's current research interests are primarily in the areas of information security, computer crime investigation and information ethics. Spaf (as he is known to his friends, colleagues, and students) is Executive Director of the Purdue CERIAS (Center for Education and Research in Information Assurance and Security), and was the founder and director of the (superseded) COAST Laboratory. This is his homepage.

*project.honeynet.org*

The Honeynet Project is a non-profit research organization of security professionals dedicated to information security. They have no products, services or employees, and all research is done on a volunteer basis. Their goal is to learn the tools, tactics, and motives of the blackhat community and share these lessons learned. Founded in October, 1999, all work is OpenSource and shared with the security community.

*www.infosecuritymag.com*

*Information Security* is the enterprise security and risk managers' leading source of critical, objective information on strategic and practical security issues. *Information Security's* team of veteran security journalists and experts break down the security problems challenging enterprises and provide practical resolutions.

*www.interhack.net/pubs/fwfaq*

This collection of Frequently Asked Questions and answers about Internet firewalls has been compiled over the years from fora such as Usenet, mailing lists, and Web sites. If you have a question, looking here to see whether it has been answered before posting your question is good form. Don't send your questions to the FAQ maintainers.

*www.cerias.purdue.edu/coast/firewalls*

This site provides the comprehensive list of resources associated with Internet firewalls. The list is divided into sections to make finding information easier.

*www.microsoft.com/technet/security*

The Microsoft homepage for computer security resources.

*csrc.nist.gov*

National Institute of Standards and Technology, Computer Security Division.

*www.networkcomputing.com*

Network Computing magazine, part of the tech web business technology network, features content covering general networking topics as well as specific security topics.

*www.securityfocus.com*

Formerly the preferred clearing house for security vulnerability announcements, Security Focus lost prestige after Symantec bought them (many readers assumed Symantec would bias the reporting). We haven't noticed any dramatic decline in quality, and we routinely use the site -- especially its acclaimed Bugtraq list -- for information about new vulnerabilities. **Pro:** Often the first place security researchers post their advisories. Has a great "Basics" reading room for IT beginners. **Cons:** Advisories are posted in dense jargon difficult for beginners to comprehend. Poorly organized site can make finding a specific item tricky. **Net:** Authoritative, comprehensive, definitely a useful arrow in any sys admin's quiver.

*NewsNow*

NewsNow's UK-based spiders and bots automatically search over 15,000 news sources and return live links with the results, updated every five minutes. They offer dozens of newsfeeds (but do we really need to hear the latest on Michael Jackson every five minutes?). The feed you want is called "Security" (listed under "Internet" in the left column. Don't choose "Hacking;" you'll get countless articles about various hackers in legal trouble.) **Pro:** Comprehensive, up-to-the-minute survey of worldwide Internet security. **Con:** The same information repeats countless times as various online sources report it. **Net:** A great glimpse of security issues worldwide.

*The Register*

This is not the first place you'll learn of emerging threats, but when you hear of one, depend on The Reg for the most honest, no-hype summary of the issue. **Pro:** Plain-English writing style is great for IT beginners. Check out their "BOFH" series for hilariously bleak parodies of a network administrator's life. **Con:** Their scathing anti-Microsoft bias can get heavy-handed. **Net:** If you have to explain a new vulnerability to non-technical superiors, you'll appreciate The Register's style.

*Secunia*

**Pro:** This list notifies on every vulnerability under the sun. **Con:** Secunia mostly reproduces vendor releases, without analysis or suggested remediation for IT beginners. And did I mention they report on everything under the sun? If you don't know Linux/Unix, you won't understand a lot of the bulletins. **Net:** High volume, but all on topic (unlike FullDisclosure). Try it to see if it's for you.

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## White Hat Web Sites

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American cinema of the 1930s, 40s, and early 50s, with their endless stream of big-city gangsters and singing cowboys, popularized the metaphorical idea that "good guys" wear white hats and "bad guys" reliably identify themselves by wearing black hats. Extending the tradition today, "white hat" computer security researchers find security holes in commercial software, but instead of telling everyone, they first inform the manufacturer of the flaw. Then they cooperate with the manufacturer in getting the flaw fixed before announcing their discovery to the public. We appreciate the efforts of these good guys.

*Crypto-Gram*

Bruce Schneier has two gifts you rarely see in one person: he is a bona fide cryptographic expert, and he can write in clear English. This free e-newsletter is not an alert service. Rather, Schneier's insights on security issues will, over time, teach you how to think about security in general; for example, how to assess whether a "cure" costs more than the risk it addresses, and how to resist falling for a great-sounding plan that doesn't actually provide added security.

*Insecure.org*

Check out the online home of the well-known security researcher Fyodor, who authored nmap, the best port scanning tool available. From this site you can download nmap and 74 other security tools from others, many of them excellent. Insecure.org serves as a repository for numerous other security lists which may not have an archive of their own (such as FullDisclosure). If you don't want to fill your Favorites with every security list (BugTraq, FullDisclosure, Pen Test, and so on), bookmark this one site and you can find them all from here.

*Microsoft TechNet*

IT professionals running a Windows network look here for the latest Microsoft security bulletins. **Pro:** Authoritative source for Microsoft security fixes. **Con:** Microsoft's alerts minimize the truly bad implications of some vulnerabilities, sometimes unfairly. Bring a suspicious mind to the part of each alert that talks about "mitigating factors" that supposedly reduce risk. **Net:** If you use Windows, you've got to visit here at least monthly.

*CERT.org*

This government-funded source of security advisories describes itself as "a center to coordinate communication among experts during security emergencies and to help prevent future incidents." **Pro:** CERT does an excellent job of coordinating information when vulnerabilities are found in the most commonly-used Internet resources. **Con:** Because their work is "official" and because so many vendors can have a say in CERT's advisories, this is often the last entity to issue a security advisory. **Net:** Pretty much the final word on anything Internet-related and not owned by a private vendor. A must for your arsenal of resources.

## Grey Hat Sites

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We characterize these security researchers as "grey hats" because, unlike white hats, they might not inform the appropriate manufacturer before publicly revealing their findings and posting exploit code (often passed off euphemistically as "proof of concept" code). Technically they're not breaking laws or acting maliciously, like "black hats." But announcing security holes before vendors can fix them is like giving an army a map of the castle they're attacking, with a big red arrow marking the secret entrance. Grey hats commonly claim their behavior contributes to overall security by making vendors watch themselves more diligently. Whether that is true is a battle we'll leave to someone else.

Nonetheless, "grey hat" sites are worth inspecting when you want to understand more about how a particular vulnerability works. These sites are often the first to reveal new vulnerabilities, much sooner than you'll get the info from the appropriate vendor. When trying to prioritize how urgently you need to patch flawed software on your network, flaws where the exploit code is publicly posted should go to the top of your list. To learn whether exploit code is publicly available, monitor our LiveSecurity® alerts, and check some of the following sites.

### *Ryan1918.com*

On this site, you'll find hackers selling and trading exploits, including botnets and trojans. In true script-kiddy style, this forum is not online 100% of the time. If not, try again later - so far, it has always returned.

### *Packetstormsecurity.org*

This site offers a repository of the Top 20 security tools, advisories, and exploits, updated throughout the week.

### *K-otik.com*

This French site is usually the first place you'll find significant exploit code. They also archive notable white papers in various languages, so multilingual administrators can get a world of security instruction here.

### *2600.com*

This Web site supplements the printed journal *2600*, the seminal, well-known "hacker's quarterly," where programmers inform one another of new flaws, exploits, and attacks on everything from networks to phone systems. Worth a read so you can realistically assess the strength of your countermeasures.

### *Governmentsecurity.org*

Despite its name, this site is not sponsored by a government. Like many of the other sites we've recommended, it archives daily security news. But our favorite feature is the moderated security forums, where you can discuss relevant topics (ranging from general network security, to how to compile and run specific exploits) with other network administrators.

## Other Web Sites

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[www.howstuffworks.com](http://www.howstuffworks.com)

Simple explanations of how all kinds of things, including system and network components, work.

[www.zebra.org/zebra/index.html](http://www.zebra.org/zebra/index.html)

Online gnu zebra configuration document for Firebox users using dynamic routing protocols.

[www.watchguard.com/support/advancedfaqs/log\\_sniffing.asp](http://www.watchguard.com/support/advancedfaqs/log_sniffing.asp)

Check here for information on a useful Network Packet Analyzer.

[www.iana.org](http://www.iana.org)

Look here for lists of protocol number assignments and TCP and UDP port numbers.

[www.telusplanet.com/public/sparkman/netcalc.htm](http://www.telusplanet.com/public/sparkman/netcalc.htm)

A network calculator.

[www.winguides.com/registry/](http://www.winguides.com/registry/)

A good site for information about the Windows registry.

[www.watchguard.com/glossary/?nav=ic](http://www.watchguard.com/glossary/?nav=ic)

Online glossary of security terms.

[vmyths.com](http://vmyths.com)

Some viruses you hear about are not real. Though each of virus vendor has a "virux hoax" page, when we have to prove to a hysterical user that a problem doesn't really exist, we like the write-ups here.

[slashdot.org](http://slashdot.org)

For fun, no self-respecting geek should miss viewing science, pop culture, and the world of computers through the perspective of the IT-minded community (millions strong!) who contribute to Slashdot.

## Dictionaries of Computer Terminology

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[www.webopedia.com](http://www.webopedia.com)

[www.whatis.com](http://www.whatis.com)

[info.astrian.net/jargon/](http://info.astrian.net/jargon/)

[www.techweb.com/encyclopedia/](http://www.techweb.com/encyclopedia/)

## RSS Feeds

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Rich Site Summary (RSS) is an XML-based Web standard for easily distributing news and other information in syndication. In other words, RSS provides a format that delivers news from many sources directly to your desktop.

Furthermore, WatchGuard® provides a free RSS feed, WatchGuard Wire, that covers many security topics and, when combined with LiveSecurity® or LiveSecurity Informer, keeps you up to date with the latest breaking security news.

During a network administrator's hectic day, it can be hard to find the time to browse the Web for all the latest IT and network security news. Yet, sometimes this news could help you save your network from the latest virulent worm. An RSS reader can provide you with a convenient, one-stop shop consolidating news from all your favorite sources. Try out RSS and WatchGuard Wire. They are free, and keep you informed while saving you time.

Resources:

[www.watchguard.com/rss/Aboutrss.aspx](http://www.watchguard.com/rss/Aboutrss.aspx)

An introduction to the WatchGuard Wire RSS feed.

[www.watchguard.com/rss/list.aspx](http://www.watchguard.com/rss/list.aspx)

A Web archive of the latest WatchGuard Wire articles.

## Security Feeds

[www.watchguard.com/rss/watchguardwire.xml](http://www.watchguard.com/rss/watchguardwire.xml)

WatchGuard Wire

[www.securityfocus.com/rss/vulnerabilities.xml](http://www.securityfocus.com/rss/vulnerabilities.xml)

SecurityFocus Latest Vulnerabilities

[www.securityfocus.com/rss/news.xml](http://www.securityfocus.com/rss/news.xml)

SecurityFocus news

[www.sophos.com/virusinfo/infofeed/tenalerts.xml](http://www.sophos.com/virusinfo/infofeed/tenalerts.xml)

Sophos Ten Latest Virms

[www.sophos.com/virusinfo/infofeed/hoax.xml](http://www.sophos.com/virusinfo/infofeed/hoax.xml)

Sophos Top Virus Hoaxes

[www.sophos.com/virusinfo/infofeed/topten.xml](http://www.sophos.com/virusinfo/infofeed/topten.xml)

Sophos Top Virms Last Month

[www.microsoft.com/technet/security/bulletin/secrss.aspx](http://www.microsoft.com/technet/security/bulletin/secrss.aspx)

Microsoft Security Bulletin Feed

[www.2600.com/rss.xml](http://www.2600.com/rss.xml)

2600 (Hacker journal)

## IT Related Feeds

[slashdot.org/slashdot.rss](http://slashdot.org/slashdot.rss)

[news.com.com/2547-1\\_3-0-5.xml](http://news.com.com/2547-1_3-0-5.xml)

CNET News Main News Feed

[news.com.com/2547-7343\\_3-0-5.xml](http://news.com.com/2547-7343_3-0-5.xml)

CNET News Enterprise Software Feed

[news.com.com/2547-1001\\_3-0-5.xml](http://news.com.com/2547-1001_3-0-5.xml)

CNET News Enterprise Hardware Feed

[news.com.com/2547-1009\\_3-0-5.xml](http://news.com.com/2547-1009_3-0-5.xml)

CNET News Security Feed

[news.com.com/2547-1035\\_3-0-5.xml](http://news.com.com/2547-1035_3-0-5.xml)

CNET News Networking Feed

## Fun Feeds

[www.wired.com/news/feeds/rss2/0,2610,,00.xml](http://www.wired.com/news/feeds/rss2/0,2610,,00.xml)

Wired top stories

[www.wired.com/news/feeds/rss2/0,2610,3,00.xml](http://www.wired.com/news/feeds/rss2/0,2610,3,00.xml)

Wired technology stories

[www.wired.com/news/feeds/rss2/0,2610,2,00.xml](http://www.wired.com/news/feeds/rss2/0,2610,2,00.xml)

Wired culture stories

[www.wired.com/news/feeds/rss2/0,2610,4,00.xml](http://www.wired.com/news/feeds/rss2/0,2610,4,00.xml)

Wired political stories

[dwlt.net/tapestry/dilbert.rdf](http://dwlt.net/tapestry/dilbert.rdf)

Daily Dilbert

[dwlt.net/tapestry/pa.rdf](http://dwlt.net/tapestry/pa.rdf)

Penny Arcade

## Web Logs (Blogs)

*F-Secure*

This blog covers any kind of malware that spreads, and often has useful screen shots so you know exactly what to watch out for.

*Microsoft Security Resource Center (MSRC)*

Run by the team that puts out Microsoft Security Bulletins, this is where you'll get early notification of what they plan to patch each month. After Patch Day, get more in-depth explanation of Microsoft vulnerabilities at their *Security Vulnerability R&D* blog.

*SANS Internet Storm Center*

A great place to look for the earliest warning of emerging threats, especially if you prefer facts over FUD. The "Handler's Diary" is updated at least every day, sometimes more often.

*The Security Skeptic*

Dave Piscitello is a very knowledgeable security consultant who currently works as a Fellow of ICANN's Security and Stability Advisory Committee. His seasoned observations of network security range from small-scale practical tips to questions about how to keep the Internet working for decades to come.

*Sunbelt*

Sunbelt makes anti-spyware and anti-spam products, which means they survey the malware scene every day. This is the spot where we often first hear of new threats. Though this is one of the earliest places a new problem might be reported, the information is fact-based and reliable.

## Web Logs (Blogs)

### *Radio Free Security*

WatchGuard's podcast covers network security issues of interest to small- to medium-sized businesses. Learn how to prioritize threats by hearing the LiveSecurity reporters pick the "Security Story of the Month"; then keep it on play to hear the renowned industry experts assess the latest threats and give practical tips and insights. Get the feed *directly* or from *iTunes*.

### *Risky Business*

This security podcast from Australia provides a veteran perspective on security issues all over the world, and is the best-paced podcast we've found for busy administrators.

### *www.getmon.com*

This site aggregates all the best-known network security podcasts. Let the listener beware -- some of the more popular podcasts, such as Security Now, have been known to broadcast technically inaccurate information. Not for everyone, but worth sampling: Pauldotcom, and Security Bites. If you are a podcast addict, this is your candy store.

# 7

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U.S. Patent Nos. 6,493,752; 6,597,661; 6,618,755; D473,879. Other Patents Pending.

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Rev. April, 2006

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bzip2/libbzip2 version 1.0.3 of 15 February 2005

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This client was substantially modified and enhanced by Elliot Poger for use on Linux while he was working on the MosquitoNet project at Stanford.

The current version owes much to Elliot's Linux enhancements, but was substantially reorganized and partially rewritten by Ted Lemon so as to use the same networking framework that the Internet Software Consortium DHCP server uses. Much system-specific configuration code was moved into a shell script so that as support for more operating systems is added, it will not be necessary to port and maintain system-specific configuration code to these operating systems - instead, the shell script can invoke the native tools to accomplish the same purpose.

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## **zlib**

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