

Extended ACL Configuration Mode Commands

To create and modify extended access lists on a WAAS device for controlling access to interfaces or applications, use the **ip access-list extended** global configuration command. To disable an extended access list, use the **no** form of this command.

```
ip access-list extended {acl-name | acl-num}
```

```
no ip access-list extended {acl-name | acl-num}
```

Syntax Description	extended	Enables extended ACL configuration mode. The CLI enters the extended ACL configuration mode in which all subsequent commands apply to the current extended access list. The (config-ext-nacl) prompt appears: WAE(config-ext-nacl)#
	<i>acl-name</i>	Access list to which all commands entered from ACL configuration mode apply, using an alphanumeric string of up to 30 characters, beginning with a letter.
	<i>acl-num</i>	Access list to which all commands entered from access list configuration mode apply, using a numeric identifier. For extended access lists, valid values range from 100 to 199.

Defaults

An access list drops all packets unless you configure at least one **permit** entry.

Command Modes

global configuration

Device Modes

application-accelerator
central-manager

Usage Guidelines

Within ACL configuration mode, you can use the editing commands (**list**, **delete**, and **move**) to display the current condition entries, to delete a specific entry, or to change the order in which the entries will be evaluated. To return to global configuration mode, enter the **exit** command at the ACL configuration mode prompt.

To create an entry, use a **deny** or **permit** keyword and specify the type of packets that you want the WAAS device to drop or to accept for further processing. By default, an access list denies everything because the list is terminated by an implicit **deny any** entry. Therefore, you must include at least one **permit** entry to create a valid access list.

**Note**

ACLs that are defined on a router take precedence over the ACLs that are defined on the WAE. ACLs that are defined on a WAE take precedence over the WAAS application definition policies that are defined on the WAE.

After creating an access list, you can include the access list in an access group using the **access-group** command, which determines how the access list is applied. You can also apply the access list to a specific application using the appropriate command. A reference to an access list that does not exist is the equivalent of a **permit any** condition statement.

To create an extended access list, enter the **ip access-list extended** global configuration command. Identify the new or existing access list with a name up to 30 characters long beginning with a letter, or with a number. If you use a number to identify an extended access list, it must be from 100 to 199

**Note**

You must use a standard access list for providing access to the SNMP server or to the TFTP gateway/server. However, you can use either a standard access list or an extended access list for providing access to the WCCP application.

To allow connections from a specific host, use the **permit host source-ip** option and replace *source-ip* with the IP address of the specific host.

To allow connections from a specific network, use the **permit host source-ip wildcard** option. Replace *source-ip* with a network ID or the IP address of any host on the network that you want to specify. Replace *wildcard* with the dotted decimal notation for a mask that is the reverse of a subnet mask, where a 0 indicates a position that must be matched and a 1 indicates a position that does not matter. For instance, the wildcard 0.0.0.255 causes the last eight bits in the source IP address to be ignored. Therefore, the **permit 192.168.1.0 0.0.0.255** entry allows access from any host on the 192.168.1.0 network.

After you identify the extended access list, the CLI enters the extended ACL configuration mode and all subsequent commands apply to the specified access list.

```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)#
```

Examples

The following example shows how to create an access list on the WAAS device. You create this access list to allow the WAAS device to accept all web traffic that is redirected to it but limit host administrative access using SSH:

```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)# permit tcp any any eq www
WAE(config-ext-nacl)# permit tcp host 10.1.1.5 any eq ssh
WAE(config-ext-nacl)# exit
```

The following example shows how to activate the access list for an interface:

```
WAE(config)# interface gigabitethernet 1/0
WAE(config-if)# ip access-group testextacl in
WAE(config-if)# exit
```

The following example shows how this configuration appears when you enter the **show running-configuration** command:

```
...
!
```

```
interface GigabitEthernet 1/0
 ip address 10.1.1.50 255.255.0.0
 ip access-group testextacl in
 exit
. . .
ip access-list extended testextacl
 permit tcp any any eq www
 permit tcp host 10.1.1.5 any eq ssh
 exit
. . .
```

Related Commands

clear arp-cache
show ip access-list
(config-if) ip access-group
(config-ext-nacl) deny
(config-ext-nacl) delete
(config-ext-nacl) list
(config-ext-nacl) move
(config-ext-nacl) permit

(config-ext-nacl) delete

To delete a line from the extended ACL, use the **delete** extended ACL configuration command.

delete *line-num*

Syntax Description	<i>line-num</i>	Entry at a specific line number in the access list.
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Defaults	No default behavior or values.	
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Command Modes	extended ACL configuration mode	
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Device Modes	application-accelerator central-manager	
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Examples	The following example shows how to delete line 10 from the extended ACL testextacl:	
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```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)# delete 10
```

Related Commands	(config-ext-nacl) list (config-ext-nacl) move	
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(config-ext-nacl) deny

To add a line to an extended access list that specifies the type of packets that you want the WAAS device to drop, use the **deny** extended ACL configuration command. To add a condition to the extended ACL, note that the options depend on the chosen protocol.

For IP, use the following syntax to add a condition:

```
[insert line-num] deny {gre | icmp | tcp | udp | ip | proto-num} {source-ip [wildcard] |
    host source-ip | any} {dest-ip [wildcard] | host dest-ip | any}
```

```
no deny {gre | icmp | tcp | udp | ip | proto-num} {source-ip [wildcard] | host source-ip | any}
    {dest-ip [wildcard] | host dest-ip | any}
```

For TCP, use the following syntax to add a condition:

```
[insert line-num] deny tcp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]] [established]
```

```
no deny tcp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]] [established]
```

For UDP, use the following syntax to add a condition:

```
[insert line-num] deny udp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]]
```

```
no deny udp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]]
```

For ICMP, use the following syntax to add a condition:

```
[insert line-num] deny icmp {source-ip [wildcard] | host source-ip | any} {dest-ip [wildcard] |
    host dest-ip | any} [icmp-type [code] | icmp-msg]
```

```
no deny icmp {source-ip [wildcard] | host source-ip | any} {dest-ip [wildcard] | host dest-ip | any}
    [icmp-type [code] | icmp-msg]
```

Syntax	Description
insert <i>line-num</i>	(Optional) Specifies to insert the conditions following the specified line number into the access list.
gre	Specifies to match packets using the Generic Routing Encapsulation protocol.
icmp	Specifies to match ICMP packets.
tcp	Specifies to match packets using the TCP protocol.
udp	Specifies to match packets using the UDP protocol.
ip	Specifies to match all IP packets.
<i>proto-num</i>	IP protocol number.
<i>source-ip</i>	Source IP address. The number of the network or host from which the packet is being sent, specified as a 32-bit quantity in 4-part dotted-decimal format (for example, 0.0.0.0).

<i>wildcard</i>	(Optional) Wildcard. The notation is in 4-digit, dotted-decimal format. The bits to match are identified by a digital value of 0; the bits to ignore are identified by a 1. For extended IP ACLs, the <i>wildcard</i> parameter of the ip access-list command is always optional. If the host keyword is specified for an extended IP ACL, then the <i>wildcard</i> parameter is not allowed.
host <i>source-ip</i>	Specifies to match the following IP address.
any	Specifies to match any IP address.
<i>dest-ip</i>	Specifies destination IP address. The number of the network or host to which the packet is being sent, specified as a 32-bit quantity in 4-part dotted decimal format (for example, 0.0.0.0).
<i>operator port</i>	(Optional) Operator to use with specified ports, where lt = less than, gt = greater than, eq = equal to, neq = not equal to, and range = an inclusive range. The port value is a number (0–65535) or a keyword; two port numbers are required with the range keyword. See the “Usage Guidelines” section for a listing of the UDP and TCP keywords.
established	(Optional) Specifies to match TCP packets with the acknowledgment or reset bits set.
<i>icmp-type</i>	(Optional) Match with ICMP message type (0–255).
<i>code</i>	(Optional) Code type is 0–255.
<i>icmp-msg</i>	(Optional) Match a combination of ICMP message type and code types, as expressed by the keywords shown in the “Usage Guidelines” section.

Defaults

An access list drops all packets unless you configure at least one **permit** entry.

Command Modes

extended ACL configuration mode

Device Modes

application-accelerator
central-manager

Usage Guidelines

To create an entry, use a **deny** or **permit** keyword and specify the type of packets that you want the WAAS device to drop or to accept for further processing. By default, an access list denies everything because the list is terminated by an implicit **deny any** entry. You must include at least one **permit** entry to create a valid access list.

To allow connections from a specific host, use the **permit host source-ip** option and replace *source-ip* with the IP address of the specific host.

To allow connections from a specific network, use the **permit host source-ip wildcard** option. Replace *source-ip* with a network ID or the IP address of any host on the network that you want to specify. Replace *wildcard* with the dotted decimal notation for a mask that is the reverse of a subnet mask, where

a 0 indicates a position that must be matched and a 1 indicates a position that does not matter. For instance, the wildcard 0.0.0.255 causes the last eight bits in the source IP address to be ignored. The **permit 192.168.1.0 0.0.0.255** entry allows access from any host on the 192.168.1.0 network.

For extended IP ACLs, the **wildcard** parameter is required if the **host** keyword is not specified.

Use an extended access list to control connections based on the destination IP address or based on the protocol type. You can combine these conditions with information about the source IP address to create more restrictive conditions.

Table 3-1 lists the UDP keywords that you can use with extended access lists.

Table 3-1 UDP Keywords for Extended Access Lists

CLI UDP Keyword	Description	UDP Port Number
bootpc	Bootstrap Protocol (BOOTP) client	68
bootps	Bootstrap Protocol (BOOTP) server	67
cmm	Cluster Membership Manager service	5787
domain	Domain Name System (DNS)	53
mms	Microsoft Media Server	1755
netbios-dgm	NetBIOS datagram service	138
netbios-ns	NetBIOS name service	137
netbios-ss	NetBIOS session service	139
nfs	Network File Server service	2049
ntp	Network Time Protocol	123
snmp	Simple Network Management Protocol	161
snmptrap	SNMP traps	162
tacacs	Terminal Access Controller Access Control System	49
tftp	Trivial File Transfer Protocol	69
wccp	Web Cache Communication Protocol	2048

Table 3-2 lists the TCP keywords that you can use with extended access lists.

Table 3-2 TCP Keywords for Extended Access Lists

CLI TCP Keyword	Description	TCP Port Number
domain	Domain Name System	53
exec	Exec (rcp)	512
ftp	File Transfer Protocol	21
ftp-data	FTP data connections (used infrequently)	20
https	Secure HTTP	443
mms	Microsoft Media Server	1755
nfs	Network File System service	2049
ssh	Secure Shell login	22

Table 3-2 TCP Keywords for Extended Access Lists (continued)

CLI TCP Keyword	Description	TCP Port Number
tacacs	Terminal Access Controller Access Control System	49
telnet	Telnet	23
www	World Wide Web (HTTP)	80

Table 3-3 lists the keywords that you can use to match specific ICMP message types and codes.

Table 3-3 Keywords for ICMP Messages

administratively-prohibited	alternate-address	conversion-error
dod-host-prohibited	dod-net-prohibited	echo
echo-reply	general-parameter-problem	host-isolated
host-precedence-unreachable	host-redirect	host-tos-redirect
host-tos-unreachable	host-unknown	host-unreachable
information-reply	information-request	mask-reply
mask-request	mobile-redirect	net-redirect
net-tos-redirect	net-tos-unreachable	net-unreachable
network-unknown	no-room-for-option	option-missing
packet-too-big	parameter-problem	port-unreachable
precedence-unreachable	protocol-unreachable	reassembly-timeout
redirect	router-advertisement	router-solicitation
source-quench	source-route-failed	time-exceeded
timestamp-reply	timestamp-request	traceroute
ttl-exceeded	unreachable	

Examples

The following example shows how to create an access list on the WAAS device. You create this access list to allow the WAAS device to accept all web traffic that is redirected to it but limit host administrative access using SSH:

```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)# permit tcp any any eq www
WAE(config-ext-nacl)# deny tcp host 10.1.1.5 any eq ssh
WAE(config-ext-nacl)# exit
```

The following example shows how to activate the access list for an interface:

```
WAE(config)# interface gigabitethernet 1/0
WAE(config-if)# ip access-group extended testextacl in
WAE(config-if)# exit
```

The following example shows how this configuration appears when you enter the **show running-configuration** command:

```
...
!
```



```
interface GigabitEthernet 1/0
 ip address 10.1.1.50 255.255.0.0
 ip access-group extended testextacl in
 exit
. . .
ip access-list extended testextacl
 permit tcp any any eq www
 permit tcp host 10.1.1.5 any eq ssh
 exit
. . .
```

Related Commands

[\(config-ext-nacl\) delete](#)

[\(config-ext-nacl\) list](#)

[\(config-ext-nacl\) move](#)

[\(config-ext-nacl\) permit](#)

(config-ext-nacl) exit

To terminate extended ACL configuration mode and return to the global configuration mode, use the **exit** command.

exit

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes all modes

Device Modes application-accelerator
central-manager

Examples The following example shows how to terminate extended ACL configuration mode and return to global configuration mode:

```
WAE(config-ext-nacl)# exit  
WAE(config)#
```

(config-ext-nacl) list

To display a list of specified entries within the extended ACL, use the **list** extended ACL configuration command.

```
list [start-line-num [end-line-num]]
```

Syntax Description	<i>start-line-num</i>	(Optional) Line number from which the list begins.
	<i>end-line-num</i>	(Optional) Last line number in the list.

Defaults No default behavior or values.

Command Modes extended ACL configuration mode

Device Modes application-accelerator
central-manager

Examples The following example shows how to display a list of specified entries within the extended ACL:

```
WAE(config)# ip access-list extended testextacl  
WAE(config-ext-nacl)# list 25 50
```

Related Commands [\(config-ext-nacl\) delete](#)
[\(config-ext-nacl\) move](#)

(config-ext-nacl) move

To move a line to a new position within the extended ACL, use the **move** extended ACL configuration command.

move *old-line-num* *new-line-num*

Syntax	Description
<i>old-line-num</i>	Line number of the entry to move.
<i>new-line-num</i>	New position of the entry. The existing entry is moved to the following position in the access list.

Defaults No default behavior or values.

Command Modes extended ACL configuration mode

Device Modes application-accelerator
central-manager

Examples The following example shows how to move a line to a new position within the extended ACL:

```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)# move 25 30
```

Related Commands [\(config-ext-nacl\) delete](#)
[\(config-ext-nacl\) list](#)

(config-ext-nacl) permit

To add a line to an extended access list that specifies the type of packets that you want the WAAS device to accept for further processing, use the **permit** extended ACL configuration command. To add a condition to the extended ACL, note that the options depend on the chosen protocol.

For IP, use the following syntax to add a condition:

```
[insert line-num] permit {gre | icmp | tcp | udp | ip | proto-num} {source-ip [wildcard] |
    host source-ip | any} {dest-ip [wildcard] | host dest-ip | any}
```

```
no permit {gre | icmp | tcp | udp | ip | proto-num} {source-ip [wildcard] | host source-ip | any}
    {dest-ip [wildcard] | host dest-ip | any}
```

For TCP, use the following syntax to add a condition:

```
[insert line-num] permit tcp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]] [established]
```

```
no permit tcp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]] [established]
```

For UDP, use the following syntax to add a condition:

```
[insert line-num] permit udp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]]
```

```
no permit udp {source-ip [wildcard] | host source-ip | any} [operator port [port]]
    {dest-ip [wildcard] | host dest-ip | any} [operator port [port]]
```

For ICMP, use the following syntax to add a condition:

```
[insert line-num] permit icmp {source-ip [wildcard] | host source-ip | any} {dest-ip [wildcard] |
    host dest-ip | any} [icmp-type [code] | icmp-msg]
```

```
no permit icmp {source-ip [wildcard] | host source-ip | any} {dest-ip [wildcard] | host dest-ip |
    any} [icmp-type [code] | icmp-msg]
```

Syntax	Description
insert <i>line-num</i>	(Optional) Specifies to insert the conditions following the specified line number into the access list.
gre	Specifies to match packets using the Generic Routing Encapsulation protocol.
icmp	Specifies to match ICMP packets.
tcp	Specifies to match packets using the TCP protocol.
udp	Specifies to match packets using the UDP protocol.
ip	Specifies to match all IP packets.
<i>proto-num</i>	IP protocol number.
<i>source-ip</i>	Source IP address. The number of the network or host from which the packet is being sent, specified as a 32-bit quantity in 4-part dotted-decimal format (for example, 0.0.0.0).

<i>wildcard</i>	(Optional) Wildcard. The notation is in 4-digit, dotted-decimal format. The bits to match are identified by a digital value of 0; the bits to ignore are identified by a 1. For extended IP ACLs, the <i>wildcard</i> parameter of the ip access-list command is always optional. If the host keyword is specified for an extended IP ACL, then the <i>wildcard</i> parameter is not allowed.
host <i>source-ip</i>	Specifies to match the following IP address.
any	Specifies to match any IP address.
<i>dest-ip</i>	Specifies destination IP address. The number of the network or host to which the packet is being sent, specified as a 32-bit quantity in 4-part dotted decimal format (for example, 0.0.0.0).
<i>operator port</i>	(Optional) Operator to use with specified ports, where lt = less than, gt = greater than, eq = equal to, neq = not equal to, and range = an inclusive range. The port value is a number (0–65535) or a keyword; two port numbers are required with the range keyword. See the “Usage Guidelines” section for a listing of the UDP and TCP keywords.
established	(Optional) Specifies to match TCP packets with the acknowledgment or reset bits set.
<i>icmp-type</i>	(Optional) Match with ICMP message type (0–255).
<i>code</i>	(Optional) Code type is 0–255.
<i>icmp-msg</i>	(Optional) Match a combination of ICMP message type and code types, as expressed by the keywords shown in the “Usage Guidelines” section.

Defaults

An access list drops all packets unless you configure at least one **permit** entry.

Command Modes

extended ACL configuration mode

Device Modes

application-accelerator
central-manager

Usage Guidelines

To create an entry, use a **deny** or **permit** keyword and specify the type of packets that you want the WAAS device to drop or to accept for further processing. By default, an access list denies everything because the list is terminated by an implicit **deny any** entry. You must include at least one **permit** entry to create a valid access list.

To allow connections from a specific host, use the **permit host source-ip** option and replace *source-ip* with the IP address of the specific host.

To allow connections from a specific network, use the **permit host source-ip wildcard** option. Replace *source-ip* with a network ID or the IP address of any host on the network that you want to specify. Replace *wildcard* with the dotted decimal notation for a mask that is the reverse of a subnet mask, where

a 0 indicates a position that must be matched and a 1 indicates a position that does not matter. For instance, the wildcard 0.0.0.255 causes the last eight bits in the source IP address to be ignored. The **permit 192.168.1.0 0.0.0.255** entry allows access from any host on the 192.168.1.0 network.

For extended IP ACLs, the **wildcard** parameter is required if the **host** keyword is not specified.

Use an extended access list to control connections based on the destination IP address or based on the protocol type. You can combine these conditions with information about the source IP address to create more restrictive condition.

Table 3-4 lists the UDP keywords that you can use with extended access lists.

Table 3-4 UDP Keywords for Extended Access Lists

CLI UDP Keyword	Description	UDP Port Number
bootpc	Bootstrap Protocol (BOOTP) client	68
bootps	Bootstrap Protocol (BOOTP) server	67
domain	Domain Name System (DNS)	53
mms	Microsoft Media Server	1755
netbios-dgm	NetBIOS datagram service	138
netbios-ns	NetBIOS name service	137
netbios-ss	NetBIOS session service	139
nfs	Network File System service	2049
ntp	Network Time Protocol	123
snmp	Simple Network Management Protocol	161
snmptrap	SNMP traps	162
tacacs	Terminal Access Controller Access Control System	49
tftp	Trivial File Transfer Protocol	69
wccp	Web Cache Communication Protocol	2048

Table 3-5 lists the TCP keywords that you can use with extended access lists.

Table 3-5 TCP Keywords for Extended Access Lists

CLI TCP Keyword	Description	TCP Port Number
domain	Domain Name System	53
exec	Exec (rcp)	512
ftp	File Transfer Protocol	21
ftp-data	FTP data connections (used infrequently)	20
https	Secure HTTP	443
mms	Microsoft Media Server	1755
nfs	Network File System service	2049
ssh	Secure Shell login	22

Table 3-5 TCP Keywords for Extended Access Lists (continued)

CLI TCP Keyword	Description	TCP Port Number
tacacs	Terminal Access Controller Access Control System	49
telnet	Telnet	23
www	World Wide Web (HTTP)	80

Table 3-6 lists the keywords that you can use to match specific ICMP message types and codes.

Table 3-6 Keywords for ICMP Messages

administratively-prohibited	alternate-address	conversion-error
dod-host-prohibited	dod-net-prohibited	echo
echo-reply	general-parameter-problem	host-isolated
host-precedence-unreachable	host-redirect	host-tos-redirect
host-tos-unreachable	host-unknown	host-unreachable
information-reply	information-request	mask-reply
mask-request	mobile-redirect	net-redirect
net-tos-redirect	net-tos-unreachable	net-unreachable
network-unknown	no-room-for-option	option-missing
packet-too-big	parameter-problem	port-unreachable
precedence-unreachable	protocol-unreachable	reassembly-timeout
redirect	router-advertisement	router-solicitation
source-quench	source-route-failed	time-exceeded
timestamp-reply	timestamp-request	traceroute
ttl-exceeded	unreachable	

Examples

The following example shows how to create an access list on the WAAS device. You create this access list to allow the WAAS device to accept all web traffic that is redirected to it but limit host administrative access using SSH:

```
WAE(config)# ip access-list extended testextacl
WAE(config-ext-nacl)# permit tcp any any eq www
WAE(config-ext-nacl)# permit tcp host 10.1.1.5 any eq ssh
WAE(config-ext-nacl)# exit
```

The following example shows how to activate the access list for an interface:

```
WAE(config)# interface gigabitethernet 1/0
WAE(config-if)# ip access-group example in
WAE(config-if)# exit
```

The following example shows how this configuration appears when you enter the **show running-configuration** command:

```
...
!
```



```
interface GigabitEthernet 1/0
 ip address 10.1.1.50 255.255.0.0
 ip access-group testextacl in
 exit
. . .
ip access-list extended testextacl
 permit tcp any any eq www
 permit tcp host 10.1.1.5 any eq ssh
 exit
. . .
```

Related Commands

[\(config-ext-nacl\) delete](#)

[\(config-ext-nacl\) deny](#)

[\(config-ext-nacl\) list](#)

[\(config-ext-nacl\) move](#)

■ (config-ext-nacl) permit