

## Parameter Types

---

Global and local parameters are assigned a type. The type indicates the SRC CLI options in which you can use the parameter.

For example, address is a type of parameter. In the SRC CLI, whenever there is an option for which you can specify an IP address, you can use the ? to display a list of all local and global parameters of type address. For example:

```
user@host# set source-network network ip-address ?
```

Possible completions:

<ip-address> IP address of the source or destination network or host

gateway\_ipAddress

interface\_ipAddress

service\_ipAddress

user\_ipAddress

virtual\_ipAddress

There are a few cases in which a global parameter value appears, but because of the context, the value does not make sense to use. For example, in NAT actions, the global parameter any appears in for the IP network setting. In this context, any is not a valid value.

Table 1 on page 1 lists the parameter types, the predefined parameters for each type, the policy objects in which you can use the parameter type, and how the type is used.

**Table 1: Parameter Types**

Type	Predefined Parameters	Used In	Used to Specify
address	gateway_ipAddress	Classify-traffic condition	IP addresses in dotted decimal notation.
	interface_ipAddress		
	service_ipAddress	Next-interface action	
	user_ipAddress	Next-hop action	
	virtual_ipAddress		

---

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
addressMask	interface_ipMask service_ipMask user_ipMask	Classify-traffic condition	IP masks in dotted decimal notation.  For JUNOS policies and JUNOS policies (except for firewall policies), a mask must be equivalent to some prefix length. For example, 255.255.255.0 is allowed, but 255.255.255.1 is not. The software searches this constraint for default parameter values, but not for any other substitution values until runtime when the policy engine constructs the policy.
allowIpOptions		Classify-traffic condition	
any			The set of all values.
applicationProtocol	bootp, dce_rpc, dce_rpc_portmap, dns, exec, ftp, h323, green, icmp_app, iiop, netbios, netshow, realaudio, rpc, rpc_portmap, rtsp, shell, snmp, sqlnet, tftp, traceroute, winframe, yellow	Classify-traffic condition  (Predefined parameters map protocol numbers to synonyms.)	
bandwidthSizeUnit	bps percent	Policer action	
boolean	false true		
burst		Rate-limit action Policer action DOCSIS action	Burst sizes. The range is 214—232–1.
color	green red yellow	Classify-traffic condition  Color action	Color of action or classifier.  The policy engine validates these values; the substitution engine does not.
dceRpcUuid		Classify-traffic condition	

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
dropProfileProtocol	any_protocol	Scheduler action	
	non_tcp		
	tcp_only		
dropProfileType	interpolated	Scheduler action	
	segmented		
exceptionApplication	http	Exception application actions	The policy rule for traffic that has a specific application, such as a Web server
forwardingClass		Classify-traffic condition	
		QoS condition	
fragOffset		Classify-traffic condition	<p>The value of the fragment offset field of IP packets.</p> <p>For JUNOS routers:</p> <ul style="list-style-type: none"> <li>■ eq 0—Equal to 0</li> <li>■ eq 1—Equal to 1</li> <li>■ gt 1—Greater than 1</li> <li>■ any—Any value</li> </ul> <p>For JUNOS routing platforms and PCMM policies, integer in the range 0–8191.</p> <p>The policy engine validates these values; the substitution engine does not.</p>
grantSize		DOCSIS action	
icmpCode		Classify-traffic condition	8-bit values that represent patterns in the ICMP code and ICMP type fields in IP packets. The policy engine validates these values; the substitution engine does not.
icmpType			
igmpType		Classify-traffic condition	8-bit values that represent patterns in the IGMP type field in IP packets. The policy engine validates these values; the substitution engine does not.

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
interfaceGroup		Classify-traffic condition	
InterfaceSpec	bfwlf gfwlf	Next-interface action	The router interface.  For JUNOS interfaces, the format is: '< type of specifier > = < value >' For example: name = 'fastEthernet3/0' For JUNOS interfaces, the format is: 'name = < mediatype > - < slot > / < pic > / < port > . < unit > ' For example: 'name = AT-0/1/0.0'
interval		DOCSIS action	
ipFlags ipFlagsMask		Classify-traffic condition	3-bit values that represent patterns for the IP flags field in an IP packet. The high bit is reserved, the middle bit is don't fragment, and the low bit is more fragments.
ipSecSpi		Classify-traffic condition	
IPv4range			
jitter		DOCSIS action	
matchDirection	both input output	Classify-traffic condition	
maxLatency		DOCSIS action	
messageType		Reject action	
microSecond			
natTranslationType		NAT action	

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
network	any	Classify-traffic condition  NAT action	<p>IP subnets using two forms:</p> <p>&lt; address &gt; / &lt; mask &gt;</p> <p>&lt; address &gt; / &lt; prefixLength &gt;</p> <p>where &lt; address &gt; and &lt; mask &gt; are in the traditional dotted decimal notation.</p> <p>&lt; prefixLength &gt; is a number in the range 0–32, which specifies how many of the first bits in the address specify the network.</p> <p>In policy conditions, network specifies patterns for the address fields in packets. Networks can be preceded by “ not” to indicate that the condition matches every address not in the subnet.</p>
networkOperation		Classify-traffic condition	<p>Whether a network field of a packet should match or not match the value specified in a policy condition.</p> <ul style="list-style-type: none"> <li>■ 0—Does not match</li> <li>■ 1—Matches</li> </ul>
packetLength		Classify-traffic condition  DOCSIS action  FlowSpec action	
packetLossPriority	any_priority  high_priority  low_priority	Loss priority action	

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
packetOperation		Rate-limit action	Actions taken on packets.
		Policer action	For rate-limit actions, valid values are: '\$forward', '\$filter', and '\$mark < tosByte > < tosMask > '.
		Stateful firewall	For policer actions, valid values are: filter, forwardingClass, lossPriority.
			For stateful firewalls, valid values are: filter, forward, reject.  The policy engine validates these values; the substitution engine does not.
percent		Scheduler action	
policedUnit		FlowSpec action	
port	service_port	Classify-traffic condition	16-bit values that represent patterns in the port fields in IP packets.
		NAT action	
portOperation	eq	Classify-traffic condition	Whether a port field should match or not match the value(s) specified in a condition. For JUNOS policies valid values are: '\$eq', '\$lt', '\$gt', '\$neq' and '\$range'.  For JUNOS the allowed values are:  <ul style="list-style-type: none"> <li>■ 0—Does not match</li> <li>■ 1—Matches</li> </ul> The policy engine validates these values; the substitution engine does not.
	neq		
prPrecedence		Policy rule	
protocol	ah, esp, gre, icmp, igmp, ip, ipip, ospf, pim, rsvp, tcp, udp	Classify-traffic condition	8-bit values that represent patterns in the protocol field in IP packets. The policy engine validates these values; the substitution engine does not.
		(Predefined parameters map protocol numbers to synonyms.)	

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
protocolOperation	is not	Classify-traffic condition	Whether a protocol field of a packet should match or not match the value specified in a policy condition.  ■ 0—Does not match ■ 1—Matches
qosProfileSpec		QoS-attachment action	Strings in QoS attachment actions that specify QoS profiles. They can be any string that names a QoS profile on the JUNOS router.
rate	interface_speed	Rate-limit action  Policer action  DOCSIS action  FlowSpec action  Traffic-shape action	Rates in the range 0—232–1.
rateLimitType	one_rate two_rate	Rate-limit action	Rate-limit type. The allowed values are \$'one-rate' and \$'two-rate'. The policy engine validates these values; the substitution engine does not.
requestTransmissionPolicy		DOCSIS action	
routingInstance		Routing instance action	
rpcProgramNumber		Classify-traffic condition	
schedulerBufferSize		Scheduler action	
schedulerBufferSizeUnit	buffer_size_percentage buffer_size_remainder temporal	Scheduler action	

**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
schedulerPriority	high	Scheduler action	
	low		
	medium_high		
	medium_low		
	strict_high		
schedulerTransmitRate		Scheduler action	
schedulerTransmitRateUnit	rate_in_bps	Scheduler action	
	rate_in_percentage		
	rate_in_remainder		
serviceClassName		Service class name action	
serviceNumber	controlled_load_service	FlowSpec action	
	guaranteed_service		
sessionClassIdPriority		GateSpec action	
slackTerm		FlowSpec action	
snmpCommand	get	Classify-traffic condition	
	get_next		
	set		
	trap		
tcpFlags		Classify-traffic condition	6-bit values that represent patterns for the TCP flags field in IP packets. The bits from high to low mean: urgent, acknowledge, push, reset, synchronize, finish.
tcpFlagsMask			
timeout		Classify-traffic condition	
tokenBucketSize		FlowSpec action	



**Table 1: Parameter Types** *(continued)*

Type	Predefined Parameters	Used In	Used to Specify
tosByte		Classify-traffic condition	8-bit values that represent patterns in the ToS byte field in IP packets.
tosByteMask		Rate-limit action Mark action	When tosByteMask is used in ToS conditions, the allowed values are 0, 224, 252, and 255.  The policy engine validates these values; the substitution engine does not.
traceRouteTtlThreshold		Classify-traffic condition	
trafficClassSpec		Traffic-class action	Strings in traffic-class actions that specify traffic-class profiles. They can be any string that names a traffic class on the JUNOS router.
trafficPriority		DOCSIS action	
trafficProfileType	best_effort unsolicited_grant down_stream unsolicited_grant_with_activity_detection real_time non_real_time	DOCSIS action	Service flow scheduling type
translationType			
userPacketClass		User packet class action	4-bit value. For JUNOS policies, valid values are in the range 0–15.  The policy engine validates these values; the substitution engine does not.

### Predefined Global Parameters

Table 2 on page 10 describes the predefined built-in and runtime global parameters that the SRC software provides. Only three of the predefined parameters can be modified: any, bwlf, and gfwlf.

**Table 2: Predefined Global Parameters**

Predefined Parameter	Description	Type	Runtime
ah	Maps protocol 51 to AH	protocol	
any	This network matches any address	network	
any_priority	Sets packet loss priority to “any”	packetLossPriority	
any_protocol	Sets drop profile protocol to “any”	dropProfileProtocol	
best_effort	Sets the service flow scheduling type to best effort	trafficProfileType	
bfwlf	Specifier of the interface that leads to the bronze firewall server	interfaceSpec	Yes
bootp	Specifies the BOOTP protocol	applicationProtocol	
both	Specifies the direction of the policy as input and output	matchdirection	
bps	Specifies that the indicated bandwidth size is in bps	bandwidthSizeUnit	
buffer_size_percentage	Specifies that the indicated buffer size is a percentage	schedulerBufferSizeUnit	
buffer_size_remainder	Specifies that the indicated buffer size is a remainder	schedulerBufferSizeUnit	
controlled_load_service	Specifies that the type of FlowSpec service is controlled-load service	serviceNumber	

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
dce_rpc	Specifies the DCE RPC protocol	applicationProtocol	
dce_rpc_portmap	Specifies the DCE RPC portmap	applicationProtocol	
dns	Specifies the DNS protocol	applicationProtocol	
down_stream	Sets the service flow scheduling type to downstream	trafficProfileType	
egp	Maps protocol 8 to EGP	protocol	
eq	Matches packets with a port that is equal to the specified port	portOperation	
esp	Maps protocol 50 to ESP	protocol	
exec	Specifies the Exec protocol	applicationProtocol	
false	Sets Boolean values to false	boolean	
ftp	Specifies the FTP protocol	applicationProtocol	
gateway_ipAddress	IP address of the gateway as specified by the service object	address	Yes
get	Specifies the get SNMP command	snmpCommand	
get_next	Specifies the get-next SNMP command	snmpCommand	
gfwlf	Specifier of the interface that leads to gold firewall server	interfaceSpec	Yes

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
gre	Maps protocol 47 to GRE	protocol	
green	Specifies the color that indicates a low drop preference	color	Yes
guaranteed	Specifies that the type of FlowSpec service is guaranteed service	serviceNumber	
h323	Specifies the H.323 protocol	applicationProtocol	
high	Sets the scheduler priority to high	schedulerPriority	
high_priority	Sets the packet loss priority (PLP) to high	packetLossPriority	
icmp	Maps protocol 1 to ICMP	protocol	
icmp_app	Specifies the ICMP protocol	applicationProtocol	
igmp	Maps protocol 2 to IGMP	protocol	
iiop	Specifies the Internet Inter-ORB Protocol, a TCP protocol	applicationProtocol	
input	Specifies the direction of the policy as input	matchdirection	
interface_ipAddress	IP address of the interface	address	Yes
interface_ipMask	IP mask of the interface	addressMask	Yes

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
interface_speed	Speed of the subscriber's IP interface on the router or the speed of the subscriber's DOCSIS interface	rate	
interpolated	Sets the drop profile type to interpolate	dropProfileType	
ip	Maps protocol 0 to IP	protocol	
ipip	Maps protocol 4 to IP-IP	protocol	
is	Matches packets with the protocol that is equal to the specified protocol	protocolOperation	
low	Sets scheduler priority to low	schedulerPriority	
low_priority	Sets packet loss priority to low	packetLossPriority	
medium_high	Sets scheduler priority to medium-high	schedulerPriority	
medium_low	Sets scheduler priority to medium-low	schedulerPriority	
neq	Matches packets with a port that is not equal to the specified port	portOperation	
netbios	Specifies the NetBIOS protocol	applicationProtocol	
netshow	Specifies the NetShow protocol	applicationProtocol	

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
non_real_time	Sets the service flow scheduling type to NRTPS	trafficProfileType	
non_tcp	Sets the drop profile protocol to any protocol other than TCP	dropProfileProtocol	
not	Matches packets with the protocol that is not equal to the specified protocol	protocolOperation	
one_rate	Sets the rate-limit type to one rate	rateLimitType	
ospf	Maps protocol 89 to OSPF	protocol	
output	Specifies the direction of the policy as output	matchdirection	
percent	Specifies that the indicated bandwidth size is a percentage of bandwidth	bandwidthSizeUnit	
pim	Maps protocol 103 to PIM	protocol	
rate_in_bps	Specifies that the indicated transmit rate is in bps	schedulerTransmitRateUnit	
rate_in_percentage	Specifies that the indicated transmit rate is a percentage	schedulerTransmitRateUnit	
rate_in_remainder	Specifies that the indicated transmit rate is a remainder	schedulerTransmitRateUnit	
realaudio	Specifies the RealAudio protocol	applicationProtocol	

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
real_time	Sets the service flow scheduling type to RTPS	trafficProfileType	
red	Specifies the color that indicates a high drop preference	color	Yes
rpc	Specifies the RPC UDP or TCP protocols	applicationProtocol	
rpc_portmap	Specifies the RPC portmap protocol	applicationProtocol	
rsvp	Maps protocol 46 to RSVP	protocol	
rtsp	Specifies the Real-Time Streaming Protocol	applicationProtocol	
sctp	Maps protocol 132 to the Stream Control Transmission Protocol	protocol	
segmented	Sets the drop profile type to segmented	dropProfileType	
service_ipAddress	IP address of the service as specified by the service object	address	Yes
service_ipMask	IP mask of the service as specified by the service object	address	Yes
service_port	Service port as specified by the service object	port	Yes
set	Specifies the set SNMP command	snmpCommand	

**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
shell	Specifies the Shell protocol	applicationProtocol	
snmp	Specifies the SNMP protocol	applicationProtocol	
sqlnet	Specifies the SQLNet protocol	applicationProtocol	
strict_high	Sets scheduler priority to strict-high	schedulerPriority	
tcp	Maps protocol 6 to TCP	protocol	
tcp_only	Sets the drop profile protocol to TCP	dropProfileProtocol	
temporal	Specifies that the indicated buffer size is temporal	schedulerBufferSizeUnit	
tftp	Specifies the Trivial File Transfer Protocol	applicationProtocol	
traceroute	Specifies the Traceroute protocol	applicationProtocol	
trap	Specifies the trap SNMP command	snmpCommand	
true	Sets the Boolean value to true	boolean	
two_rate	Sets the rate-limit type to two rate	rateLimitType	
udp	Maps protocol 17 to UDP	protocol	
unsolicited_grant	Sets the service flow scheduling type to UGS	trafficProfileType	



**Table 2: Predefined Global Parameters** *(continued)*

Predefined Parameter	Description	Type	Runtime
unsolicited_grant_with_activity_detection	Sets the service flow scheduling type to UGS-AD	trafficProfileType	
user_ipAddress	IP address of the subscriber	address	Yes
user_ipMask	IP mask of the subscriber	address	Yes
virtual_ipAddress	Virtual portal address of the SSP that is used in redundant SAE installations	address	Yes
winframe	Specifies the WinFrame protocol	applicationProtocol	
yellow	Specifies the color that indicates a medium drop preference	color	Yes

## Naming Global Parameters

A global parameter is stored in the directory with the parameter name as its naming attribute. The directory stores the case for the parameter name; however, the directory does not allow you to create another global parameter with a name that differs only by the use of upper and lowercase letters. For example, if there is a parameter named fastspeed, the directory will not allow the creation of a parameter named fastSpeed without first deleting fastspeed.

Also, when you define a substitution for a global parameter, make sure that the case in the substitution matches the case of the global parameter.

