NGFW SMC API

6.11

for Forcepoint Next Generation Firewall

User Guide

Revision B

Contents

Introduction

Forcepoint NGFW Security Management Center (SMC) is part of the Forcepoint Next Generation Firewall (Forcepoint NGFW) solution. You can access the SMC in two ways: through the Management Client or through the SMC application programming interface (API).

This guide describes how to enable the SMC API and provides examples of its use. The target audience for this guide includes system administrators and developers.

Note

This guide does not provide detailed information about resources and actions in the SMC API. Detailed information about resources and actions is available in the automatically generated API documentation in the `smc_api.zip` file in the `Documentation/SMC_API` folder of the SMC installation files.

For detailed information about changes introduced since the previous version, see the automatically generated change log reports in the `api_change_log.zip` file in the `Documentation/SMC_API` folder of the SMC installation files.

The SMC API provides functions for adding, editing, and deleting elements in the Management Server database.

General use cases that are supported through the SMC API include the following:

- Adding, editing, and removing simple elements (such as Hosts, Networks, and Address Ranges)
- Adding, editing, and removing Access rules, NAT rules, and Inspection rules
- Uploading a policy to an engine
- Retrieving or changing the routing of an engine
- Configuring VPNs

A Python-based library that provides basic functions for interacting with the SMC API is available. See https://github.com/Forcepoint/fp-NGFW-SMC-python.

Although the SMC API follows the architectural style of RESTful web APIs, this guide introduces only the basic concepts. For more information, see https://en.wikipedia.org/wiki/Representational_state_transfer and the linked content.

Deprecation of blacklist and whitelist terms in SMC v7.0

Terms whitelist and blacklist will be deprecated from SMC version 7.0.

Following table lists the terms that will be used:

Updated verbs

Previous usage	Modified usage
blacklist	block_list
flush_blacklist	flush_block_list

Updated data model

Previous usage	
conn_blacklisted	conn_block_listed
blacklist_entry	block_list_entry
blacklist_endpoint	block_list_endpoint
blacklist_scopes	block_list_scopes
blacklist_scope	block_list_scope
valid_blacklister	valid_block_lister

Backward compatibility

Backward compatibility is guaranteed to specific versions.

SMC API 6.11 provides access to the 6.10 and 6.11 versions of the SMC API, from two version-specific URIs, and also to the 6.8 version.

Example use cases

These scenarios highlight the ways you can use the SMC API.

- Integrate the SMC with third-party policy management and risk management applications. The SMC API is already used by vendors such as Tufin and FireMon.
- Provide the necessary tools for managed security service providers (MSSPs) to include functions related to Management Servers and Log Servers on their own web portals.
- Automate frequent tasks through scripting without administrators manually configuring them in the Management Client.
- Develop an alternative user interface for managing Management Servers and Log Servers.

User session identification

The SMC API supports two methods for associating all requests with a single user between the logon and logoff actions.

- **Cookies** — The API Client sends back in each request all (non-expired) cookies that the server sent.
- **SSL Sessions** — Sessions are tracked by the server based on SSL connections.

Note

Cookies are the default. If you want to use SSL Sessions instead, you must enable it.

To save server resources, clients should log off at the end of the session.

Related tasks

Enable SMC API on page 6

Adjust the HTTP session inactivity timeout

You can change the HTTP session inactivity timeout.

By default, the HTTP session inactivity timeout is 30 minutes. After 30 minutes of inactivity, the SMC API prompts you to log on again to be able to execute any new HTTP requests.

Steps

1) On the computer where the Management Server is installed, browse to the <installation directory>/data directory.

2) Edit the SGConfiguration.txt file and add this parameter: WEB_SERVER_SESSION_TIMEOUT=<time in minutes>.

3) Save the SGConfiguration.txt file.

Limitations

Some limitations apply when using the SMC API.

Limitations

Limitation	Description
Import synchronization	During the import or update package activation task, all requests to update a resource are delayed until the task is completed. This synchronization is necessary to avoid data integrity failure during the import.
SMC Appliance configuration paths removed	The paths for configuration of the SMC Appliance have been removed from the SMC API. The paths /6.4/appliance/ and /6.4/appliance/ are no longer available.

Configure SMC API

The Application Programming Interface (API) of SMC allows external applications to connect with the SMC.

> **Note**
>
> If there is a firewall between SMC and the other applications, make sure that there is an Access rule to allow communication.

The SMC API can be used to run actions remotely using an external application or script.

Create TLS credentials for SMC API Clients

If you want to use encrypted connections, the SMC API Client needs TLS credentials to connect with the Management Server.

> **Note**
>
> You can import the existing private key and certificate if they are available.

Steps

For more details about the product and how to configure features, click **Help** or press **F1**.

1) In the Management Client, select **Configuration**.
2) Browse to **Administration** > **Certificates** > **TLS Credentials**.
3) Right-click **TLS Credentials**, then select **New TLS Credentials**.
4) Complete the certificate request details.
   a) In the **Name** field, enter the IP address or domain name of SMC.
   b) Complete the remaining fields as needed.
   c) Click **Next**.
5) Select **Self Sign**.
6) Click **Finish**.

Result

The TLS Credentials element is added to **Administration** > **Certificates** > **TLS Credentials**. The **State** column shows that the certificate has been signed.

Enable SMC API

To allow other applications to connect using the SMC API, enable SMC API on the Management Server.

Steps

❓ For more details about the product and how to configure features, click **Help** or press **F1**.

1) In the Management Client, select 🏠 **Home**.

2) Browse to **Others** > **Management Server**.

3) Right-click the Management Server, then select **Properties**.

4) Click the **SMC API** tab, then select **Enable**.

5) (Optional) In the **Host Name** field, enter the name that the SMC API service uses.

> **Note**
>
> API requests are served only if the API request is made to this host name. To allow API requests to any host name, leave this field blank.

6) Make sure that the listening port is set to the default of 8082 on the Management Server.

7) If the Management Server has several IP addresses and you want to restrict access to one, enter the IP address in the **Listen Only on Address** field.

8) If you want to use encrypted connections, click **Select**, then select the TLS Credentials element and the Cryptography Suite Set element.

9) Click **OK**.

Create an API Client element

External applications use API clients to connect to SMC.

Before you begin

SMC API must be enabled for the Management Server.

Steps

❓ For more details about the product and how to configure features, click **Help** or press **F1**.

1) Select ⚙ **Configuration**, then browse to **Administration**.

2) Browse to **Access Rights**.

3) Right-click **Access Rights** and select **New** > **API Client**.

4) In the **Name** field, enter a unique name for the API Client.

5) Use the initial authentication key or click **Generate Authentication Key** to generate a new one.

Important

This key appears only once, so be sure to record it. The API Client uses the authentication key to log on to SMC API.

6) Click the **Permissions** tab.

7) Select the permissions for actions in the SMC API.

8) Click **OK**.

Using WebSockets with the SMC API

You can use WebSockets with the SMC API to monitor status information and browse log data.

Important

Make sure to log on before each WebSocket connection, and unsubscribe and close the WebSocket after use.

Set up WebSockets in your browser

If you want to use WebSockets to get monitoring information from the SMC API, set up WebSockets in your browser.

Before you begin

Configure the SMC API on the Management Server.

Steps

1) Configure a REST Client in your web browser.
For example, in Google Chrome, add the following extensions:
   - Talend API Tester — Talend API Tester makes it easy to invoke, discover, and test HTTP and REST APIs.
   - WebSocket Test Client — WebSocket Test Client can be used to help construct custom WebSocket requests and handle responses to directly test the WebSocket services.

Use WebSockets to listen to element notifications

You can use WebSockets to listen to notifications about elements stored in the Management Server database.

To monitor elements, you subscribe to status notifications. When the Management Server receives new information about the elements to which you have subscribed, you receive new status entries.

Steps

1) Connect to the WebSocket using the following URL:

```
ws://[server]:[port]/[version]/status/socket
```

2) Send one of the following types of commands to subscribe to status notifications:

- To open a channel to subscribe to notifications from all elements that belong to the same element family type, enter:

  ```
  {"context":filter_context_value}
  ```

  Replace `filter_context_value` with the element family type, such as fw_single or virtual_fw.

- To open a channel to subscribe to notifications from specific individual elements, such as a virtual firewall node or a route-base VPN tunnel endpoint, enter:

  ```
  {"element":element_uri}
  ```

  Replace `element_uri` with the URI of the element.

  For example:

  ```
  http://[server]:[port]/[version]//elements/vpn/{id}/tunnels/{tunnel_id}/endpoints/
  {end_point_id}
  ```

You receive this type of response:

```
{"success":"Subscribed for status", "subscription_id":{id}}
```

3) To unsubscribe from status notifications, send the following query:

```
{"unsubscribe":{id_of_the_previous_subscription}}
```

For example, when you send this command to subscribe to notifications about a policy-based VPN tunnel endpoint:

```
{"element":"https://http://localhost:8082/6.11/elements/vpn/5/tunnels/MiM1OQ==/endpoints/
MSMxMTQ="}
```

You receive this response:

```
{"success":"Subscribed for status","subscription_id":0}
{"status":{"status":
{"health_in_percent":71,"jitter_in_ms":3,"latency_in_ms":71,"monitoring_state":"READY",
"monitoring_status":"OK","name":"Corporate VPN","packet_loss_in_permyriad":361,
"result":[{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjU=",
"name":"Gateway Tunnel Helsinki VPN Gateway-Paris VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjc=","name":"Gateway Tunnel
 Helsinki VPN Gateway-Tunis VPN Gateway",
"type":"gateway_tunnel"},{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjQ=",
"name":"Gateway Tunnel Helsinki VPN Gateway-Moscow VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjA=","name":"Gateway Tunnel
 Helsinki VPN Gateway-London VPN Gateway",
"type":"gateway_tunnel"},{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTgjNTk=",
"name":"Gateway Tunnel Beijing VPN Gateway-Helsinki VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjM=","name":"Gateway Tunnel
 Helsinki VPN Gateway-Milan VPN Gateway",
"type":"gateway_tunnel"},{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTYjNTk=",
"name":"Gateway Tunnel Atlanta VPN Gateway-Helsinki VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/MiM1OQ==","name":"Gateway Tunnel VPN
 Client-Helsinki VPN Gateway",
"type":"gateway_tunnel"},{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTUjNTk=",
"name":"Gateway Tunnel Algiers VPN Gateway-Helsinki VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjI=","name":"Gateway Tunnel
 Helsinki VPN Gateway-Mexico City VPN Gateway",
"type":"gateway_tunnel"},{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjY=",
"name":"Gateway Tunnel Helsinki VPN Gateway-Riyadh VPN Gateway","type":"gateway_tunnel"},
{"href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/NTkjNjE=","name":"Gateway Tunnel
 Helsinki VPN Gateway-Madrid VPN Gateway",
"type":"gateway_tunnel"}],"traffic_in_bits_per_sec":1881231412,"vpn_status_code":"Idle"}},
"subscription_id":0}
```

When you send this command to subscribe to notifications about a firewall node:

```
{"element":"http://localhost:8082/6.11/elements/single_fw/1649/firewall_node/1650"}
```

You receive this response:

```
{"success":"Subscribed for status","subscription_id":5}
{"status":{"status":{"monitoring_state":"READY","monitoring_status":"OK","name":"Plano node
 1"}},"subscription_id":5}
```

Use WebSockets to listen to status notifications

You can use WebSockets to listen to notifications about the status of monitored elements.

Steps

1) Connect to the WebSocket using the following URL:

```
ws://[server]:[port]/[version]/notification/socket
```

2) Send one of the following types of commands to listen for notifications:

   - To open a channel to subscribe to notifications for all elements, enter:

     ```
     {"context":"*"}
     ```

The channel is identified by its subscription_id value.

- To open a channel to listen to a specific type of element, enter:

  ```
  {"context":"RelName"}
  ```

  The command opens of a channel dedicated to the element associated with the RelName. You can use a list of RelNames separated by a comma followed by a space (,) in the command:

  Example: "host, router"

  The list of RelNames can be found from the link `http://127.0.0.1:8082/6.11/api`.

3) To unsubscribe from status notifications, send the following query:

   ```
   {"unsubscribe":{id_of_the_previous_subscription}}
   ```

For example, if you send the following commands:

```
{"context":"*"}
{"context":"host"}
```

You receive one notification on the channel with "subscription_id":0 listening to all elements and one notification the channel with "subscription_id":1 dedicated to of hosts elements. The creation of a host sends a notification on both channels. The creation of a router only sends a notification on the "subscription_id":0 channel.

```
>>>{"event":{"type":"create","element":"http://localhost:8082/6.11/elements/
router/1733"},"subscription_id":0}
>>>{"event":{"type":"create","element":"http://localhost:8082/6.11/elements/
host/1732"},"subscription_id":0}
>>>{"event":{"type":"create","element":"http://localhost:8082/6.11/elements/
host/1732"},"subscription_id":1}
>>>{"event":{"type":"update","element":"http://localhost:8082/6.11/elements/
admin_user/3"},"subscription_id":0}
>>>{"event":{"type":"update","element":"http://localhost:8082/6.11/elements/
admin_user/3"},"subscription_id":0}
```

Use WebSockets for session monitoring

You can use WebSockets to monitor connections, blacklists, VPN SAs, users, routing, SSL VPNs, and neighbors.

Steps

1) Connect to the WebSocket using the following URL:

   ```
   ws://[server]:[port]/[version]/monitoring/session/socket
   ```

2) To query for specific session monitoring information and fetch the result, send a command with the following syntax:

```
{query":{"definition":"SESSION NAME","target":" ENGINE NAME"}, "fetch":{}, "format":
{"type":"texts"}}
```

Replace `SESSION NAME` with one of these session monitoring definitions:

- CONNECTIONS (established connections)
- BLACKLIST (blacklisted connections)
- VPN_SA (established security associations)
- USERS (authenticated users)
- ROUTING
- SSLVPNV2 (SSL VPN users logged on the portal)
- ACTIVE_ALERTS
- NEIGHBORS

Replace `ENGINE NAME` with the name of the NGFW Engine to query.

For the ACTIVE_ALERTS session monitoring definition, replace `ENGINE NAME` with the name of the administrative Domain to query.

For example, to open a channel to monitor the blacklist on the Plano FW NGFW Engine and output the result as text, send the command:

```
{"query":{"definition":"BLACKLIST","target":"Plano FW"}, "fetch":{}, "format":{"type":"texts"}}
```

The resulting entries contain a delta_key value. The delta_key value identifies an event, such as a blacklisted connection. Several entries can be associated with an event. Each entry corresponds to a state of the event, such as creation (added), update, and delete.

Additionally, each blacklist entry contains a reference:

```
“blacklist_href":http://localhost:8082/5.9/elements/single_fw/1649/blacklist/MQ==
```

This reference allows you to retrieve a specific blacklist entry and delete it using the SMC API:

```
>>>{"fetch":-
1616514795,"records":{"added":[{"SessionEvent":"1","BlacklistEntrySourcePort":"1024","CompId":
"Plano FW node 1","ReceptionTime":"2015-05-29 12:35:15",
"blacklist_href":"http://localhost:8082/6.11/elements/single_fw/1649/blacklist/MQ==",
"DataType":"7","DataTags":"INFO: Blacklist Monitoring","BlacklistEntryDestinationIp":"1.1.1.0",
"BlacklistEntryDuration":"0","BlacklistEntryProtocol":"TCP","SenderDomain":"Shared Domain",
"BlacklistEntrySourceIp":"1.1.1.0","BlacklistEntryId":"MQ==","NodeId":"Plano FW node 1",
"BlacklistEntrySourceIpMask":"255.255.255.0","delta_key":"AgE=",
"BlacklistEntrySourcePortRange":"65535","RefEvent":"2015-05-29 12:35:12",
"Timestamp":"2015-05-29 12:35:15","BlacklistEntryDestinationIpMask":"255.255.255.0",
"BlacklistEntryDestinationPort":"80"}],"updated":[],"deleted":[]}}
```

Using WebSockets to browse log data

Query and fetch log data using WebSockets

Steps

1) Connect to the WebSocket using the following URL:

```
ws://[server]:[port]/[version]/monitoring/log/socket
```

2) To query for log data, send a command with the following syntax:

```
{"query":{}}
```

This request queries all types of stored log data.

3) To fetch the result of the query, send a command with the following syntax:

```
{"fetch":{}}
```

This request retrieves any stores log entries.

Tip

You can also combine the command into a single request: `{"query":{},"fetch":{}}`.

You can retrieve the full syntax for queries using the following request:

```
GET http://[server]:[port]/[version]/monitoring/log/schemas
```

Result

After you send your request, you receive an immediate response that indicates whether the request has succeeded or failed.

Response	Description
`{"failure": FAILURE_REASON}`	The request failed. FAILURE_REASON is a message that describes the cause of the failure.
`{"success":"No fetch"}`	A request that does not include a fetch command succeeded.
`{"success":"Fetch started", "fetch":FETCH_ID}`	A fetch request succeeded. FETCH_ID is an integer that identifies search results that match the query. This result might also contain field descriptions, depending on the selected format type and options.

When a request contains a fetch command, you receive one or more fetch results. Each fetch result references the fetch ID that was sent during the initial response to the fetch request. Each result contains intermediate information about the status of the fetch operation. The last result indicates why the fetch operation ended.

Example of a response to a simple fetch request:

```
{"fetch":1,"end":"end of data"}
{"fetch":1,"status":"Querying..."}
{"fetch":1,"status":"Querying, filtering at 2012-03-26 16:00:05, scanned 659 days, 1 hour, 47
 seconds (604471 mins/sec)",
"records":["1389711476185/1727/13","1389711476108/1727/4062434450241469840",
"1389711475658/1833/-9223372036854775807","1389711475182/1724/40",
"1389711474640/1722/4062434450241469840","1389711474609/1724/4062434450241469840",
"1389711474499/1722/-9223372036854775807","1389711472655/1833/-9223372036854775807",
"1389711469589/1725/27","1389711469502/1725/4062434450241469840",
"1389711468899/1720/-9223372036854775802"]}
{"fetch":1,"status":"Querying, filtering at 2012-03-26 16:00:05, scanned 659 days, 1 hour, 47
 seconds (604471 mins/sec)",
"records":["1389711648533/1833/-9223372036854775790","1389711647530/1727/482",
"1389711646362/1498/874","1389711646019/1724/512","1389711644988/1722/-9223372036854775790",
"1389711641938/1730/-3475223237406465276","1389711641021/1497/846","1389711640797/1725/501",
"1389711640173/1728/515","1389711640029/1732/390”,…"1389711579459/1720/-9223372036854775788",
"1389711578481/1833/-9223372036854775797","1389711576984/1727/285","1389711576364/1498/531",
"1389711576127/1727/4062547184543063856",”1389711481520/1730/4062434450241469840",
"1389711481004/1497/29","1389711479826/1728/69","1389711479713/1728/4062434450241469840",
"1389711479661/1725/53","1389711478949/1720/-9223372036854775799",
"1389711478450/1833/-9223372036854775807"]}
{"fetch":1,"status":"Querying, filtering at 2014-01-14 15:58:45, scanned 2 minutes, 7 seconds (1
 mins/sec)",
"records":["1389711651959/1730/-3475223237406465266","1389711651020/1497/895",
"1389711650868/1725/529","1389711650194/1728/543","1389711650066/1732/418",
"1389711649817/1720/-9223372036854775780"]}
{"success":"Fetch started","fetch":1}
```

To cancel an ongoing fetch, you can use the abort request with the appropriate fetch ID. To cancel the fetch in the previous example:

```
{"abort": 1}
```

Result:

```
{"fetch":1,"end":"aborted"}
{"success":"No fetch"}
```

Reducing the scope of a query for log data and formatting the output

You can specify some parameters on fetch requests to reduce the scope of the query and to define the formatting of the output.

You can set these parameters to reduce the scope of the query:

Parameter	Description
"type"	Specifies whether to search stored or current log entries. ■ "stored" — Searches stored log entries. ■ "current" — Searches current log entries. The default is "stored".

Parameter	Description
"start_ms": NUMBER	Restricts the search to a specific time frame. ■ "start_ms":NUMBER specifies the start of the time frame. The default is 0 (unspecified). ■ "end_ms" :NUMBER specifies the end of the time frame. The default is 0 (unspecified).
"end_ms" : NUMBER	
"filter"	Adds a filter to the query to narrow down the log entries that the fetch command returns.

You can optionally set several parameters on the same fetch request:

Parameter	Description
"backwards": BOOLEAN	Specifies the direction of the search. ■ "true" — The search starts from the most recent log entries and searches backwards. ■ "false" — The search starts from the oldest log entries and searches forwards. The default is "true".
"quantity": NUMBER	Specifies the number of log entries to fetch. The default is 0 (unspecified), which fetches all log entries.
"start_record": RECORD_ID	Specifies the string ID of the log entry from which to start the search.
"start_inclusive": BOOLEAN	Specifies whether to include the log entry specified in the "start_record" parameter in the search. The default value is false (the specified log entry is not included in the search).

You can optionally set the value of the "format" parameter to specify the output format. If you do not specify any specific "format" type, the fetched records are sent in the "string" format.

Value	Description
"string"	The output shows a string ID (log key) for the record. The string ID consists of a time stamp, a component identifier, and an event identifier, each separated by a forward slash (/). `{"format":{"type":"string"}}`
"detailed"	The output shows the key values that represent the log fields for each record, but also includes a resolving map that allows you to look up the raw value of a field to obtain its resolved value. `{"format":{"type":"detailed"}}`
"raw"	The output is shown as a set of key values that represent the log fields for each record, and the unresolved data for each log field. `{"format":{"type":"raw"}}`

You can retrieve the full syntax for formatting using the following request:

```
GET http://[server]:[port]/[version]/monitoring/log/schemas
```

Filtering queries for log data

Adding a filter to a query narrows down the records that the fetch command returns.

The easiest way to build a filter is to reference an existing filter element by its URI.

Example:

```
{"format":{"type":"raw"},"fetch":{"quantity":1},
"query":{"filter":{"type":"expression",
"href":"http://127.0.0.1:8082/6.11/elements/filter_expression/82"}}}
```

You can also build a filter without using an existing filter element.

For example, this query fetches all log entries in which the 'Action' field (14) is set to 'Allow' (1) or 'Permit' (11):

```
{"query": {"filter": {"type": "in", "left": {"type": "field", "id" : 14},
"right": [{"type": "constant", "value":1 },{"type": "constant", "value":11 }]}},
"fetch":{}}
```

This query fetches the 100 first log entries in which 'Originator' field (4) equals the ip address '127.0.6.44':

```
{"format":{"type":"string"},"query": {"type":"current","filter":
{"type":"in", "left":{"type":"field","id":4},"right":
[{"type":"ip","value":"127.0.6.44"}]}},"fetch":{"quantity":100}}
```

Values for filters

Filters are constructed through a prefixed logical sequence. You can use these values with these filters.

Filter	Values

"field"
Matches a log field.
	■ "id" — references the field by its integer ID.
	Example:
	`{"type":"field", "id":14}`
	■ "name" — references the field by its string name.
	Example:
	`{"type":"field", "name":"Action"}`

"element" Matches a specific element using its URI.	"href" specifies the URI for the element. Example: `{"type":"element", "href":"elements/host/42"}`
"constant" Matches a constant value for a given field.	"value" specifies the numeric value for the constant. Example: `{"type": "constant", "value":1}`

<table>
<tr><th>Filter</th><th>Values</th></tr>
<tr><td>"service"
Matches a service.</td><td>"value" specifies the service using one of the following formats depending on the protocol:
<ul><li>TCP/Port</li><li>UDP/Port</li><li>ICMP/Type/Code (/Code being optional)</li><li>ETH/FrameTypeID/ParamValue</li></ul>
You can optionally include one or more parameter values depending on the Ethernet FrameType:
<table>
<tr><th>FrameType ID</th><th>FrameType Name</th><th>Parameter Values</th></tr>
<tr><td>0</td><td>Ethernet 2 (DIX)</td><td>MAC Type</td></tr>
<tr><td>1</td><td>Raw IPX (Novell)</td><td>N/A</td></tr>
<tr><td>2</td><td>LLC</td><td>SSAP, DSAP</td></tr>
<tr><td>3</td><td>SNAP</td><td>Vendor, Type</td></tr>
</table>
Example:
<pre>{"type":"service","value":"TCP/80"}</pre>
For more information about Ethernet services, see the <i>Forcepoint Next Generation Firewall Product Guide</i>.</td></tr>
<tr><td>"ip"
Matches an IP address.</td><td>"value" specifies the IP address as a string.
Example:
<pre>{"type":"ip", "value":"127.0.0.1"}</pre></td></tr>
<tr><td>"number"
Matches the specified numeric value.</td><td>"value" specifies the numeric value.
Example:
<pre>{"type":"number", "value":42}</pre></td></tr>
<tr><td>"string"
Matches the specified string.</td><td>"value" specifies the string.
Example:
<pre>{"type":"string", "value":"mystring"}</pre></td></tr>
<tr><td>"translated"
Uses the internal SMC filter format.</td><td>"value" specifies a string in the internal SMC filter format.
Example:
<pre>{"type":"translated", "value":"$Number == 42"}</pre></td></tr>
</table>

Get field IDs and constant values to use in filters

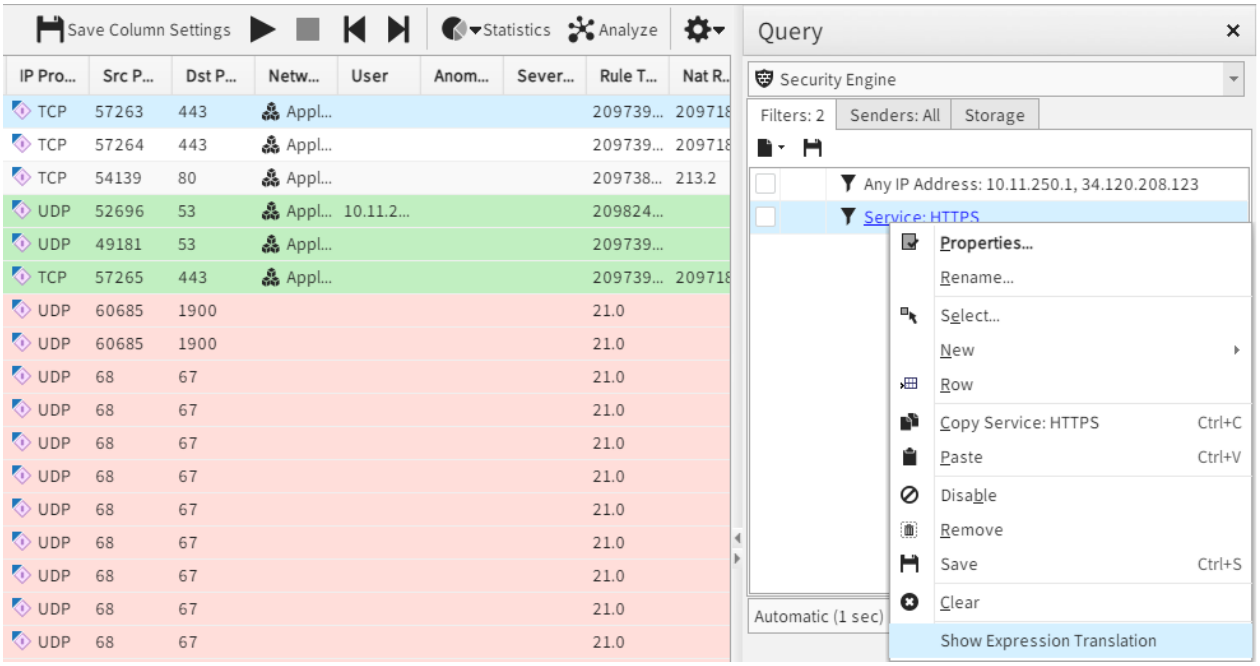
You can use the Management Client to get field IDs and constant values to use in filters.

For more information about using the Management Client, see the *Forcepoint Next Generation Firewall Product Guide*.

Steps

1) In Logs view of the Management Client, create a filter.

2) Right-click the filter, then select **Show Expression Translation**.



IP Pro...	Src P...	Dst P...	Netw...	User	Anom...	Sever...	Rule T...	Nat R...
TCP	57263	443	Appl...				209739...	209718
TCP	57264	443	Appl...				209739...	209718
TCP	54139	80	Appl...				209738...	213.2
UDP	52696	53	Appl...	10.11.2...			209824...	
UDP	49181	53	Appl...				209739...	
TCP	57265	443	Appl...				209739...	209718
UDP	60685	1900					21.0	
UDP	60685	1900					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	
UDP	68	67					21.0	

Any IP Address: 10.11.250.1, 34.120.208.123

Service: HTTPS

The Management Client shows an alias that you can use as the field ID and a constant that you can use as the value for the field ID.

Filter operators

Operator	Description
and	Matches if all of the filters in the list match "values" a list of filters. Example: `{"type":"and", "values": [{"type":”defined”, “value”:{"type":"field", "id":255}},{"type":”defined”, “value”:{"type":"field", "id":256}}, {"type":”defined”, “value”:{"type":"field", "id":257}}]}`

Operator	Description

ci_like	Matches if the left filter is equivalent to the right part (case insensitive) "left" a filter "right" a filter.
	Example:
	`{"type":"ci_like", "left":{"type":"field", "id":255},`
	`"right":{"type":"string", "value":"mystring"}}`

cs_like	Matches if the left filter is equivalent to the right part (case sensitive) "left" a filter "right" a filter.
	Example:
	`{"type":"cs_like", "left":{"type":"field", "id":255},`
	`"right":{"type":"string", "value":"mystring"}}`

defined	Matches if the given filter value in parameter is defined "value" filter. Example: `{"type":"defined", "value":{"type":"field", "id":255}}`

in	Matches if the evaluation of the left part is equivalent to one of the element of the right part "left" a filter "right" a list of filters.
	Example:
	`{"type": "in", "left": {"type": "field", "id" : 14}, "right":`
	`[{"type": "constant", "value":1 },{"type": "constant", "value":11 }]}`

not	Matches if the given filter as parameter do not match "value" a filter.
	Example:
	`{"type":"not", "value": {"type":”defined”, “value”:{"type":"field",`
	` "id":255}}}`

or	Matches if any of the filters in the list match "values" a list of filters.
	Example:
	`{"type":"or", "values": [{"type":”defined”, “value”:{"type":"field",`
	`"id":255}},{"type":”defined”, “value”:{"type":"field", "id":256}},`
	`{"type":”defined”,`
	`“value”:{"type":"field", "id":257}}]}`

Working with RESTful principles

The SMC API is a RESTful API that includes these features.

- The API is strictly based on the HTTP protocol and is platform-independent.
- Each resource is identified by a unique URI, which is opaque to the API clients.
- URIs and actions that can be performed on resources are accessible through hyperlinks.

- The SMC API supports multiple representations for each resource. Currently, only JSON and XML, or plain text when it is understandable, are supported.
- ETags are used for cacheability and conditional updates with If-Match, If-None-Match, and If-Modified-Since parameters.

Requests

There are several types of requests and they affect resources in different ways.

You can perform these actions:

- Create resources by using POST requests on the URI of the collection that lists all elements. The URI of the created resource is returned in the **Location** header field.
- Read resources by using GET requests. To save network bandwidth and avoid transferring the complete body in the response, HEAD requests If-None-Match and If-Modified-Since are supported.
- Update resources by using PUT requests. All updates are conditional and rely on Etag and If-Match header parameters.

  Note

  Etag is not supported as a header parameter in PUT requests in SMC API version 6.4 or higher. Use If-Match instead of Etag as a header parameter in PUT requests.

- Delete resources by using DELETE requests. All delete actions are conditional and rely on the If-Match header parameter.
- Trigger actions such as Policy Uploads by using POST requests.

Important

Only GET, HEAD, and OPTIONS requests are safe and do not have side effects. PUT and DELETE requests have no additional effect if they are called more than once with the same parameters, but We recommend avoiding redundant requests. POST requests might have additional effects if called more than once with the same input parameters; clients are responsible for avoiding multiple POST requests.

Status codes and error messages

When requests are made, they return HTTP response status codes.

For more information, the HTTP response status codes follow the principles outlined in https://en.wikipedia.org/wiki/List_of_HTTP_status_codes.

For an error message, the server also attempts to send relevant information in the response body.

304 status code handling

The SMC API supports the 304 Not Modified Error status code as a result of a GET request with the If-None-Match header parameter. This response indicates that the resource has not been modified since the version specified by the If-Modified-Since or If-None-Match request headers.

There is no need to retransmit the resource because the requested element has not been modified and the client still has a previously downloaded copy. For example, if you add your ETag element version to the If-None-

Match parameter in the header of your GET request, the SMC API returns a 304 status code instead of the element content. This response indicates that your downloaded copy of the element is the same as the requested element.

503 status code handling

The SMC API supports the 503 Service Unavailable status code. This response indicates that the server is currently unable to handle the request because it is running a system task that is accessing the same resource.

The implication is that this is a temporary condition and the request can be retried after some delay.

If the server returns the 503 Service Unavailable status code, the response header contains the Retry-After parameter and shows the amount of delay the server waits before sending the request again. The default delay is one second.

Opaque URIs, URI discovery, and hypermedia

All URIs must be considered opaque values; clients should not have to construct URIs by concatenating substrings.

All URIs must be recursively discovered from:

- The API entry-point URI, as defined in the SMC API configuration
- Top-level service URIs
- The top-level lists of elements
- Links to other resources that are mentioned in these elements
- The action links identified by the verbs (for example, upload) that are mentioned in these elements

Some URIs support or mandate the use of additional query parameters, for example, for filtering purposes.

Body content and query parameters

REST operations contain specific content or support additional parameters.

- Create and update operations require content in the body of the request.
- Read and delete operations on a single element do not require any additional content.
- Element listing operations support filtering arguments as query parameters.
- Some action URIs require additional parameters.

Entry point structure

Each entry point contains an operation verb and other information to direct the user to a URI.

Verbs

Verbs represent keywords for specific element operations.

Verbs are listed in the XML/JSON element description as a link entry.

Self verbs

The self verb is included in each element and is based on REST philosophy. The self verb allows you to retrieve the API URI for the current element.

Example: For a host, the self verb might look like the following.

```
“link":
    [
        {
            "href": "http://localhost:8082/6.11/elements/host/86",
            "rel": "self",
            "type": "host"
        }
    ]
```

A link entry has the following structure:

- href: The API's URI to the associated verb
- rel: The keyword that is preserved beyond SMC versions. It represents the verb
- type: Optional information about the return type

Installing a policy from a Policy element

The `upload` verb is present on several Policy elements, such as `fw_policy`.

Example: The JSON description of a policy refers to the verb in this way:

```
"link":
    [
        {
            "href": "http://localhost:8082/6.11/elements/fw_policy/56/upload",
            "rel": "upload"
        },
         …
    ]
```

This verb can be found in each policy type.

Example: Here it is shown in the Firewall Policy. It presents a query parameter — a filter that can be uploaded on a specific engine (`?filter=TheEngineName`).

This verb starts the upload of the specific policy on the specified engine. It returns a 200 HTTP response status code and an upload status description similar to the following:

```
{
    "follower": "http://localhost:8082/6.11/elements/fw_policy/56/upload/
NWYyMDBiOTA4ZTY3NDM0ZTo0YzM2ZTg5MDoxM2ZlNzhhMDZlZTotN2VhZA==",
    "href": "http://localhost:8082/6.11/elements/fw_policy/56",
    "in_progress": true,
    "last_message": "",
    "success": true
}
```

The upload status has the following structure:

- follower: The API's URI to the current upload status
- href: The source of the upload (in this example, the policy)
- in_progress: A flag that shows whether the upload is still in progress
- last_message: The last upload status message
- success: A flag that shows whether the current upload has succeeded

Uploading the engine configuration from an engine element

The `upload` verb is present on each engine element, such as `single_fw`.

Example: the JSON description of an engine refers to the verb in the following way:

```
"link":
    [
        …
        {
            "href": "http://localhost:8082/6.11/elements/single_fw/1552/upload",
            "rel": "upload"
        },
        …
    ],
```

This verb can be found in each engine type. In this example, it is shown in a Single Firewall. It presents a query parameter — a filter that can be uploaded on a specific policy (`?filter=ThePolicyName`).

This verb starts the upload on the specific engine and the specified policy. It returns a 200 HTTP response status code and a similar upload status description as for the policy upload.

Refreshing the engine configuration from an engine element

You can use the `refresh` verb to refresh the policy from engine elements.

Example: The JSON description of an engine refers to the verb in the following way:

```
"link":
    [
        …
        {
            "href": "http://localhost:8082/6.11/elements/single_fw/1552/refresh",
            "rel": "refresh"
        },
        …
    ],
```

This verb can be found in each engine type. In this example, it is shown in a Single Firewall.

This verb starts the policy refresh of the specific engine if a policy has already been installed on the engine. It returns a 200 HTTP response status code and a similar upload status description as for the policy upload.

API discovery

To ease migration during major version upgrades, it is preferable to discover the API starting from an entry-point rather than to define all URIs.

Verbs do not change in major version upgrades but URIs might change.

The execution of a GET request on this URI returns a list of available functions.

`GET https://[server]:[port]/[version]/api`

Example: `GET https://localhost:8082/6.11/api`

Links

`GET 6.11/api` allows the discovery of all available entry-points of the API.

The examples in this section show a sample of the HTTP response body in XML and JSON.

The structure of each entry-point is:

- href: The API's URI to the associated entry-point
- rel: A keyword that is the same in all version-specific entry-points

The `OPTIONS` method returns a list of the methods that you can use with each rel. Execute the `OPTIONS` method using the following syntax: `OPTIONS http://localhost:8082/6.11/<rel>`

Examples of the OPTIONS method

rel	OPTIONS method	Supported methods
logout	`OPTIONS http://localhost:8082/6.11/logout`	OPTIONS, PUT To use the logout rel, use a PUT method. Example: `PUT http://localhost:8082/6.11/logout`

rel	OPTIONS method	Supported methods
elements	`OPTIONS http://localhost:8082/6.11/elements`	HEAD, GET, OPTIONS To use the elements rel, use a GET method. Example: `GET http://localhost:8082/6.11/elements`

For example, for the entry-point host, the API's URI is `GET 6.11/elements/host`. Execution of `GET 6.11/elements/host` returns all defined Host elements in the HTTP response body.

To log in, execute `POST 6.11/login`.

Note

`GET 6.11/api` does not give query parameter information. Query parameters are defined in the API documentation.

The execution of `GET 6.11/api` with `Accept: application/xml` returns the following:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<api>
    <entry_point href="http://localhost:8082/6.11/logout" rel="logout"/>
    <entry_point href="http://localhost:8082/6.11/elements" rel="elements"/>
    <entry_point href="http://localhost:8082/6.11/elements/sub_ipv6_fw_policy"
 rel="sub_ipv6_fw_policy"/>
    ...
</api>
```

The execution of `GET 6.11/api` with `Accept: application/json` returns the following:

```
{
    "entry_point":[
    {
      "href": "http://localhost:8082/6.11/logout",
      "rel": "logout"
    },
    {
      "href": "http://localhost:8082/6.11/elements",
      "rel": "elements"
    },
    {
      "href": "http://localhost:8082/6.11/elements/sub_ipv6_fw_policy",
      "rel": "sub_ipv6_fw_policy"
    ...
  ]
}
```

Data element formats

You can retrieve elements from the API in both JSON and XML formats.

The format depends on the **Accept** HTTP header parameter. `Accept: application/json` returns elements in JSON. `Accept: application/xml` returns elements in XML.

Elements include at least the name and comment information. If administrative Domains are used, elements also include a link to the domains to which the elements belong. In addition, elements include two flags that show whether they are system and/or read-only. Custom elements have system and read-only attributes with a false value.

Elements must show the key attribute to be updated. Elements show their specific attributes and elements as a content description. The API uses the element type and the key attribute to identify the element. The key attribute must be unique within each element type, but elements of different types can have the same key attribute.

By default, all attributes and elements from the data element input that are not supported are ignored. For this reason, we recommend to first retrieve an existing element in XML or JSON and then create an element or update the existing element.

For example, the “link” element is always ignored in data element input, the “key” attribute is always ignored in element creation, and the “system” and “read_only” attributes are always ignored.

JSON

The default data format for the API is JSON.

JSON is based on key/value arrays.

Example: The system `"Your-Freedom Servers"` host is represented in JSON as follows:

```
    {
        "address": "66.90.73.46",
        "comment": "Your-Freedom Servers to help blocking access from Your-Freedom clients",
        "key": 86,
"link":
    [
        {
            "href": "http://localhost:8082/6.11/elements/host/86",
            "rel": "self",
            "type": "host"
        }
    ],
    "name": "Your-Freedom Servers",
    "read_only": true,
    "secondary":
    [
        "193.164.133.72",
        …
    ],
    "system": true,
    "third_party_monitoring":
    {
        "netflow": false,
        "snmp_trap": false
    }
  }
```

The system and read-only flags are correctly set to `true` to indicate that the element in question is a system/read-only element. The name and comment attributes are correctly shown. In addition, there is more specific information — the address, the secondary address, and the `"third_party_monitoring"` status. Finally, the self verb is shown on the link row.

The primary IP address of this system host is `66.90.73.46`. The host also has several secondary IP addresses, and third-party monitoring is disabled.

For more information about the JSON format, see https://en.wikipedia.org/wiki/Json.

XML

The API supports the XML format. As a standard, the XML format is more verbose than the JSON format.

The XML format appears more verbose particularly in collections, which present an XML tag grouping of all XML child elements.

Example: the system `"Your-Freedom Servers"` host has the following content:

```
   <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
   <host comment="Your-Freedom Servers to help blocking access from Your-Freedom clients"
address="66.90.73.46" key="86" name="Your-Freedom Servers" read_only="true" system="true">
   <links>
   <link href="http://localhost:8082/6.11/elements/host/86" rel="self" type="host"/>
   </links>
   <secondary_addresses>
   <secondary>193.164.133.72</secondary>
   …
   </secondary_addresses>
   <third_party_monitoring netflow="false" snmp_trap="false"/>
   </host>
```

There are common attributes with the JSON format — name, comment, key, system, and read-only. The attributes specific to XML are address (XML attribute), secondary_addresses, and third_party_monitoring (XML children elements).

For more information about the XML format, see https://en.wikipedia.org/wiki/XML.

Working with resource elements

You can manage resource elements with several operations.

Searching for resources

You can filter each element entry point based on a specified part of a name, comment, or IP address.

For example, all elements can be listed with `GET 6.11/elements`. You can search all elements using the 192.168.* IP address pattern with the following query:

```
GET 6.11/elements?filter=192.168.*
```

You can filter specifically by type using a type-specific URI. For example, this search returns a list of all host elements with ‘host’ in their names or comments:

```
GET 6.11/elements/host?filter=host
```

You can use query parameters to limit the scope of your searches and specify how searches match the search string.

The filter_context query parameter allows you to limit the search to the specified type of element. This parameter is useful for searching for types of elements that can group together multiple element types, such as network_elements, alias, engine_clusters, fw_clusters, ips_clusters, layer2_clusters, services, services_and_applications, tags, and situations.

For example, this search returns a list of Service elements with 'http' in their names or comments:

```
GET 6.11/elements?filter_context=services&filter=http
```

The exact_match query parameter allows you to exactly match the specified string. For example, this search matches only the element named 'master'. It does not match elements named 'master-89' or 'master-90'.

```
GET 6.11/elements?exact_match=true&filter=master
```

The case_sensitive query parameter allows you to match the capitalization specified in the search string. For example, this search matches only elements with 'HQ' in their names or comments. It does not match elements with 'hq' in their names or comments:

```
GET 6.11/elements?case_sensitive=true&filter=HQ
```

Related concepts

Specific searches on page 30

Using json_path to filter an attribute of an element

You can use the json_path query parameter to return only the specified attribute of an element.

Example: The following command:

```
GET http://localhost:8082/6.11/elements/alias/1672?json_path=.name
```

Returns only the name attribute of the element:

```
[
  "$ SMTP_SERVERS"
],
```

Example: The following command:

```
GET http://localhost:8082/6.11/elements/single_fw/1649?json_path=
$.physicalInterfaces..physical_interface[?(@.interface_id == 0)]
```

Returns only the physical interface with interface ID 0:

```
[
  {
"aggregate_mode": "none",
"arp_entry": [],
"cvi_mode": "none",
"dhcp_server_on_interface": {
"default_lease_time": 7200,
"dhcp_range_per_node": [],
},
"duplicate_address_detection": true,
...
```

Retrieving a resource

You can use a GET request on the specific API Client element's URI to retrieve the content of the element.

Example: After having retrieved the API's URI for hosts, the following request:

```
GET 6.11/elements/host
```

returns the following:

```
{
    "result":
    [
        {
            "href": "http://localhost:8082/6.11/elements/host/86",
            "name": "Your-Freedom Servers",
            "type": "host"
                },
        {
            "href": "http://localhost:8082/6.11/elements/host/39",
            "name": "DHCP Broadcast Destination",
            "type": "host"
        },
        …
    ]
}
```

The HTTP request lists all defined hosts with their API's URIs. If a specific host is needed, search for the host by name to get a similar result but only including the particular host.

For example, the following request:

```
GET 6.11/elements/host/39
```

returns a 200 HTTP response status code and the specified XML/JSON description.

Tip

The **Accept HTTP** request header determines the output format (XML or JSON).

Expanding an attribute of an element

You can use the expand query parameter to expand an attribute of an element.

Example: The following request returns information about the specified attribute of the element:

```
GET http://localhost:8082/6.11/elements/single_fw/1649?expand=internal_gateway_ref
"internal_gateway_ref": [
  {
"antivirus": false,
"auto_certificate": true,
"auto_site_content": true,
"dhcp_relay": {
...
```

Creating a resource

To create an element, you need the associated element entry-point to execute a POST on it.

The API documentation describes all attributes that are needed for constructing elements in JSON or XML.

Example: For a host, the `POST 6.11/elements/host` REST call returns a 201 HTTP response status code and the created element API's URI in the HTTP header:

```
{
    "name": "myHost",
    "address": "192.168.0.1"
}
```

Tip

The **Content-Type HTTP** request header determines the input format (XML or JSON).

Updating a resource

When updating an element, the REST operation is a PUT.

First, you must execute a GET operation on the element to retrieve the ETag from the HTTP header.

After modifying the JSON/XML element content, you can execute a PUT operation with the ETag value in the If-Match request header parameter. The If-Match header parameter is required to make sure that the version element is the most current version.

It is important to modify the results of the GET execution to make sure that all attributes are present for the update (for example, the key).

No merge is done for collections during an update. The API replaces the existing resource with the new one.

If the execution succeeds, it returns a 200 HTTP response status code and, in the HTTP header, the updated element API's URI.

Tip

The **Content-Type HTTP** request header determines the input format (XML or JSON).

Using a JSON PATCH request to update an attribute of an element

You can use a JSON PATCH request to update specific attributes of an element.

You must include `Accept : application/json-patch+json` in the header of the request.

Example: The following request updates the IP address of the specified Host element to 172.20.1.72:

```
PATCH …/elements/host/1445 with payload [ { “op”: “replace”, “path”: “/address”,
 “value”:”172.20.1.72”} ]
```

Example: The following request updates the secondary IP addresses of the specified Host element to 1.1.1.1, 2.2.2.2:

```
PATCH …/elements/host/1445 with payload [ { "op": "add", "path": "/secondary", "value": ["1.1.1.1",
 "2.2.2.2"] } ]
```

Example: The following request removes the secondary IP addresses from the specified Host element:

```
PATCH …/elements/host/1445 with payload [ { "op": "remove", "path": "/secondary" } ]
```

Using a JSON merge-patch request to update attributes of an element

You can use a JSON merge-patch request to update specific attributes of an element.

You must include `Accept: application/merge-patch+json` in the header of the request.

Example: The following request updates the IP address of the specified Host element to 17.44.1.72:

```
PATCH …/elements/host/1566 with payload { "address": "17.44.1.72" }
```

Example: The following request updates the secondary IP addresses of the specified Host element to 1.1.1.1, 2.2.2.2:

```
PATCH …/elements/host/1445 with payload { "secondary": ["1.1.1.1", "2.2.2.2"] }
```

Example: The following request removes the secondary IP addresses from the specified Host element:

```
PATCH …/elements/host/1445 with payload { "secondary": null }
```

Deleting a resource

When you want to delete an element, the REST operation is a DELETE.

When you know the element API's URI, you can execute a DELETE operation on it. If the execution succeeds, it returns a 204 HTTP response status code.

Specific searches

The API makes it possible to execute specific searches, such as unused elements or duplicate IP addresses.

Searching for unused elements

This operation executes a search for all unused elements.

```
GET 6.11/elements/search_unused
```

It is also possible to filter this search by a specific name, comment, or IP address with the query parameter filter.

Searching for duplicate IP addresses

This operation executes a search for all duplicate IP addresses.

```
GET 6.11/elements/search_duplicate
```

It is also possible to filter this search by a specific name, comment, or IP address with the query parameter filter.

System information

This entry-point operation returns the current SMC version and the last activated Dynamic Update package.

```
GET 6.11/system
```

Examples

As you begin working with the SMC API, see these examples as a reference.

The following configuration is used for these examples:

- The SMC API is configured on port 8082, without host name restrictions, and reached from the same system as the Management Server.
- The SMC API entry-point URI is `http://localhost:8082/api`.
- An API Client element with the appropriate permissions and an authentication key of `sqfTm8UCd6havtycRP7P0001` has been defined in the Management Client.

Unless otherwise specified, all examples use JSON representations. The example elements (such as Helsinki FW and HQ Policy) derive names and properties from the elements that exist in the SMC installed in demo mode.

There are several python example scripts in the samples directory. Explanations of these samples are provided in the following sections.

Client access and logon

These tasks give the client access to the SMC through the API.

Version-specific entry point

You can create a list of all supported API versions and their entry points.

First, the client must retrieve the version-specific entry-point URI. A GET request on the API entry-point URI (`http://localhost:8082/api`) returns an array, named version, which lists all supported API versions and their entry-point URIs.

```
GET http://localhost:8082/api
Status Code: 200 OK
{
    "version": [
        {
            "href": "http://localhost:8082/6.10/api",
            "rel": "6.10"
        }
        {
            "href": "http://localhost:8082/6.11/api",
            "rel": "6.11"
        }
    ]
}
```

Global services and element URIs

The client must retrieve the login URI, as most services and element URIs require the client to be properly authenticated.

The version-specific URI declares the URIs for all elements and root services in a list named entry_point. The login URI is named login:

```
GET http://localhost:8082/6.11/api
Status Code: 200 OK
{
    "entry_point": [
        {
            "href": "http://localhost:8082/6.11/elements",
            "rel": "elements"
        },
…
        {
            "href": "http://localhost:8082/6.11/elements/host",
            "rel": "host"
        },
…
        {
            "href": "http://localhost:8082/6.11/login",
            "rel": "login
        }
    ]
}
```

Logging on

Logon is performed with a POST request on the login service URI.

Before using protected services, clients must log on using their authentication key, which is generated when the API Client element is configured in the Management Client.

The API Client authentication key must be specified in the payload:

- For JSON content type `{"authenticationkey":"XXXXX"}`
- For XML content type `<login_info authenticationkey='XXXXX'/>`

```
POST http://localhost:8082/6.11/login
Content-type: application/json
Payload : {"authenticationkey":"sqfTm8UCd6havtycRP7P0001"}
Status code: 200 OK
```

Working with hosts

Use the SMC API to find and configure hosts and Host elements.

Listing the hosts collection

After logon, you can get a list of all defined hosts with this request:

`GET http://localhost:8082/6.11/elements/host`

This request returns a 200 HTTP response status code and this result:

```
{
    "result":
    [
        {
            "href": "http://localhost:8082/6.11/elements/host/40",
            "name": "DHCP Broadcast Originator",
            "type": "host"
        },
        {
            "href": "http://localhost:8082/6.11/elements/host/43",
            "name": "IPv6 Unspecified Address",
            "type": "host"
        },
        …
    ]
}
```

Filtering elements

Use filters to narrow your element search.

After logon, you can search for a specific host called Your-Freedom Servers with the following request:

```
GET http://localhost:8082/6.11/elements/host?filter=Your-Freedom Servers
```

This request returns a 200 HTTP response status code and this result:

```
{
    "result":
    [
        {
            "href": "http://localhost:8082/6.11/elements/host/86",
            "name": "Your-Freedom Servers",
            "type": "host"
        }
    ]
}
```

Creating a host

Create a host with the JSON format.

After logon, create a Host element in the JSON format with the following request:

```
POST http://localhost:8082/6.11/elements/host
Request body:
{
        "name": "mySrc1",
        "comment": "My SMC API's my Src Host 1",
        "address": "192.168.0.13",
        "secondary": ["10.0.0.156"]
}
```

The request returns a 201 HTTP response status code and the following in the Location HTTP header:

```
http://localhost:8082/6.11/elements/host/1704
```

See `createHostThenDeleteIt.py` JSON or XML samples.

The system prevents you from creating an element without a unique name.

If you try to create an element with an existing name, you receive a 404 HTTP error status code and the following error message:

```
    {
        "details":
        [
            "Element name fra-hide is already used."
        ],
        "message": "Impossible to store the element fra-hide."
    }
```

Modifying an existing host

After logon, you must first search for the host and then you can modify an existing host.

> **Note**
>
> Etag is not supported as a header parameter in PUT requests in SMC API version 6.4 or higher. Use If-Match instead of Etag as a header parameter in PUT requests.

Search for the host using the filtering feature:

```
GET http://localhost:8082/6.11/elements/host?filter=mySrc1
```

After the element is found, use the following request:

```
GET http://localhost:8082/6.11/elements/host/1704
```

It returns the JSON host description and its ETag in the HTTP header in the following way:

```
Etag: MTcwNDMxMTEzNzQwNDMwNzM1NDQ=
    {
        "address": "192.168.0.13",
        "comment": "My SMC API's my Src Host 2",
        "key": 1704,
        "link":
        [
            {
                "href": "http://localhost:8082/6.11/elements/host/1704",
                "rel": "self",
                "type": "host"
            }
        ],
        "name": "mySrc2",
        "read_only": false,
        "secondary":
        [
            "10.0.0.156"
        ],
        "system": false,
        "third_party_monitoring":
        {
            "netflow": false,
            "snmp_trap": false
        }
}
```

From the JSON content, you can update the host as needed (add attributes, or add, remove, or update hosts).

```
PUT http://localhost:8082/6.11/elements/host/1704
```

Using `If-Match: MTcwNDMxMTEzNzQwNDMwNzM1NDQ=` as the HTTP request header, and the updated JSON content as the HTTP request payload, returns a 200 HTTP response status code and the following in the HTTP response header:

```
Location: http://localhost:8082/6.11/elements/host/1704
```

See `updateHostThenDeleteIt.py` JSON or XML samples.

If you use an incorrect Etag value in the If-Match request parameter, a 409 Conflict status code is shown.

Deleting a host

After logon, you must first search for the host and then you can find and delete an existing host.

Search for the host using the filtering feature:

```
GET http://localhost:8082/6.11/elements/host?filter=mySrc1
```

```
http://localhost:8082/6.11/elements/host/1704
```

After the host is found, using the following request returns a 204 HTTP response status code:

```
DELETE http://localhost:8082/6.11/elements/host/1704
```

See `createHostThenDeleteIt.py` and `updateHostThenDeleteIt.py` JSON or XML samples.

Working with IP address lists

Use the SMC API to import IP address lists.

Listing existing IP address lists

After logon, you can get a list of all defined IP Address List elements with this request:

```
GET http://localhost:8082/6.11/elements/ip_list
```

This request returns a 200 HTTP response code and this result:

```
{
    "result":
    [
        {
            "href": "http://localhost:8082/6.11/elements/ip_list/667",
            "name": "new_ip_list",
            "type": "ip_list"
        },
        {
            "href": "http://localhost:8082/6.11/elements/ip_list/312",
            "name": "Skype Servers IP Address List",
            "type": "ip_list"
        },
        ...
    ]
}
```

Creating an IP address list

IP address lists are created in two phases: first create the IP Address List element, then upload the content to the IP Address List element.

After logon, create an IP Address List element with the following request:

```
POST http://localhost:8082/6.11/elements/ip_list
Request body:
{
  "name": "myIpList1",
  "comment": "My SMC API's my IP Address List 1"
}
```

The request returns a 201 HTTP response status code and the following in the Location HTTP header:

```
http://localhost:8082/6.11/elements/ip_list/1704
```

Upload the content for the created IP Address List element with the following request:

```
POST http://localhost:8082/6.11/elements/ip_list/1704/ip_address_list
Request body:
{
    "ip":
    [
        "1.2.3.4",
        "10.0.0.0/8",
        "192.168.0.0-192.168.255.255"
    ]
}
```

On success, the request returns HTTP response status code 202.

You can modify the content of the IP Address List element by uploading new content for an existing IP Address List element. The existing content is overwritten by the content in the request.

To read the content of the IP Address List element, call GET to the same URI as above:

```
GET http://localhost:8082/6.11/elements/ip_list/1704/ip_address_list
```

On success, the response code is 200 and the content is provided in an identical format to the content upload above:

```
{
    "ip":
    [
        "1.2.3.4",
        "10.0.0.0/8",
        "192.168.0.0-192.168.255.255"
    ]
}
```

See `createIpAddressListModifyAndDeleteIt.py` JSON and XML samples.

Working with Policy elements

The SMC API can be used to modify, upload, and monitor the status of Policy elements.

Modifying a rule in a policy

You can modify a rule within an existing policy.

After logon, you must first search for the policy using the filtering feature:

```
GET http://localhost:8082/6.11/elements/fw_policy?filter=HQ Policy
```

After the policy is found, you can retrieve a specific type of rule with the following request:

```
http://localhost:8082/6.11/elements/fw_policy/56
```

```
GET http://localhost:8082/6.11/elements/fw_policy/56
```

These special links to the Firewall Policy retrieve all applicable rules in the current policy:

- fw_ipv4_access_rules — Retrieves all Firewall IPv4 Access rules
- fw_ipv6_access_rules — Retrieves all Firewall IPv6 Access rules
- fw_ipv4_nat_rules — Retrieves all Firewall IPv4 NAT rules
- fw_ipv6_nat_rules — Retrieves all Firewall IPv6 NAT rules

For example, in Firewall IPv4 Access rules, the first rule is @514.0:

```
{
        "href": "http://localhost:8082/6.11/elements/fw_policy/56/fw_ipv4_access_rule/514",
        "name": "Rule @514.0",
        "type": "fw_ipv4_access_rule"
}
```

```
GET http://localhost:8082/6.11/elements/fw_policy/56/fw_ipv4_access_rule/514
```

The content of the @514 Firewall IPv4 Access rule is retrieved:

```
    {
        "comment": "Set logging default, set long timeout for SSH connections",
        "is_disabled": false,
        "key": 2543,
        "link":
        [
            {
                "href": "http://localhost:8082/6.11/elements/fw_policy/56/fw_ipv4_access_rule/514",
                "rel": "self",
                "type": "fw_ipv4_access_rule"
            }
        ],
        "parent_policy": "http://localhost:8082/6.11/elements/fw_policy/56",
        "rank": 4,
        "read_only": false,
        "system": false,
        "tag": "514.0"
}
```

The result has ETag: MjU0Mzk4MTEzMDYyMzMyMzYxMTg= as the HTTP response header.

This rule seems to be a comment rule (no source/destination/service attributes are defined), so you could update the comment, for example:

```
PUT http://localhost:8082/6.11/elements/fw_policy/56/fw_ipv4_access_rule/514
```

The new JSON content with the updated comment and `If-Match: MjU0Mzk4MTEzMDYyMzMyMzYxMTg=` as the HTTP request header returns a 200 HTTP response status code and the following in the HTTP response header:

```
http://localhost:8082/6.11/elements/fw_policy/56/fw_ipv4_access_rule/514
```

See `addRuleAndUpload.py` JSON or XML samples.

Uploading a policy and monitoring its status

There are two ways of uploading or refreshing a policy — from the engine and from the policy.

To upload a policy from the engine, you must first search for the engine after logging in using the filtering feature:

```
GET http://localhost:8082/6.11/elements?filter=Helsinki FW
```

Engine

After the engine has been retrieved, the following JSON content is displayed:

```
    "link":
    [
    {
    "href": "http://localhost:8082/6.11/elements/fw_cluster/1563/refresh",
    "rel": "refresh"
    },
    {
    "href": "http://localhost:8082/6.11/elements/fw_cluster/1563/upload",
    "rel": "upload"
    },
    …
]
```

Policy

The verb ‘upload’ is listed, so you can execute the following request:

```
POST http://localhost:8082/6.11/elements/fw_cluster/1563/upload?filter=HQ Policy
```

By filtering the REST call with the HQ Policy, you enable the upload of the HQ Policy on the Helsinki Firewall Cluster.

This results in the 201 HTTP response status code and the following:

```
{
        "follower": "http://localhost:8082/6.11/elements/fw_cluster/1563/upload/
NWYyMDBiOTA4ZTY3NDM0ZTotNzgyM2JmMmI6MTNmZWMxMGI3ZGY6LTdmZDA=",
        "href": "http://localhost:8082/6.11/elements/fw_cluster/1563",
        "in_progress": true,
        "last_message": "",
        "success": true
}
```

To follow up on the upload, you can periodically request for its status in the following way:

```
GET http://localhost:8082/6.11/elements/fw_cluster/1563/upload/
NWYyMDBiOTA4ZTY3NDM0ZTotNzgyM2JmMmI6MTNmZWMxMGI3ZGY6LTdmZDA=
```

For as long as the attribute in_progress is not set to false, the upload continues with a new last_message attribute.

It is also possible to refresh a policy on the engine. As you can see from the engine links, the verb ‘refresh’ is also available on the engine:

```
POST http://localhost:8082/6.11/elements/fw_cluster/1563/refresh
```

This process ends in the same way as an upload. The engine must have a policy already installed to proceed to the upload.

See `addRuleAndUpload.py` JSON or XML samples.

Working with VPNs

You can use the SMC API to configure gateways, certificates, VPN topology, and settings for VPNs.

The following data elements are used in VPN configuration.

Data elements for VPN configuration

Data element	Data type	Parent element	Actions
vpn	VPN	elements	none
vpn_profile	VPN Profile	elements	none
gateway_profile	Gateway Profile	elements	none
gateway_settings	Gateway Settings	elements	none
gateway_certificate	Gateway Certificate	internal_gateway	certificate_export, renew
gateway_certificate_request	Gateway Certificate Request	internal_gateway	certificate_import, certificate_export, self_sign
internal_gateway	Internal Gateway	single_fw, fw_cluster, master_engine	generate_certificate
external_gateway	External Gateway	elements	none
vpn_certificate_authority	VPN Certificate Authority	elements	certificate_import, certificate_export

Data elements for VPN configuration support the following standard operations:

- List (GET)
- Read (GET)
- Create (POST)

  Note

  The gateway_certificate and gateway_certificate_request data elements do not support the Create (POST) operation. You must use the generate_certificate action for the internal_gateway data element to create gateway_certificate and gateway_certificate_request data elements.

- Modify (PUT)

  Note

  The gateway_certificate and gateway_certificate_request data elements do not support the Modify (PUT) operation. You must use the generate_certificate action for the internal_gateway data element to modify gateway_certificate and gateway_certificate_request data elements.

- Delete (DELETE)

Viewing information about VPNs

You can use GET requests to list VPNs and view information about VPNs.

After logon, use this request to list all defined VPNs:

```
GET http://localhost:8082/6.11/elements/vpn
```

Note

In all examples, the VPN's ID number is 5.

After logon, use this request to view information about a VPN:

`GET http://localhost:8082/6.11/elements/vpn/5`

This request returns a 200 HTTP status response code and this result:

```
{
    "key":5
    "link":[
             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/gateway_tree_nodes/central",
             "rel":"central_gateway_node"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite",
             "rel":"satellite_gateway_node"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/gateway_tree_nodes/mobile",
             "rel":"mobile_gateway_node"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/open",
             "rel":"open"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/save",
             "rel":"save"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/close",
             "rel":"close"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/validate",
             "rel":"validate"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/tunnels",
             "rel":"gateway_tunnel"
             },

             {
             "href":"http://127.0.0.1:8082/6.11/elements/vpn/5",
             "rel":"self",
             "type":"vpn"
             }],

    "mobile_vpn_topology_mode":"None",
    "name":"Corporate VPN",
    "nat":false,
    "read_only":false,
    "system":false,
    "vpn_profile":"http://127.0.0.1:8082/6.11/elements/vpn_profile/1"
}
```

Opening a VPN topology

You must open a VPN topology before you can modify it.

Note

Only one VPN topology can be opened at a time for each HTTP session.

Open a VPN topology with this request:

```
POST http://localhost:8082/6.11/elements/vpn/5/open
```

This request returns a 200 HTTP status response code. You are now able to query inside the VPN topology.

Viewing information about gateway-to-gateway tunnels

You can use GET requests to list the tunnels between gateways in a VPN, and to view information about a specific gateway-to-gateway tunnel.

After opening the VPN topology, use this request to list the gateway-to-gateway tunnels in the VPN:

```
GET http://localhost:8082/6.11/elements/vpn/5/tunnels
```

This request returns a 200 HTTP status response code and this result:

```
{
     "result":
     [
               {
               "href":"http://127.0.0.1:8082/6.11/elements/vpn/5/tunnels/ADcAOw==",
               "name":"Gateway Tunnel 55-59",
               "type":"gateway_tunnel"
               },
]}
```

Use this request to view information about a specific gateway-to-gateway tunnel:

```
GET http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==
```

This request returns a 200 HTTP status response code and this result:

```
{
    "enabled":true,
    "gateway_node_1":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/55",
    "gateway_node_2":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/central/59",
    "key":0,
    "link":[
            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==",
            "rel":"self",
            "type":"gateway_tunnel"
            },

            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==/endpoints",
            "rel":"gateway_endpoint_tunnel",
            "type":"gateway_endpoint_tunnel"
            }
            ],
    "preshared_key":"iAb28nUyhweaQ6nLLrBG7NyaxJc48zFU5nn9HphYGVpZcrupy
     WiEf47z6JENq2EXZXgceStoRArsMxHQqoDY9wCnaVGNs3Vv4G9rcm6X9EPQRqaQBq
     pprfKAHEToaCMR97rE7dqK9BBJFD"
}
```

Viewing information about endpoint-to-endpoint tunnels

You can use GET requests to list the tunnels between endpoints in a VPN, and to view information about a specific endpoint-to-endpoint tunnel.

After opening the VPN topology, use this request to list the endpoint-to-endpoint tunnels for a specific gateway:

`GET http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==/endpoints`

The request returns a 200 HTTP status response code and this result:

```
{
    "result":
    [
              {
              "href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==/endpoints/
AGoAcg==",
              "name":"Gateway EndPoint Tunnel 106-114",
              "type":"gateway_endpoint_tunnel"
              },
    ]
}
```

Use this request to view information about a specific endpoint-to-endpoint tunnel:

`GET http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==/endpoints/AGoAcg==`

The request returns a 200 HTTP status response code and this result:

```
{
    "enabled":true,
    "endpoint_1":"http://localhost:8082/6.11/elements/fw_cluster/1554/internal_gateway/55/
internal_endpoint/106",
    "endpoint_2":"http://localhost:8082/6.11/elements/fw_cluster/1563/internal_gateway/59/
internal_endpoint/114",
    "key":0,
    "link":[
            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/tunnels/ADcAOw==/endpoints/AGoAcg==",
            "rel":"self",
            "type":"gateway_endpoint_tunnel"
            }
    ]
}
```

Viewing information about a gateway

You can use GET requests to view information about gateways in a VPN topology.

There are two requests for viewing information about gateways in the VPN topology:

- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/central` — Shows information about gateways on the central gateways list.
- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite` — Shows information about gateways on the satellite gateways list.

After opening the VPN topology, use this request to view information about a specific gateway node:

`GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67`

The request returns a 200 HTTP status response code and this result:

```
{
    "child_node":["http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/65"],
    "gateway":"http://localhost:8082/6.11/elements/fw_cluster/1588/internal_gateway/67",
    "key":67,
    "link":[
            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67",
            "rel":"self",
            "type":"satellite_gateway_node"
            },

            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67/
sites/enabled",
            "rel":"vpn_site",
            "type":"vpn_site"
            },

            {
            "href":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67/
sites/disabled",
            "rel":"vpn_site",
            "type":"vpn_site"
            }
    ],

    "node_usage":"satellite",
    "parent_node":"http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66",
    "vpn_key":5
}
```

Note

The gateway_tree_nodes data element represents nodes in the VPN topology tree. The internal_gateway attribute gives access to the gateway data element.

Adding a gateway node to the VPN topology

You can use POST requests to add a gateway node to the VPN topology.

After opening the VPN topology, use this request to add an internal_gateway data element to the gateway_tree_nodes in the VPN topology:

```
POST http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite
{"gateway":"http://localhost:8082/6.11/elements/fw_cluster/1557/internal_gateway/56",
"node_usage":"central"}
```

Note

The gateway_tree_nodes data element represents nodes in the VPN topology tree. The internal_gateway attribute gives access to the gateway data element.

Deleting a gateway node from the VPN topology

You can use DELETE requests to delete a gateway node from the VPN topology.

Note

Deleting a gateway node from the VPN topology does not delete the internal_gateway or external_gateway data element.

After opening the VPN topology, use this request to delete a gateway node from the VPN topology:

Moving a gateway node in the VPN topology

You can move a gateway node to the central or satellite gateways list, or move a gateway node under a parent node in the VPN topology.

After opening the VPN topology, use this request to move a gateway node from the central gateways list to the satellite gateways list in the VPN topology:

```
PUT http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/central/67
"node_usage":"satellite"
```

After opening the VPN topology, use this request to move a gateway node from the satellite gateways list to the central gateways list in the VPN topology:

```
PUT http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67
"node_usage":"central"
```

After opening the VPN topology, use this request to move a gateway node under a parent node in the VPN topology:

```
PUT http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/67
"parent_node":http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66
```

Listing the sites in a VPN

You can use GET requests to list the enabled and disabled sites in a VPN.

After opening the VPN topology, use these requests to list the sites associated with a central gateway in a VPN:

- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/central/88/sites/enabled` — Lists the enabled sites associated with the central gateway.
- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/central/88/sites/disabled` — Lists the disabled sites associated with the central gateway..

After opening the VPN topology, use these requests to list the sites associated with a satellite gateway in a VPN:

- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/enabled` — Lists the enabled sites associated with the satellite gateway.
- `GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/disabled` — Lists the disabled sites associated with the satellite gateway.

After opening the VPN topology, use this request to list the enabled sites associated with a satellite gateway in the VPN:

`GET http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/enabled`

Note

In this example, the satellite gateway's ID number is 66.

This request returns a 200 HTTP status response code and this result:

```
{
result: [2]
0:  {
href: "http://127.0.0.1:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/enabled/68"
name: "vpn_site 68"
obsolete: false
type: "vpn_site"
}-
1:  {
href: "http://127.0.0.1:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/enabled/61"
name: "vpn_site 61"
obsolete: false
type: "vpn_site"
}-
-
}
```

Enabling or disabling sites in a VPN

You can use DELETE requests to change the status of a site in a VPN.

Note

The DELETE request toggles the status of the site. Sites in the enabled sites list are moved to the disabled sites list. Sites in the disabled sites list are moved to the enabled sites list.

After opening the VPN topology, use this request to disable a site in a VPN:

```
DELETE http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/enabled/68
```

The site is removed from the enabled sites list and added to the disabled sites list.

After opening the VPN topology, use this request to enable a site in a VPN:

```
DELETE http://localhost:8082/6.11/elements/vpn/5/gateway_tree_nodes/satellite/66/sites/disabled/68
```

The site is removed from the disabled sites list and added to the enabled sites list.

Validating a VPN topology

You can use the SMC API to retrieve a list of VPN topology validation issues.

Note

In this example, the validation has already been done. The example request queries the result of the validation. It does not trigger the validation action.

There are three kinds of validation issues:

- VPN Global Issues — Issues that affect the whole VPN.
- GwGw Issues — Issues that affect tunnels between gateways.
- EpEp Issues — Issues that affect tunnels between endpoints.

Retrieve the list of VPN topology validation issues with this request:

```
GET http://localhost:8082/6.11/elements/vpn/5/validate
```

This request returns a 200 HTTP status response code and this result:

```
{
"value":"VPN Topology validation detects some warnings/errors for VPN 5, please check it:
GwGw Issues:
  - 66<->67
    -- WARNING: The Gateway Riyadh VPN Gateway is a hub in the Overall Topology, but has no Site in
 Hub mode in this VPN.
  - 65<->67
    -- WARNING: The Gateway Tunis VPN Gateway is a hub in the Overall Topology, but has no Site in
 Hub mode in this VPN."
}
```

Saving a VPN topology

When you finish changing a VPN topology, save the VPN topology.

Note

Saving a VPN topology is resource-intensive. Avoid excessive save operations.

To save the VPN topology, use this request:

```
POST http://localhost:8082/6.11/elements/vpn/5/save
```

This request returns a 200 HTTP status response code.

Closing a VPN topology

When you finish working with a VPN topology, close the VPN topology.

CAUTION

Closing the VPN topology without saving the VPN topology discards the changes.

To close the VPN topology, use this request:

```
POST http://localhost:8082/6.11/elements/vpn/5/close
```

This request returns a 200 HTTP status response code.

Filtering searches by group type

It is possible to filter searches by group type.

These search context groups are currently available:

- **Network_elements** — Search for all Network elements. Network elements are used in the Source/Destination cells in the **Policy Editing** view.
- **Services** — Search for all services. Services are used in the Service cell in the **Policy Editing** view.
- **Services_and_applications** — Search for all Services and Applications. Services and Applications are used in the Service cell in the **Policy Editing** view.
- **Tags** — Search for all tags. Tags are used in the **Policy Editing** view for Inspection rules.
- **Situations** — Search for all Situations. Situations are used in the **Policy Editing** view for Inspection rules.

For example, the REST call could have the following content:

```
https://[server]:[port]/[version]/elements?
filter=NameOfElement&filter_context=ElementTypeOrSearchContextGroup
```

In this example, `ElementTypeOrSearchContextGroup` can be either the type of the element, like `host/address_range/…`, or `network_elements/services/ services_and_applications/tags/` situations. Lists of element types are also supported. For example, “host, router, network” can be used to filter the types to host, router, or network elements.

Retrieving routing/antispoofing information

You can retrieve static or dynamic routing information from an engine.

To retrieve the complete (static/dynamic) routing information from an engine, you can execute the following request:

```
GET /[version]/elements/[cluster_type]/[cluster_key]/routing/[routing_key]
```

To retrieve antispoofing information, you can execute the following request:

```
GET /[version]/elements/[cluster_type]/[cluster_key]/antispoofing/[ antispoofing _key]
```

For example, for the Helsinki Firewall Cluster, you would have the following:

```
"link":
    [
    …
    {
    "href": "http://localhost:8082/6.11/elements/fw_cluster/1563/routing/887",
    "rel": "routing",
    "type": "routing"
    },
    {
    "href": "http://localhost:8082/6.11/elements/fw_cluster/1563/antispoofing/990",
    "rel": "antispoofing",
    "type": "antispoofing"
    },
    …
],
```

To access the routing information, you must use the routing link:

```
GET http://localhost:8082/6.11/elements/fw_cluster/1563/routing/887
```

The routing link returns a 200 HTTP response status code and the following:

```
{
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563",
"ip": "10.8.0.21",
"key": 887,
"level": "engine_cluster",
"link":
[
{
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563/routing/887",
"rel": "self",
"type": "routing"
}
],
"name": "Helsinki FW",
"read_only": false,
"routing_node":
[
{
"exclude_from_ip_counting": false,
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563/physical_interface/276",
"key": 888,
"level": "interface",
"name": "Interface 0",
"nic_id": "0",
"read_only": false,
"routing_node":
[
```

To access the antispoofing information, you must use the antispoofing link:

`GET http://localhost:8082/6.11/elements/fw_cluster/1563/antispoofing/990`

The antispoofing link returns a 200 HTTP response status code and the following:

```
…
"auto_generated": "true",
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563/tunnel_interface/343",
"key": 1333,
"level": "interface",
"name": "Tunnel Interface 1002",
"nic_id": "1002",
"read_only": false,
"system": false,
"validity": "enable"
}
],
"auto_generated": "true",
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563",
"ip": "10.8.0.21",
"key": 990,
"level": "engine_cluster",
"link":
[
{
"href": "http://localhost:8082/6.11/elements/fw_cluster/1563/antispoofing/990",
"rel": "self",
"type": "antispoofing"
}
],
"name": "Helsinki FW",
"read_only": false,
"system": false,
"valid"
}
```

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