Avaya Session Border Controller

API Quick Start Guide

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Licensee shall comply with all applicable laws and regulations, including without limitation those applicable to data privacy, intellectual property, trade secret, and fraud. Licensee is advised that the Technical Information is of U.S. origin and subject to the U.S. Export Administration Regulations ("EAR") and may be subject to applicable local country import/export laws and regulations. Diversion contrary to U.S. and/or applicable local country law and/or regulation is prohibited. Licensee agrees not to directly or indirectly export, re-export, import, download, or transmit the Technical Information to any country, end user or for any use that is contrary to applicable U.S. and/or local country regulation or statute (including but not limited to those countries embargoed by the U.S. government). Licensee represents that any governmental agency has not issued sanctions against Licensee or otherwise suspended, revoked or denied Licensee's import/export privileges. Licensee agrees not to use or transfer the Technical Information for any use relating to nuclear, chemical or biological weapons, or missile technology, unless authorized by the U.S. and/or any applicable local government by regulation or specific written license. Additionally, Licensee is advised that the Technical Information may contain encryption algorithm or source code that may not be exported to government or military end users without a license issued by the U.S. Bureau of Industry and Security and any other country's governmental agencies, where applicable.

13.0 WAIVER.

The failure to assert any rights under this Agreement, including, but not limited to, the right to terminate in the event of breach or default, will not be deemed to constitute a waiver of the right to enforce each and every provision of this Agreement in accordance with their terms.

14.0 SEVERABILITY.

If any provision of this Agreement is determined to be unenforceable or invalid, this Agreement will not be rendered unenforceable or invalid as a whole, and the provision will be changed and interpreted so as to best accomplish the objectives of the original provision within the limits of applicable law.

15.0 GOVERNING LAW AND DISPUTE RESOLUTION.

15.1 Governing Law. This Agreement and any dispute, claim or controversy arising out of or relating to this Agreement ("Dispute"), including without limitation the formation, interpretation, breach or termination of this Agreement, or any issue regarding whether a Dispute is subject to arbitration under this Agreement, will be governed by New York State laws, excluding conflict of law principles, and the United Nations Convention on Contracts for the International Sale of Goods.

15.2 Dispute Resolution. Any Dispute will be resolved in accordance with the provisions of this Section 15. The disputing party shall give the other party written notice of the Dispute in accordance with the notice provision of this Agreement. The parties will attempt in good faith to resolve each controversy or claim within 30 days, or such other longer period as the parties may mutually agree, following the delivery of such notice, by negotiations between designated representatives of the parties who have dispute resolution authority.

15.3 Arbitration of Non-US Disputes. If a Dispute that arose anywhere other than in the United States or is based upon an alleged breach committed anywhere other than in the United States cannot be settled under the procedures and within the timeframe set forth in Section 15.2, it will be conclusively determined upon request of either party by a final and binding arbitration proceeding to be held in accordance with the Rules of Arbitration of the International Chamber of Commerce by a single arbitrator appointed by the parties or (failing agreement) by an arbitrator appointed by the President of the International Chamber of Commerce (from time to time), except that if the aggregate claims, cross claims and counterclaims by any one party against the other party exceed One Million US Dollars at the time all claims, including cross claims and counterclaims are filed, the proceeding will be held in accordance with the Rules of Arbitration of the International Chamber of Commerce by a panel of three arbitrator(s) appointed in accordance with the Rules of Arbitration of the International Chamber of Commerce. The arbitration will be conducted in the English language, at a location agreed by the parties or (failing agreement) ordered by the arbitrator(s). The arbitrator(s) will have authority only to award compensatory damages within the scope of the limitations of Section 8 and will not award punitive or exemplary damages. The arbitrator(s) will not have the authority to limit, expand or otherwise modify the terms of this Agreement. The ruling by the arbitrator(s)) will be final and binding on the parties and may be entered in any court having jurisdiction over the parties or any of their assets. The parties will evenly split the cost of the arbitrator(s)' fees, but Avaya and Customer will each bear its own attorneys' fees and other costs associated with the arbitration. The parties, their representatives, other participants and the arbitrator(s) will hold the existence, content and results of the arbitration in strict confidence to the fullest extent permitted by law. Any disclosure of the existence, content and results of the arbitration will be as limited and narrowed as required to comply with the applicable law. By way of illustration, if the applicable law mandates the disclosure of the monetary amount of an arbitration award only, the underlying opinion or rationale for that award may not be disclosed.

15.4 Choice of Forum for US Disputes. If a Dispute by one party against the other that arose in the United States or is based upon an alleged breach committed in the United States cannot be settled under the procedures and within the timeframe set forth in Section 15.2, then either party may bring an action or proceeding solely in either the Supreme Court of the State of New York, New York County, or the United States District Court for the Southern District of New York. Except as otherwise stated in Section 15.3 each party consents to the exclusive jurisdiction of those courts, including their appellate courts, for the purpose of all actions and proceedings arising out of or relating to this Agreement.

15.5 Injunctive Relief. Nothing in this Agreement will be construed to preclude either party from seeking provisional remedies, including, but not limited to, temporary restraining orders and preliminary injunctions from any court of competent jurisdiction in order to protect its rights, including its rights pending arbitration, at any time. The parties agree that the arbitration provision in Section 15.3 may be enforced by injunction or other equitable order, and no bond or security of any kind will be required with respect to any such injunction or order.

15.6 Time Limit. Actions on Disputes between the parties must be brought in accordance with this Section within 2 years after the cause of action arises.

16.0 AGREEMENT IN ENGLISH.

The parties confirm that it is their wish that the Agreement, as well as all other documents relating hereto, including all notices, have been and shall be drawn up in the English language only. Les parties aux présentes confirment leur volonté que cette convention, de même que tous les documents, y compris tout avis, qui s'y rattachent, soient rédigés en langue anglaise.

17.0 ENTIRE AGREEMENT.

This Agreement, its exhibits, schedules and other agreements or documents referenced herein, constitute the full and complete understanding and agreement between the parties and supersede all contemporaneous and prior understandings, agreements and representations relating to the subject matter hereof. No modifications, alterations or amendments shall be effective unless in writing signed by both parties to this Agreement.

18. REDISTRIBUTABLE CLIENT FILES.

The list of SDK client files that can be redistributed, if any, are in the SDK in a file called Redistributable.txt.

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Overview

In Avaya Session Border Controller Release 8.1.0.0, a new feature called the Configuration API was added to allow users to programmatically configure an SBC after it has been commissioned. The initial release targeted trunk specific APIs and was limited in scope and usefulness. This feature has been expanded in Avaya Session Border Controller Release 8.1.2.0 to support nearly every aspect of configuration of an SBC, and future releases plan to increase that scope as well as support additional aspects such as update, installation, and reporting.

This document contains information on how to get started with the Configuration API in Avaya Session Border Controller Release 10.2.0.0. This document assumes the reader has a working understanding of how to interact with HTTP servers and is already familiar with how to configure an SBC device and is looking to automate configuration after commissioning an SBC device. For more information on how to configure an SBC, refer to the *Administering Avaya Session Border Controller* document available on the Avaya Support site. For a refresher on the HTTP protocol, Mozilla has an excellent wiki covering the topic.

What's Included

The following items are included in this API Development Kit (**`10.2.0.0 GA API Development Kit.zip`**):

OpenAPI Definition Files & Documentation

`API Schema/authentication.yml`

This file is a schema definition containing all of the authentication endpoints currently supported by the ASBC platform. This file can be used to generate API client code using a tool like OpenAPI Generator.

`API Schema/authentication.json`

This file is a JSON equivalent of **`API Schema/authentication.yml`**. Some tools may not accept a YAML schema file, so both formats are provided for convenience.

`API Schema/authentication.html`

This file is an HTML representation of **`API Schema/authentication.yml`** for easy reference.

`API Schema/configuration.yml`

This file is a schema definition containing all of the configuration endpoints currently supported by the ASBC platform. This file can be used to generate API client code using a tool like OpenAPI Generator.

`API Schema/configuration.json`

This file is a JSON equivalent of **`API Schema/configuration.yml`**. Some tools may not accept a YAML schema file, so both formats are provided for convenience.

`API Schema/configuration.html`

This file is an HTML representation of **`API Schema/configuration.yml`** for easy reference.

`API Schema/monitoring.yml`

This file is a schema definition containing all of the configuration endpoints currently supported by the ASBC platform. This file can be used to generate API client code using a tool like OpenAPI Generator.

`API Schema/monitoring.json`

This file is a JSON equivalent of **`API Schema/monitoring.yml`**. Some tools may not accept a YAML schema file, so both formats are provided for convenience.

`API Schema/monitoring.html`

This file is an HTML representation of **`API Schema/monitoring.yml`** for easy reference.

Sample Configuration Scripts

See **`Sample Configuration Scripts/README.txt`** for more information.

Changelog

Release 10.2.0.0

- Added Monitoring API introduced in 10.2.0.0, which supports Packet Capture and the newly added System Information feature.
- Added documentation for features introduced in 10.2.0.0, including TCP/TLS connection re-use, SIP conferencing URI configuration, and additional SNI configuration.
- Added alt text to all images in this document to improve accessibility.

Release 10.1.2.0

- The attached schema files now follow the OpenAPI 3.1.0 specification.
- Fixed incorrect API definitions in Signaling Interface, Media Interface, URI Group, and TLS Client Profile.
- Added missing fields to SIP Server Address and Media Rule Advanced definitions.
- Added missing documentation for Feature Control API endpoint.
- Fixed typos in various descriptions.
- Added documentation for HTTP version added to Reverse Proxy Profiles added in 10.1.2.0.

Release 10.1.0.0

- Added some missing fields to endpoint policy group APIs and added defaults.
- Added documentation for IP Blocklist functionality added in 10.1.0.0.
- Added documentation for enhanced network management APIs updated in 10.1.0.0.

Release 8.1.3.0

- Corrected inaccuracies in existing API endpoint documentation.
- Added documentation for H.248 API for functionality added in 8.1.3.0.

Release 8.1.2.0

- Initial public release.
- Added documentation for API endpoints covering most existing configuration functionality added in 8.1.2.0.
- Removed bundled api-user.py/api-roles.py scripts as they have been integrated into the SBC platform.

Release 8.1.0.0 / 8.1.1.0

- Initial internal release.
- Added documentation for subset of APIs related to SIP trunk creation.

API Quick Start

Getting Started

The following items are required for developing using the SBC API:

- A text editor, IDE, HTTP client, and/or programming environment
- An SBC in the `COMMISSIONED` state
- (Optional) Client code generated using the provided schema files

Access & Permissions

The SBC API allows a more fine-grained level of access control compared to the SBC GUI. Each SBC API endpoint requires a specific capability (i.e. – permission) to be set for a given user before a request can be made against an endpoint by that user.

Capabilities Primer

A capability can be broken down in up to 6 components:

- *(Optional)* Prefix
- Target
- *(Optional)* Endpoint
- *(Optional)* Action
- *(Optional)* Identifier
- *(Optional)* Sub-Identifier

> **Note:**
>
> The SBC API currently only utilizes 2 components – the target and the action.

This can be represented textually in the following format:

```
[[prefix[#]]#]target-name[@endpoint][:action[:identifier[:sub-identifier]]]
```

The *target* component is the primary component that is used to specify a given API. For example, the Certificates endpoint uses the capability name certificate, so a user would need to be granted the `certificate` capability.

The *action* component is a granularity specifier to further refine access. By default, no action implies that a user or role can perform all actions within a given capability. If an action is specified on a user or role, then that user can only perform that given action. For example, the ability to read a specific certificate requires the `certificate:read` capability, so a user would need to be granted the `certificate` (implicitly allows all actions) or `certificate:read` capability.

The other components will further expand the granularity of how data can be accessed, but they are not supported as of this release.

(Optional) Create a Role

A role may be created to help organize capabilities (permissions) for multiple users with similar capability requirements. Roles are completely optional as capabilities can be directly assigned to users.

Note:

A role must contain at least one capability. A special capability called `#all` will allow access to all endpoints. More information about available capabilities can be found in the Configuration API schema and related documentation.

To list existing roles, run the following command:

```
/usr/local/ipcs/peon/tools/api-role.py list
```

To view information about an existing role, run the following command:

```
/usr/local/ipcs/peon/tools/api-role.py info <role-name>
```

To add a new API role, run the following command:

```
/usr/local/ipcs/peon/tools/api-role.py add <role-name> --allow-
capability <capability name>
```

Note:

Multiple capabilities can be added by specifying the --allow-capability flag and value multiple times.

This also applies to the edit command with the --add-allowed-capability flag.

To edit an existing API role, run the following command:

```
/usr/local/ipcs/peon/tools/api-role.py edit <role-name> --add-allowed-capability <capability-name>
```

To delete an existing API role, run the following command:

```
/usr/local/ipcs/peon/tools/api-role.py delete <role-name>
```

More information about this script, including additional parameters that can be specified, can be found by running:

```
/usr/local/ipcs/peon/tools/api-role.py --help
```

Create a User

A new user MUST BE created in order to utilize the SBC API, as no default users are provided.

Note:

Do not use the internal SBC users as they are dynamically generated, can change at any time, and will have full access to all APIs without any restrictions.

A user must have a role or contain at least one capability. A special capability called `#all` will allow access to all endpoints. More information about available capabilities can be found in the Configuration API schema and related documentation.

To add a new API user, run the following command:

```
/usr/local/ipcs/peon/tools/api-user.py add <username> --password <password> --role-name <role-name>
```

To edit a new API user, run the following command:

```
/usr/local/ipcs/peon/tools/api-user.py edit <username> --new-password
<password> --new-role-name <role-name>
```

To delete a new API user, run the following command:

```
/usr/local/ipcs/peon/tools/api-user.py delete <username>
```

To list existing users, run the following command:

```
/usr/local/ipcs/peon/tools/api-user.py list
```

To view information about an existing user, run the following command:

```
/usr/local/ipcs/peon/tools/api-user.py info <username>
```

More information about this script, including additional parameters that can be specified, can be found by running:

```
/usr/local/ipcs/peon/tools/api-user.py --help
```

Toggling the API

By default, the SBC API is enabled on the SBC during installation (as of 8.1.2.0). If the API is not enabled on a specific SBC system, the following command can be executed to enable the API:

Note:

All commands in this section must be run as root.

```
/usr/local/ipcs/web/scripts/deploy.py --api --enable
```

In some cases, it may be desirable to disable the API, especially on low-end EMS+SBC combination systems where resource constraints may be very tight. The API can be disabled with the following command:

```
/usr/local/ipcs/web/scripts/deploy.py --api --disable
```

If the API is running on a separate SBC (not a combination EMS+SBC “SingleBox” configuration), then the Tomcat service should also be stopped. Tomcat can be stopped on the SBC using the following command:

```
service ipcs-ems stop
```

Utilizing the API

Issuing API requests to the ASBC API will happen in two parts – authentication and invocation. The authentication phase will issue a token which will be used for subsequent invocation phases until the token expires. API requests should be issued to the SBC’s M1 management interface.

The following sections contain information on how to make requests to the authentication API as well as the configuration API. Examples are provided as pure HTTP requests as well as cURL commands (these commands can be executed on the SBC itself).

Authentication

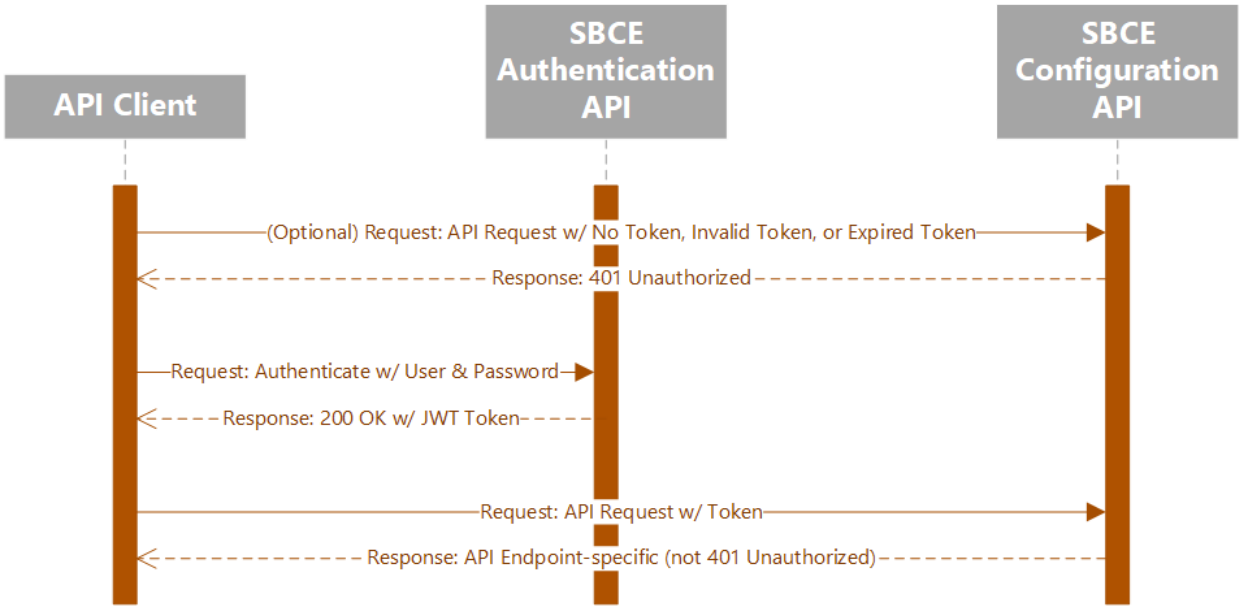

Figure 1 - Successful API Invocation

The authentication request can be visualized as the following:

```
POST https://{SBC-M1-Address}/api/auth/v1/token
Accept: application/json
Authorization: Basic {Base64-Encoded-Username-Password}
```

To execute this request with cURL:

```
curl -k https://{SBC-M1-Address}/api/auth/v1/token -u {SBC-API-
Username}:{SBC-API-Password} -d {}
```

A response would look like the following:

```
HTTP/1.1 200 OK
Date: Mon, 27 Jan 2020 18:30:08 GMT
Content-Type: application/json
Content-Length: 1092
Connection: keep-alive

"API-Token-Encoded-as-JSON-String"
```

In the response, the API token is encoded as a JSON string in the response body. This token must be used when submitting requests to the API or the API endpoint will reject the request with `401 Unauthorized`. The issued token will be valid for 5 minutes and any requests submitted with an invalid or expired token will return `401 Unauthorized`. If a given token does not have access to a particular API endpoint (e.g. – lacking the proper capability) then `403 Forbidden` will be returned.

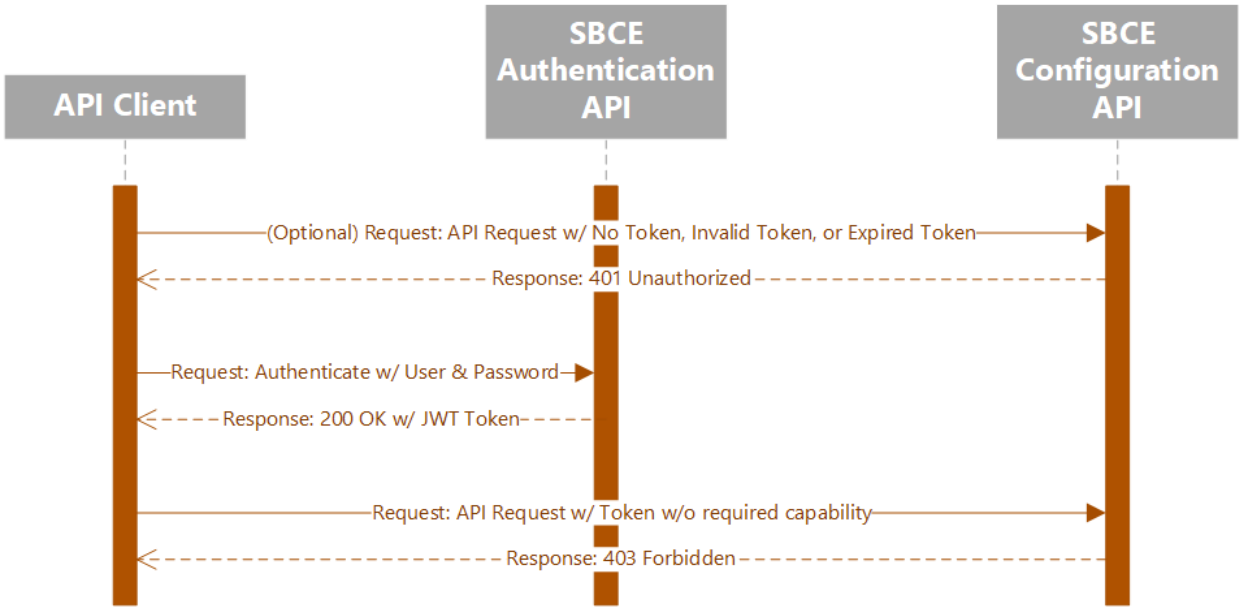

Figure 2 - Failed API Invocation

Invocation

Once a valid token has been obtained, a request may be made by calling the API endpoint with the appropriate method and URL as defined in the provided API definition file. The token must be provided in the HTTP request in the Authorization header with `Bearer` as the prefix.

An example request to list all installed certificates might look like this (the API token has been highlighted in **bold**):

```
GET https://{SBC-M1-Address}/api/config/v1/certificates
Authorization: Bearer {Token-Without-Quotes}
Accept: application/json
```

To execute this request with cURL:

```
curl -k https://{SBC-M1-Address}/api/config/v1/certificates -H
"Authorization: Bearer {Token-Without-Quotes}"
```

The corresponding response would look like this:

```
HTTP/1.1 200
```

```
Date: Mon, 27 Jan 2020 18:50:15 GMT
Content-Type: application/json
Transfer-Encoding: chunked
Connection: keep-alive
Vary: Origin
Vary: Access-Control-Request-Method
Vary: Access-Control-Request-Headers
X-Content-Type-Options: nosniff
X-XSS-Protection: 1; mode=block
Cache-Control: no-cache, no-store, max-age=0, must-revalidate
Pragma: no-cache
Expires: 0
Strict-Transport-Security: max-age=31536000 ; includeSubDomains
X-Frame-Options: DENY

{
  "cert": [],
  "ca": [
    "AvayaDeviceEnrollmentCAchain.crt"
  ],
  "crl": [],
  "csr": [],
  "key": []
}
```

Further Reading

For a full list of API endpoints, refer to the HTML documentation and API schema definitions included in the API Schema folder. The provided schema definitions define the API and available endpoints in its entirety and can optionally be used to generate client code to quickly get started with interacting with the API.

The schema definitions are written in accordance with the OpenAPI 3.1 specification and can be utilized with any tool that can support that specific specification and version. An example tool is the open-source project OpenAPI Generator which can be found on GitHub. This tool can be used to generate client code in over dozens of languages including C, C#, Java, JavaScript, Kotlin, Swift, and Python.