Event Broker Management

solace.

Module Objectives

- Understand the basics of Message-VPNs
- Understand Authentication & Authorizations for client apps
- Introduce the various management tools
- Get started with each tool and configure various options with them

Message-VPNs

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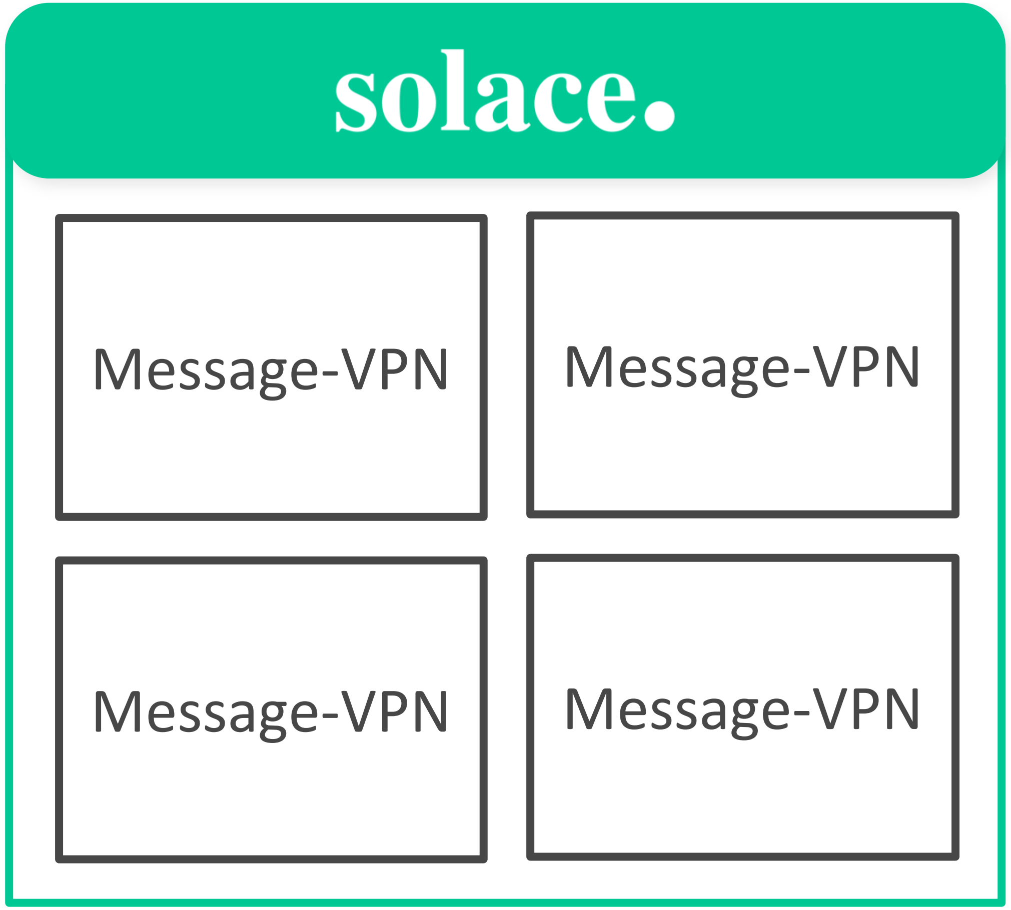
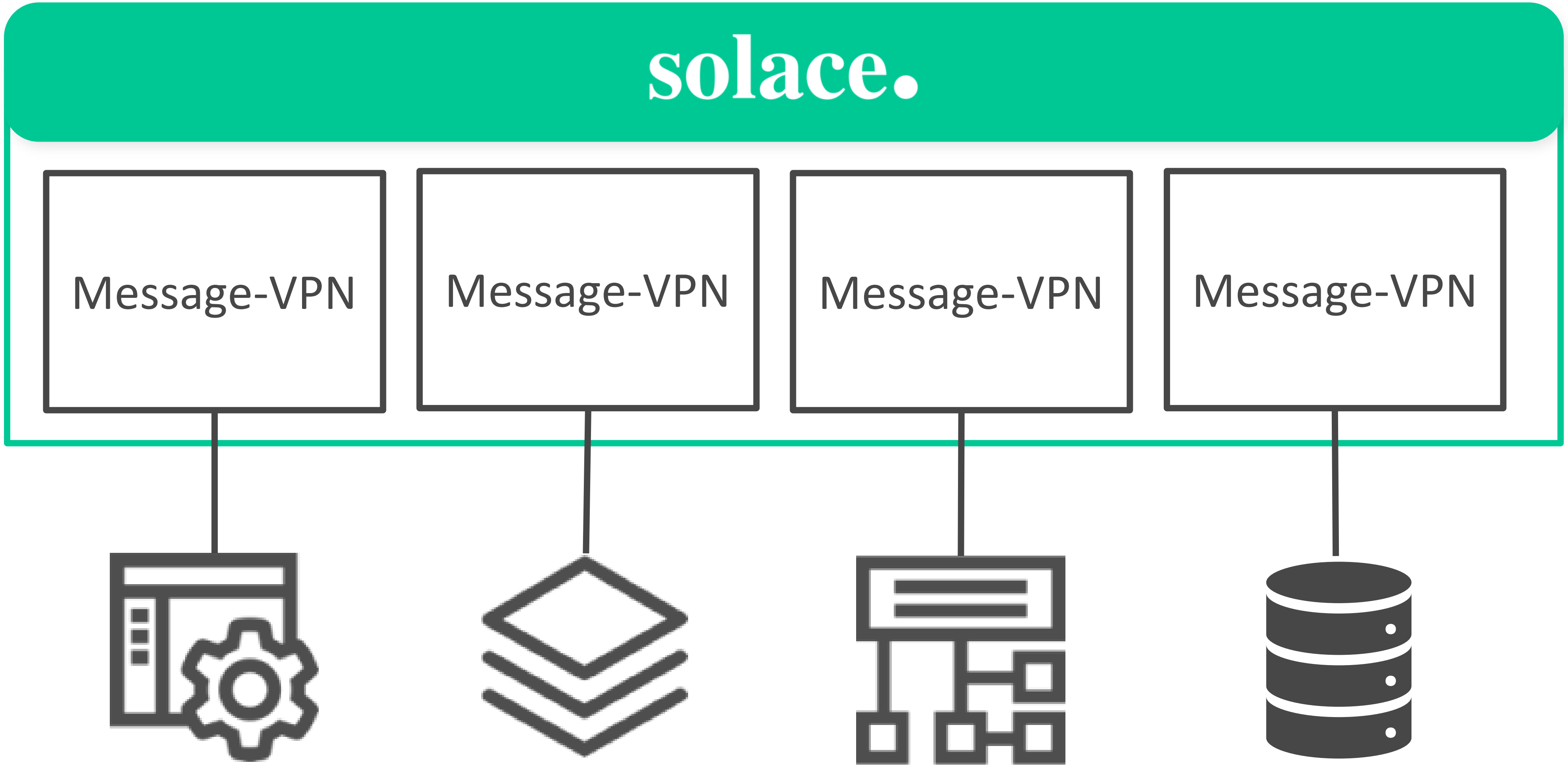
What is a Message-VPN?

- **Enables sharing of a single PubSub+ Event Broker**

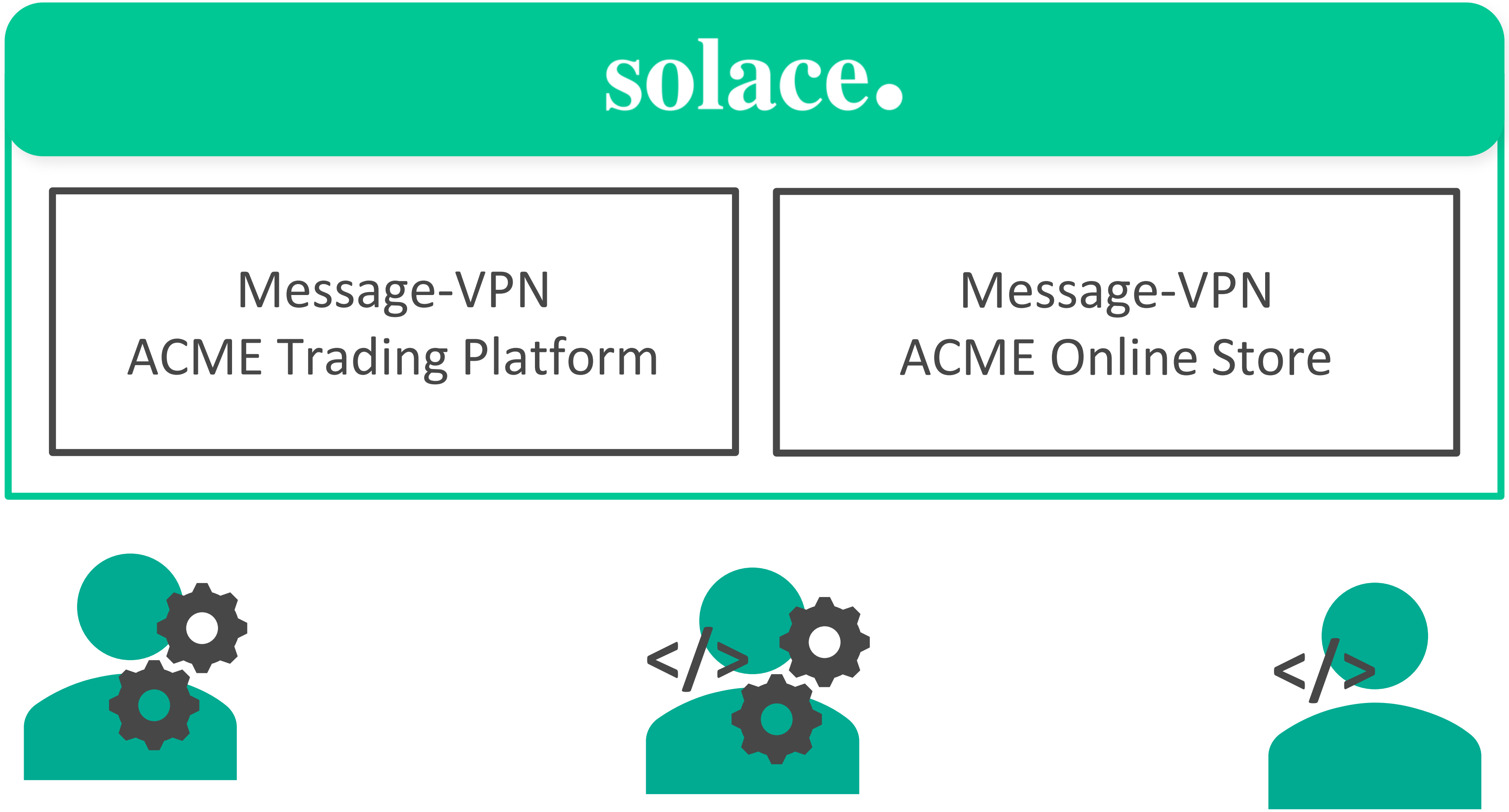
- **Message-VPNs allow for**
  - Messaging data separation
  - Resource partitioning



Messaging Applications



Example – ACME Applications



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Message-VPN
ACME Trading Platform

Message-VPN
ACME Online Store

Middleware Team

Application Support

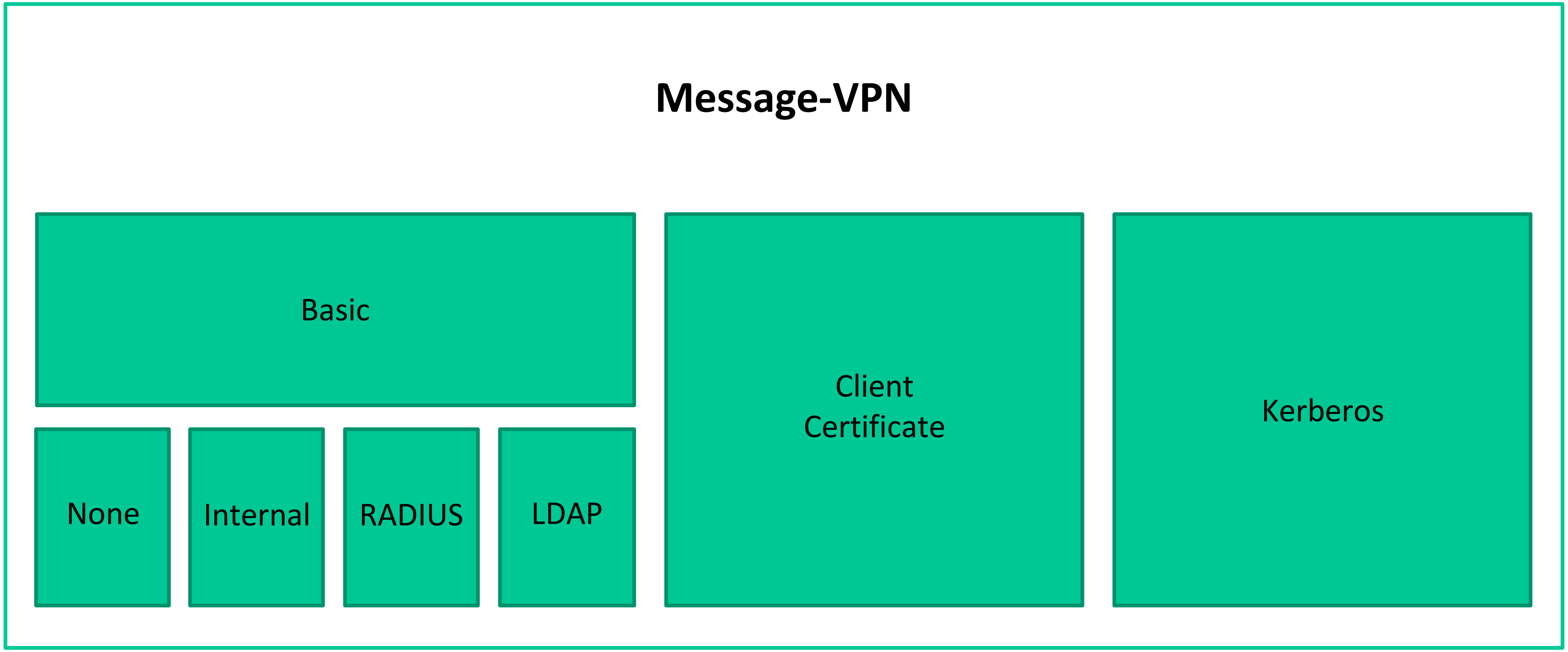
Application Developers

Example – Administrative User Access

	Global	acme_atp_dev	acme_aos_dev
Middleware Team	Admin	Read-write	Read-write
Application Support	Read-only	Read-write	Read-write
ACME Trading Platform Developers	None	Read-only	None
ACME Online Store Developers	None	None	Read-only

Client Authentication & Authorization

Client Authentication

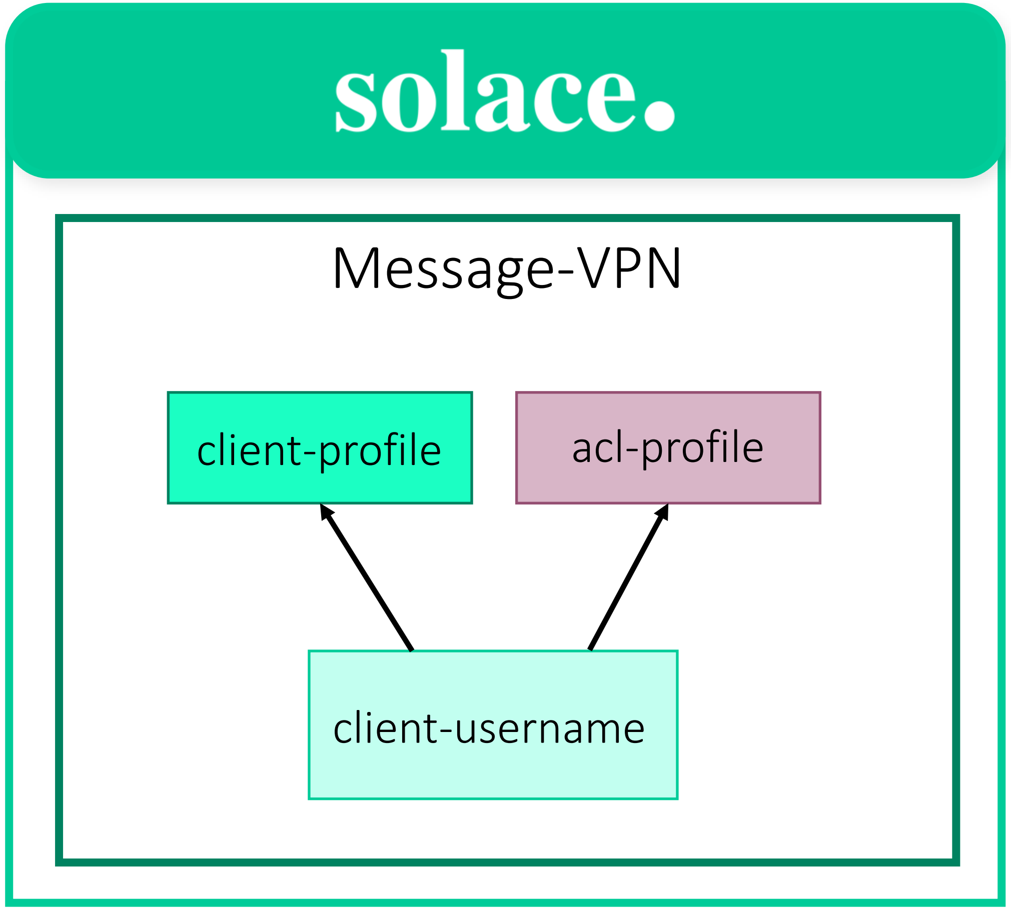


Basic Authentication

- **None**
  - Requires a username at login
- **Internal**
  - Requires a username and password at login
- **RADIUS**
  - Users are authenticated using provisioned RADIUS servers through the configured RADIUS profile name
- **LDAP**
  - Users are authenticated using provisioned LDAP servers through the configured LDAP profile name

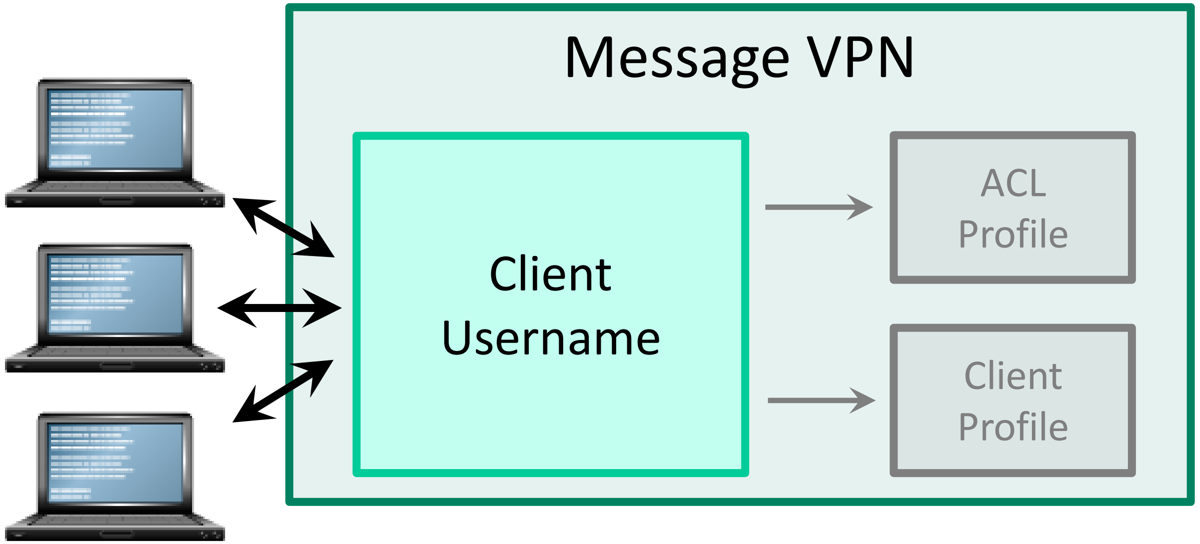
Client Object Model

- Message-VPN
- Client-username
- Client-profile
- ACL-profile



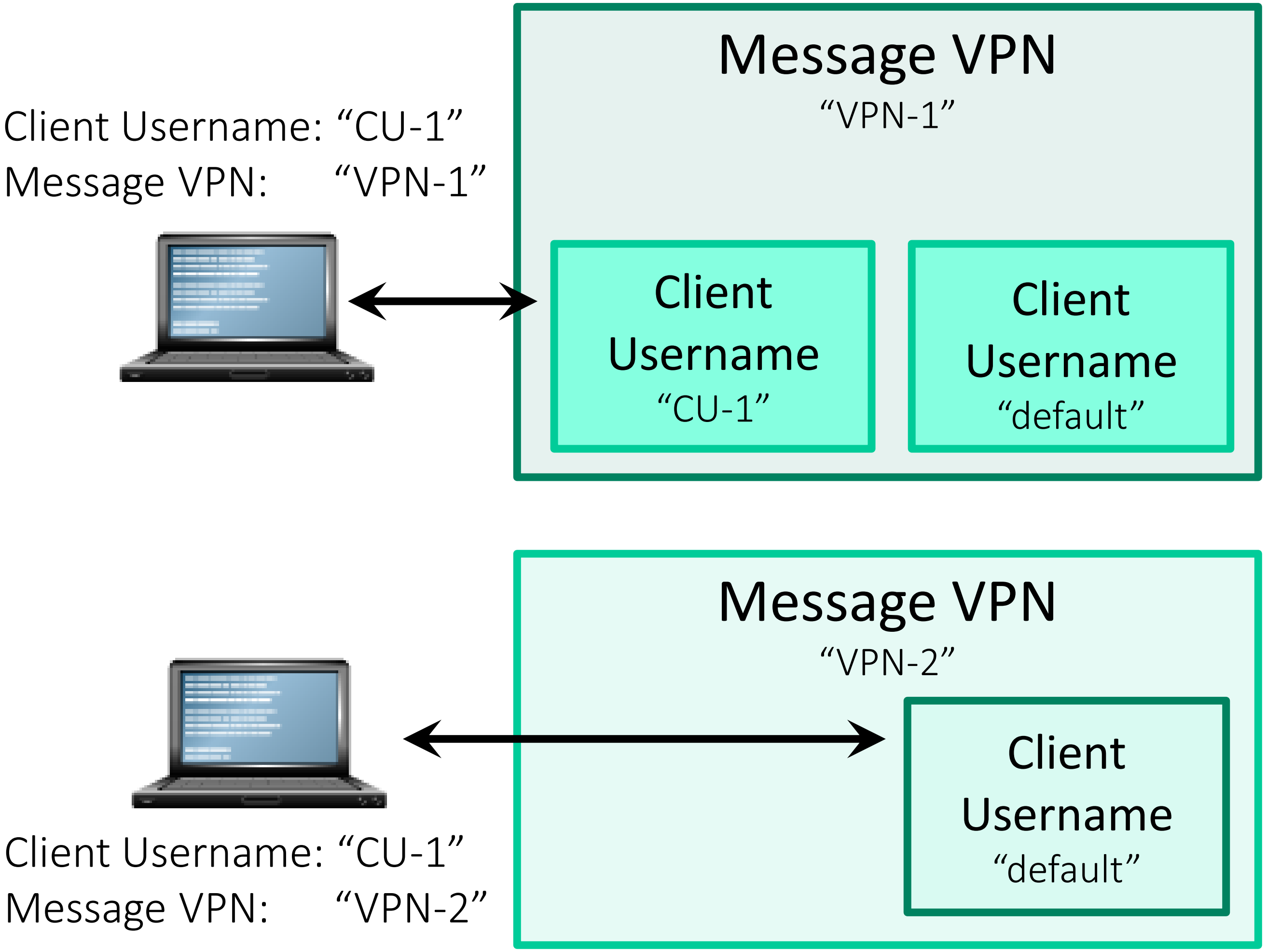
Client-Username

- **Message VPN specific**
- **Authenticate using Client Username**
- **Multiple connections**
- **Must be enabled**
  - Disabling causes disconnect
- **Associated with Profiles**



Client-Username: default

- **Every Message VPN**
  - Always exists
  - Cannot be deleted
- **Connecting Clients**
  - Non-existent Client Usernames
  - External Authentication
  - Enabled by default on Software Event Brokers
  - Development and testing



Client Username: “CU-1”
Message VPN: “VPN-1”

Message VPN
“VPN-1”

Client Username
“CU-1”

Client Username
“default”

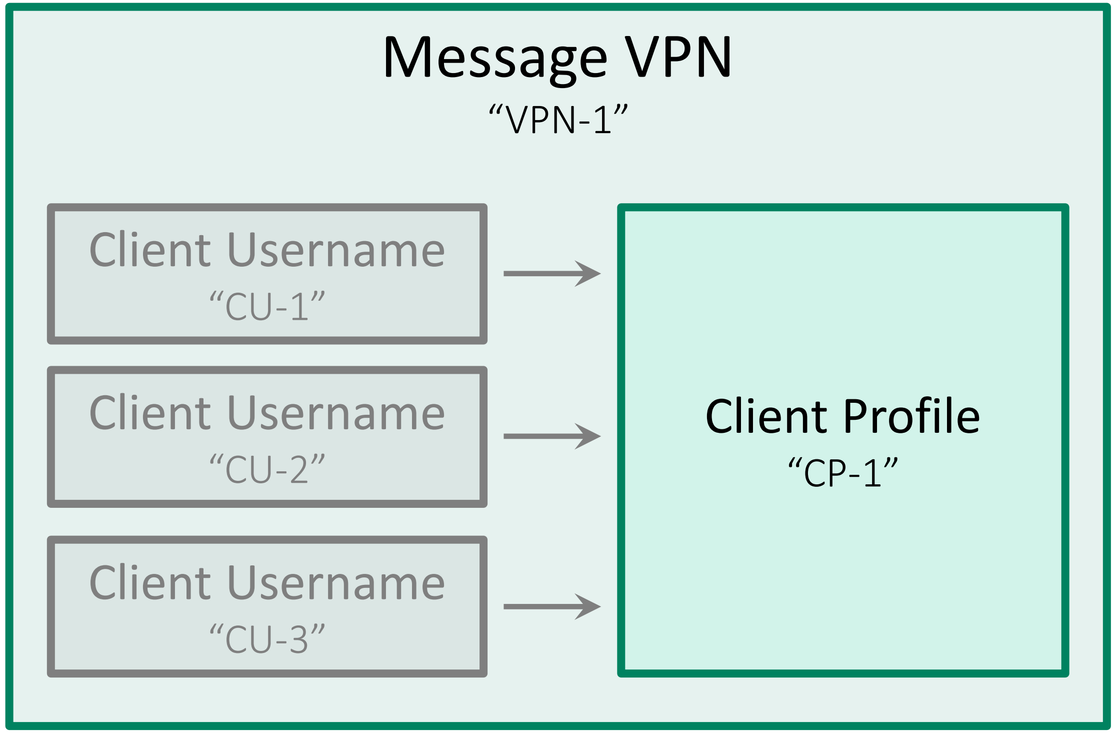
Message VPN
“VPN-2”

Client Username
“default”

Client Username: “CU-1”
Message VPN: “VPN-2”

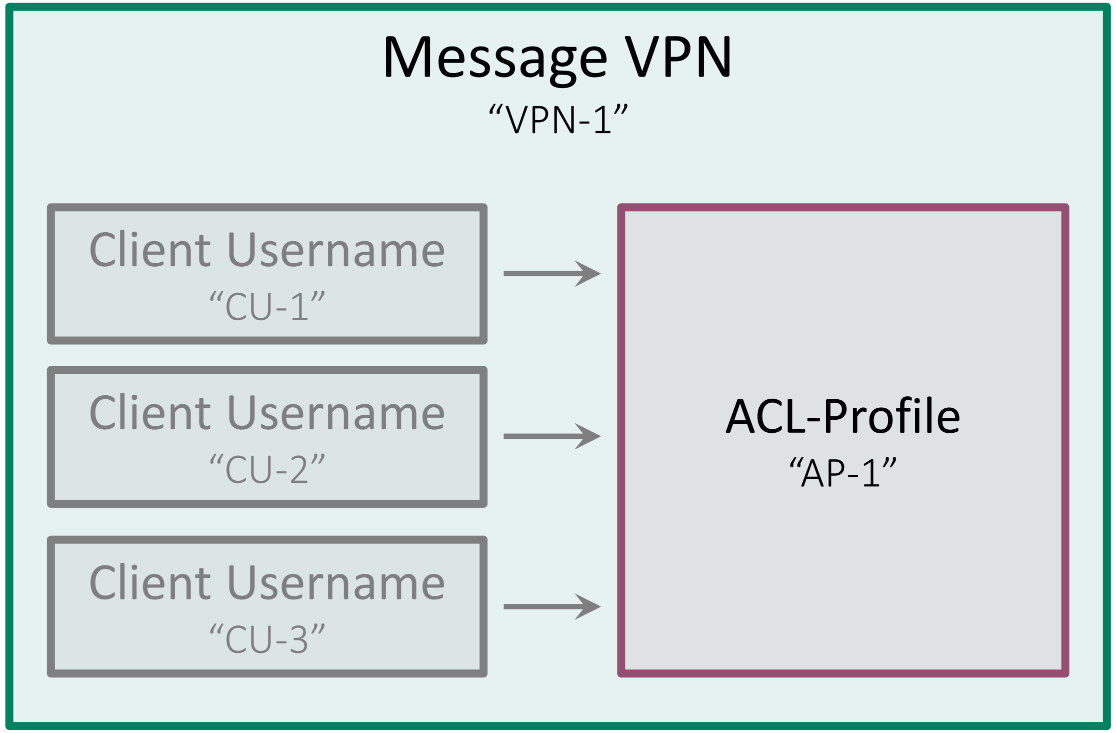
Client-Profile

- **Resource allocation**
  - Limit Client Usernames connections
  - Per-client transport queues
- **Client characteristics**
  - TCP connection tuning
  - Guaranteed messaging capabilities
    - Ability to send/receive guaranteed messages
    - Ability to create queue dynamically using the PubSub+ APIs
  - Event thresholds



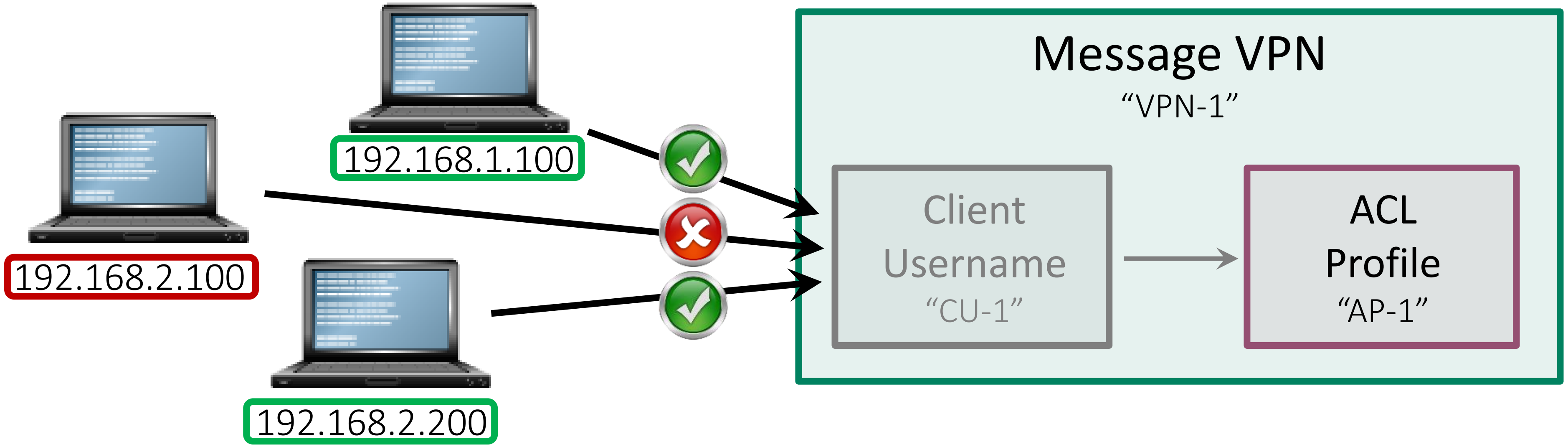
ACL-Profile

- **ACL Behavior**
  - Allow or restrict Client actions
- **ACL Controlled Actions**
  - Client Connect (Source IP address)
  - Publish Topics
  - Subscribe Topics
- **ACL Configuration**
  - Default behavior (allow / disallow)
  - Exception list



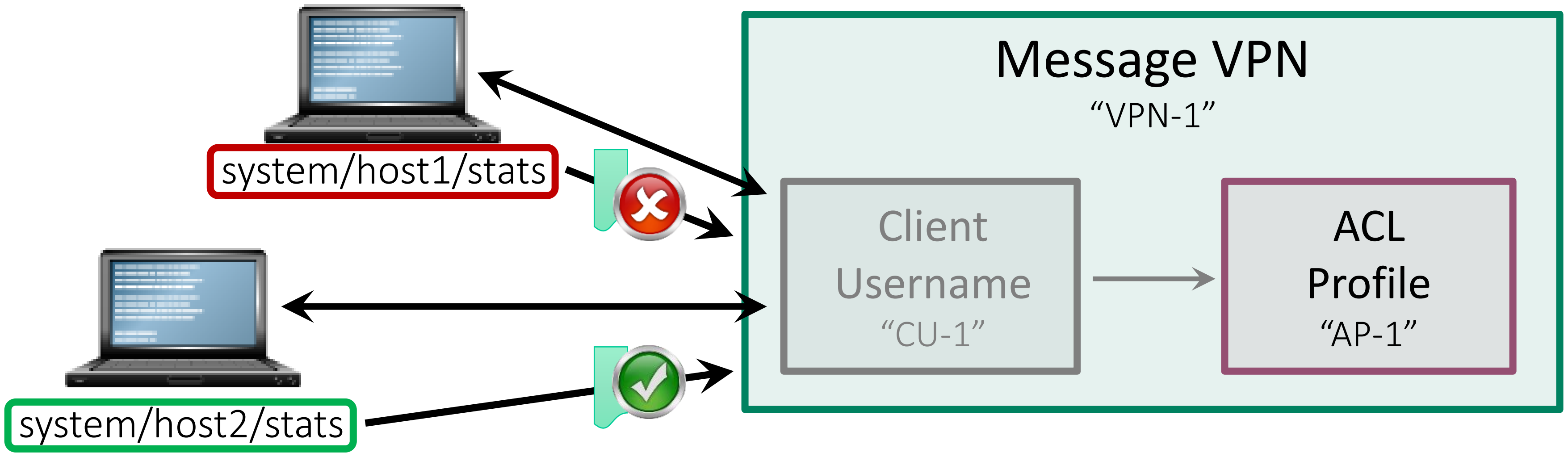
ACL-Profile Client Connect

```
solace> show acl-profile AP-1 message-vpn VPN-1 detail

Profile Name : AP-1
Vpn Name     : VPN-1
  Client Connect Default Action : disallow
    Exceptions : 2
    192.168.1.0/24
    192.168.2.200/32
...
solace>
```



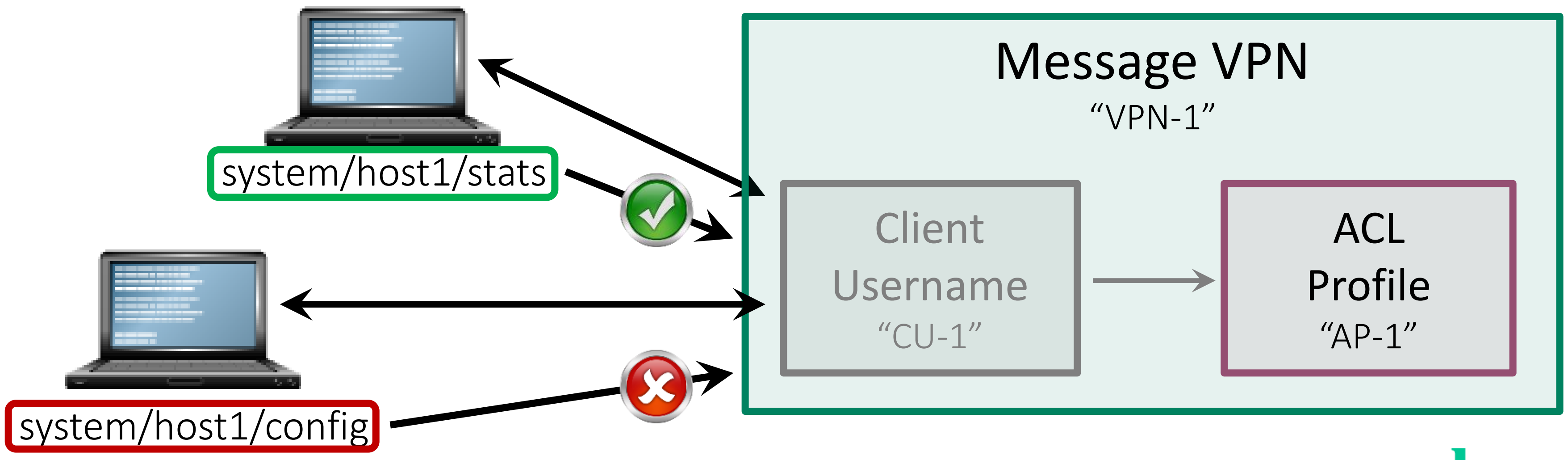
ACL-Profile Publish Topic

```
solace> show acl-profile AP-1 message-vpn VPN-1 detail

Profile Name : AP-1
Vpn Name     : VPN-1
...
 Publish Topic Default Action : allow
    Exceptions : 1
      system/host1/>
...
solace>
```



ACL-Profile Subscribe Topic

```
solace> show acl-profile AP-1 message-vpn VPN-1 detail

Profile Name : AP-1
Vpn Name     : VPN-1
...
 Subscribe Topic Default Action : disallow
    Exceptions : 1
      system/*/stats
...
solace>
```



Management Tools

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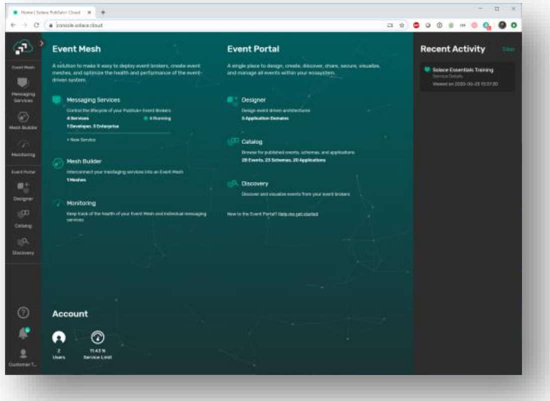
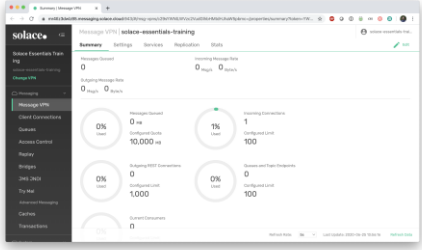
Tools to Manage PubSub+ Event Brokers

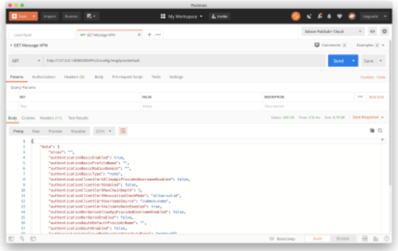
PubSub+ Cloud Console



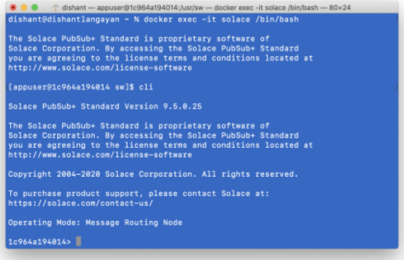
PubSub+ Manager



SEMP



CLI



```
dishant@dishantlangayan ~ % docker exec -it solace /bin/bash

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[appuser@1c964a194014 sw]$ cli

Solace PubSub+ Standard Version 9.5.0.25

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Operating Mode: Message Routing Node

1c964a194014>
```
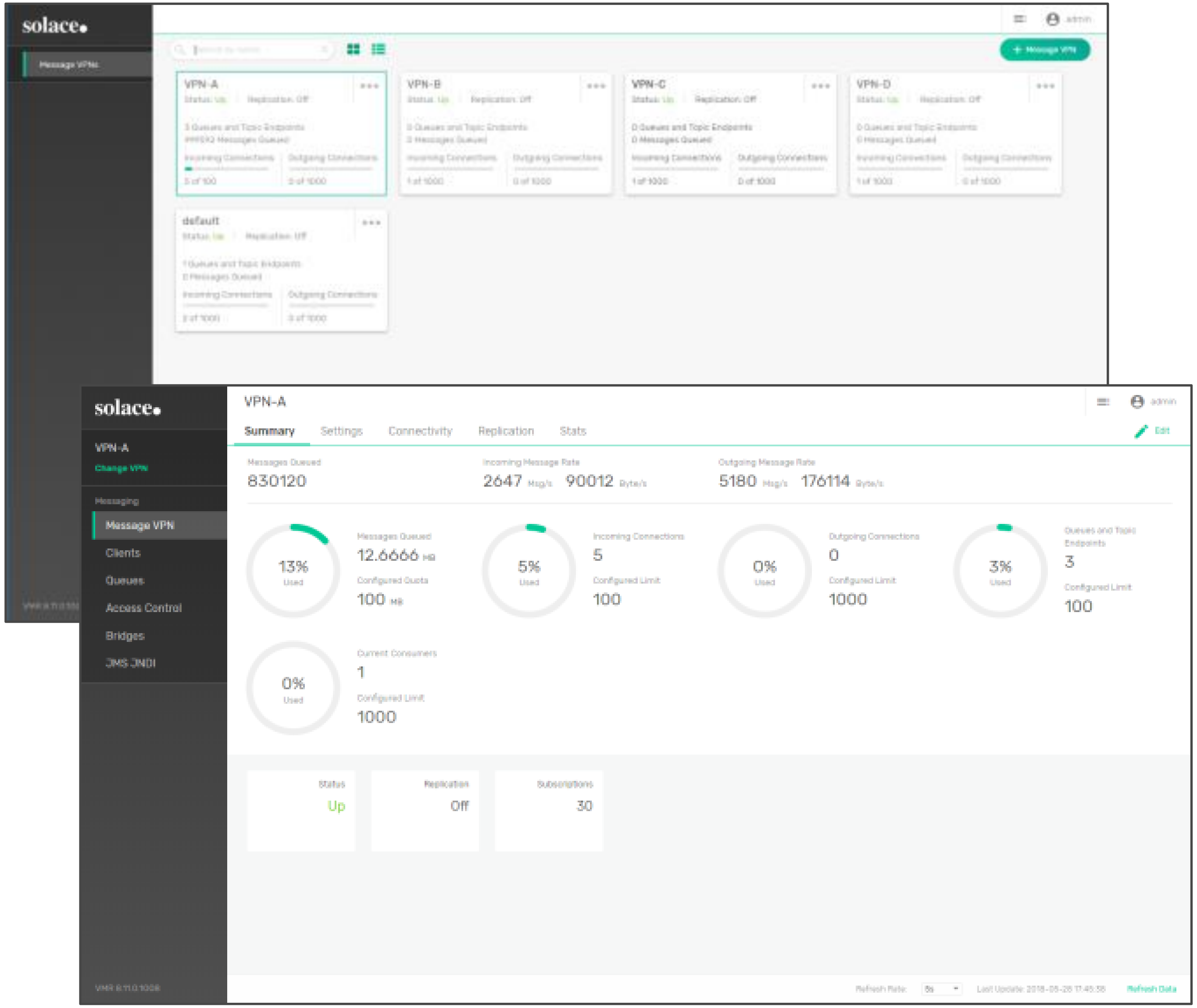

PubSub+ Manager Overview

- Browser-based admin console packaged with broker
- Next-gen UI for configuring, viewing, and troubleshooting brokers
- Intuitive and easy to use
- Integrated with PubSub+ Cloud
- Replaces SolAdmin
- Uses SEMPv2 APIs



VPN-A

Summary | Settings | Connectivity | Replication | Stats

Messages Queued: 830120

Incoming Message Rate: 2647 Msg/s 90012 Byte/s

Outgoing Message Rate: 5180 Msg/s 176114 Byte/s

13% Used — Messages Queued: 12.6666 MB; Configured Quota: 100 MB

5% Used — Incoming Connections: 5; Configured Limit: 100

0% Used — Outgoing Connections: 0; Configured Limit: 1000

3% Used — Queues and Topic Endpoints: 3; Configured Limit: 100

0% Used — Current Consumers: 1; Configured Limit: 1000

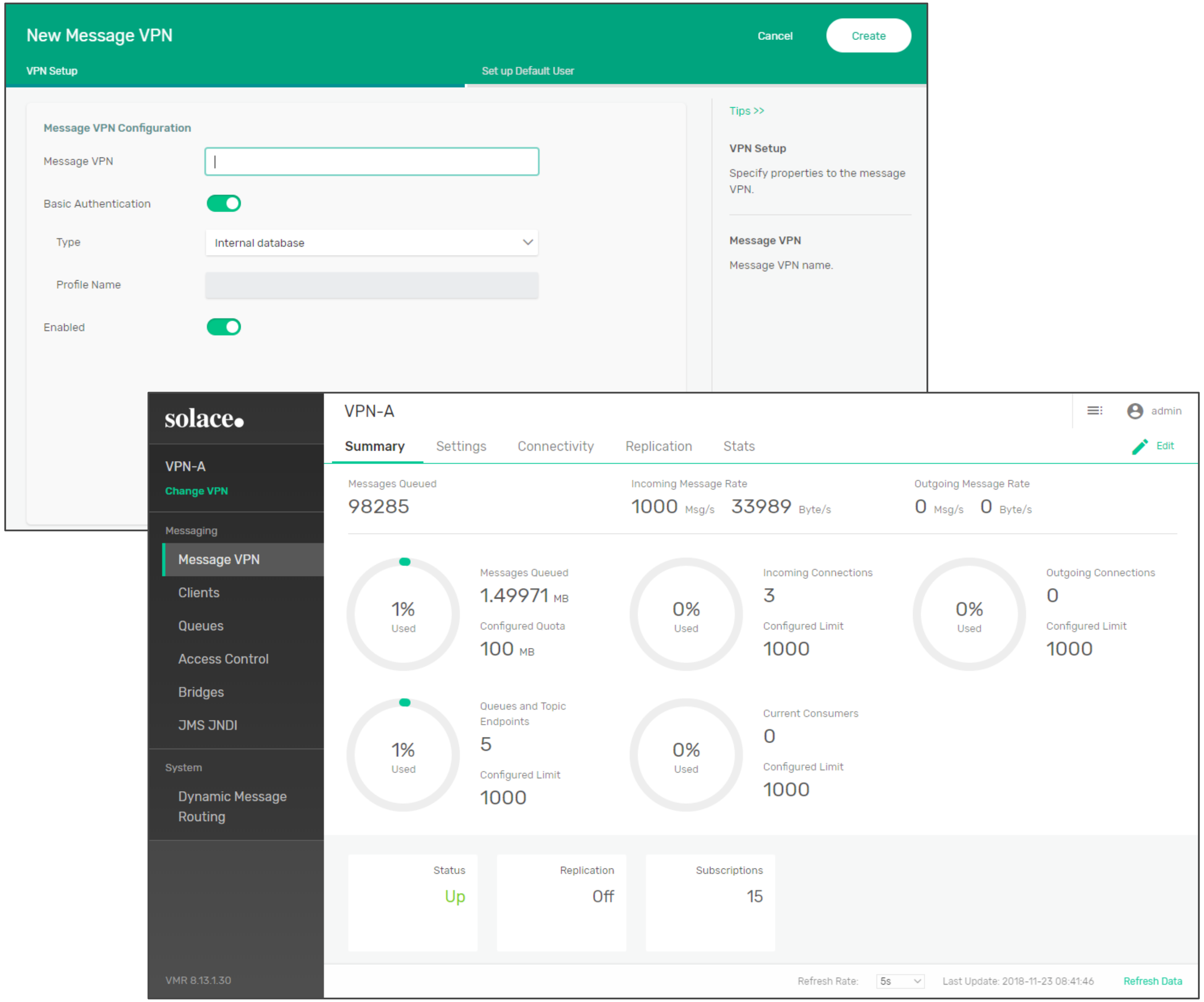
Status: Up

Replication: Off

Subscriptions: 30

PubSub+ Manager Key Features

- Configure Brokers for Horizontal Scaling
- Create Hybrid-Cloud Event Mesh
- Message VPN Management
- Queue Configuration and Stats
- Access Control Management
- Message Replay Management
- VPN Bridge Management w/ “Click to Connect” wizard
- JNDI Server Configuration



New Message VPN

Message VPN Configuration

Message VPN: |

Basic Authentication: ●

Type: Internal database

Profile Name:

Enabled: ●

Tips >>

VPN Setup

Specify properties to the message VPN.

Message VPN

Message VPN name.

Messages Queued 98285

Incoming Message Rate 1000 Msg/s 33989 Byte/s

Outgoing Message Rate 0 Msg/s 0 Byte/s

1% Used — Messages Queued 1.49971 MB; Configured Quota 100 MB

0% Used — Incoming Connections 3; Configured Limit 1000

0% Used — Outgoing Connections 0; Configured Limit 1000

1% Used — Queues and Topic Endpoints 5; Configured Limit 1000

0% Used — Current Consumers 0; Configured Limit 1000

Status: Up

Replication: Off

Subscriptions: 15

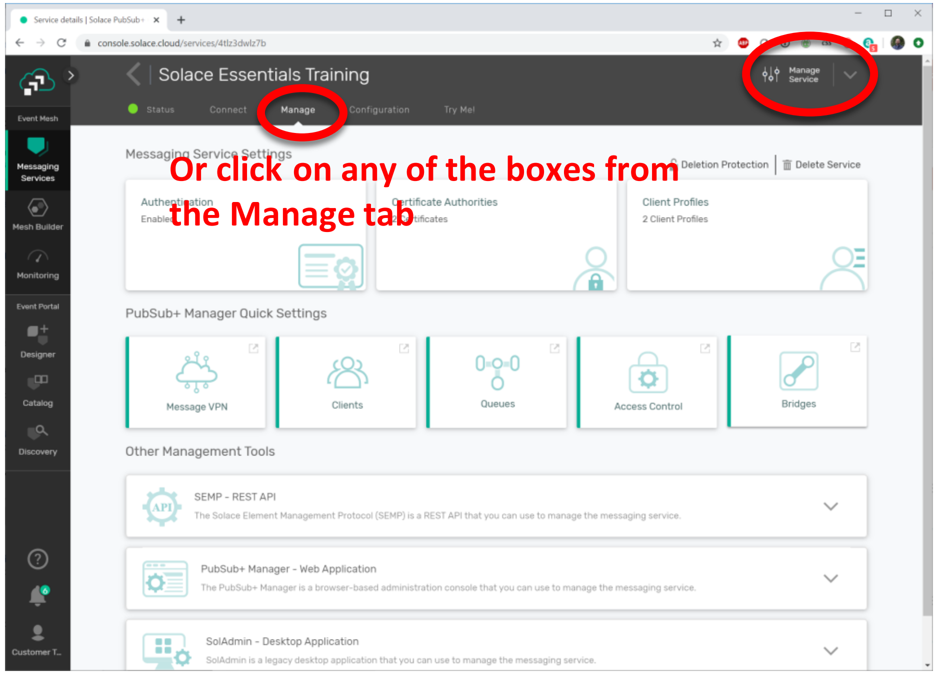
Refresh Rate: 5s

Last Update: 2018-11-23 08:41:46

To Access PubSub+ Manager

PubSub+ Cloud

- Open you cloud messaging service and click on Manage Service



Or click on any of the boxes from the Manage tab

Solace Essentials Training

Messaging Service Settings

Authentication
Enabled

Certificate Authorities
2 Certificates

Client Profiles
2 Client Profiles

PubSub+ Manager Quick Settings

Message VPN | Clients | Queues | Access Control | Bridges

Other Management Tools

SEMP - REST API
The Solace Element Management Protocol (SEMP) is a REST API that you can use to manage the messaging service.

PubSub+ Manager - Web Application
The PubSub+ Manager is a browser-based administration console that you can use to manage the messaging service.

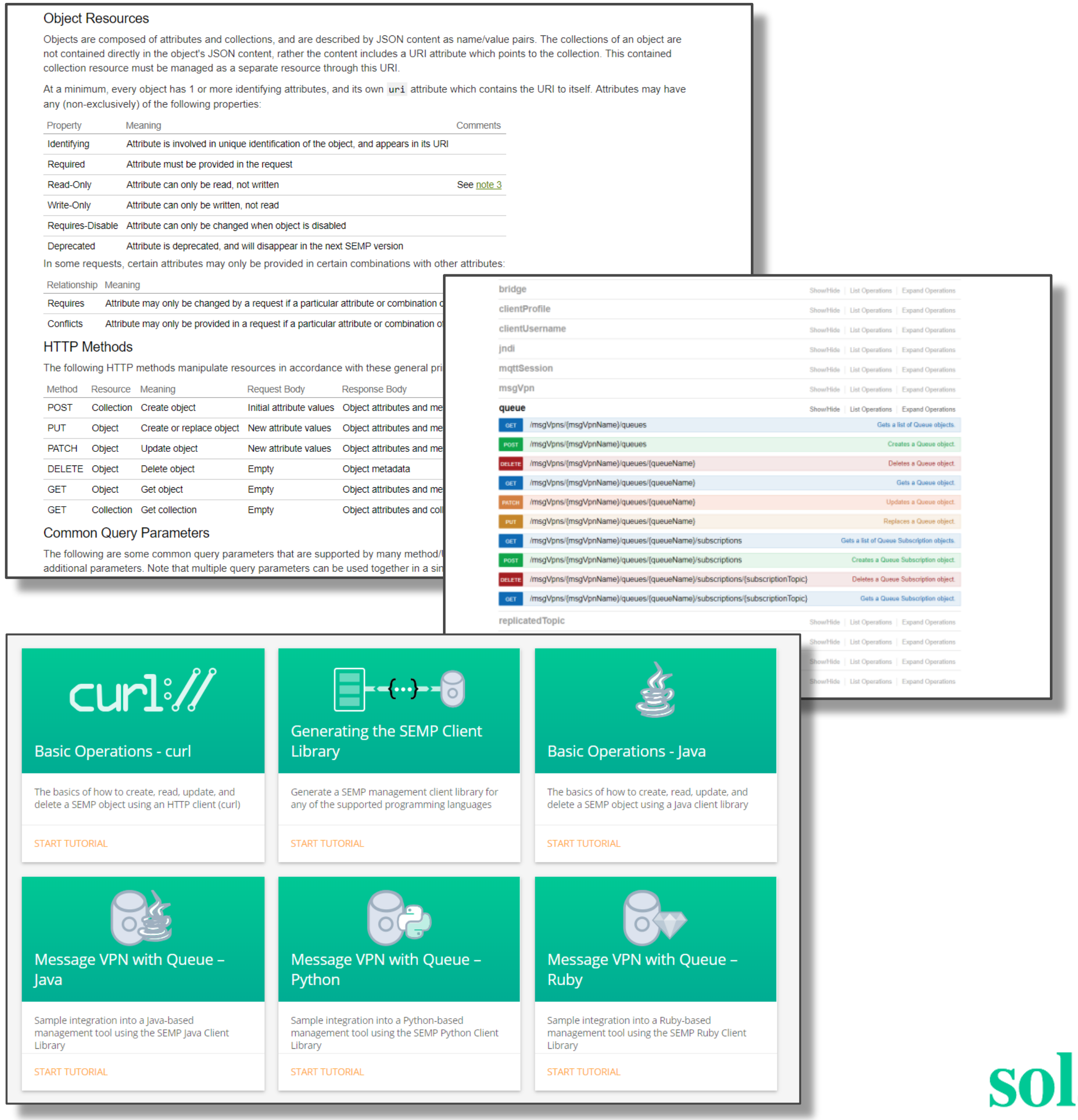
SolAdmin - Desktop Application
SolAdmin is a legacy desktop application that you can use to manage the messaging service.

PubSub+ Software & Appliance

- Open a browser and enter one of the following URLs:
  - To connect using HTTP, enter: `http://<your-Solace PubSub+ software event broker's-address>:8080` (port 80 for a PubSub+ Appliance)
  - To connect using HTTPS, enter: `https://<your-Solace PubSub+ software event broker's-address>:943` (port 443 for an appliance).

SEMP

- RESTful API that complements CLI and PubSub+ Manager
- Lets you provision, operate, and maintain brokers anywhere
- SEMP Spec is in Swagger and available:
  - Directly from a message/event broker `http://<host>/SEMP/v2/config/help`
  - Solace Docs Site `https://docs.solace.com/API-Developer-Online-Ref-Documentation/swagger-ui/index.html`



Object Resources

Objects are composed of attributes and collections, and are described by JSON content as name/value pairs. The collections of an object are not contained directly in the object's JSON content, rather the content includes a URI attribute which points to the collection. This contained collection resource must be managed as a separate resource through this URI.

At a minimum, every object has 1 or more identifying attributes, and its own `uri` attribute which contains the URI to itself. Attributes may have any (non-exclusively) of the following properties:

Property	Meaning	Comments
Identifying	Attribute is involved in unique identification of the object, and appears in its URI	
Required	Attribute must be provided in the request	
Read-Only	Attribute can only be read, not written	See note 3
Write-Only	Attribute can only be written, not read	
Requires-Disable	Attribute can only be changed when object is disabled	
Deprecated	Attribute is deprecated, and will disappear in the next SEMP version	

In some requests, certain attributes may only be provided in certain combinations with other attributes:

Relationship	Meaning
Requires	Attribute may only be changed by a request if a particular attribute or combination c
Conflicts	Attribute may only be provided in a request if a particular attribute or combination of

HTTP Methods

The following HTTP methods manipulate resources in accordance with these general pri

Method	Resource	Meaning	Request Body	Response Body
POST	Collection	Create object	Initial attribute values	Object attributes and me
PUT	Object	Create or replace object	New attribute values	Object attributes and me
PATCH	Object	Update object	New attribute values	Object attributes and me
DELETE	Object	Delete object	Empty	Object metadata
GET	Object	Get object	Empty	Object attributes and me
GET	Collection	Get collection	Empty	Object attributes and coll

Common Query Parameters

The following are some common query parameters that are supported by many method/U additional parameters. Note that multiple query parameters can be used together in a sin

bridge

clientProfile

clientUsername

jndi

mqttSession

msgVpn

queue

GET	/msgVpns/{msgVpnName}/queues	Gets a list of Queue objects.
POST	/msgVpns/{msgVpnName}/queues	Creates a Queue object.
DELETE	/msgVpns/{msgVpnName}/queues/{queueName}	Deletes a Queue object.
GET	/msgVpns/{msgVpnName}/queues/{queueName}	Gets a Queue object.
PATCH	/msgVpns/{msgVpnName}/queues/{queueName}	Updates a Queue object.
PUT	/msgVpns/{msgVpnName}/queues/{queueName}	Replaces a Queue object.
GET	/msgVpns/{msgVpnName}/queues/{queueName}/subscriptions	Gets a list of Queue Subscription objects.
POST	/msgVpns/{msgVpnName}/queues/{queueName}/subscriptions	Creates a Queue Subscription object.
DELETE	/msgVpns/{msgVpnName}/queues/{queueName}/subscriptions/{subscriptionTopic}	Deletes a Queue Subscription object.
GET	/msgVpns/{msgVpnName}/queues/{queueName}/subscriptions/{subscriptionTopic}	Gets a Queue Subscription object.

replicatedTopic

Basic Operations - curl

The basics of how to create, read, update, and delete a SEMP object using an HTTP client (curl)

START TUTORIAL

Generating the SEMP Client Library

Generate a SEMP management client library for any of the supported programming languages

START TUTORIAL

Basic Operations - Java

The basics of how to create, read, update, and delete a SEMP object using a Java client library

START TUTORIAL

Message VPN with Queue – Java

Sample integration into a Java-based management tool using the SEMP Java Client Library

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Message VPN with Queue – Python

Sample integration into a Python-based management tool using the SEMP Python Client Library

START TUTORIAL

Message VPN with Queue – Ruby

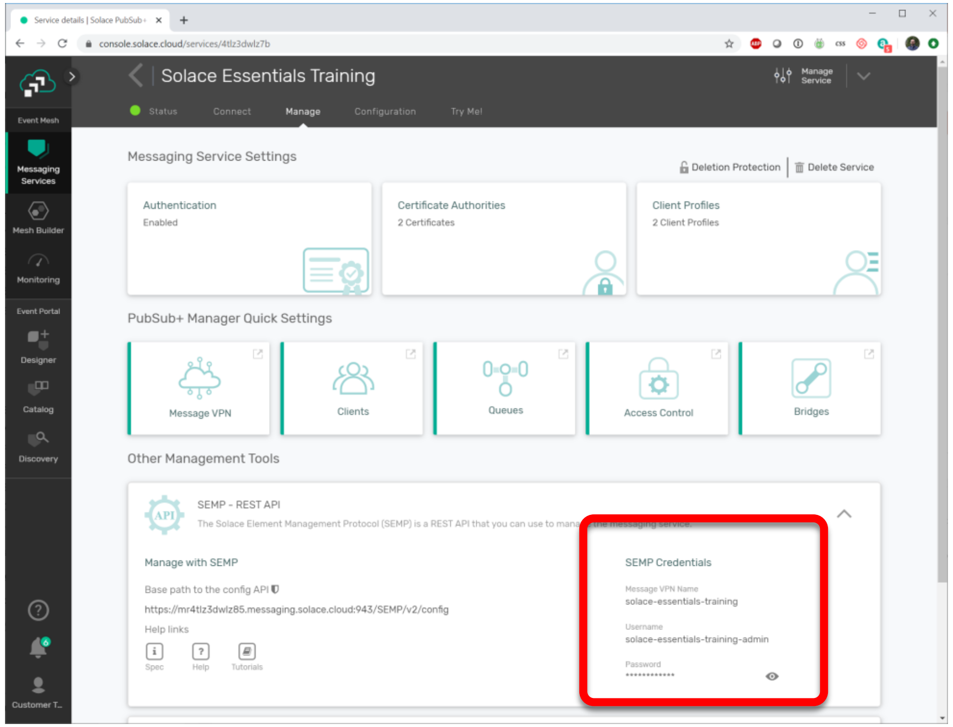
Sample integration into a Ruby-based management tool using the SEMP Ruby Client Library

START TUTORIAL

SEMP API URLs and Access Info

PubSub+ Cloud

- Open you cloud messaging service and click on Manage tab



Messaging Service Settings

Authentication
Enabled

Certificate Authorities
2 Certificates

Client Profiles
2 Client Profiles

PubSub+ Manager Quick Settings

Other Management Tools

SEMP - REST API

The Solace Element Management Protocol (SEMP) is a REST API that you can use to mana... the messaging service.

Manage with SEMP

Base path to the config API
https://mr4tlz3dwlz85.messaging.solace.cloud:943/SEMP/v2/config

Help links

SEMP Credentials

Message VPN Name
solace-essentials-training

Username
solace-essentials-training-admin

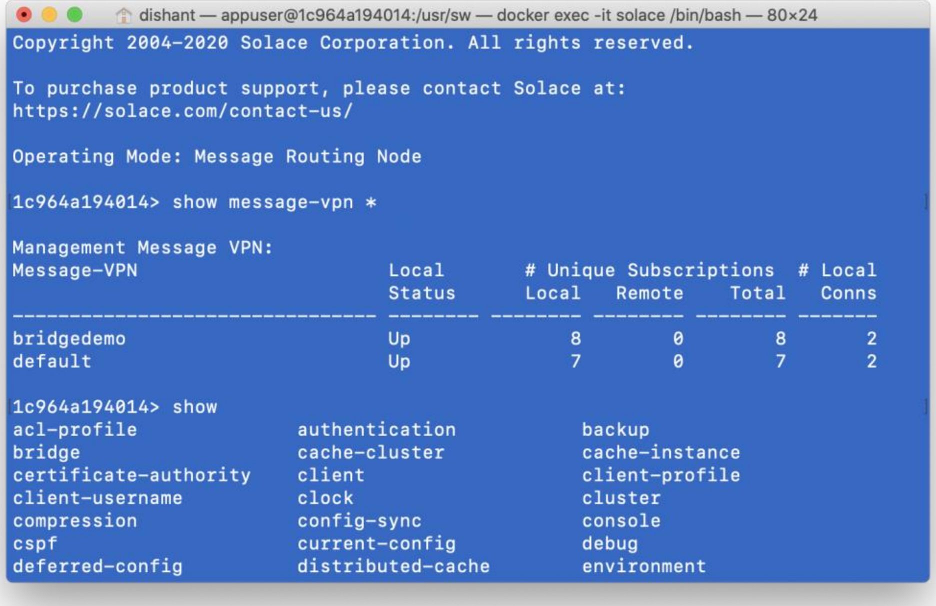
Password
****

PubSub+ Software & Appliance

- Use tools like cURL or Postman:
  - To send requests using HTTP, use: `http://<your-broker-ip>:8080/SEMP/v2/config` (port 80 for a PubSub+ Appliance)
  - To send requests using HTTPS, use: `https://<your-broker-ip>:943/SEMP/v2/config` (port 443 for an appliance).

CLI

- **Command Line Interface**
- **Integrated with the broker**
- **Access through SSH connection**
- **Mainly used with PubSub+ Software or Appliance Event Brokers**
  - Required during initial setup of a new appliance



dishant — appuser@1c964a194014:/usr/sw — docker exec -it solace /bin/bash — 80×24

```
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Operating Mode: Message Routing Node

1c964a194014> show message-vpn *

Management Message VPN:
Message-VPN                      Local       # Unique Subscriptions  # Local
                                 Status      Local   Remote    Total   Conns
-------------------------------- -------- -------- -------- -------- -------
bridgedemo                       Up              8        0        8       2
default                          Up              7        0        7       2

1c964a194014> show
acl-profile              authentication           backup
bridge                   cache-cluster            cache-instance
certificate-authority    client                   client-profile
client-username          clock                    cluster
compression              config-sync              console
cspf                     current-config           debug
deferred-config          distributed-cache        environment
```

To Access CLI

Docker Containers

- From a terminal window/command prompt:
  - `docker exec -it <your-container-name> /bin/bash cli`

Appliance/Software Event Brokers (cloud or machine images)

- Using SSH tools:
  - `ssh -p 2222 admin@<your-broker-ip>`

Hands-on Activity

- Creating a Message-VPN using PubSub+ Manager
- Creating a Queue using PubSub+ Manager
- Mapping Topics to Queues
- Managing Queues using SEMP
- CLI Basic Commands

Hands-on Activity

- **Creating a Message-VPN using PubSub+ Manager**

Hands-on Activity

- Creating Queues using PubSub+ Manager

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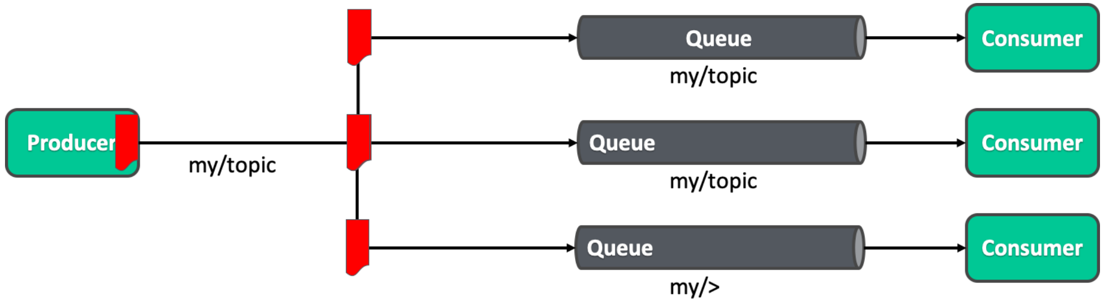
Hands-on Activity

- Mapping Topics to Queues



Hands-on Activity

- **Managing Queues using SEMP**

Hands-on Activity

- **CLI Basic Commands**