



CA API Gateway: What's new in 9.3

CA Microgateway 1.0

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MICROGATEWAY

Highlights

Gateway 9.2 Common Criteria Certification

COMMUNICATIONS SECURITY ESTABLISHMENT Certificate of Product Evaluation



CA Technologies CA API Gateway v9.2

Access Control Devices and Systems

CA Technologies

This is to certify that the named product has been evaluated under the terms and conditions of the Canadian Common Criteria Scheme and complies with the requirements for Common Criteria Recognition Agreement (CCRA).

Conformance Claim:	Standard Protection Profile for Enterprise Security Management Policy Management, v2.1, 24 October 2013 and Standard Protection Profile for Enterprise Security Management Access Control, v2.1, 24 October 2013
CC Evaluation Facility:	EWA-Canada
Date Issued:	10 October 2017

The IT product identified in this certificate has been evaluated at an approved evaluation facility established under the Canadian Common Criteria Scheme using the Common Methodology for IT Security Evaluation, Version 3.1 Revision 5, for conformance to the Common Criteria for IT Security Evaluation, Version 3.1 Revision 5. This certificate applies only to the specific version and release of the product in its evaluated configuration and in conjunction with the complete certification report. The evaluation has been conducted in accordance with the provisions of the Canadian Common Criteria Scheme and the conclusions of the evaluation facility in the evaluation report are consistent with the evidence adduced. This certificate is not an endorsement of the IT product by CSE or by any other organization that recognizes or gives effect to this certificate, and no warranty of the IT product by CSE or by any other organization that recognizes or gives effect to this certificate, is expressed or implied.

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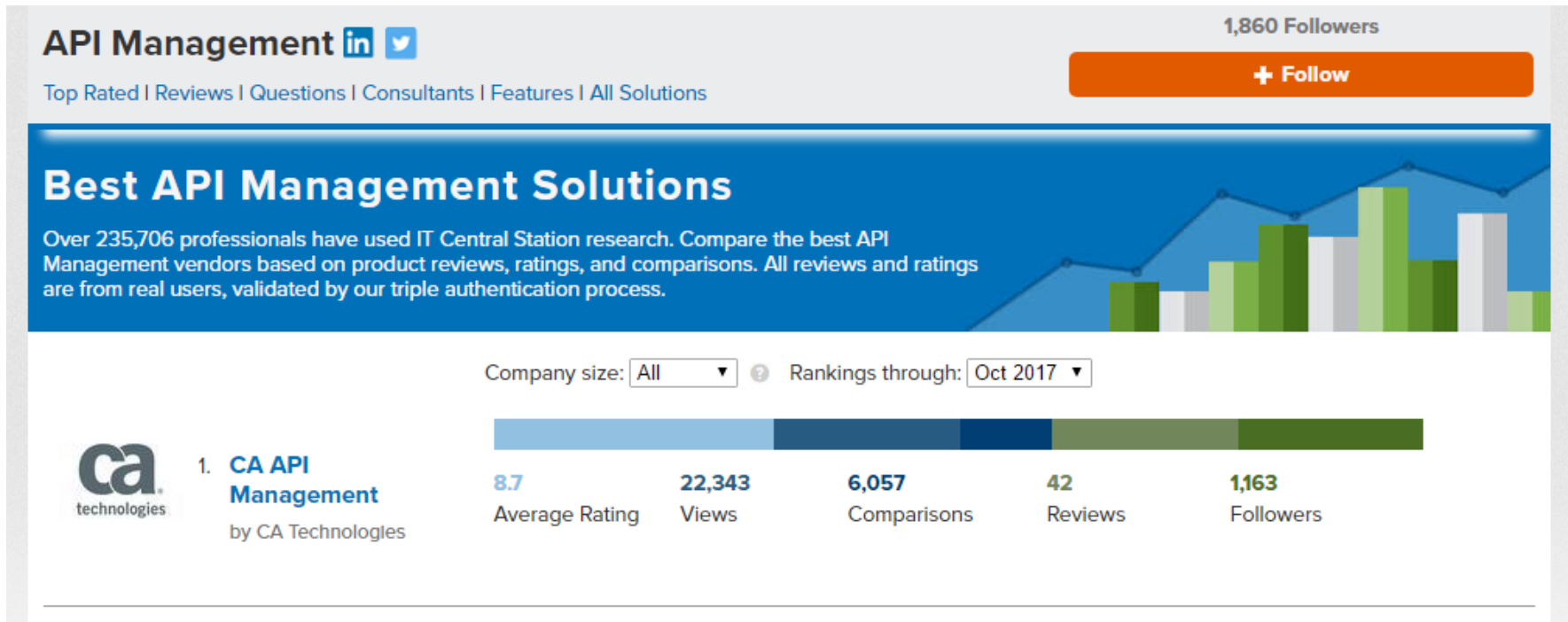
Manager COTS Assurance Programs

Canada



IT Central Station

https://www.itcentralstation.com/categories/api-management#top_rated



Roadmap Sessions

<https://www.ca.com/us/product-roadmaps.html>

Product Roadmaps & Feedback Sessions

Together, let's shape the future of CA.



We are always listening to our customers, and one of the most common requests we receive is for the insight into roadmaps for our products. You can now join your industry peers to hear directly from our product management team about the future direction of our products. By attending the product roadmap and feedback sessions, you'll gain firsthand knowledge about upcoming product functionality and features along with architectural enhancements. At CA, we strive to eliminate the barriers between your ideas and the business outcomes you seek.

Product Roadmap Sessions

CA API Management

(Roadmap as of October 2017)

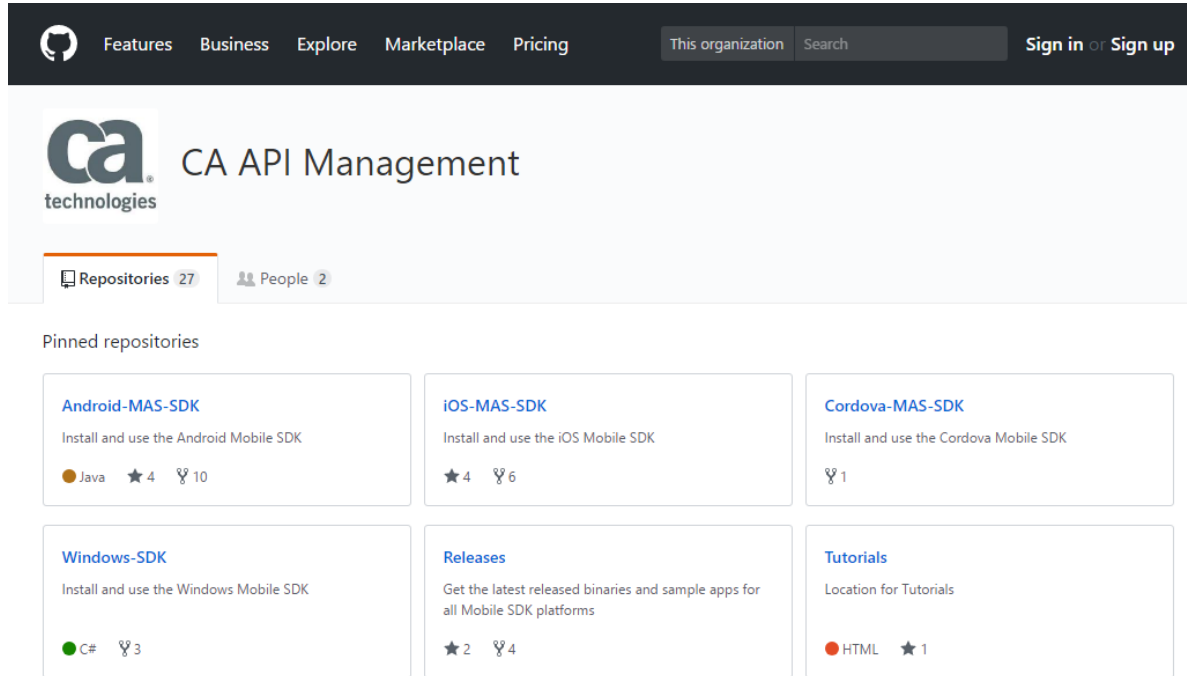
Click 'Register' to select session

- December 13, 2017 2 PM EST
- January Dates: Coming Soon!
- February Dates: Coming Soon!
- March Dates: Coming Soon!

Register

CA API Management Tutorials in public gitHub

<https://github.com/CAAPIM>



The screenshot shows the GitHub organization page for CA API Management. The header includes navigation links like Features, Business, Explore, Marketplace, and Pricing, along with a search bar and login/signup options. The organization's name and logo are prominently displayed. Below this, there are tabs for Repositories (27) and People (2). The 'Pinned repositories' section features six cards arranged in a 2x3 grid. Each card represents a different SDK or resource, including descriptions, supported languages, and star/fork counts.

Repository Name	Description	Language	Stars	Forks
Android-MAS-SDK	Install and use the Android Mobile SDK	Java	4	10
iOS-MAS-SDK	Install and use the iOS Mobile SDK		4	6
Cordova-MAS-SDK	Install and use the Cordova Mobile SDK			1
Windows-SDK	Install and use the Windows Mobile SDK	C#		3
Releases	Get the latest released binaries and sample apps for all Mobile SDK platforms		2	4
Tutorials	Location for Tutorials	HTML	1	

Container Gateway

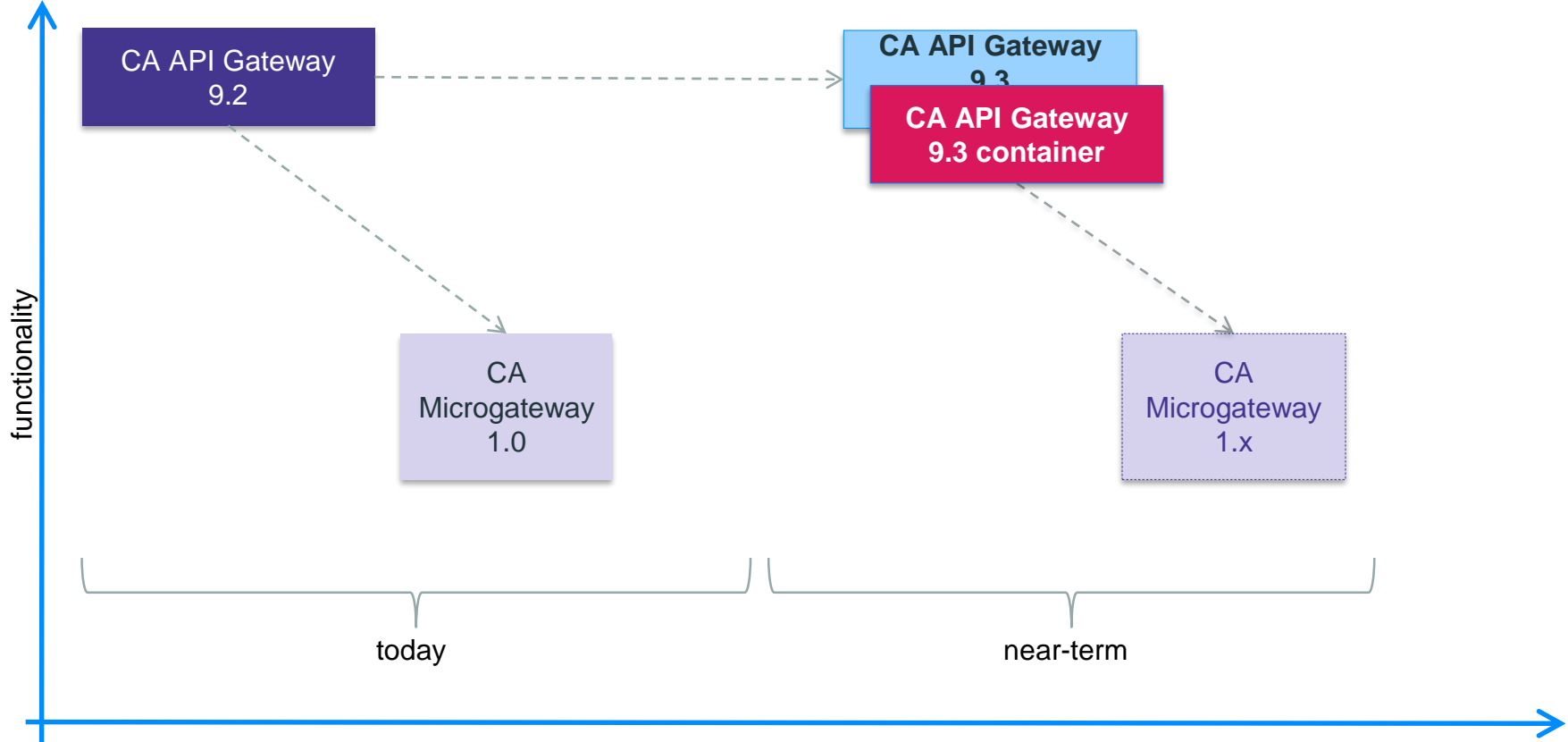
Why Containers Matter

API's and the environments they run in are changing

- decomposing the monolithic application
 - distributed systems, microservices, adaptive scaling
- embracing dev-ops focused lifecycle – light touch, quick deploy

API Gateway still needed in modern environments

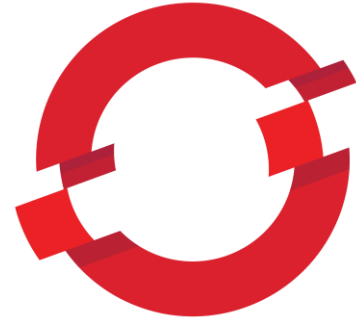
Gateway Containers



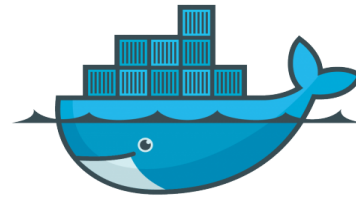
Gateway Container for 9.3

Flexible, easy management

Feature	Customer benefit
Scriptable install, deployment, upgrade using standard tools	Integration with existing CI/CD pipeline, speed of deployment
Platform as a Service (PaaS) enablement and support	use industry standard tools to deploy, scale, monitor Gateway
flexible deployment model	potential broad environment support, single form factor



OPENSIFT



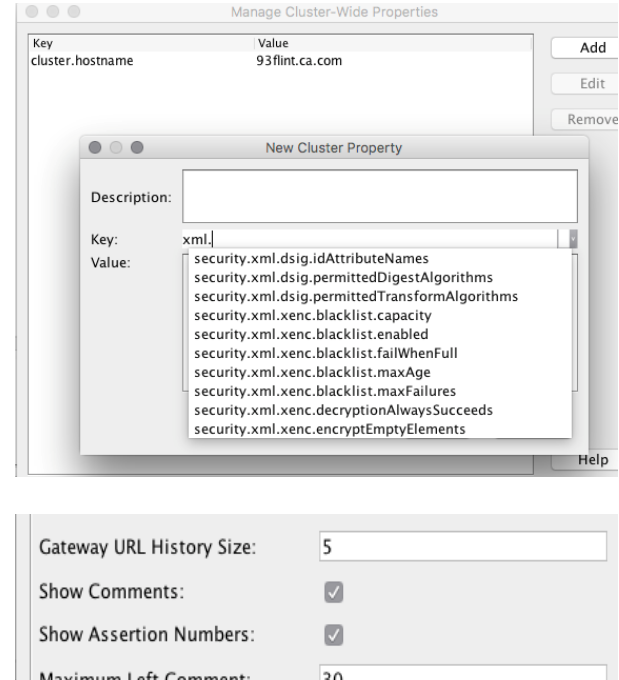
docker

Developer Tools and Improvements

Policy Manager usability enhancements

- autocomplete search for cluster properties, cipher list
- keyboard shortcuts for "add assertion", "reorder assertion", close tabs
- set assertion number and comments on globally

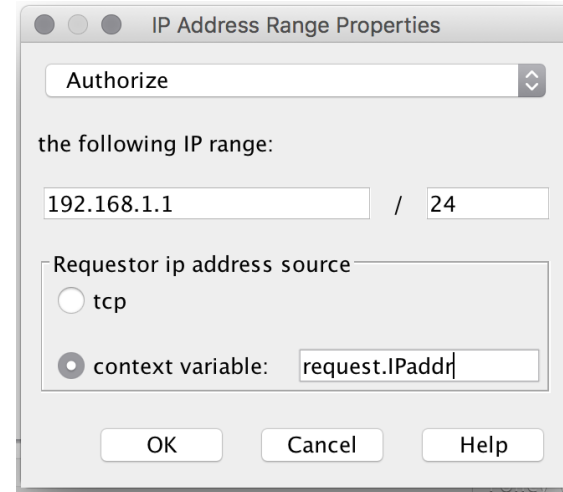
Easier navigation for quicker build and deploy



Policy Manager usability enhancements

Easier to build and
troubleshoot policy

- expose LDAP status codes/attributes in policy
- restrict by IP address now accepts variables



LDAP write

Fill gap in Gateway LDAP interoperability

- supports same LDAP providers as Gateway supports for authentication

Avoid need to use multiple tools single use case

Write LDAP Properties

LDAP Connector:* Tacoma AD

DN:* uid=\${uid},ou=Users,dc=tacoma,dc=com

Changetype:* Modify

Attributes and Values:

Attribute	Value
replace password	\${userPass}

Prefix:* ldapWrite

OK

OK Cancel

Improved JSON support

Better, modern tools for JSON inspection and validation

JSON Schema v4

- support for v4 keywords and validation
- errors returned via failure code to policy

Improved JSON Path

- consistent, repeatable results for ordering
- support compression

CA Single Sign On (SSO) authentication with JWT

Authenticate Against CA Single Sign-On Properties

CA Single Sign-On Variable Prefix: * ☒ OK

Credentials

☐ Use Last Credentials

☒ Specify Credentials

Supported Credential Types

☐ Username Password Username:

☐ X.509 Certificate Certificate CN or DN:

☒ JSON Web Token (JWT)

☒ Create SSO Token

☐ Use SSO Token from Context Variable:

(Available in SSO 12.8)

Gateway authenticate to SSO using JWT token type

- can be constructed on the Gateway (from another token type) in policy
- can be passed in from requesting application

Operational Enhancements

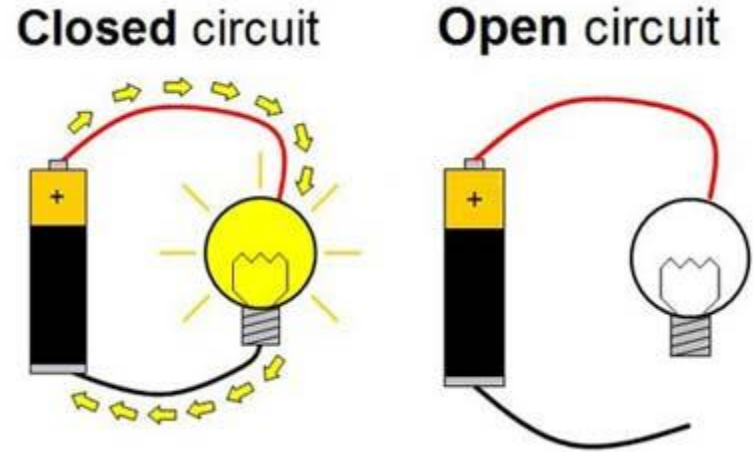
Circuit Breaker

Building fault tolerance into policy

Manage environmental issues

- high latency back end systems
- long running assertions that impact performance
- sudden network interruptions

Fail fast, flexible execution



<http://www.mechanictomillionaire.com/88-closed-circuit-open-circuit/>

Circuit Breaker

- Require HTTP Basic Credentials
- ▼ Apply Circuit Breaker
 - Request: Apply XSL Transformation
 - Request: Protect Against SQL Attacks [URL Query String + Body]
 - Request: Protect Against Code Injection [URL Path + URL Query String]
 - Write LDAP: Modify
 - Route via HTTP to http://server.com

Circuit Breaker Properties

Policy Failure Circuit

- ☒ Enabled
- Max Failures: 5
- Sampling Window (ms): 5000
- Recovery Period (ms): 10000
- ☐ Custom Event Tracker ID

Latency Circuit

- ☒ Enabled
- Max Failures: 5
- Sampling Window (ms): 5000
- Recovery Period (ms): 10000
- Max Latency (ms): 500
- ☐ Custom Event Tracker ID

OK Cancel

Ability to suspend execution of policy logic, based on

- long latency: slow web server, database query, long policy execution
- assertion failures

Build policy to anticipate breaks, workaround

Migration enhancements

Increased flexibility

- Map by path: migrate between environments using service name and path
- map by URI: additional migration by service URI

```
./GatewayMigrationUtility.sh manageMappings -b bundle.xml -t  
service -srcPath /folderA/folderB/testService -targetPath  
/folderA/folderB/folderC/fooService -f resultMappings.xml
```

```
./GatewayMigrationUtility.sh manageMappings -b bundle.xml -t  
service -srcRoutingUri /testService -targetRoutingUri /fooService  
-f resultMappings.xml
```

Platform Updates

Gateway platform updates

Updates to supported 3rd party products:

- IBM MQ8
 - including expanded options for configuring queue parameters
- MySQL 5.7 is now default supported database
- CA SSO 12.7

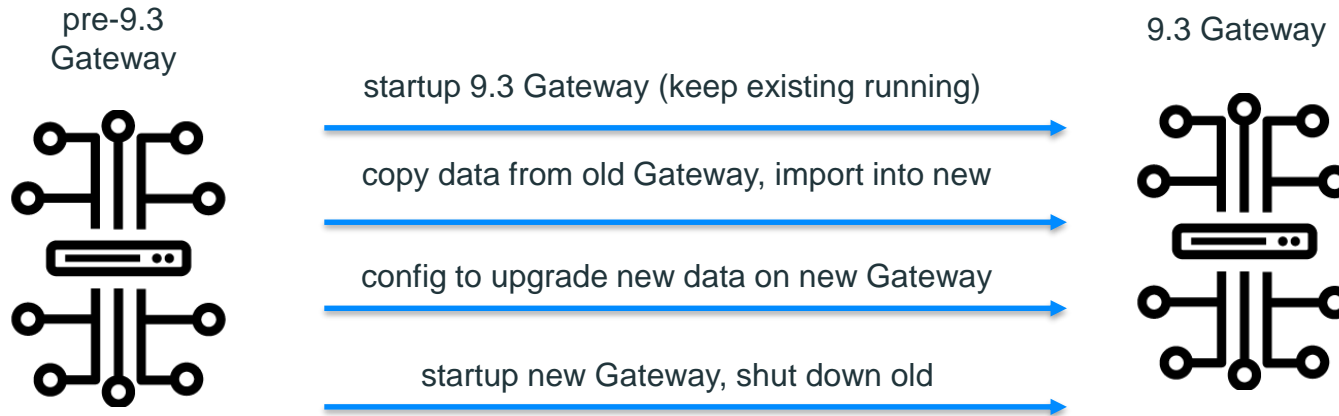
Platform updates

- Virtual appliance supports virtual hardware version 10 and 11
- AMI improvements for environment adoption

Upgrade, Upgrade, Upgrade

Accelerated upgrade process

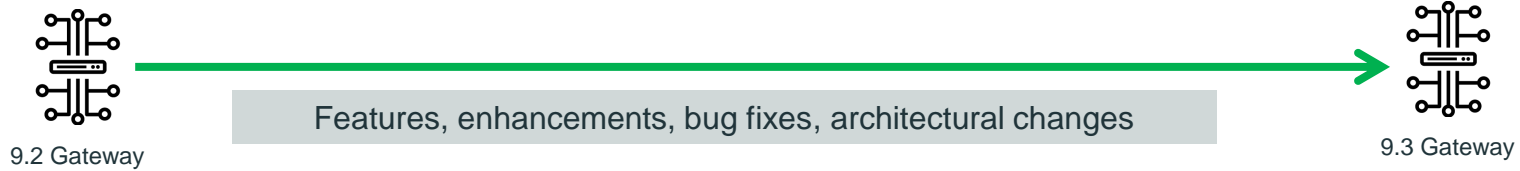
A different way to upgrade the Gateway



saves time and effort!

More frequent, smaller updates

“Normal” Process:

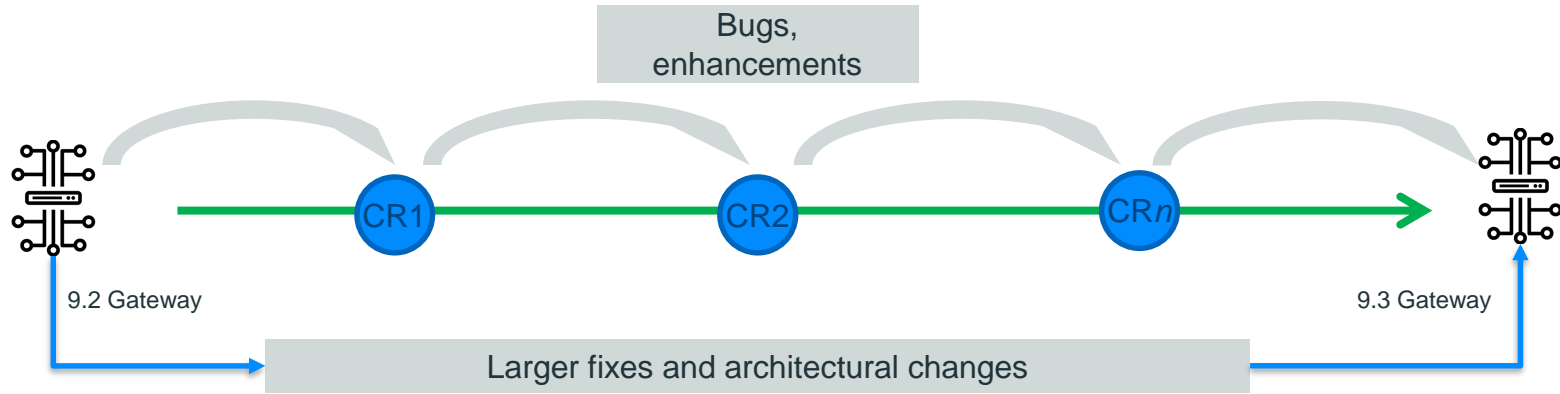


Customer Resistance:

- Gateway releases can be long (often greater than 6 months)
- Scope of fixes can be widespread, introduce lots of changes
- changes in default behavior, regressions

More frequent, smaller updates

Cumulative Releases:



Benefits:

- Users get higher quality fixes and enhancements to their immediate issues faster
- smaller scope == minimal impact on upgrade

Summary and Takeaways

Container form factor

Provide containerized version of full function Gateway.

Using container and corresponding platform to modernize the Gateway

OPS and DEV improvements

Continue to make the Gateway easier to work in, easier to operate, more flexible performance

Easier to upgrade

Tools and processes that make it easier for customers to upgrade their Gateways to latest version, and receive value faster

CA Microgateway

CA Microgateway

Secure and Integrate Your Microservices

Microservices Team Autonomy

- Publish API through meta-policy
- QuickStart policy templates

Microservices Orchestration

- JSON syntax orchestration
- Circuit breaker

Microservices Security

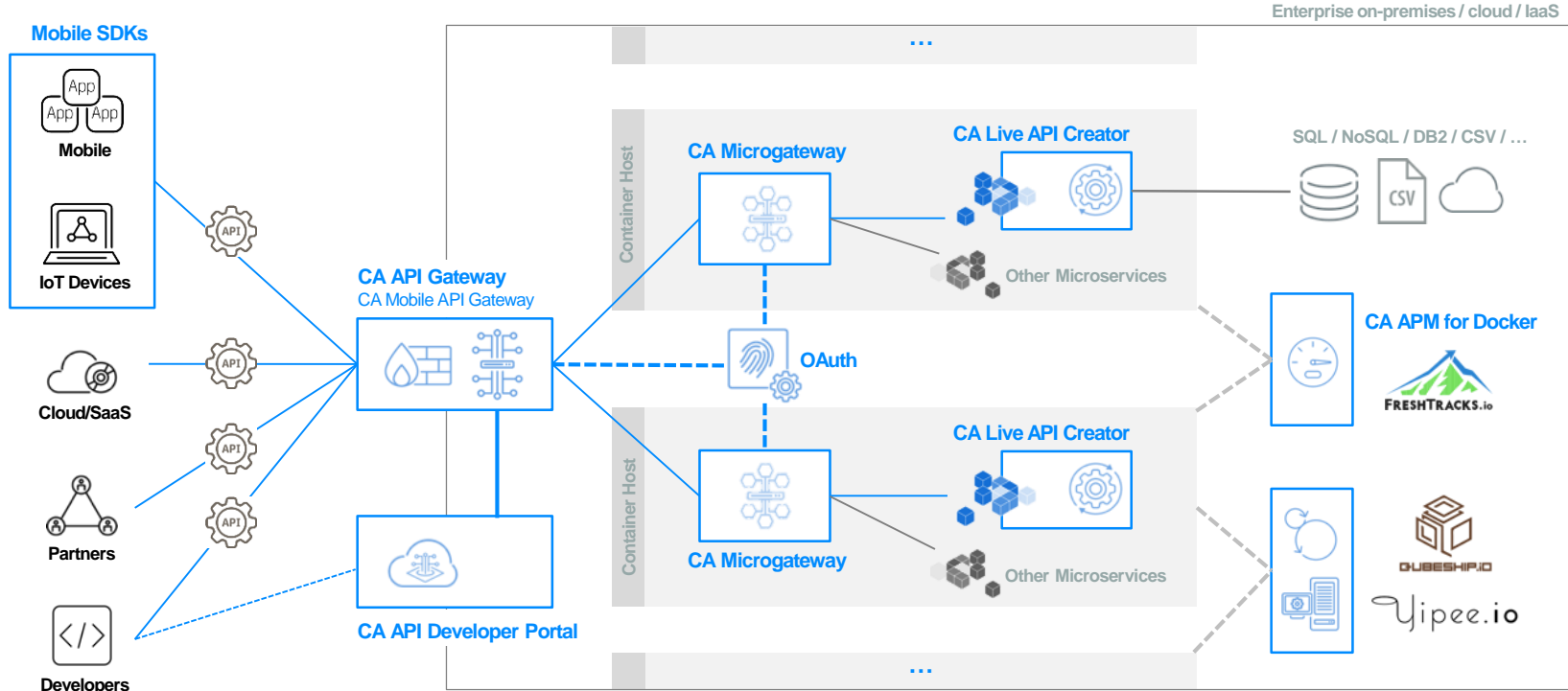
- OAuth & JWT templates
- Mutual TLS
- Simple LDAP

Microservices Platform

- Headless docker container gateway

<https://github.com/CAAPIM/Microgateway>

Modernizing Architecture with APIs & Microservices



FreshTracks.io, Qubeship.io and Yipee.io are CA Accelerator innovation projects.

CA Microgateway

Service meta-policy and QuickStart policy templates

Encapsulated Assertions

- ▼ Quick Start Templates
 - ▼ Encapsulated Assertion Fragments
 - ▶ Custom Encapsulated Assertion Fragments
 - ✖ CredentialSourceHttpBasic
 - ✖ **EncodeDecodeJWT**
 - ✖ OAuth2JWTHeader
 - ✖ RequireOAuth2Token
 - ✖ RouteHttp
 - ✖ RouteOrchestrator
 - 🔗 quickStart [/quickstart/1.0/services*]



Encapsulated Assertion: EncodeDecodeJWT

Inputs

Name	Type
iss_sender	String
jwt	String
alg_sender	String
jwt.payload	String

Outputs

Name
error.code
jwt.header
jwt.payload
jwt

- ▼ At least one assertion must evaluate to true
 - ▶ All assertions must evaluate to true
 - ▼ All assertions must evaluate to true
 - ✔ Compare Variable: \${jwt} is not empty; If Multivalued all values must pass
 - ✔ Compare Variable: \${jwt.payload} is empty; If Multivalued all values must pass
 - ✔ Set Context Variable action as String to: validate
 - ▶ All assertions must evaluate to true
- ▼ At least one assertion must evaluate to true
 - ▼ All assertions must evaluate to true
 - ✔ Compare Variable: \${action} is equal to create; If Multivalued all values must pass
 - ▼ At least one assertion must evaluate to true
 - ▼ **All assertions must evaluate to true**
 - 🔗 Encode Json Web Token: sign payload
 - ⚙️ \${jwt.compact}: Evaluate Regular Expression – ^([^.]+)
 - ✔ Set Context Variable jwt as String to: \${jwt.compact}

CA Microgateway

Service meta-policy and QuickStart policy templates

POST https://localhost/quickstart/1.0/services

```
{
  "Service": {
    "name": "Google Search With OAuth",
    "gatewayUri": "/google-with-oauth",
    "httpMethods": [ "get" ],
    "policy": [
      {
        "RequireOAuth2Token": {
          "scope_required": "GOOGLE_SEARCH",
          "scope_fail": "false",
          "onetime": "false",
          "given_access_token": ""
        }
      },
      {
        "RouteHttp" : {
          "targetUrl" : "http://www.google.com/search${request.url.query}",
          "httpMethod" : "Automatic"
        }
      }
    ]
  }
}
```



- ▼ ec2-35-183-12-172.ca-central-1.compute.amazonaws.com
 - ▶ OTK
 - ▶ PolicySDK
 - ▶ Quick Start Templates
 - Gateway REST Management Service [/restman/*]
 - Google Search With OAuth [/google-with-oauth]
 - Health Check [/sys/probe/healthcheck]

Google Search With OAuth [/google-with-oauth] (v1/1, active)

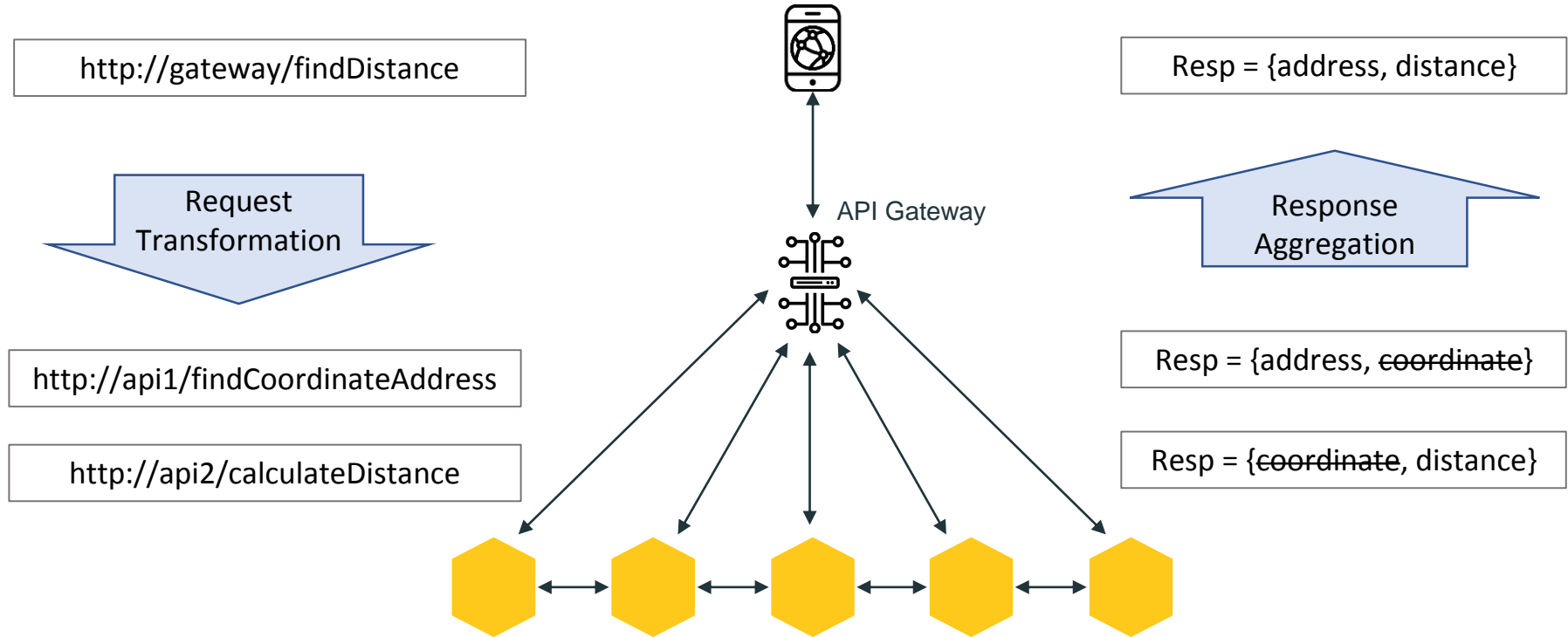
Save and Activate Save Validate Export Policy Import Policy

RequireOAuth2Token

RouteHttp

CA Microgateway

API Orchestration – JSON based low-code orchestration layer



CA Microgateway

RouteOrchestrator template – JSON syntax

```
"Service":{
  .....
  "policy":[
    {
      "RouteOrchestrator":{
        "rule":{
          "orchestrator":[{
            "aggregator":[{
              "RouteHttp":{ }, "RouteHttp":{ }
            }]
          },
          { orchestrator_transform },
          {
            "aggregator":[
              {
                "RouteHttp":{ }, "RouteHttp":{ }
              }
            ]
          }
        }
      }
    }
  ]
}
```



```
"RouteHttp":{
  "targetUrl":"https://...",
  "httpMethod":"GET",
  "parameters":[ ],
  "headers":[ ],
  "requestTransform":[ ],
  "responseTransform":[
    {
      "jolt":[ ]
    }
  ]
}
```

CA Microgateway

Microgateway container

- *Docker-compose up*
- *Docker-compose down*
- *Docker-compose scale*

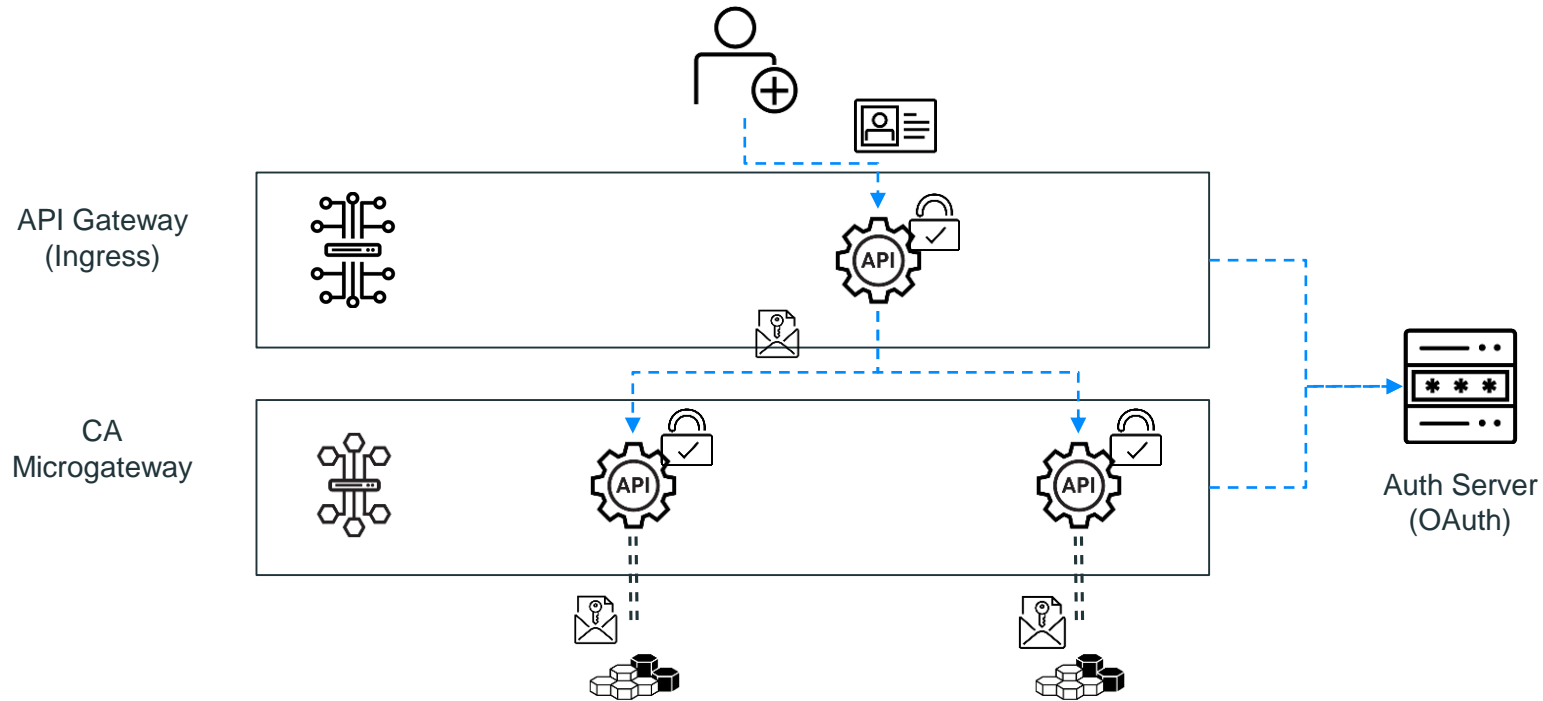
Other platforms supported:

- Openshift
- Kubernetes
- AWS container service

```
version: '3'
services:
  ssg:
    image: caapim/microgateway:1.0.00
    extra_hosts:
      - "httpbin.mycompany.com:10.7.36.179"
      - "otk.mycompany.com:10.7.32.187"
    deploy:
      resources:
        limits:
          memory: 2048m
    env_file:
      - ./config/core.env
      - ./config/license.env
      - ./config/certificates.env
      - ./config/otk.env
      - ./config/jwt.env
      - ./config/feature-flags.env
      - ./config/solutionkits/policysdk.env
    environment:
      SSG_ADMIN_USERNAME: "admin"
      SSG_ADMIN_PASSWORD: "password"
      SSG_SSL_KEY:
      SSG_SSL_KEY_PASS: ""
      SSG_INTERNAL_SERVICES: "restman"
```

CA Microgateway

End-to-End Security Capabilities– OAuth, JWT, mTLS



<https://github.com/CAAPIM/Microgateway/tree/ca-world>

QuickStart REST Mode vs. Startup Mode

- **Scenario 1 REST Mode: Fluid environment, with possible frequent API changes**
 - You are deploying the CA Microgateway into an environment that is dynamic and fluid. You need the flexibility to push updates to the Microgateway without needing to bring the system down first. The life cycle of an API is independent of the life cycle of the CA Microgateway Docker container. This mode is the default.
- **Scenario 2 Startup Mode: Strong governance required, APIs seldom change**
 - You are deploying the CA Microgateway into an environment that does not permit run-time changes to the services and policies on the Microgateway. The life cycle of an API is tied to the life cycle of the Docker container that runs the CA Microgateway.

Summary

A Few Words to Review

Microservices

- Empower innovation through loosely coupled, autonomous services
- Enabled by platform and Infrastructure
- Require localized solutions for enterprise challenges

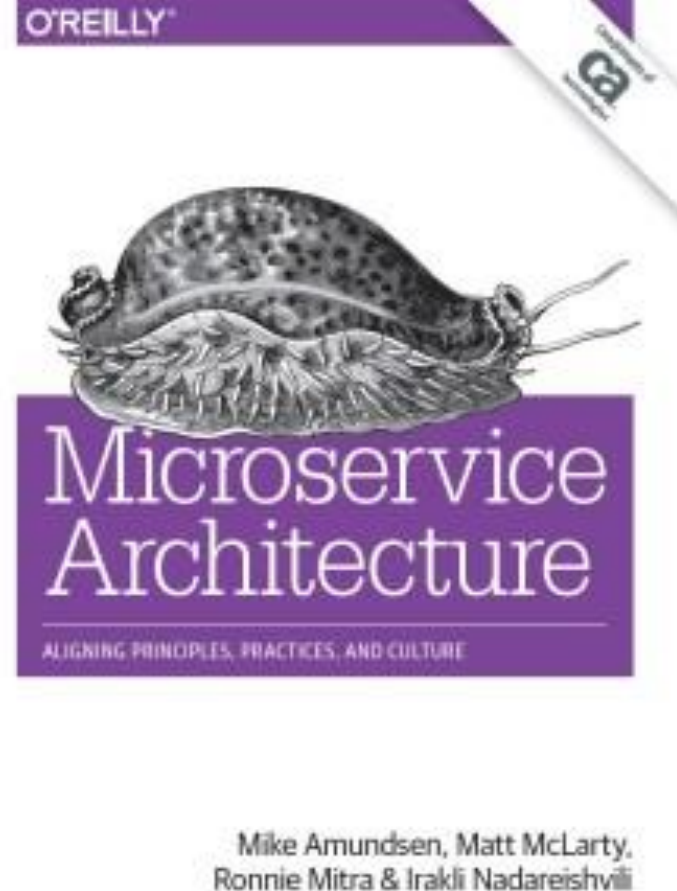
CA Microgateway

- Provide building blocks for secure service mesh
- Reduce complexity and lead time from business capabilities to clients

<https://github.com/CAAPIM/Microgateway>

For more information...

- [CA Microgateway Datasheet](#)
- [Microservice Architecture](#) book
- [Microservices Architecture for the Enterprise](#) eBook
- [An Architect's Guide to Microservices](#) Solution Brief
- [Microservices landing page](#)
- [CA Microgateway Product Page](#)





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