Service Design - New

Deliverables Checklist :: Demo and Review Status

		Brillio Technical Team								Experian Technical Tear					
		Service Design Submission Date				Implementation Reviewed By (Name & Title)				Service Design Reviewed By (Name, Title & Date)				Imp Reviewed By	
	Item	HLD	Sequence Diagram	Flow	Implementation Steps	Bitbucket	Terraform Script	CD	CI	HLD	Sequence Diagram	Flow	Implementation Steps	Bitbucket	
1	Certificates Management	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23								
2	**B2C** :: Okta Integration with AWS Cognito & Dynamo DB	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23	15-Dec-23								
3	**B2B** :: Okta Integration with AWS Cognito & Dynamo DB														
4	Okta Integration with AWS API GW														
5	Service Catalog Services Onboarding														
6	API GW integration with Microgateway														
7	Portal Customization (Drupal Forms)														
8	a) Portal Customization: Listing APIs on API GW using Drupal Forms														

9	b) Portal Customization: Publishing APIs to Developer Portal													
10	c) Portal Customization: Creating apps, adding products using Drupal Form													
11	API Security Assessment													
12	Final Demo 1 - End to end integration													
13	Final Demo 2 - end to end integration													
14	Final Demo 3 - end to end integration													

Overview

Goal/Purpose: Implement the AWS API Gateway including portal customization, CI/CD, perform a full API Security review and deploy two APIs end to end. Deliver the templates to deploy the enterprise gateway and Microgateways and deploy them to sandbox or testing environment. Experian cloud team will deploy the templates on higher environment.

Out of Scope: Assisting the BU development team in accelerating the AWS API Gateway adoption, ie. development support as well as architecture support

Standard Operating Protocols (SoP):
The templates will be applied on Sandbox or testing environment, Experian cloud team will be responsible for deploying the scripts to other environment. The project team requires appropriate access to the necessary systems, tools, and environments (Sandbox access, Service Catalog, GitHub, CI/CD, Okta access, Harness . Need administrative access to the Drupal content management system (CMS).

Highlights of the suggested requirements for the Enterprise AWS API GW solution:

• API Proxies should be tech stack agnostic and aligned to Open API Specification

• Managed API Proxies instances and enterprise ingress separately
• Utilize cloud-native single or cross-role-based security key vaults
• Manage similar proxies under one App with multiple Apps under one product

• Utilize serverless computing to emulate the pre-flows and post-flows
• Utilize Account and organization-wide guardrails to manage the product
• Loosely Coupled with IdP so any major IdP vendor can be integrated with plug and play
• Secure OAuth Flow – prefer not to use passwords or implicit
• Manage similar proxies under one App with multiple Apps under one product
• Automate the API Gateway from Service Catalog
• Automate the Proxy Upload
• Automate the Proxy deployment artifacts as input to the Developer portal publishing
• Utilize the policy engine to evaluate IaC configurations before deployment

Ensure the AWS API Gateway proxies are handled with similar or the same WAF as the current solution Automate the Proxy Upload
• Cloud-native OWASP API Security Top 10 controls at the API Gateway
• Cloud-native OWASP API Security Top 10 controls at the API Gateway
• Implement the OWASP API Security Top 10 at the Gateway level (API Product integrated as part of DevOps pipeline

Self-Documentation API with Swagger generation
• Create outputs from automated deployment that can be used to publish in the portal Expand the capability of Experian to integrate with new API-M solutions
• Integrate API-M solution with the portal deployment
• Automate change management with human-in-the-loop controls

Apigee will Continue to serve as Experian Enterprise API-M in parallel Experian AWS API Gateway will be available for Business Units to use on AWS. A decision tree will be published to determine when to use Apigee Vs. AWS Okta will be used as one of the Identity provider options for the AWS API Gateway
• Introduce more identity providers in the future Experian API Portal will serve as the external API Developer Portal The API AWS Gateway will be available as a service on AWS Service Catalog A CI/CD pipeline will be available for deploying the APIs on the AWS API gateway A shared global Enterprise AWS API Gateway will be introduced to enforce global security policies.

• Enterprise AWS API Gateway will be owned by API CoE
• The Micro gateways will be owned by BUs

Business Use Cases

Following are the business use cases for the various workflows (WF) of the solution

WF-01: Service Catalog

Primary Actor: APICoE Admin Team

Maintained By: APICoE team

Description: This workflow is part of the infrastructure setup processes that will act as a pre-requisite for BU users to manage API-LCM. Once the workflow completes, it will ensure that a customized portfolio of ServiceCatalog products are created for the BU Admin, that when executed (as a Harness job, refer WF-02) will launch the relevant products for the specified portfolio.

Usage:
1) When a new Service Catalog portfolio needs to be created for a specific Business Unit

Components:
1) Harness
2) Service Catalog
3) AWS Account
4) Okta Integration

Pre-requisites:
1) Integrate Harness with SSO
2) Provide access to APICoE Admin to log into Harness via SSO
3) The AWS account, Region, Avalability Zone, IAM roles, IAM policy is provisioned by the Cloud Platform Engineering (CPE) team
4) Harness Job for launching service catalog products is created for APICoE Admin

Steps:
1) APICoE logs into Harness via SSO
2) APICoE Admin runs job 'Create ServiceCatalog Portfolio' that will will internally invoke 'ServiceCatalogMain.tf', for creating a portfolio, associate portfolio w.r.t. the products, and assign the portfolio as a Service Catalog entry.
3) The Service Catalog portfolio created, will need to be allowed to be shared with the master account.

Result:
1) The portfolio with relevant products for BU Admin are setup under Service Catalog

WF-02: Setup - CI/CD Harness & Terraform Scripting

Primary Actor: Business Unit (BU) Team
Maintained By: APICoE team
Description: This workflow is part of the infrastructure setup processes that will act as a pre-requisite for BU users to manage API-LCM. Once the workflow completes, it will ensure the end-to-end infrastructure for a new Enterprise Gateway solution will be avaialble for the respective Business unit.

Components:
1) Harness
2) Service Catalog
3) AWS Account
4) Okta Integration

Usage:
1) When new BU needs to create a dedicated Enterprise Gateway solution
2) When BU would want to onboard a new API

Pre-requisites;
1) Integrate Harness with SSO
2) Provide access to BU User/BU Admin and APICoE Admin to log into Harness via SSO
3) The AWS account, VPC, VPCe, subnet, Availability Zone, CIDR block, Region, IAM roles, IAM policy, S3 is provisioned by the Cloud Platform Engineering (CPE) team
4) The portfolio with relevant products for BU Admin and APICoE Admin are setup under Service Catalog
5) Harness Job for launching service catalog products is created for BU Admin and APICoE Admin

Steps:
1) BU Admin receives confirmation from CPE team on dedicated infrastructure provisioning
2) BU logs into Harness and modifies service overides, for the job 'Launch BU Enterprise Gateway', with the infrastructure parameters information provided by CPE team

Alternatively, BU can also send serviceNoW request to APICoE admin to modifiy file under bitbucket repository w.r.t. infrastructure info provided by CPE team and check into the repository

3) The Harness job at the background triggers the 'ServieCatalogMain.tf' that will allow the BU Admin to launch products realted to the portfolio 'BU Admin'
4) The job returns the result of successfully launching products under the respective AWS account.
5) The following products are launched/provisioned assocated with BU AWS account
Enterprise Gateway, Lambda function, AWS Certificate Manager, REST APIs, AWS Cognito, AWS DynamoDB, CloudTrail, CloudWatch
5) Check in the AWS console to view the above mentioned AWS services are provisioned.

WF-03: DNS Creation, Registration and Certificate Management

Primary Actor: APICoE Admin Team

Maintained By: APICoE team

Description: This workflow is part of the infrastructure setup processes that will allow Business Units to setup and apply certificates to Enterprise gateway services on cloud and allow Business Users to invoke APIs from their respective enterprises.

Usage:
1) This will allow the certificates created for a specific DNS to be applied to the AWS Certificate Manager and Enterprise Gateway as a part of establishing certificate based authentication allowing traffic to be routed through CSS Ingress to AWS API GW solution.

Components:
1) S3
2) AWS Certificate Manager
3) Lambda Function
4) AWS API GW

5) Microgateway

Pre-requisites:
1) Integrate Harness with SSO
2) Provide access to APICoE Admin to log into Harness via SSO
3) The AWS account, Region, Avalability Zone, IAM roles, IAM policy is provisioned by the Cloud Platform Engineering (CPE) team
4) Harness Job for launching service catalog products is created for APICoE Admin

Steps:

1) APICoE team gets approval from marketing team on 'DNS' entry. The APICoE raises a request for a new DNS entry via Email sent to the CSS team. A serviceNow ticket is created with the CName/DNS
2) CSS team creates and registers the domain and updates the environment based on ServiceNow approval
3) Certificate created by the APICoE team. 3 Certificates are manually downloaded and the content is copied into a pem file eg. 'certwith_chain.pem'
4) API CoE team applies the pem file to both, WAF and S3 bucket
5) APICoE logs into Harness via SSO
6) APICoE Admin runs job 'Create ServiceCatalog Portfolio' that will will internally invoke 'ServiceCatalogMain.tf', for creating a portfolio, associate portfolio w.r.t. the products, and assign the portfolio as a Service Catalog entry.
7) The Service Catalog portfolio created, will need to be allowed to be shared with the master account.
8) Lambda function updateTruststore() gets triggered & update the AWS Certificates Manager
9) Lambda function applyCertificate() gets triggered & updates AWS API GW with the certificate
10) VPC endpoint routing table will be configured to identify the businessunit and the respective VPC endpoint eg /cisusgateway/stage, /bisusgateway/test
11) Rules needs to be defined as routes in Enterprise API GW eg. cisusgateway/v1/token, bisusgateway/stage/v1/token

Refer Cloud Security Stack (CSS) Ingress for Domain Registration and Certificate Management.
Diagram Source - E-Connect (v3) Ingress - Simplified - Cloud Engineering - Confluence Global (experian.com)
https://pages.experian.com/display/SC/E-Connect+%28v3%29+Ingress+-+Simplified#tab-Flow+to+Experian+Private+API+Gateway

Result:
1) The DNS is registered on WAF and certificates are applied for Business users to be able to access the relevant APIs using the public url 'enterpriseapi.experian.com'

De-centralized VPC endpoint mapping w.r.t. BU account:

The excel sheet defining the example of setting up the environment w.r.t. VPC endpoints for each Business Unit account.

	Environment	BU	URI for the Business user	WAF	VPC Endpoint	Custom DNS for API GW	AWS API GW Routing Table	REST API
PROD	PROD	cisusgateway	https://enterpriseapi.experian.com/cisusgateway/v1/token	enterpriseapi.experian.com	vpc_id => 657564 = /cisusgateway/	enterpriseapi.experian.com	cisusgateway/v1/token	/v1/token
			https://enterpriseapi.experian.com/cisusgateway/v1/checksum	enterpriseapi.experian.com	vpc_id => 657564 = /cisusgateway/	enterpriseapi.experian.com	cisusgateway/v1/checksum	/v1/checksum
		bisusgateway	https://enterpriseapi.experian.com/bisusgateway/v1/token	enterpriseapi.experian.com	vpc_id => 352762 = /bisusgateway/	enterpriseapi.experian.com	bisusgateway/v1/token	/v1/token
			https://enterpriseapi.experian.com/bisusgateway/v1/checksum	enterpriseapi.experian.com	vpc_id => 352762 = /bisusgateway/	enterpriseapi.experian.com	bisusgateway/v1/checksum	/v1/checksum
PROD	Sandbox	cisusgateway	https://sandbox-enterpriseapi.experian.com/cisusgateway/v1/token	sandbox-enterpriseapi.experian.com	vpc_id => 215781 = /cisusgateway/sandbox	sandbox-enterpriseapi.experian.com	cisusgateway/sandbox/v1/token	/v1/token
			https://sandbox-enterpriseapi.experian.com/cisusgateway/v1/checksum	sandbox-enterpriseapi.experian.com	vpc_id => 215781 = /cisusgateway/sandbox	sandbox-enterpriseapi.experian.com	cisusgateway/sandbox/v1/checksum	/v1/checksum
		bisusgateway	https://sandbox-enterpriseapi.experian.com/bisusgateway/v1/token	sandbox-enterpriseapi.experian.com	vpc_id => 515731 = /bisusgateway/sandbox	sandbox-enterpriseapi.experian.com	bisusgateway/sandbox/v1/token	/v1/token
			https://sandbox-enterpriseapi.experian.com/bisusgateway/v1/checksum	sandbox-enterpriseapi.experian.com	vpc_id => 515731 = /bisusgateway/sandbox	sandbox-enterpriseapi.experian.com	bisusgateway/sandbox/v1/checksum	/v1/checksum
	UAT	cisusgateway	https://uat-enterpriseapi.experian.com/cisusgateway/v1/token	uat-enterpriseapi.experian.com	vpc_id => 198844 = /cisusgateway/uat	uat-enterpriseapi.experian.com	cisusgateway/uat/v1/token	/v1/token
			https://uat-enterpriseapi.experian.com/cisusgateway/v1/checksum	uat-enterpriseapi.experian.com	vpc_id => 198844 = /cisusgateway/uat	uat-enterpriseapi.experian.com	cisusgateway/uat/v1/checksum	/v1/checksum
		bisusgateway	https://uat-enterpriseapi.experian.com/bisusgateway/v1/token	uat-enterpriseapi.experian.com	vpc_id => 786555 = /bisusgateway/uat	uat-enterpriseapi.experian.com	bisusgateway/uat/v1/token	/v1/token
			https://uat-enterpriseapi.experian.com/bisusgateway/v1/checksum	uat-enterpriseapi.experian.com	vpc_id => 786555 = /bisusgateway/uat	uat-enterpriseapi.experian.com	bisusgateway/uat/v1/checksum	/v1/checksum
NON-PROD	Stage	cisusgateway	https://stage-enterpriseapi.experian.com/cisusgateway/v1/token	stage-enterpriseapi.experian.com	vpc_id => 315781 = /cisusgateway/stage	stage-enterpriseapi.experian.com	cisusgateway/stage/v1/token	/v1/token
			https://stage-enterpriseapi.experian.com/cisusgateway/v1/checksum	stage-enterpriseapi.experian.com	vpc_id => 315781 = /cisusgateway/stage	stage-enterpriseapi.experian.com	cisusgateway/stage/v1/checksum	/v1/checksum
		bisusgateway	https://stage-enterpriseapi.experian.com/bisusgateway/v1/token	stage-enterpriseapi.experian.com	vpc_id => 615781 = /bisusgateway/stage	stage-enterpriseapi.experian.com	bisusgateway/stage/v1/token	/v1/token
			https://stage-enterpriseapi.experian.com/bisusgateway/v1/checksum	stage-enterpriseapi.experian.com	vpc_id => 615781 = /bisusgateway/stage	stage-enterpriseapi.experian.com	bisusgateway/stage/v1/checksum	/v1/checksum
	TEST	cisusgateway	https://test-enterpriseapi.experian.com/cisusgateway/v1/token	test-enterpriseapi.experian.com	vpc_id => 417781 = /cisusgateway/test	test-enterpriseapi.experian.com	cisusgateway/test/v1/token	/v1/token
			https://test-enterpriseapi.experian.com/cisusgateway/v1/checksum	test-enterpriseapi.experian.com	vpc_id => 417781 = /cisusgateway/test	test-enterpriseapi.experian.com	cisusgateway/test/v1/checksum	/v1/checksum
		bisusgateway	https://test-enterpriseapi.experian.com/bisusgateway/v1/token	test-enterpriseapi.experian.com	vpc_id => 815731 = /bisusgateway/test	test-enterpriseapi.experian.com	bisusgateway/test/v1/token	/v1/token
			https://test-enterpriseapi.experian.com/bisusgateway/v1/checksum	test-enterpriseapi.experian.com	vpc_id => 815731 = /bisusgateway/test	test-enterpriseapi.experian.com	bisusgateway/test/v1/checksum	/v1/checksum
	DEV	cisusgateway	https://dev-enterpriseapi.experian.com/cisusgateway/v1/token	dev-enterpriseapi.experian.com	vpc_id => 598844 = /cisusgateway/dev	dev-enterpriseapi.experian.com	cisusgateway/dev/v1/token	/v1/token
			https://dev-enterpriseapi.experian.com/cisusgateway/v1/checksum	dev-enterpriseapi.experian.com	vpc_id => 598844 = /cisusgateway/dev	dev-enterpriseapi.experian.com	cisusgateway/dev/v1/checksum	/v1/checksum
		bisusgateway	https://dev-enterpriseapi.experian.com/bisusgateway/v1/token	dev-enterpriseapi.experian.com	vpc_id => 286555 = /bisusgateway/dev	dev-enterpriseapi.experian.com	bisusgateway/dev/v1/token	/v1/token
			https://dev-enterpriseapi.experian.com/bisusgateway/v1/checksum	dev-enterpriseapi.experian.com	vpc_id => 286555 = /bisusgateway/dev	dev-enterpriseapi.experian.com	bisusgateway/dev/v1/checksum	/v1/checksum
PROD	PROD	cisukgateway	https://enterpriseapi.experian.co.uk/cisukgateway/v1/token	enterpriseapi.experian.co.uk	vpc_id => 657564 = /cisukgateway/	enterpriseapi.experian.co.uk	cisukgateway/v1/token	/v1/token
			https://enterpriseapi.experian.co.uk/cisukgateway/v1/token	enterpriseapi.experian.co.uk	vpc_id => 657564 = /cisukgateway/	enterpriseapi.experian.co.uk	cisukgateway/v1/checksum	/v1/checksum
		bisukgateway	https://enterpriseapi.experian.co.uk/bisukgateway/v1/token	enterpriseapi.experian.co.uk	vpc_id => 352762 = /bisukgateway/	enterpriseapi.experian.co.uk	bisukgateway/v1/token	/v1/token
			https://enterpriseapi.experian.co.uk/bisukgateway/v1/token	enterpriseapi.experian.co.uk	vpc_id => 352762 = /bisukgateway/	enterpriseapi.experian.co.uk	bisukgateway/v1/checksum	/v1/checksum
	Sandbox	cisukgateway	https://sandbox-enterpriseapi.experian.co.uk/cisukgateway/v1/token	sandbox-enterpriseapi.experian.co.uk	vpc_id => 215781 = /cisukgateway/sandbox	sandbox-enterpriseapi.experian.co.uk	cisukgateway/sandbox/v1/token	/v1/token
			https://sandbox-enterpriseapi.experian.co.uk/cisukgateway/v1/token	sandbox-enterpriseapi.experian.co.uk	vpc_id => 215781 = /cisukgateway/sandbox	sandbox-enterpriseapi.experian.co.uk	cisukgateway/sandbox/v1/checksum	/v1/checksum
		bisukgateway	https://sandbox-enterpriseapi.experian.co.uk/bisukgateway/v1/token	sandbox-enterpriseapi.experian.co.uk	vpc_id => 515731 = /bisukgateway/sandbox	sandbox-enterpriseapi.experian.co.uk	bisukgateway/sandbox/v1/token	/v1/token
			https://sandbox-enterpriseapi.experian.co.uk/bisukgateway/v1/token	sandbox-enterpriseapi.experian.co.uk	vpc_id => 515731 = /bisukgateway/sandbox	sandbox-enterpriseapi.experian.co.uk	bisukgateway/sandbox/v1/checksum	/v1/checksum
	UAT	cisukgateway	https://uat-enterpriseapi.experian.co.uk/cisukgateway/v1/token	uat-enterpriseapi.experian.co.uk	vpc_id => 198844 = /cisukgateway/uat	uat-enterpriseapi.experian.co.uk	cisukgateway/uat/v1/token	/v1/token
			https://uat-enterpriseapi.experian.co.uk/cisukgateway/v1/token	uat-enterpriseapi.experian.co.uk	vpc_id => 198844 = /cisukgateway/uat	uat-enterpriseapi.experian.co.uk	cisukgateway/uat/v1/checksum	/v1/checksum
		bisukgateway	https://uat-enterpriseapi.experian.co.uk/bisukgateway/v1/token	uat-enterpriseapi.experian.co.uk	vpc_id => 786555 = /bisukgateway/uat	uat-enterpriseapi.experian.co.uk	bisukgateway/uat/v1/token	/v1/token
			https://uat-enterpriseapi.experian.co.uk/bisukgateway/v1/token	uat-enterpriseapi.experian.co.uk	vpc_id => 786555 = /bisukgateway/uat	uat-enterpriseapi.experian.co.uk	bisukgateway/uat/v1/checksum	/v1/checksum
NON-PROD	STAGE	cisukgateway	https://stage-enterpriseapi.experian.co.uk/cisukgateway/v1/token	stage-enterpriseapi.experian.co.uk	vpc_id => 615781 = /cisukgateway/stage	stage-enterpriseapi.experian.co.uk	cisukgateway/stage/v1/token	/v1/token
			https://stage-enterpriseapi.experian.co.uk/cisukgateway/v1/token	stage-enterpriseapi.experian.co.uk	vpc_id => 615781 = /cisukgateway/stage	stage-enterpriseapi.experian.co.uk	cisukgateway/stage/v1/checksum	/v1/checksum
		bisukgateway	https://stage-enterpriseapi.experian.co.uk/bisukgateway/v1/token	stage-enterpriseapi.experian.co.uk	vpc_id => 515731 = /bisukgateway/stage	stage-enterpriseapi.experian.co.uk	bisukgateway/stage/v1/token	/v1/token
			https://stage-enterpriseapi.experian.co.uk/bisukgateway/v1/token	stage-enterpriseapi.experian.co.uk	vpc_id => 515731 = /bisukgateway/stage	stage-enterpriseapi.experian.co.uk	bisukgateway/stage/v1/checksum	/v1/checksum
	TEST	cisukgateway	https://test-enterpriseapi.experian.co.uk/cisukgateway/v1/token	test-enterpriseapi.experian.co.uk	vpc_id => 517781 = /cisukgateway/test	test-enterpriseapi.experian.co.uk	cisukgateway/test/v1/token	/v1/token
			https://test-enterpriseapi.experian.co.uk/cisukgateway/v1/token	test-enterpriseapi.experian.co.uk	vpc_id => 517781 = /cisukgateway/test	test-enterpriseapi.experian.co.uk	cisukgateway/test/v1/checksum	/v1/checksum
		bisukgateway	https://test-enterpriseapi.experian.co.uk/bisukgateway/v1/token	test-enterpriseapi.experian.co.uk	vpc_id => 815731 = /bisukgateway/test	test-enterpriseapi.experian.co.uk	bisukgateway/test/v1/token	/v1/token
			https://test-enterpriseapi.experian.co.uk/bisukgateway/v1/token	test-enterpriseapi.experian.co.uk	vpc_id => 815731 = /bisukgateway/test	test-enterpriseapi.experian.co.uk	bisukgateway/test/v1/checksum	/v1/checksum
	DEV	cisukgateway	https://dev-enterpriseapi.experian.co.uk/cisukgateway/v1/token	dev-enterpriseapi.experian.co.uk	vpc_id => 198844 = /cisukgateway/dev	dev-enterpriseapi.experian.co.uk	cisukgateway/dev/v1/token	/v1/token
			https://dev-enterpriseapi.experian.co.uk/cisukgateway/v1/token	dev-enterpriseapi.experian.co.uk	vpc_id => 198844 = /cisukgateway/dev	dev-enterpriseapi.experian.co.uk	cisukgateway/dev/v1/checksum	/v1/checksum
		bisukgateway	https://dev-enterpriseapi.experian.co.uk/bisukgateway/v1/token	dev-enterpriseapi.experian.co.uk	vpc_id => 786555 = /bisukgateway/dev	dev-enterpriseapi.experian.co.uk	bisukgateway/dev/v1/token	/v1/token
			https://dev-enterpriseapi.experian.co.uk/bisukgateway/v1/token	dev-enterpriseapi.experian.co.uk	vpc_id => 786555 = /bisukgateway/dev	dev-enterpriseapi.experian.co.uk	bisukgateway/dev/v1/checksum	/v1/checksum

WF-04: Admin - Portal Customization

Primary Actor: APICoE Admin
Maintained By: APICoE team
Description: This workflow essentially highlights the process for allowing admin users to import swagger file, update information on APIs eg. region, rate limit etc. The Drupal form would allow the APIs to be added to the AWS Enterprise Gateway and further publish those APIs for B2B user consumption.

Components:
1) Okta Integration
2) REST APIs
3) AWS Account

4) Drupal Setup

5) Bitbucket

6) AWS Enterprise Gateway solution

Usage:
1) When APICoE admin should be able to publish APIs for BU user Consumption via Drupal AWS connector

Pre-requisites;
1) Swagger file is provided by the Business unit

2) The drupal environment should be up and running
3) AWS Enterprise Gateway infrastructure should be up and running

Steps:

- Workflow-1: Publish APIs to AWS Enterprise Gateway using Drupal CMS. Steps are as follows
    - Admin user logs into Developer Portal. Redirect to OKTA or Authentication using JWT authentication type. Returns error '403' if credentials are invalid
    - Receive swagger Docs from Business Unit that needs to be published
    - Use Drupal form to check threshold limits and get API products per region
    - AWS API Edge Client will help publish APIs to API GW

- Log into Developer Portal (https://developer.experian.com) as an admin
-

  Install a AWS Client Connector app that will integrate Drupal and AWS API GW

- Receive Swagger Docs from BU
- Open form "Enter API details". Enter information such as 'Region', 'Threshold limits' etc. Customize the APIs before publishing them by way of AWS API GW
  eg. -Restrict the exposure of specific resources, methods, and operations of an API to other applications.
  -Define a custom gateway endpoint by customizing the URL of the gateway endpoint that your users will use to access the API.
- Upload the swagger doc. This will export the APIs to AWS API GW and list them
- API Gateway allows you to publish APIs to Developer Portal from where they are available for consumption by developers and consumers.
  API Gateway also allows you to publish the APIs to the following destinations:
  Service registries. This enables applications to dynamically locate an API Gateway instance that can process that API.
  Integration Server. This is used in API first implementation approach.
- The following sections describe how you can activate an API, customize the gateway endpoint, and publish APIs to different destinations.
    - Activating an API
        - You must first activate the API before publishing it to a portal so that the gateway endpoint is available for developers and consumers to invoke the API.
        - You must have the Activate/Deactivate APIs functional privilege assigned to perform this task. You can activate an API in the Manage APIs page. Alternatively you can also activate the API from the API Details page.
        - The Gateway endpoint is now available, which can be used by the consumers of this API. You can now publish the API to the required destination and expose the API for consumption by the consumers.
    - Once the API is activated, you can define the custom gateway endpoints. For more information about gateway endpoints, see Gateway Endpoints.
    - Once the API is activated, you can enable the tracer. For more information about how to enable the tracer and view the tracing details, see Trace API.
    - Publishing an API to Developer Portal sends the SOAP and REST APIs to Developer Portal on which they are exposed for testing and user consumption. The process of publishing an API to Developer Portal is initiated from API Gateway and is carried out on the Developer Portal server. Doing this involves the following high-level steps:
        - You initiate the publish process by selecting the API to be published, specify the API endpoints to be visible to the consumers, and the Developer Portal communities in which the API is to be published.
        - API Gateway publishes the API to each of the specified Developer Portal communities.
        - During bulk publishing of APIs, the process continues even if API Gateway encounters a failure with Developer Portal.
    - When publishing an API to the Developer Portal destination, keep the following points in mind:
        - The Developer Portal destination must be configured in API Gateway.
        - You must have the Publish to Developer Portal functional privilege.
        - You cannot publish an API if it is in inactive state. You have to activate the API before publishing it.

WF-05: B2C (Business-to-Consumer) users - Portal Customization

Primary Actor: APICoE Admin
Maintained By: APICoE team
Description: This workflow essentially highlights the process for allowing end users to register and log into the gdp portal to explore MyApp creation and adding products/APIs for a specific region, to it. This would also enable them to generate AWS Cognito Client_id/client_secret and further generate JWT access_token creation for them to be able to invoke the relevant APIs. This feature would only be restricted for B2C users on sandbox environment. This would not be deployed or is meant to be used on Production (live) environment.

Components:
1) Okta Integration
2) REST APIs
3) AWS Account

4) Drupal Setup

5) Bitbucket

6) AWS Enterprise Gateway solution

Usage:
1) The B2C user should be able to register as a user, login into the portal, create a customized app, add products/APIs to the customized app, generate client_id/client_secret, authorize the APIs and generate JWT token

Pre-requisites;
1) The drupal environment should be up and running
2) Relevant APIs should already be published

3) AWS Enterprise Gateway infrastructure should already be running

Steps:

1) Log into Developer Portal (https://developer.experian.com)

2) Click on My Apps link in user navigation menu and choose the Region(Click on View My Apps button)

3) Click on the create new app button
A new form that will take the 'App Name' as an input and checkbox of APIs that could be listed in the app. 'Add App'

4) The 'client_id' and 'client_secret' gets generated from Drupal and stored in the Drupal DB
These will be used to make the calls from your application to the Experian API.

5) The 'New App' should get listed under the respective region under 'MyApps' with information from Drupal DB
APP Name | client_id | client_secrets | Operations (Edit/Delete) | Status (Approved)

6) Get an access token from AWS Cognito
Get your access token using the Client ID and Client Secret from the application created earlier along with your Developer Portal username and password. The call to get the Oauth2 token is a POST request with a Content-Type which needs to be specified as JSON; the response will also be in JSON format:

Request example
```
curl -X POST https://sandbox-us-api.experian.com/oauth2/v1/token \
  -H 'Accept: application/json' \
  -H 'Content-type: application/json' \
  -H 'Grant_type: password' \
  -d '{"username": "<USERNAME>","password": "<PASSWORD>","client_id": "<CLIENT_ID>","client_secret": "<CLIENT_SECRET>"}'
```

Response example
```
{
    "issued_at": "1478405901908",
    "expires_in": "1800",
    "token_type": "Bearer",
    "access_token": "eyJraWQiOiJBSmpTMXJQQjdJODBHWjgybmNsSlZPQkF3V3B3ZTVYblNKZUdSZHdpcEYxIiwidHlwIjoiSldUIiwiYWxnIjoiUlMyNTYifQ.
                eyJzdWIiOiJmcmVkZGllIiwiRW1haWwiOiJmcmVkZXJpYy52YW5kZXJlbHN0QGV4cGVyaWFuLmNvbSIsIkZpcnN0TmFtZSI6ImZyZWRkaWU
iL
                CJpc3MiOiJFWFBFUklBTiIsIkxhc3ROOYW1lIjoidmFuZGVyIGVscyIsImV4cCI6MTUwOTAyNDkxMSwiaWF0IjoxNTA5MDE3NzExLCJqdGkiOi
                I1YTdlYzJhZS00YzdiLTQ3MzktYmU0MS1hMDdjZTBmNTc2N2YifQ.MINbv9JtA9JeBW0cp6mhRZ7xhOvu3oI8WDu73xInj14w1fZRX0PaHFR9
                OsCgzGrn-7s46vS2vyScd_MWYfFRWQ8TUGpZ6Gbdh43l_B4UJxu5Uujh1bhrWA1KCsxr5p7LKNI6Pxhc76oVd2EAd0I3X7um-d_fIlds1N4KA
                XmYtXT_oU8DklKHYiWH6L5Yx3Ue_kYQwXikqU0nXdvab35KyFCza9XqSJEeVEubTSdTvvVluzv4AJxN5X-yEtzOtNTV_Yynj4KzdYv8tpuoF2
                LGdzp4G0fOe8mLRNY3g4rCfAnpe0yc1h6LHh0TMhu2e8jaIro4dx7b3VhLlXULm1RqPw",
    "refresh_token": "3Ib5SjC6AOUx5R47ffobFFi8DhGlC2GO"
}
```

7) A session_token is created by Drupal to maintain the user session state

7) Send the access_token to Okta

8) Send your first request, by using the access_token as a bearer token in the authorization header and make your first API call as shown below.

Request example
```
curl -X GET
 'https://sandbox-us-api.experian.com/businessinformation/businesses/v1/search' \
 -H 'accept: application/json' \
 -H 'authorization: Bearer
eyJraWQiOiJBSmpTMXJQQjdJODBHWjgybmNsSlZPQkF3V3B3ZTVYblNKZUdSZHdpcEYxIiwidHlwIjoiSldUIiwiYWxnIjoiUlMyNTYifQ.
                eyJzdWIiOiJmcmVkZGllIiwiRW1haWwiOiJmcmVkZXJpYy52YW5kZXJlbHN0QGV4cGVyaWFuLmNvbSIsIkZpcnN0TmFtZSI6ImZyZWRka
WU
                iLCJpc3MiOiJFWFBFUklBTiIsIkxhc3ROOYW1lIjoidmFuZGVyIGVscyIsImV4cCI6MTUwOTAyNDkxMSwiaWF0IjoxNTA5MDE3NzExLCJqdG
                kiOiI1YTdlYzJhZS00YzdiLTQ3MzktYmU0MS1hMDdjZTBmNTc2N2YifQ.MINbv9JtA9JeBW0cp6mhRZ7xhOvu3oI8WDu73xInj14w1fZRX0
                PaHFR9OsCgzGrn-7s46vS2vyScd_MWYfFRWQ8TUGpZ6Gbdh43l_B4UJxu5Uujh1bhrWA1KCsxr5p7LKNI6Pxhc76oVd2EAd0I3X7um-
d_fI
                lds1N4KAXmYtXT_oU8DklKHYiWH6L5Yx3Ue_kYQwXikqU0nXdvab35KyFCza9XqSJEeVEubTSdTvvVluzv4AJxN5X-
yEtzOtNTV_Yynj4Kz
                dYv8tpuoF2LGdzp4G0fOe8mLRNY3g4rCfAnpe0yc1h6LHh0TMhu2e8jaIro4dx7b3VhLlXUL
```

Result:
1) The B2C user successfully receives the JWT access token and is able to explore creating new Apps and select relevant products

WF-06: B2B (Business-to-Business) users - Onboarding

Primary Actor: Business Users, APICoE Admin

Maintained By: APICoE team

Description: This workflow represent the complete flow of Busines (B2B) user onboarding w.r.t. Okta and AWS Cognito

Usage:
1) This will allow the Business to Business (B2B) users authenticate with Okta, authorize with AWS Cognito, generate client_id/client_secrets, and generate & return JWT access_token.

Components:
1) S3
2) AWS Certificate Manager
3) Lambda Functions
4) AWS API GW

5) Microgateway
6) AWS Cognito

7) AWS DynamoDB

8) Microgateway

Pre-requisites:
1) B2B user vetting
2) Creation of EWACS account
3) Creation of B2B user in OKTA based on EWACS user information.
4) Infrastructure provisioning for the complete AWS API GW solution

Steps:

1) Business Unit will raise a ServiceNow request to onboard a new B2B user
2) The GSA Support team will then go ahead and create an user profile on OKTA
3) Business Unit will request client_id/client_secret, token_url for the developer application from APICoE team
4) APICoE team will Launch Cognito Client App via Service catalog
5) Create Client App in B2B AWS Cognito user pool for the B2B user as per the user profile details (variables) defined using drupal forms. Client_id /client_secret is generated for the Cognito Client app
6) APICoE team maps Cognito Client application with respective API GW
7) AWS Cognito returns 'Client_id/client_secret' to APICoE team
8) APICoE team shares client_id/client_secret, token_url with Business Unit
9) Business user uses token_url to invoke Access Token Gateway using 'grant_type=password', Okta user/password
10) Access Token Gateway sends the 'access token request' to Enterprise Gateway
11) Enterprise Gateway returns the 'JWT access token' back to the Business user

Result:
1) The B2B user successfully receives the JWT access token

WF-07: B2B (Business-to-Business) users - API Invocation

Primary Actor: Business Users, APICoE Admin

Maintained By: APICoE team

Description: This workflow represent the complete flow of Busines (B2B) user onboarding w.r.t. Okta and AWS Cognito

Usage:
1) This will allow the Business to Business (B2B) users to invoke the relevant APIs.

Components:
1) S3
2) AWS Certificate Manager
3) Lambda Functions
4) AWS API GW

5) Microgateway
6) AWS Cognito

7) AWS DynamoDB

8) Microgateway

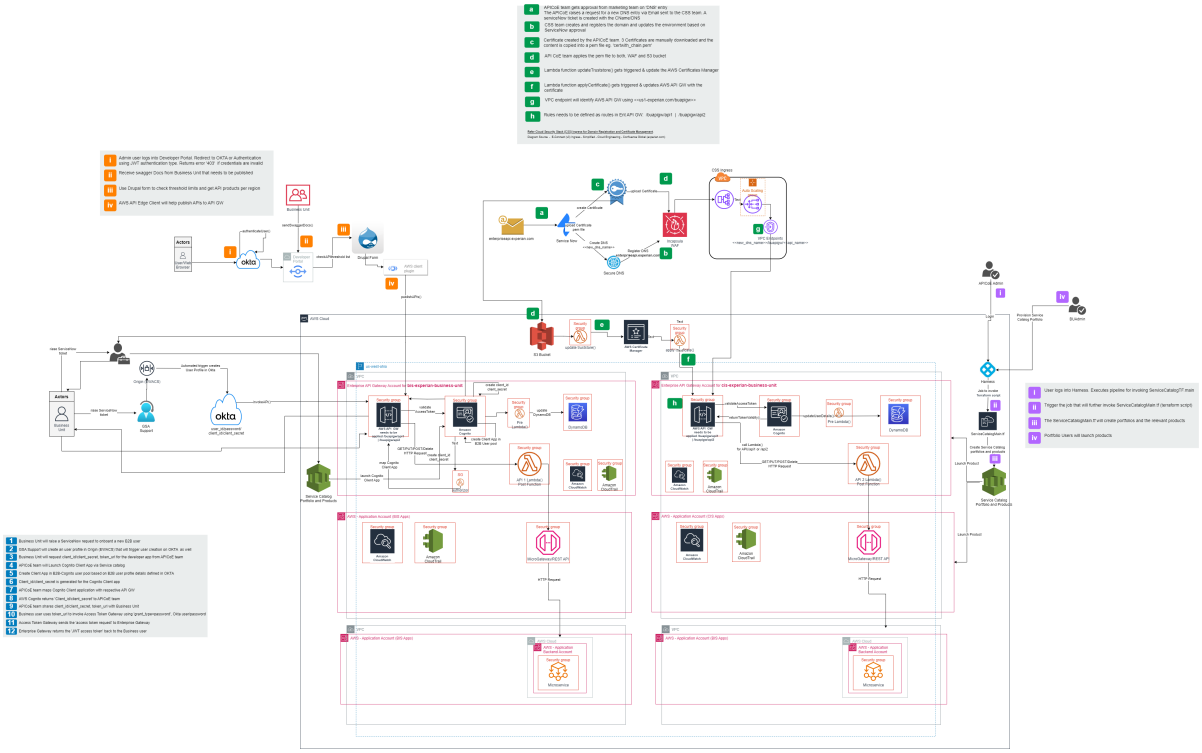
Pre-requisites:
1) B2B user onboarding
2) APIs published
3) Infrastructure provisioning for the complete AWS API GW solution

Steps:

1) Business user accesses the 'enterpriseapi.experian.com' using JWT access_token on request header. The request reaches the Enterprise Gateway first.
2) Enterprise Gateway will validate the access token and the scope with AWS Cognito.
3) AWS Cognito returns token validity back to Enterprise Gateway.
4) If the token is invalid then 'Unauthorized message is sent to the user from Enterprise Gateway. If the token is valid, then the request is forwarded to MicroGateway from Enterprise Gateway.
5) Microgateway will forward the request to the respective backend API.
6) Backend API will return the data with HTTP response.

Result:
1) The B2B user is successfully able to invoke APIs

High Level Diagram



Pre-Functions being used (Lambda function names. the names will change and version history will be able to track it)

Name	Use case
OKTA-COGNITO-PRE-SIGNUP-DYNAMO	When user sign up for the very first time , user is created in AWS Cognito and this lambda function will capture the user details and store it it Dynamo db table
B2B-token-generator	This lambda function validates the user from OKTA , then check same in AWS Cognito and then generate JWT access token
auto-create-cert	This lambda function checks the S3 bucket for .pem and .key file and once that happens , lambda function imports a new certificate in AWS certificate manager
acm-api	This lambda function works on event bridge ,whenever a new certificate is imported in AWS certificate manager, lambda will apply that on respective API gateway
Post-Function being used (Lambda function names. the names will change and version history will be able to track it)	
Name	Use case
multi-rest-api-lambda-node	This lambda is integrated with Enterprise gateway and send request to the respective microgateway based on the routes
auto-reimport-cert	This lambda is integrated with a folder in S3 bucket that will be used for latest .pem and .key file for certification renew. This function will reimport the existing certificate present in ACM with latest files.

Important documentation links related

- Certificates Management and DNS registration Certificates Management and DNS Registration
- Okta Integration with WAF and API Gateway Manual Okta Integration with WAF and API Gateway
- Service Catalog delete the page
- Authorization/Authentication APIs Test cases scenarios
- Developer Portal Test cases scenarios
- CI/CD
- Terraform name conventions Terraform Best Practices#NameConvention
- Terraform scripts organization Terraform Best Practices#StandardStructure
- Bitbucket project link https://code.experian.local/projects/APDE/repos/eits-enterpriseapigateway-aws/browse