GBM Technical Proposal v3.0

Response to RFP for API Manager/Gateway Implementation

Prepared for:	Ahlibank
Prepared by:	Gulf Business Machines (Oman) Co. LLC
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21 December 2023	1.0	Mohammed Haymoni	Technical proposal
14 May 2023	2.0	Mohammed Haymoni	Adding Internal API Gateway Adding VM Based deployment as an option
04 June 2024	3.0	Mohammad Al Haymoni	Removing Openshift deployment option. VM Based Deployment for one gateway

Validity Statement

This proposal is valid for 30 days from the date of submission unless otherwise noted.

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Cover letter

To,

IT Vendor Management, Digital Transformation Office
Ahlibank S.A.O.G
Head Office: Al Nahda Street, Al Watayah,
Governorate of Muscat, Sultanate of Oman
Email: DTO@ahlibank.om

Reference: Your RFP for API Manager/Gateway Implementation

Dear Sir,

At the outset, please accept our thanks to you for giving us an opportunity to submit our technical proposal for your RFP mentioned above.

Any changes to this offer to suit your requirements will be discussed with you and the offer will be suitably modified.

Thank you for your time and interest. We look forward to answering your questions. Please feel free to contact us if you need additional information.

For Gulf Business Machines (Oman) Co. LLC

GBM Account Manager:	Adonis Mhanna
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1 Introduction

The **Ahlibank's** business objectives in striving to offer innovative products and superior service; the Bank intends to implement a robust and highly scalable **API Management Solution** which may include IBM API Connect.

It is with this in mind that **Ahlibank** wishes to implement API Banking solution that is robust, scalable and that fulfils all the requirements listed in this document.

Ahlibank is looking for Implementation of API Banking solution to meet the current and future business requirements. A requirements document for the same has been issued to invite bidders to submit the proposal. This document details the basic understanding of requirements, scope of services, Assessment and implementation methodology provided by GBM Systems Integrators for implementing the proposed solution.

2 GBM Overview

We are proud to have supported the region's growth over the years by working closely with governments and private sector organizations to help them transform and achieve their goals. Here's why the region's leading organizations trust us to develop their digital transformation agenda.

1

WE HAVE A PROVEN TRACK RECORD

With almost three decades of proven success and an established presence in the region. We care about the societies in which we operate.

2

WE BELIEVE IN CONSTANT SUPPORT

With on-the-ground, readily available teams of skilled experts that understand the local market and speak the language of our customers. You can rely on us for around the clock support.

3

WE ARE EXPERTS WITHIN OUR FIELD

We have been recognized by the world's leading technology innovators with numerous awards and accreditations.

4

WE HAVE A PASSION FOR DRIVING REAL BUSINESS RESULTS

Through our commitment to excellence we want to become as fundamental to the future success of our customers as they are to ours.

5

WE BELIEVE IN PROVIDING THE BEST SERVICE

We will always strive to provide exceptional value to our customers and are willing to go the extra mile, every time.

As demand for disruptive technologies continue, we will continue to prepare businesses for tomorrow.

3 About GBM

With over 28 years of expertise, 7 offices, and a workforce exceeding 1500 professionals throughout the region, Gulf Business Machines (GBM) stands as the foremost provider of digital solutions in the region. Serving as your comprehensive digital transformation ally, GBM presents the broadest portfolio in the region, encompassing top-notch infrastructure, digital business solutions, security, and services.

Fostering alliances with the world's leading technology firms, GBM has invested in a highly skilled workforce to implement solutions tailored to meet customers' specific, intricate, and diverse business requirements. With readily available expertise on the ground, GBM delivers round-the-clock support to customers throughout the region. **OUR OFFERINGS**

Managed Services

We provide a varied range of services to address your transformation requirements, ranging from the complete outsourcing of assets and human resources to on-site and remote services.

Digital Infrastructure Solutions

These serve as the foundational elements for your digital transformation framework and include Servers, Storage, Next Generation Datacenters, Cloud Infrastructure, Wireless & Networking, and AV & Conferencing.

Digital Business Solutions

Empower your organization through the adoption of cutting-edge technologies such as Digital Automation, IoT, Enterprise Application, Customer Engagement, AI, and Analytics, unleashing the full potential of digital transformation.

Security Solutions

Take a comprehensive approach to safeguarding your organization against internal and external threats, covering People, Data, Applications, Network, and End-Point Security.

Hybrid IT & Cloud Services

Facilitate your journey to the cloud by offering services ranging from data center services to integrated private and cloud services. We collaborate with customers to convert their existing legacy environments into a more agile infrastructure.

Technical Support & Professional Services

Ensure the longevity and reliability of your infrastructure by providing hardware and software warranty and maintenance solutions. This approach enhances your return on investment by sustaining a robust and dependable technological environment.

4 Why GBM

We have continuously nurtured partnerships with leading technology innovators across the globe, to provide our customers with world class digital solutions, tailored to their unique needs.

We are proud to be one of IBM's most strategic partners in the Gulf, having partnered with them since our inception as their sole distributor throughout the GCC (excluding Saudi Arabia and selected IBM product and services).

Our long-standing partnership with Cisco dates back to 1999. We hold the highest level of certification with them – Cisco Gold partner status and today we are the only Gulf company to hold both a Cisco Master Collaboration, Master Security Partner accreditation and Master Networking Specialization.

Whilst we started out with a partnership with IBM, our customer offering has expanded to include many other global leading IT organizations. We are a VMware Premier level partner and also have strategic partnerships with; Lenovo, Red Hat, Toshiba, Citrix, F5 and Schneider amongst others.

28+ years in the region with a partnership with Cisco, and VMware's largest partner in the region

1500+ employees, 13+ languages, 13 certified program and project managers, 40% + of employees hold engineering degrees.

Over 45 prestigious industry and partner awards, 2000 clients in the region.

Quality Management System:SO9001:2008 A total of 850 vendor certifications and over 51% of the workforce have over 5 years of service.

5 GBM's Service Offerings

GBM provides Enterprise Business Solutions around the globe by leveraging over many years of practical experience and accumulated best practices around enterprise integration. Our end-to-end Portal, SOA and Security solutions allow companies to leverage their key resources—information, applications, people, and processes.
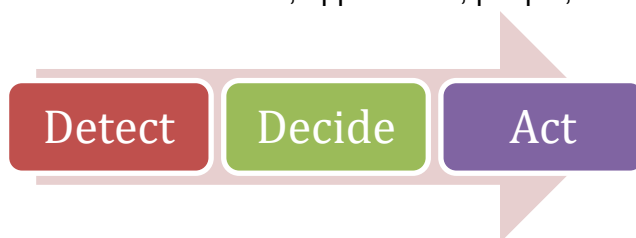
The areas in which GBM have specialist skills are:

- ✓ Business Integration and SOA
- ✓ Business Process Management& Operations Decision Management
- ✓ Enterprise Portals& Content Management
- ✓ Enterprise Security, Identity Management & Compliance
- ✓ Enterprise Information management & Data Management
- ✓ Business Intelligence & Analytics
- ✓ Collaboration & Mobility
- ✓ Social & Cloud Solutions.

Our expert consultants provide highly specialized skills to all aspects of the full project lifecycle including architectural advisement, design, and development through deployment, administration, testing and training. With our corporate experience in information technology, GBM has established a methodology for rapid design, development, and delivery that is second to none.

6 Proposed Solution/Statement of Work

6.1 Our Understanding of the scope of work

Ahlibank is planning to implement API banking solution with IBM API Connect product to meet the current and future business requirements. GBM is proposing VM based deployment for **IBM API Connect components** for enabling the required solution,

The following sections deal with the scope of work, our understanding and the activities that are in scope, assumptions and dependencies. Scope also includes Training and Post Implementation Support.

The scope of this proposal constitutes Installation, Configuration of API Connect Solution components and deployment/implementation of the Solution in **Development as separate API gateway Test, Production and Disaster Recovery (DR) environments.**

6.2 Requirements Elaboration

The following section describes our understanding of the requirements:

- ✓ Performing Requirements gathering by conducting workshops and discussions with Ahlibank business, IT and other key team members. Gathering and documenting functional requirements, non-functional requirements, security, and user management and business requirements.
- ✓ Performing requirement gathering by conducting workshops with IBM for the Infra and Hardware sizing based on the RFP expectation by the bank.
- ✓ Installation of API Connect Solution and its components in TEST, PRODUCTION and DR environments and separate gateway for development on VM based.
- ✓ Common Control planes (UAT and Dev)
- ✓ The Environments setup will be as below:
    - o Development API Gateway – single gateway
    - o TEST- HA on gateway level
    - o PRODUCTION-HA
    - o DR - HA
- ✓ GBM is proposing development of 10 API's (4 Complex, 3 mediums, 3 simple API's) however will work with Ahlibank team to arrive at the exact list of APIs to be developed for this phase.
- ✓ The API Banking Solution to be developed leveraging IBM API Connect product part of CP4I on VM based.
- ✓ All the lifecycle management of existing APIs to be handled in IBM API Connect, with IBM APIC providing a scalable, robust platform for designing, building, publishing and maintaining the APIs.
- ✓ GBM assumes that there will be T&M Model engagement for the API implementation after 10 API's implementation, The proposal will be given separately for the same.
- ✓ GBM will arrange/provide necessary training to IT team/Business unit users on using the application.
- ✓ GBM will provide 2-month post go-live for a period as mentioned in the RFP.

7　API Solutions

The API solution is to be developed leveraging on IBM product Cloud Pak for Integrations will be deployed on VM platform.

7.1 Requirement Analysis

We understand the challenges of ensuring the business stays flexible and the applications stay focused. There is a need to connect disparate applications and business data across multiple platforms. Business data must be available exactly where you want it and, in the format, you need it. As the integration needs evolve, the time and expense to develop and maintain custom links between applications increase, potentially affecting your bottom line.

We recognize your need to connect applications using reliable delivery mechanisms, and to help ensure the data being exchanged is delivered in the right format, to the right application, at the right time. Combining all your IT resources can help maximize operating efficiencies and provide consistent, accurate information to your customers, trading partners, and suppliers.

7.2 Approach to Meeting the requirements.

IBM API Connect is a security-rich API management solution that uses an intuitive experience to help consistently create, manage, secure, socialize and monetize APIs, helping power digital transformation on premises and across clouds.

7.3 Solution Architecture

As part of the proposal GBM is proposing VM-based deployment the API Connect solution.

The following is the High-level solution architecture of the Ahlibank where in API Connect and DataPower layers will be deployed on VM Ware.

When deploying API Connect for High Availability, it is recommended that you configure a cluster with at least three nodes and a load balancer. A sample configuration is provided for placing a load balancer in front of your API Connect OVA deployment.
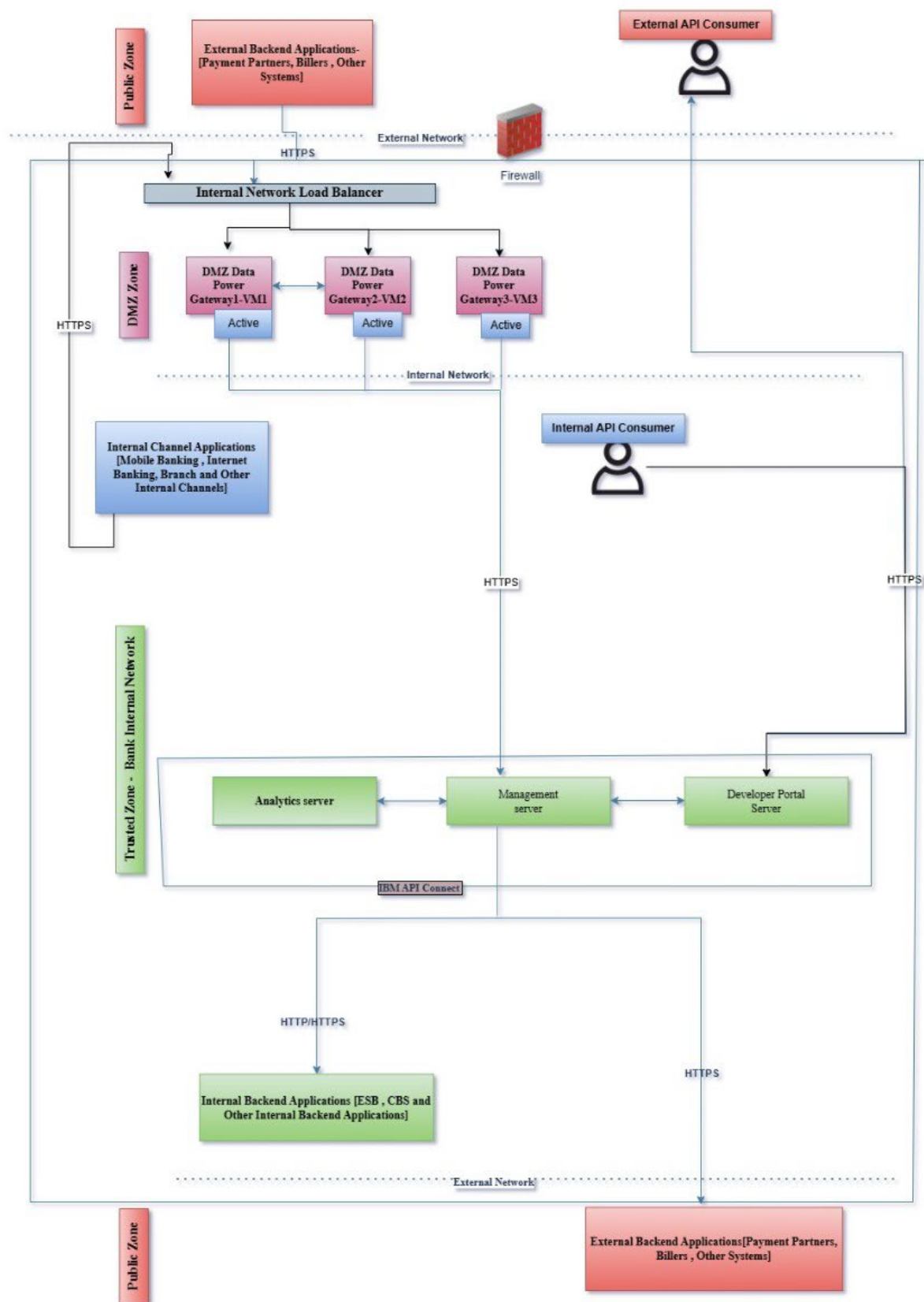
Production Site

Figure 2: Solution architecture of API Connect for Ahli Bank VM based.

7.4 IBM Cloud Pak for Integration

IBM Cloud Pak for Integration offers a simplified solution to integration challenge, allowing the enterprise to modernize its processes while positioning itself for future innovation.

IBM Cloud Pak for Integration brings together proven, best-in-class capabilities to deliver a streamlined forward-looking modern integration solution, available as a single high value purchase at lower cost. This new product unifies disparate tools into one solution that integrates both modern and traditional products. IBM Cloud Pak for Integration simplifies purchasing, deployment, management and maintenance of Integration requirements of any enterprise.

Only the IBM Cloud Pak for Integration enables:

- Best of breed capabilities across the broadest set of integration styles (App, APIs, Messaging, Events, Fast Transfer, etc.) to lower project risk
- Secure integration to any cloud, SaaS service or on-prem environment for ultimate flexibility
- Centralized single pane of glass administration across integration styles and environments to reduce TCO.
- Out of the box reuse and control to speed integration projects.

IBM Cloud Pak for Integration helps support the speed, flexibility, security and scale required for integration and digital transformation initiatives. It also comes with a pre-integrated set of capabilities which include API lifecycle, application and data integration, messaging and events, high speed transfer and integration security.

The following components are integrated in IBM Cloud Pak for Integration

- Platform Navigator, a simple integrated user interface spanning components.
- OpenShift, providing a Kubernetes-based foundation.
- API Connect, implementing managed APIs.
- IBM DataPower Gateway, for gateway services. Aspera High Speed Transfer Server, for large file transfers

7.5 platform Specification and Sizing

7.5.1 VM Based Deployment

7.5.1.1 VM Based Supporting one Gateway Only (External Gateway)

#	Part No.	Description	Qty
1	D20ZBLL	IBM Cloud Pak for Integration Virtual Processor Core License + SW Subscription & Support 12 Months	38

Required Sizing

Production							
Description	**Component**	**Deployment**	**Replicas**	**vCPU**	**Total vCPU**	**CP4I Ratio**	**CP4I VPC**
API Connect - Centralized Control Plane	API Manager	VMWare	1	4	4	1	4
	Developer Portal	VMWare	1	4	4	1	4
	API Analytics	VMWare	1	4	4	1	4
API Gateway - External	API Gateway	VMWare	3	4	12	1	12
			Sub-Total	-	-	24	-	24

UAT							
Description	**Component**	**Deployment**	**Replicas**	**vCPU**	**Total vCPU**	**CP4I Ratio**	**CP4I VPC**
API Connect - Centralized Control Plane	API Manager	VMWare	1	4	4	0.5	2
	Developer Portal	VMWare	1	4	4	0.5	2
	API Analytics	VMWare	1	4	4	0.5	2
API Gateway - External	API Gateway	VMWare	3	4	12	0.5	6
			Sub-Total	-	-	24	-	12

DEV							
Description	**Component**	**Deployment**	**Replicas**	**vCPU**	**Total vCPU**	**CP4I Ratio**	**CP4I VPC**
API Connect - Centralized Control Plane			Shared with UAT				
API Gateway - External	API Gateway	VMWare	1	4	4	0.5	2
			Sub-Total	-	-	4	-	2

Sub-Total - Production	24
Sub-Total - Non-Production	14
Total - Production + Non-Production	**38**

DR							
Description	**Component**	**Deployment**	**Replicas**	**vCPU**	**Total vCPU**	**CP4I Ratio**	**CP4I VPC**
API Connect - Centralized Control Plane	API Manager	VMWare	1	4	4	1	4
	Developer Portal	VMWare	1	4	4	1	4
	API Analytics	VMWare	1	4	4	1	4
API Gateway - External	API Gateway	VMWare	3	4	12	1	12
			Sub-Total	-	-	24	-	24

** Cold DR

7.6 Disaster Recovery Site Deployment for VM Based

The following is the disaster recovery plan for API Connect solution deployed on VM Based environments.

We will create the similar setup of the Production site in the DR site as well, we will keep taking the backups of all components of API connect and DataPower and restore them in the DR site to make sure the DR is almost in sync with production site.

We will do a DR failover test for to ensure the DR is taking over the API traffic smoothly, In order to this we will configure the DR Ips instead of the Production Ips in FQDN or in any domain server in the Bank. So that the traffic will move to the DR site.
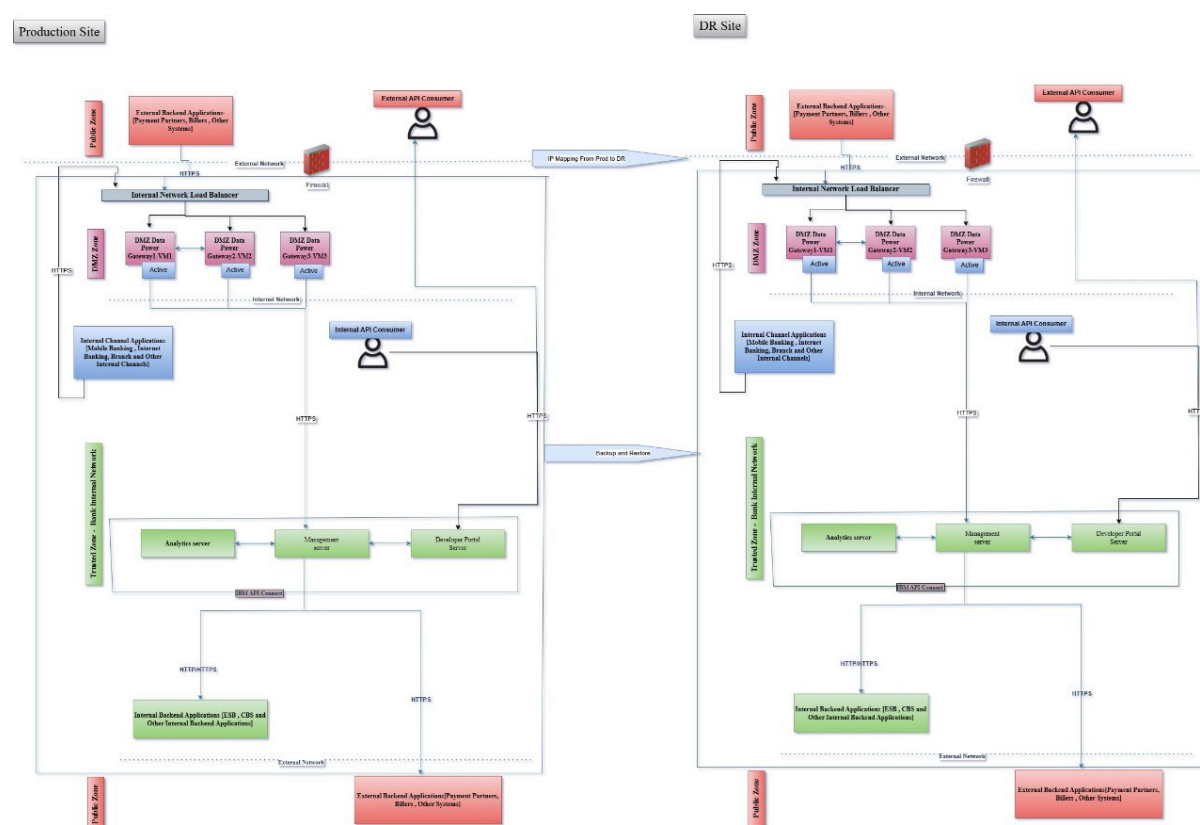
7.7 IBM API Connect

IBM API Connect is an integrated API management offering, where all the steps in the API lifecycle, and the actions that surround it, are performed within the offering.

The steps of the API lifecycle include creating, running, managing, and securing APIs, as depicted in the following diagram.

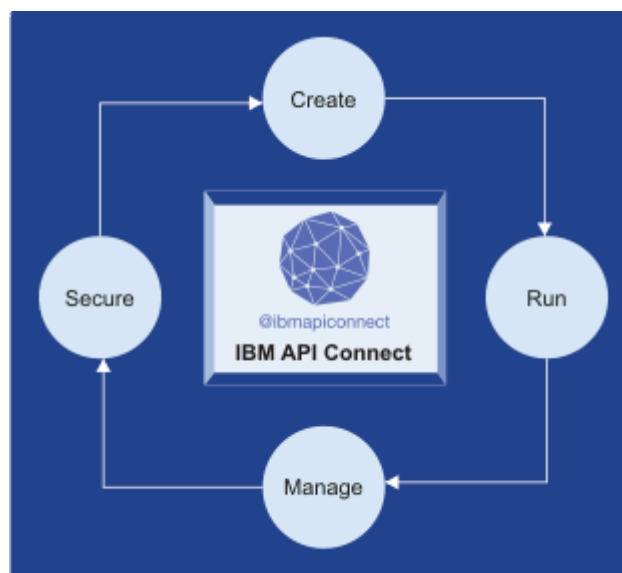With API Connect, you can perform all the lifecycle steps in a single integrated offering, removing the requirement to use multiple API management offerings to obtain the same capability. API Connect includes the following key capabilities to cover the lifecycle of an API:

- Automated, visual, and coding options that API providers can use to create scalable APIs.

- Node.js and Java support for creating micro services applications and APIs with integrated tooling.
- Integrated enterprise grade clustering, management, and security for Node.js and Java
- Lifecycle management and governance for APIs
- Access control over APIs for both API providers and consumers by using role-based permissions, API packaging constructs, and subscription and community management.
- Customizable, self-service portals for publishing APIs for discovery and use
- Runtime enforcement of built-in and user-defined policies, and mechanisms to secure, control, and optimize API traffic.
- API usage analytics for both API providers and consumers, with runtime and historical reporting on usage patterns and performance metrics

7.8 Platform Navigator

The initial installation of ICP4I procedure establishes a base Cloud framework. Once you have logged in to the base framework, the Platform Navigator then allows seamless access to any other components you have running, without requiring any further logins. You can then create instances of the other components you need to implement solutions.

7.9 IBM API Connect Overview

IBM® API Connect is an integrated API management offering, where all of the steps in the API lifecycle, and the actions that surround it, are performed within the offering.

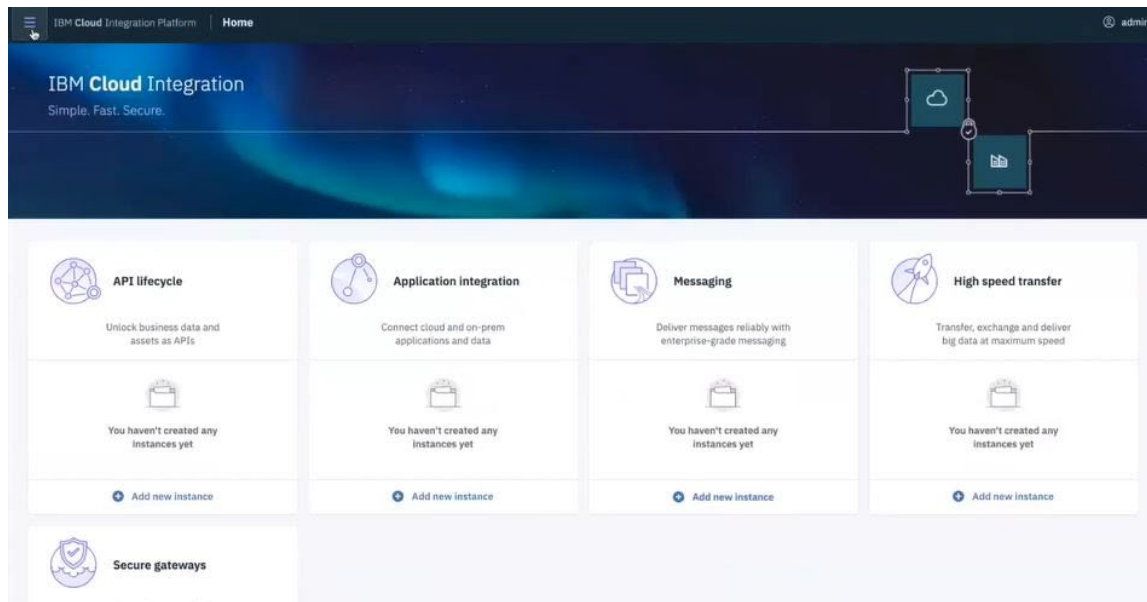The steps of the API lifecycle include creating, running, managing, and securing APIs, as depicted in the following diagram and Table 1 summarizes these steps.

Create	Develop and write the API definition and implementation and test the API.

Run	Package and deploy the API. Ensure that the API is hosted securely on a stable platform.
Manage	Create and manage self-service portals that expose the API-to-API consumers. Monitor the set of rules and conditions that govern the API to ensure it is fulfilling its intended purpose and adjust if necessary. Retire and archive the API when appropriate.
Secure	Incorporate access control, monitoring, and logging to properly secure the API.

Table 1. Steps of the API lifecycle

With API Connect, you can perform all the lifecycle steps in a single integrated offering, removing the requirement to use multiple API management offerings to obtain the same capability. API Connect includes the following key capabilities to cover the lifecycle of an API:

- ✓ Automated, visual, and coding options that API providers can use to create scalable APIs
- ✓ Node.js and Java support for creating micro services applications and APIs with integrated tooling.
- ✓ Integrated enterprise grade clustering, management, and security for Node.js and Java
- ✓ Lifecycle management and governance for APIs
- ✓ Set pricing details in plans to define revenue-producing subscription plans for your APIs.
- ✓ Access control over APIs for both API providers and consumers by using role-based permissions, API packaging constructs, and subscription and community management.
- ✓ Customizable, self-service portals for publishing APIs for discovery and use
- ✓ Runtime enforcement of built-in and user-defined policies, and mechanisms to secure, control, and optimize API traffic.
- ✓ API usage analytics for both API providers and consumers, with runtime and historical reporting on usage patterns and performance metrics

7.10 API Connect concepts.
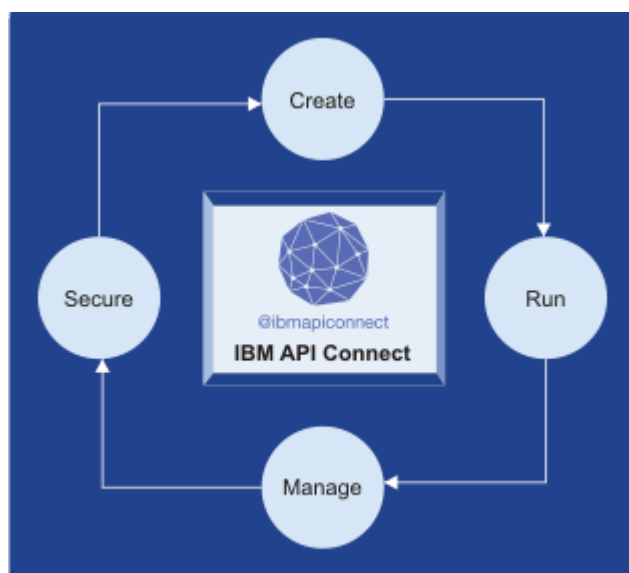
7.10.1   Packaging strategy and terminology in API Connect

API Connect uses a proprietary packaging strategy for creating and publishing collections of APIs.

The packaging strategy supports API providers in meeting the requirements of the API consumers. An understanding of the concepts and terminology behind the packaging strategy is required before developing and deploying APIs using IBM API Connect.

The following sections describe the concepts and terminology behind the packaging strategy for IBM API Connect:

- ✓ APIs
- ✓ Plans and Products
- ✓ Catalog and Spaces
- ✓ Organizations and users
- ✓ Applications
- ✓ Sample provider organization with two Catalogs

7.10.2   API Connect components.

The API Connect components provide a unified user experience across the API lifecycle. Changes in one stage of the API lifecycle are automatically reflected in the other components of API Connect.

The following diagram depicts the API Connect components, summarizes the key functions of each component, and illustrates how the components interact. The components are further described in the sections that follow.
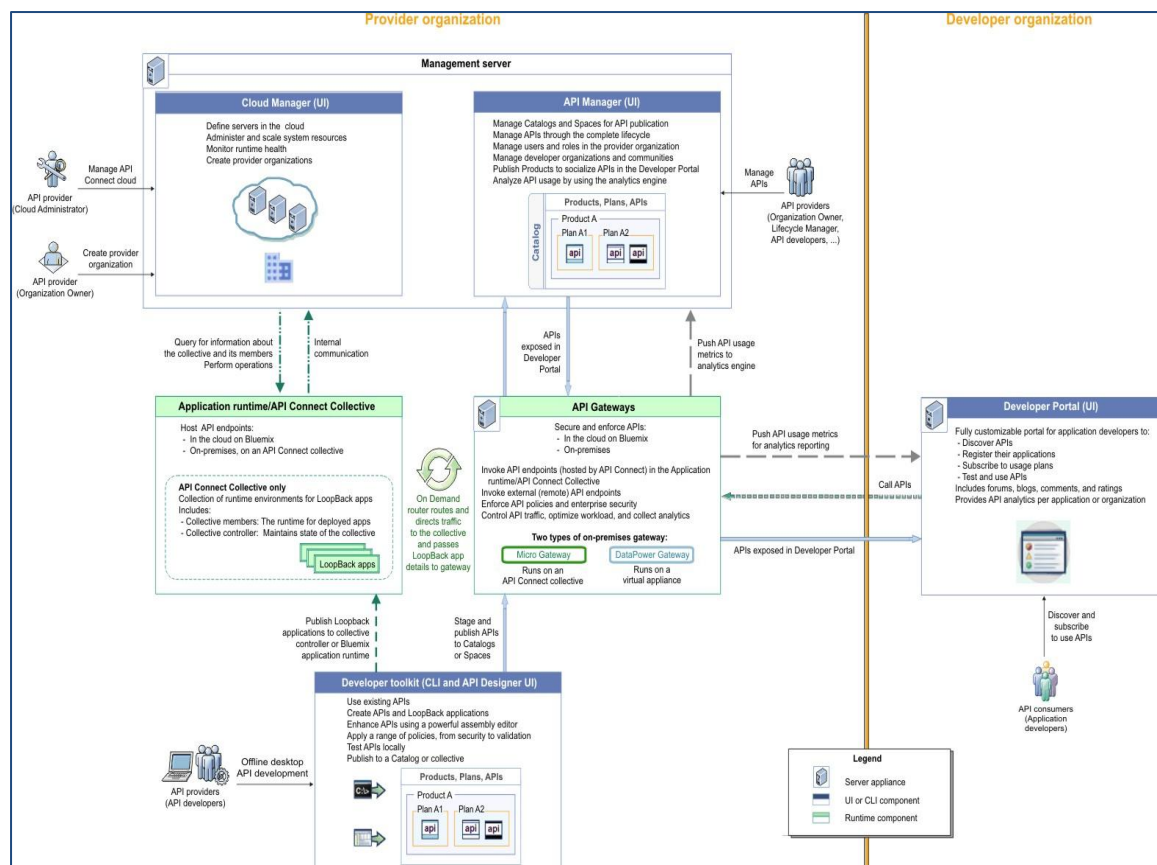
- ✓ Cloud Manager
- ✓ The developer toolkit
- ✓ API Manager
- ✓ API Gateways
- ✓ Developer Portal
- ✓ Typical tasks per interface component
- ✓ API Connect server requirements

7.10.3   Cloud Manager

The API Connect Cloud Manager component is used to manage the API Connect on-premises cloud. The Cloud Administrator uses this UI to:
- ✓ Define the cluster of *Management servers*, *Gateway servers*, and *containers* that are required in the cloud, and configure the topology.
- ✓ Manage (modify, move, remove, restart, reboot) the servers in the cloud.
- ✓ Monitor the health of the cloud.
- ✓ Define and manage the provider organizations that develop APIs. (Assigned managers or owners of provider organizations can also complete this task.)
- ✓ Define additional cloud administrators or set up users with roles that enable access to specific capabilities.
- ✓ Add user registries for authenticating users and securing APIs and configure the secure transmission of data (for example, through websites).

The developer toolkit provides the tools for modeling, developing, and testing APIs and LoopBack® applications. The developer toolkit includes a command line interface (CLI)

and a corresponding graphical user interface, the API Designer. It incorporates LoopBack, an open source Node.js framework.

API developers use the API management functions in the API Designer or the CLI to create draft API definitions for REST and SOAP APIs, or for OAuth provider endpoints that are used for OAuth 2.0 authentication. The API definitions can be configured to add the API to a Product, add a policy assembly flow (to manipulate requests/responses), and to define security options and other settings. APIs can then be tested locally prior to publishing, to ensure they are defined and implemented correctly.

Using LoopBack, an API developer can create a Node.js application, connect to a data source such as a back-end database or a REST API to be consumed, and then expose the application as a REST API by creating a model definition. A LoopBack model defines the application data, validation rules, data access capabilities, and business logic for an API, and provides a REST API by default. This REST API can then be used by a REST API definition that was created using the API Designer or CLI and exposed to your users. The API and its associated application, which are implemented as a LoopBack project, must both be published to enable the project to be run. LoopBack projects can also be tested locally. The following diagram illustrates the LoopBack project architecture:
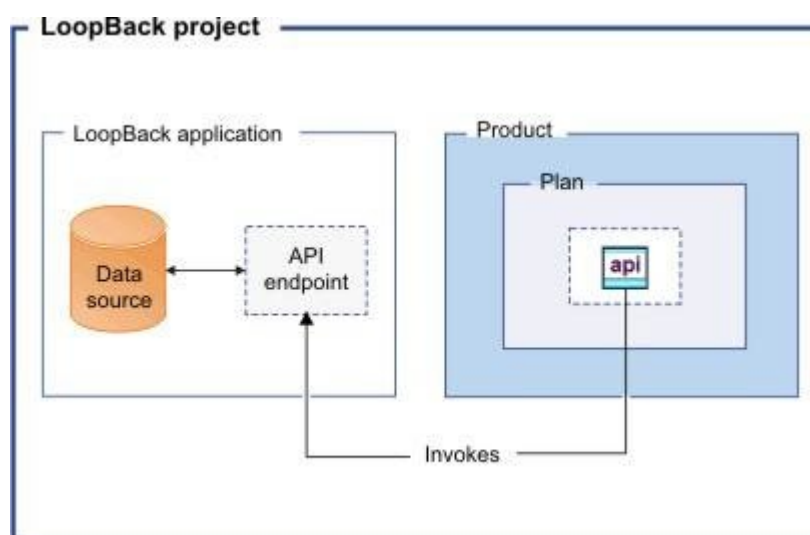
Draft APIs (in their containing Products) that are created using the API Designer, CLI, or LoopBack are published to Catalogs. Applications created using LoopBack are published to containers or to an API Connect collective, from where they run when called.

7.10.4   API Manager

The API Manager provides a user interface that facilitates promotion and tracking of APIs that are packaged within Products and Plans. API providers can move the Products through their lifecycle and manage the availability and visibility of APIs and Plans.

Catalogs and Spaces are created in the API Manager to act as staging targets through which APIs, Plans, and Products are published to developer organizations. API providers can stage

their Products to Catalogs or Spaces, and then publish them to make the APIs in those Products visible on a Developer Portal for external discovery.

To control access to the available API management functions, users in the provider organization can be set up in the API Manager UI with assigned roles and permissions. API providers can also use the UI to manage the developer organizations that sign up to access their APIs and Plans. Developer communities can additionally be created as a way of grouping together a collection of developer organizations to whom a particular set of Products and Plans can be made available.

The API Manager UI also includes functions to manage the security of the API environment and provides access to analytics information about API invocation metrics within customizable dashboard views.

7.10.5   API Gateways

Gateways enforce runtime policies to secure and control API traffic, provide the endpoints that expose APIs to the calling applications, and provide assembly functions that enable APIs to integrate with various endpoints. They also log and report all API interactions to the API Connect analytics engine, for real-time and historical analytics and reporting. Two types of Gateway are available for use in API Connect:

   ✓ The Micro Gateway is a Gateway that is built on Node.js, for use by developers and single departmental projects, and it provides enforcement for the authentication, authorization, and flow requirements of an API. The Micro Gateway provides a limited set of API policies for security and traffic management. The Micro Gateway is deployed on an API Connect collective and supports a single Catalog per instance or cluster.

   ✓ The DataPower Gateway is an enterprise API Gateway that is built for departments and cross-enterprise usage. This Gateway provides a comprehensive set of API policies for security, traffic management, mediation, acceleration, and non-HTTP protocol support. The DataPower Gateway is deployed on a virtual or physical DataPower appliance and supports multiple Catalogs per instance or cluster. The DataPower Gateway has more policies available to it than the Micro Gateway and can handle enterprise level complex integration. DataPower Gateway supports containers for flexible runtime management.

Your API Connect offering (or edition) can include a Micro Gateway only, or both a Micro Gateway and virtual DataPower Gateway. Support for a physical DataPower Gateway is also available, subject to certain conditions.

Application runtime/Containerized runtime/API Connect Collective:

You can run applications and API implementations in application containers.
Application runtime

The application runtime provides a runtime environment for executing APIs in API Connect.

Containerized runtime

A containerized runtime environment provides a lightweight deployment location for APIs and applications. A container wraps an application in a complete file system that includes everything it needs to run, such as code, runtime, system tools, and system libraries. You can use Docker Swarm or Kubernetes containers to run your APIs and applications being managed by API Connect.

API Connect Collective

In an on-premises environment, the API Connect Collective component additionally provides a collection of runtime environments for executing LoopBack applications that are created using the developer toolkit.

In API Connect, a *collective* is used to deploy and run LoopBack applications and the Micro Gateway (which itself is created as a LoopBack app). A collective is an administrative and operational domain for a collection of servers. In this context, a *server* refers to a LoopBack application, which is packaged as an application server for deployment to the collective. When a LoopBack application (server) is published to a collective, it must be *joined* to the collective, which then makes that application server a *collective member*. A collective member is the runtime for a deployed application. The collective members for each deployed application run on a *member host*, which is a machine that is set up to run servers in a collective, has an SSH daemon installed, and is registered with the collective.

The collective members are managed by a *collective controller*, which is a (WebSphere Application Server) Liberty Network Deployment Java server that maintains the state of the collective. The collective controller runs on a *controller host* machine. The collective controller acts as a centralized control point for the collective to perform operations such as file transfer and cluster management and includes storage and collaboration capabilities. More specifically, the collective controller is responsible for deploying a published LoopBack application *as a server* on the member host (using SSH), joining the server to the collective (to make it a collective member), and then starting the server so that the application can run.

The collective controller and collective members use HTTPS for bidirectional communication. The collective members share information about their network location, security details, and operational status, which ensures that information can be readily retrieved without having to invoke an operation on each individual member. The collective controller also periodically monitors the health of the servers to see if they need to be restarted. The controller publishes information about the member applications to the Micro Gateway and to the DataPower Gateway (using an On Demand router), so they know what applications are available to route to. The collective also provides a *Liberty Admin Center* UI console on the collective controller, which can be used to monitor the collective. The Admin Center is accessible from the API Manager UI with read-only access. API Connect clients that run software processes can also connect to the collective controller to query for information about the collective and its membership, or to perform operations.

A collective can be configured with one or more collective controllers, depending on scalability and high availability requirements, and can have multiple member hosts. The collective controller and collective members can also either be on separate hosts or on the same host.

The following diagram depicts the architecture for an API Connect collective to which the Cloud Manager and API Manager connect. The collective controller is on a separate host from the three collective members.
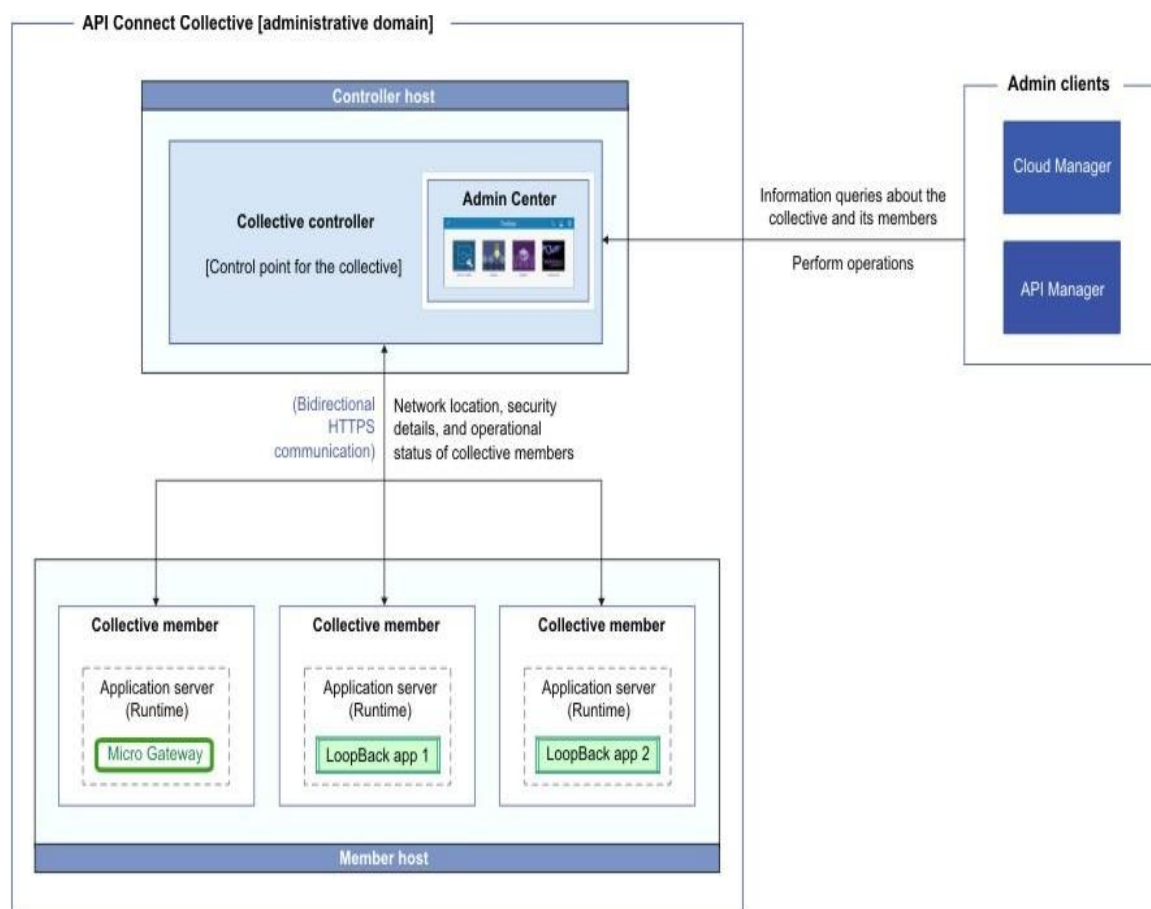
To enable communication between a collective and the other API Connect components, the collective and collective controller must be registered within the Cloud Manager.

7.10.6   Developer Portal

The Developer Portal provides a customizable self-service web-based portal to application developers to explore, discover, and subscribe to APIs.

When API providers publish APIs in the API Manager, those APIs are exposed in the Developer Portal for discovery and usage by developer organizations. Application developers can access the Developer Portal UI to register their applications, discover APIs, use the required APIs in their applications (with access approval where necessary), and subsequently deploy those applications.

The Developer Portal provides additional features, such as forums, blogs, comments, and ratings, for socialization and collaboration. API consumers can also view analytics information about the APIs that are used by an application or used within a developer organization.

7.10.7   API Connect server requirements.

From an on-premises cloud, you can create, promote, use, and track APIs. An on-premises cloud is composed of various appliances, where each appliance is a server of a specific type. The collection of servers defines your cloud and determines how to distribute the work of managing, analyzing, routing, and storing data.

Your on-premises cloud can be a combination of new and existing physical appliances and virtual appliances or can be entirely composed of virtual appliances. The type and quantity of servers in an API Connect environment are determined by the individual needs of each enterprise, but the minimum requirement is one Management server, one Gateway server, and one server to host the Developer Portal.

The API Connect Cloud Pak for integration includes the following server types:

- ✓ Management server. Stores all the cloud configuration, and controls communication between the other servers within API Connect. Manages the operations of the various servers in the API Connect cloud and provides the tools to interface with the various servers. The Management server also provides analytic functions that collect and store information about APIs and API users. The Cloud Manager and API Manager User interfaces run on the Management server.

- ✓ Gateway server. Processes and manages security protocols and stores relevant user and appliance authentication data. The Gateway server also provides assembly functions that enable APIs to integrate with various endpoints, such as databases or HTTP-based endpoints. The Gateway types include a Micro Gateway and a DataPower Gateway.

- ✓ Developer Portal server. Provides a customizable social developer portal with a full-featured content management system and includes clustering capability. Enables API providers to build portals for their application developers and provides the interface for application developers to discover APIs and subscribe to usage Plans contained in the published Products for use in their applications.

- ✓ API Analytics Server: You can use IBM API Connect to filter, sort, and aggregate your API event data. You can present the results within correlated charts, tables, and maps to help you manage service levels, set quotas, establish controls, set up security policies, manage communities, and analyze trends. API analytics is built on the Kibana open-source analytics and visualization platform, which is designed to work with the Elasticsearch real-time distributed search and analytics engine.

The following diagram is the API connect end to end solution example.
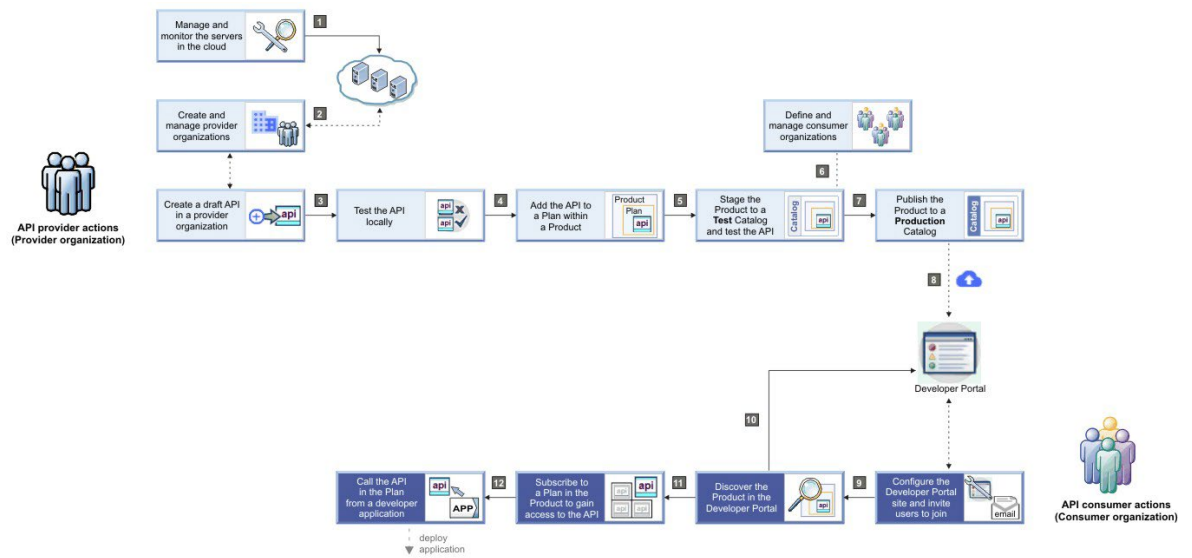
7.11 IBM API Connect Best Practices to consider:

When it comes to developing APIs for banks, adhering to industry best practices is crucial due to the sensitive nature of financial data and the importance of security and reliability. Here are some industry best practices for API segregation, categorization, and development for banks.

- Security Firsts
- Segregation by Functionality
- RESTful Architecture
- Standardized Data Format
- Developer Support and Thorough Documentation
- Rate Limiting and Quotas
- Monitoring and Analytics
- Disaster Recovery and High Availability

Security:

Security should be the top priority when designing APIs for banks. Use industry-standard authentication mechanisms like OAuth 2.0 or OpenID Connect to ensure secure access to APIs. Implement strong encryption (such as TLS) for data in transit and at rest. Regularly update security protocols and patches to mitigate emerging threats.
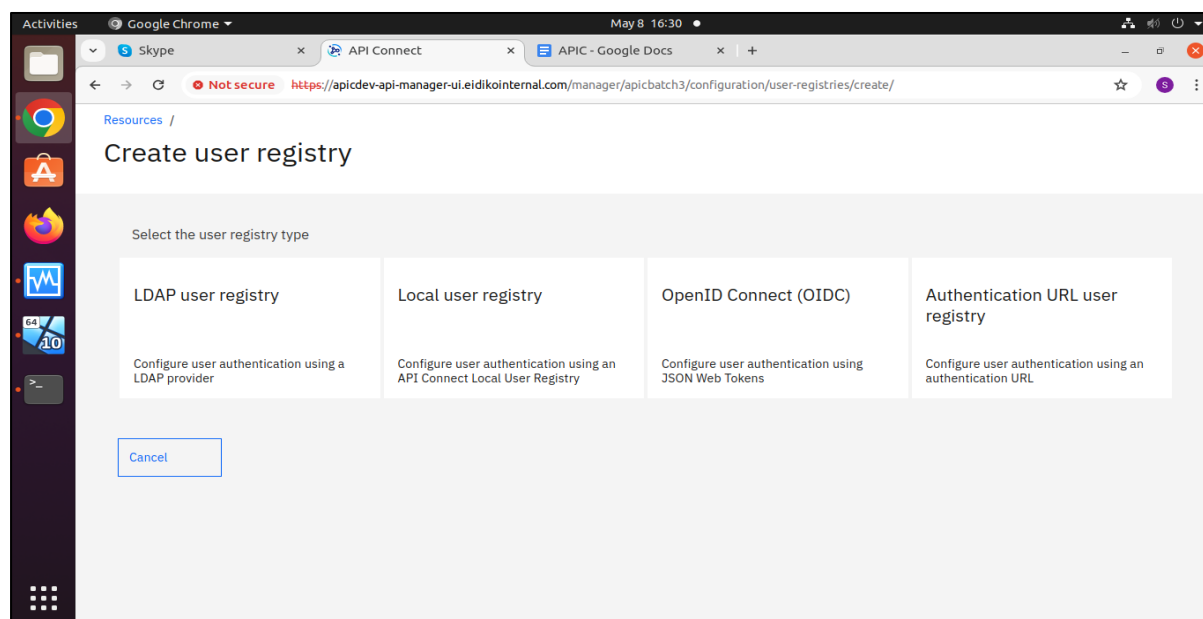
Segregation by Functionality:

Categorise APIs based on their functionalities to ensure clarity and ease of use. Common categories may include account information, transactions, payments, customer information, authentication, and authorization.
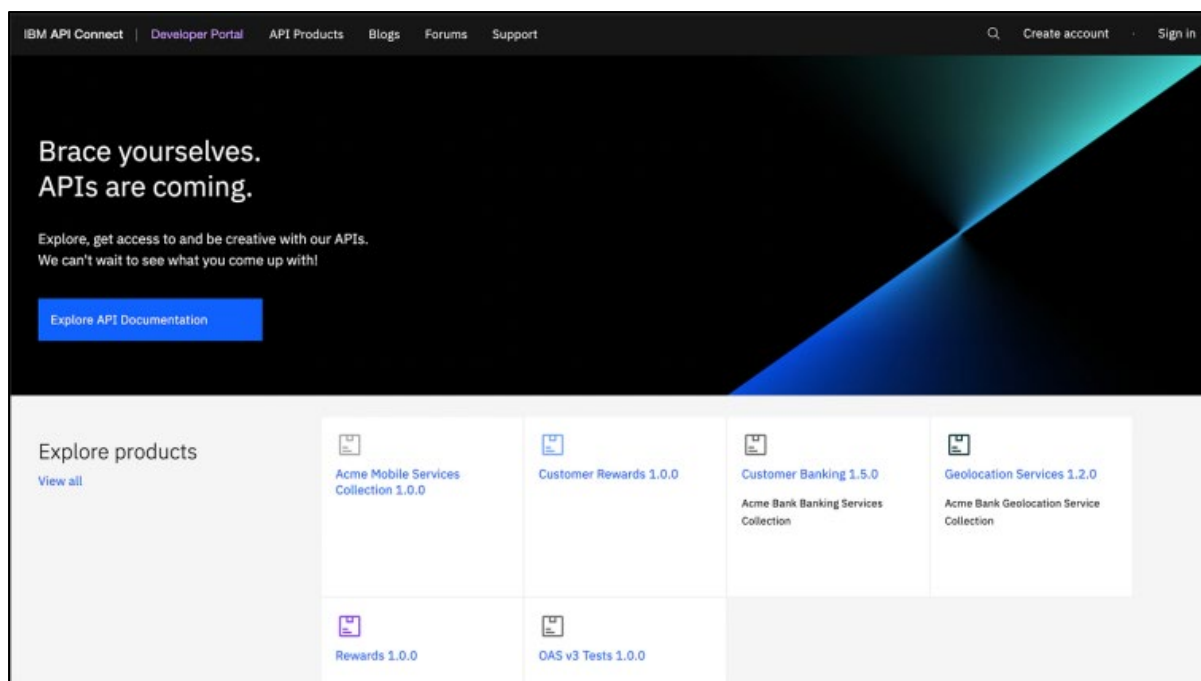
RESTful Architecture:

Follow RESTful principles for API design to enhance interoperability, scalability, and simplicity. Use HTTP methods (GET, POST, PUT, DELETE) for CRUD operations and leverage resource-based URLs for intuitive navigation.
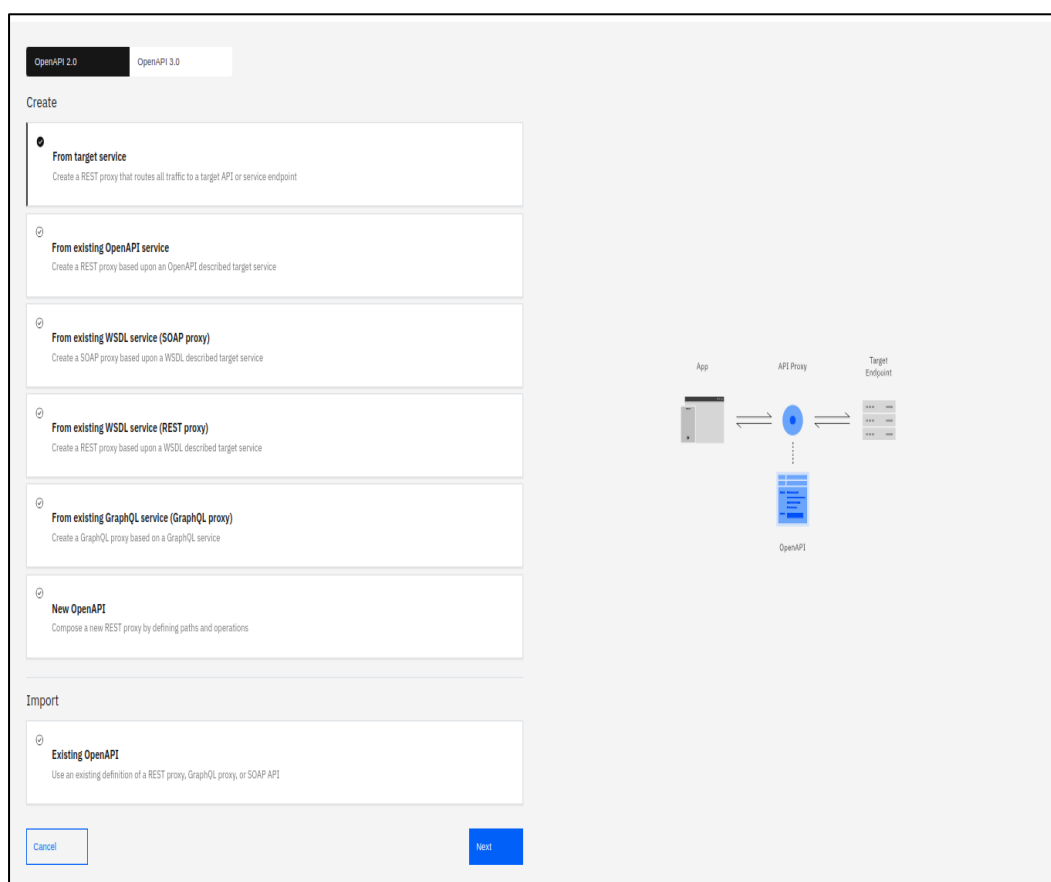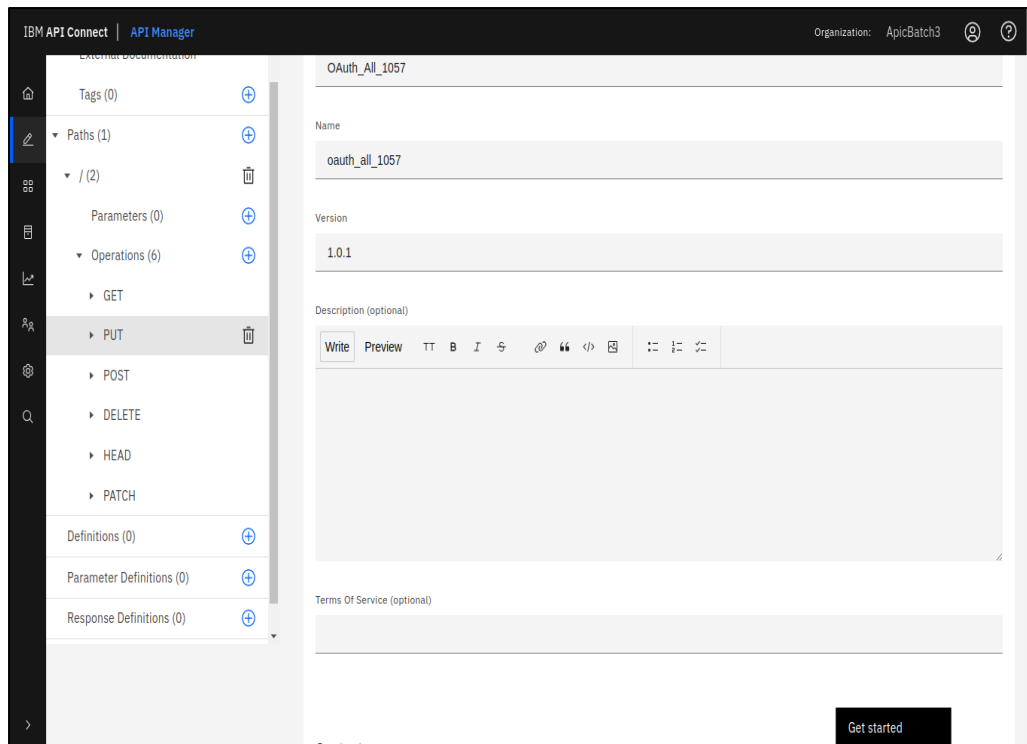
Standardized Data Formats

Standardize data formats such as JSON or XML for API payloads to ensure compatibility across different systems and platforms. Avoid proprietary formats to promote interoperability.
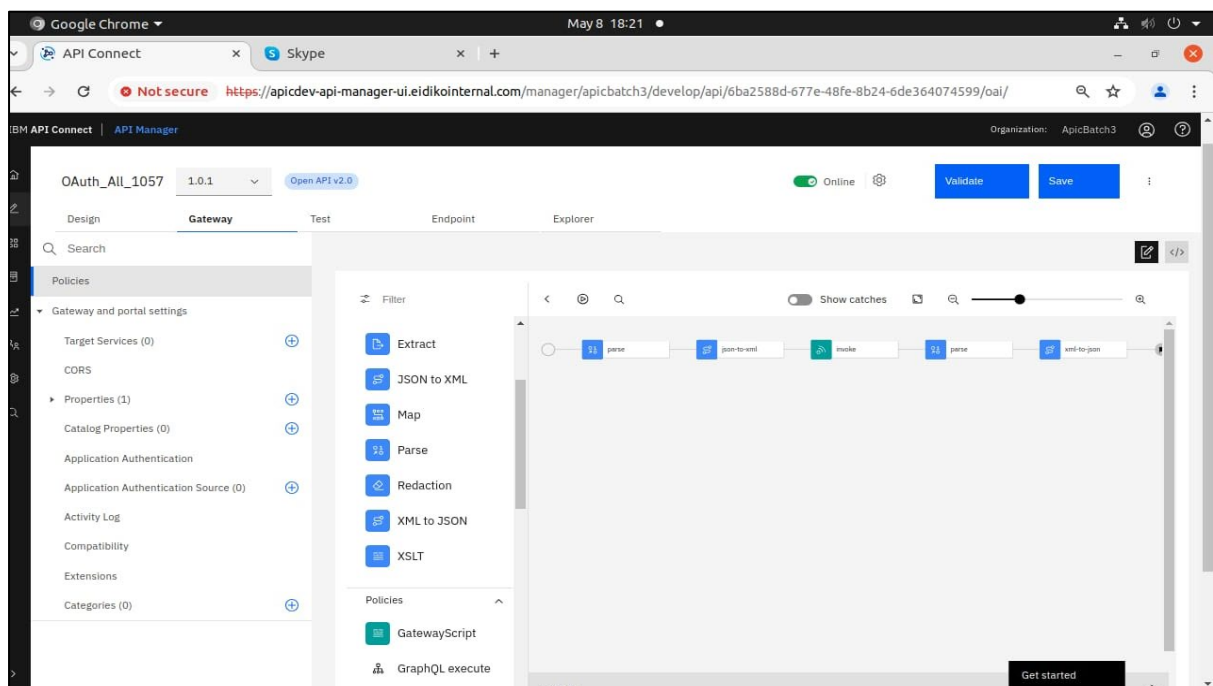
Developer Support and Thorough Documentation:

IBM Offers developer support channels such as forums, documentation, portals, and dedicated developer relations teams to assist developers in integrating with your APIs. Provide sandbox environments for testing and debugging.
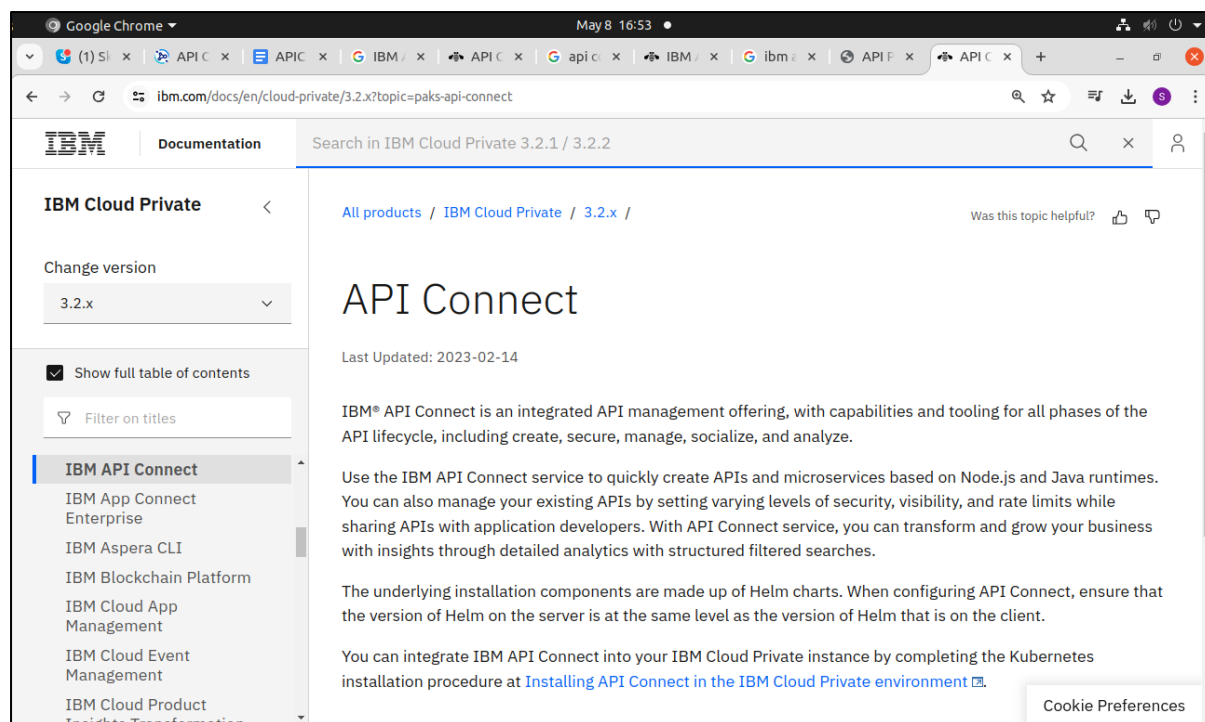
Rate Limiting and Quotas:

Enforce rate limiting and quotas to prevent abuse and ensure fair usage of APIs. Define appropriate limits based on factors such as user type, subscription plan, and API endpoint.
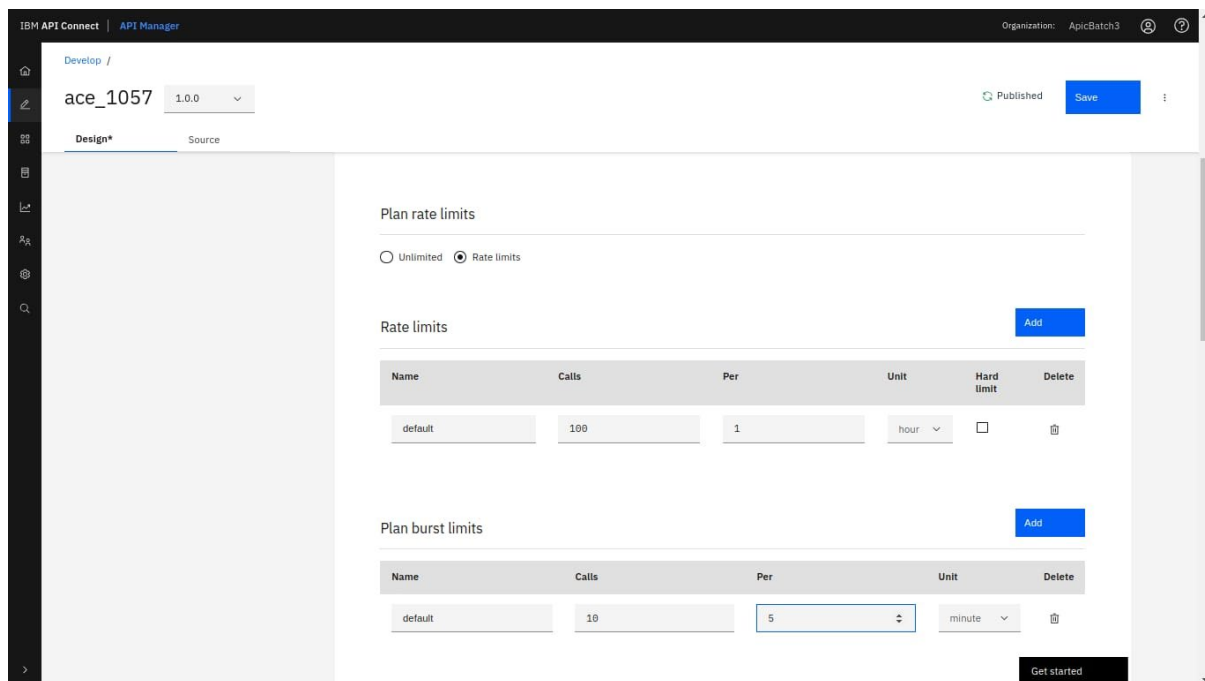
Monitoring and Analytics:

Implement robust monitoring and analytics capabilities to track API usage, performance metrics, and security incidents in real-time. Use tools like API gateways and logging services to monitor traffic and detect anomalies.
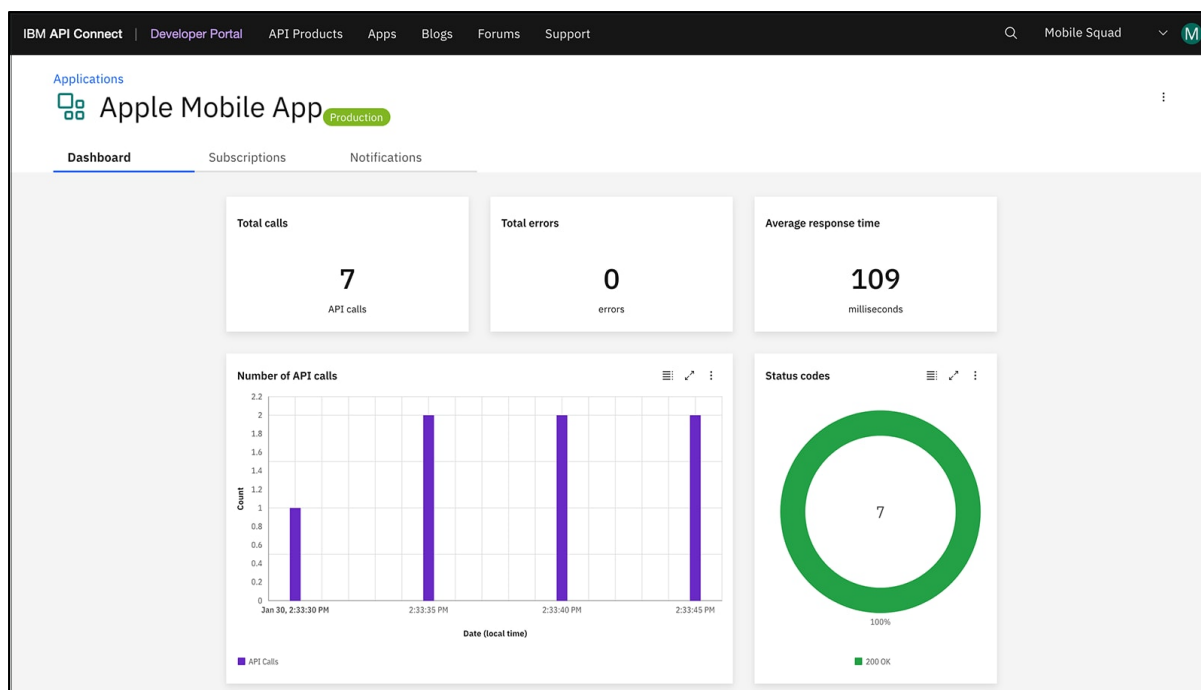
Disaster Recovery and High Availability:

Design APIs with disaster recovery and high availability in mind to minimise downtime and ensure business continuity. Implement redundant systems, failover mechanisms, and data replication strategies.
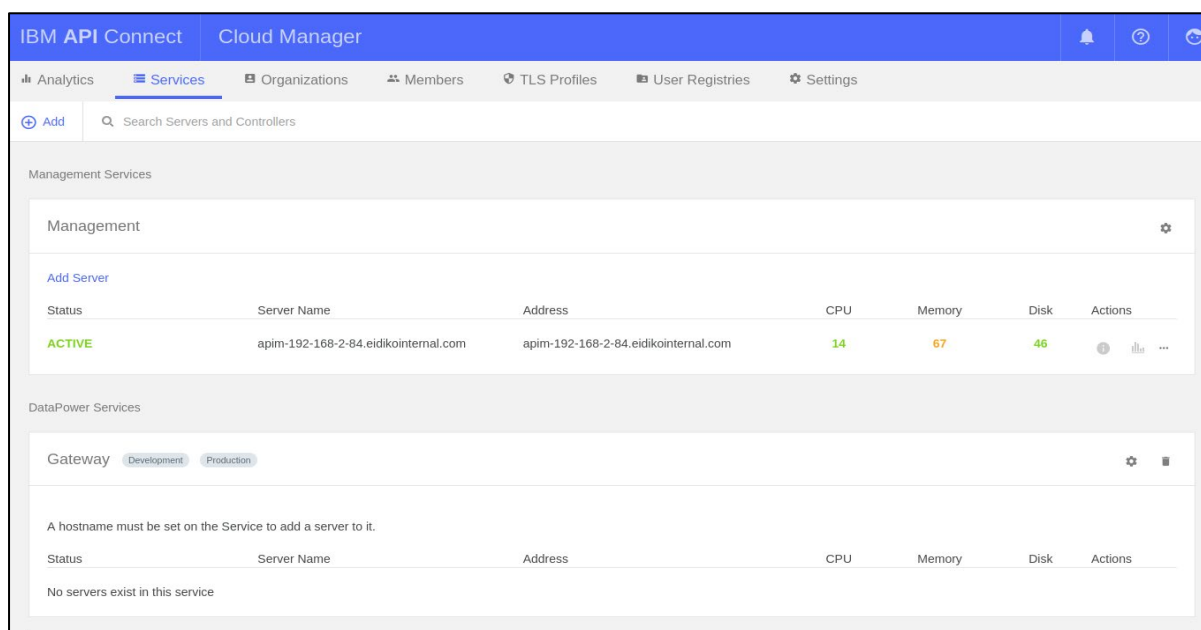
7.11.1 Security and authentication

In API Manager, you can use TLS profiles to secure the transmission of data between the management server and other API Connect subsystems and external services, and also configure user registries to securely authenticate your Catalogs and APIs.

For details of authentication in IBM API Connect, see the following subtopics:

- **Creating a TLS client profile**
  In the IBM API Connect API Manager interface, TLS profiles are used to secure transmission of data between the management server and other API Connect subsystems and external services. TLS and SSL certificates guarantee that information you submit will not be stolen or tampered with. In this topic, you learn how to create a TLS profile in API Manager.
- **Authenticating by using your enterprise user registry**
  IBM API Connect supports a variety of user registry types for authenticating users and securing APIs.
- **Configuring a native OAuth provider**
  Native OAuth providers are configured and managed by you within your cloud.
- **Configuring a third-party OAuth provider**
  Enter the secure endpoints to provide OAuth authentication from a third party.
- **OAuth concepts for API Connect**
  OAuth is a token-based authorization protocol that allows third-party websites or applications to access user data without requiring the user to share personal information.

7.11.2 Network Infra and bandwidth requirements.

Here are some general considerations for the network and bandwidth requirements:

1. **Node Communication:**

API Connect typically involves multiple components such as the API Gateway, API Manager, and Analytics. These components need to communicate with each other for the management and execution of APIs.

2. **API Gateway Traffic:**

API Gateway handles incoming API requests and forwards them to the appropriate backend services. Ensure that there is proper network connectivity between the API Gateway and the backend services.

3. **Database Connectivity:**

API Connect may use a database (such as MongoDB or other supported databases) for storing configuration data. Ensure that there is proper network connectivity between API Connect components and the database.

4. **External Connectivity:**

API Connect may need internet access for tasks such as checking for updates, accessing external services, or interacting with cloud services.

5. **Management Interface:**

The API Connect management interface (web-based or command-line interface) may be accessed over the network, so proper network access is required for administrators.

Here are some general considerations for the network and bandwidth requirements of **DataPower:**

1. **Backend Service Communication:**

DataPower devices often act as intermediaries between clients and backend services. Ensure that there is proper network connectivity between DataPower, and the backend services it interacts with.

2. **Security Gateway:**

DataPower devices are often used as security gateways for handling security-related functions such as authentication, authorization, and encryption. Ensure proper network connectivity for these security features.

3. **Web Interface:**

DataPower devices have a web-based management interface for configuration. Ensure proper network access for administrators to manage and configure DataPower devices.

4. **Logging and Monitoring:**

DataPower devices may send logs and monitoring data to external systems. Ensure proper network connectivity for logging and monitoring purposes.

5. **SSL Offloading:**

If DataPower is configured for SSL offloading, it needs to communicate securely with backend services. Ensure proper SSL/TLS configuration and network connectivity.

6. **Integration with API Connect:**

In an API ecosystem, DataPower may be integrated with API Connect for API management and security. Ensure that there is proper network connectivity between DataPower and API Connect components.

7. **Firewall Rules:**

Configure firewall rules to allow the necessary communication between DataPower devices and other components in your network.

8 Implementation Approach and methodology

8.1 Project Initiation

A formal kick-off of the project would happen during this stage. During this phase, GBM will create a formal project management plan with Work break down structure and introduce the project team, thereby formally marking the beginning of the project.

Activities and Deliverables

Activity Description	Customer / Partner Responsibilities	Deliverables
1. Prepare and submit the detailed project plan and schedule	• Introduce GBM team to stakeholders. • Arrange Workshops to communicate the objective and agree on strategy with Ahlibank Team • Approve submitted plans	• Project plan, Work Breakdown structure (WBS) • Phase Roll-out or OPCO-Wise Roll out and Approach Document
2. Prepare and submit the project logistics. Hold formal kick off and socialize logistics with Ahlibank stakeholders.	• Share the processes and templates followed within Ahlibank from IT Implementation perspective. • Get regulatory/statutory approvals if any. • Share with GBM team the expected Quality KPI's • Approve submitted plans	• Risk and Mitigation Management Plan • Project Communication Plan • Change Management process. • Formal introduction and on boarding of the project delivery team

8.2 Requirements Gathering

8.2.1 High Level Requirement Gathering

During this stage, GBM team will closely work with Ahlibank team to arrive at the complete list of services and features, integrations any other requirements to be implemented. If any addition details about requirements are captured, they will be updated to the main list.

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
Distribute Questionnaire / Requirements Template to individual BU's/IT teams	• Ensure that right resources from individual BU's/IT teams are allocated to respond to the questionnaire in time.	• Finalized the High-level Requirements. • Deployment methodology
	• Review and approve the approach for requirements, implementation and deployment priorities	

8.2.2 Detailed Requirements Gathering

During this stage, GBM team with the help from AhliBank teams will perform detailed requirement gathering of services, features, integrations to be implemented.

AhliBank will ensure that the necessary meetings/workshops with Stakeholders/SME's from are arranged well in advance with all the teams to ensure effective participation and Ahlibank will appoint an in charge whose decision will be final for implementation and deployments further. The requirements gathered during this activity will help GBM team come up with a "High Level Design Document", which would form the basis of design, implementation, and testing of the solution.

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
1. Identify all aspects of • API Banking solution needs • Business and Technical drivers • Technical Requirements 2. Gather the following details. • Requirements from Data owner service providers, and other stakeholders • Governance and Reporting requirement from PMO • Detailed analysis and review of current operating environments, Business processes etc 3. Prepare High Level Design Document	• Actively participate in requirements analysis activities • Security guidelines to be shared. • Brainstorm and finalize on the list of reports, features that would be custom built within the API Banking solution. • Provide details of any specific business logic/rules, transformation, data enrichment, and data mapping rules for each of the identified process. • Facilitate all the necessary documents or accessibility to various system to understand the current architecture and framework. • Provide clarifications for any processes/ requirements questions and issues raised by GBM. • Review the deliverables for completeness and correctness	• High Level Design Document comprising the following details. o Business Requirements Specifications o System Requirements Specification o List of all non-functional requirements o Proposed Design for Business Processes implementation

8.3 Design Solution Architecture

During this stage, GBM team will closely work with Ahli Bank teams to finalize and brainstorm on the Logical and Physical Architecture of API Banking solution and components across all environments. The proposed topologies and architecture would be provided to Ahli Bank to get their acceptance...

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
Design Logical and Physical Architecture	● Ensure effective participation to provide inputs that would help GBM team arrive at the architecture	● Solution Architecture Document
Understand high level requirements and agree on deployment topology	● Ensure participation from Security and admin teams to review and approve the proposed deployment topologies	
Prepare Solution Architecture Document	● Review and approve the deliverable	

8.3.1 Low Level Design

The High-Level Design Document prepared during previous stage will be transformed into a detailed specification of services during this stage. The functional and data requirements from previous activity would be converted into a Low-Level Design in terms of

- Integration Design
- Standards
- Protocols
- Message Formats
- Configuration

The design elements will include Interface Specification Design, Reporting Designs, Physical Architecture Diagrams, Data Transformation and Unification Designs.

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
1. Analyze Functional and Data Requirements to arrive at Low Level Design in terms of Integration Design Standards Protocols Reports Message Formats Configuration 2. Prepare Documentation	● Provide Clarifications to GBM team (if any) ● Review and approve the submitted documentation.	● API Specification Documents ● Interface Specifications Document ● Low Level Orchestration Design Document ● Canonical Data Model and Framework Design specification

8.4 API Connect Setup and Implementation

During this stage, GBM will install the proposed solution across all environments and ensure that the necessary configurations are done. The software components in proposed solution will be installed across the following environments as per the proposed topologies for each environment.

- Development API Gateway
- TEST
- PRODUCTION
- DR

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
1. Installation and Configuration of API Banking solution as per the topology proposed for each environment (DEV, TEST, PRODUCTION-DR)	• Provide access to servers within the scope of installation. • Provide a full-time administrator who can address to administrative issues during the installation activity. • Ensure participation from network team to resolve any network issues. • Ensure that the servers provided have the necessary Operating Systems and OS level clustering done. • Ensure Software and Hardware compliance for the proposed software installation and configuration.	• Solution Installation and Deployment Document • Parameterization and configuration document

8.4.1 Infrastructure Readiness

The Infrastructure and all Environments (Development Gateway, TEST, PRODUCTION-DR) should be available and accessible to GBM team for study the as-Is model and prepare for the deliverables accordingly.

8.5 Development, Unit Testing& System Integration Testing

The requirements for the business workflows, document management, content management would be Implemented, the test case mapping will be done from the Requirements to The Test cases that will be executed to cover all scenarios and unit tested during this stage based on Low Level Design. The activities involved during this stage are as follows.

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
• Develop Canonical Data model based on High Level Design Document • Develop APIs (common re-usable components) based on High-Level Design • DB Design and WSDL's/ Swaggers preparation • Implement Services of API Gateway based on Low level design	• Provide access to all environments to GBM resources (onsite and offshore) • Provide Infrastructure and Database Admin support for environments in scope if required. • For WSDL /Swagger preparation, Share information regarding data formats and restrictions for data fields in individual services/features in Business Process.	• Developed Code Base
• Prepare Unit Test Cases based on requirements in "High Level Design" Document. • Develop Stub (mock-up) flows for Unit Testing • Unit Testing of Developed APIs. • Fix bugs encountered during Unit Testing	• Provide access rights to necessary environments during unit testing phase. • Provide Test Data to conduct Unit Tests. • Review and accept Unit Test Report	• Unit Test Plan • Unit Test Report

8.6 UAT& Bug Fixing

For all testing performed by the Ahlibank Team, GBM scope is limited to provide the necessary support (limited to activities listed be in table below) during each testing phase.

We have reasonably assumed the effort required for each testing phase as per the table above and the support provided by GBM is limited to these timelines. Should there be a need for additional support CUSTOMER foresees, the same would be handled through a Project Change Control Procedure (PCR).

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
• Provide Technical Details about the APIs to be implemented to the testing vendor • Promote developed code to individual testing environments • Resolve issues that are raised during individual testing phases • Generate Test report related to number of issues assigned to implementation team and those resolved with the resolution timeline	• Provide access to bug tracking tool used by the testing vendor. • Review and approve Test Report	• Test fixed resolution report

8.6.1 Security Assessment

Application security and vulnerabilities on the platform will be tested. The security patches required will be deployed and ensure that no vulnerabilities are caught unhandled.

8.7 Deployment, Production & Go-Live

The tested components are promoted/deployed to live environment during this stage. The activities involved in this phase are as follows.

Activities and Deliverables

Activity Description	CUSTOMER Responsibilities	Deliverables
• Prepare Roll out Plan MOP for the production environment • Perform Sanity testing • Monitor the Business Processes	• Provide admin support during Go-Live • Provide support to test the new processes/features launched. • Decision on Go-Live/ Roll back • Provide Sign-off	• Live environment

8.8 Knowledge Transfer Methodology

The objective is to impart practical knowledge that is required to monitor and manage the platform and perform some initial configurations. This is directed towards the personnel conducting UAT or Business users who would operate the platform post go live.

8.9 Deliverables

GBM will provide following deliverables as Exit criteria from each phase and start of new phase.

Phase Name	Deliverables end of phase
Project Initiation	• Project Plan • Project Organization • Requirement Gathering Template • Interviews/Workshops/Data Gathering detail plan
Requirement Gathering & Analysis	• Business Requirement • Technical Requirement • Requirements Traceability Matrix • High level Design
Solution Design	• Low Level Technical Design • System architecture documentation • Network architecture documentation (include physical and logical network architecture diagram) • Application documentation
Development & SIT	• Unit Test report • Integration test document • Fail-over test document. • Load test document • Training Documentation
Training	• Knowledge Transfer to Operations team • Acceptance test document (Pre UAT and UAT)
Test	• User acceptance test report • Roll-out Strategy document
Built to Operation Handover	• Method of Procedure (MOP) for Deployment • Sign-off from Operations
Deployment	• Operations Manual • Standard Operating Procedures
Stabilization	• Performance Report

8.10 Out of scope

The following are out of scope activities for GBM:

Following activities are excluded from the services to be provided in this proposal:

- Installation, Configuration, or development of any component which is not explicitly mentioned in the document, scope of work.
- Activities related to existing applications within Ahli Bank (i.e., development, deployment, troubleshooting, testing, debug, support etc.).
- Setting up of the required Hardware, Partitions, Networking are out of scope for GBM.
- Providing, fixing network issues or operating system support issues.
- General Assets, Non-IT Assets, Contract Management, Charge backs, Procurement, Financial information tracking and other activities explicitly mentioned in clarification as either not required or not applicable are excluded from scope.

9 Development of Scoped 10 APIs

As a part of the scope, GBM offering development of 10 APIs for AhliBank as per the below complexity matrix.

9.1 Scoped API's Complexity

- 4 Complex API's
- 3 Mediums API's
- 3 Simple API's

9.2 API's Complexity Matrix Description

Type of API	Description
Simple	The simple service has no more than 20 fields in the request and response, as well as no more than one additional calculation in the transformation process, and no additional request retries on errors. The service integrates not more than 2 systems.
Medium	The medium service has no more than 50 fields in the request and response, as well as no more than five additional calculations in the transformation process. This service can include requesting retries on errors. The service integrates not more than 4 systems.
Complex	The complex service has 50–100 fields in the request and response, as well as 5–10 additional calculations in the transformation process. This service can include requesting retries on errors and saving information about the request status. The service can integrate more than 4 systems.

10 Training

GBM is recommending the below IBM API Connect Customized Training for AhliBank Team members.

10.1   Instructor Lead Training (Online)

Course Agenda:

Day 1

"Introduction to API Connect" topic covering below items

a. Major components and API catalogs

b. Create/Delete/Edit APIs, API products, API Plans

c. Basic API lifecycle & subscription

Day 2

- Installation & Configuration of API Connect in Virtual Machine (including Toolkit & License services)
- Upgrade API Connect fix packs & major version
- Capacity Scaling - Replica override for microservices & pods

Day 3

- Advanced configuration for the management subsystem
- Advanced configuration for the analytics subsystem
- Advanced configuration for the gateway subsystem (Including Gateway Peering, Quorum configuration)
- Configuration of developer portal subsystem

Day 4

- Operations & Administration - User Management & User roles management
- Backup and restoration
- Disaster recovery
- Monitoring and health checks
- Logs & Log monitoring
- Troubleshooting
- Maintaining a two data center deployment

Day 5

- API Connect Security - deep dive into securing APIs (using OAuth 2.0, 3rd party OAuth providers)
- APIC Commands & API for administration - Consumer REST APIs for day-to-day administration of the product
- API Deployment automation using Devops

11 Software & Professional Services BoQ

11.1   IBM Software for API Management & Gateway

Unlimited API Calls (1 Year Software Subscription & Support)			
#	Part No.	Description	Qty
1	D20ZBLL	IBM Cloud Pak for Integration Virtual Processor Core License + SW Subscription & Support 12 Months	38

11.2   Professional Services
11.2.1   Implementation Services Based On VMware Platform
11.2.1.1   Implementation Services Based On VMware Platform – One Gateway

#	Description
	Implementation Services
1	**Installation and configuration of Total 3 environments [TEST, PROD and DR] Separate Gateway for Dev**
2	**Implementation of 10 APIs**
3	**Knowledge Transfer to Operations team**
4	**2 Months 16*5 post implementation support using Onsite-Offshore hybrid support model.**

11.2.2   GBM Support Line

#	Description
1	**GBM Premium Support Line** **Sample Services:** **24x7 Remote software diagnostics and defect resolution, irrespective of severity.** **Unlimited number of remote support calls.** **Assistance with short duration defect and non-defect issues.**

11.2.3 IBM API Connect Training

#	Description
1	IBM API Connect Training – Virtual Customized Training. 5 Days Instructor Lead Training Create/Delete/Edit APIs, API products, API Plans Installation & Configuration of API Connect in Virtual Machine (including Toolkit & License services) Advanced configuration for the management subsystem Advanced configuration for the gateway subsystem (Including Gateway Peering, Quorum configuration) Configuration of developer portal subsystem Operations & Administration - User Management & User roles management API Connect Security - deep dive into securing APIs

11.2.4 Optional Professional Services

API Development Onsite Services	
#	Description
1	IBM API Connect Developer - 1 Year Onsite

API Development Offshore Services	
#	Description
1	IBM API Connect Developer - 1 Year Offshore

API Development Onsite Services 1 Month)	
#	Description
1	IBM API Connect Developer - 1 Month Onsite

API Development Rate Card Based on Complexity	
#	Description
1	Simple Complexity API
2	Medium Complexity API
3	High Complexity API

12 Production Support – AMC

GBM will provide 16*5 post implementation support using a tried and tested Onsite-Offshore hybrid support model. GBM will deploy Onsite-Offshore resources to coordinate with AHLIBANK's designated team to identify issues, if any, are raised. GBM onsite resource will route the tickets to the offshore team depending on the criticality, and severity of the issue.

12.1 Support Services Description

The following section describes the support services offered.

12.1.1   Call handling

For all application covered by the SLA Service Operations will act as a single point of contact for the customer: the customer can raise a service call for an issue as below.

12.1.2   Handling of incidents

An incident being any event which causes an application to function not in line with its functional specification and which causes, or may cause, an interruption to, or a reduction in, the quality of the function of the application.

12.1.3   Handling of service requests

Service requests can be defined as every incident not being a failure of the application. Service requests are routed via the incident management procedure. Service requests can have a priority 'High' at the most.

12.1.4   Handling of problems

A problem is an unknown root cause of one or more incidents. Finding the underlying error because of the root cause analysis is the aim of the problem management process. Once the error is found a request for change can be created to eliminate the problem. The problem management procedure describes the way in which problems are handled.

12.1.5   Handling of complaints

In case a customer is not satisfied with the received service he can file a complaint: A complaint is a formal statement of dissatisfaction. A complaint can be reported to the Service Delivery Manager.

12.2 Resolution

During daily operation the customer's authorized callers can enter service calls. Service calls should be entered via the online tool available through website.

The user assigns an impact and urgency to each service call based on the definitions below. Impact and urgency result in a priority level, each priority has its own response time and target solution time.

	Urgency		
Business/User Impact	High	Medium	Low
Large	Critical	High	Medium
Medium	High	Medium	Low
Small	Medium	Low	Low

Priority	Description
Critical (1)	**Incidents that cause significant impact on business processes.** The entire application or a part thereof is not operational or cannot be accessed. All application users or several groups of application users are unable to conduct normal business; there is a high sense of urgency with respect to resolving the fault and the issue cannot be circumvented.
High (2)	**Incidents that cause significant impact on the application.** One or more major features of the application are not operational or severely restricted. A group of users cannot use a part of the application. The issue cannot be circumvented but does not totally impede users' standard workflow.
Medium (3)	**Incidents that cause some impact.** Failure of one or more minor features of the application. The reported issue is an annoyance but is not negatively affecting daily operation. The issue does not severely impede user's ability to conduct normal business and can be circumvented.
Low (4)	**Incidents that cause no immediate impact on functionality or a cosmetic change or any queries.**

NOTE: The below defined SLA's are only for the indicative purposes. Concrete SLA's need to be arrived upon discussion with Customer.

Process	Indicator	Service Element	Service Level	+Comply	Reporting Period
Incident Management	KPI	Response time	<=8 Hour	80%	Monthly
Incident Management	KPI	Resolution: Critical High Medium Low	<=16 Hours =24 Hours =48 Hours =72 Hours	60%	Monthly
Service Requests	KPI	Service requests are handled via IM	<=16 Hours =24 Hours =48 Hours =72 Hours	70%	Monthly

12.3 Roles and Responsibilities

Both parties entering into a service level agreement has responsibilities. These responsibilities are listed, indicating who the primarily responsible is.

Roles & Responsibilities	Customer	Service Operations
Availability of the Service Operations service desk during agreed service hours		√
Make sure qualified people submit calls	√	
Submit incidents and service requests	√	
Submit incidents and problems		√
Logging issues in the request tooling	√	√
Prioritization of the incidents	√	√
Dispatching of tickets		√
Response to calls conform the agreement		√
Solving calls conform the agreement and the priority code assigned		√
Progress monitoring, communication and escalation (priority depending)		√
Closure of the calls after agreement by the submitter	√	
Review the quality of the service by monitoring and reporting the service levels within the contract.		√
Having a skillful user base, trained in the use of the Service Operations processes / tooling	√	
Timely providing information regarding future major business changes that might lead to consequences for the load on the production systems.	√	

12.4 Support Activities

In a full Support Model, the table below provides details of the types of activities that will be carried out by GBM support staff.

Support Activity	Description
Troubleshooting	Addressing any specific issues related to the Data Integration Platform infrastructure that prevents development/testing from proceeding or has caused problems in the Production environment. For example, unplanned changes made to configurations.
Backup and Recovery	Assist with the creation of backups and testing of the recovery of backups and documentation of how the backups would be restored (i.e., the steps required).
Maintaining Data Integration Environments	Maintain scripts for system administration jobs like start, stop and status check for the complete Data Integration and Application Environment
Running Daily Checks and taking preventative action	Daily checks run to determine any potential problem areas issues – e.g., log files too large / memory dumps occurring / Portal trace enabled / CPU usage over time, and then informing customer so that necessary actions to resolve the issue can be approved by customer and implemented by GBM. Proactive monitoring and response to system alerts, setting up the necessary checks.
Update and manage changes to Data Integration Platform	Document amendments to current support process and standards defined for the development, test and production environments.
Scheduling and Implementing Patches/Fix packs	Monitoring IBM support notices for relevant fix packs and ensuring the patch level is maintained. Liaising with the Customer Project Manager and development teams to schedule the implementation of relevant fix packs to conform with the agreed maintenance strategy.
IBM PMR Management	Raising IBM Passport Advantage support tickets (PMRs) and managing the resolution of any support tickets.
General Support Tasks	List of tasks for support services will cover for example: ● Any component/ Services not starting on Data Integration Platform. ● Excessive CPU and memory ● Connectivity down between Database, Applications, DataPower, Pods issues, Memory etc.

13 Timelines & Resources for Implementation

13.1 Project Timeline

Below are the timelines for the API Banking solution implementation, launch along with the post live stabilization period.

VM Based Deployment: setup and configuration for API connect and its components on VM.

Implementation plan on Ahli Bank API Connect																				
Week Starting/Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
Requirements Workshop(Finalizing Business requirements, deployment architecture,)	■	■																		
Solution Design API Connect		■	■	■																
Installation and Configuration API Connect[DEV,TEST, PROD and DR]				■	■	■														
Implementation API Connect							■	■	■											
System Integration Tests (SIT)									■	■										
User Acceptance Tests (UAT)										■	■									
Users Training												■								
Go- Live & Post Go Live Support													■	■	■	■	■	■	■	■

13.2 Resource Plan

The following resources are to be engaged for implementation of API Banking Solution.

Resources for API connect solution on VM.

Week Starting/Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
Project Manager	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Solution Architect	1	1	1	1																
Onsite API Developer								1	1	1	1	1								
Offshore API Developer								1	1	1	1	1	1	1	1	1	1	1	1	1
Onsite Admin & Support				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Offshore Admin & Support				1	1	1	1	1												

14 Assumptions & Dependencies

The proposed solution's timelines, resource plan, pricing is arrived at based on certain assumptions. The following are the assumptions and dependencies that the proposal is based on:

- Installation and configuration of Total 3 environments [Development Gateway , TEST, PROD and DR] part of this proposal.
- If only 10 APIs will be implemented and supported part of this proposal.
- Bank will provide supported HW servers and CP4I Supported Storage for the solution.
- Further to 10 APIs will be taken up on a T&M basis, A separate proposal will be given for the same in case if required.
- Apart from CP4I and API connect related components no other components considered part of this proposal.
- Deployment automation, Monitoring is not considered part of this proposal.
- No specific performance considered for Non-Prod Environment
- The installation servers would have the required network for the installation and configuration.
- If the Post, Go Live support of 2 months will be provided on 16*5 mode.
- GBM expects at least 3 weeks of notice for the engagement to be kicked off.
- Any activity not explicitly included in this scope of work is implicitly excluded from GBM deliverables.
- There is no integration that needs to be carried out with other systems except for the ones that have been explicitly mentioned in the scope.
- Access to the appropriate servers must be provided, including staging and testing environments. For deployment of themes, access to production servers must be provided.
- For any technical issues that need Product team support from IBM Labs, GBM team will raise Support Ticket with Customer support and resolution may impact project schedules and scope. Any such impact beyond 1 week on the project schedule will need to be considered as change request to cover associated costs on GBM Systems Integrators.
- No changes to functionality will be carried out during the project once finalized in requirement gathering workshop.
- Defects that exist in the current application may continue to exist in the application.
- Any interfacing system that may need change to accommodate platform upgrade will be Customer responsibility.
- GBM will make all efforts to continue the same team throughout the project duration. However, this may not be possible all the time due to resources constraints etc. In such cases, GBM will provide replacements with equally competent resources and necessary knowledge transition to continue the project with minimal impact on the delivery schedules and quality.
- All deliverables, Documentation and communication will be in English.
- The onsite activities will be in a week and will be 5 days with 8 hours in a day.
- Training is not GBM's responsibility, and it is not included in the scope and pricing.
- Customer will be responsible for the following:
- Appoint an individual to act as a project manager who will:
  - Be the single point of contact for GBM during this engagement.
  - Make decisions on your behalf in respect of this engagement.

- o Schedule the availability of your technical and business staff with appropriate knowledge and authority in a timely manner.
- o Make available all relevant information so that GBM can fulfil our obligations under this proposal of work.
- o Manage the timely response to our technical and business questions.
- o Ensure that all hardware environments and software media are available and appropriately licensed.
- The Customer Project Manager will provide appropriate resources to the project that have detailed knowledge of the existing environment to assist the Consultant(s) in performing activities listed in Scope.
- Customer will provide a work environment for the Consultant(s) consisting of internet access and telephone.
- Provide required documentation related to technical design, test data, access matrix etc.

15 Implementation Methodology

This engagement we propose is an AGILE development methodology that will enable development teams to operate adaptively within a complex environment using precise processes. In our experience adopting agility, we have experienced and realized that complex product development occurs under rapidly changing circumstances. Producing orderly work packets under chaotic circumstances requires maximum flexibility. The closer development team operates, while still maintaining order, the more competitive and useful the resulting output will be.

Characteristics of the proposed Methodology

- The first and last phases (Planning and Closure) will consist of defined processes, where all processes, inputs and outputs will be well defined.
- The knowledge of how to do these processes will be explicit. With a linear flow and some iteration involved in the planning phase
- The Sprint phase will be an empirical process. It will be treated as a black box that requires external controls. Accordingly, controls including risk management will be put on each iteration of the Sprint phase to avoid chaos while maximizing flexibility.
- The Sprint will be nonlinear and flexible.
- Explicit process and domain knowledge will be used wherever available. Tacit knowledge, and trail & error will be used to build knowledge wherever unavailable.
- The project will be open to the environment until the Closure phase. The deliverable can be changed at any time during the Planning and Sprint phases of the project
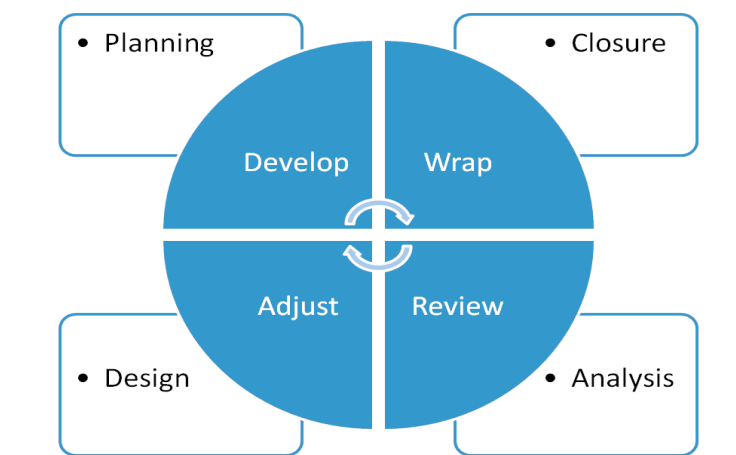
16 Project Planning and Management

Technical lead deputed Onsite will be the single-point-of-contact for this project with GBM. Our Account Manager sitting offsite will act as the primary escalation point of contact.

The Technical Lead will be planning, tracking, execution and controlling of the various phases of the project lifecycle. Each module is divided into several major activities and each activity is further divided into several tasks and defined milestones. Each activity has a start and end date together with milestone identification and is tracked to closure. All project monitoring will be conducted using the project plans and schedules. The Technical Lead will prepare and forward Weekly Status Reports to Ahlibank.

16.1 Project Controls

The Project Manager will utilize project tracker to help in the planning, tracking, execution and controlling of the various phases of the project lifecycle. Each module is divided in several major activities and each activity is further divided into several tasks and defined milestones. Each activity has a start and end date together with milestone identification and is tracked to closure.
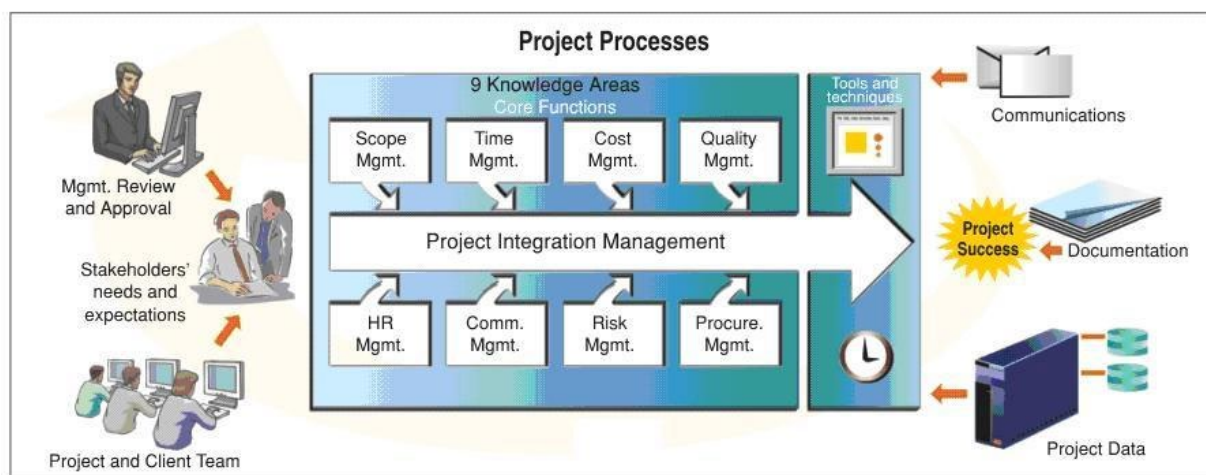
The following is the highlight of our project monitoring and control activities:
- GBM Project Manager will have regular structured interactions with the AHLIBANK to monitor the progress and course corrections.
- GBM project manager will coordinate Conference Calls to review status or discuss issues.
- Emails will be used to obtain clarifications, review comments on work products / documents, submit periodic progress reports etc.
- GBM Project Manager and GBM director will have periodic review meetings to appraise engagement health.
- The escalation hierarchy within GBM for issues will be the following: GBM – Project Manager, Head of Delivery, Director and CEO
- GBM would expect a similar escalation process to be provided by AHLIBANK upon initiation of the engagement.

- GBM team will remain in constant touch with AHLIBANK team through Internet chat, phone and email.
- GBM uses engagement specific custom Wikipedia of sorts to have the discussion threads going effectively on clarifications, reference notes between the teams. The same can be explored for this engagement.
- GBM would use a Project Management tool for project tracking, configuration management, issues and defects tracking by default, unless AHLIBANK facilitates a different solution
- GBM can supplement our regular status reports with extensive reports in Excel based on need.

16.2 Communication Plan

GBM understands that timely and effective communication is a critical success factor for any engagement. Effective Communication across the Software Development Lifecycle is important to maintain the pace of the product evolution and eliminate delays / rework and enable correction actions as needed.

During the planning phase of the engagement, GBM Technical Lead will discuss and document the frequency of status updates in the Communication Plan. In addition, the plan will describe the status report formats, meeting schedules, etc.

GBM Lead will compile the status reports, as per the directives of the Communication plan, Processes and Procedures and make it available to the stakeholders prior to scheduled meetings. Status reports will include the following information:

- Overall Project Status – On Plan, Ahead of Plan, and Behind Plan
- Activities completed during the week.
- Activities planned for the next week.
- Activities completed during the previous week.
- Percentage of completion.
- Any issues / problems /action items that require attention.
- Summary of Milestones with targeted v/s Actual dates.
- Staff Levels.
- Issues.
- Status Reviews.

Status Reviews

The Lead will conduct (Weekly) Project Review Meetings with the Project Team. The Lead will be responsible for setting the agenda, preparing the items for review, conducting the meeting and documenting the results. During these meetings project schedule and milestones, risk, scope changes, issues and budget will be reviewed. Progress on assigned action items will be reported.

Project Reviews

The Lead will conduct (Monthly) Review Meetings with steering committee. The Lead will be responsible for setting the agenda, preparing the items for review, conducting the meeting and documenting the results. During these meetings project schedule and milestones, risks, scope

changes, issues and budget will be reviewed. Overall health will be assessed, and project continuation will be approved.

16.3 Quality Assurance Plan

GBM will follow its Quality Management Approach for successful completion of this project. GBM is a quality conscious organization with documented procedures and processes that are certified compliant to industry standards.

At GBM, Quality Assurance is an audit function that ensures that processes are followed and that the product or services satisfy the given requirements and standards for quality. We accomplish this by reviewing all activities and work products during the various phases of the software development life cycle to check their adherence to applicable process descriptions, standards, and procedures.

16.4 Change Management

Any significant deviation from the scope of the work is handled through the GBM's Change Management Process. This section describes in detail our change management process.

16.4.1 Design

While designing the solution, GBM's team of architects and SME's include a strategy for anticipating and implementing the changes that might happen during the implementation of the solution. Having a structured well defined strategy in place helps us incorporate changes with minimum impact.

16.4.2 Change Request Information

When a change request is received, whether informally or formally or via accepted channels of communication or not, the change request is completely documented and reverted back to the initiator for accuracy. Once the change request has been fully documented and verified it will be evaluated for the degree of deviation.

16.4.3 Assessment

First the requested change is evaluated properly. Whether the requested change impacts the design or not and whether the CR increases or decreases the scope of work, an impact analysis is conducted along with risk analysis. After documenting the impact analysis and risk analysis, the same is shared with the Initiator, customer stakeholders and GBM stakeholders.

If the change request is approved, then the work breakdown structure for implementing the change is prepared. Also the effort estimates and resources required for implementing the change are determined

16.4.4   Prepare and present a recommendation.

Based on the effort estimates, resources, volume of the change and the impact, GBM stakeholders will present an implementation plan. If the effort estimates, impact and risks are too low and if the change is minimal that can be implemented without code changes, such as configuration changes, DB source changes, changes in procedures etc, then GBM will plan to take up as part of ongoing implementation.

If the effort requires code change, re-development or a design change, GBM will present an effort estimate with appropriate pricing plan to ensure that change requested is sanctioned by the customer business teams.

16.4.5   Implement the changes

Post approval, the change is implemented and is tested through the established SDLC. The changes are then communicated to the implementation team and is managed by our change management tools deployed for the project.

16.5 Risk Management

GBM's Risk management methodology is an integral part of its Project Management Framework which runs throughout the course of the project duration. GBM believes in early identification of the risk so that the corrective actions can be taken in time to avoid Schedule and cost overruns at stage.

Risks Management Cycle has been depicted in the below with the stages that occur

- Risk Identification
- Risk Analysis/Assessment
- Risk Treatment (Action)
- Risk Control
- Risk Monitoring

16.5.1 Risk identification

Risk identification provides the foundation of risk management. The identification methods at GBM are formed by templates for identifying source, problem or event. Having good knowledge of the customer region, regulatory requirements, environments and climatic conditions gives us greater advantage to identify the risks early. The risks are added in the project Risk Register for assessment, treatment and further monitoring.

16.5.2 Risk Assessments

Once risks have been identified, they must then be assessed as to their potential severity to the project and the probability of occurrence. Based on the assessment the ranking will be done on each risk to evaluate the magnitude and urgency to handle the same, The documentation will be added/updated to the Project Risk register during the risk review meetings.
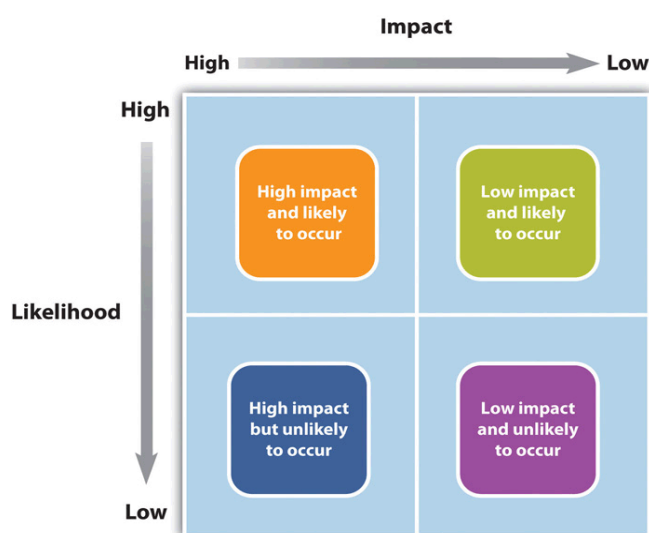
16.5.3 Risk Treatment (Action)

The identified and assessed risk are then taken up from the risk register to formulate an Action plan. This action is defined as Risk response planning, which is done with GBM's project team, Project Manager etc. to define one of the below actions.

- Avoid Risk: Possible alternatives to completely avoid the Risk.
- Transfer Risk: Look for alternative mechanism to transfer the risk to any external entity.
- Mitigate Risk: Mitigate the risk when the risk cannot be avoided completely, the impact of the risk on the project can be reduced by other means.
- Accept Risk: Accept the risk any of the above risk management methods outweigh the project benefits.

16.5.4 Risk Control& Monitoring

The risk control and monitoring are a continuous process that runs throughout the project phases. There would be evaluation of the risks that have been treated and look for the new risk that might happen to occur. The project team involves in analysis and check points to see that no unforeseen risk has crept during the course. When the risks are identified again the risk management cycle is carried out by making updates to the risk register and follow-up on the treatment needed to overcome it.

17 Non-Disclosure

The contents of the proposal and all the project outputs should not be disclosed to any party unless GBM and Customer mutually agree in writing. Customer will not use the contents of this proposal to bid for any other service provider.

18 Project Resources

18.1 Project Manager

General Information	
Name:	Ruqaiya Salim Ali Al Abri, PMP
Position:	Project Manager
Academic Qualifications:	Bachelor's in computer science Minor: Business Administration
Total Years of Working Experience:	3.5 years
Past Working Experience		

No.	Company Name, Department, Position Held and Details of Work Experience	Period
1	PMO Department, Project Manager. • Storage Migration Project for Royal Oman Police as a project manager • ECM Upgrade Project for Diwan Royal Court & Royal Court Affairs as a project coordinator • CMS Upgrade Project in a 1-year for the Ministry of Finance as Project Coordinator (Completed)	2013 - till date

Training	
2016	training of Project Management Jump start training on best practices, tools and templates – In GBM, Oman
2014	Training on virtualization, cloud computing and VMware
2014	Participated in IBM Insight 2014 - The Conference for Big Data and Analytics – In Las Vegas, Nevada.

18.2 Technical Project Lead

SNO	Field	Details
	Total years of work experience	10+
	Year of employment with Bidder	10+
	Previous places of employment before joining vendor	NA
	Proposed role on Project	Technical Project Manager
	Educational/Professional and technical certifications	Bachelor of Technology and certified in IBM ACE and IBM APIC.
	Prior implementation experience. Indicate the following for each prior client experience provided • Name of client • Engagement Start – finish date • Scope of work • Role of candidate on team • Description of specific areas of responsibility and key activities performed	"Prior implementation experience. Indicate the following for each prior client experience provided • Name of client - RAK Bank & Dashen Bank • Engagement Start – finish date Rak Bank is on-going project and Dashen is in Production support stage where it has started in 2020 May and went Live on 22nd Oct 2021 • Scope of work - Used to interact with the business and get the requirement. Based on that design the architecture and delegate to the team members. • Role of candidate on team - Managing and technically assisting the team • Description of specific areas of responsibility and key activities performed" - Designed complex modules and assisted the team on the applications assigned
	English Language proficiency (Low, Medium, High) – Oral, written and comprehension	English - High

18.3 Solution Architect

SNO	Field	Details
	Total years of work experience	10+
	Year of employment with Bidder	10+
	Previous places of employment before joining vendor	NA
	Proposed role on Project	Solution Architect
	Educational/Professional and technical certifications	Master of Computer Application and certified in IBM ACE and IBM APIC.
	Prior implementation experience. Indicate the following for each prior client experience provided • Name of client • Engagement Start – finish date • Scope of work • Role of candidate on team • Description of specific areas of responsibility and key activities performed	"Prior implementation experience. Indicate the following for each prior client experience provided • Name of client - RAK Bank & Dashen Bank • Engagement Start – finish date Rak Bank is on-going project and Dashen is in Production support stage where it has started in 2020 May and went Live on 22nd Oct 2021 • Scope of work - Used to interact with the business and get the requirement. Based on that design the architecture and delegate to the team members. • Role of candidate on team - Managing and technically assisting the team • Description of specific areas of responsibility and key activities performed" - Designed complex modules and assisted the team on the applications assigned
	English Language proficiency (Low, Medium, High) – Oral, written and comprehension	English - High

18.4 APIC Developer and Admin

SNO	Field	Details
	Total years of work experience	5+
	Year of employment with Bidder	5+
	Previous places of employment before joining vendor	NA
	Proposed role on Project	APIC Developer and Admin
	Educational/Professional and technical certifications	Bachelor of Technology and certified in IBM APIC.
	Prior implementation experience. Indicate the following for each prior client experience provided • Name of client • Engagement Start – finish date • Scope of work • Role of candidate on team • Description of specific areas of responsibility and key activities performed	"Prior implementation experience. Indicate the following for each prior client experience provided • Name of client - Dashen Bank • Engagement Start – finish date: Dashen is in Production support stage where it has started in 2020 May and went Live on 22nd Oct 2021 • Scope of work - Developed few modules related to Account Transactions and enquiries which will interact with the Backend system through channels and implemented OAuth 2.0. • Role of candidate on team - Developer • Description of specific areas of responsibility and key activities performed" - Designed few medium level modules
	English Language proficiency (Low, Medium, High) – Oral, written and comprehension	English - High

18.5 Application Developer

SNO	Field	Details
	Total years of work experience	4+
	Year of employment with Bidder	4+
	Previous places of employment before joining vendor	NA
	Proposed role on Project	Application Developer
	Educational/Professional and technical certifications	Bachelor of Technology and certified in IBM APIC.
	Prior implementation experience. Indicate the following for each prior client experience provided • Name of client • Engagement Start – finish date • Scope of work • Role of candidate on team • Description of specific areas of responsibility and key activities performed	"Prior implementation experience. Indicate the following for each prior client experience provided • Name of client - Dashen Bank • Engagement Start – finish date: Dashen is in Production support stage where it has started in 2020 May and went Live on 22nd Oct 2021 • Scope of work - Developed few modules related to Account Transactions and enquiries which will interact with the Backend system through channels and implemented OAuth 2.0. • Role of candidate on team - Developer • Description of specific areas of responsibility and key activities performed" - Designed few medium level modules
	English Language proficiency (Low, Medium, High) – Oral, written and comprehension	English - High

18.6 APIC/DP Admin

SNO	Field	Details
	Total years of work experience	5+
	Year of employment with Bidder	5+
	Previous places of employment before joining vendor	NA
	Proposed role on Project	APIC/DP Admin
	Educational/Professional and technical certifications	Bachelor of Technology and certified in IBM APIC and Data Power.
	Prior implementation experience. Indicate the following for each prior client experience provided • Name of client • Engagement Start – finish date • Scope of work • Role of candidate on team • Description of specific areas of responsibility and key activities performed	"Prior implementation experience. Indicate the following for each prior client experience provided • Name of client - Dashen Bank and Small Ujjivan Bank • Engagement Start – finish date: Ujjivan is an on-going project where I have been assigned to this project last year September and Dashen is in Production support stage where it has started in 2020 May and went Live on 22nd Oct 2021 • Scope of work - Developed few modules related to Account Transactions and enquiries which will interact with the Backend system through channels and implemented OAuth 2.0. • Role of candidate on team - Configured the APIC and done the Gateway peering between Data Power and IBM APIC • Description of specific areas of responsibility and key activities performed" - I have an admin to these projects
	English Language proficiency (Low, Medium, High) – Oral, written and comprehension	English - High

19 Legal Notices

Confidentiality

Gulf Business Machines (Oman) Co. L.L.C. is referred to as "**GBM Oman**". GBM Oman is a GBM company and the terms GBM Oman and GBM can be used interchangeably throughout this proposal. This proposal contains the intellectual property of GBM and/or other third parties with whom GBM has business relationships. The information in this proposal is confidential and shall not be disclosed outside the customer organisation and shall not be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal, provided that if a contract is awarded to GBM as a result of or in connection with the submission of this proposal, the customer shall have the right to duplicate, use or disclose the information to the extent provided in the contract or related Agreement for Exchange of Confidential Information. Acknowledgement of this proposal will represent acceptance of the confidentiality statements herein. This restriction does not limit the right of the customer to use information contained in the proposal if it is obtained from another source without restriction.

Disclaimer

The prices quoted in this proposal are for budgetary and planning purposes and are intended as an estimate for your reference only, unless stated otherwise in the commercial section of this proposal. It assumes that GBM standard terms and conditions apply and is based on your preliminary requirements. Any modifications to these provisions or additional terms required by you could increase our responsibilities and risks and consequently could impact the proposed price and other terms.

Accordingly, should GBM be awarded the business, we suggest that the parties, enter discussions, in good faith, to allow time for validation of requirements and to agree a suitable agreement based on the GBM standard terms and conditions. GBM reserves the right to negotiate in good faith and mutually agree the applicable agreement or purchase order terms from the premise of mitigating risk and driving better value for price. However, until such agreement or purchase order is negotiated and agreed, or in the event that it is not, our response to you is submitted on the basis that, should we be awarded the business, your request and our response by way of this proposal will not be a binding contract, but that such award and any products and services ordered by you, will be subject to the provisions of the GBM standard terms and conditions, and that such award to us also constitutes your acceptance of the above arrangement. This proposal is not an offer or contract. Neither GBM nor you have any obligations or liability to the other unless our authorised representatives enter into definitive written agreement. Terms included in this proposal are not binding unless they are included in such a written agreement.

Charges and Payment

This proposal is valid for 45 days unless otherwise noted. Prices and charges in this proposal are subject to change without notice. Customer agrees that, unless stated to the contrary, all amounts are due and payable within 30 days of receipt of the invoice. Any dispute must be registered by customer to GBM within 10 working days of receipt of the invoice or the invoice will be deemed to have been accepted.

If any authority imposes any duty, tax, levy or fee, excluding those based on GBM's net income, upon any transaction or supply of products and/or services under this proposal, then customer is responsible for and agrees to pay that amount as specified in an invoice or supply appropriate exemption documentation.

All prices quoted herein are exclusive of value added tax or similar tax of any nature ("VAT"), unless clearly stated to the contrary and shown as a separate item. VAT will be charged according to the applicable VAT law in relation to any transaction or supply of products or

services under this Agreement and shall be borne by the customer. All invoices containing such VAT shall be deemed valid tax invoices. Any exemption will be subject to the provision of appropriate exemption documentation by the customer prior to the invoice date.

Penalties and Liquidated Damages

In the event that any delay penalties, service credits or liquidated damages are sought by the customer within any applicable agreement or purchase order, such delay penalties, service credits or liquidated damages in aggregate will be limited to 10% of the applicable fees, or as otherwise finally negotiated and mutually agreed by GBM.

Title and Risk of loss

GBM transfers title to any products delivered to the customer upon payment of all the amounts due. Failure to pay all amounts for products, by the due date, shall give GBM the right, without liability, to repossess such products with or without notice and to avail itself of any legal remedy. For licenced programs provided as a deliverable, GBM will ensure that the customer is granted the required license to use such licensed programs. All licenced programs provided under an agreement or purchase order are made available solely subject to and based on applicable terms and conditions of the license owner. The customer agrees to comply fully with the applicable terms and conditions of the license owner when using any licensed program.

For any products delivered to customer, the risk of loss or damage passes to the customer on delivery to customer's designated location.

Warranties and Disclaimers

This document and all information herein are provided AS IS, without warranty and nothing herein, in whole or in part, shall be deemed to constitute a warranty. Machines supplied by GBM are subject to the manufacturer's Statements of Limited Warranty accompanying the applicable Machine. Program Products (software) provided by GBM are subject to the applicable license terms of the licence owner.

The GBM standard warranties are contained in the GBM Services Agreement. Any warranties that GBM provides will be included in a contract to be negotiated by the parties. Nothing contained in this proposal should be construed as a warranty of effective results and the effectiveness of the solution is subject to the proper implementation of the solution as a whole.

Intellectual Property Rights

Nothing in any agreement or purchase order shall act to transfer the ownership of any existing intellectual property rights belonging to either party or to any third party or derivative works thereof. The ownership of any intellectual property rights in newly created works will be specified in the applicable agreement.

Suspension or Termination for Customer Payment Default

Without prejudice to other termination rights GBM may agree under any agreement or purchase order, GBM shall have the right to suspend the performance of services or to terminate an agreement or purchase order if the customer breaches its payment obligations (which shall be deemed a material breach) and does not remedy the breach within the notice time informed by GBM and in no event more than 30 days as of invoice date. Such suspension or termination shall be without prejudice to any other rights or remedies GBM may be entitled to hereunder or at law and shall not affect any accrued rights or liabilities of GBM, nor the coming into or continuance in force of any provision hereof which are expressly or by implication intended to come into or continue in force on or after such termination, including GBM's right to receive payment for all products supplied or services completed through the date of suspension or termination.

Liabilities

To the maximum extent permitted under applicable law, GBM is liable for no more than the amount of any other actual direct damages or loss, up to the actual payments the customer has made for the service or products that are the subject of the claim. GBM shall not be liable for any loss of records or data or third-party claims against the customer (other than those for bodily injury including death and damage to real tangible property). Neither party shall be liable to the other in agreement, tort or otherwise howsoever, and whatever the cause thereof for any special, incidental, consequential or indirect damages, or for any economic loss (including loss of profits, business, revenue, data, contracts, goodwill, or anticipated savings), even if the party is informed of the possibility.

Force Majeure

GBM will not be in default nor liable for any delay or failure to perform due to any act beyond the control of GBM. This includes Acts of God, War (declared and undeclared), riots, civil commotions, revolutions, hostilities, strikes, epidemics, pandemics, accidents, fire, floods, earthquakes, explosions, blockades, nuclear hazards, extreme weather conditions and any other cause similar to the kind herein mentioned or of equivalent force occurring which is beyond the control of GBM and unavoidable. If a delay or failure to perform its obligations is caused or anticipated due to force majeure, the performance of GBM obligations will be suspended. In the event that force majeure prevents GBM from performing or continuing to perform its obligations for a period of more than two (2) months, GBM may immediately terminate without liability or charge any agreement or purchase order on providing notice in writing to the customer. GBM shall take all actions which are reasonable under the circumstances to overcome any such cause of prevention or delay and to proceed with the performance of its obligations hereunder. Where our relationship will be terminated as result of these terms by accepting this proposal and irrespective of any terms to the contrary you agree to pay for any products ordered and/or services delivered up to the date of termination. Unless otherwise agreed in writing by GBM in an agreement, where GBM's ability to perform is impacted due to reasons outside his control GBM reserves all rights to renegotiate contractual terms applicable to its scope.

Export Regulations

Each party will comply with all applicable export and import laws and associated embargo and economic sanction regulations, including those of the United States, that prohibit or restrict the export, re-export, or transfer of products, technology, services or data, directly or indirectly, to certain countries, or for certain end uses or end users. GBM is subject to the rules and regulations of the U.S. Treasury and Commerce Departments. Consequently, nothing in any agreement or purchase order resulting from or in connection to this proposal will be construed as an obligation for GBM to take any action, or to refrain from taking any action, that is inconsistent with or penalized under these rules and regulations.Additional Information

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