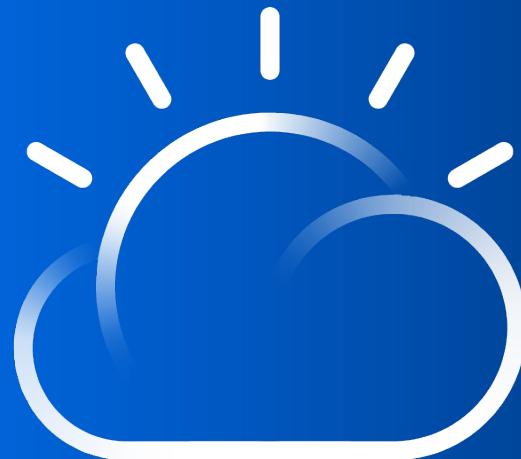


Shipra Jain
Developer Advocate
shipra_jain@in.ibm.com

Lab:
Ishani Pandey
Developer Advocate



Agenda

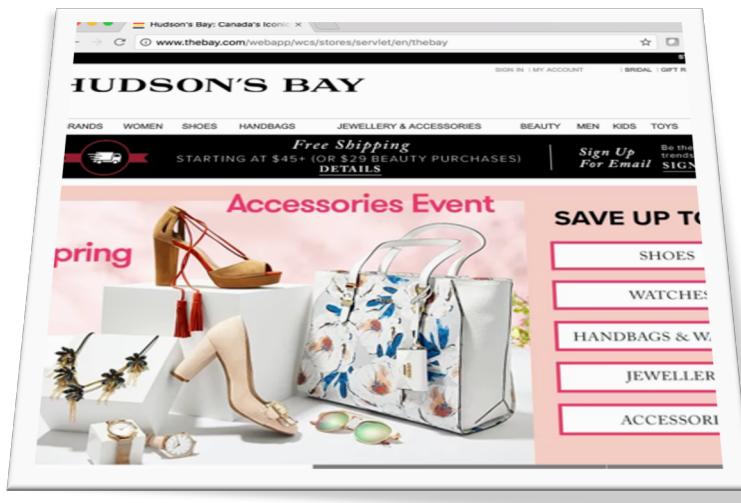
Why API Management

API Connect overview/intro

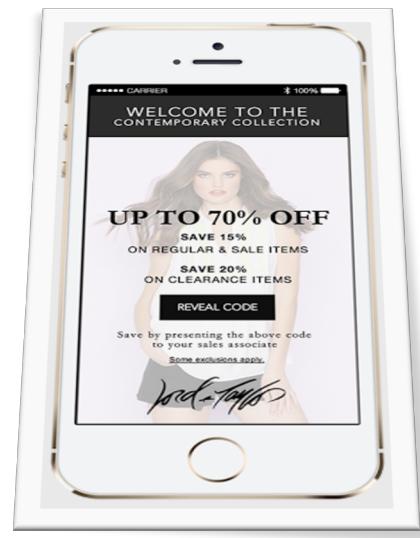
API Lifecycle

- Create
- Test
- Secure
- Manage
- Socialize
- Monetize
- Analyze
- Monitor

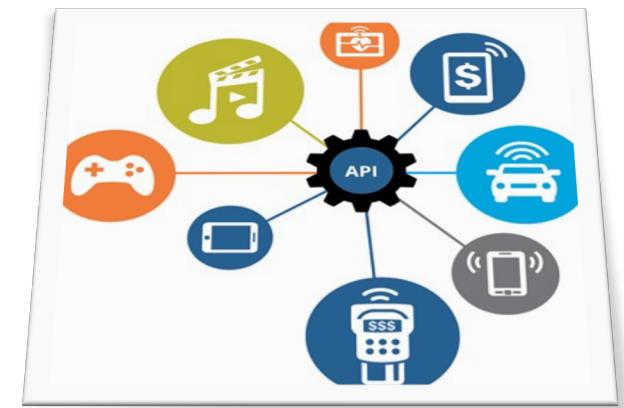
Web, Mobile & APIs – What Do They have In Common?



Late 1990s



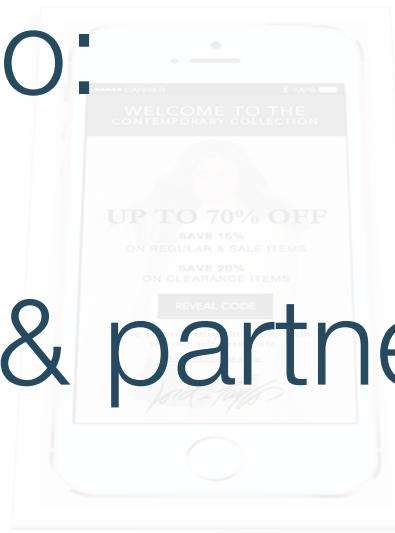
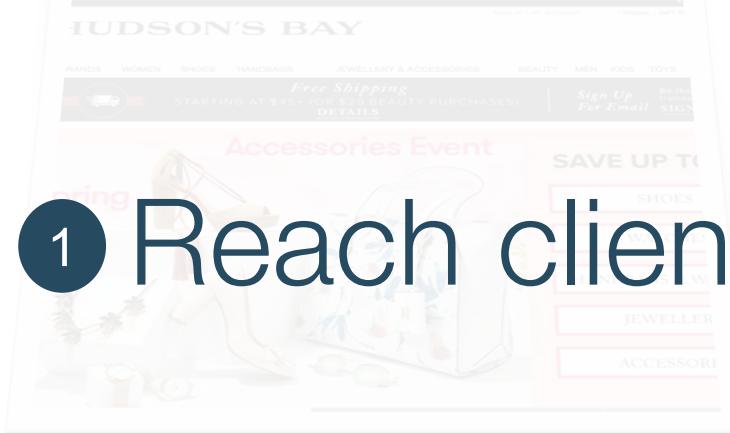
2000s



2015+

Web, Mobile & APIs Offer Organizations...

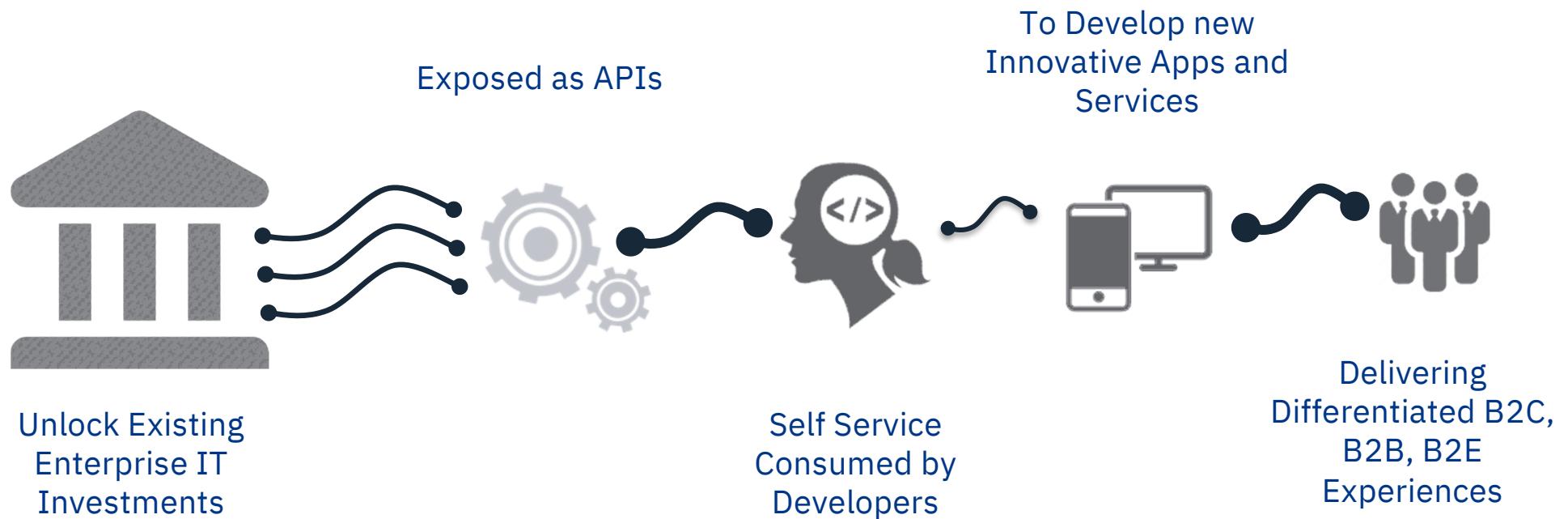
A new channel to:



- ① Reach clients & partners
- ② Enable new businesses models

Basic concept - Shift focus to consumers

API Economy Value Chain



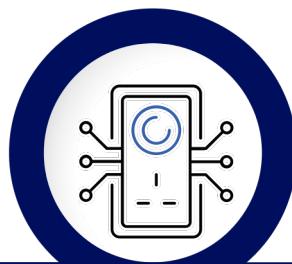
The need for Integration increases



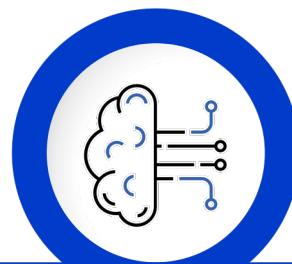
**SaaS
Adoption**



IoT



**Process
Automation**

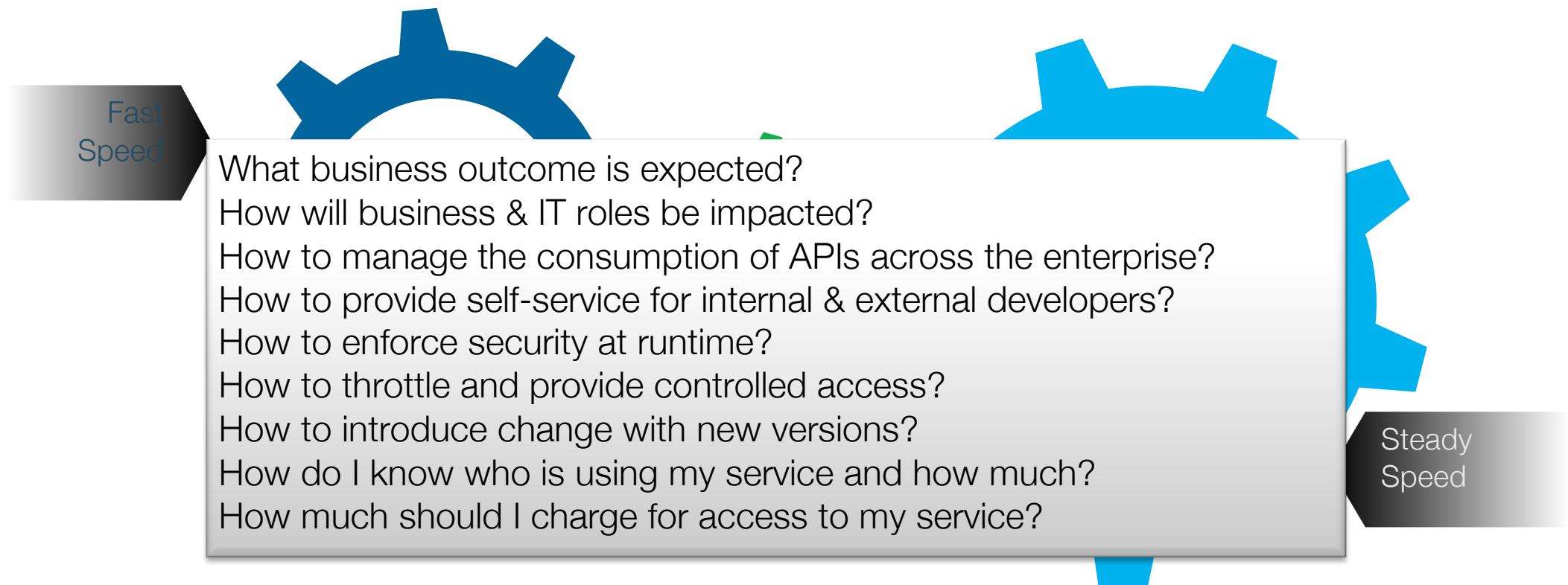


AI



**Micro services
Design**

Challenges with Multi-Speed IT



An API Strategy To...

1

Speed application development

Via self service library of reusable APIs



2

Securely expose systems of record

Apps and data to Mobile, IoT, & hybrid cloud apps



3

Publish APIs to expand brand reach

Tap into developer & partner ecosystems



4

Enable new business

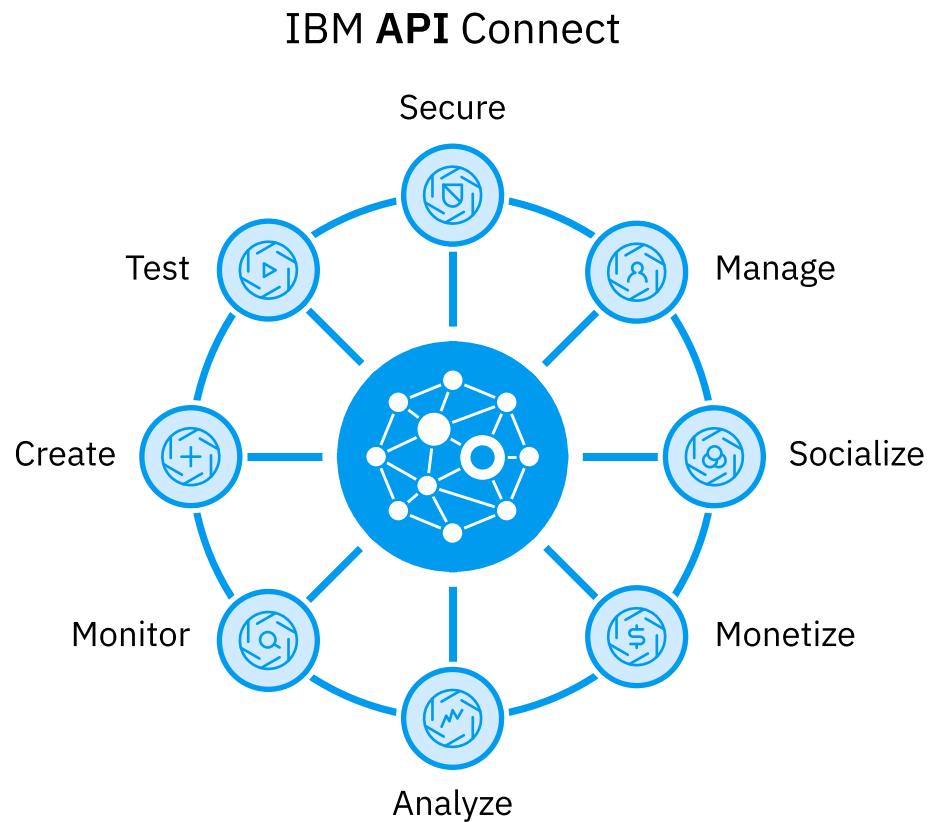
Monetize existing and new data & algorithms



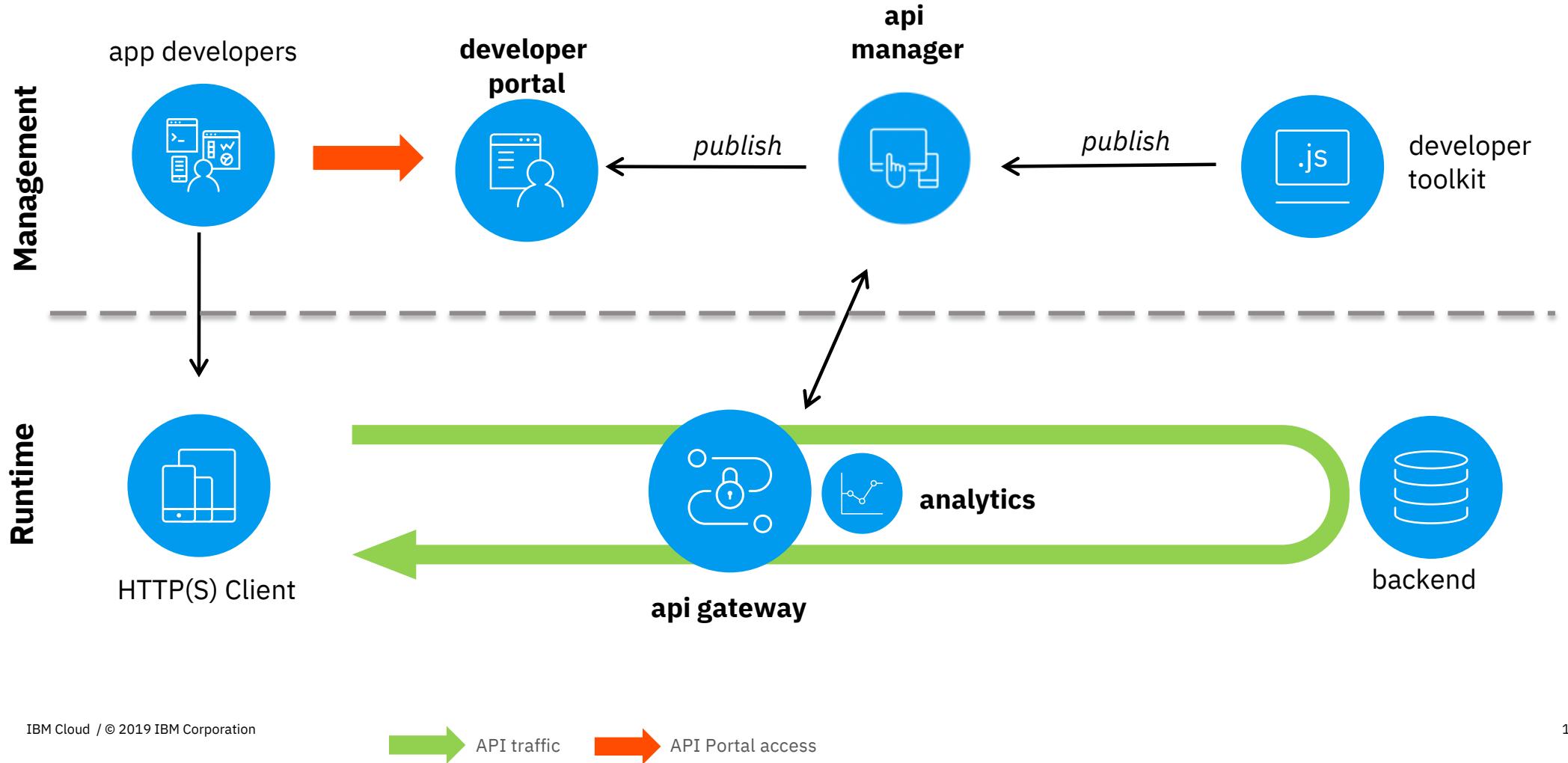
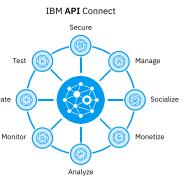
API Management

IBM API Connect

Overview



API Connect – Components



Components functionality



Gateway Instance

- API Policy Enforcement
- Security & Control
- Traffic control & mediation
- Workload optimization
- Monitoring/Analytics data Collection



Management Instance

- API Discovery
- API Policy Creation
- Product Version & Lifecycle Management



Portal Instance

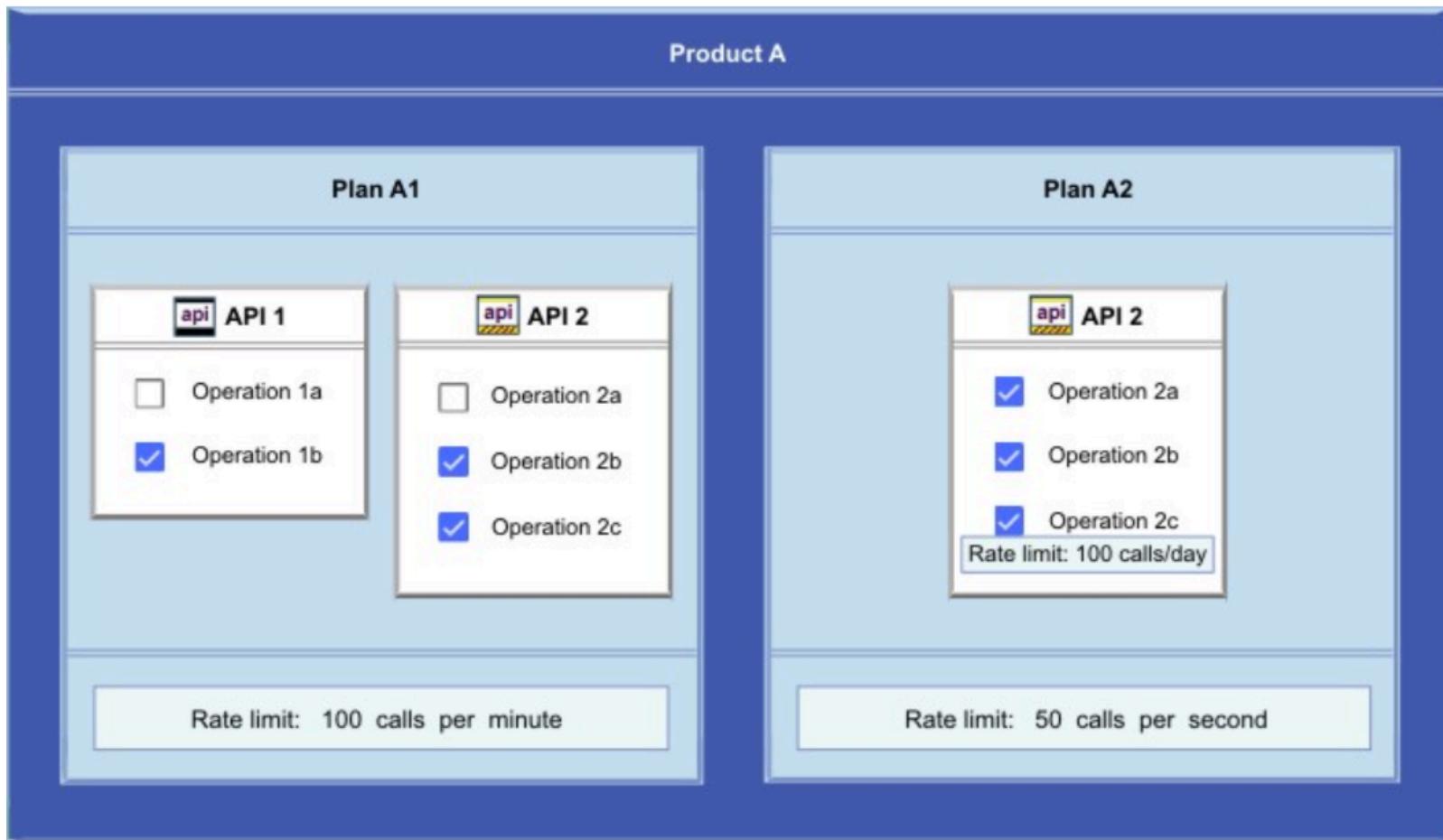
- Self-service App Developer Portal based on Drupal 8
- User Management
- Social Collaboration
- Subscription & Community Management



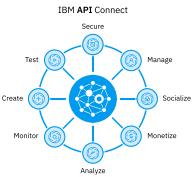
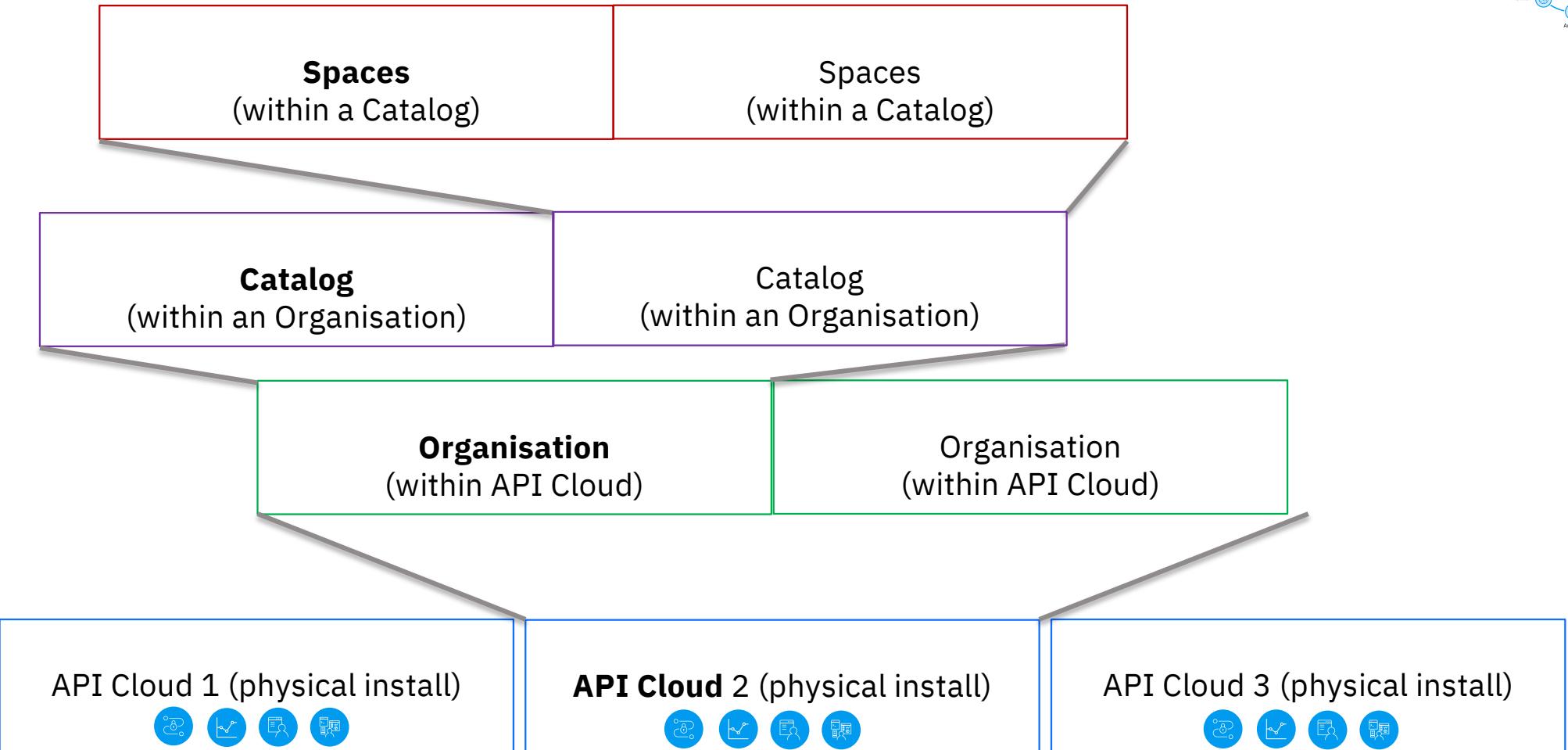
Analytics Instance

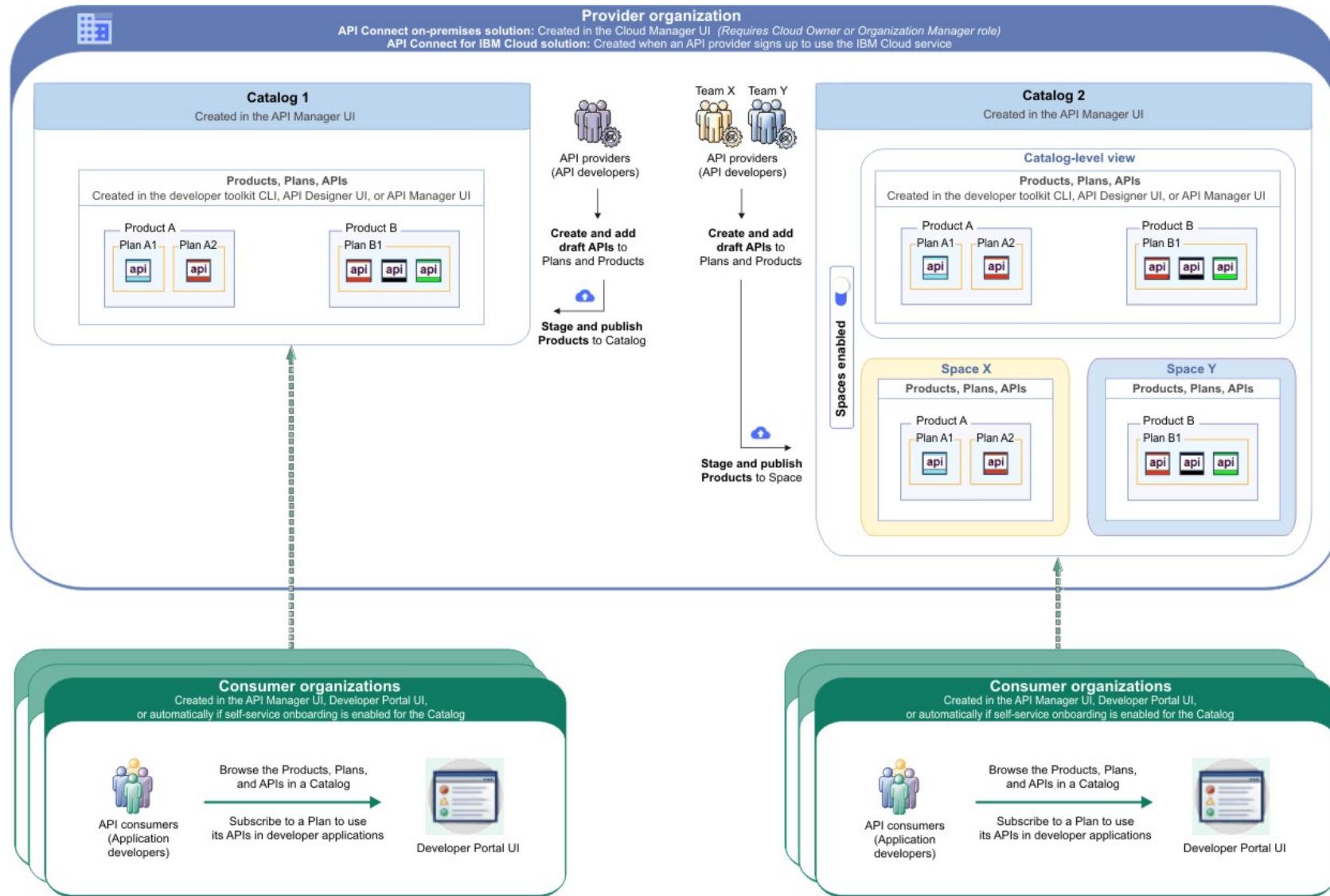
- API Monitoring Analytics

Products, Plans, and APIs - Levels of Segregation



Levels of Segregation

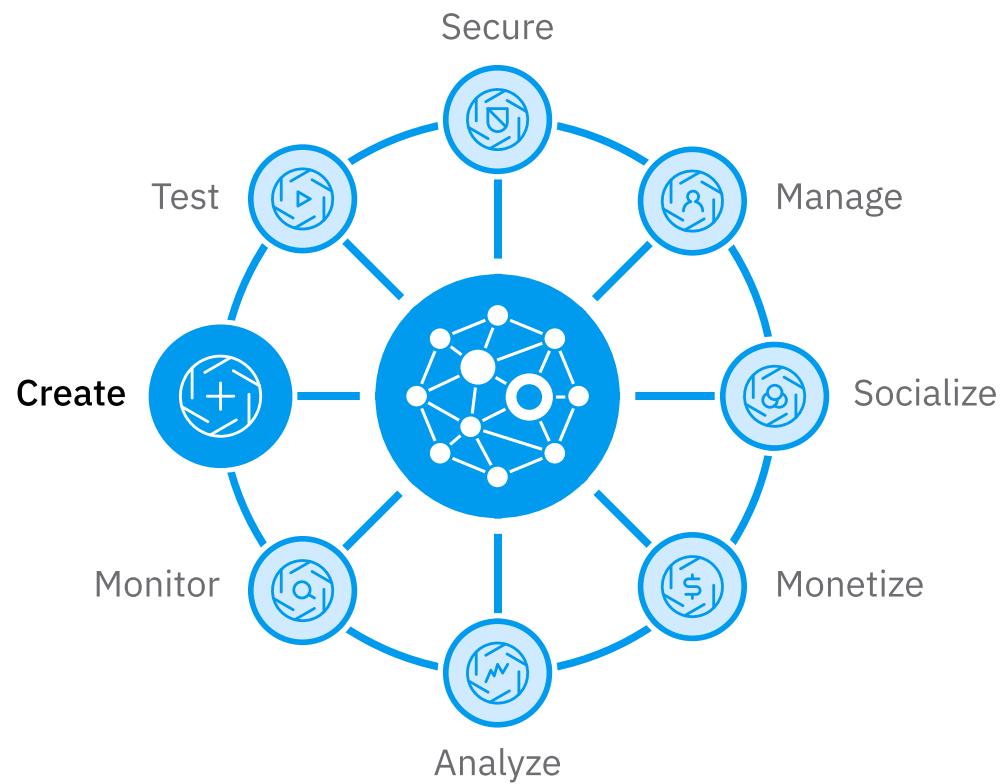




API Management

IBM API Connect

Create



Creating APIs

Create

From target service

Create a REST proxy that routes all traffic to a target API or service endpoint

From existing WSDL service (SOAP proxy)

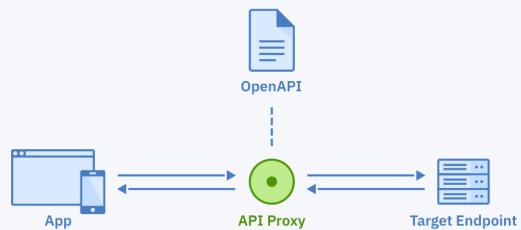
Create a SOAP proxy based upon a WSDL described target service

From existing WSDL service (REST proxy)

Create a REST proxy based upon a WSDL described target service

New OpenAPI

Compose a new REST proxy by defining paths and operations



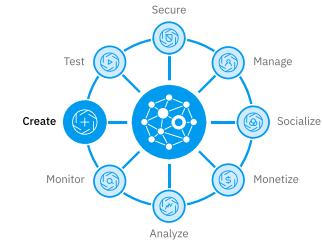
Import

Existing OpenAPI

Use an existing definition of a REST proxy

Cancel

Next



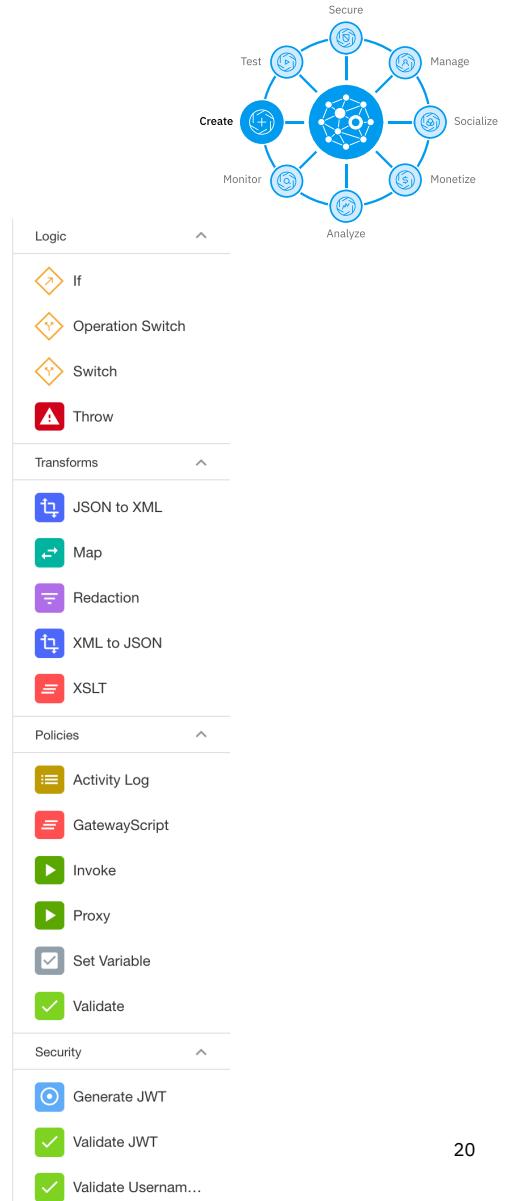
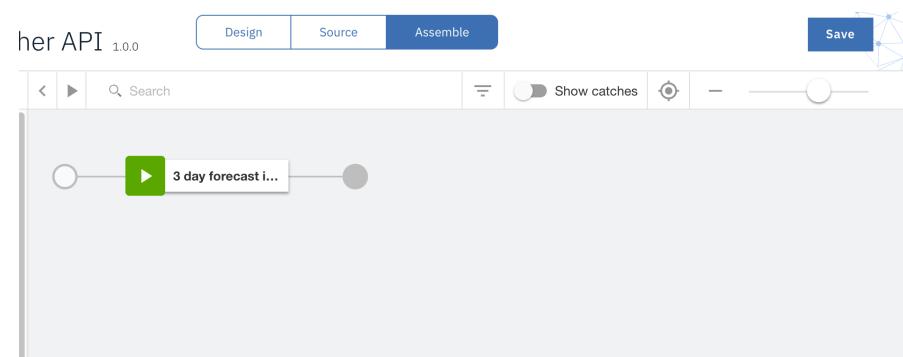
Three views – same source

The screenshot shows the 'Source' view of the Climbing Weather API in the IBM API Connect API Manager. The interface includes tabs for 'Design', 'Source', and 'Assemble'. The 'Source' tab is active, displaying the API's OpenAPI specification. The specification includes details such as the API title ('Climbing Weather API'), version ('1.0.0'), and supported schemes ('HTTP', 'HTTPS'). The code editor shows the following OpenAPI definition:

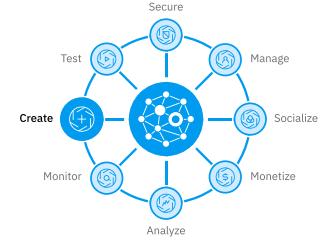
```

1 swagger: '2.0'
2 info:
3   title: Climbing Weather API
4   x-api-name: climbing-weather-api
5   x-api-version: 1.0.0
6   host: ${{catalogHost}}
7   schemes:
8     - https
9   basePath: /
10  protocols:
11    - application/json
12  consumes:
13    - application/json
14  security:
15    - client-secret: []
16    - client-id: []
17  securityDefinitions:
18    clientSecret:
19      type: apiKey
20      description: ''
21      in: header
22      name: X-IBM-Client-Secret
23    clientId:
24      type: apiKey
25      description: ''
26      in: header
27      name: X-IBM-Client-Id
28    x-csrf-configuration:
29      phase: realized
30      testable: true
31      enforced: true
32      enabled: true
33      enabled: true
34      application-authentication:
35        certificates: false
36      assemble:
37        execute:
38          - invoke:
39            target-url: >
40              https://api.us-east.cloud.ibm.com/v1/operations/apiconnect/apirequest.path${{request.search}}&client_id=532e725b-ddd8-4ea9-9312-
41              &date=2019-07-10T12:00:00Z&forecast=3day
42              &cache-reuse-time-to-live
43              &cache-key: ${{request.search}}
44          gateway: datapower-strategy

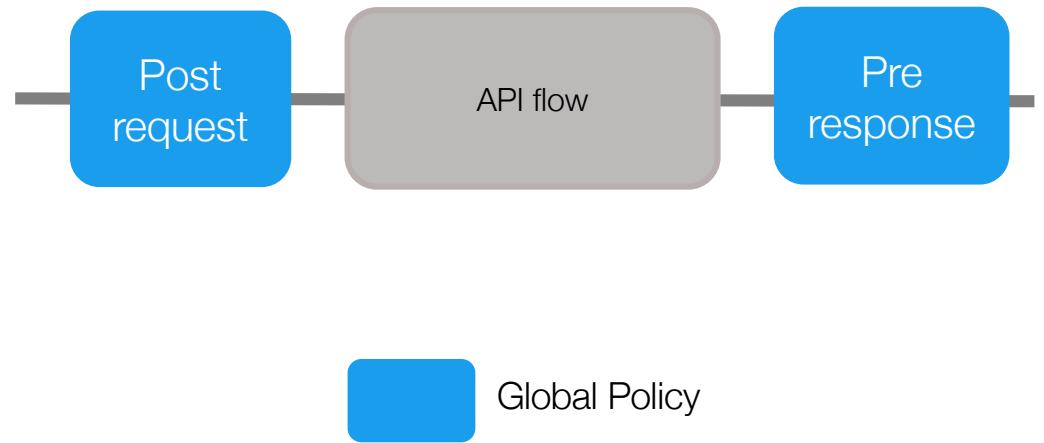
```



Global Policies for Corporate Governance



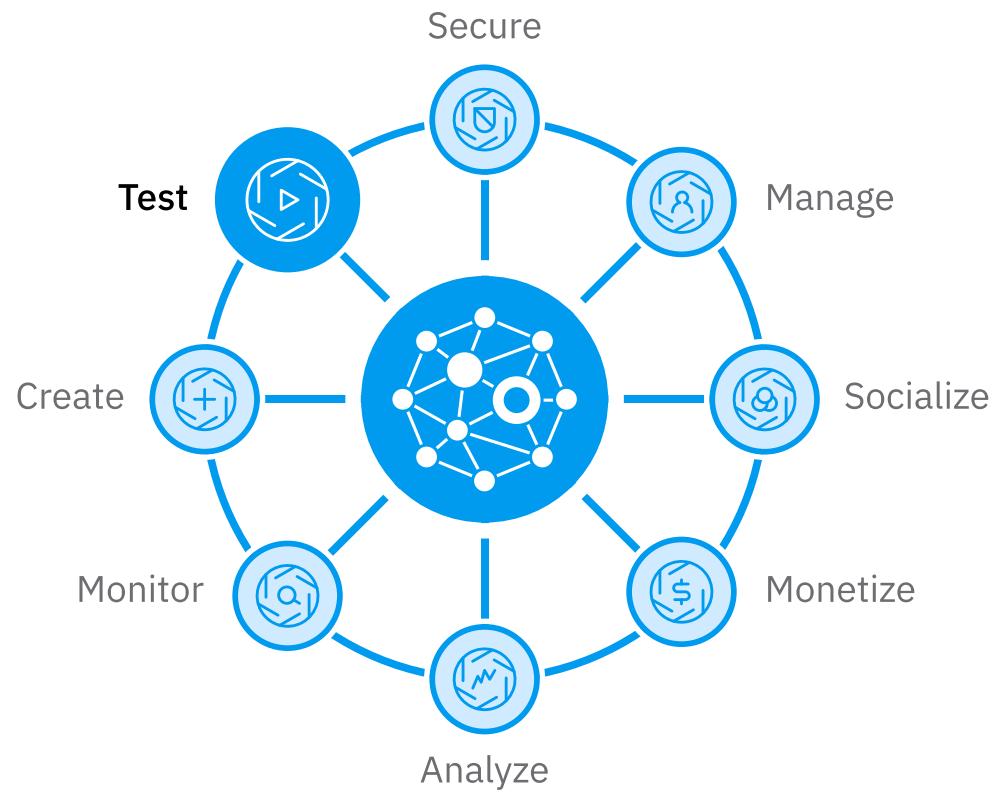
- **Enforce corporate standards** and centralize governance with common security and logging policies without impacting API development
- **Flexible security permissions for deploying global policies**, enabling CSO / security professionals additional access control and flexibility
- **Accelerated definition** as it follows the same assembly constructs of that within the API



API Management

IBM API Connect

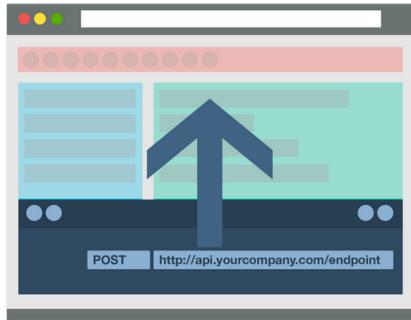
Test



API Test and Monitor



Let's Get Started!



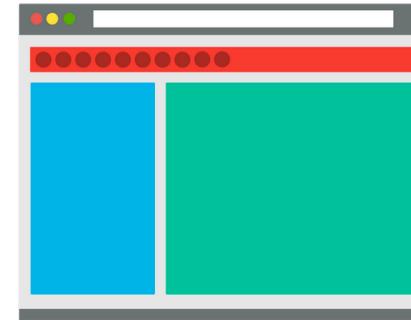
Quick start from an API call

Select



Quick start from an example unit

Select



I got this, let's start from scratch

Select

API Test and Monitor

Create Projects

The screenshot shows a central "Test status: Live" section with three gear icons. To the left, a "Last Run" summary is displayed: PASSED on 10/23/2018 at 08:30:02. Below it, a "Notifications" section indicates that Murali_Sitaraman will be notified for any failure. To the right, "Runs Stats" show 1 run in the us-east location. At the bottom, two versions are compared: a "Working Copy" (modified 10/11/2018 2:13 PM) and a "Published Version" (modified 10/03/2018 4:57 PM). A note states that the Working Copy is a draft and needs to be published to become live.

Last Run
PASSED
10/23/2018 @ 08:30:02

Notifications
You (Murali_Sitaraman) will be notified for any failure

Test status: Live

Runs Stats
Runs count: 1
Locations: us-east

This is a draft version of the test you are currently editing. This version is NOT live, and is not the test being executed by your schedule. To push live click the Publish button.

Working Copy
Author: Murali_Sitaraman
Modified: 10/11/2018 2:13 PM

Published Version
Author: Murali_Sitaraman
Modified: 10/03/2018 4:57 PM

This is the LIVE version of the test. It is the test that is executed based on the schedule you have set. To update the test edit a Working Copy and hit the Publish button. Do so with caution, there is no undo button.



Compose



Publish



Clear Working Copy



Schedule



Build from SPEC



Automatch



Copy To Clipboard

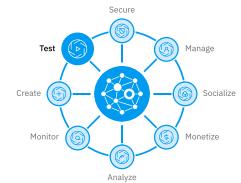


Resources



Delete Test

<http://ibm.biz/apitest>



API Test and Monitor

The screenshot shows two panels of the IBM API Connect Test and Monitor interface. The left panel, titled 'Monitor', displays a single test step: 'GET to https://us-east.apitest.apiconnect.ibmcloud.com/app/api/examples/retail/products'. The right panel, titled 'Test Payload', shows the same test step with detailed assertions:

- Ae payload.success must exist
ASSERT EXISTS Mode: - Level: - Stop test if fails: -
- Ae payload.content must exist
ASSERT EXISTS Mode: - Level: - Stop test if fails: -
- Ai payload.content.products must be array
ASSERT IS Mode: - Type: array Level: - Execute only if item exists: - Stop test if fails: -
- for each in → payload.content.products
the nested assertions will be executed
- Ai _1 must be integer
ASSERT IS Mode: - Type: integer Level: - Execute only if item exists: - Stop test if fails: -

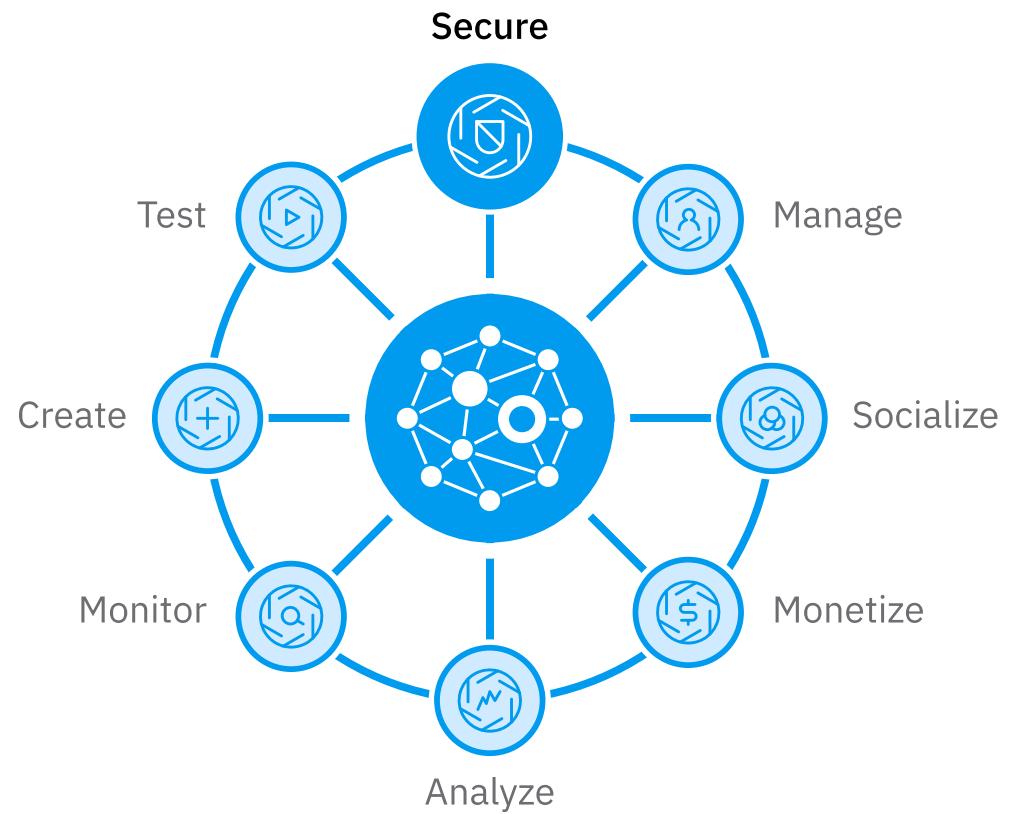
Test for availability and response times

Test for availability and response times & validate responses

API Management

IBM API Connect

Secure



Requirements for an API Gateway

An API Gateway needs to be



Secure



High performant



Customizable



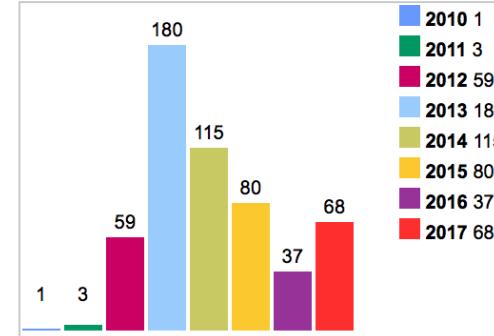
Robust

Some components, for example Java, require frequent patching,
and very few vendors would recommend running them in the DMZ

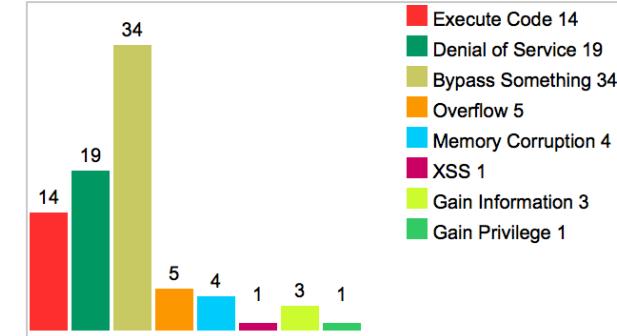
Would we run our App Server directly in the DMZ?

	Product Name	Vendor Name	Product Type	Number of Vulnerabilities
1	Linux Kernel	Linux	OS	1970
2	Mac Os X	Apple	OS	1915
3	Chrome	Google	Application	1523
26	JRE	Oracle	Application	543
28	JDK	Oracle	Application	532

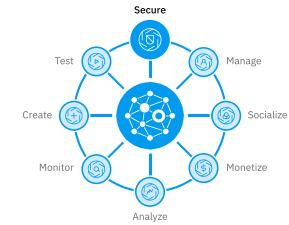
Vulnerabilities By Year



Vulnerabilities By Type



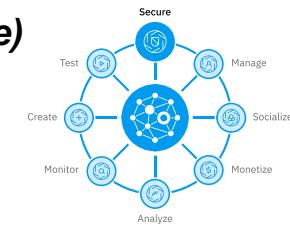
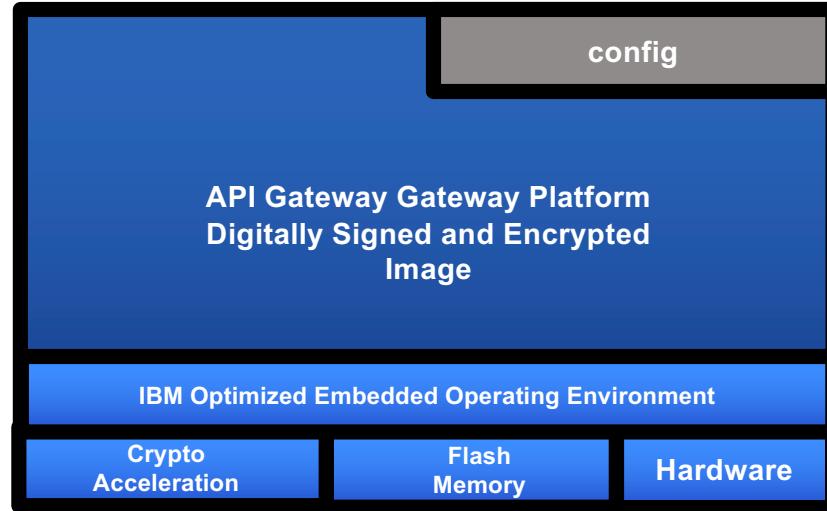
Source: https://www.cvedetails.com/product/19116/Oracle-JDK.html?vendor_id=93



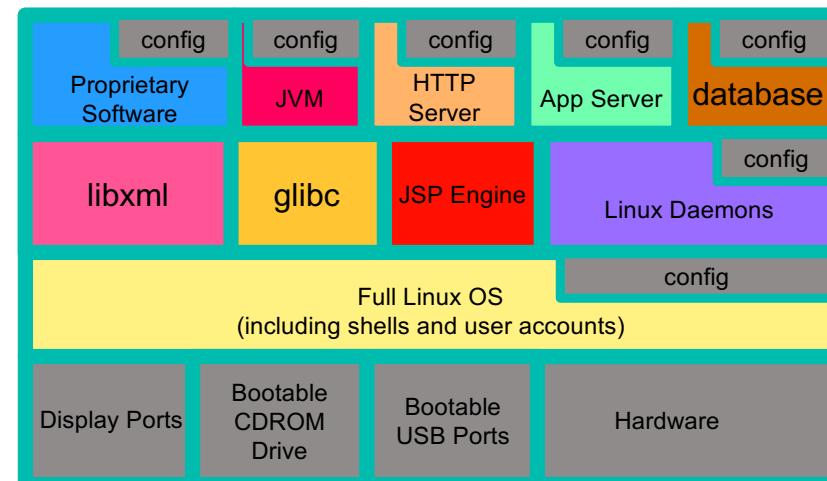
Simple & Secure Architecture

- How is API Gateway Gateway different?
Purpose-built, secure gateway platform
 - Complete gateway platform delivered as hardened image
- **Guiding philosophy is to centralize common security, traffic management, mediation, acceleration functions and optimize them** in a security-hardened gateway stack delivered in Docker container, Linux application, Virtual machine and Physical appliance form factors

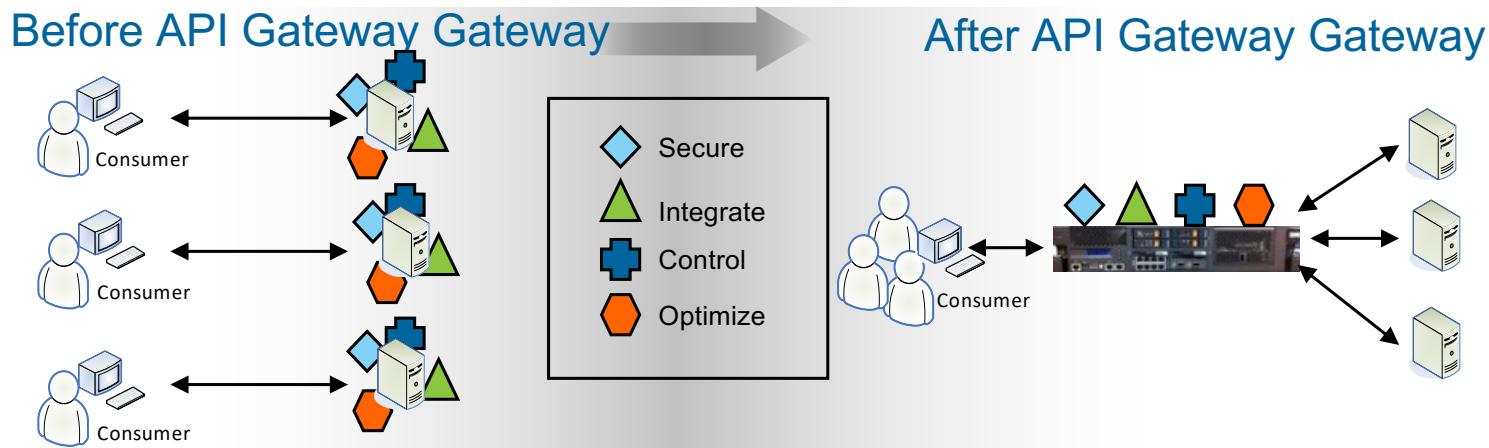
API Gateway Gateways (*Secure & Easy to Manage*)



Commodity Gateways (*Insecure & Hard to Manage*)



Rapidly deliver secure integration & optimized access for a full range of workloads



Secure

- Authentication, authorization, auditing
- Security token translation
- Threat protection
- Schema validation
- Message filtering
- Digital signatures
- Encryption/decryption
- Application Firewall (XML, Web....)

Integrate

- Any-to-any message xform
- Transport protocol bridging
- Message enrichment
- Database connectivity
- Mainframe connectivity
- B2B trading partner connectivity
- Hybrid cloud integration

Control

- Quota enforcement, rate limiting
- Content-based routing
- Failure re-routing
- Integration with governance platforms
- B2B partner management

Optimize

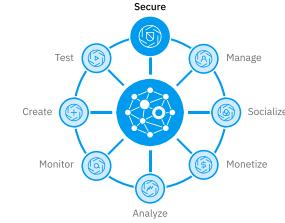
- SSL/TLS offload
- Hardware accelerated crypto operations
- JSON, XML offload
- JavaScript, JSONiq, XSLT, Xquery acceleration
- Response Caching
- Intelligent load distribution

Policies for Enforcement on API Gateway Service

- Gateway Script and XSLT policy support provides flexible message mediation & dynamic security enforcement
- Dynamic Routing support through Conditional Policy
- Enforce strong security through Parse, JSON and XML Schema Validation policy
- OpenID Connect support to enable banks to meet PSD2 / Open Banking regulations
- OAuth Token revocation to enable self-service token management



API Gateway
Service (APIGW)



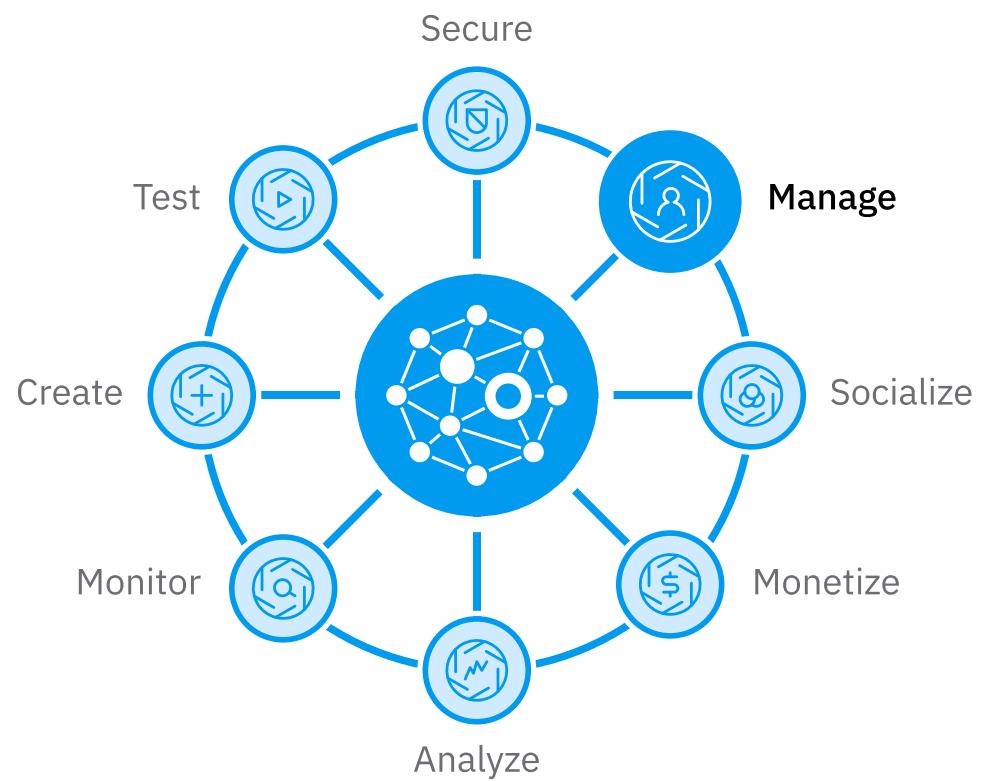
Foundational	Security	Mediation
Invoke	API Key ⁺	Map
Activity Log ⁺	JWT Validate	JSON-XML
Rate Limit ⁺	JWT Generate	Gateway Script
Throw	OAuth Policy	XSLT
Set Variable	Parse (Threat Detection)	
Conditional	Validate*	
	User Security	
	OpenID Connect ^{*+}	

+ Configured outside API Assembly * Available as part of 2018.4.1.1

API Management

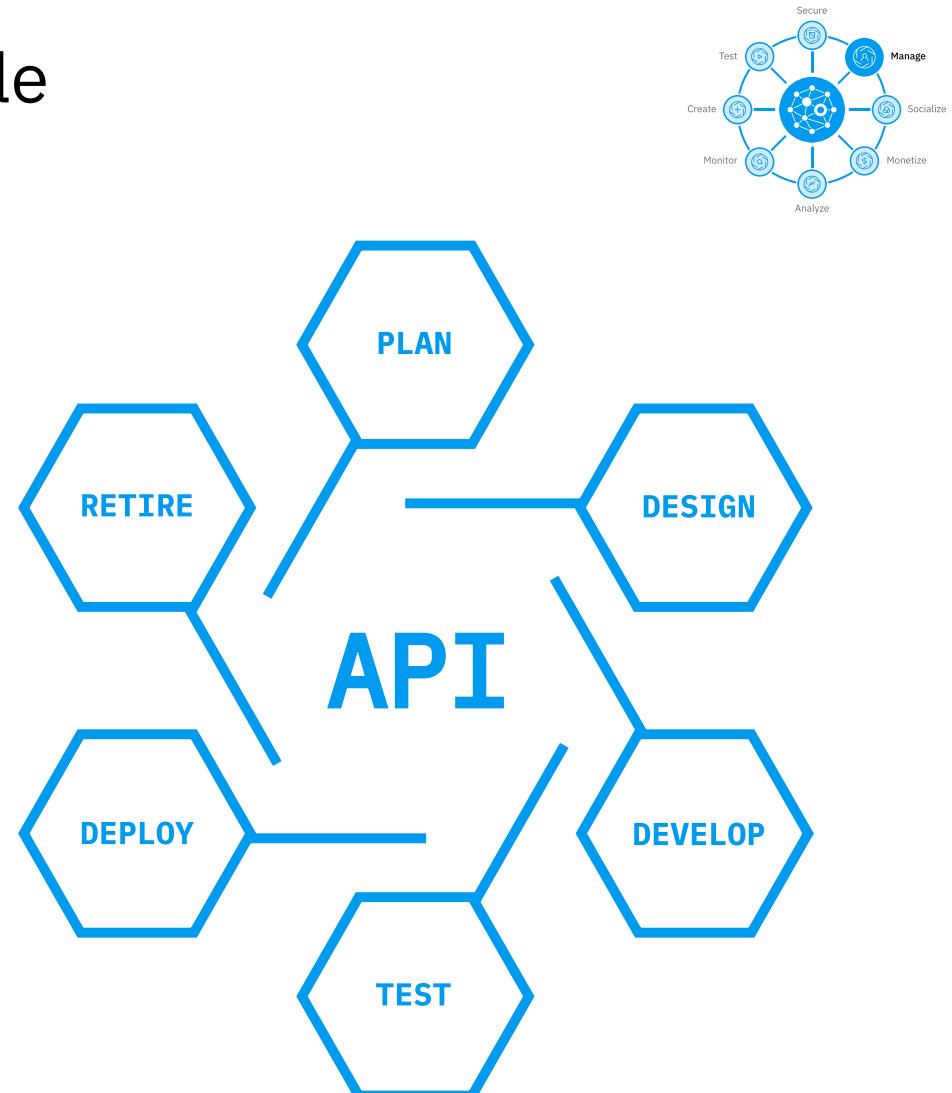
IBM API Connect

Manage

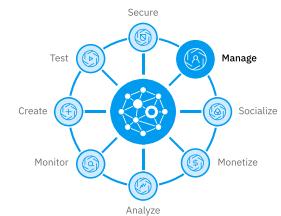


Manage APIs through the API Lifecycle

- **Define & Import REST or SOAP APIs** to enable clients to evolve their SOA tier
- **Package APIs into Products** and tailor them to target specific consumer markets
- **Publish and Promote** across different environments to align with DevOps practices
- **Manage and Control API Lifecycle and versioning** from staging to deprecation to meet corporate governance needs
- **Subscription and Community management** to grow go-to-market channels



Enhanced API Publishing Control



- **Blue/Green deployment support** out of the box for new API versions with ease
- **Granular control to selectively publish APIs to specific gateways** providing flexibility for multiple line of business operation

Publish from Marketing

Select product Select publish targets

Publish To
Description goes here

Catalog
Sandbox

Select the spaces and gateway services to publish this product to

SPACE
 Space 01

GATEWAY SERVICE
 Gateway Service US Main
 Gateway Service US West
 Gateway Service US Central
 Gateway Service US East

> Space 02
> Space 03
> Space 04
> Space 05
> Space 06

Lorem Ipsum

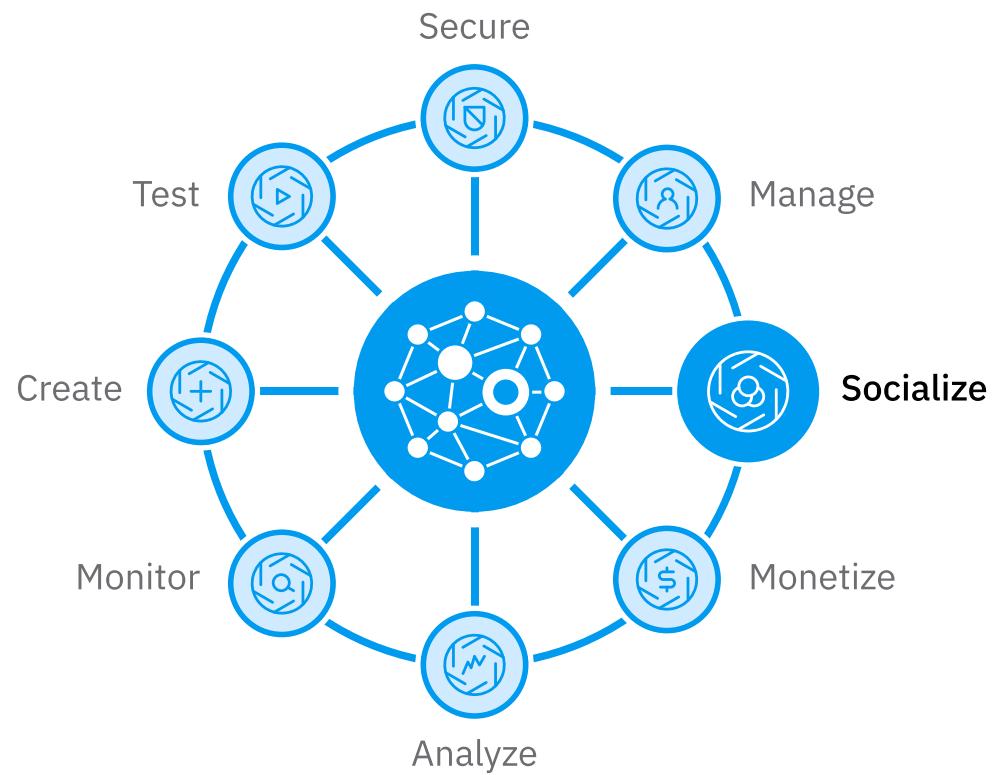
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop burgdoggen jowl corned beef. Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop burgdoggen jowl corned beef.

[Learn more](#)

API Management

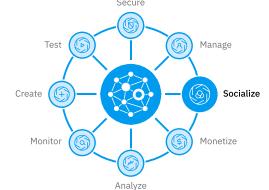
IBM API Connect

Socialize



Developer Portal

- **Modern UI/UX design** based on customer and market feedback
- **Simple, powerful and extensible** customizations built on open-source Drupal 8
- **Fast track app creation** with a simple subscription wizard designed to reduce friction
- **Delight and increase app developer productivity** with a first class Portal Analytics experience
- **Effectively engage your developer community** with custom email support



The diagram illustrates the interconnected components of the Developer Portal ecosystem:

- Secure**: Represented by a shield icon.
- Test**: Represented by a test tube icon.
- Create**: Represented by a person icon.
- Monitor**: Represented by a monitor icon.
- Manage**: Represented by a gear icon.
- Socialize**: Represented by a social media icon.
- Monetize**: Represented by a money bag icon.
- Analyze**: Represented by a bar chart icon.

The central hub is connected to each of these components, indicating a bidirectional relationship between the core portal and its external ecosystem.

IBM API Connect Developer Portal

API Products Apps Blogs Forums Support

Search Organization Andre Developer A

API Products

Filter by categories: Comments (9) Commits (0) Development (3) Security (0) API Management (1) IOT (9) Finance (1) DevOps (1) Integrate (0) Mobile (1)

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

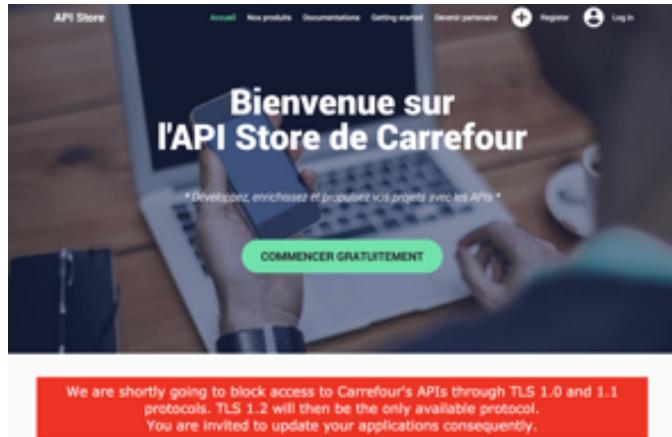
Pet Adoptions 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
Medical records 1.0
Swagger pet store 1.0
Volunteer work 1.0
View pricing plans

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

Product 1.0.0
Spicy jalapeno bacon ipsum dolor amet prosciutto capicola tongue salami doner. Rump strip steak cupim, pork chop corned beef.
API 1.0
API 1.0
API 1.0
API 1.0 ...

Examples

The screenshot shows the 'PSA developer' support page. It includes sections for 'Support' (with links to 'Frequently Asked Questions' and 'Contact Us'), 'Developer forum' (with a link to 'Visit developer forum'), 'FAQ' (with a link to 'Visit Frequently Asked Questions'), 'Support Tickets' (with a link to 'Raise a support ticket'), and 'Contact us' (with a link to 'Contact us').

The support page also features a circular diagram with nodes labeled: Secure, Test, Create, Monitor, Manage, Socialize, Monetize, and Analyze.

The screenshot shows the 'Welcome to the API Portal' page. It has a red header with the title and a navigation bar with links like 'Home', 'Billing Market', 'API Library', and 'Logout'. Below the header, there's a section titled 'Find an API for your business' with a sub-section for 'Royal Mail API-Shipping V2 (SOAP)'. The page lists several API endpoints, each with a brief description and a small icon.

<https://developer.royalmail.net/api>

The screenshot shows the browser address bar with the URL 'https://developer.federalbank.co.in'. The page itself has a dark header with the Federal Bank logo and a main content area featuring the text 'Your Perfect Business Partner'.

Your Perfect Business Partner

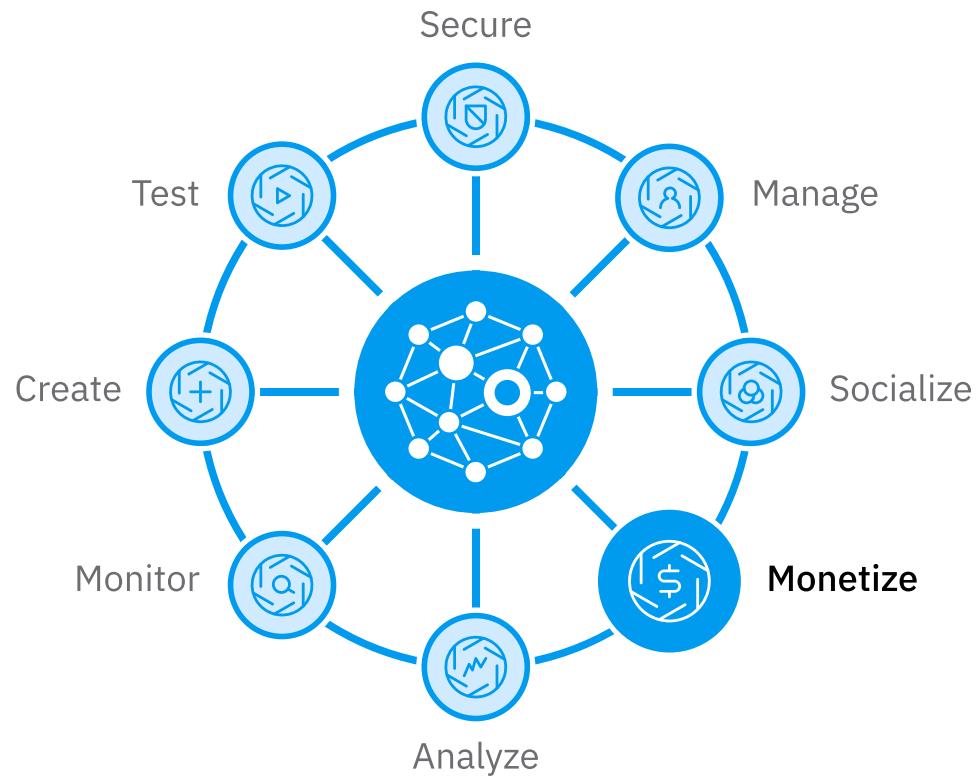
With Federal Bank APIs, you can meet all your business needs in a single platform. It is time for you to empower your customers in all walks of life. Create new business opportunities by integrating with us.

<https://developer.federalbank.co.in/>

API Management

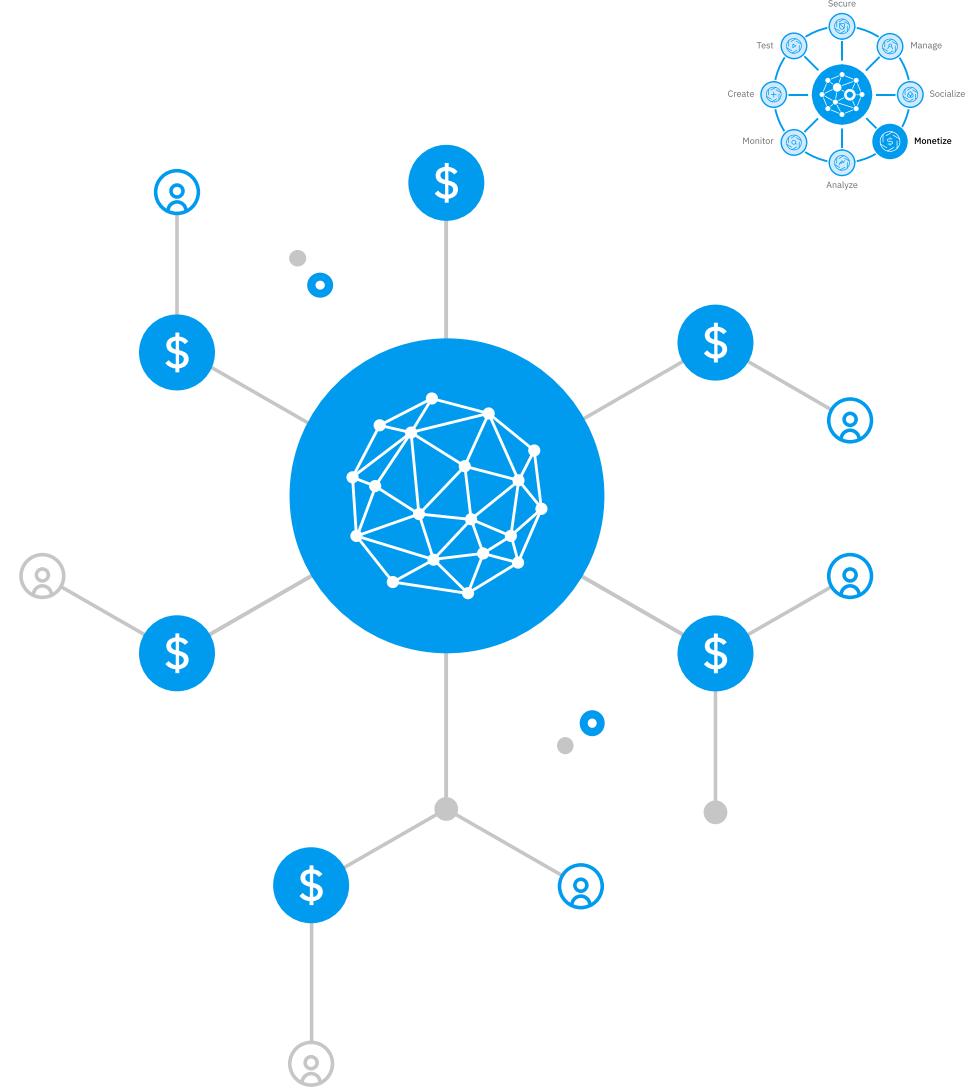
IBM API Connect

Monetize



Monetize your API Calls

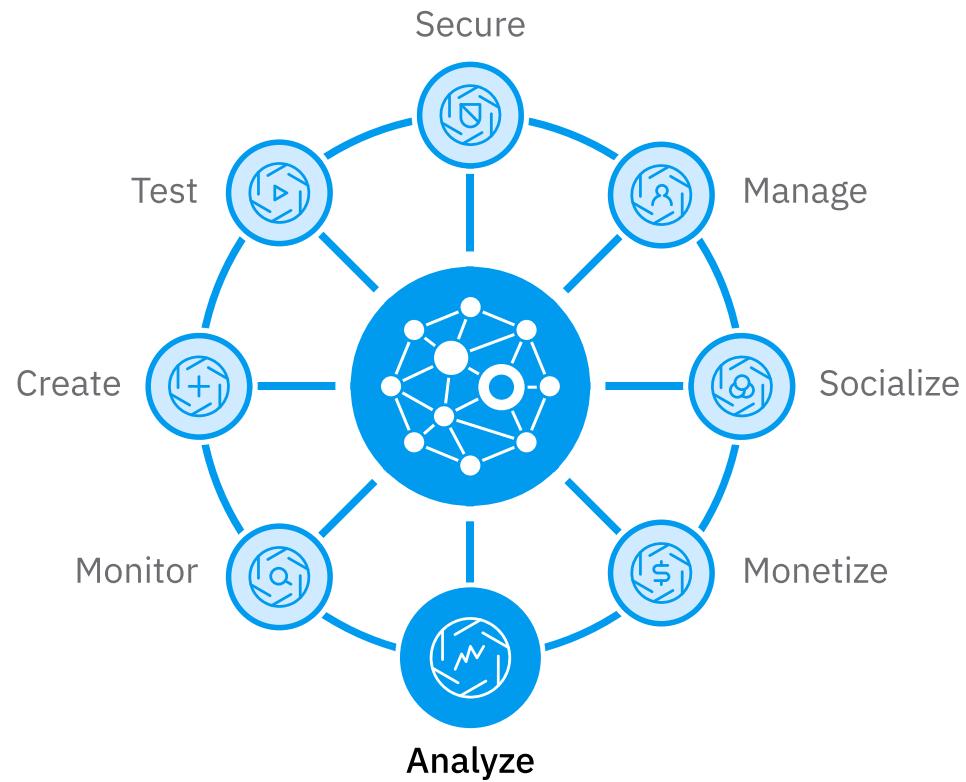
- **Modern approach & intuitive user experience** providing flexibility to define pricing details
- **Subscription pricing support** to enable recurring payments, popular in SaaS go-to-market strategies
- **Stripe integration OOTB** for smooth user-onboarding and payment collection
- **Analytics, customizable reports** for detailed insights into revenue, usage of monetized APIs
- **Offload API usage data** to existing enterprise tools to handle customized invoicing processes



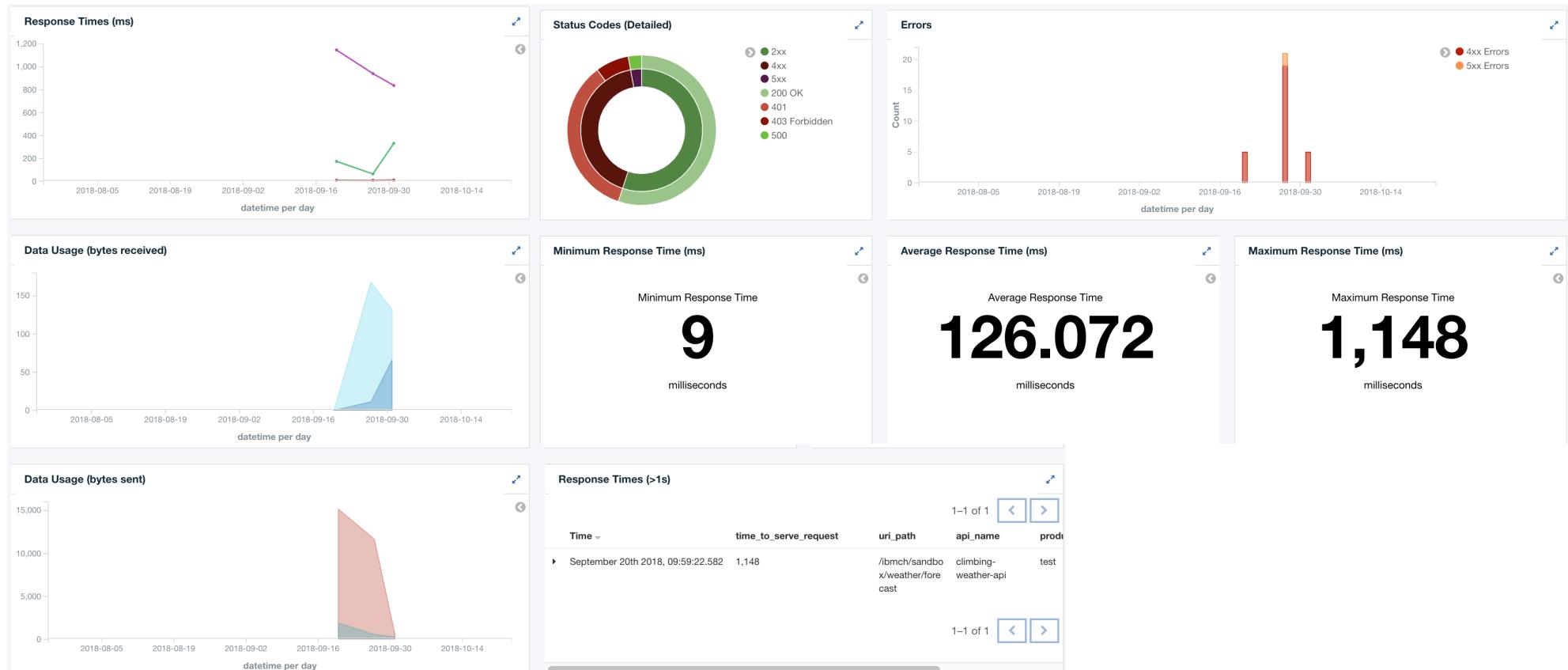
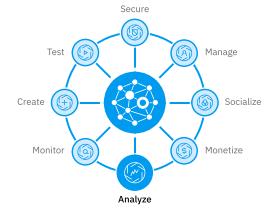
API Management

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Analyze



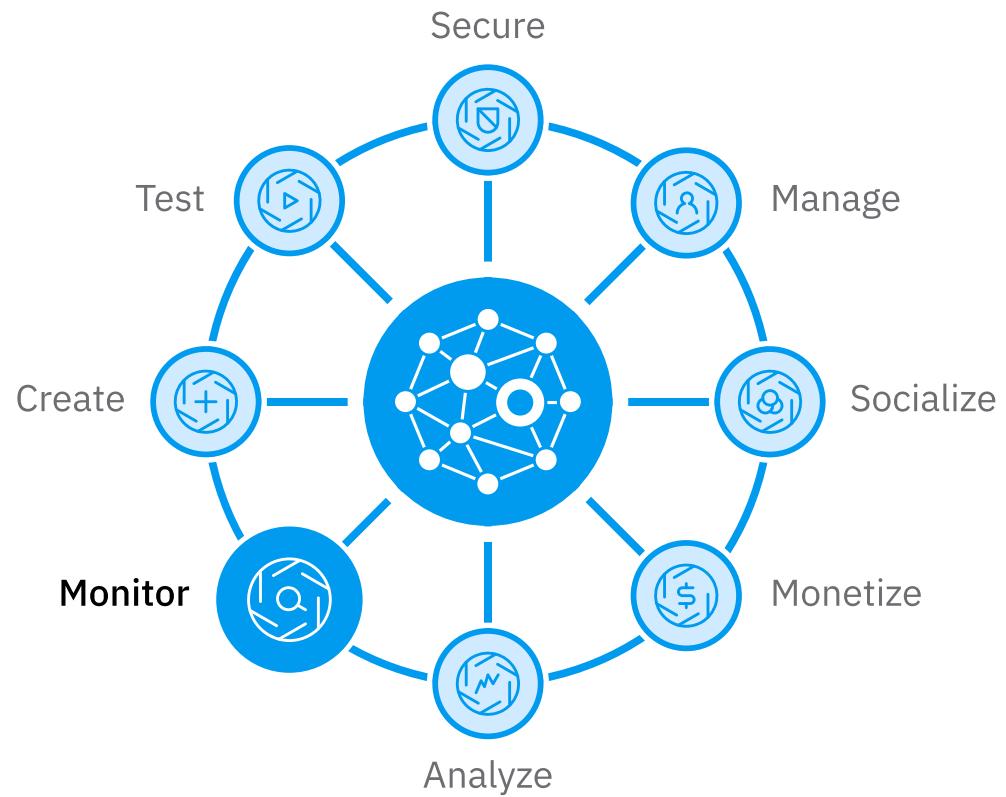
Dashboards – out of the box and custom



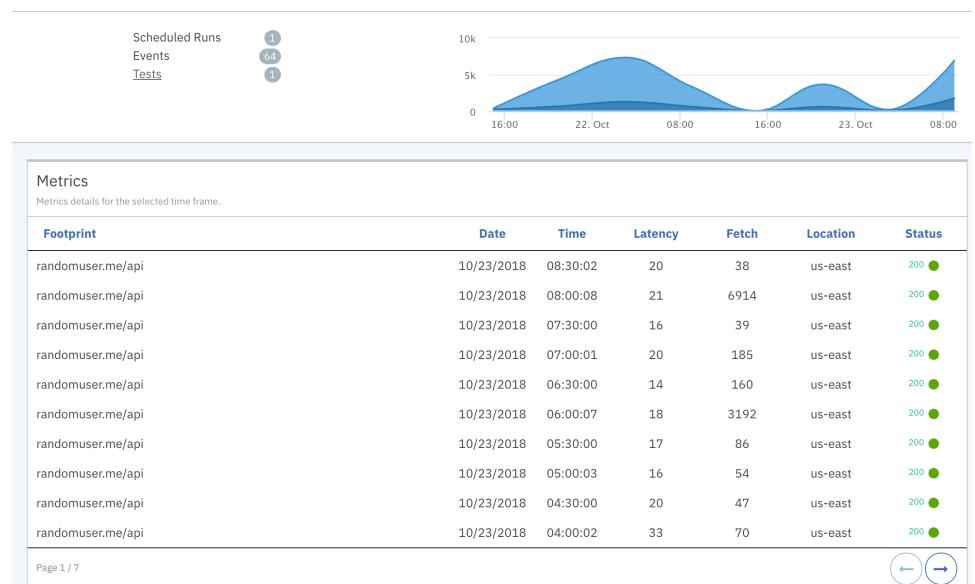
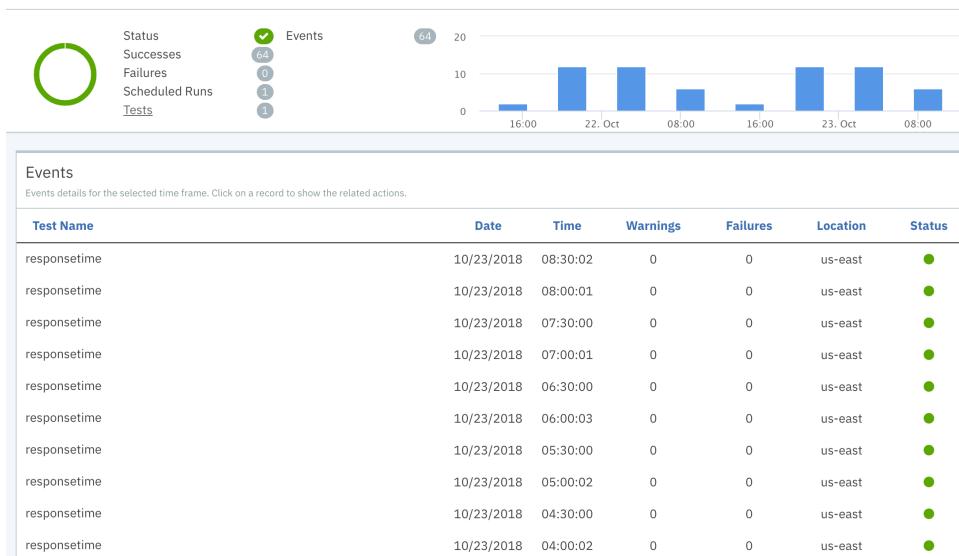
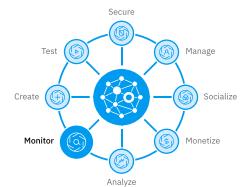
API Management

IBM API Connect

Monitor



API Test and Monitor



Optimize Operations with DPOD V1.0.8.5

- **Troubleshoot API Workload between versions** with new API Versions dashboards to compare latency
- **DevOps enabled** to import and manage DataPower services into multiple devices at once
- **High performance, federated deployment mode** for large installations
- **New Modern UX** for simplified navigation and troubleshooting

The top screenshot displays the 'IBM DataPower Operations Dashboard' interface. It features a table of transactions with columns for Time, Device, Catalog/Space, Product, Plan, API, APP Name, Client IP, Global Trans. ID, and Elapse (ms). A search bar at the top allows filtering by API Name, API Version, and App Name. The bottom screenshot shows the 'DevOps Services Portal' with a modal for importing service account status files. The modal includes fields for Selected Services, Import File, Deployment Policy, and Dry Run Before, along with a 'Browse...' button and an 'Upload' checkbox.

<https://developer.ibm.com/apiconnect/2018/10/31/whats-new-in-datapower-operations-dashboard-v1-0-8-5/>