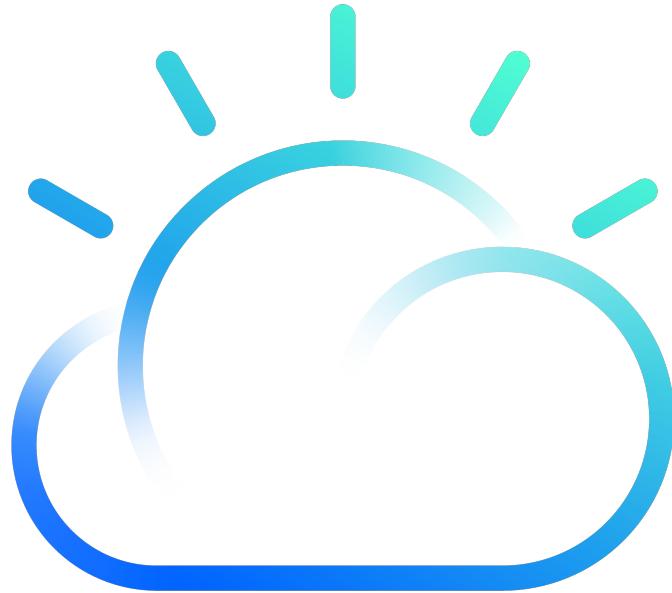


# API Connect & Gateways 201

## Product Overview



# Please note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice and at IBM's sole discretion.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

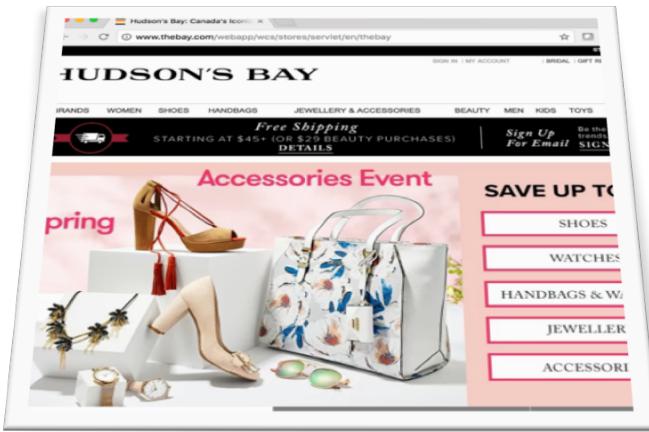
The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

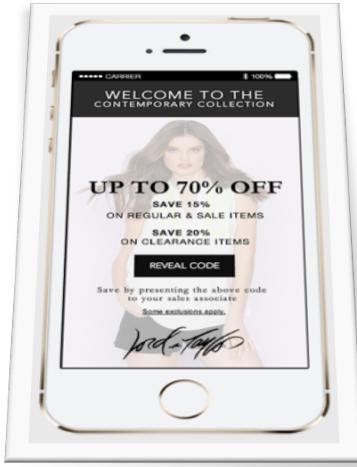
# Agenda

- **Why API Management?**
- Introduction to IBM's API Management solution

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



Late 1990s



2000s



2015+

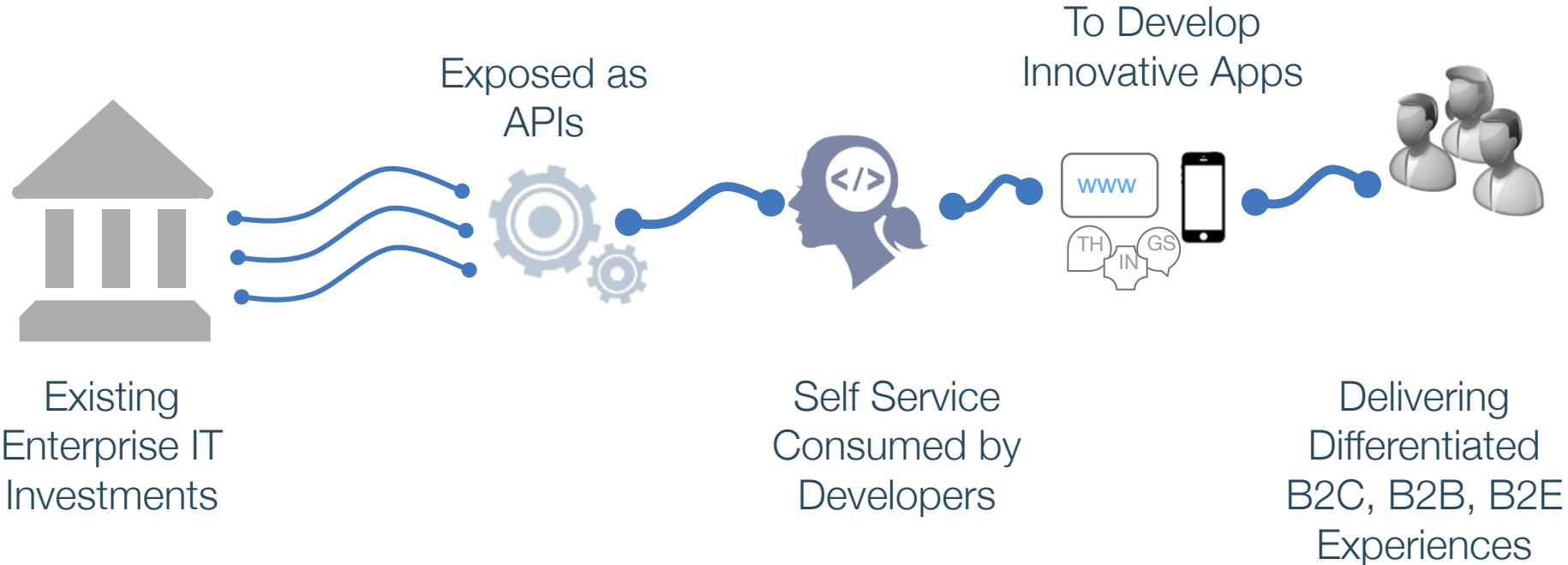
# Web, Mobile & APIs Offer Organizations...

## A new channel to:

1 Reach clients & partners

2 Enable new businesses models

# APIs Enable Differentiated Experience



# Key API Industry Usecase

1

Speed application development and ongoing app evolution via a library of reusable APIs



2

Securely expose systems of record apps and data to Mobile, Web, IoT, & cloud apps



3

Publish APIs to expand brand reach and tap into broad developer & partner ecosystems to drive innovation



4

Enable new business channels by monetizing data & algorithms



# Disruption across Industries – Fueled by APIs

## Industries

### FinTech



Citi started innovating by offering hackathons and currently delivers over 300 business services internally and externally across most core lines of business.

### HealthCare



HealthCare provider offers personalized healthcare by exposing APIs via secure platform called InterChange

### Automobile



Car company offers connected car, improves driving experience, sells vehicle data to partners

### Retail



Retailer provides digital distribution channel for affiliate revenue from customer referrals via open API portal

# Digital Applications Require a new Interaction Tier

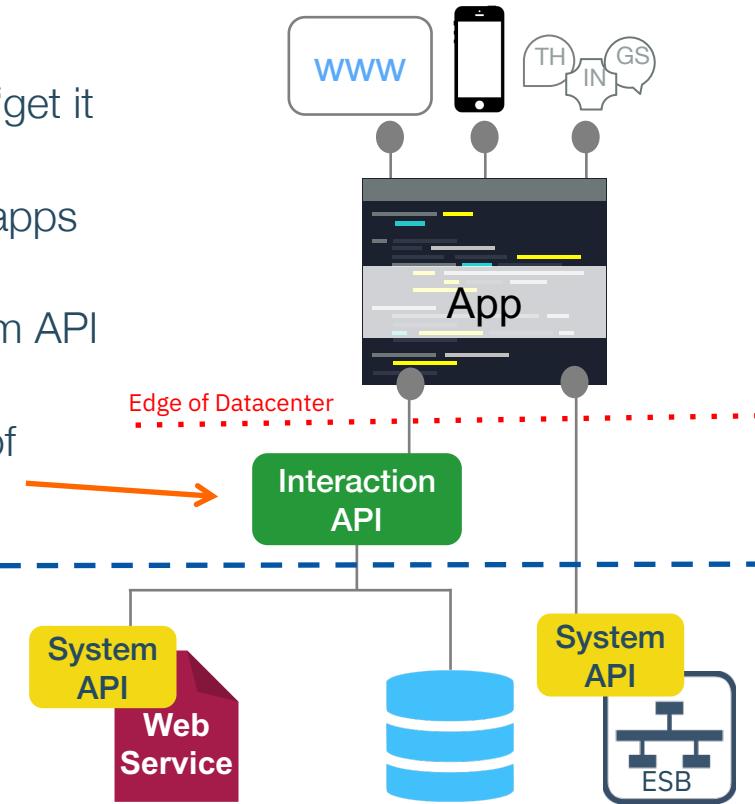
## Digital Team / Line-of-Business

Measured on time to market. Motivated to be fast (e.g. “get it out, fix it in market”).

- Can't simply call existing System API's from digital apps for performance reasons (see previous slide)
- Can't afford to wait weeks/months for a new System API that exactly meets their needs
- Needs a **NEW tier** which sits close to the systems of record, but is controlled by the Digital Team/LoB

## Central IT Team

Measured on resiliency & uptime. Motivated to be cautious. Generally takes weeks/months to turn around change requests (e.g. to support digital apps), due to change control & quality control processes.



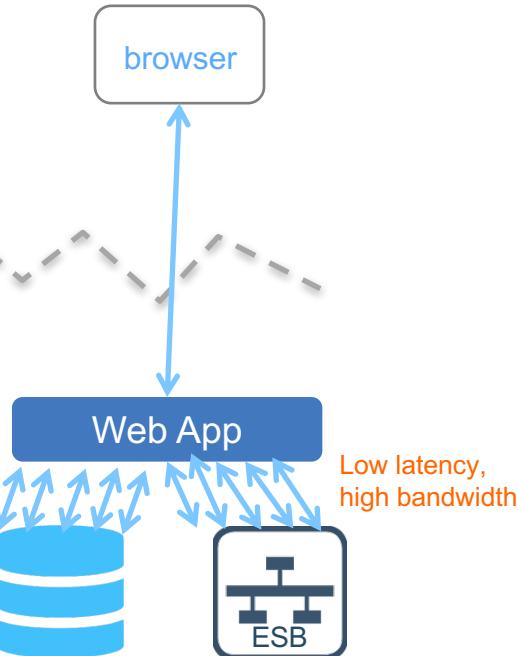
# Digital Apps Present New Challenges

## Traditional web apps

2

- Single response sent back to client

Open internet  
Enterprise



1

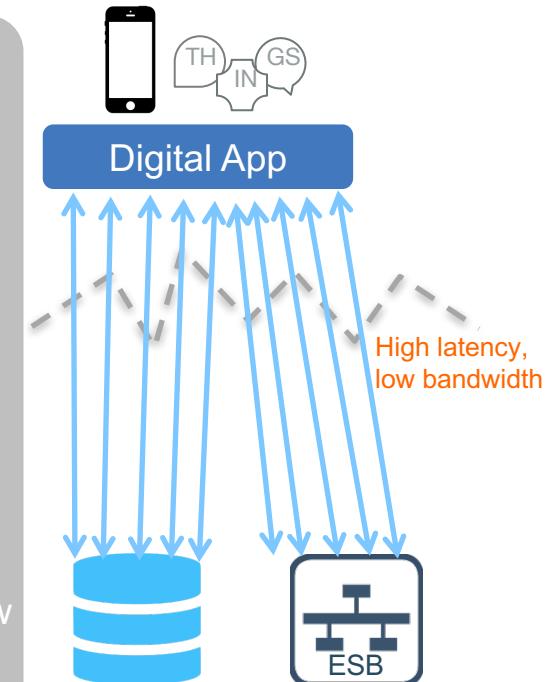
- Many calls are made, often w/ large payloads (> 1 MB).
- All within local network, so this worked

## If digital apps used same approach...

- Digital apps live in the internet (phones, IoT, dynamic web pages)

- High latency, low bandwidth connections (3G, 4G, or even high speed at long distance) make traditional approach untenable.

- Can't simply reuse existing services for new digital apps – need a new approach

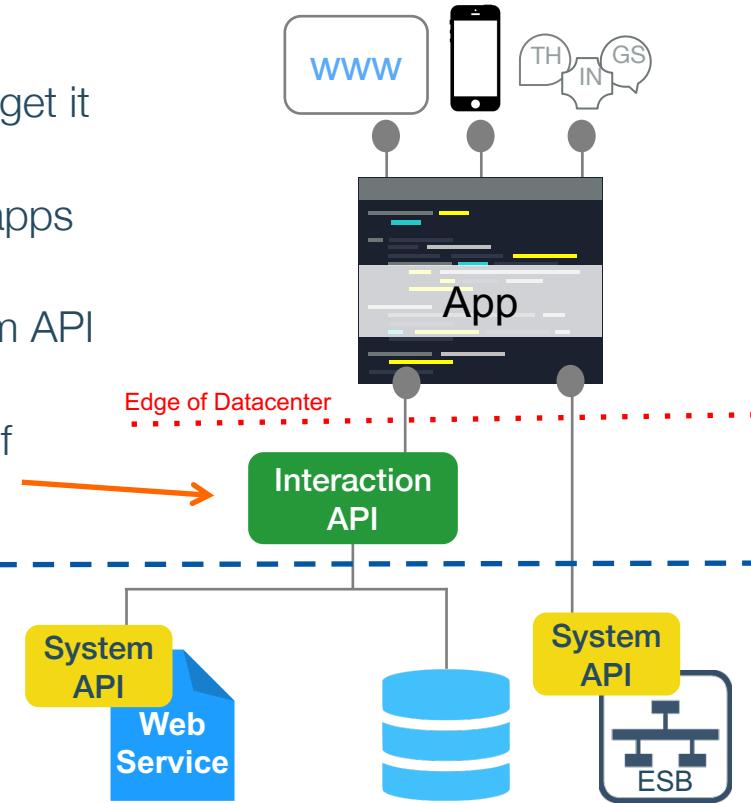


# Digital Applications Require a new Interaction Tier

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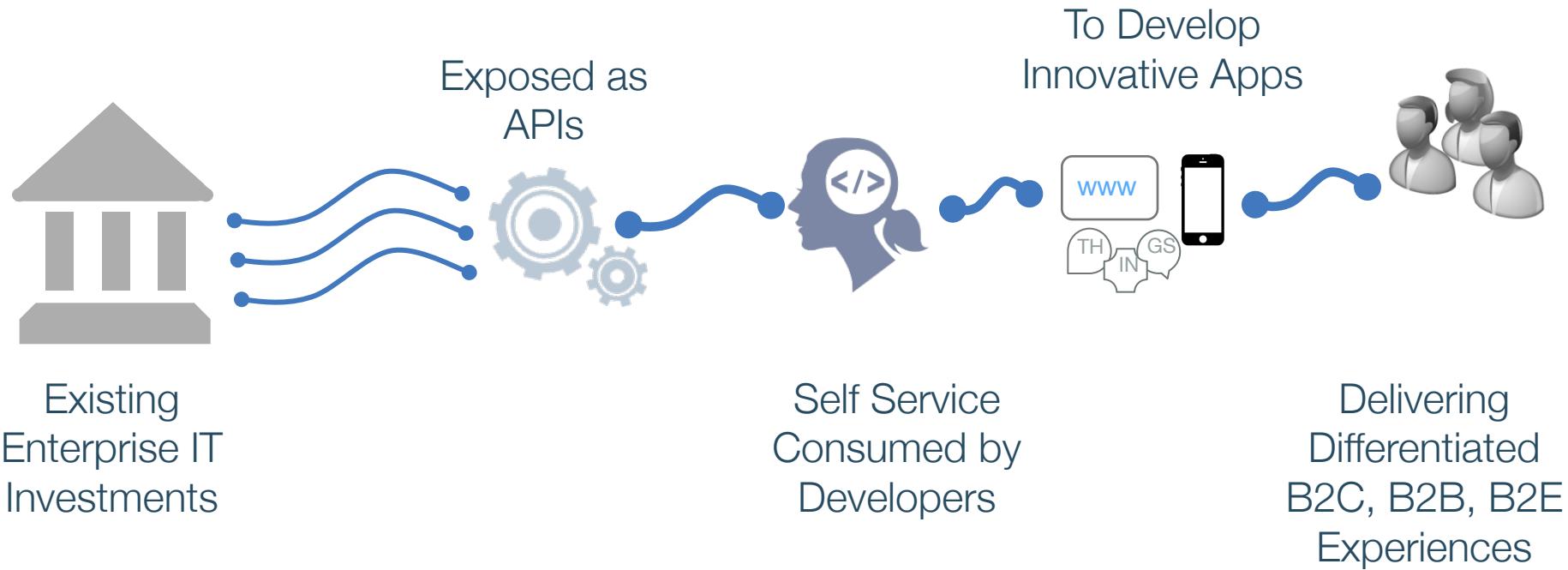
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# APIs Enable Differentiated Experiences



# Agenda

- Why API Management?
- **Introduction to IBM's API Management solution**

# What is IBM API Connect?



IBM API Connect

## The Scalable Multi-Cloud API Platform

A complete, modern and intuitive API lifecycle platform to create, securely expose and manage APIs across clouds to power digital applications



### Create

Automatically create and test APIs to expose data, microservices, enterprise applications and SaaS services.



### Secure

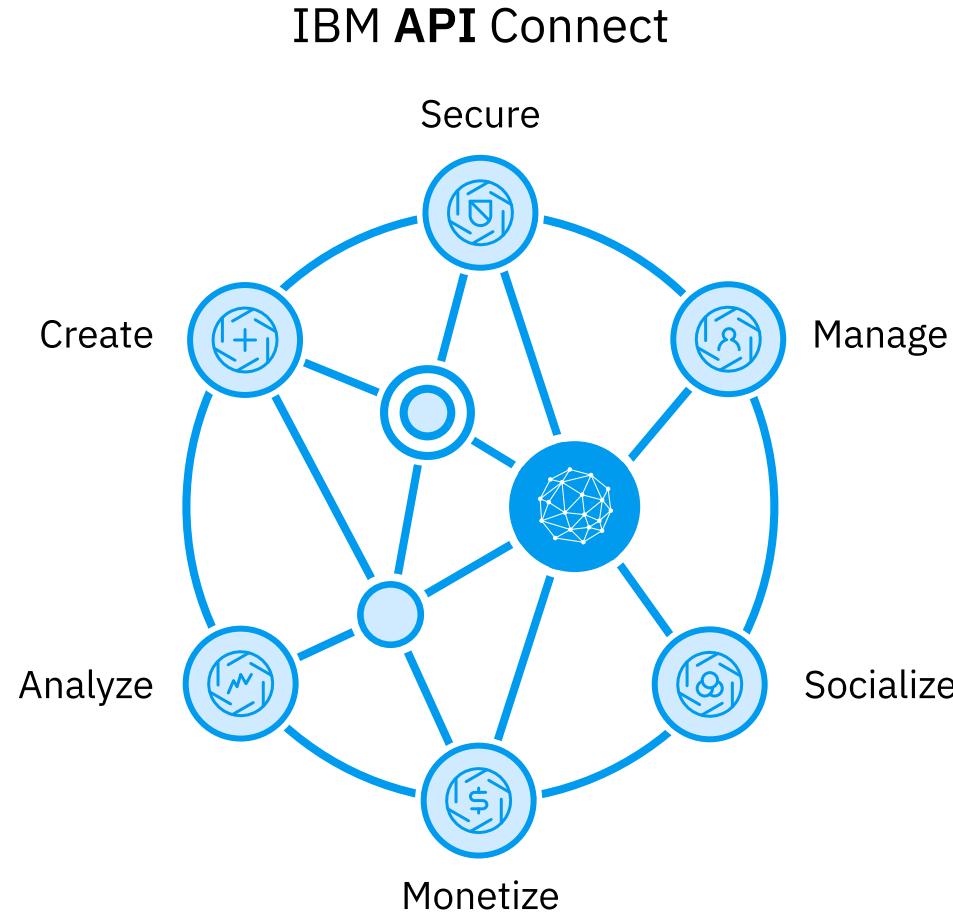
Easily apply built-in and extensible policies to secure, control and mediate the delivery of APIs with unmatched scale.



### Manage

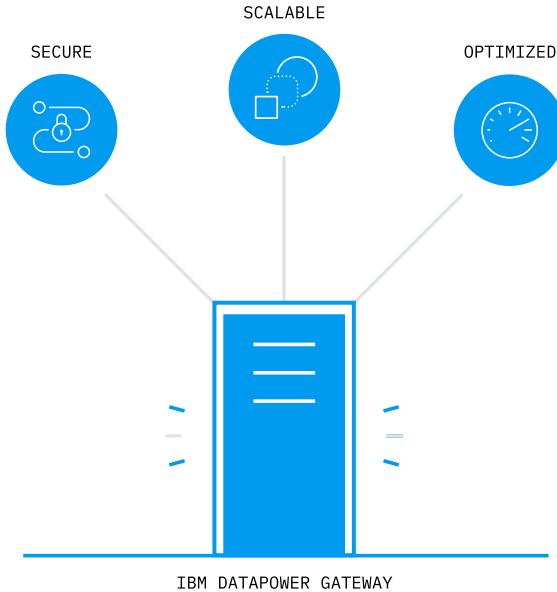
Rapidly publish, lifecycle govern, socialize, analyze, monitor and monetize APIs with built-in capabilities.

# API Connect Key Capabilities



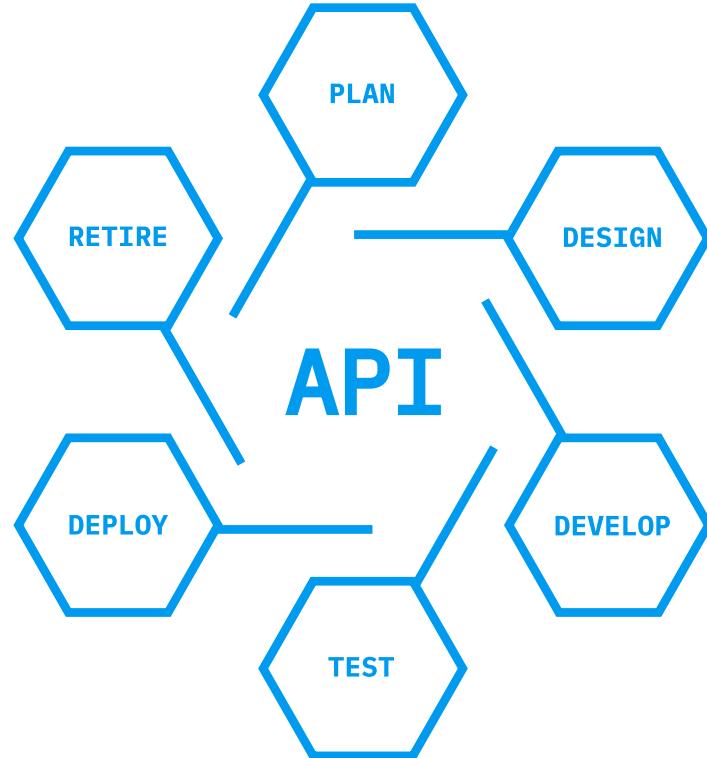
# Enterprise Security and Control with Industry leading API Gateway

- **Secure to the core** with signed, encrypted gateway image without external software dependencies to minimize risk
- **Proven API security policies** at runtime to quickly protect services and data across multi-clouds
- **Performant & scalable architecture** to help meet SLAs and improve client user experience
- **Optimized drag & drop built-in policies** for security, traffic management & mediation to accelerate time to value
- **Flexible and extensible** to align with enterprise requirements and the need for custom policies
- **Workload tenant isolation** to optimize TCO and governance on a single appliance across multiple LOBs



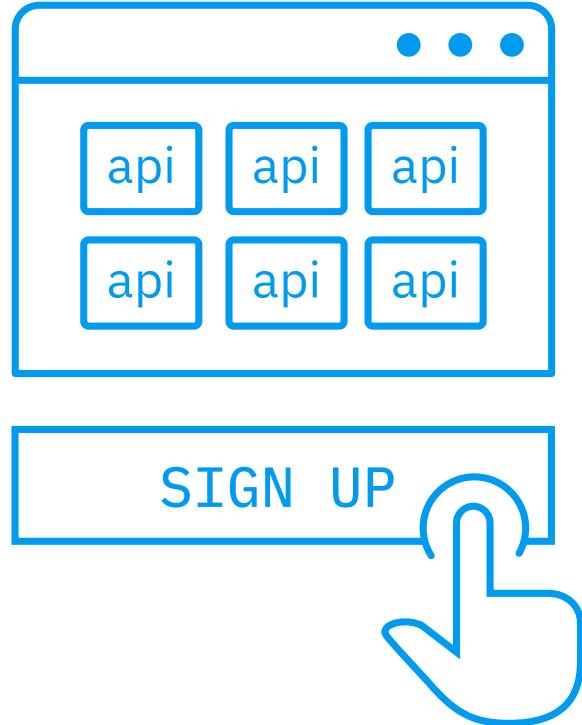
# Manage APIs through the API Lifecycle

- **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



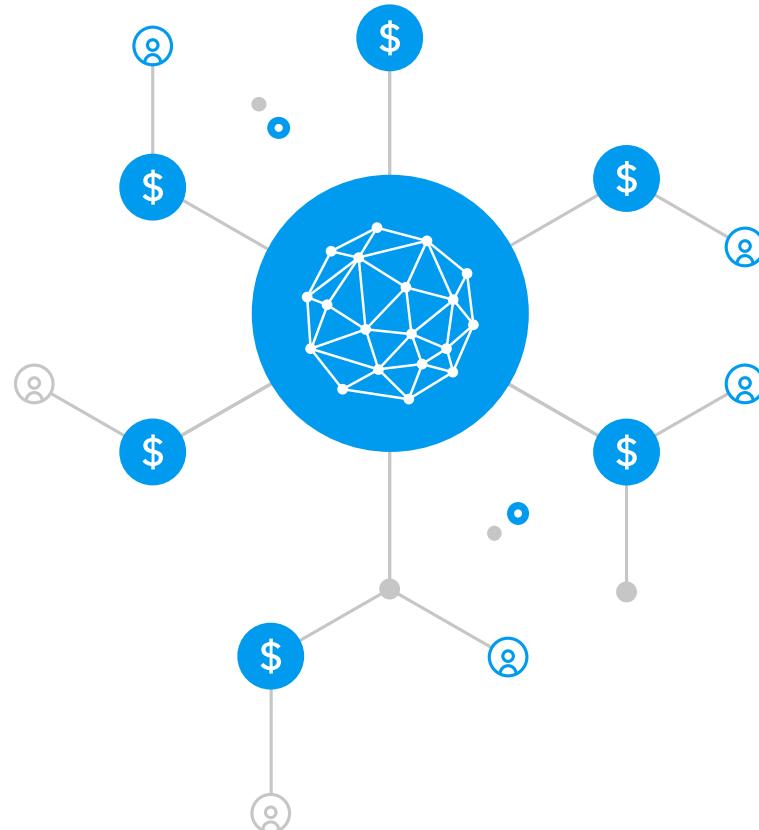
# Socialize and Engage with API Consumers to drive adoption

- **Self-service, branded Portal** across multiple API provider lines of businesses within an organization to socialize APIs
- **Engage with API consumers** via community building features: blogs, forums, ratings etc.
- **Governance & autonomy** to each provider organization to manage their APIs, products, plans and multiple gateway endpoints independently within their 'Space'



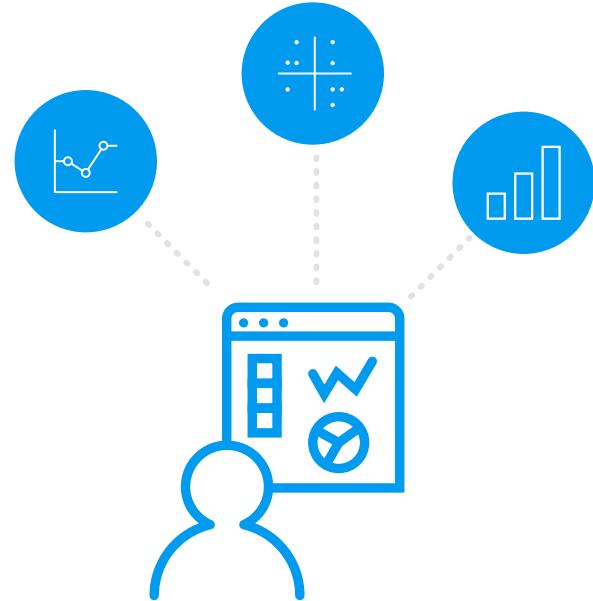
# Monetize your API Calls

- **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



# Gain Insights in to your API Business

- **Analyze API calls** to get visibility and understand API consumption
  - *Who & What is Driving my API Business?*
  - *Is my Product's packaging targeted? Or my plans appropriate ?*
  - *What are the response times of my APIs ?*
- **Drill down and build custom queries** for deeper analysis
- **Build custom dashboards** and share to address specific reporting and visualization needs
- **Offload usage data** to external systems like Splunk SAP etc.



# Accelerate API Developer Productivity

- **Enforce corporate standards** through templates for API and API Product definitions
- **Simplify API categorization & search** through customer defined metadata
- **Control API Gateway behavior** based on the additional metadata
- **Integrated Loopback vNext Experience** for Interaction tier
- **Integrated with API Connect Toolkit** for simpler user experience to create APIs

Extensions

Branch ATM

ATM Walk in

city San Francisco

state CA

citystate San Francisco, CA

This is generated automatically

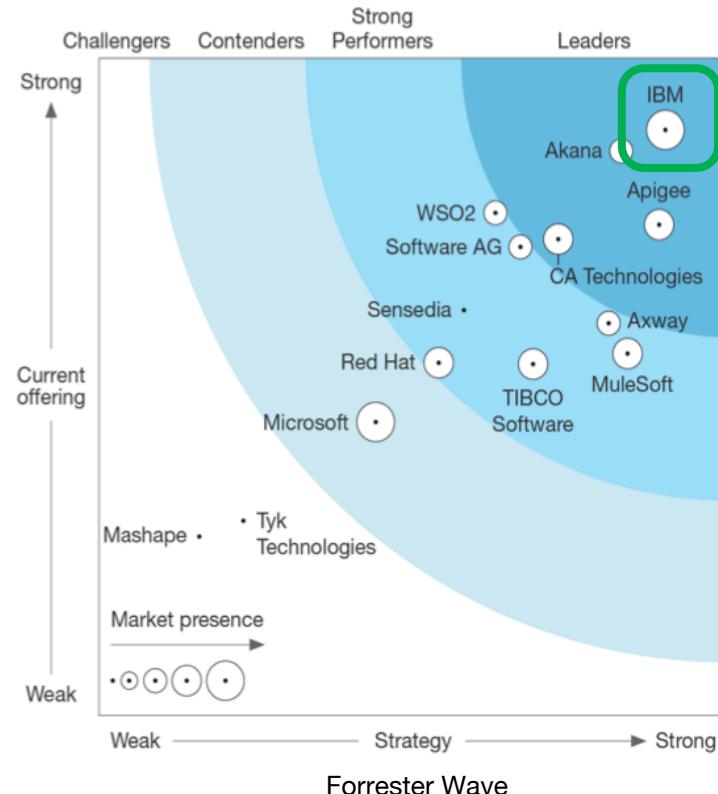
```
3 - info:
4   x-ibm-name: {{name}}
5   title: {{title}}
6   version: {{version}}
7
8   schemes:
9   {{#if schemes}}
10  {{#each schemes}}
11    - {{this}}
12  {{/each}}
13  {{else}}
14    - https
15  {{/if}}
16  host: {{hostname}}
17  basePath: {{basepath}}
18
19  consumes:
20  - application/json
21  produces:
22  - application/json
23
24  securityDefinitions:
25  clientIdHeader:
26    type: apiKey
27    in: header
28    name: X-IBM-Client-Id
29  clientSecretHeader:
30    in: "header"
31    name: "X-IBM-Client-Secret"
32    type: "apiKey"
33
34  security:
35  -
36    clientIdHeader: {}
```



LoopBack

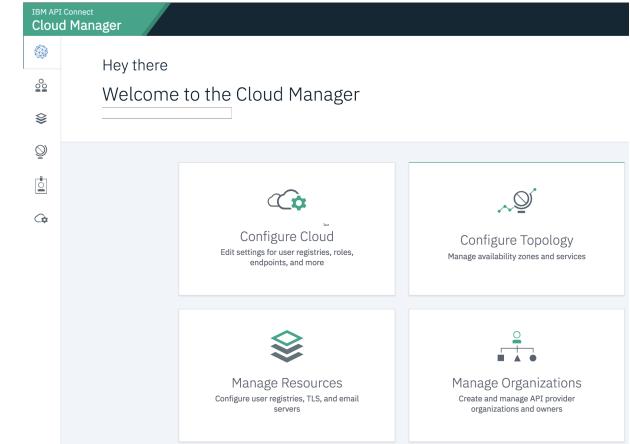
# IBM API Connect: Ranked #1

- **Ranked as Leader by all Analysts**
  - ✓ Forrester, Gartner, IDC, Ovum
- **Trusted by enterprises of all sizes across industries and geographies**
  - ✓ 500+ API Connect clients
  - ✓ 2,000+ DataPower Gateway clients



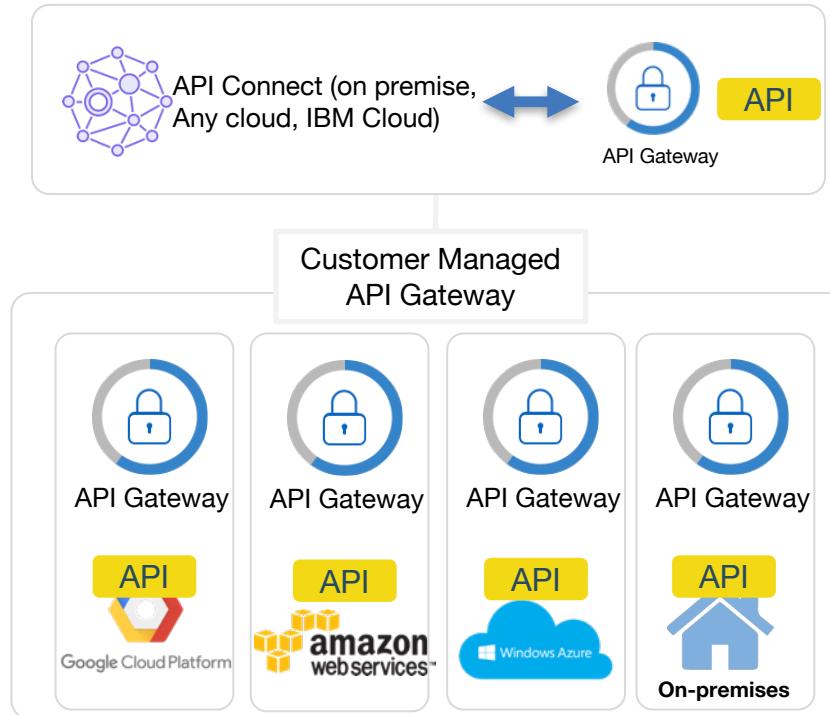
# API Connect V2018.x: Scale & Flexibility with Multi-Cloud Design

- Multi-cloud API Connect managing distributed clustered API Gateways** co-located with provider backends on virtually any cloud
- Container/Kubernetes & VMware support** for API Connect components to run virtually anywhere
- Unmatched scalability and performance** through new container and microservices based design
- Independently scale API Connect components** leveraging container orchestration tools



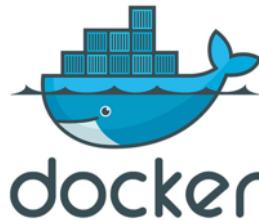
# Central Management of APIs across Multi-Cloud Deployments

**IBM managed API Connect OR Client managed API Connect**  
with **co-located** DataPower API Gateway on any Cloud



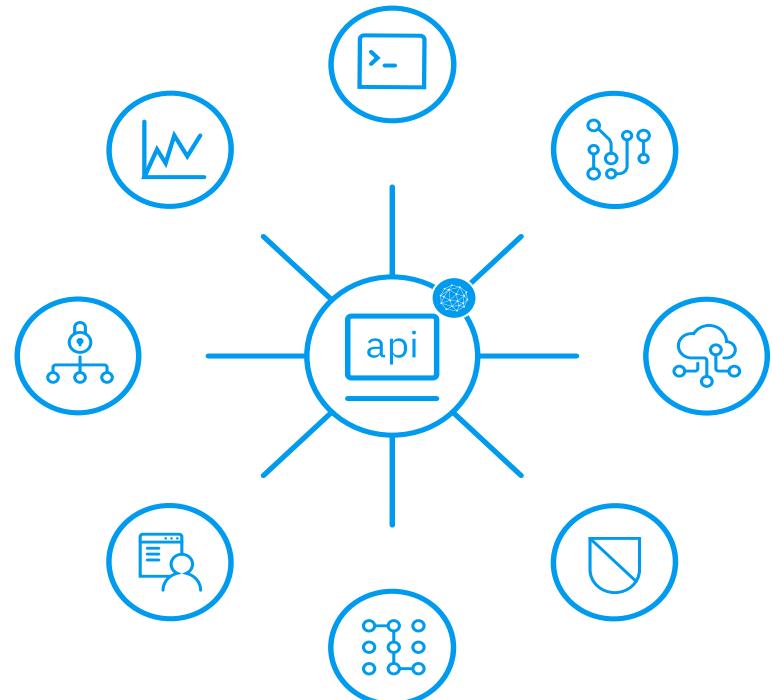
# API Connect V2018.x: Deployment Options

- **New Docker-based images with K8 orchestration** for container based deployments on a customer managed K8 environment or on IBM Cloud Private
- **VMWare OVA support** for clients to run on their existing established enterprise virtualization platform
- **Customer modifiable open VM images** based on standard Ubuntu OS for clients to customize based on corporate governance needs
- **API Gateway available in hardened cloud, virtual and physical appliance form factors** to improve security and time to value



# API Connect V2018.x: DevOps Ready for CI/CD Needs

- **Comprehensive set of Public APIs** to API Connect for CI/CD integration and automation
- **Command Line Interfaces (CLIs)** for each API operation facilitating end to end automation
- **Orchestrate VMWare** install using cloud-init configuration for simpler operations and lower TCO



# API Connect V2018.x: What's New in Analytics

- **Analytics separation from the API Manager** for enhanced performance and scalability
- **Improved management experience and productivity** with the newly redesigned analytics tool, featuring interactive dashboards and visualizations
- **Enhanced administrator user control** with direct access to the Elastic stack configuration
- **Greater flexibility for selective analytics offloading** to all the Logstash supported outputs, i.e. beyond Elasticsearch, Syslog, and HTTP

The screenshot displays two side-by-side views of the API Connect V2018.x Analytics interface, specifically the 'Discover' application.

**Top View:** Shows a list of applications with the following details:

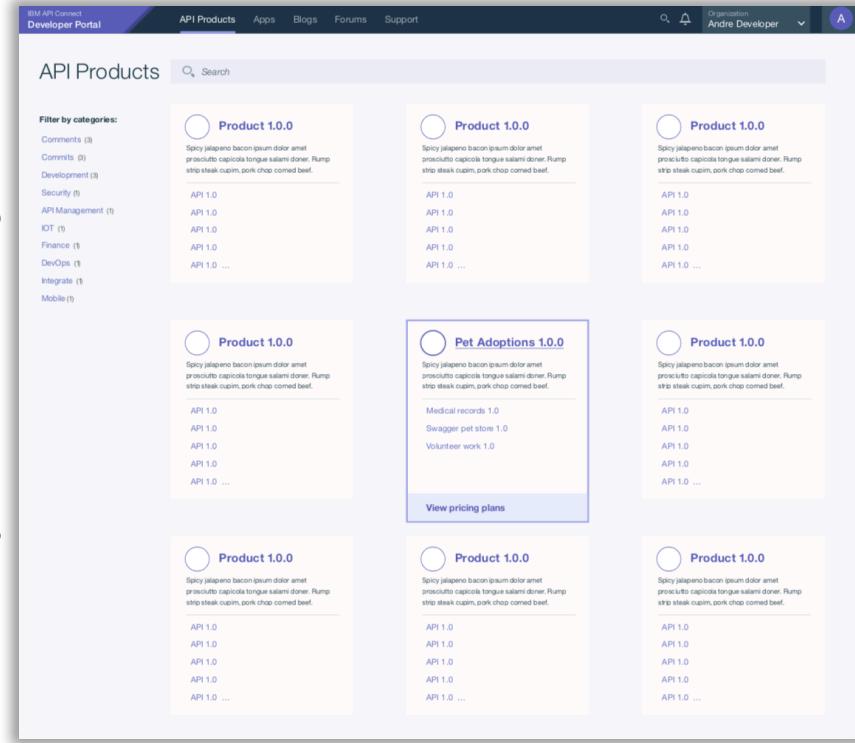
Name	Tags	Action
DELETE Requests	ADMIN	<input type="checkbox"/>
Errors	ADMIN	<input checked="" type="checkbox"/>
GET Requests	ADMIN	<input type="checkbox"/>
POST Requests	ADMIN	<input type="checkbox"/>
PUT Requests	ADMIN	<input type="checkbox"/>
Response Times (>1s)	ADMIN	<input checked="" type="checkbox"/>
Response Times (>3s)	ADMIN	<input type="checkbox"/>
Successes	ADMIN	<input checked="" type="checkbox"/>

**Bottom View:** Shows a similar list with one additional row:

Name	Tags	Action
DELETE Requests	ADMIN	<input type="checkbox"/>
Errors	ADMIN	<input checked="" type="checkbox"/>
GET Requests	ADMIN	<input type="checkbox"/>
POST Requests	ADMIN	<input type="checkbox"/>
PUT Requests	ADMIN	<input type="checkbox"/>
Response Times (>1s)	ADMIN	<input checked="" type="checkbox"/>
Response Times (>3s)	ADMIN	<input type="checkbox"/>
Successes	ADMIN	<input checked="" type="checkbox"/>
New Application		<input type="button" value="Create"/>

# API Connect V2018.x: What's New in 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



Modern UI/UX

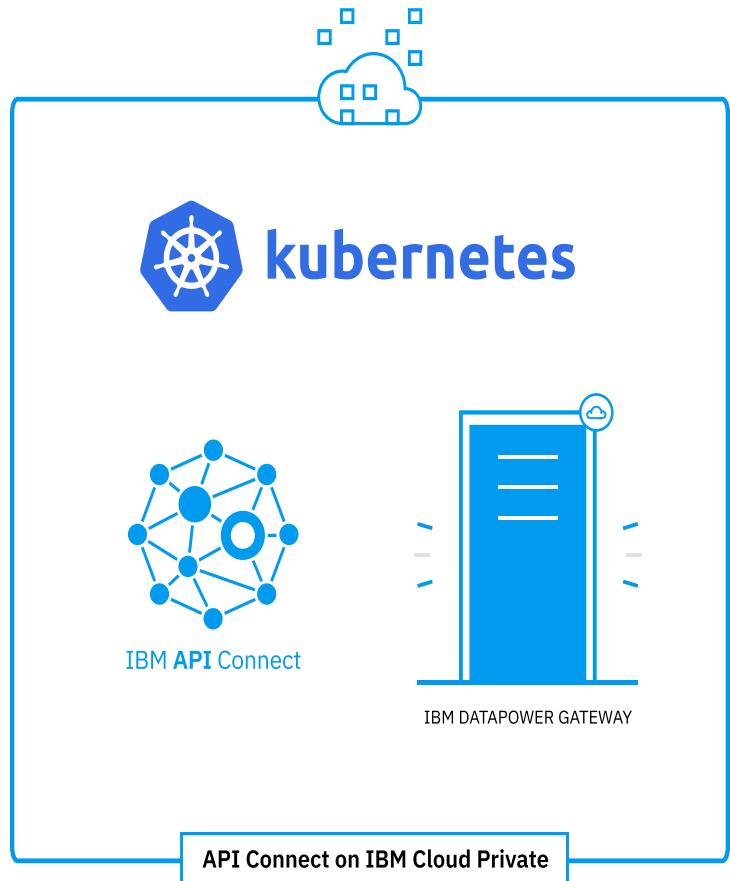
# API Connect V2018.1: Continuing Innovation across API Lifecycle

- **Control visibility and share** resources such as gateways, user registries, etc for greater governance and control
- **Email Templates** for notifications including invites and tasks for customization to match corporate branding
- **Associate Analytics to specific Gateway** services to manage latency between them
- **Role Based Access Control** extended to Cloud & Consumer orgs for granular control
- **Federated User Registry** support providing flexibility to associate multiple identity management systems
- **New API Security policy definition** at the catalog-level reducing API development complexity & simplifying user experience
- **Enhanced TLS Profiles** such as ciphers for fine grained control
- **Catalog Properties and Space Properties** to control environment specific variations

*and much more ...*

# API Connect V2018.1 & DataPower V7.7 on IBM Cloud Private

- **Securely expose** business services and data in IBM Cloud Private as APIs to accelerate innovation
- **Production-ready** DataPower Gateway on Docker, running in < 1 minute, to accelerate time to value
- **Native support for API Connect** with optimizations for logging and monitoring into IBM Cloud Private platform services to reduce total cost of ownership
- **Scale Individual API Connect components** through IBM Cloud Private's Kubernetes Platform for simplified scalability and response to unplanned usage spikes



# Next Generation DataPower Gateway (IDG) X2 Appliance

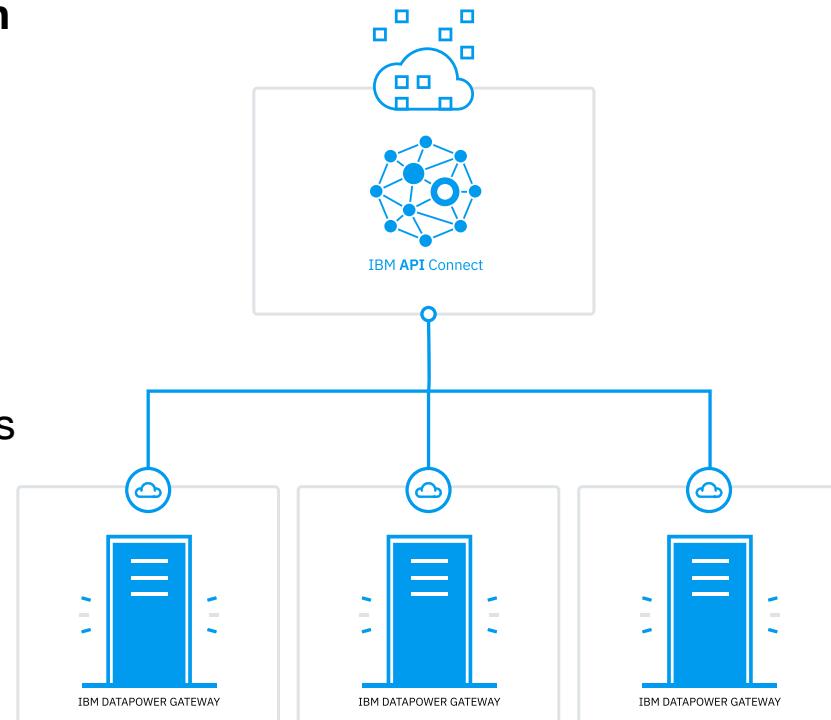
- **Up to 2X performance** with next generation hardware architecture compared to IBM DataPower Gateways (IDG) for lower TCO
- **2X 10GbE network ports** compared to IDG to accelerate application responsiveness
- **Up to 4X RSA operations** with 2048-bit keys using the optional Hardware Security Module (HSM)
- **Enhanced memory and workload capacity** available for higher performance and/or to run additional tenants
  - ✓ **One tenant for no-charge** for API Connect workloads on each DataPower Gateway physical appliance



**Action:** Plan now to refresh existing XG45, XI52 and XB62 DataPower physical appliances that reach end of service in 2019 with IDG X2.

# DataPower Gateway V7.7: Multi-cloud support for API Connect

- **Gateways can scale without manual registration in API manager node**, unleashing exciting new topologies
- **Autonomic Gateway cluster management** will allow Gateways to self-heal without manual intervention
- **Easily migrate** API Connect V5 gateway workloads to API Connect V2018.1 without any modification, accelerating market delivery of APIs
- **Increased operational resiliency** providing maximum availability during API manager maintenance and unavailability periods



# Agenda

- Why API Management?
- Introduction to IBM's API Management solution
  - **Purpose-built, secure API Gateway**

# Importance of API Gateways

*API Gateways are needed in both levels of API Management*

Full API Management

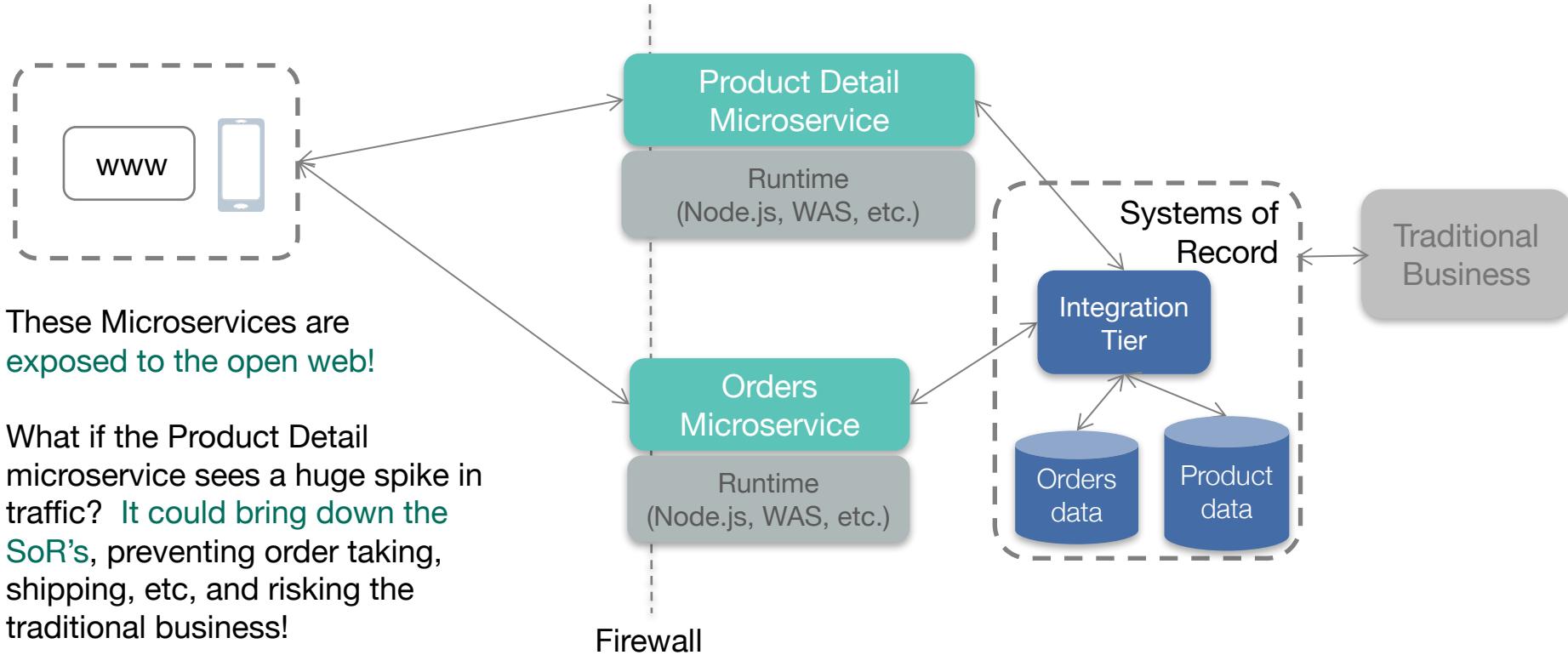
Microservice Management

Capabilities Needed	How Capability is Delivered
<ul style="list-style-type: none"><li>• Advertise availability of API's</li><li>• Provision API keys for developers</li><li>• Share API documentation w/ developers</li></ul>	<b>Developer Portal</b> (in API Connect)
<ul style="list-style-type: none"><li>• Manage API, Products, Plans</li><li>• Manage API Access Control</li><li>• API Monitoring &amp; Analytics</li><li>• Monetize APIs</li></ul>	<b>API Manager</b> (in API Connect)
<ul style="list-style-type: none"><li>• <b>Security policies</b> to threat protect, authenticate users &amp; application, ensure only the right parties access data</li><li>• <b>Rate limiting</b> to prevent overload of SoRs</li><li>• <b>Mediation policies</b> to transform data (e.g. from JSON to XML)</li><li>• <b>Traffic management policies</b> to intelligently route incoming traffic to the correct services</li></ul>	<b>API Gateway</b> (DataPower, which is available standalone or as an option with API Connect)

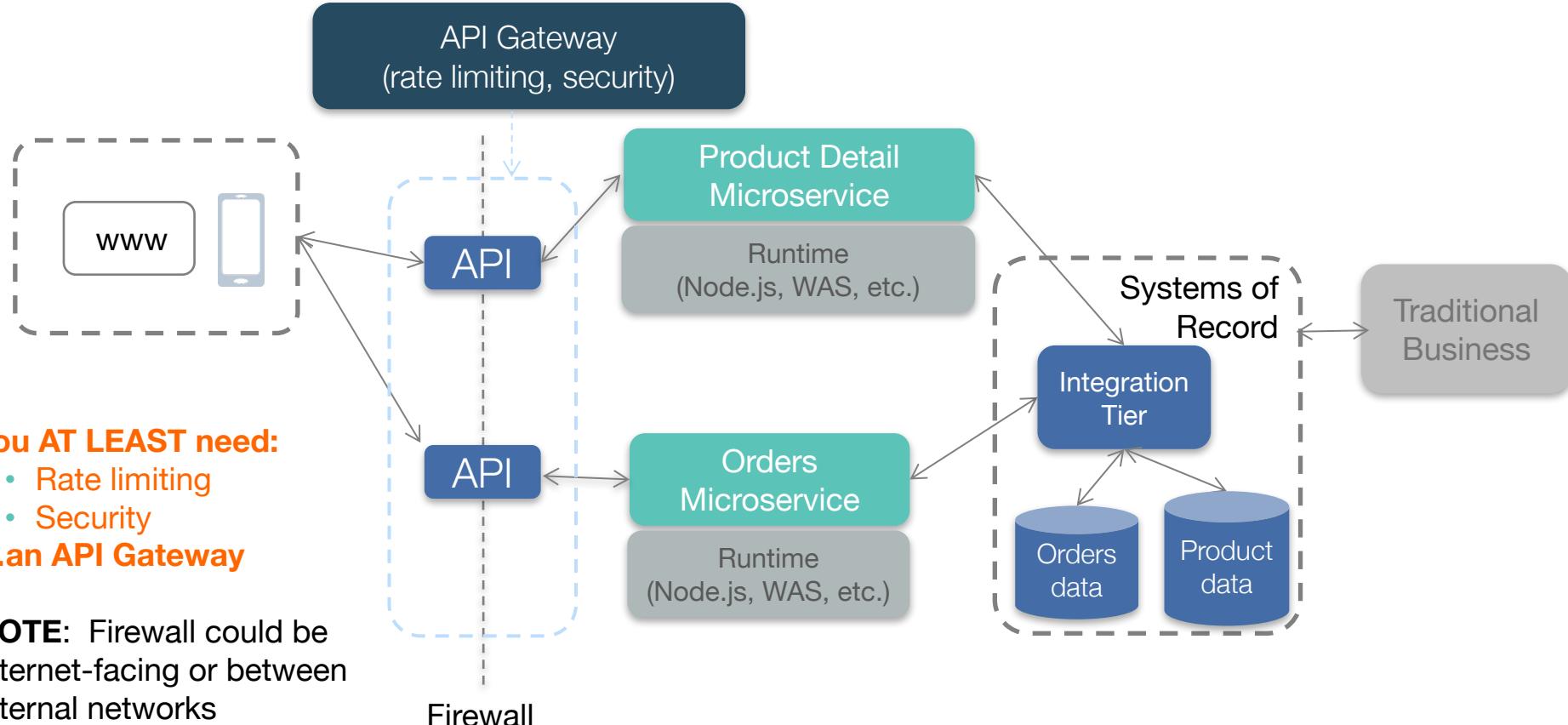
# 4 Primary Considerations

- 1 Even if you aren't ready to adopt full API Management, **you need an API Gateway**
- 2 Your gateway includes app logic. If you're not testing your gateway, you're not testing your full app. **You need to deploy your gateway in your DevOps pipeline**
- 3 Your gateway needs to sit close to your System of Record(s) for latency reasons. SoR's typically exist in many clouds. **Your gateway needs to run everywhere.**
- 4 Digital applications are different from Traditional applications, and **require a new “Interaction Tier”** to provide the required combination of performance and agility.

# What's wrong with this picture?



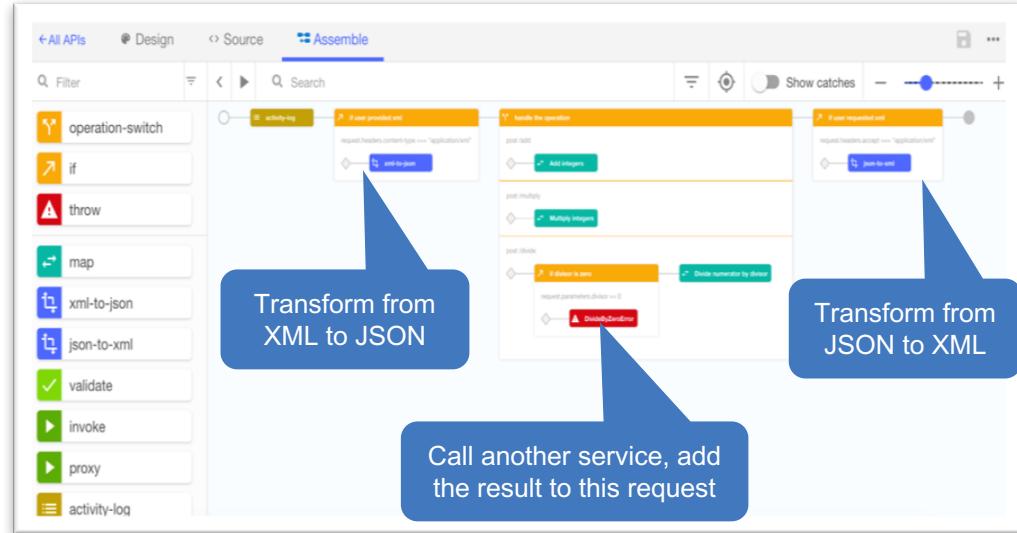
# You Need an API Gateway



# You Need to Deploy Your Gateway in your DevOps Pipeline

1. Your gateway includes important parts of your application's logic  
(e.g. transformations, invoking other services, routing logic, etc.)
  2. You probably are (or want to be) using Continuous Integration / Continuous Deployment for your MicroServices- and API- based applications.
  3. CI/CD requires an automated way to deploy & test all parts of your app.
- The market-leading **DataPower API Gateway** **is able to be deployed via Docker**, which is the best practice for DevOps deployment.

An example set of policies in an API Gateway:

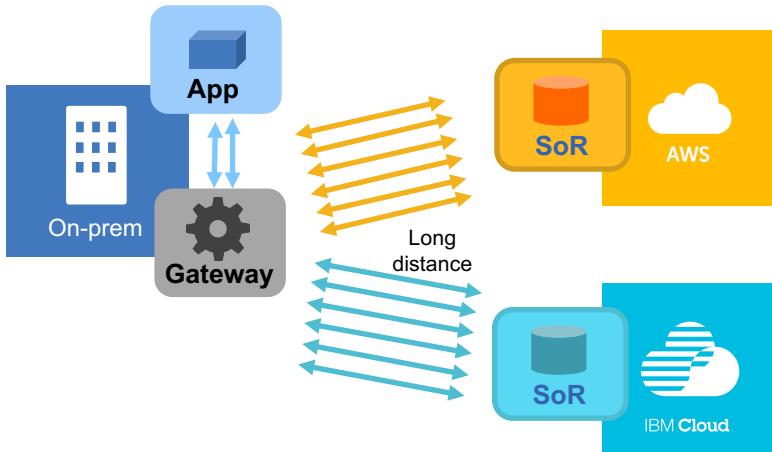


Deploy via



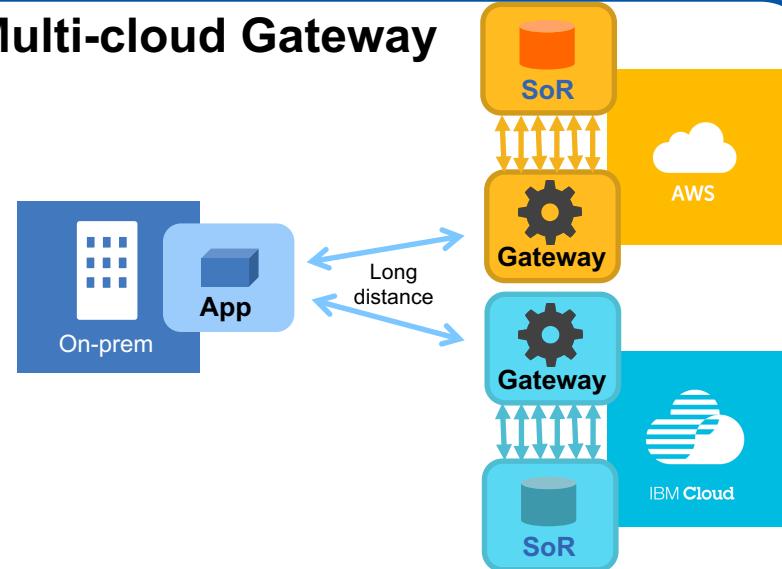
# Your Gateway Needs to Run Everywhere

## On-Prem Gateway



## Multi-cloud Gateway

Vs.



- The on-prem Gateway scenario is quite slow due to many long distance, high-latency calls
- The multi-cloud gateway scenario is much faster, as it minimizes long distance, high-latency calls
- **The IBM DataPower Gateway can run:**
  - **Natively in IBM BlueMix, Amazon Web Services, and Microsoft Azure.**
  - **In RHEL or Ubuntu Linux, either Natively or in Docker**

# How DataPower Gateways are unique?

## ***Purpose-Built, Secure Gateway***

➤ **Non-blocking event-driven I/O architecture**

- ✓ Architecture similar to Nginx & Node.js
- ✓ Continued enhancements since 2002

➤ **Parsers & compilers** for JSON & XML processing written from ground-up with several patents

➤ Secure and optimized **JavaScript runtime** called GatewayScript

➤ **Purpose-built, secure gateway image** (all form factors)

- ✓ Single self-contained, signed & encrypted secure gateway image without external software dependencies

- No arbitrary software
- Security exposure minimized due to smaller vulnerability surface (few user-exposed and 3<sup>rd</sup> party components)

- ✓ High assurance, “locked-down” configuration

- ✓ Optimized, embedded operation system

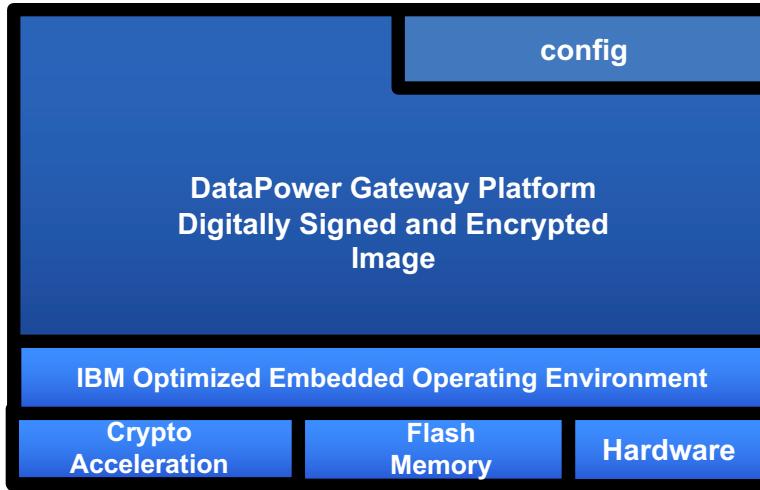
➤ **Physical security** (physical appliance only)

- ✓ Sealed, tamper-evident case
- ✓ No usable USB, VGA, other ports
- ✓ Customized intrusion detection switch
- ✓ Trusted Platform Module
- ✓ Encrypted flash drive
- ✓ Cryptographic acceleration card
- ✓ Optional FIPS 140-2 level 3 certified Hardware Security Module

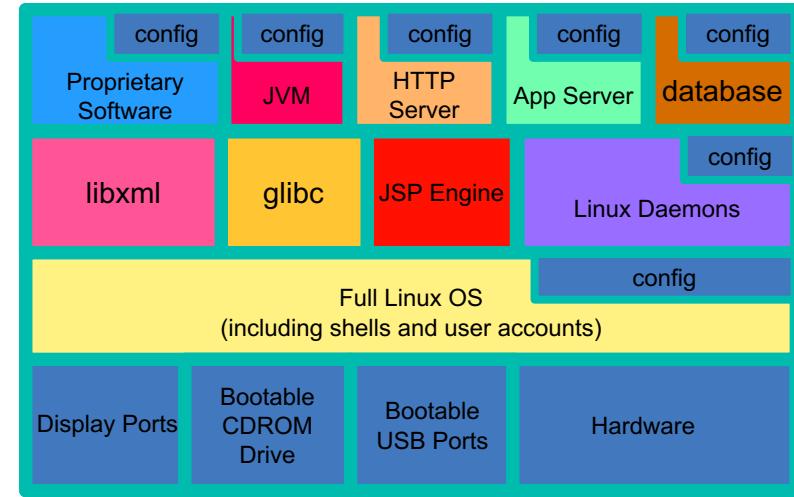
# Simple & Secure Architecture

- How is DataPower 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

## DataPower Gateways *(Secure & Easy to Manage)*

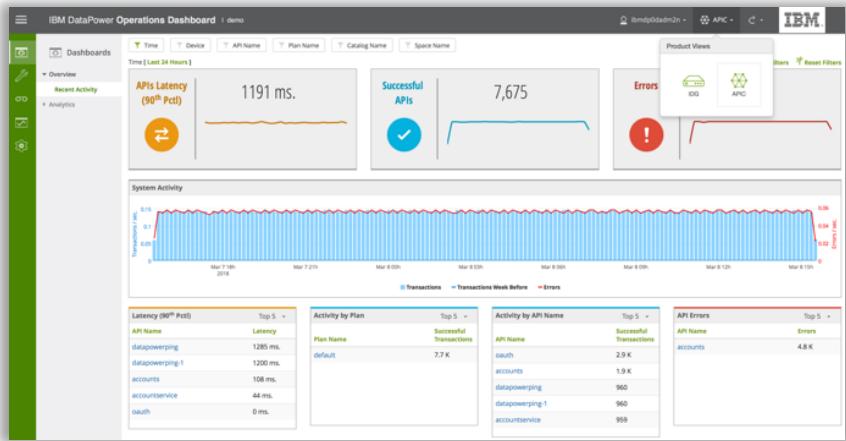


## Commodity Gateways *(In-Secure & Hard to Manage)*



# DataPower Operations Dashboard (DPOD) V1.0.7

- **Adds support for DataPower Gateway X2**
- **Monitor tenants** running on DataPower physical appliances with the new Isolated Tenant Module support
- **UX/UI improvements** with transaction export and latency alert capabilities
- **Tighter integration with IBM API Connect** with new Recent Activity dashboard that displays a high-level overview of APIs activity
- **Improved DevOps** with Firmware upgrade plan capability for both virtual and physical factors
- **Enhanced reporting capabilities** with new URI summary and detailed latency reports



# API Connect: Flexible licensing and deployment



## Deployment

***Deploy where it's most convenient for you***

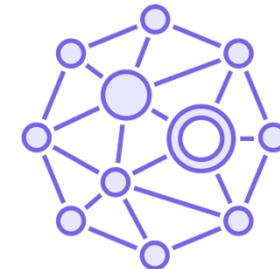
- Deploy on IBM Cloud
- Deploy to 3<sup>rd</sup> party clouds
- Deploy on-premises



## Licensing

***Pay only for what you need***

- Subscription (API calls/month)
- Perpetual (per PVU, unlimited API calls)



IBM API Connect

Number of APIs & API Products	Unlimited
Number of API Application Developers	Unlimited
Cloud infrastructure on IBM Cloud	Included
Data transfer on IBM Cloud	Included

# API Connect Offerings

API Connect Essentials (aka Lite)	API Connect Enterprise
For Developers	For Departments & Cross Enterprise
No charge, with Forum support	Paid, with IBM support
50K API calls/mo	<ul style="list-style-type: none"><li>- PayGo: 100K API calls/mo &amp; above</li><li>- Subscription: 5 Million API calls/mo &amp; above</li><li>- <b>Maximum flexibility with yearly call volume measurement (e.g. API calls / Yr)</b></li></ul>



- IBM Support
- Additional API calls
- HA requirements
- Advanced API Gateway Policies

# Resources

- ❑ <https://developer.ibm.com/apiconnect/>
- ❑ <https://developer.ibm.com/datapower/docker/>

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