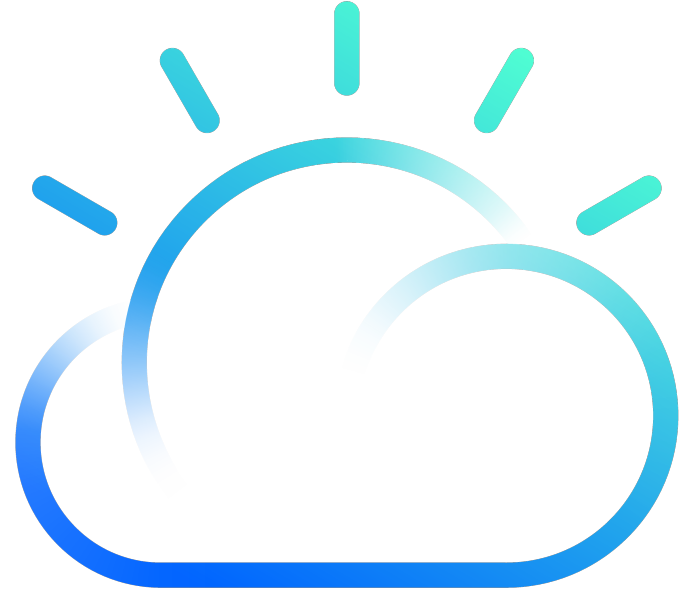


API Connect & Gateways 201

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.

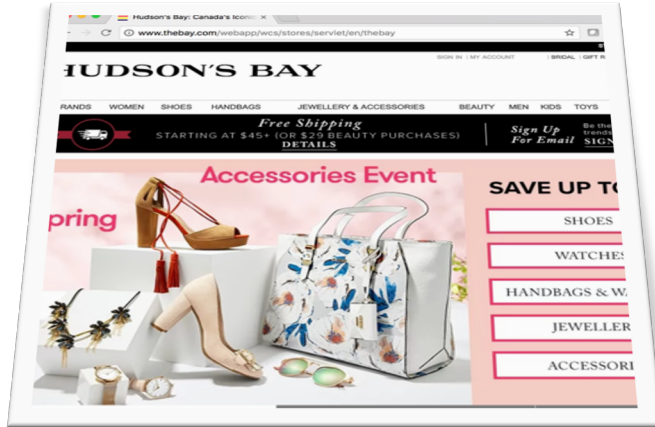
The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

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.

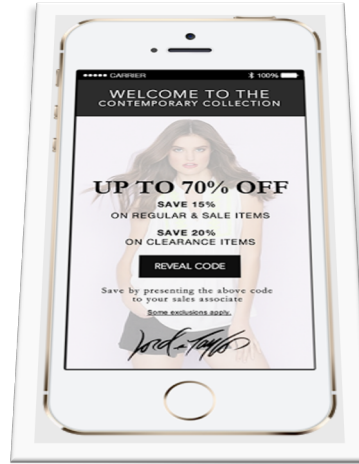
Agenda

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

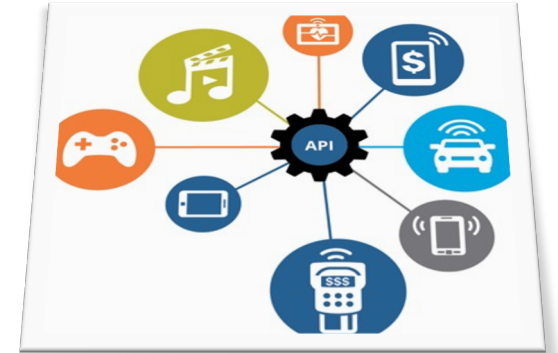
Web, Mobile & APIs – What Do They Have In Common?



Late 1990s



2000s



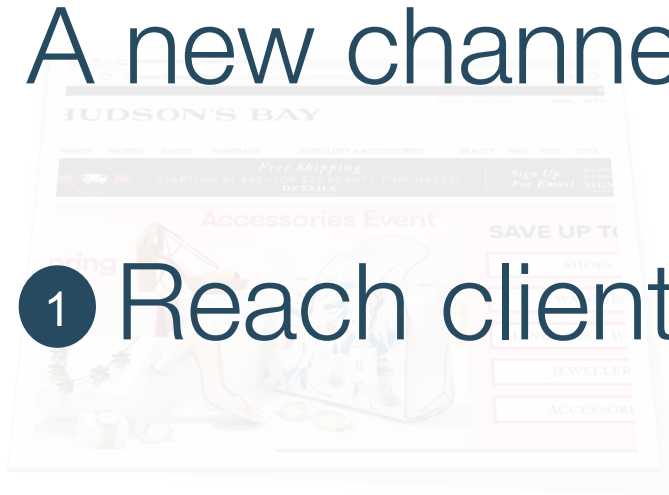
2015+

Web, Mobile & APIs Offer Organizations...

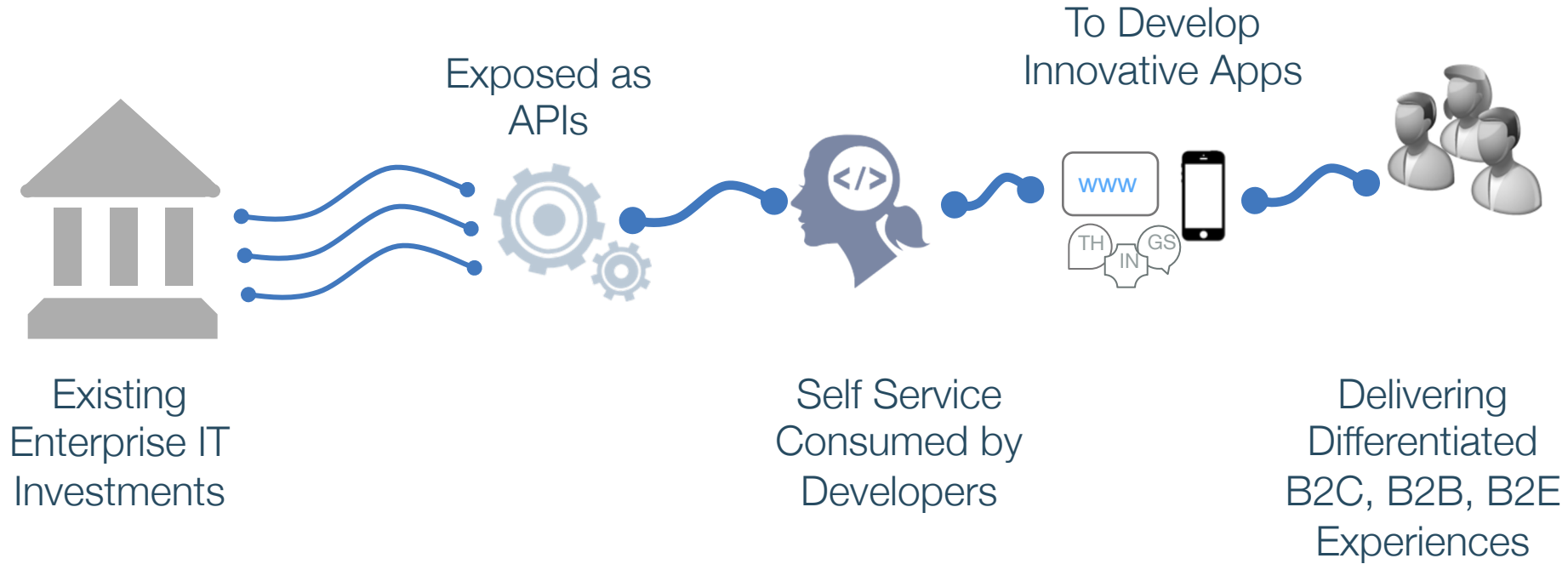
A new channel to:

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

A Large Bank 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

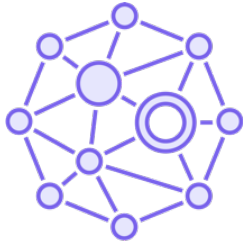
Retail

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

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.

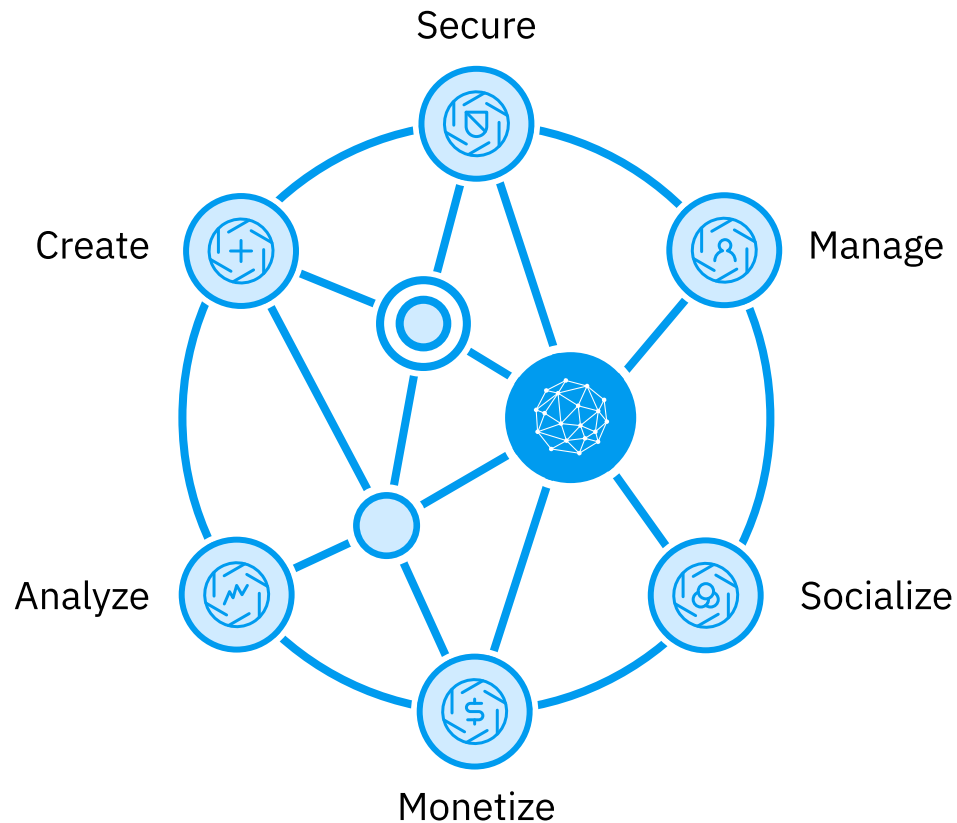


Manage

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

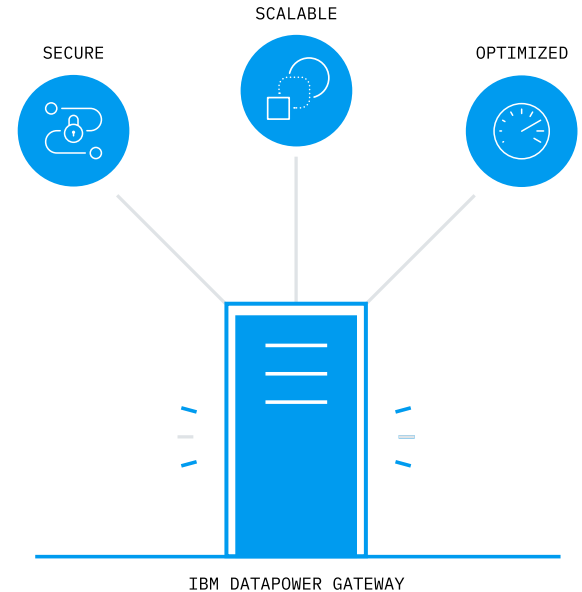
API Connect Key Capabilities

IBM **API** Connect



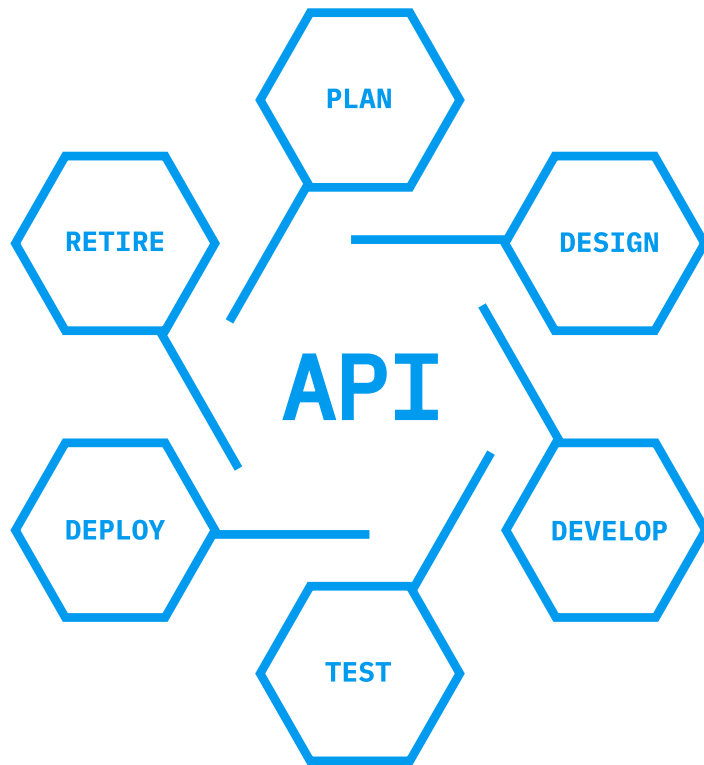
Enterprise Security and Control with Industry leading API Gateway

- **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



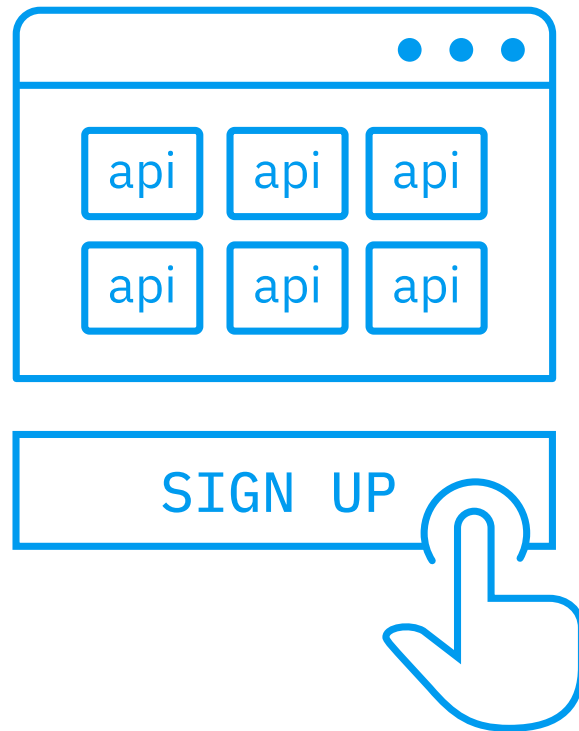
Manage APIs through the API Lifecycle

- **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



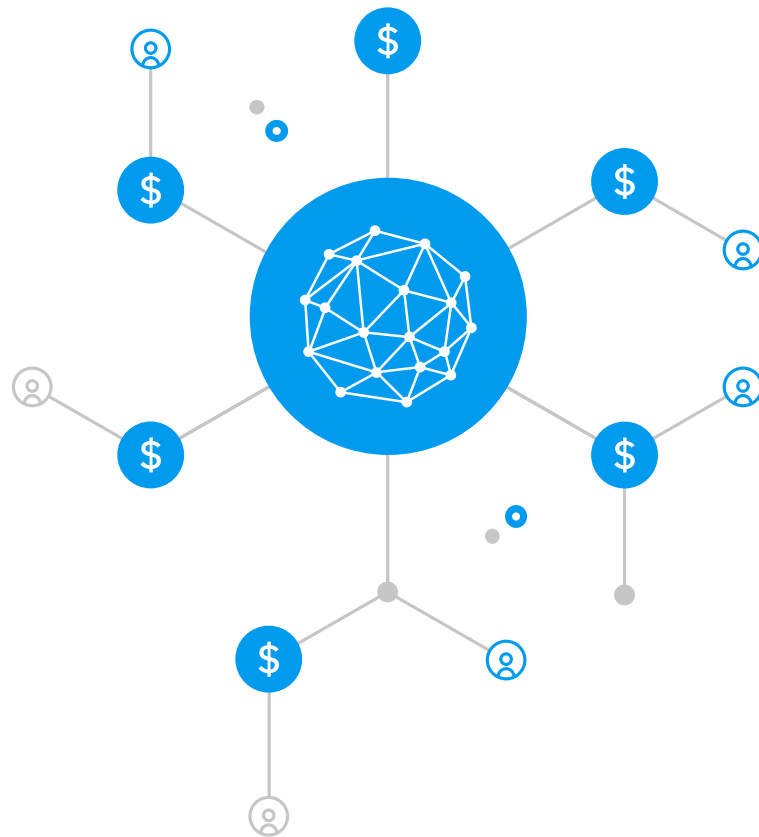
Socialize and Engage with API Consumers to drive adoption

- **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'



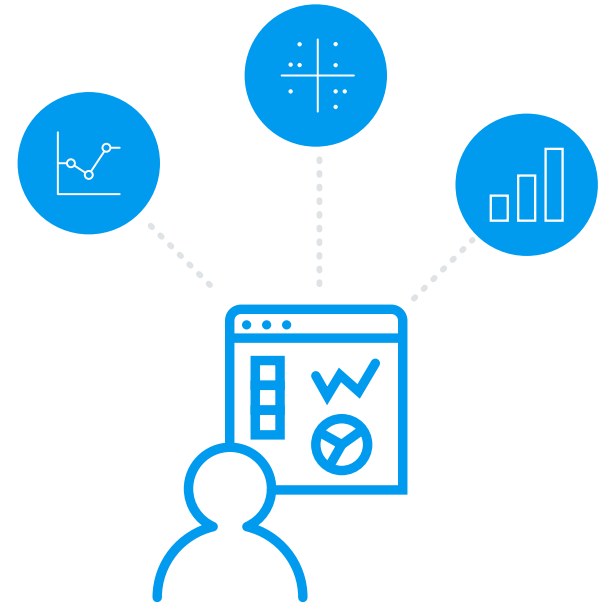
Monetize your API Calls

- **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



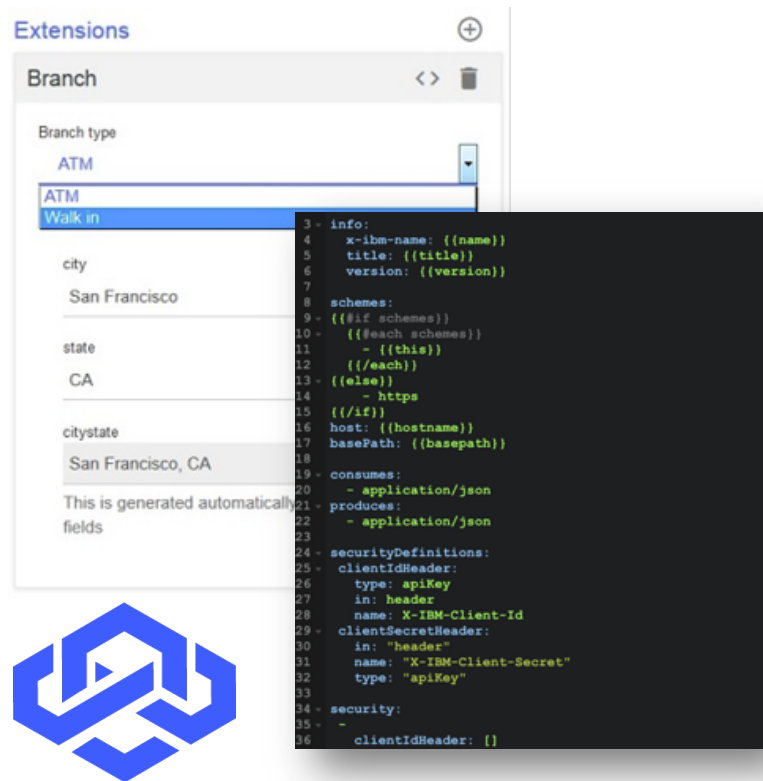
Gain Insights in to your API Business

- **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



The screenshot displays the LoopBack API Gateway interface. On the left, a 'Branch' configuration is shown for the 'ATM' type. The configuration includes a dropdown menu with 'ATM' and 'Walk in' options, and a table of metadata:

| | |
|-----------|-------------------|
| city | San Francisco |
| state | CA |
| citystate | San Francisco, CA |

Below the table, it states 'This is generated automatically fields'. On the right, a code editor shows an OpenAPI specification snippet:

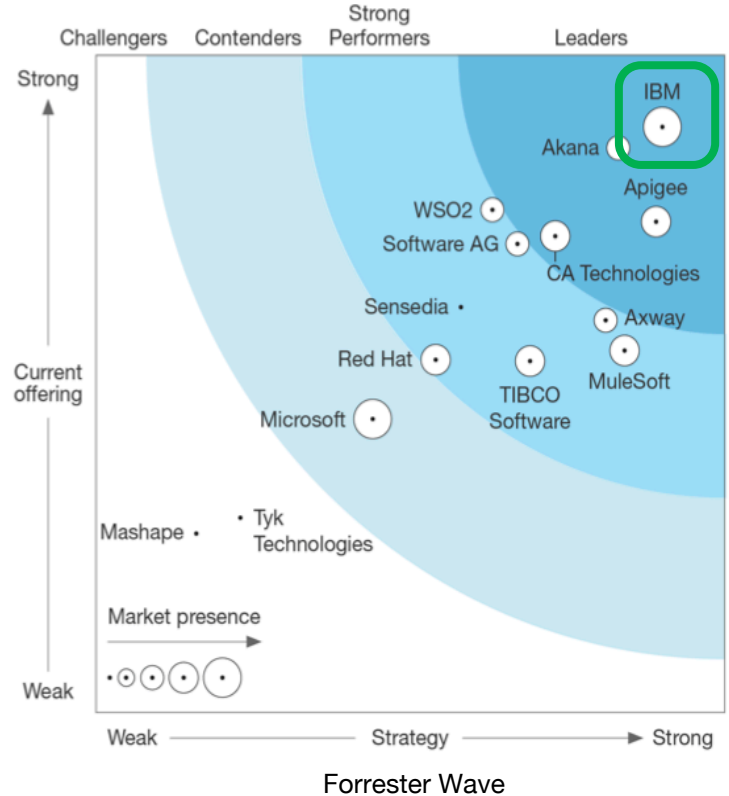
```
3 info:
4   x-ibm-name: {{name}}
5   title: {{title}}
6   version: {{version}}
7
8 schemes:
9   - {{#if schemes}}
10    - {{this}}
11  - {{/each}}
12  - {{else}}
13    - https
14  - {{/if}}
15
16 host: {{hostname}}
17 basePath: {{basepath}}
18
19 consumes:
20   - application/json
21 produces:
22   - 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

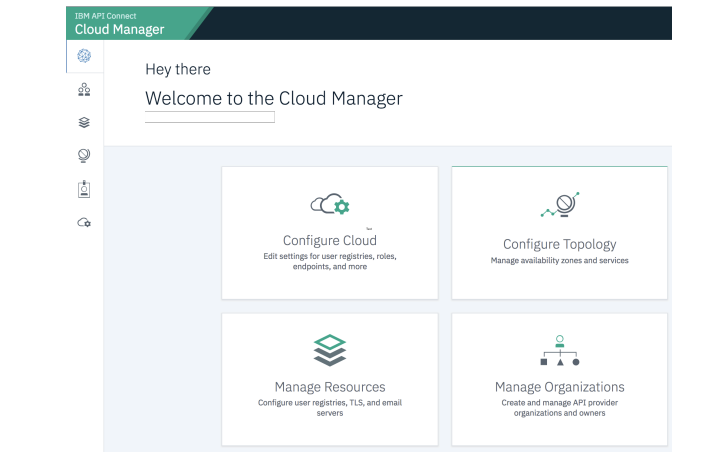
IBM API Connect: Ranked #1

- **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



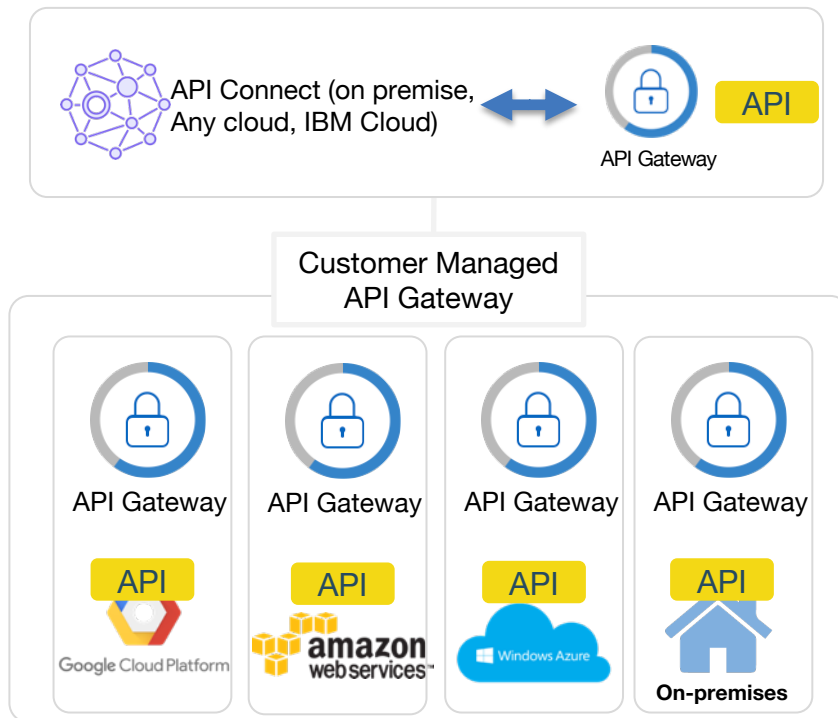
API Connect V2018 LTS: Scale & Flexibility with Multi-Cloud Design

- **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



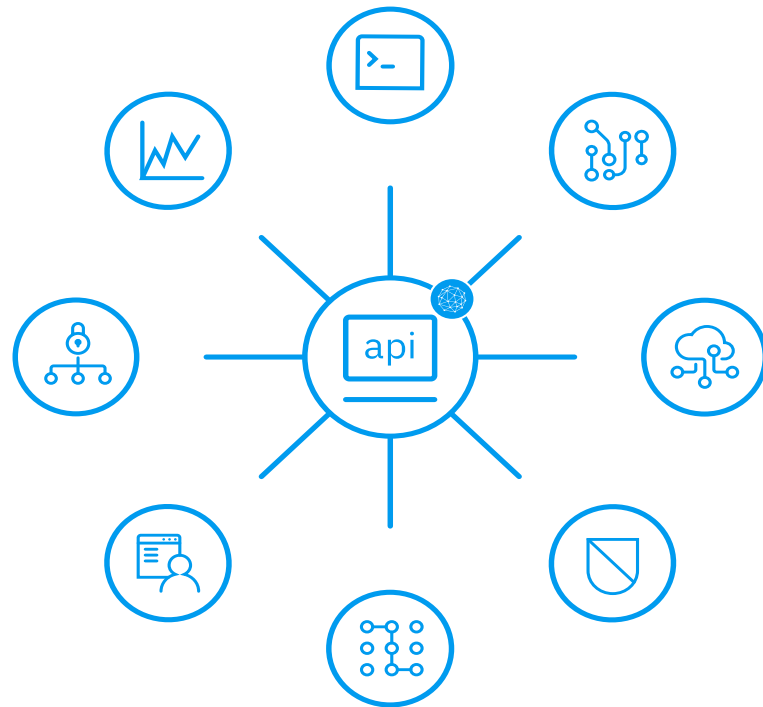
API Connect V2018 LTS: Deployment Options

- **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



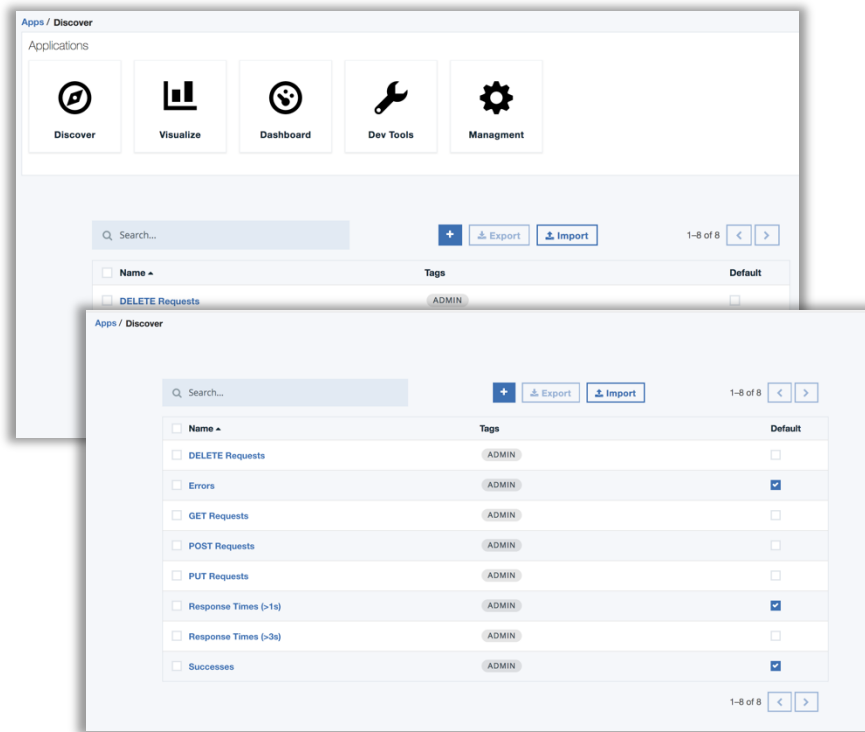
API Connect V2018 LTS: DevOps Ready for CI/CD Needs

- **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



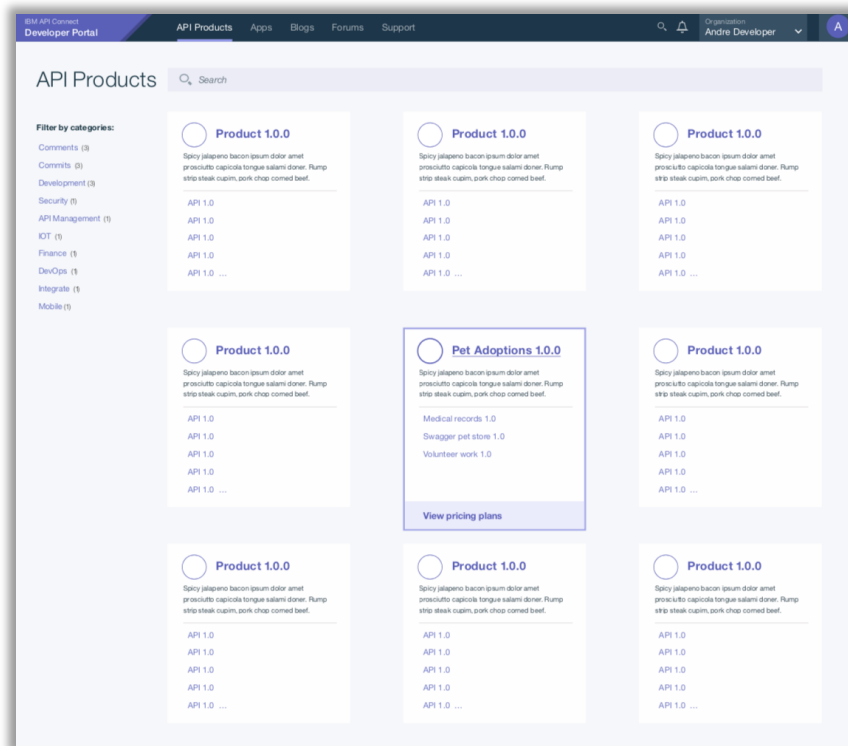
API Connect V2018 LTS: What's New in Analytics

- **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



API Connect V2018 LTS: 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

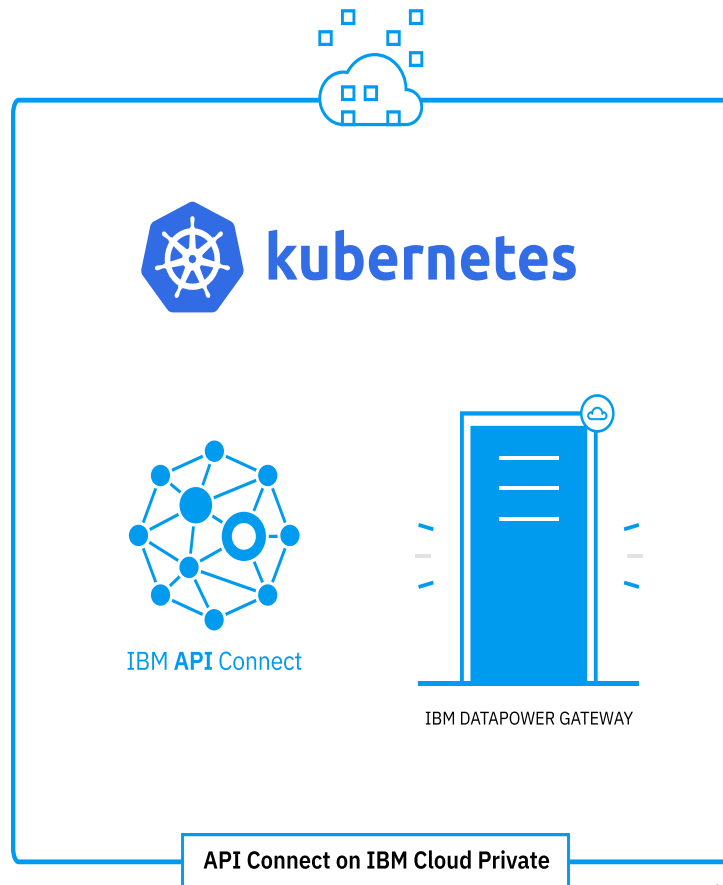
API Connect V2018 LTS: Continuing Innovation across API Lifecycle

- **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.x & 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

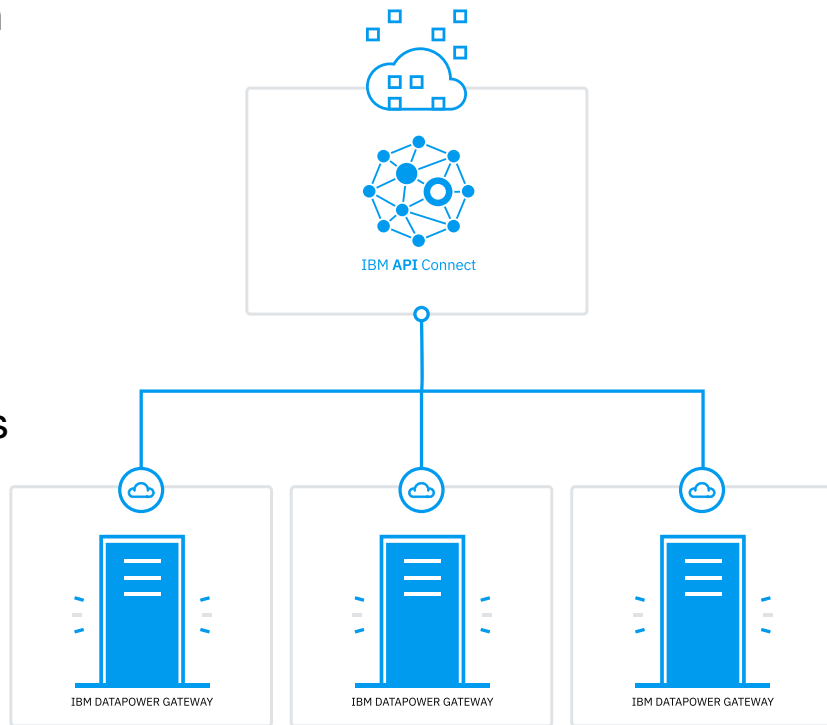
- **Up to 2X performance** with next generation hardware architecture compared to IBM DataPower Gateways (IDG) for lower TCO
- **2X 10GbE network ports** compared to IDG to accelerate application responsiveness
- **Up to 4X RSA operations** with 2048-bit keys using the optional Hardware Security Module (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 v2018.4 LTS: 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

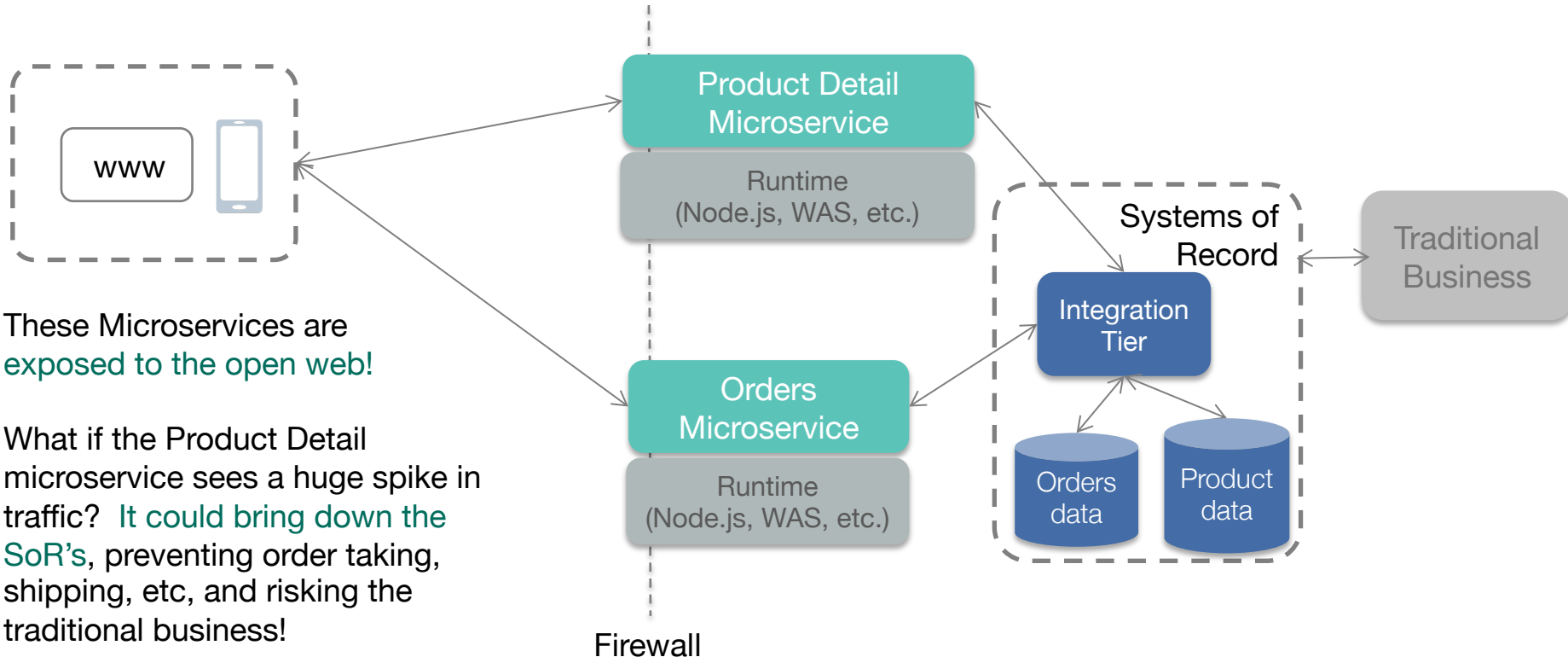
Microservice
Management

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

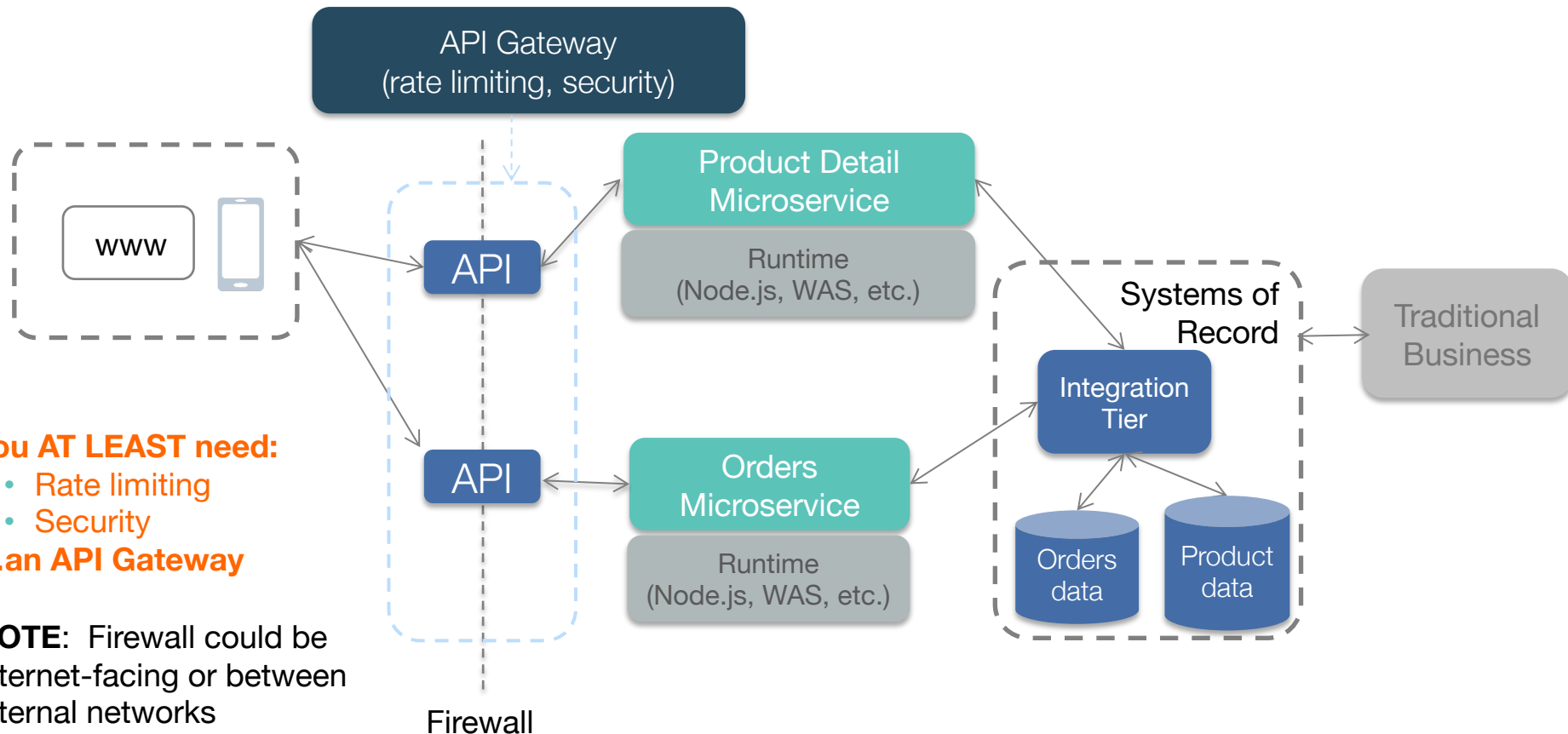
4 Primary Considerations

- 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 AT LEAST need:

- Rate limiting
- Security

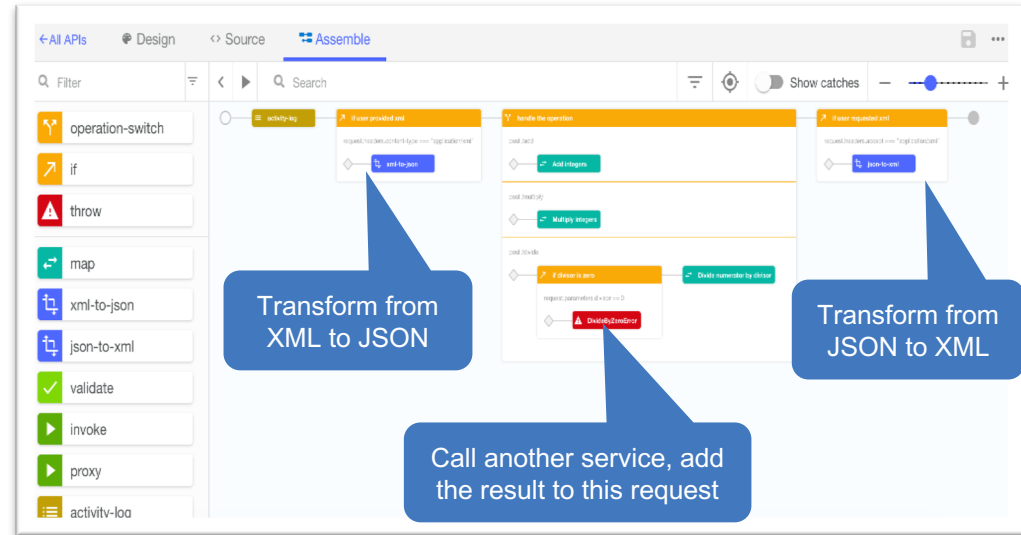
...an API Gateway

NOTE: Firewall could be internet-facing or between internal networks

You Need to Deploy Your Gateway in your DevOps Pipeline

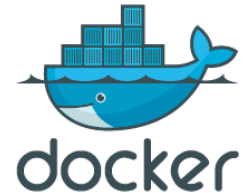
1. Your gateway includes important parts of your application's logic (e.g. transformations, invoking other services, routing logic, etc.)
2. You probably are (or want to be) using Continuous Integration / Continuous Deployment for your MicroServices- and API- based applications.
3. CI/CD requires an automated way to deploy & test all parts of your app.

An example set of policies in an API Gateway:



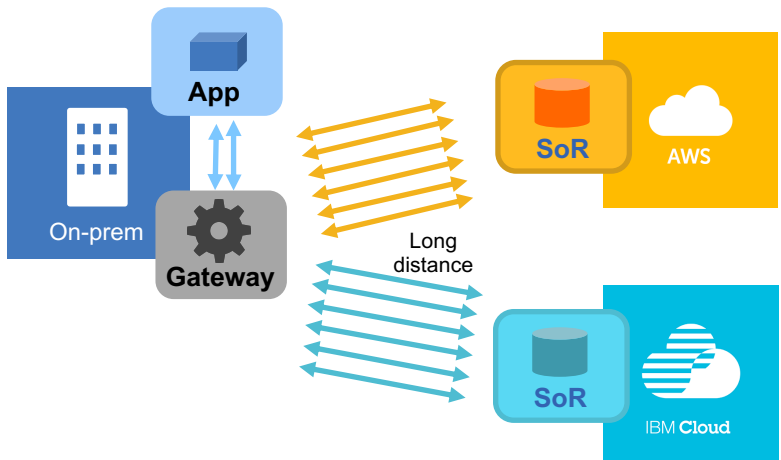
- The market-leading **DataPower API Gateway** is able to be deployed via **Docker**, which is the best practice for DevOps deployment.

Deploy via



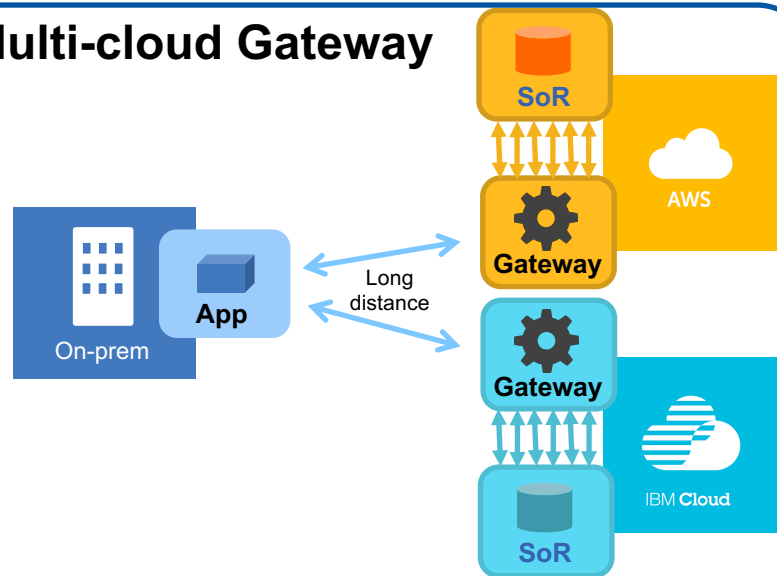
Your Gateway Needs to Run Everywhere

On-Prem Gateway



Vs.

Multi-cloud Gateway



- 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 3rd party components)
- ✓ High assurance, “locked-down” configuration
- ✓ Optimized, embedded operation system

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

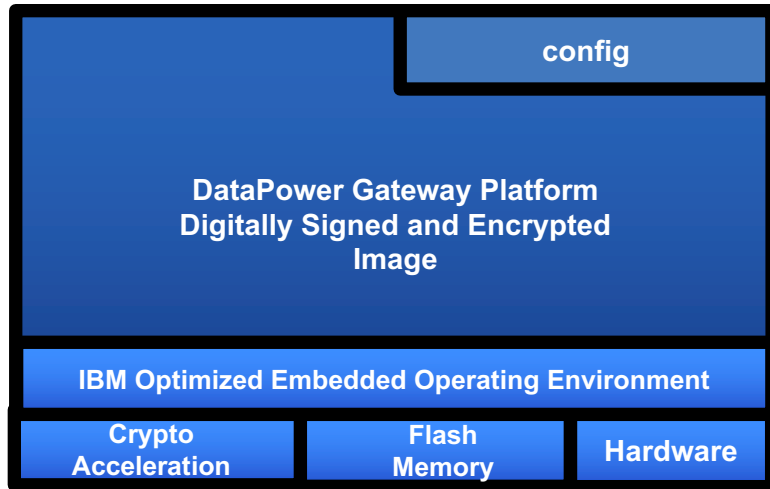
- ✓ Sealed, tamper-evident case
- ✓ No usable USB, VGA, other ports
- ✓ Customized intrusion detection switch
- ✓ Trusted Platform Module
- ✓ Encrypted flash drive
- ✓ Cryptographic acceleration card
- ✓ Optional FIPS 140-2 level 3 certified Hardware Security Module

Enterprise grade security requires a secure platform

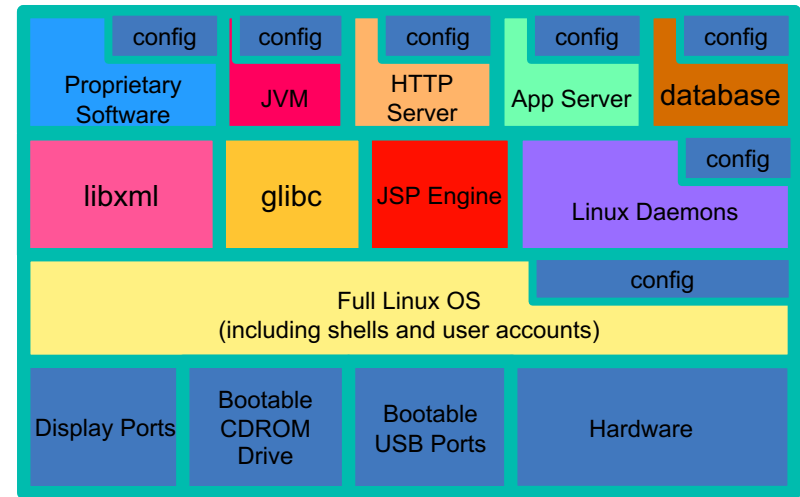
Simple & Secure Architecture

- 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)

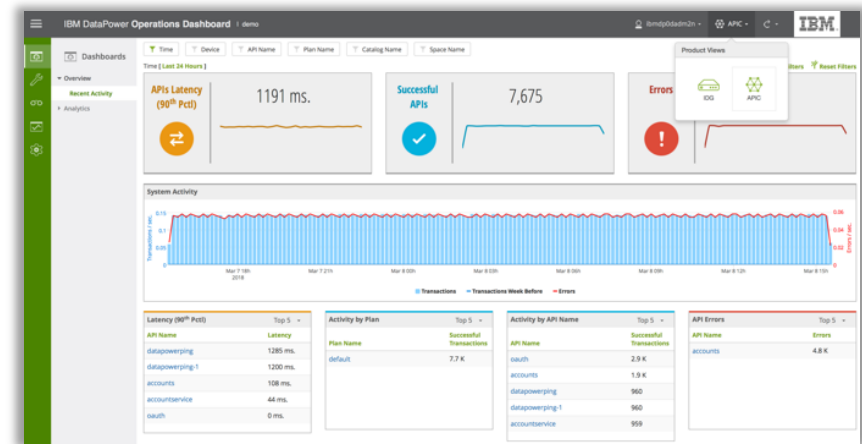


Commodity Gateways (In-Secure & Hard to Manage)



DataPower Operations Dashboard (DPOD) V1.0.x

- **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 for 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

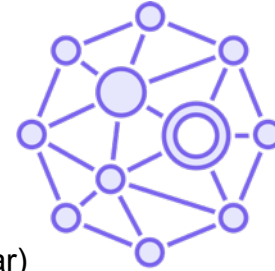
- Deploy on IBM Cloud
- Deploy to 3rd party clouds
- Deploy on-premises



Licensing

Pay only for what you need

- Subscription (API calls/month or API calls/year)
- 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 | - PayGo: 100K API calls/mo & above - Subscription: 5 Million API calls/year & above - Maximum flexibility with yearly call volume measurement (e.g. API calls / Yr) |



- 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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