The Future of Integration
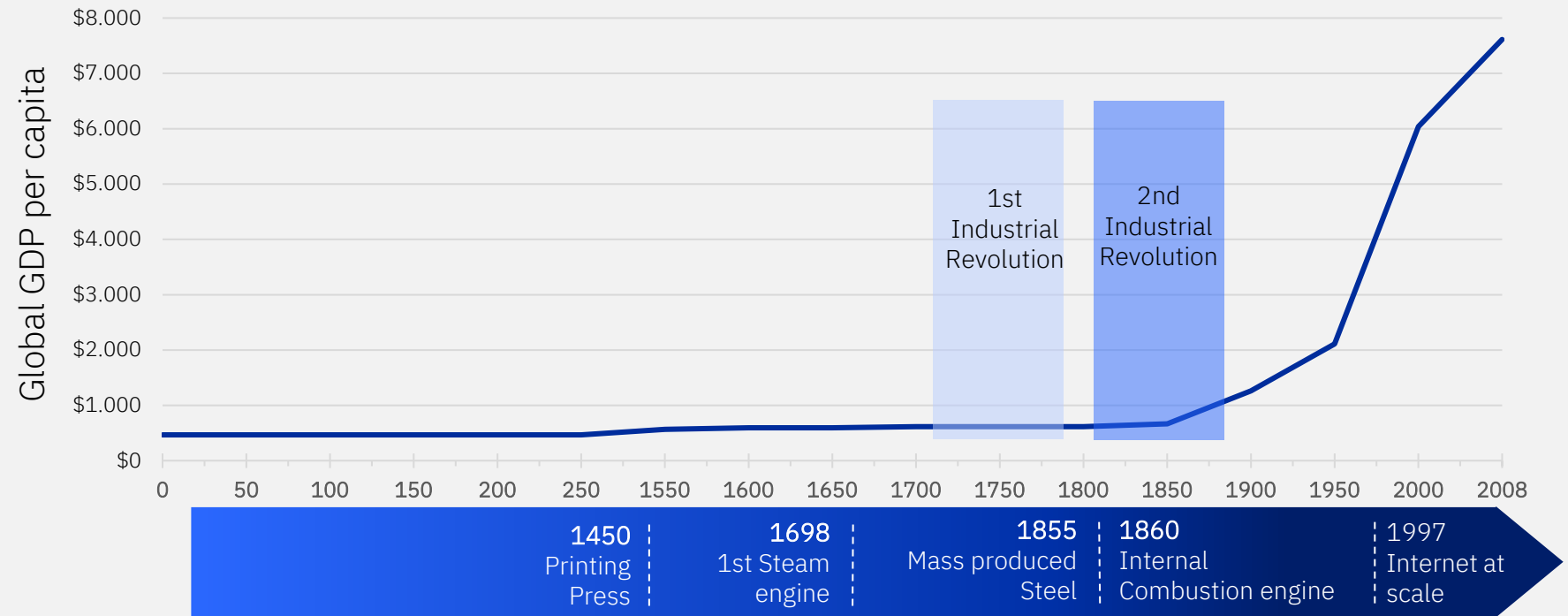
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Cloud Pak for Integration
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April 2023

IBM

Macro trends

Technology accelerated per capita growth in the last 250 years

Global GDP per capita

$8.000
$7.000
$6.000
$5.000
$4.000
$3.000
$2.000
$1.000
$0

0 50 100 150 200 250 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2008

1st Industrial Revolution

2nd Industrial Revolution

1450
Printing Press

1698
1st Steam engine

1855
Mass produced Steel

1860
Internal Combustion engine

1997
Internet at scale

3

Many businesses have a common problem

Enterprises need to be able to connect and integrate their data and applications in an automated and secure way to drive business outcomes

20%

higher revenue growth rate

for tech-adopting businesses
with more efficient systems for moving
and accessing data

:

Source: IBM Institute for Business Value, Extending Digital Acceleration, October 2021

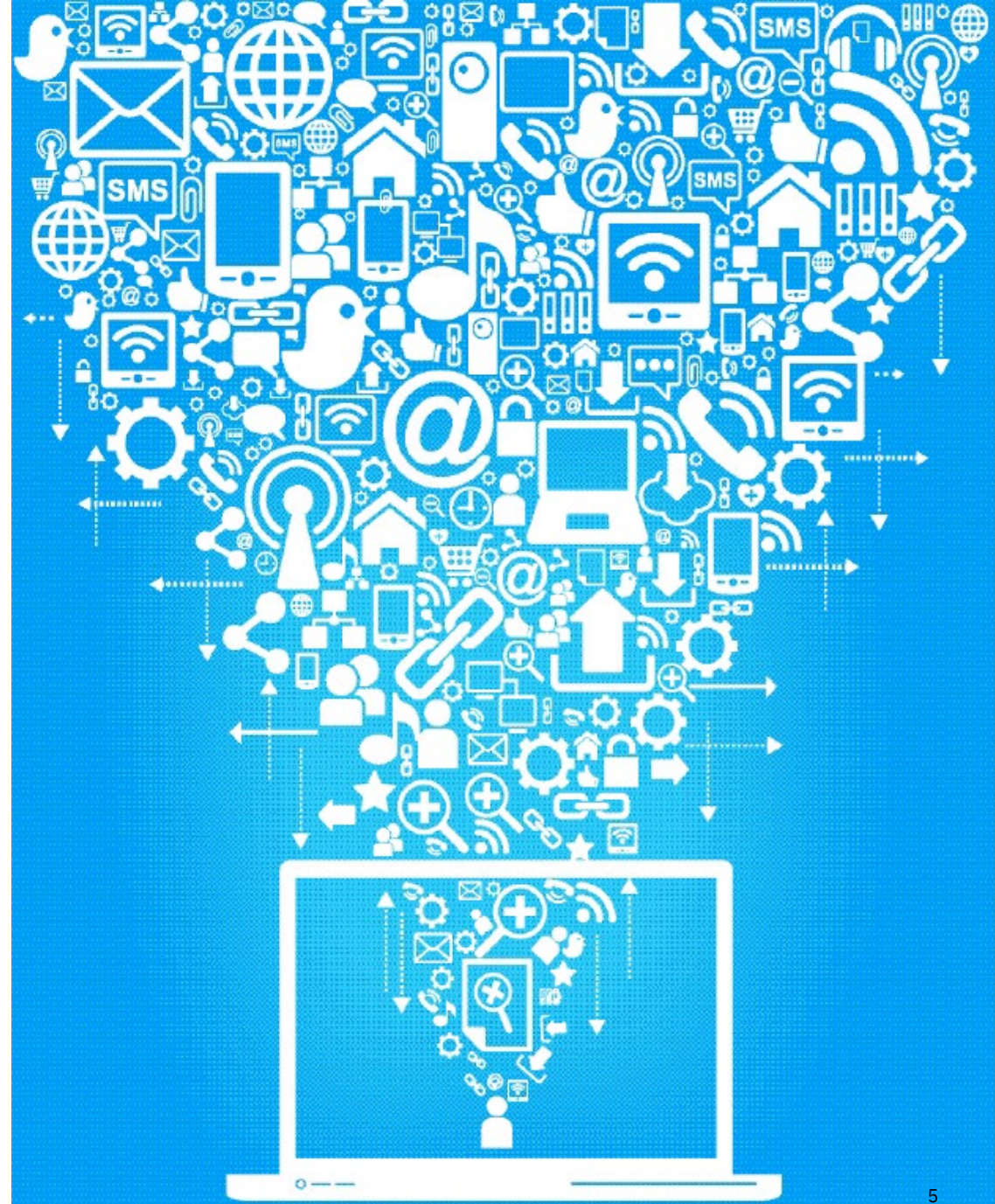# An increasingly digital world makes it a difficult problem to solve

The amount of data and applications are rapidly growing and reaching a tipping point

100+
applications

Over 50% of organizations estimate they have more than 100 applications in their portfolio today.

:

Source: IDC's 2022 Worldwide Application Services Survey

Not only is the amount of data increasing, but also the different locations where the data resides leading to growing complexity

54%
applications
will be replaced and modernized
to cloud environment in 3 years

Source: IDC's 2022 Worldwide Application Services Survey

In addition, there is a labor and skills shortage adding to the difficulty

Top 5
hardest-to-find tech skill

Integration architecture is one of the top 5 hardest-to-find tech skills

80%
non-IT developers

By 2026, developers outside IT will account for 80% of the user base of low-code dev tools

Source: Gartner Forecast Analysis: Low-code Dev, Technologies, Oct 2022; Future of Work Trends: Tinkerers Become Mechanics
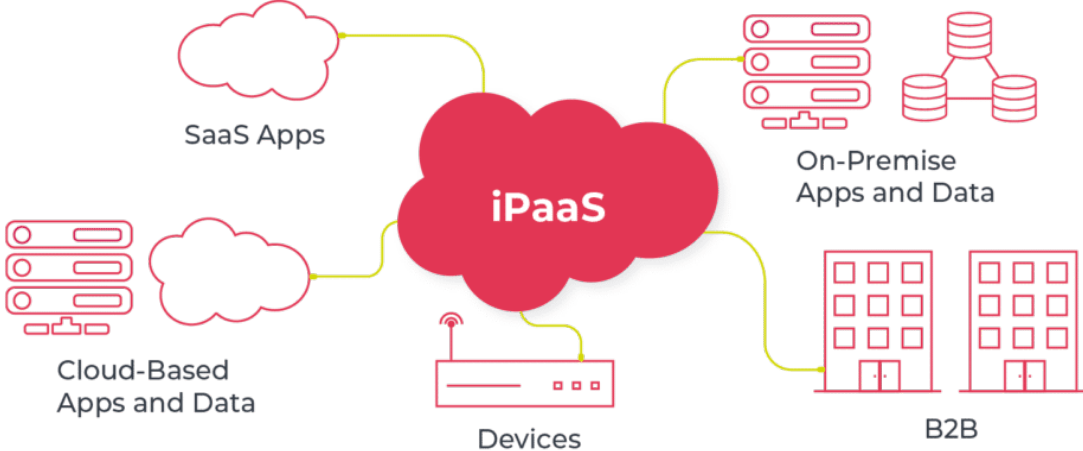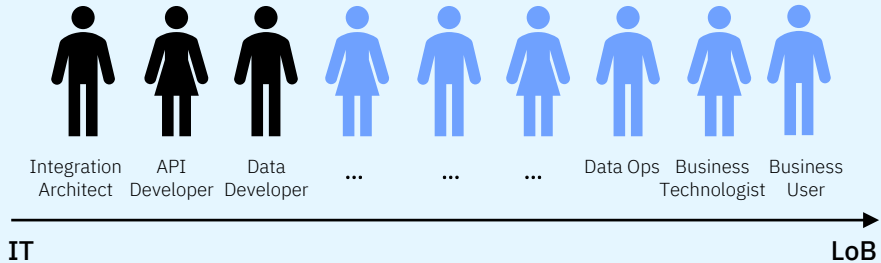
Technology trends

The market is moving to Integration Platform <u>as a Service</u> (iPaaS) with the future of **integration modernization** based on APIs

80%

Low-code users
will be outside of formal IT departments

| Integration Architect | API Developer | Data Developer | ... | ... | ... | Data Ops | Business Technologist | Business User |

IT → **LoB**

iPaaS offerings contain a mix of:
- App Integration
- Data Integration
- B2B integration
- Process Automation

Source: Gartner Forecast Analysis: Low-code Dev, Technologies, Oct 2022; Future of Work Trends: Tinkerers Become Mechanics

APIs are a key enabler of digital transformation & integration

API-led integration is a modern way to integrate applications and data through reusable APIs.

It replaces the overly complex point-to-point integration style to enable a more flexible, scalable and agile architecture.

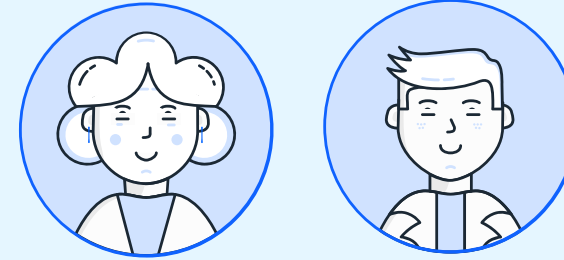Reduce cost by leading with APIs as the building blocks of integration

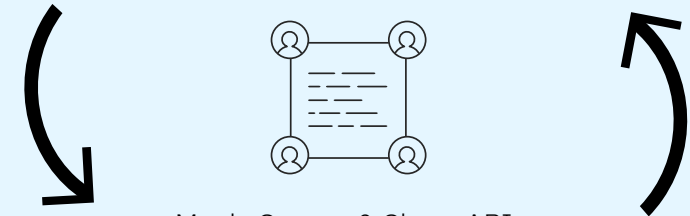Quickly adapt to changing business needs by leveraging OpenAPI standards

Manage, secure, & share your APIs more efficiently & effectively

Business & IT Integrators

Design, Implement, Deploy APIs & Flows

Mock, Secure & Share APIs

API Developers

Three key trends driving changes in the API market
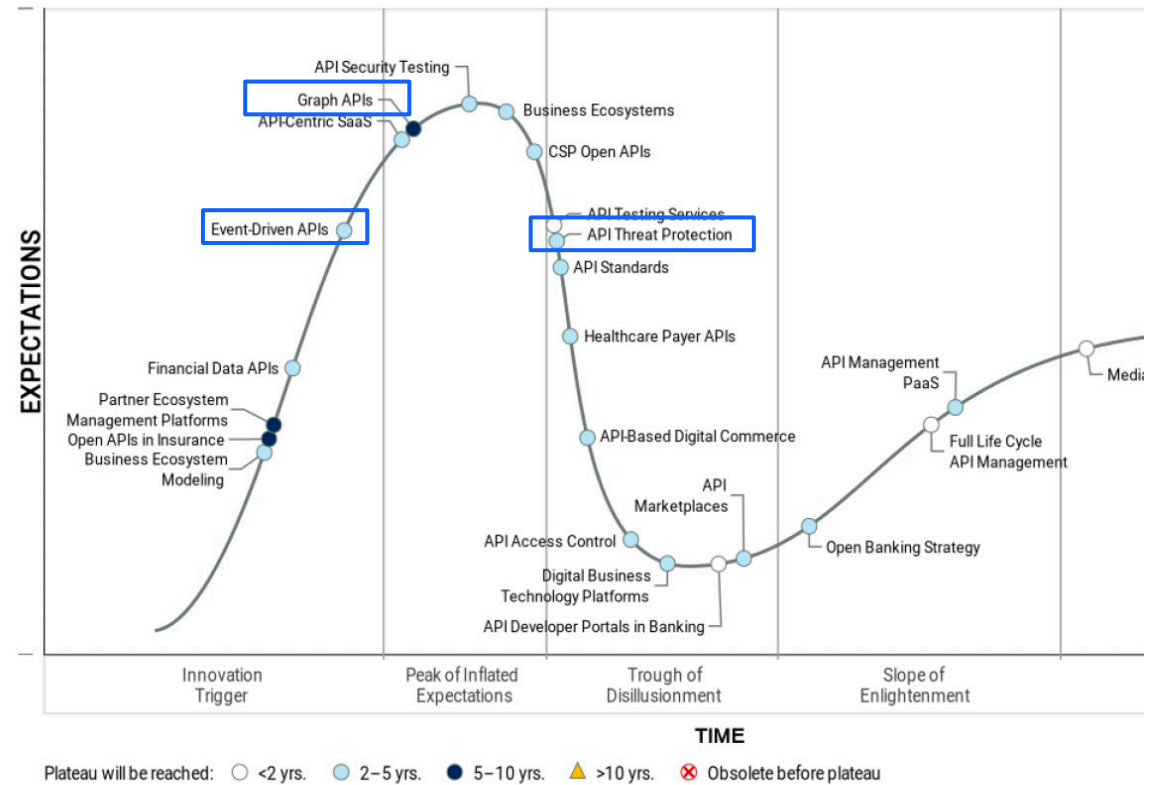
Graph APIs – flexible federated access to data

Event-driven APIs – real-time notification of changes to data and application state
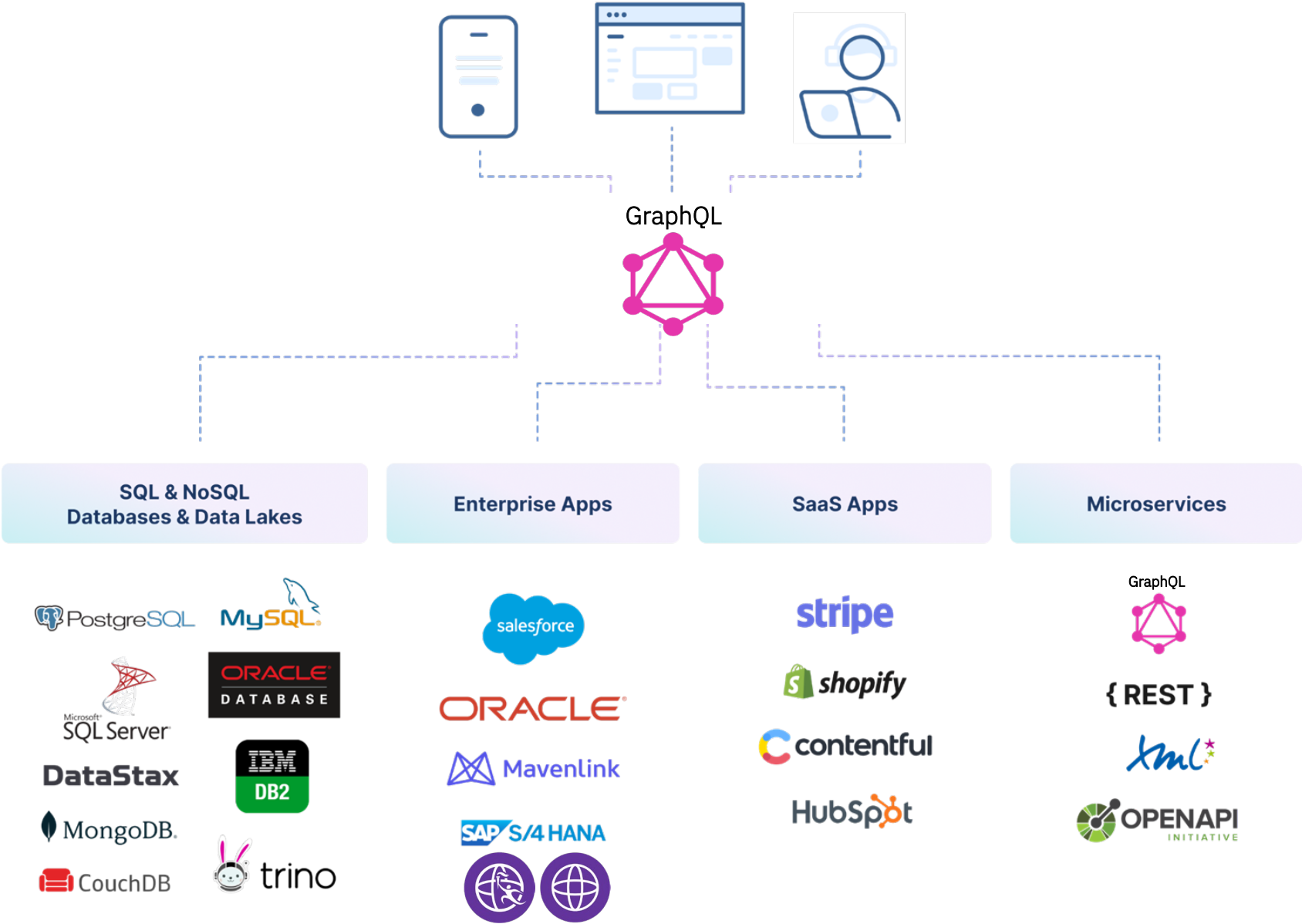
Advanced API Security – APIs are easy to expose, but difficult to defend. Traditional network and web protection tools do not protect against all the security threats facing APIs
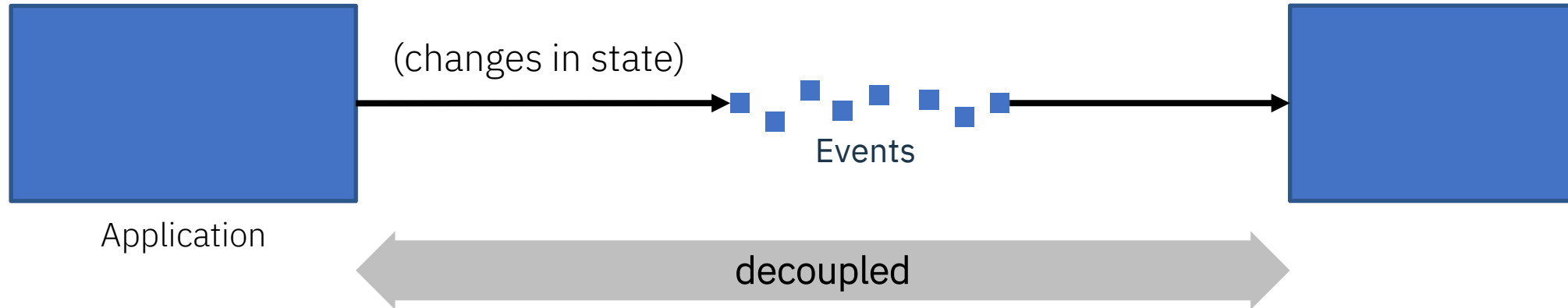

Hype Cycle for APIs, 2022

11

GraphQL APIs enable access to diverse sources

SQL & NoSQL Databases & Data Lakes: PostgreSQL, MySQL, Microsoft SQL Server, ORACLE DATABASE, DataStax, IBM DB2, MongoDB, CouchDB, trino

Enterprise Apps: salesforce, ORACLE, Mavenlink, SAP S/4 HANA

SaaS Apps: stripe, shopify, Contentful, HubSpot

Microservices: GraphQL, { REST }, xml, OPENAPI INITIATIVE

Event Driven Architecture (EDA)

Focuses on "changes in state", rather than "current state"

EDA is not new! Conceptually EDA has been present in computing since the very beginning. It can be underpinned by any mechanism that enables event data to be stored and read at independent times. Queues (e.g. MQ), logs (e.g. Kafka), database tables, files etc.

Modern day EDA moves well beyond this, increasingly making use of **event processing** to gain insight directly from the event streams rather than just processing them at the target system.

Advanced API Security

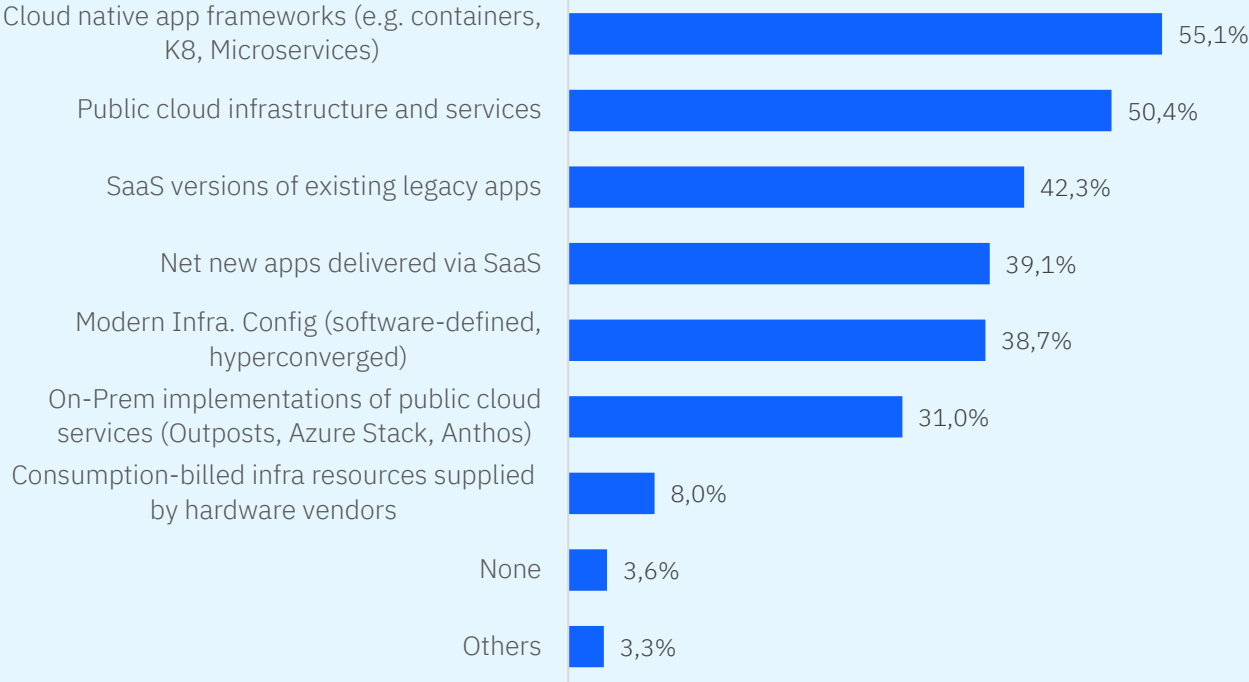| INTENSIFYING THREATS	MORE DIRECTED AT APIS	SINGLE GREATEST THREAT
Malicious actors look to exploit vulnerabilities and leverage an increased dependency on digital infrastructures. Attacks on web applications increased to make up 39% of all breaches in 2021.	Use of APIs is growing exponentially due to digitization and cloud-native development. 2/3 of analyzed cloud incidents are due to misconfigured APIs	Popularity has resulted in more attention from malicious actors. By 2022, API abuses will be the most-frequent attack vector for web apps

Enterprises are supporting a broad and diverse range of development and runtime execution platforms

- Business logic and data is widely distributed across an increasingly diverse hybrid IT landscape

- Secure Web Gateway market emerging as a much broader offering with capabilities including: threat protection, access control, data protection, Domain Name System security, and antivirus protection

Hybrid IT Platforms Used in Enterprise Modernization

Platform	%
Cloud native app frameworks (e.g. containers, K8, Microservices)	55,1%
Public cloud infrastructure and services	50,4%
SaaS versions of existing legacy apps	42,3%
Net new apps delivered via SaaS	39,1%
Modern Infra. Config (software-defined, hyperconverged)	38,7%
On-Prem implementations of public cloud services (Outposts, Azure Stack, Anthos)	31,0%
Consumption-billed infra resources supplied by hardware vendors	8,0%
None	3,6%
Others	3,3%

Sources: IDC Market Analysis Perspective Integration Software, Total Integration: The future of hybrid IT interoperability, Hype Cycle for Application Architecture and Integration, Worldwide Integration and API Management Software Forecast, 2021-2025, MI Analysis

Organizations are growing their use of AI in integration with increasing reliability to drive productivity
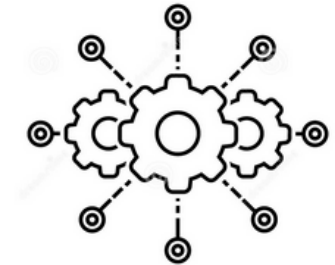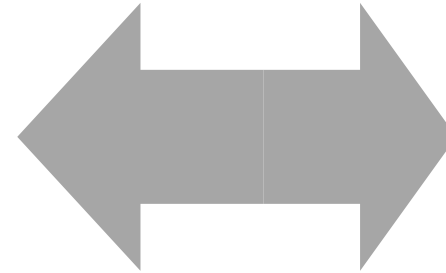
33%

increase

in AI-based intelligent process automation engagements (2020-2021)
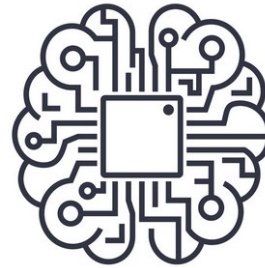
AI

AI makes integration development faster and more resilient with diagnostic tools and conversational and generative AI capabilities

Integration

Integration is key for building stronger and smarter AI models to improve how they make suggestions or decisions

IBM's Point of View

IBM Integration

Our strategy is to provide the **most comprehensive** set of automated, secure, and scalable integration capabilities to enable your organization to digitally transform and grow your business.

API management

Application integration

End-to-end security

Enterprise messaging

Event streaming

High-speed data transfer

IBM Integration: Usage patterns

Integrate by building, managing and sharing APIs

Primary products:
- API Connect
- App Connect
- DataPower (API Gateway)
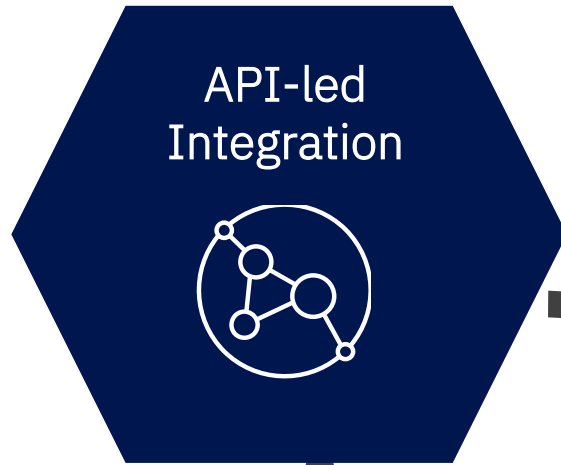
API-led Integration

Management & Security
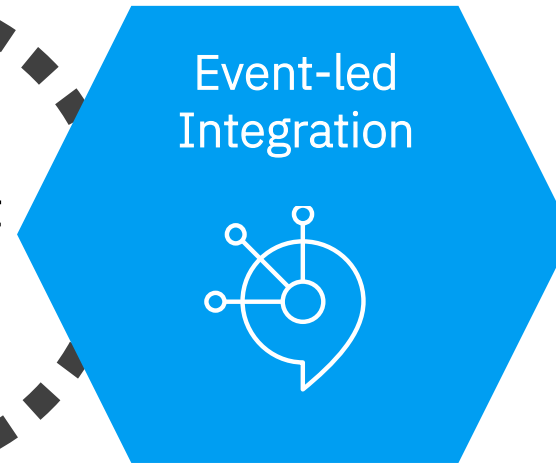
Event-led Integration

Unleash real-time insights to drive data-driven actions

Primary products:
- Event Streams
- Event Endpoint Management
- Event Gateway

Connect to anything quickly, securely and at scale

Primary products:
- MQ
- App Connect
- Aspera
- DataPower

Messaging & Connectivity

We are tackling iPaaS and modernization of integration head on with App Connect Enterprise
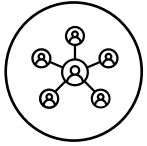
Leverage your data more effectively

- An API-Led experience for integration (Unified Authoring)

- 100s of new connectors

- Develop your own custom connectors (CDK)

- Connector community with ability to consume & contribute connectors

Integrate & automate faster with AI

- AI field mapping (map assist)

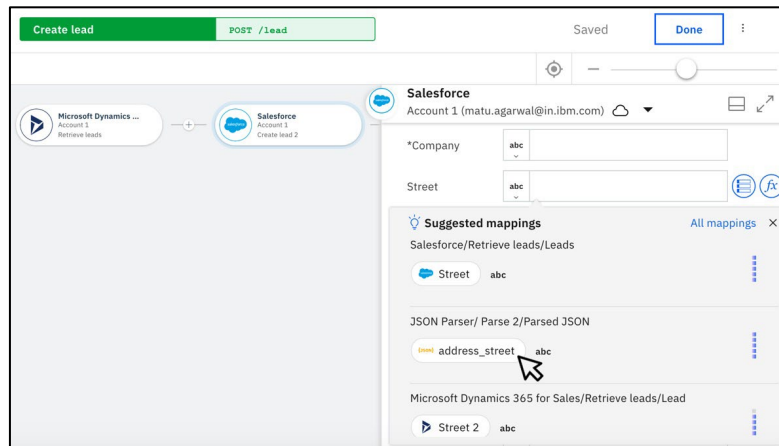- AI data mapping (data assist)

- Create flows using natural language

Consuming integration solutions on cloud

- Brand new App Connect Enterprise SaaS (iPaaS)

- Optimized integration runtimes in containers

- Purchase and deploy on more public clouds and from marketplaces (AWS, Azure and beyond)

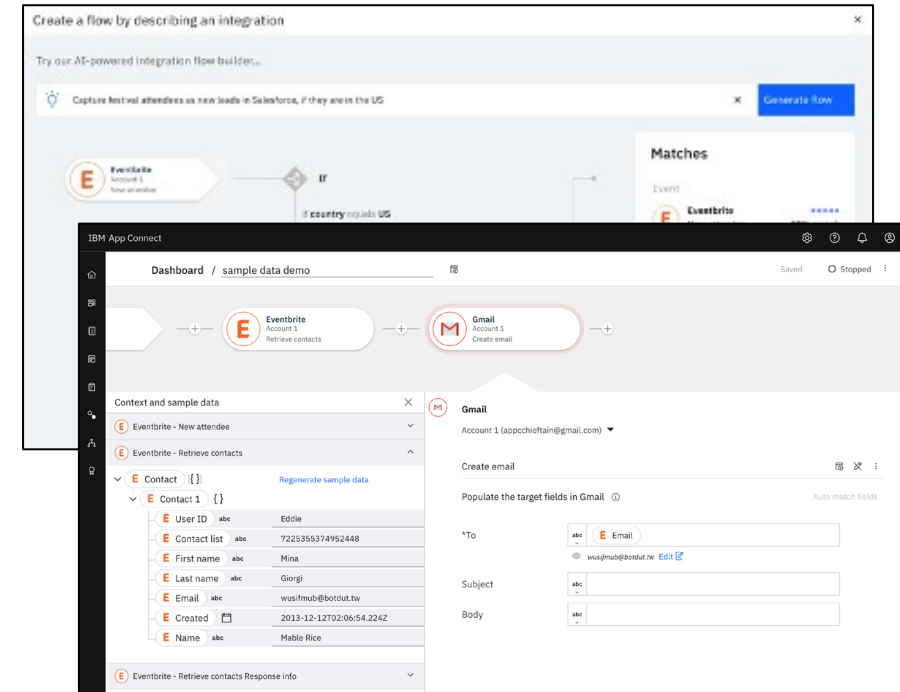# App Connect Enterprise utilizes AI capabilities to integrate and automate faster

Receive suggested mappings with Mapping Assist

Quickly transform data with Data Assist
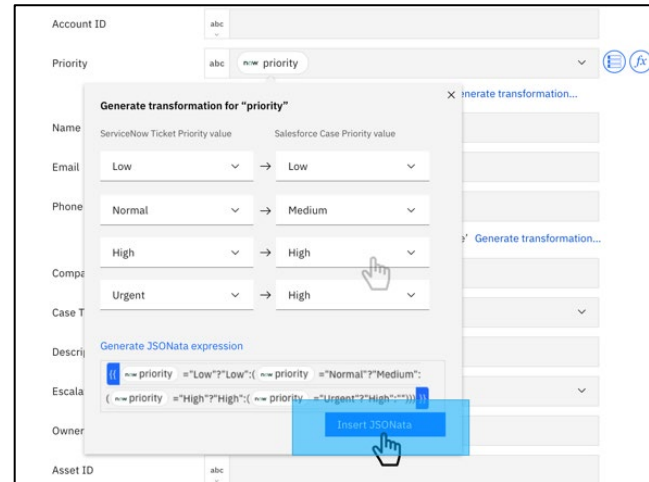
Generate flows via natural language with Goal-Orient Flow Assist

- Simplify field mapping between applications
- Easily transform data to and from JSON, XML and flat files
- Inline guidance and recommendations
- Generate flows using natural language to accelerate creation

IBM acquired StepZen, a GraphQL company, in February 2023

StepZen is a GraphQL engine
- Build GraphQL APIs declaratively (no code)
- Introspect diverse backends to easily surface data and services new apps need
- GraphQL server runtime
- Optimizes the hard problems for you

1	**Developer** GraphQL-izes backends, *easily*
2	**Developer** "stitches" the GraphQL-ized backends, *easily*
3	**StepZen** does the hard things, *transparently*

StepZen

Optimization
Protection
Scale & Low
Latency
Deployment
Caching
Geo Distribution

StepZen + IBM API Connect

Create

Build APIs your consumers will love: declaratively build GraphQL APIs.

Manage, Secure & Socialize

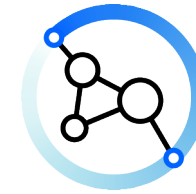Package, publish, promote and socialize. Control and mediate delivery with API Gateway.

StepZen

IBM API Connect

Build here

Manage there

SOFTWARE DEVELOPER

Build and consume APIs with multiple languages & devices
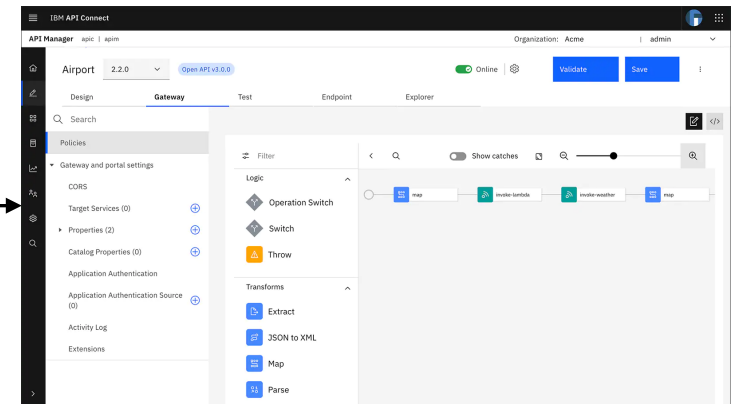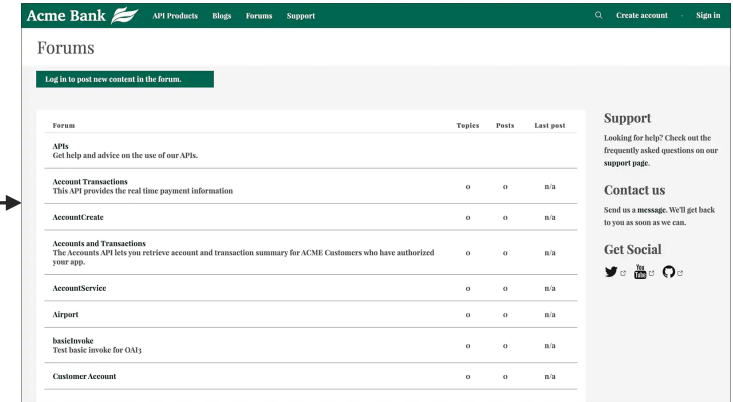
23

API Management across the API estate

Consistently access, manage, secure and socialize
StepZen-built GraphQL APIs alongside the rest of your APIs
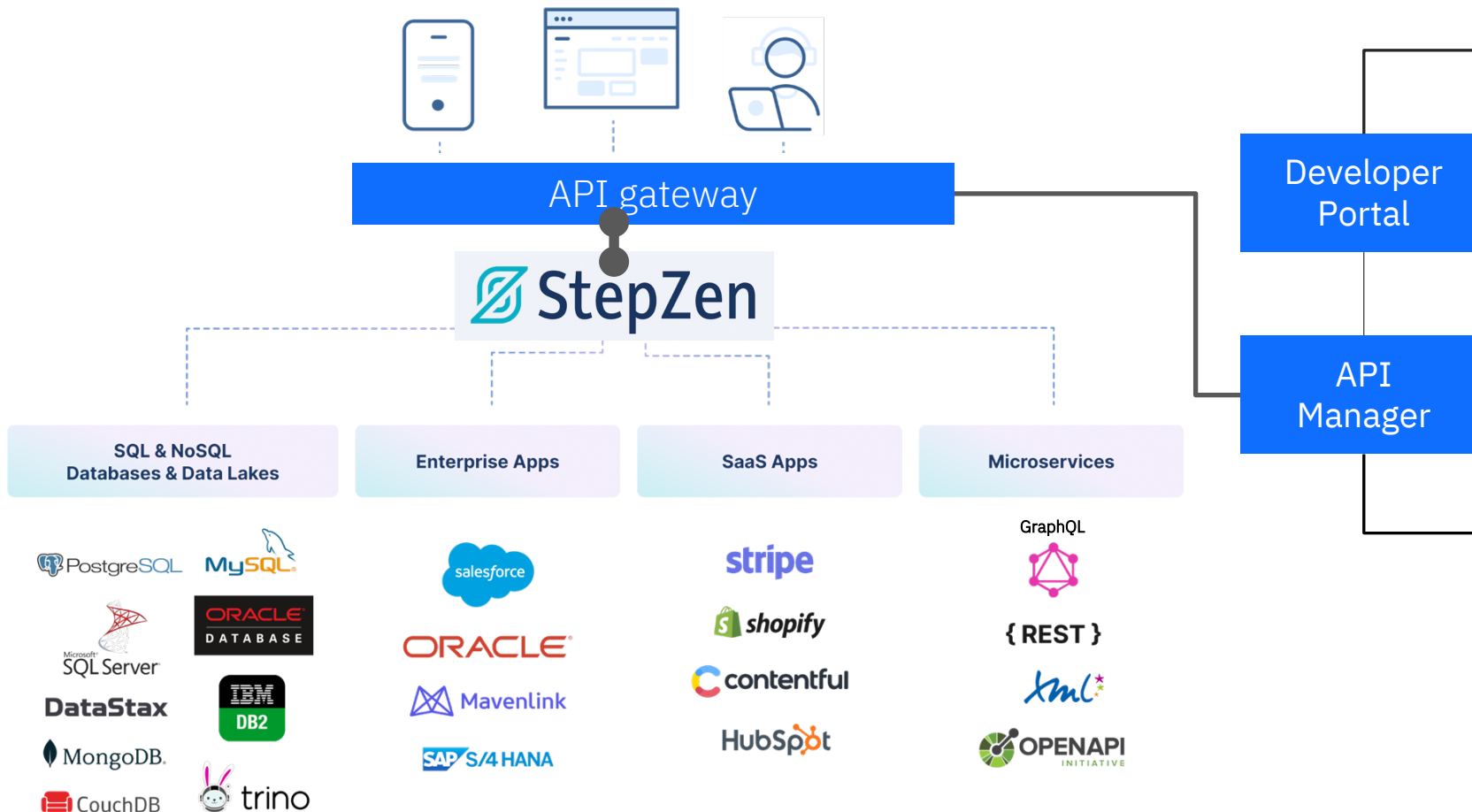
Share your API estate through developer portal

Secure and govern APIs with out of the box and custom policies

Improve API developer productivity, quality, and consistency with test automation

Cleverly generate, schedule and test APIs during its creation
- Improve developer productivity and API quality
- Send 1000s of requests to auto-test APIs during its creation
- "Biased Random" request generation, strongly biased towards correct requests unlike plain random requests
- Customize testing parameters (like error injection)

Start testing with just OpenAPI document with API endpoint
- Easily set up without requiring production data
- Semantic validation to test specific characteristics of fields
- Syntactic validation against Open API Specification

Seamlessly integrate with existing testing capabilities
- Complements Automated test generation with early detection of errors within the Open API specification
- Complements AI powered Insights geared production use cases

Comprehensive reports on coverage and results
- Drill down on errors for quick debugging
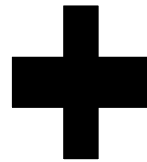
25

New Noname Advanced API Security for IBM

Automatically discover APIs, provide insights into API behavior,
and ensure compliance with best practices and policies.

API Connect

DataPower

+

Discovery

Posture Management

Behavioral Threat Detection

✓ Market-leading API Management
✓ Enterprise-grade API runtime protection

✓ Analyze, Detect, Notify & Remediate Threats with AI
✓ Discover the unmanaged APIs across your landscape
✓ Inventory & report API security posture

IBM's Event Integration strategy

Event Distribution

Built on open technologies, an **enterprise-grade packaging of Apache Kafka** with value-add services to assist connectivity and deployment across organizations at scale.

Event Discovery

Enable existing events to be **discovered and consumed by any user,** and manage your event sources like APIs to securely reuse them across the enterprise.

Event Processing

Make working with events intuitive and simple so users can understand and react to real-time business situations. **Remove the need to write SQL** and increase productivity.

Wrap up

IBM recognized as a market leader
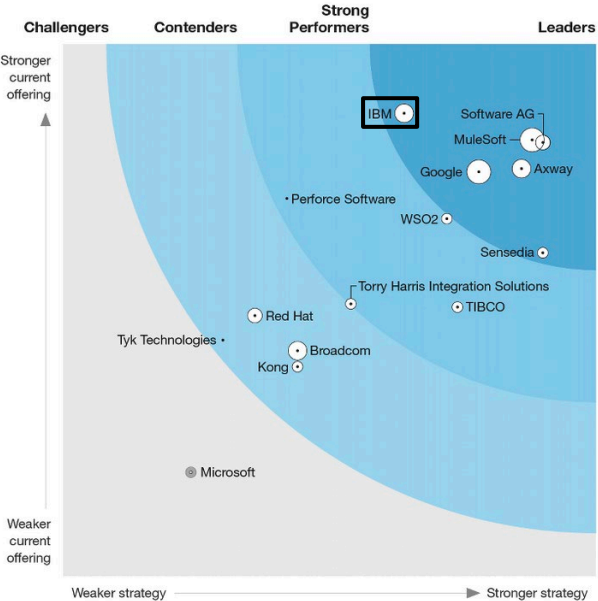
Forrester Wave: 3Q 2022

IBM Ranking: Leader
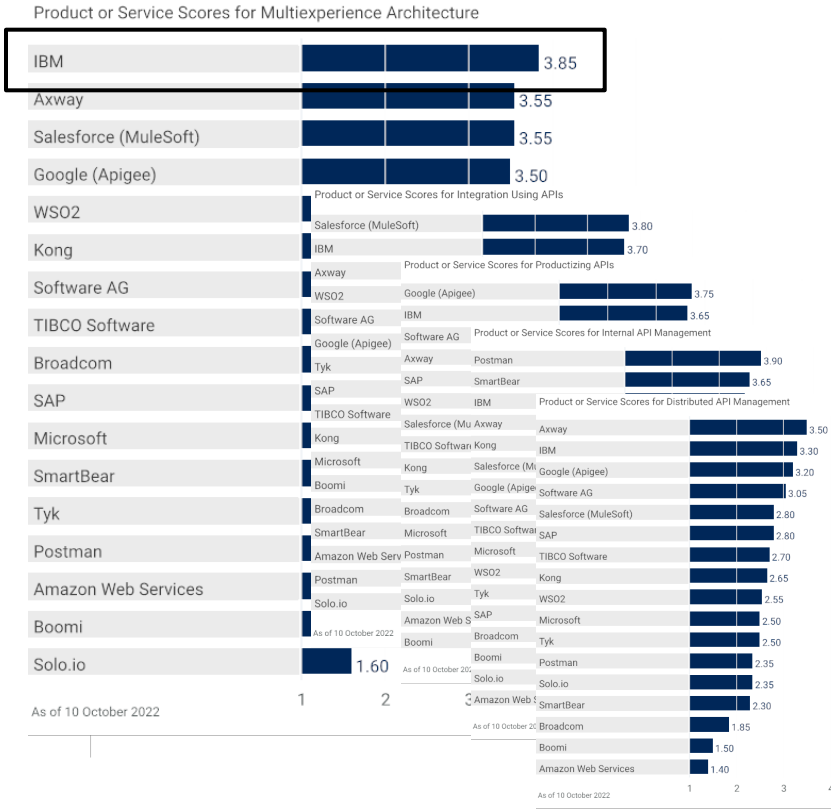
Gartner MQ: 3Q 2022

IBM Ranking: Leader 7 years in a row!

Gartner Critical Capabilities: 3Q 2022

Only vendor to rank in top 3 across all 5 use cases!

Source: Gartner (November 2022)

Full reports available: https://www.ibm.com/products/api-connect

IBM Integration customers acknowledge our innovation and value

IBM App Connect

★★★★½ **4.3 / 5 stars**

"Great App integration software, connects your data quickly and very well."

IBM MQ

★★★★½ **4.4 / 5 stars**

"IBM Messaging Queue Service is reliable, robust and secure."

IBM API Connect

★★★★½ **4.2 / 5 stars**

"Very friendly web interface for configuration of APIs, we learned very quickly how to configure and deploy our APIs at secure manner."

IBM Cloud Pak for Integration

★★★★½ **4.4 / 5 stars**

"The best part about IBM Cloud Pak for Integration is that you get all the integration tools under one [solution] be it IBM App Connect or API Connect or Datapower. This really eases life of a developer."

"The most helpful is the platform agility. Such flexibility help us to recommend to propose the best and easiest way to start with integration."

"Easy to deploy everywhere and easy to access."

Source: Based on G2's 2022 Spring Reports