

WSO2CON2025

Federated API Management for Enterprise Agility



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About this session

About This Session

- The growth of APIs and the need for API management.
- Centralized and Decentralized API management.
- Challenges with Centralized and Decentralized API management.
- How federated API management provides a balanced approach.
- Key principles of federated API Management.
- Implementation strategies for effective federated API management

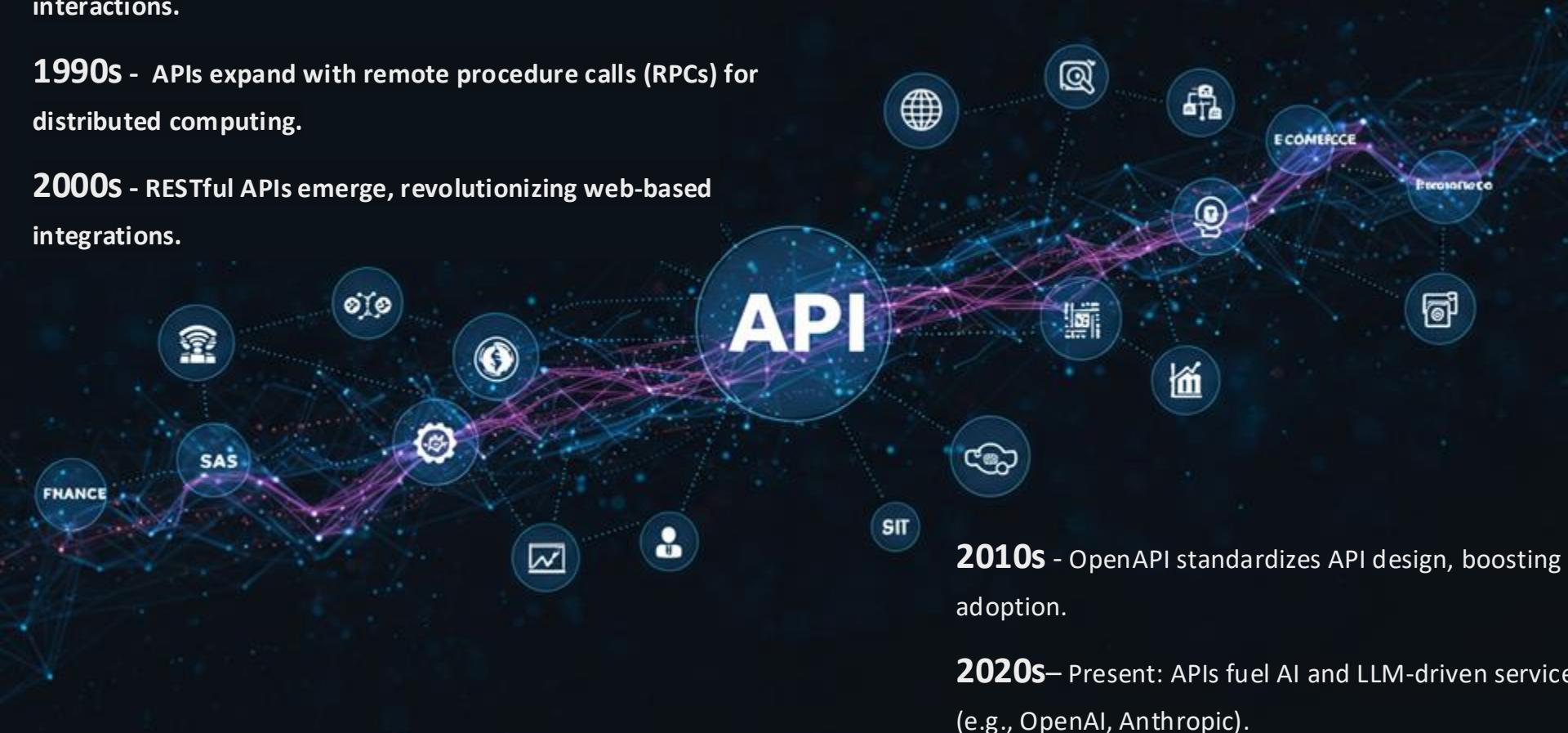
The Evolution & Growth Of APIs

The background is a rich, multi-colored space scene. It features a gradient from bright orange on the left to deep purple on the right. Scattered throughout are numerous stars of varying sizes and colors, some with prominent four-pointed diffraction patterns. In the lower-left quadrant, there is a large, teal-colored planet with a thin, dark ring system. In the lower-right quadrant, there is a smaller, blue-purple planet, also with a thin ring system. The overall effect is a sense of vastness and cosmic evolution.

1960s - The term API is introduced, enabling programmatic interactions.

1990s - APIs expand with remote procedure calls (RPCs) for distributed computing.

2000s - RESTful APIs emerge, revolutionizing web-based integrations.



2010s - OpenAPI standardizes API design, boosting adoption.

2020s— Present: APIs fuel AI and LLM-driven services (e.g., OpenAI, Anthropic).

What's Driving API Growth?

- Digital Transformation & Automation
- Microservices & Cloud
- AI & LLM APIs
- Diverse Protocols & Real-Time APIs
- APIs as revenue streams (e.g., Stripe, Twilio, OpenAI).
- Expanding API adoption for business users.
- Regulatory & Open Data



API Management Approaches: Centralized vs. Decentralized

- APIs are essential, making API Management (APIM) a core need for organizations.
- Two main models:
 - Centralized: Initially, most organizations managed APIs under a single governance layer.
 - Decentralized: As API usage grew, some shifted to fully decentralized management.
- Today, both patterns coexist, with organizations balancing governance and flexibility.



APIDays Finland 2019

Is The Future Of Api Management
Decentralized?

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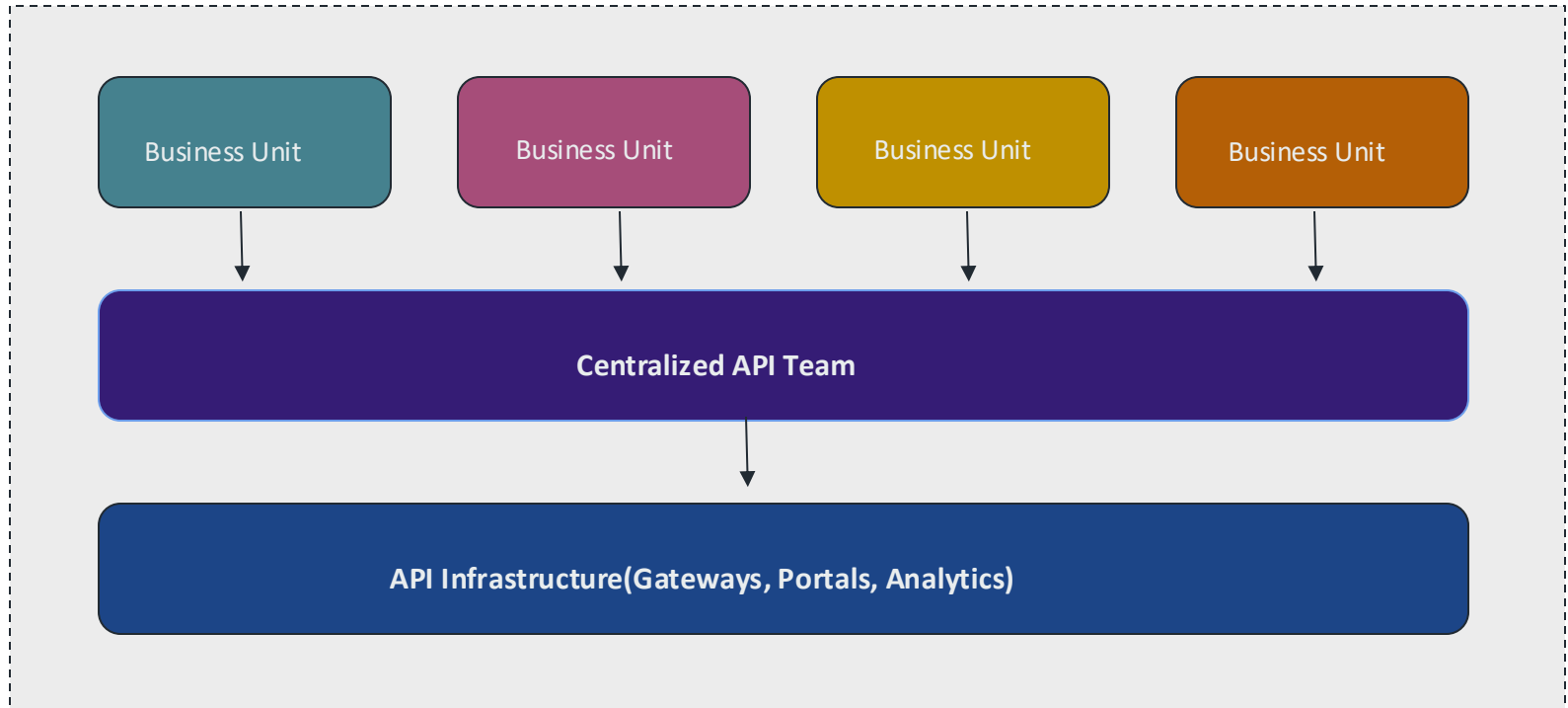


Centralized API Management

Centralized API Management

- Single Control: One team manages all APIs from a central platform.
- Policy & Security: Rules, access, and security are set and enforced centrally.
- Traffic Routing: All API requests go through a main gateway.
- Infrastructure Setup: The central team provides hosting, databases, and networking.
- Standardized Process: APIs follow common design and governance rules.
- Approval Needed: Adding new APIs or gateways requires central team approval.

Centralized API Management



Centralized API Management

- ✓ One place for all APIs and assets.
- ✓ Strong security with strict governance.
- ✓ Simplifies compliance and monetization.
- ✓ Consistent performance across APIs.
- ✓ Easier troubleshooting with centralized monitoring.
- ✓ Better data protection with centralized security enforcement.
- ✗ Slow onboarding of new APIs, gateways, and policies.
- ✗ Limited flexibility for teams to make quick changes.
- ✗ Generic solutions may not fit all team needs.
- ✗ Single point of failure can impact all APIs.
- ✗ Innovation bottlenecks due to strict processes.



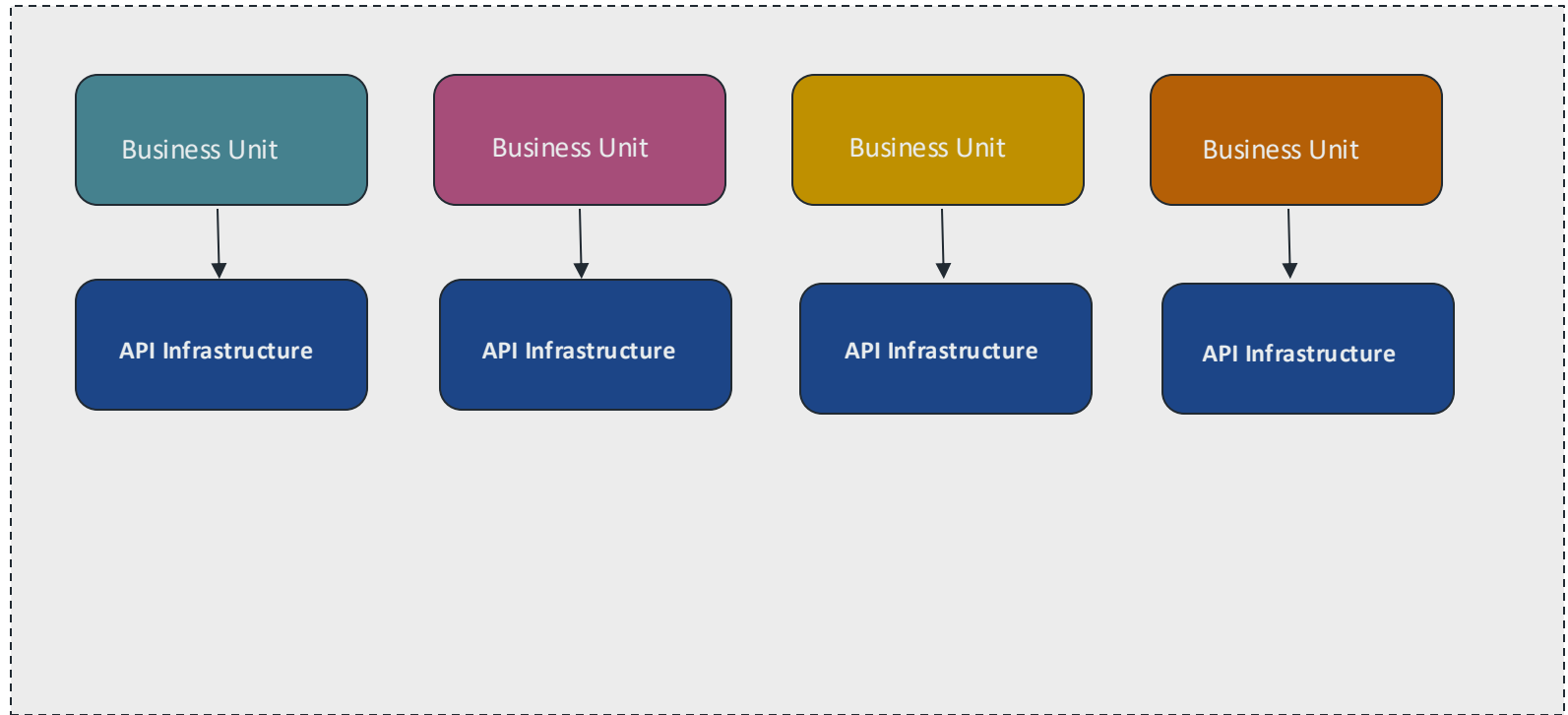


Decentralized API Management

Decentralized API Management

- Independent Control: Each team manages its own APIs and related assets.
- Team-Specific Policies: Security, access, and governance vary across teams.
- Distributed Traffic Routing: APIs use different gateways, portals, etc.
- Custom Infrastructure: Teams provision their own hosting, databases, and networking.
- Flexible Processes: API design and standards differ based on team preferences.
- Quick Deployments: New APIs and gateways can be added without central approval.

Decentralized API Management



Decentralized API Management

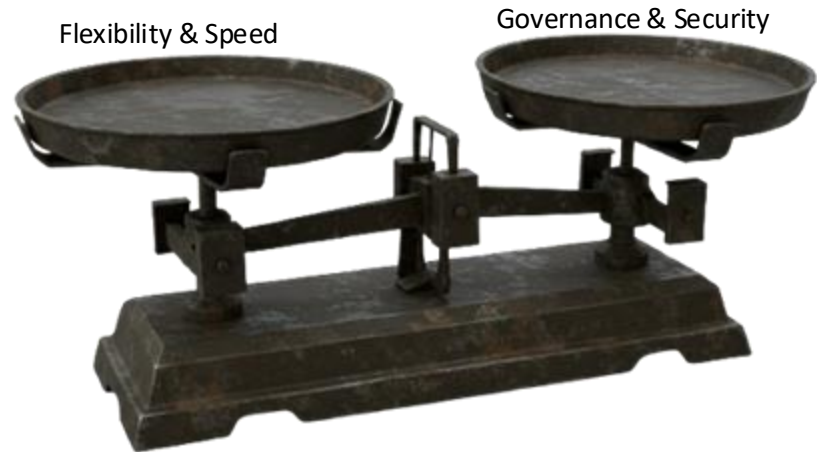
- ✓ High agility – Fast API development and deployment.
- ✓ Flexible tech – Teams pick their own tools and gateways.
- ✓ Faster innovation – No central bottlenecks.
- ✓ Scalable – APIs grow independently.
- ✓ Resilient – Failures don't impact all APIs.
- ✓ Empowers teams – Full control over APIs.
- ✗ Security risks – Inconsistent governance.
- ✗ No standardization – Harder integration.
- ✗ Duplicate efforts – Teams may build similar APIs.
- ✗ Limited visibility – Harder to track APIs.
- ✗ Higher overhead – Each team manages infra & security.
- ✗ Compliance issues – Harder to meet regulations.

Federated API Management: A Balanced Approach



Federated API Management

- A hybrid model that combines centralized governance with decentralized execution.
- Aims to balance security, compliance, and developer agility.



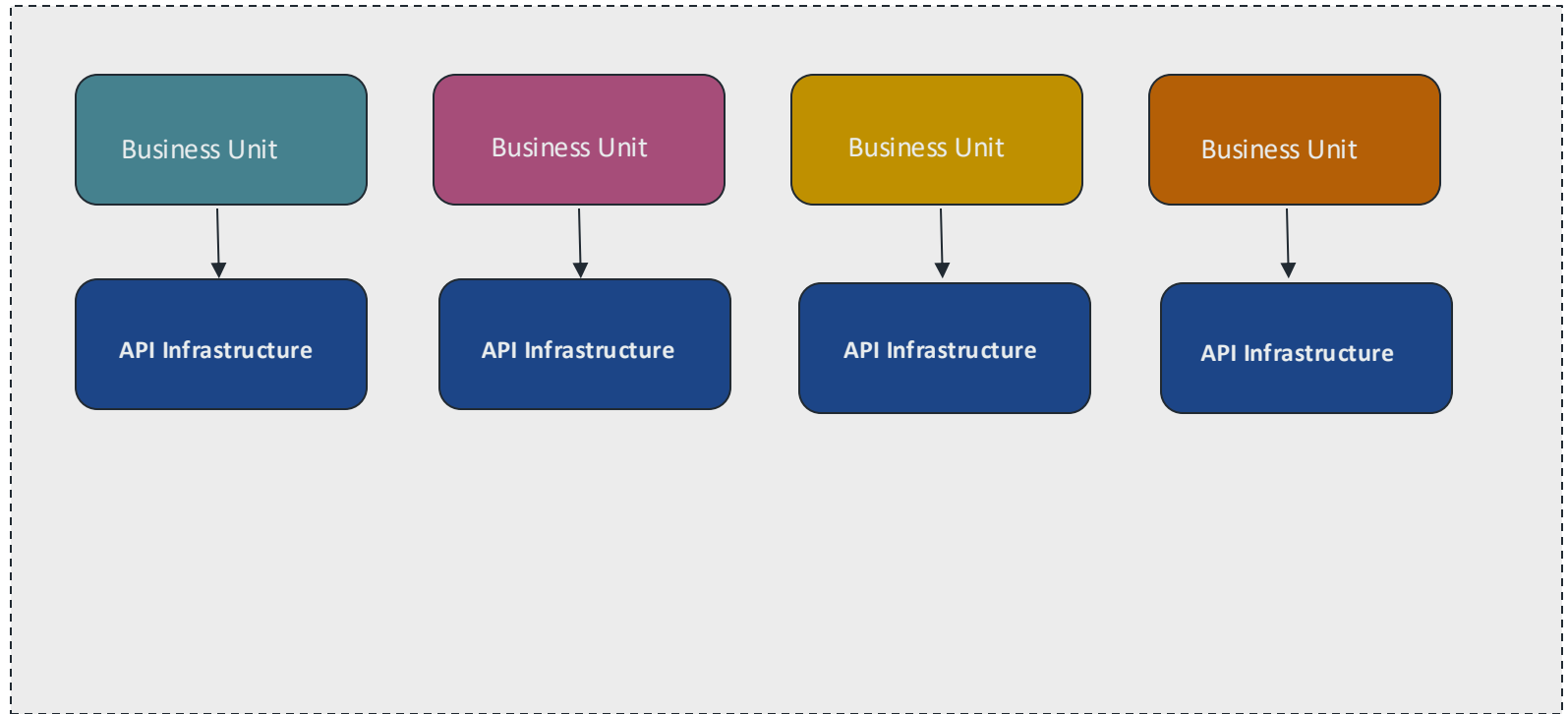
Federated API Management: Governance & Control

- Central API Team: Defines policies, security standards, and compliance.
- Shared API Catalog: APIs are centrally registered for visibility & standardization.
- Automation & Guardrails: Security policies, authentication, and observability are enforced automatically.
- Governance Without Bottlenecks: Ensures security & compliance without slowing innovation.

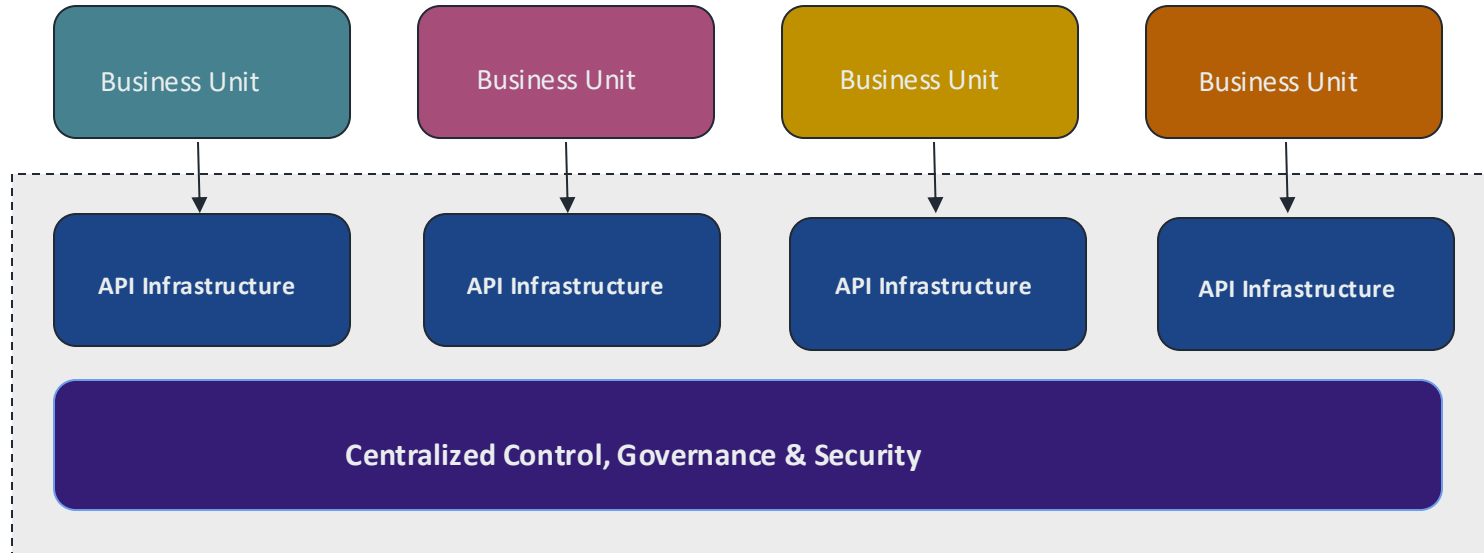
Federated API Management: Execution & Flexibility

- Decentralized Execution: Business units deploy & manage APIs within the governance framework.
- API Infrastructure-as-Code: Teams provision their own gateways, services, and runtimes.
- Flexible Gateways: Teams choose their own API gateways while following standards.
- Balanced Autonomy: Enables agility while ensuring security & compliance.


Decentralized API Management



Federated API Management



Implementing Effective Federated API Management

The background of the slide is a vibrant, multi-colored space scene. It features a gradient from deep red on the left to dark blue and purple on the right. Scattered throughout are numerous small, bright stars and several larger, glowing celestial bodies. In the lower-left quadrant, there is a large, teal-colored planet with a prominent ring system. In the lower-right quadrant, there is a smaller, purple planet, also with a ring system. The overall aesthetic is futuristic and high-tech.

How to Implement Federated API Management

- Define API Governance: Security, rate limits, authentication policies.
- Enable API Discovery: Internal API marketplace for visibility.
- Allow Multiple Gateways: Teams choose API tools within defined standards.
- Self-Service Infrastructure: Developers provision APIs with predefined templates.
- Automate Security & Compliance: CI/CD pipelines, monitoring, access control.

Enable API Marketplaces and Discovery

Allow Multiple Gateways Across Different Deployments



Define API Governance



Automation



Self-Service Infrastructure



Automated Compliance and Monitoring



Key Components of Federated API Management

- Central Control Plane: Defines global security, compliance, and monitoring policies.
- Decentralized Data Planes: Business units deploy & manage APIs independently.
- API Marketplace & Discovery: Teams can find and reuse APIs across the organization.
- Self-Service API Infrastructure: Developers provision API gateways & services on demand.
- Automated Compliance & Security: Guardrails enforce security & governance rules.

Pros & Cons of Federated API Management

The background is a vibrant space-themed gradient. It transitions from a bright orange-red on the left to a deep blue and purple on the right. Scattered throughout are numerous small white stars and several larger, stylized planets. One prominent planet in the lower-left quadrant is a reddish-orange sphere with a thin, dark ring. Another smaller planet is visible in the lower-right quadrant. The overall effect is a cosmic, futuristic aesthetic.

Advantages Of Federated API Management

- Balances governance & agility – Standardization without slowing innovation.
- Faster API deployments – Teams can launch APIs without long approvals.
- API visibility & reuse – Shared API catalog improves efficiency.
- Supports multi-cloud & hybrid strategies – Flexible API deployments.
- Security & compliance at scale – Policies enforced without manual intervention.

Things to Be Aware of in Federated API Management

- Complex to set up – Requires strong governance & automation.
- Needs a central platform team – Ongoing maintenance & policy enforcement.
- Potential inconsistencies – If not managed well, teams might deviate from best practices.
- Higher operational overhead – Each team must manage its own infrastructure.

Question Time!



The background features a dark blue to red gradient with numerous 3D geometric shapes, including cubes and spheres, scattered across the scene. Some shapes are larger and more prominent, while others are smaller and more distant, creating a sense of depth and movement.

Thank you!

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