A photograph of a man in a red t-shirt and black pants climbing a large, light-colored rock face. He is positioned in a narrow, vertical crack, using his hands and feet to grip the rock. The rock has distinct horizontal layers and some vertical fissures. In the background, a steep, densely forested hillside is visible under a clear sky.

Agility

Ongoing, repeated adaptation to
meet the challenges of the
enterprise.

Image source: National Geographic

Scalability



Image source: National Geographic



Modularity

Image source: National Geographic

Composability



Image source: National Geographic

A large flock of birds, likely geese or similar, is captured in flight against a clear blue sky. The birds are arranged in a distinct V-shape formation, which is a common pattern for many bird species during migration. The perspective is from below, looking up at the birds as they fly away.

Governance

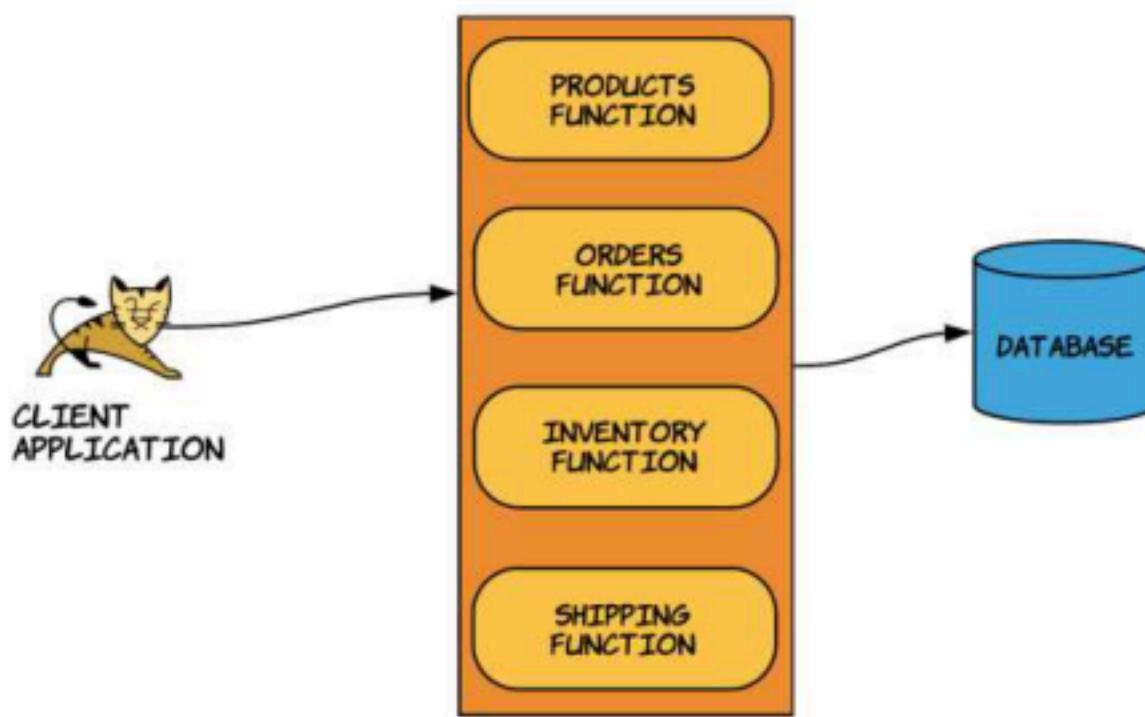
Modern businesses are consumer driven



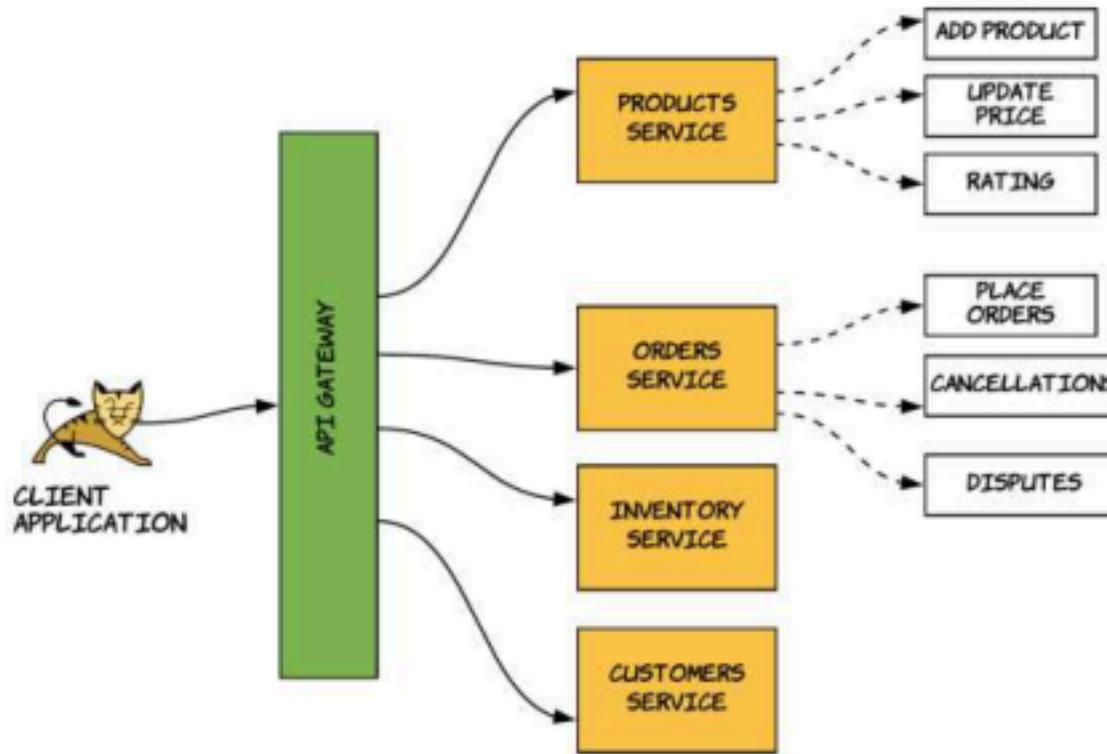
Traditionally centralized enterprise architectures no longer deliver on the expectations of the business and consumers.

Image source: newsd.in

Breaking down the Monolith



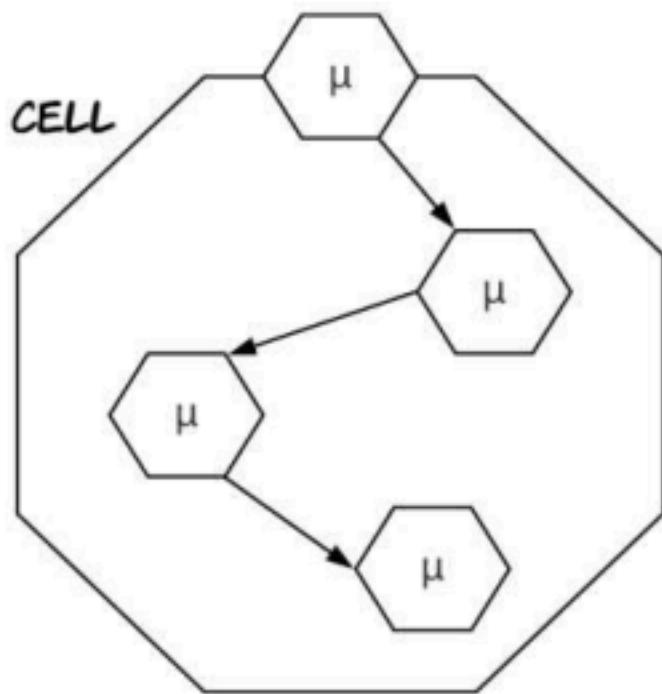
Breaking down the Monolith: Delivering Services as APIs



Problems with this architecture

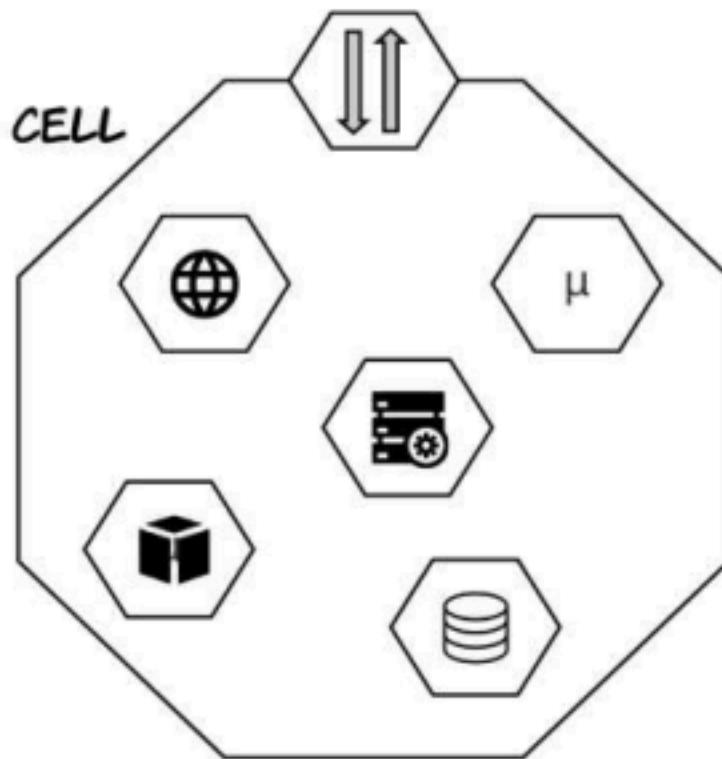
- Services are too coarse grained.
 - Unable to scale independently.
 - Still requires significant effort to release.
- The API gateway becomes a center of excellence.
 - Causes scalability complexities.
 - Causes maintainability complexities.
- Disconnect between architects, application developers and service developers.
 - Provides an internally agile but externally waterfall experience.
- Hard to accommodate change requests
 - Most of the time ends up requiring a separate integration layer to accommodate change requests.

Cellular architecture: The Cell



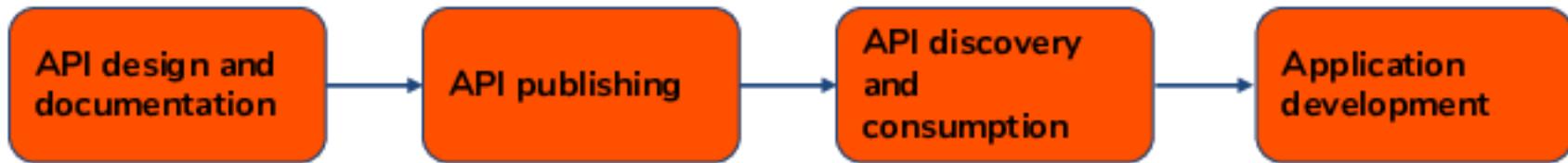
- A cell is a collection of components
- It is independently deployable, manageable, scalable and observable.
- Intra-cell communication is allowed without boundaries.
- Inter-cell communication is only allowed via the Cell gateway.
- Components within a cell are reusable and can instantiate in multiple cells.
- Capabilities of a cell must be exposed as network accessible endpoints.
- **A cell is developed and managed by a single team.**

Types of components in a cell



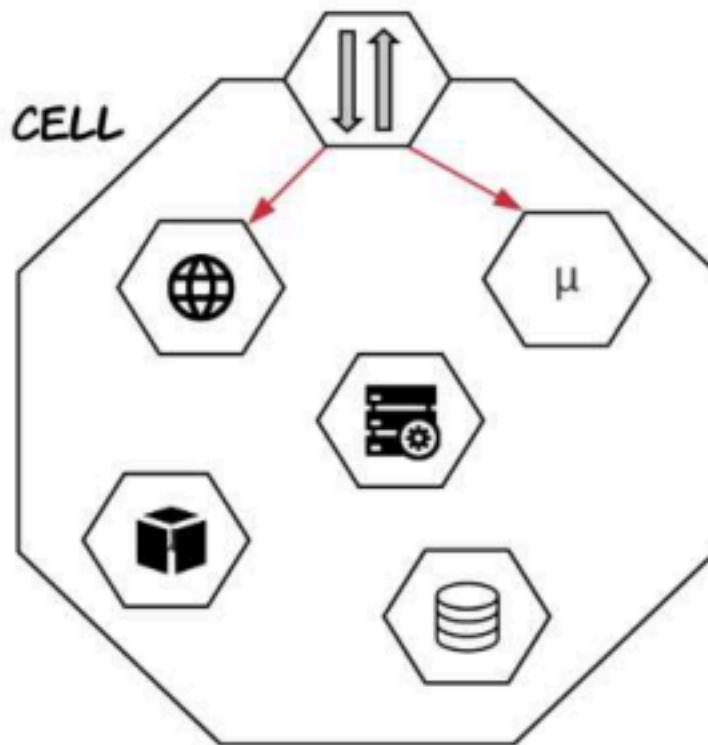
- Cell gateway
- End user applications
- Microservices
- Serverless functions
- Legacy services
- Data repositories

Typical API Management flow



What we follow today mostly is a top down approach to delivering APIs

Agile business require bottom-up delivery of APIs



- Delivering of APIs should no longer be a separate thing.
- It should be automatic and needs to be native to the service developers.
- **Microgateways facilitate bottom-up delivery of APIs as smaller groups.**

**Microgateways are the way to
decentralize APIs.**

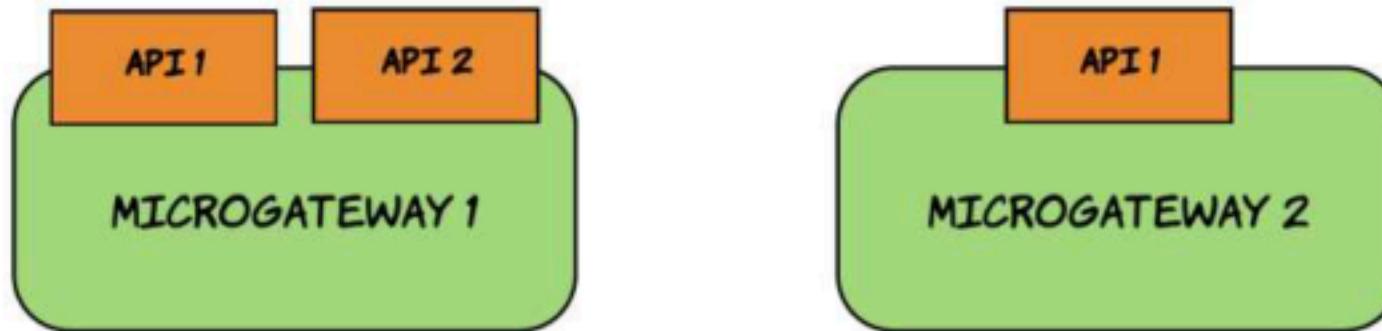
Microgateway: Generated automatically through a descriptor.



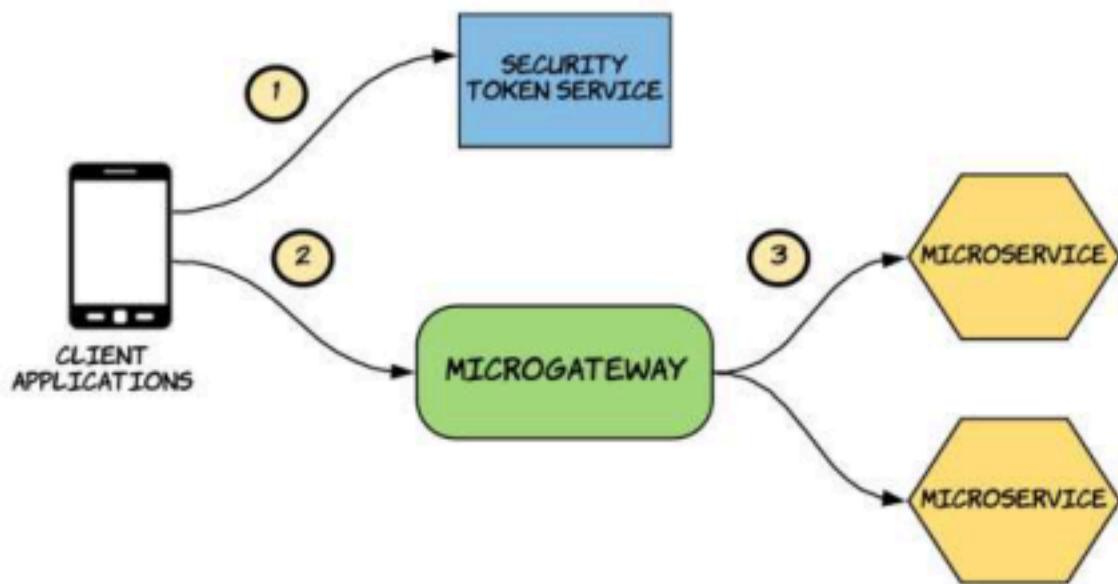
**OPEN API
SPECIFICATION**



Microgateway: Typically hosts one or few APIs

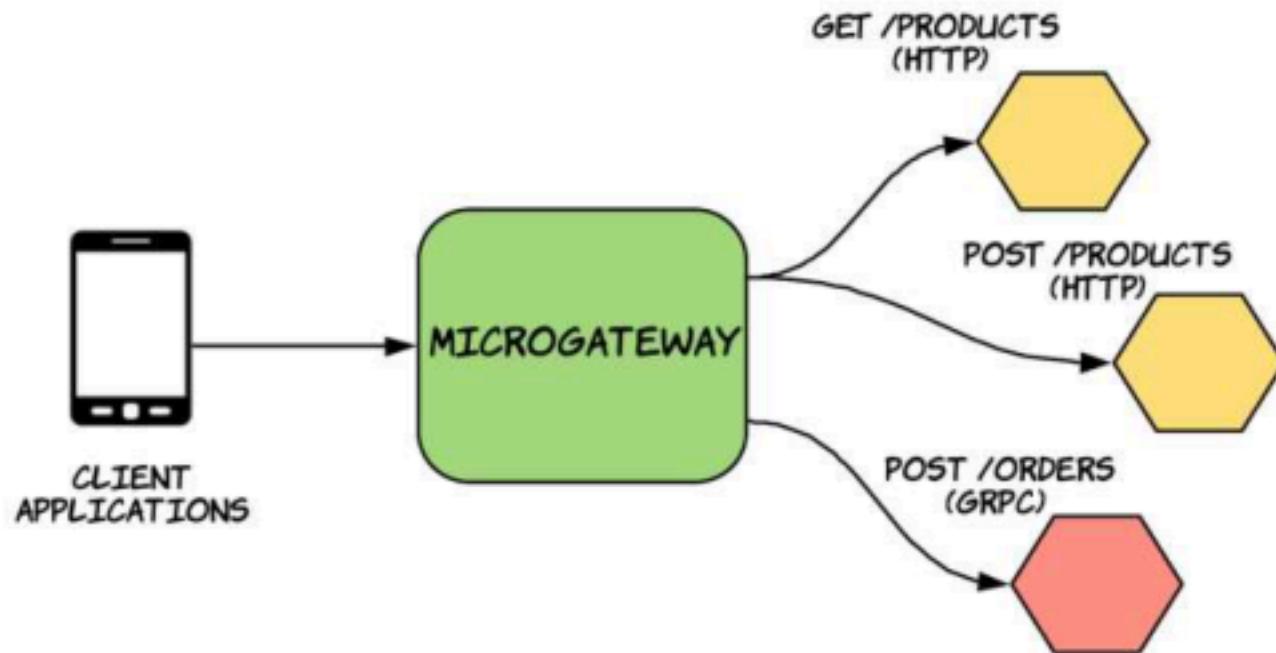


Microgateway: Independently deployable and scalable

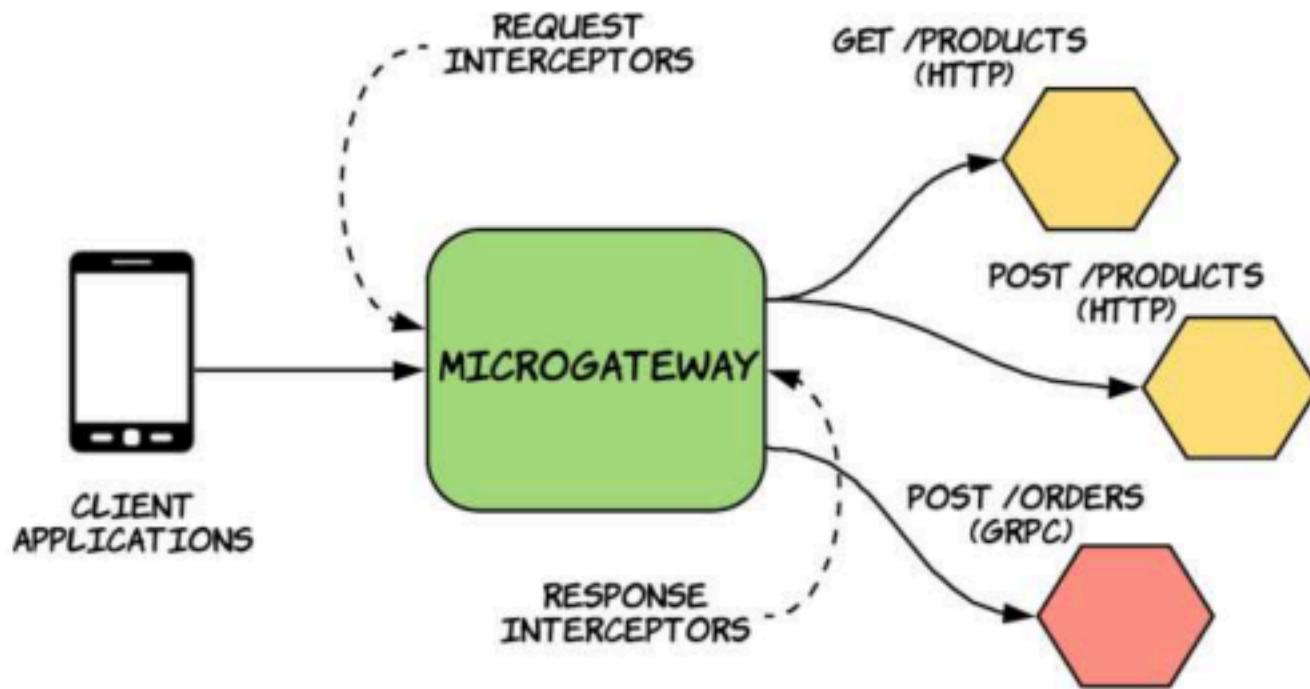


- Stateless architecture.
- No synchronous communications with external components.
- Fast boot up and low resource consumption.

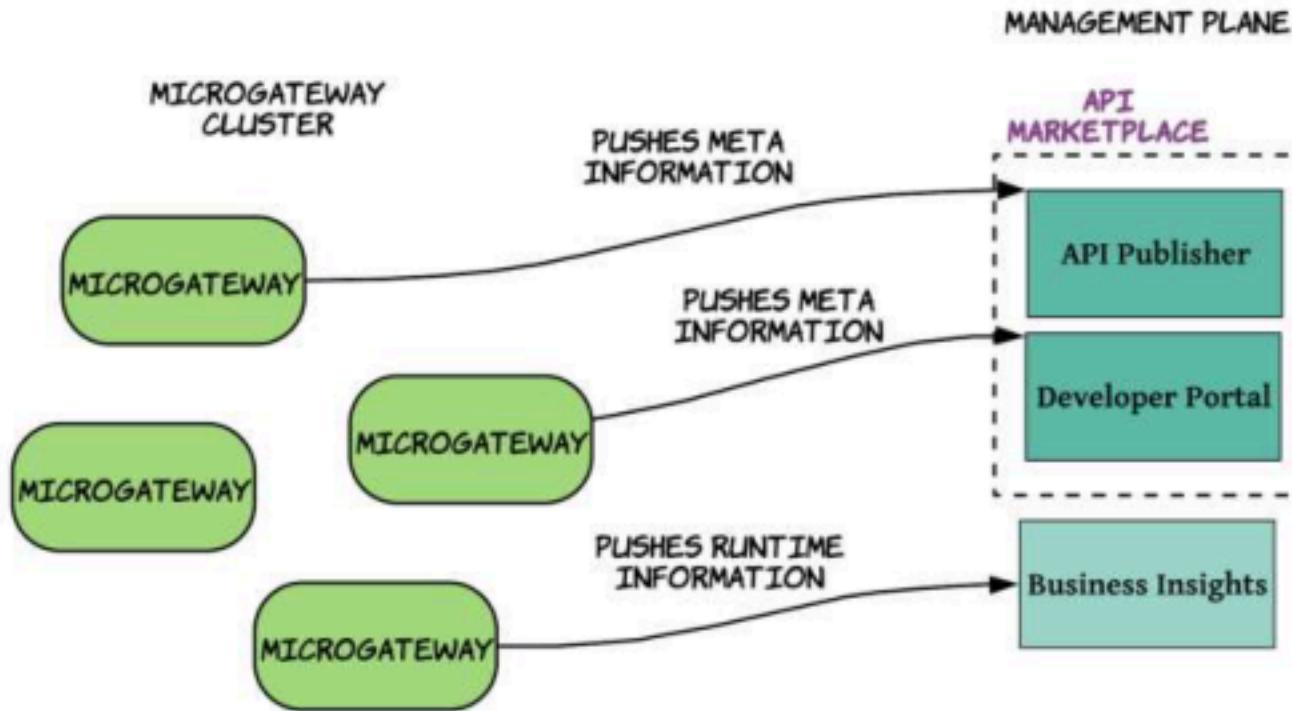
Microgateway: Supports heterogeneous backend services.



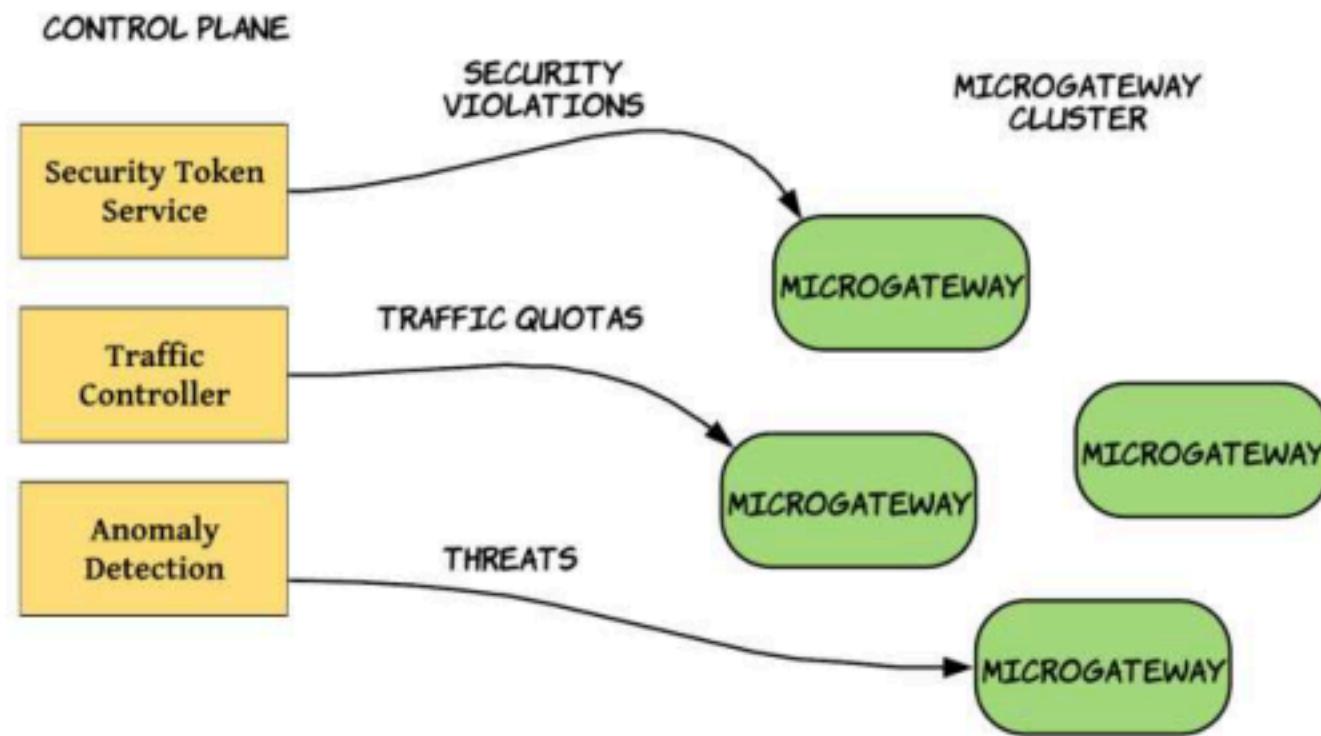
Microgateway: Intercepting requests and responses



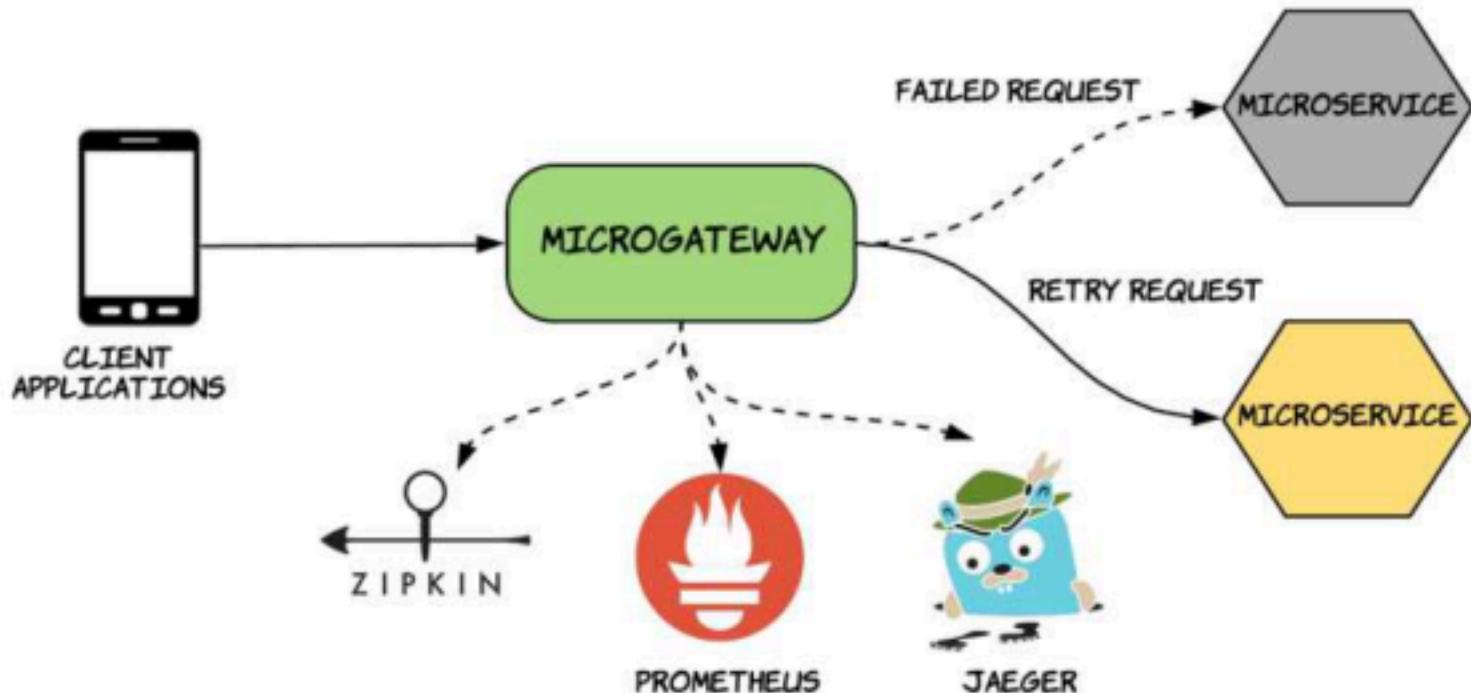
Microgateway: Observable via the Management plane.



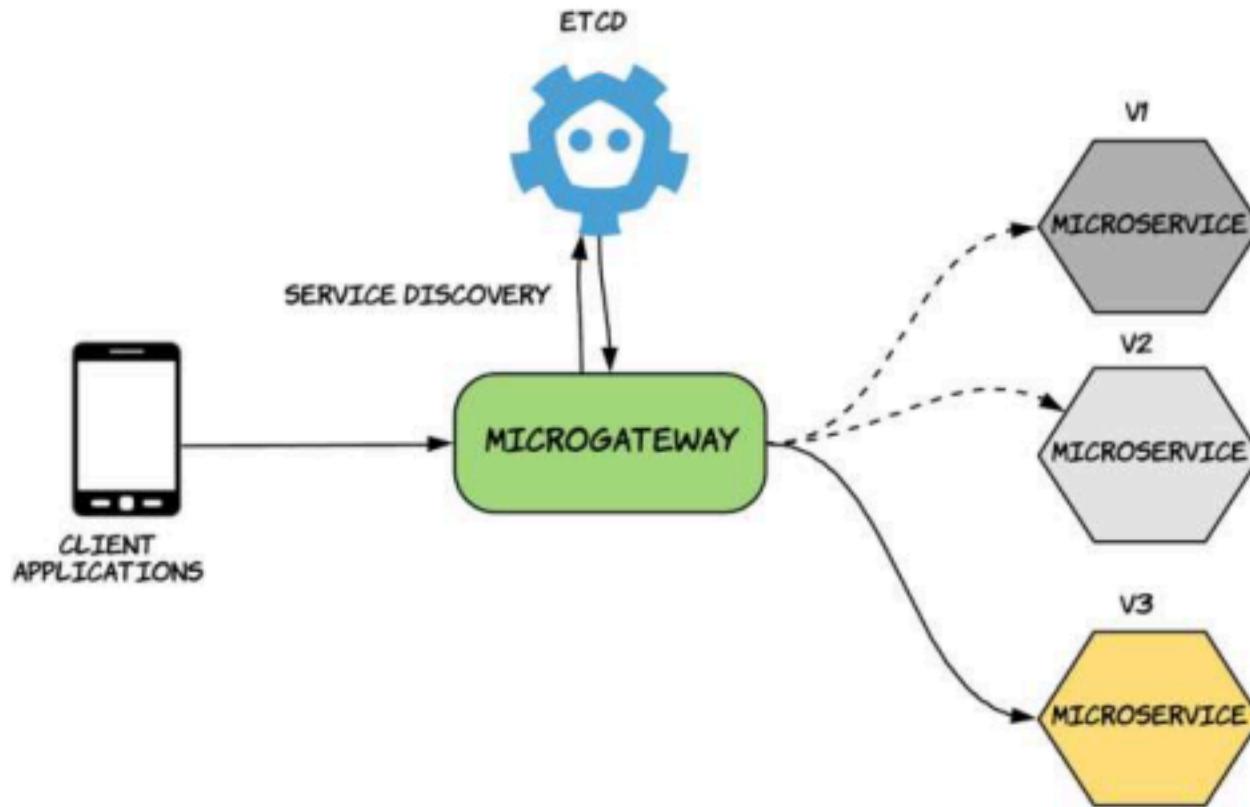
Microgateway: Controlled via the Control Plane.



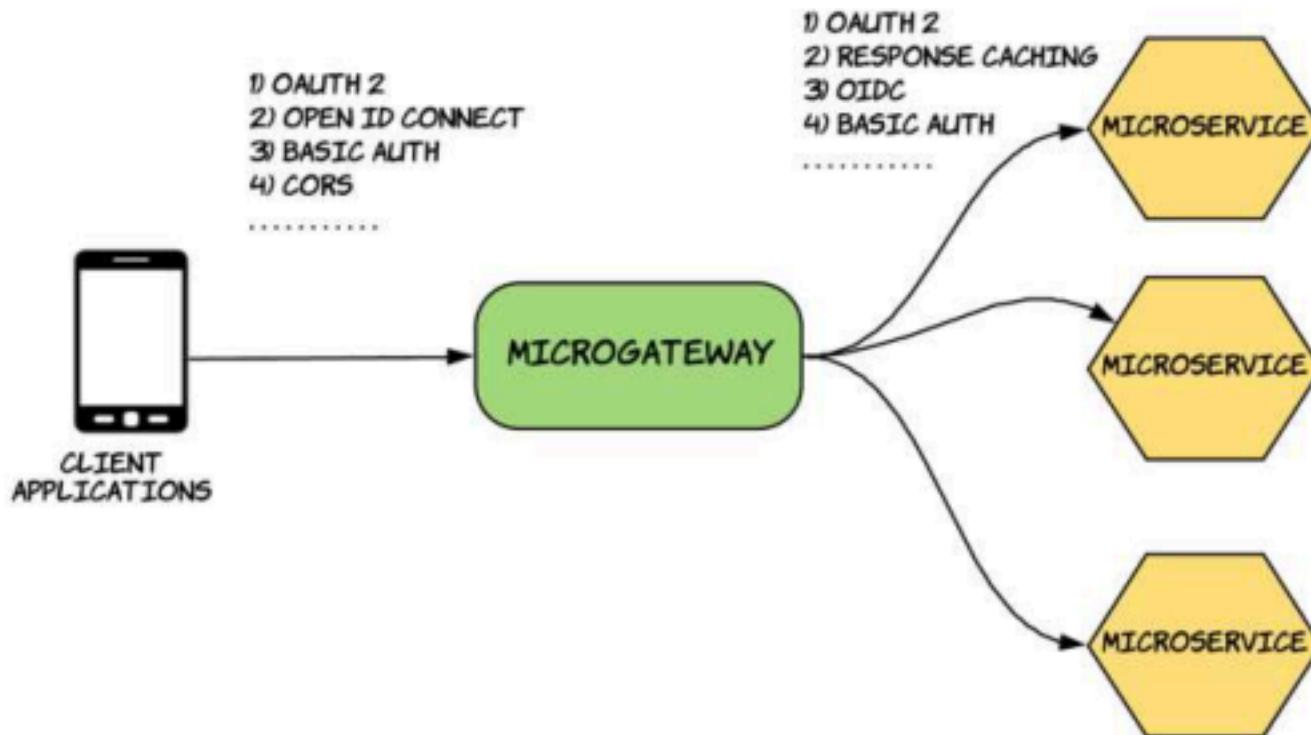
Microgateway: Resiliency and observability



Microgateway: Service discovery



Microgateway: Works on open standards to support heterogeneous applications



Summary

- Agile enterprise need systems that are scalable, composable, modular and governed.
- Cellular architecture is a reference to how we can reorganize our teams and software components to become more agile.
- Microgateways allow us to automate the deployment of APIs using a bottom up approach.
- The management plane allows us to apply standardization policies and gives us observability into the Microgateways.
- The control plane allows us to apply enforcement policies on the Microgateways.

"Action and adaptability create opportunity"

- Garrison Wynn

THANK YOU

wso2.com

