



**Machine Intelligence**  
**Modern Infrastructure**

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# Implementing Blue/Green Deployments with Istio



# What is MI2?

MI2 Webinars focus on the convergence of **machine intelligence** and **modern infrastructure**. Every alternate week, I deliver informative and insightful sessions covering cutting-edge technologies. Each webinar is complemented by a tutorial, code snippets, and a video.

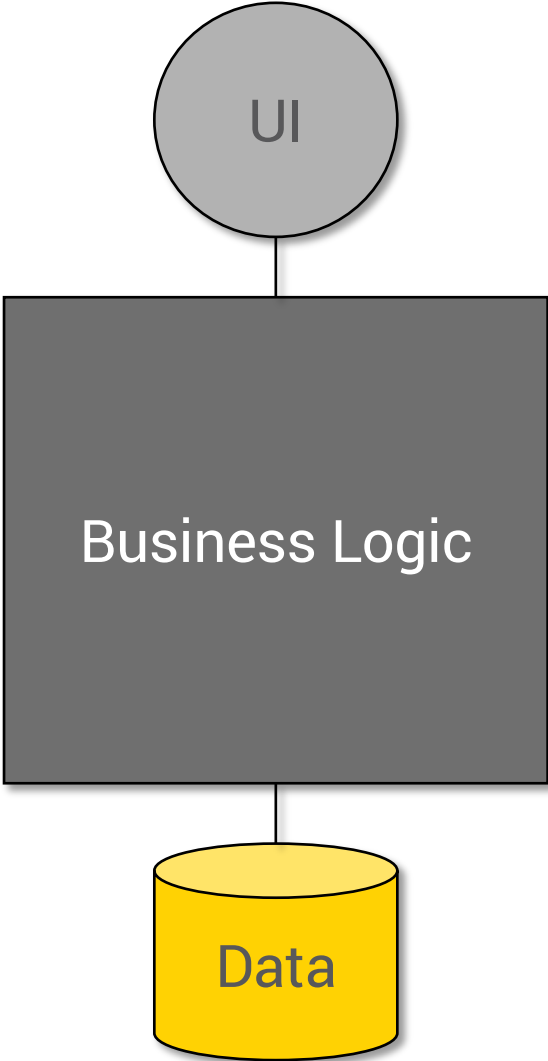
MI2 strives to be an independent and neutral platform for exploring emerging technologies.

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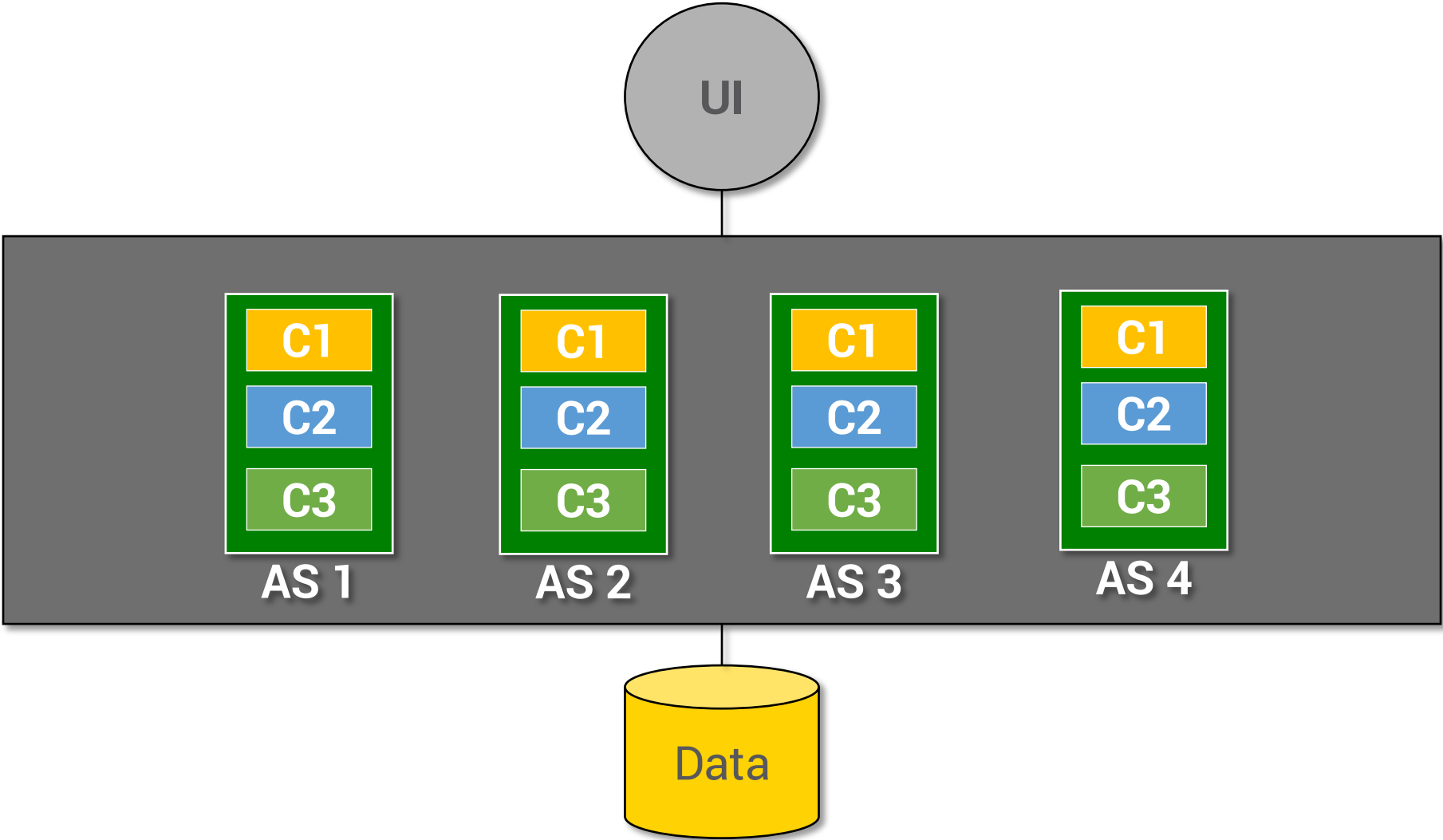
# Objectives

- Overview of Microservices
- Challenges involved with Microservices
- Why use a Service Mesh?
- Big picture of Istio
- Closer look at traffic routing policies
- Demo
- Summary

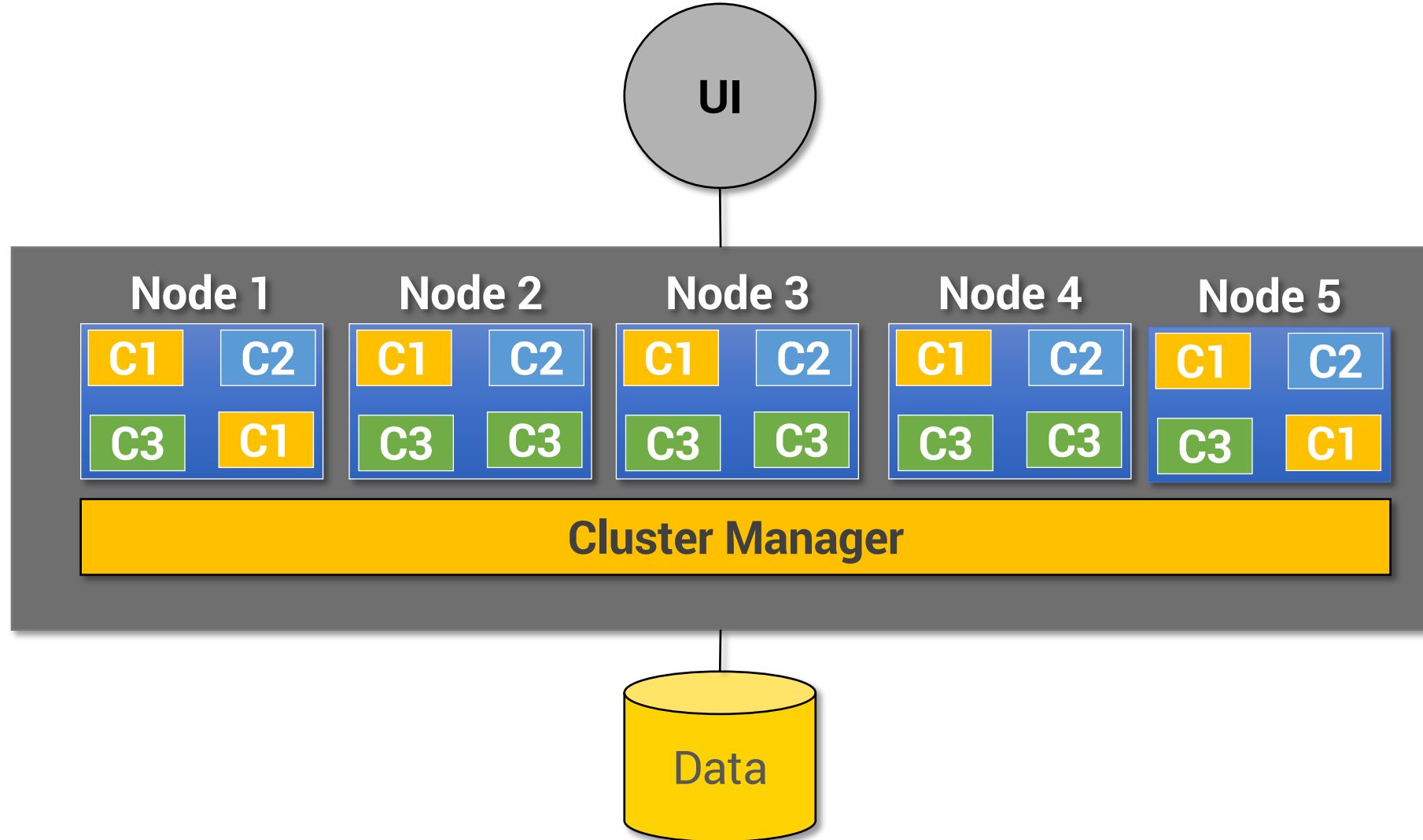
# Traditional 3 Tier Architecture



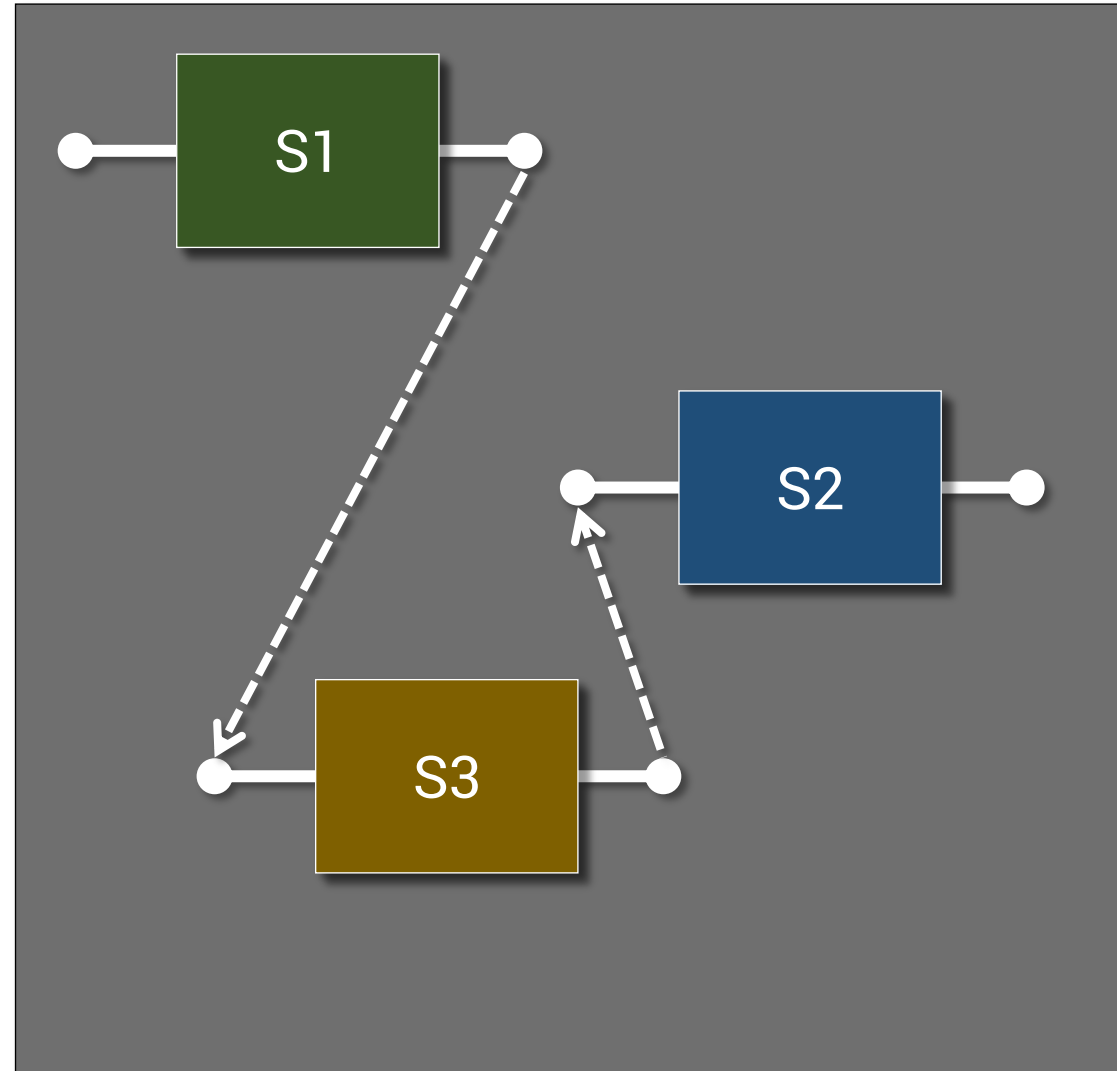
# Traditional 3 Tier Architecture



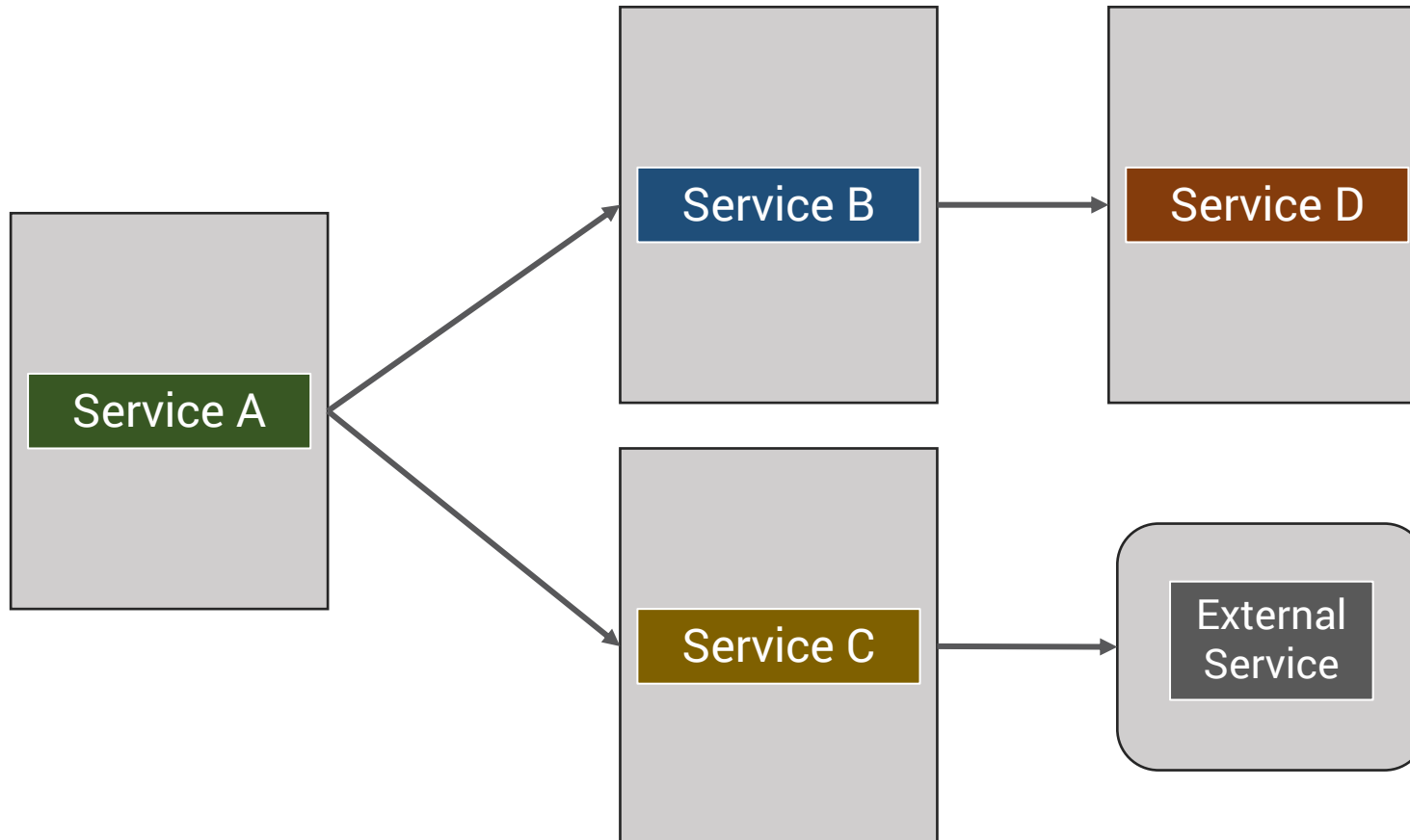
# Microservices Architecture



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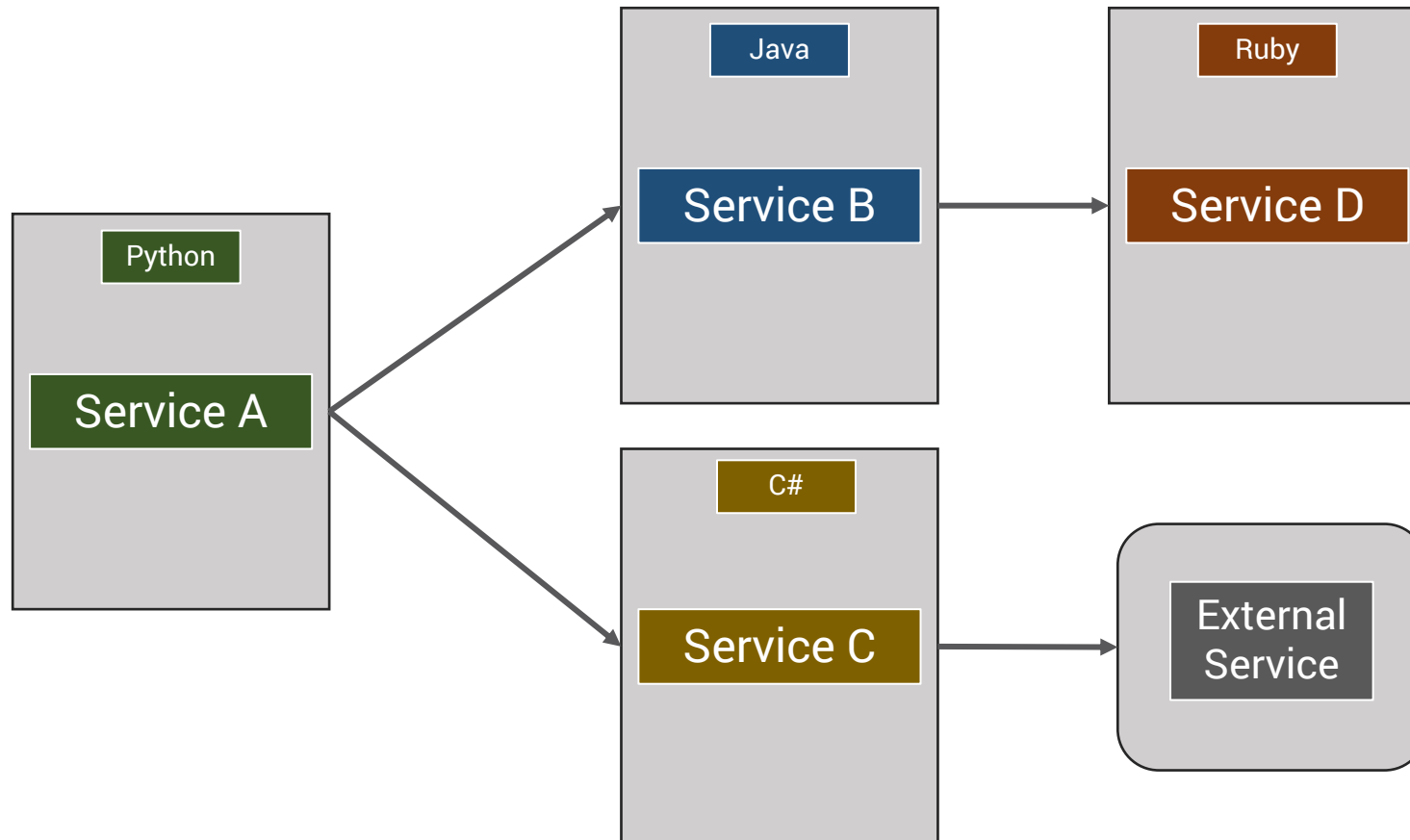


# Challenges involved with Microservices

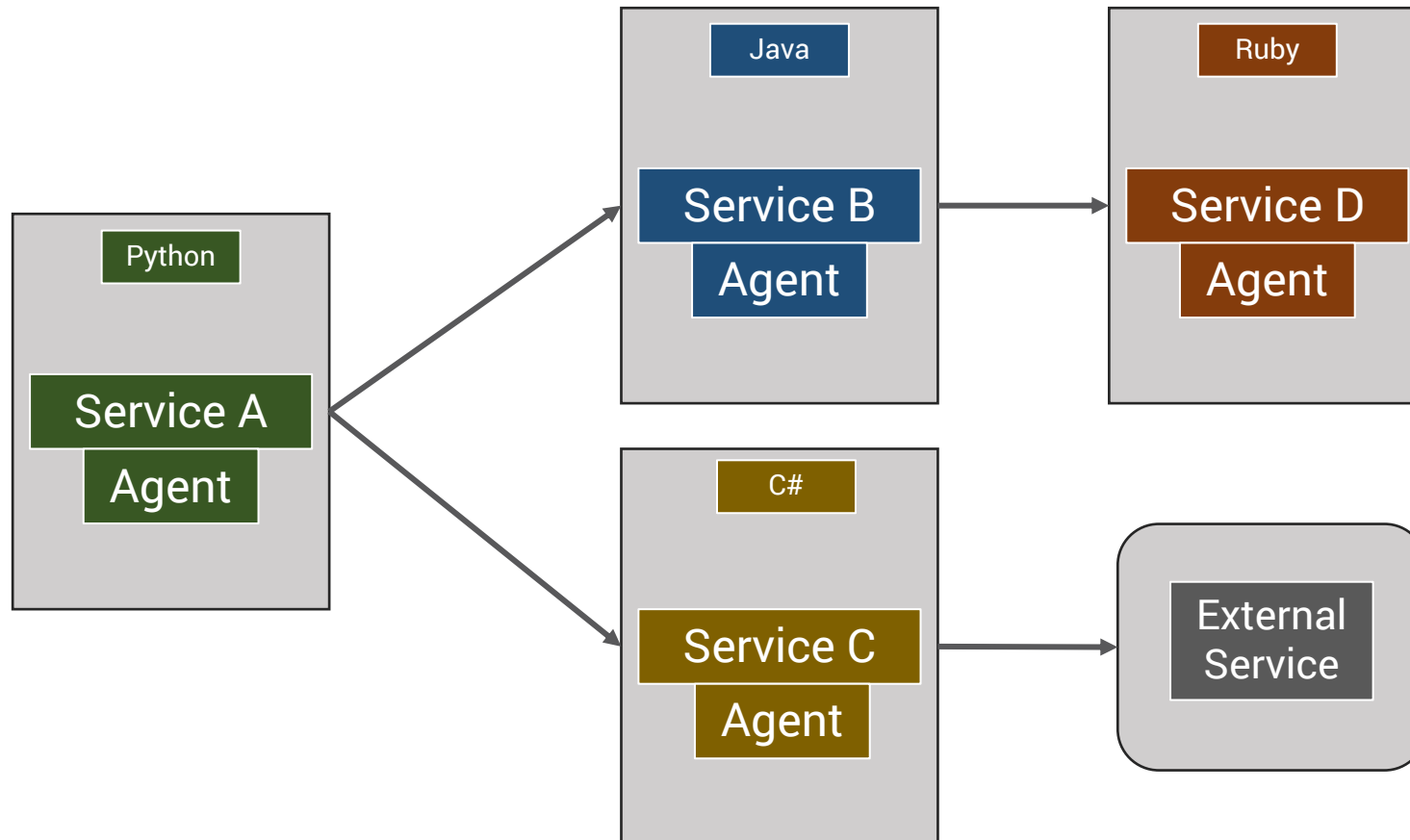




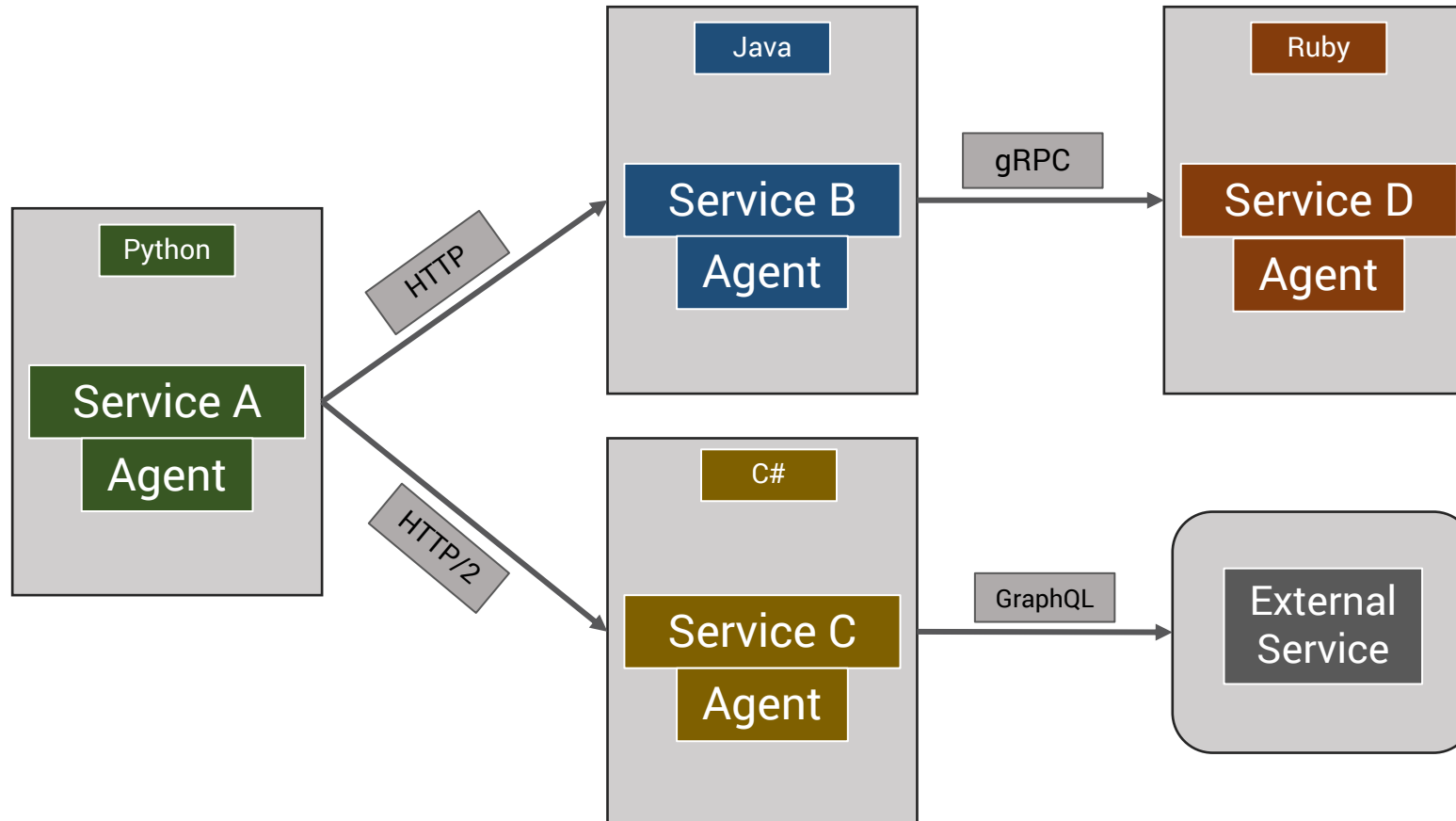
# Challenges involved with Microservices



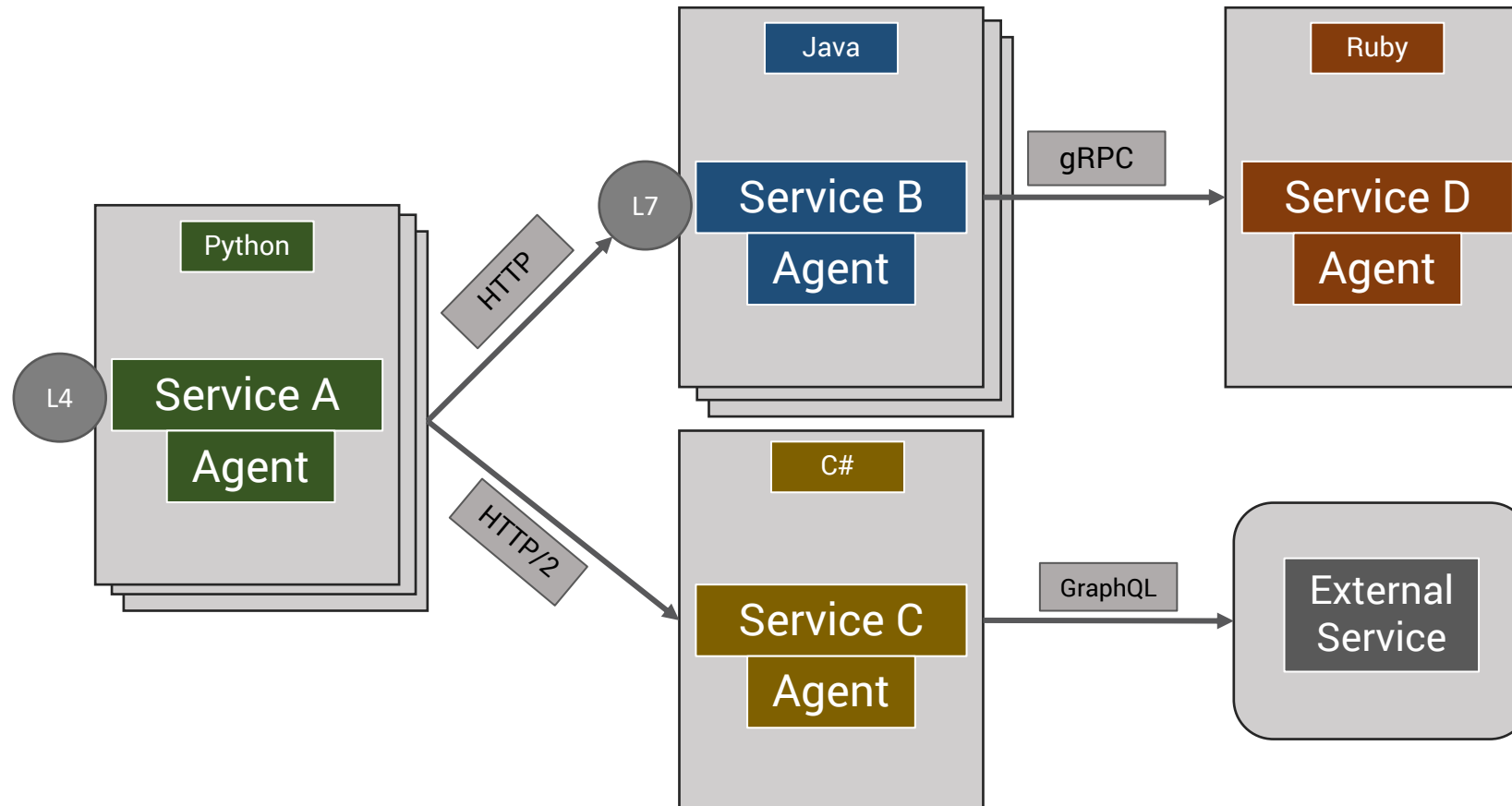
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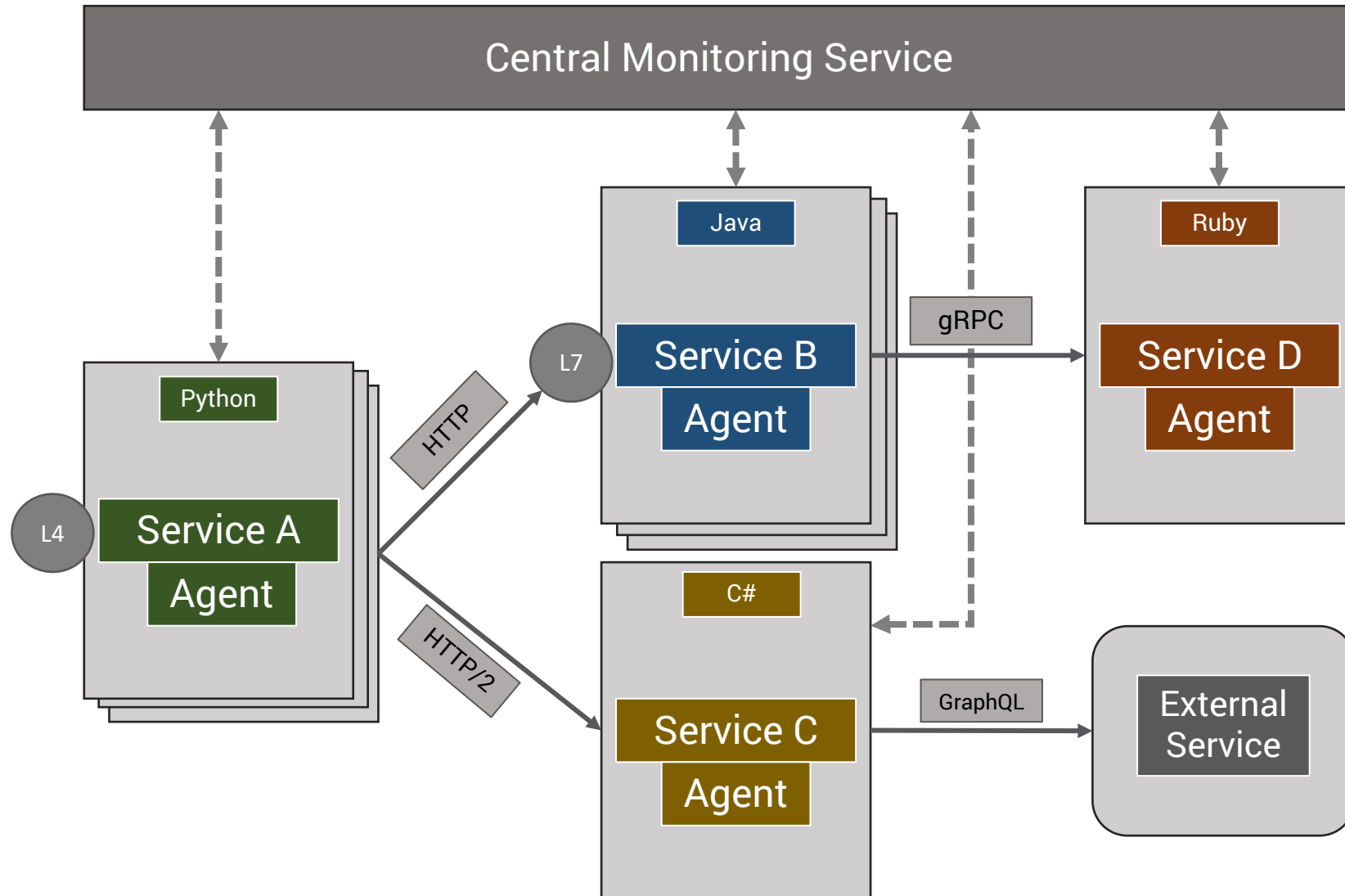
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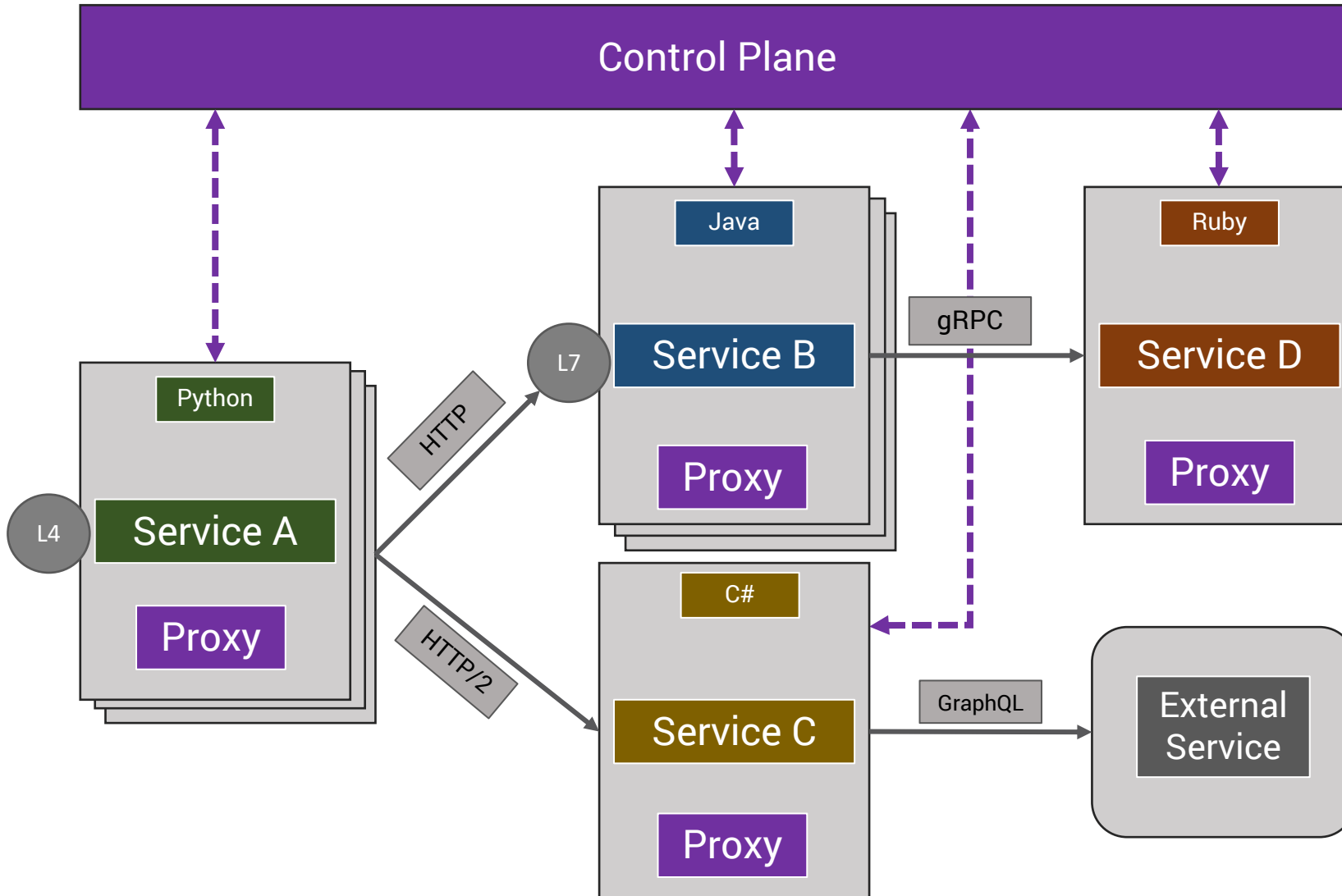
# Challenges involved with Microservices

- Polyglot programming model
- Language-specific tools and SDKs
- Diverse set of protocols
- Multiple deployment targets
- Combination of load balancers
- Complex debugging
- Lack of visibility and observability
- Hard to implement the best practices of distributed computing
- Decentralized authentication and authorization

# Service Mesh - A Possible Solution

- Out of process architecture
- Clean separation of data plane and control plane
- Support internal and external load balancing (L3/L4/L7)
- Consistent Service discovery
- Extensible protocol support
- Advanced health checks
- Real-time monitoring, logging, tracing
- Best practices of distributed computing

# Service Mesh – Control Plane vs Data Plane





# What is Istio?

- **Connect**

- Intelligent traffic routing and flow

- **Secure**

- Managed authentication, encryption

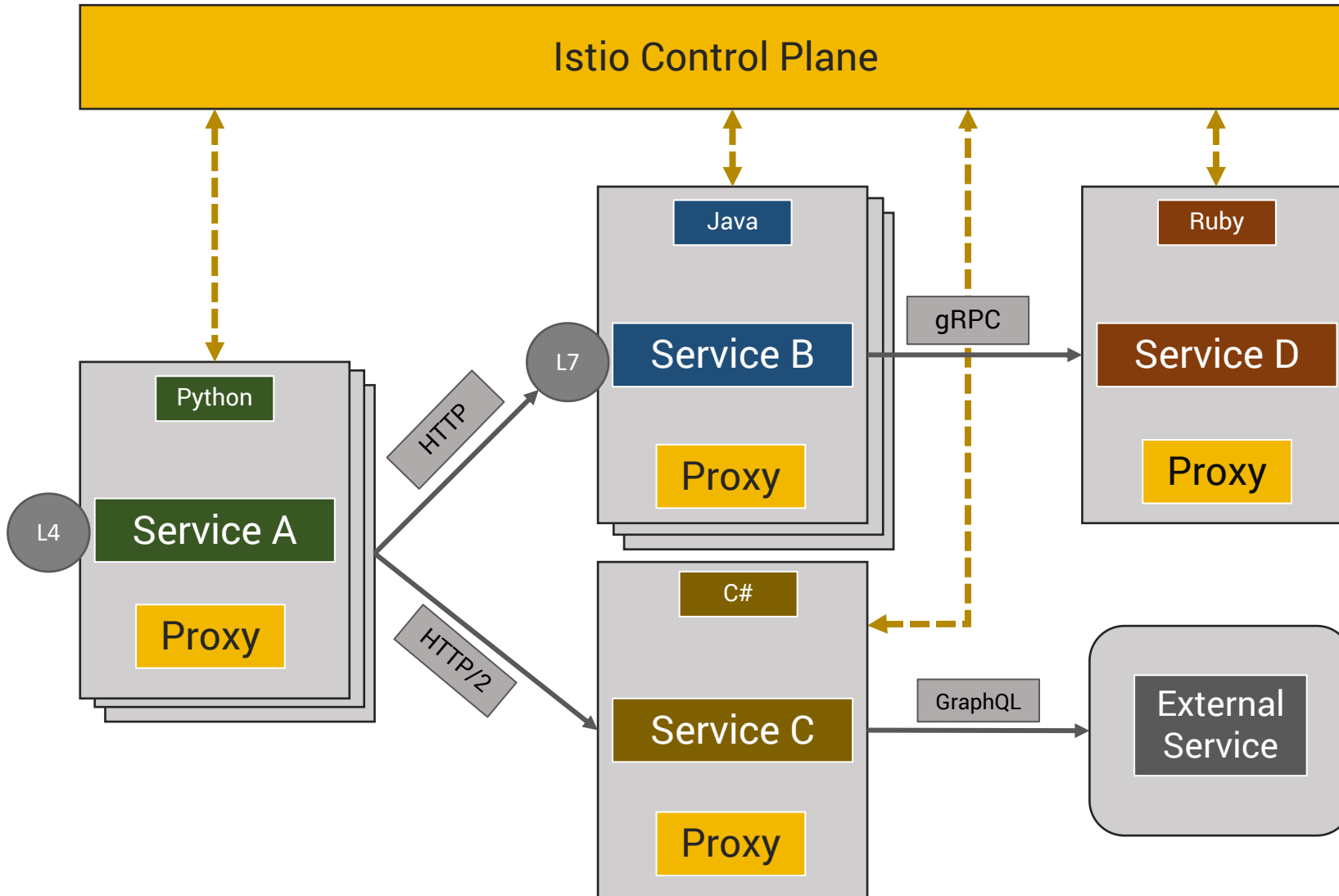
- **Control**

- Enforce policy-driven communication across services

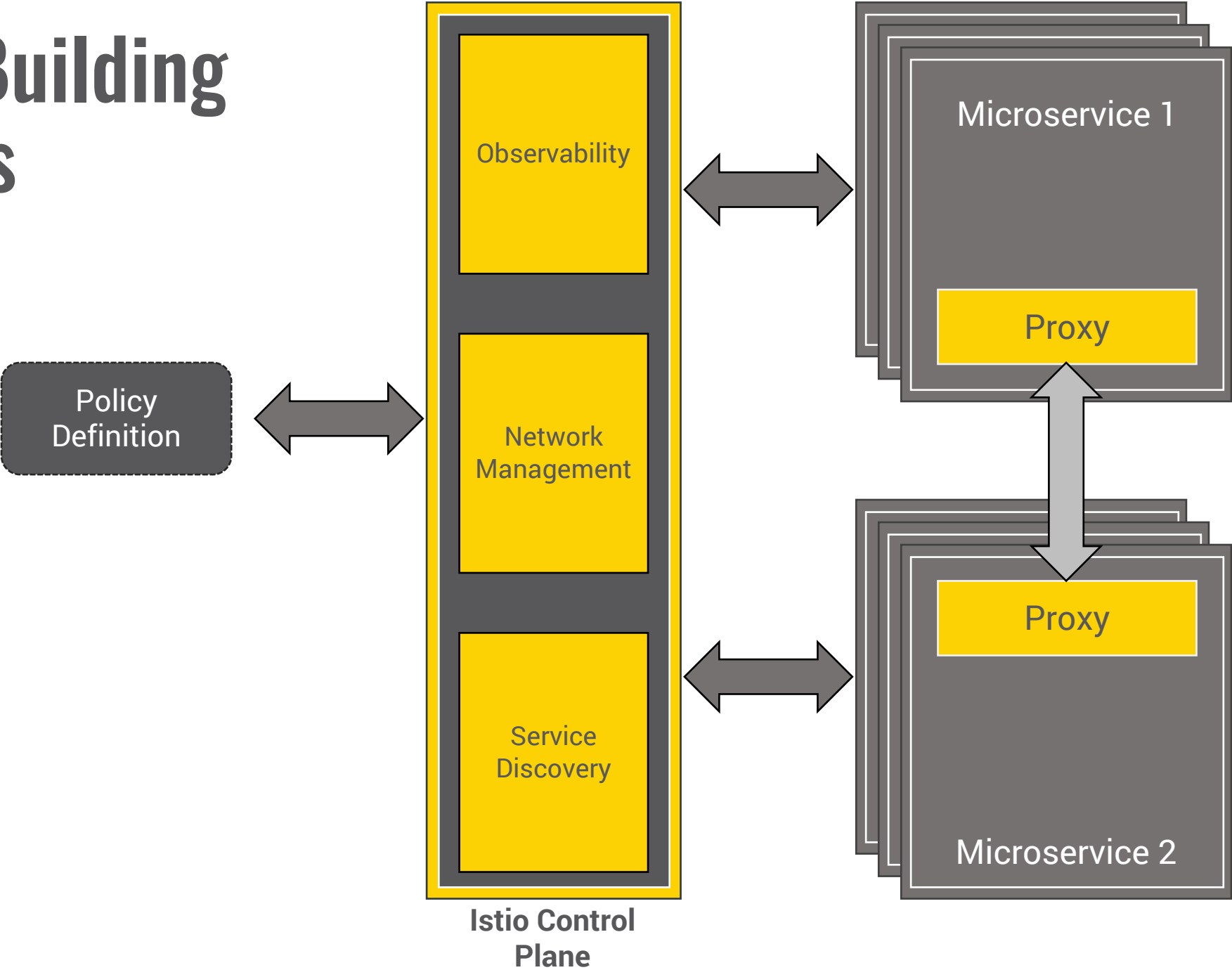
- **Observe**

- Automatic tracing, monitoring, and logging

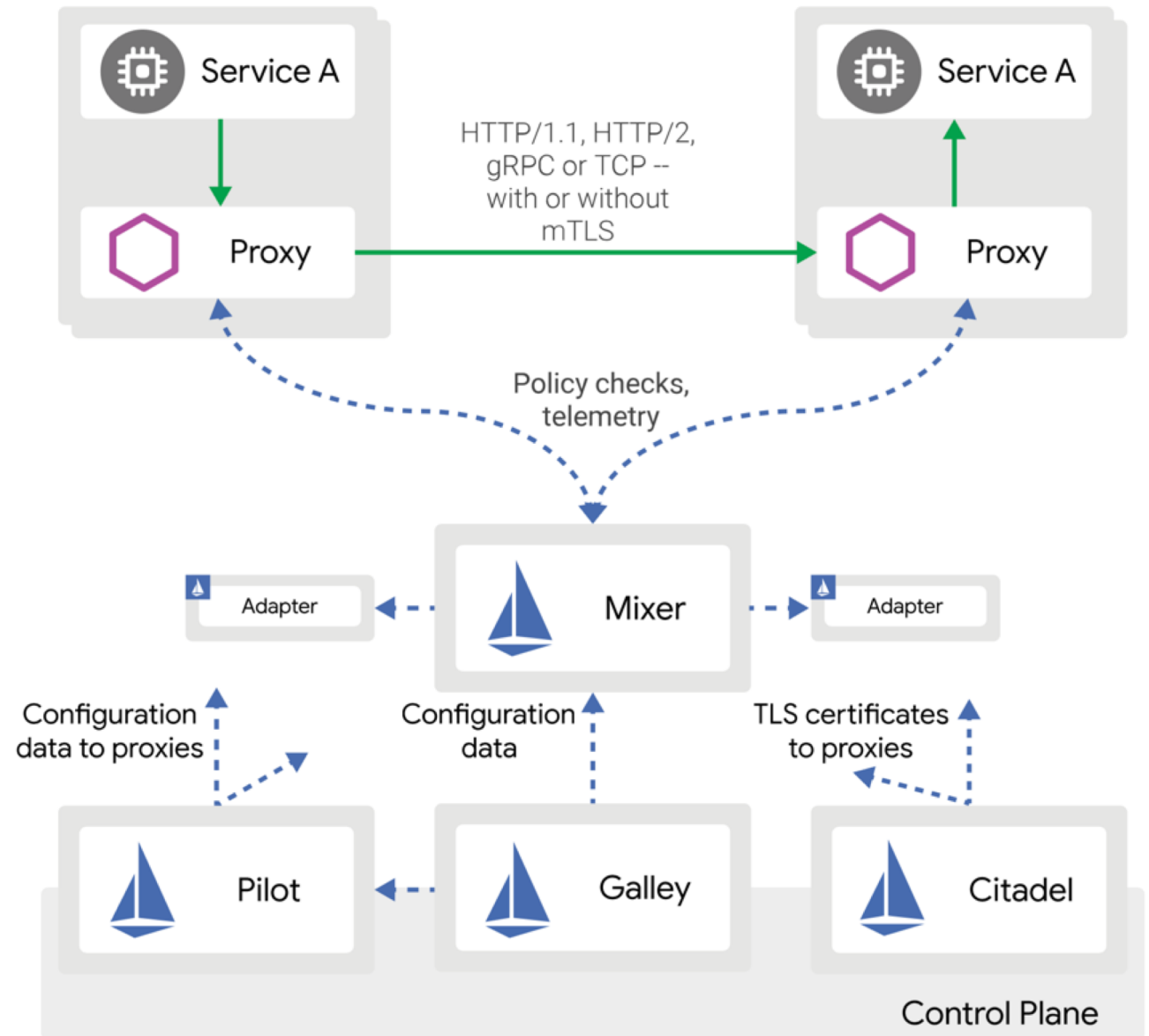
# Istio – Control Plane vs. Data Plane



# Istio Building Blocks



# Istio Architecture

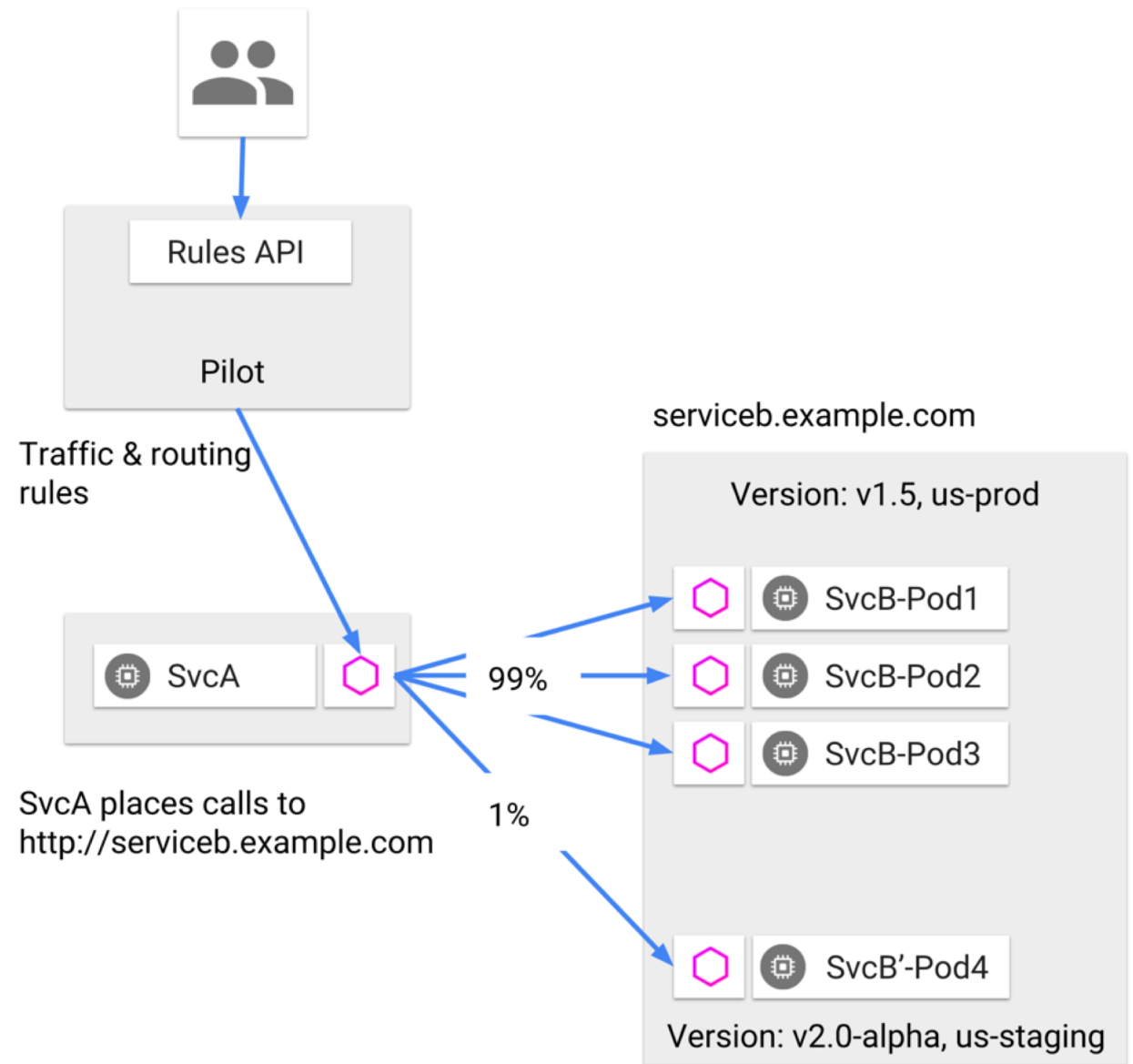


# Key Concepts of Istio Traffic Management

- **VirtualService** defines the rules that control how requests for a service are routed within an Istio service mesh.
- **DestinationRule** configures the set of policies to be applied to a request after VirtualService routing has occurred.
- **ServiceEntry** is commonly used to enable requests to services outside of an Istio service mesh.
- **Gateway** configures a load balancer for HTTP/TCP traffic operating at the edge of the mesh, most commonly to enable ingress traffic for an application.
- **Sidecar** configures one or more sidecar proxies attached to application workloads running inside the mesh.



# Blue/Green Deployments with Istio



# What are we building?

- Two versions of the same applications deployed in Kubernetes
- Dynamically adjusting the traffic routing to the application via Istio rules

# DEMO

Performing Blue/Green Deployments



# Summary

- Automatic load balancing for HTTP, gRPC, WebSocket, and TCP traffic
- Fine-grained control of traffic behavior with rich routing rules, retries, failovers, and fault injection
- A pluggable policy layer and configuration API supporting access controls, rate limits and quotas
- Automatic metrics, logs, and traces for all traffic within a cluster, including cluster ingress and egress
- Secure service-to-service communication in a cluster with strong identity-based authentication and authorization

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## Getting Started with Azure IoT Edge

Azure IoT Edge is an Internet of Things (IoT) service that builds on top of Azure IoT Hub. By moving parts of an IoT workload to the edge, devices can spend less time sending messages to the cloud and react more quickly to changes in status. Attend this session to learn how to use Azure IoT Edge to build intelligent applications that run at the edge.

**Thursday, April 18th, 2019**  
**9:00 AM PST / 9:30 PM IST**

Register at <http://mi2.live>