Istio Service Mesh

(networking for microservices)

Lew Tucker, Ph.D.
VP/CTO Cloud Computing
Cisco Systems, Inc.
@lewtucker

Cloud Computing Has Won and it's Multiple Clouds

evaluating or using public cloud

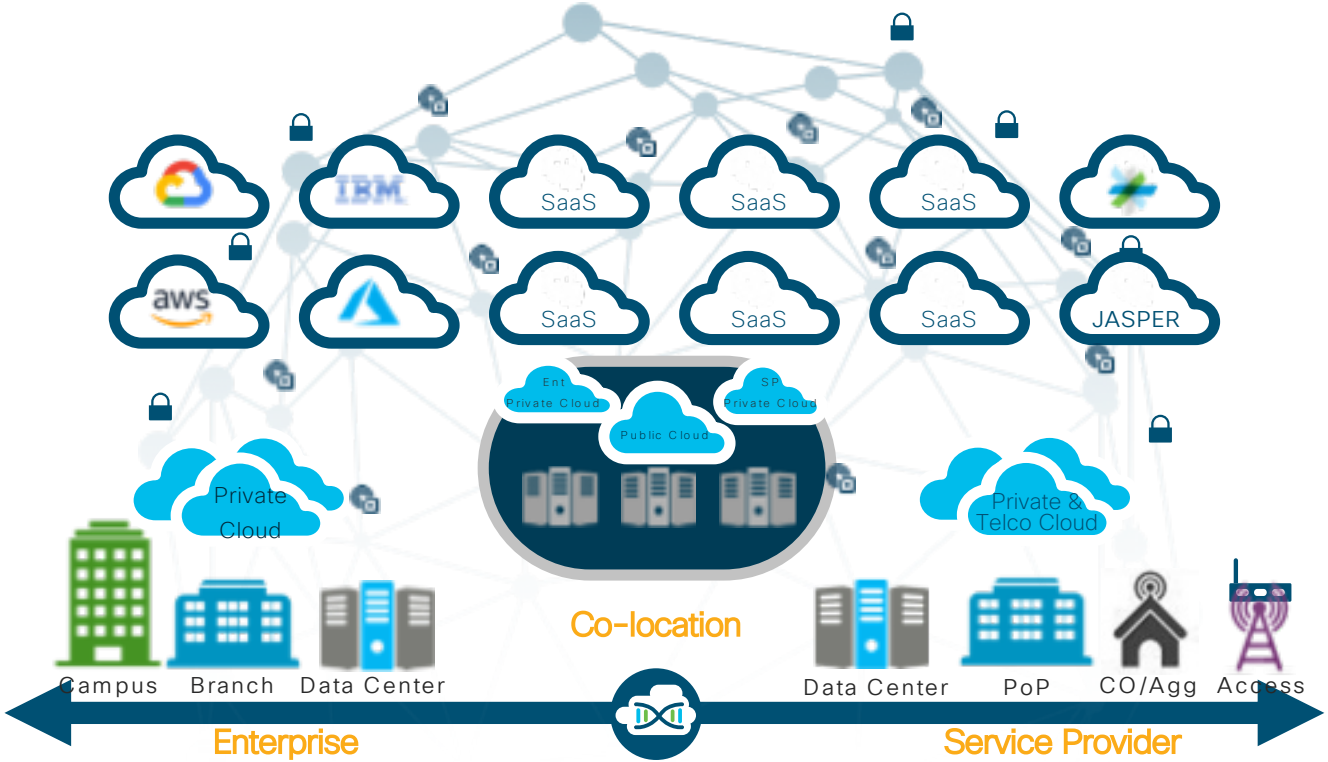
taken steps towards a hybrid cloud strategy

plan to use multiple clouds

Among cloud users

Source: IDC CloudView, April, 2017, n=8,293 worldwide respondents, weighted by country, company size and industry

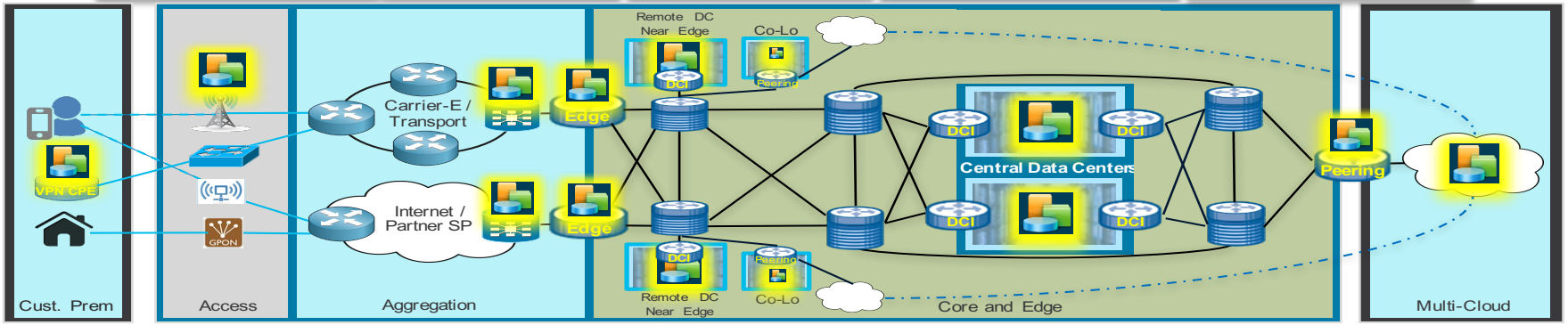
MULTICLOUD

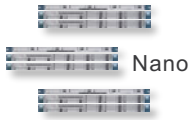


Enables new business models by driving intersection between enterprise, service providers, cloud, and co-lo providers

Many choices for where you'd like apps to run

Edge Compute	>10s of Virtual	>100s of Virtual	>1,000s of Virtual workloads	>100s of Virtual workloads
Latency sensitive apps (MEC, IoT, Edge Analytics)	Workloads, Production Services	workloads, Production services	Production & Backend services	Production services




Nano


Micro


Rack(s)


Multi-Rack


½ or Full Rack

Modular Cloud Orchestration Software Stack

kubernetes by Google · docker · KVM · openstack CLOUD SOFTWARE · BM

High Performance, Automation, Day 0 – N Lifecycle Management, HA, Consistent Networking Models, Logging, Assurance, Security

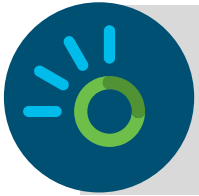
Containers and Kubernetes offer new potential

Starts faster, uses less memory

Consistent development environment

Run anywhere

Containerization challenges in a multicloud world



Multiple Open Source Solutions

Hybrid Environments

Container Complexity

Networking, Security and Storage

Container Trends

- Kubernetes is emerging as the leading container orchestration platform
- Containers are being adopted heavily in on-premise data centers

Source: CNCF Survey, January and June 2017

The Cisco Container Platform - Kubernetes

Turnkey Solution
For Production-Grade Container Environments

Container-based Applications Management
Extending Cisco's portfolio of offers

Native Kubernetes (100% Upstream)
Direct updates and best practices from open source community

Hybrid Cloud Optimized
A key element of the Cisco-Google open hybrid cloud solution

Integrated
Networking | Management | Security | Analytics

Easy to acquire, deploy & manage | Extensible platform | World-class advisory & support | Open & consistent

Google And Cisco Join Forces To Bring Kubernetes Container Tech To The 'Hybrid Cloud'

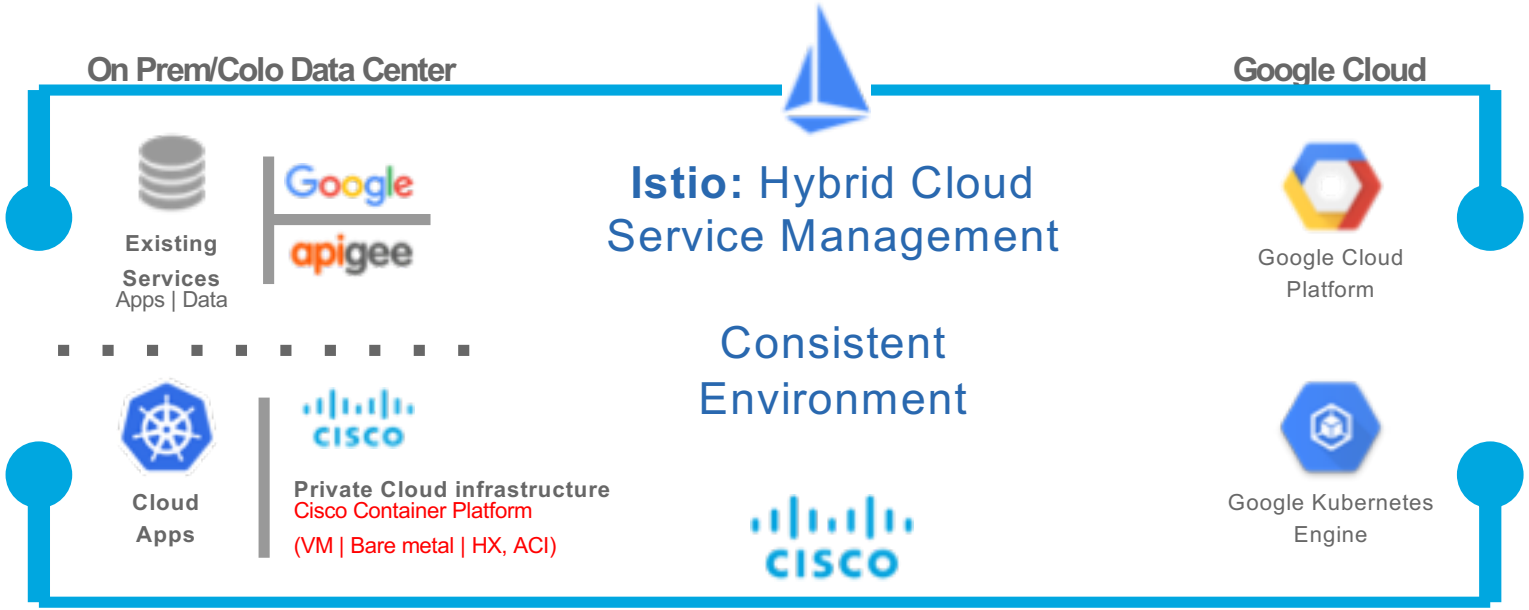
Alex Konrad, FORBES STAFF
Covering venture capital, software and startups FULL BIO

Google executive Urs Hölzle, seen here at a Google event in 2014, led the partnership with Cisco from Google's side. (Credit[+])

Google and Cisco are joining forces in the latest partnership between tech giants in the fast-growing cloud computing market.

Announced October 2017

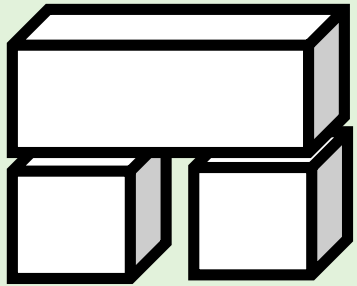
Consistent Environment for Hybrid Cloud Services



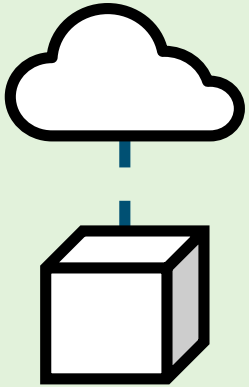
Networking | Security | Private Cloud Infrastructure | Consumption Management

CSR 1000v, ACI, Stealthwatch Cloud, Cisco Container Platform, Contiv, CloudCenter, AppDynamics

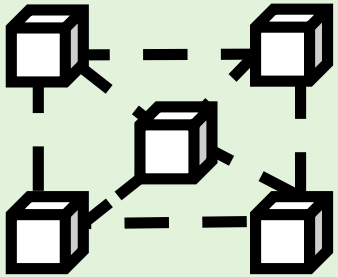
Cloud native computing is driving an evolution of application/service architecture



Monolithic



Hybrid



Microservices

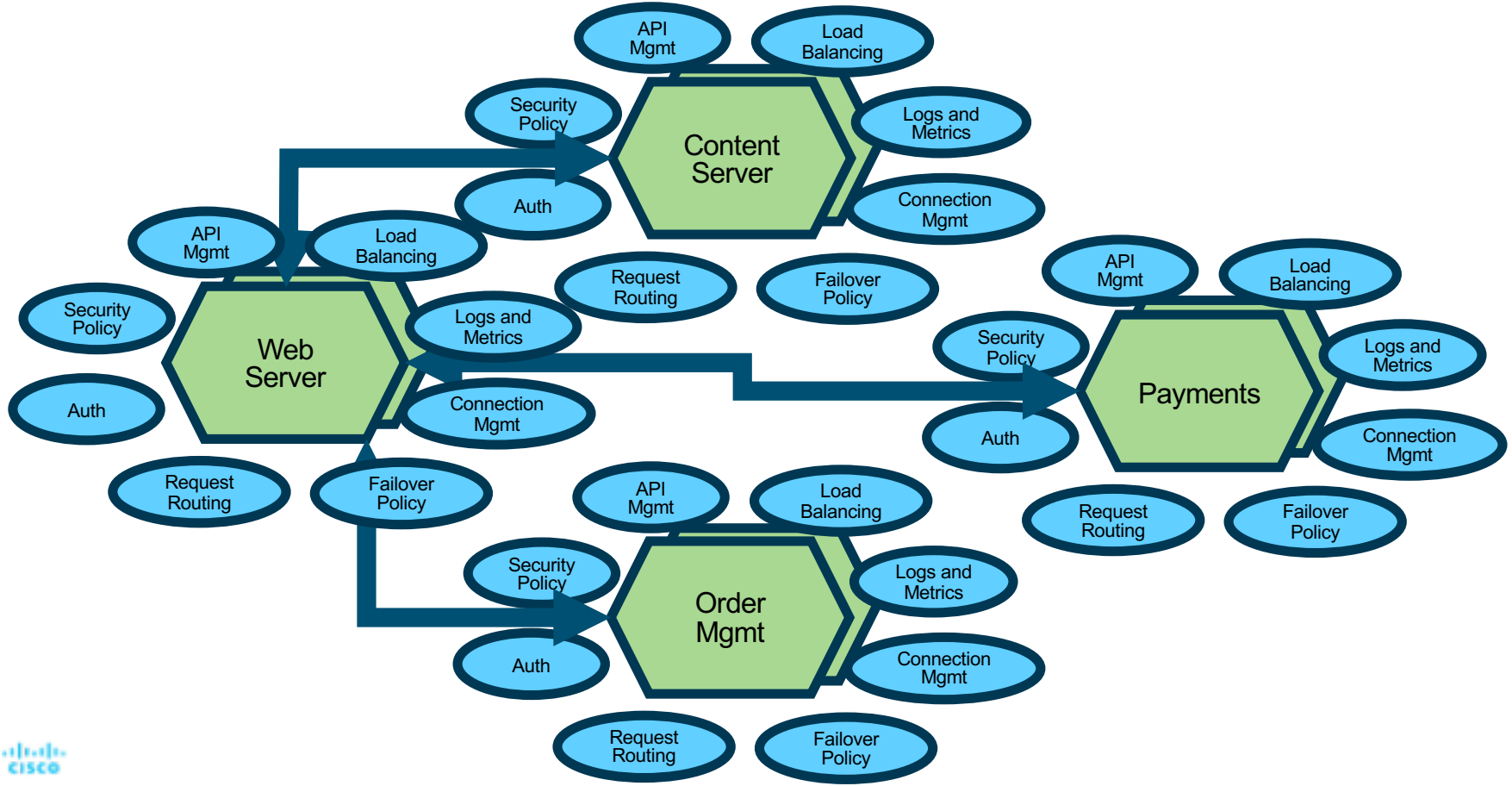
Wecome to the wonderful world of distributed systems !

Observability

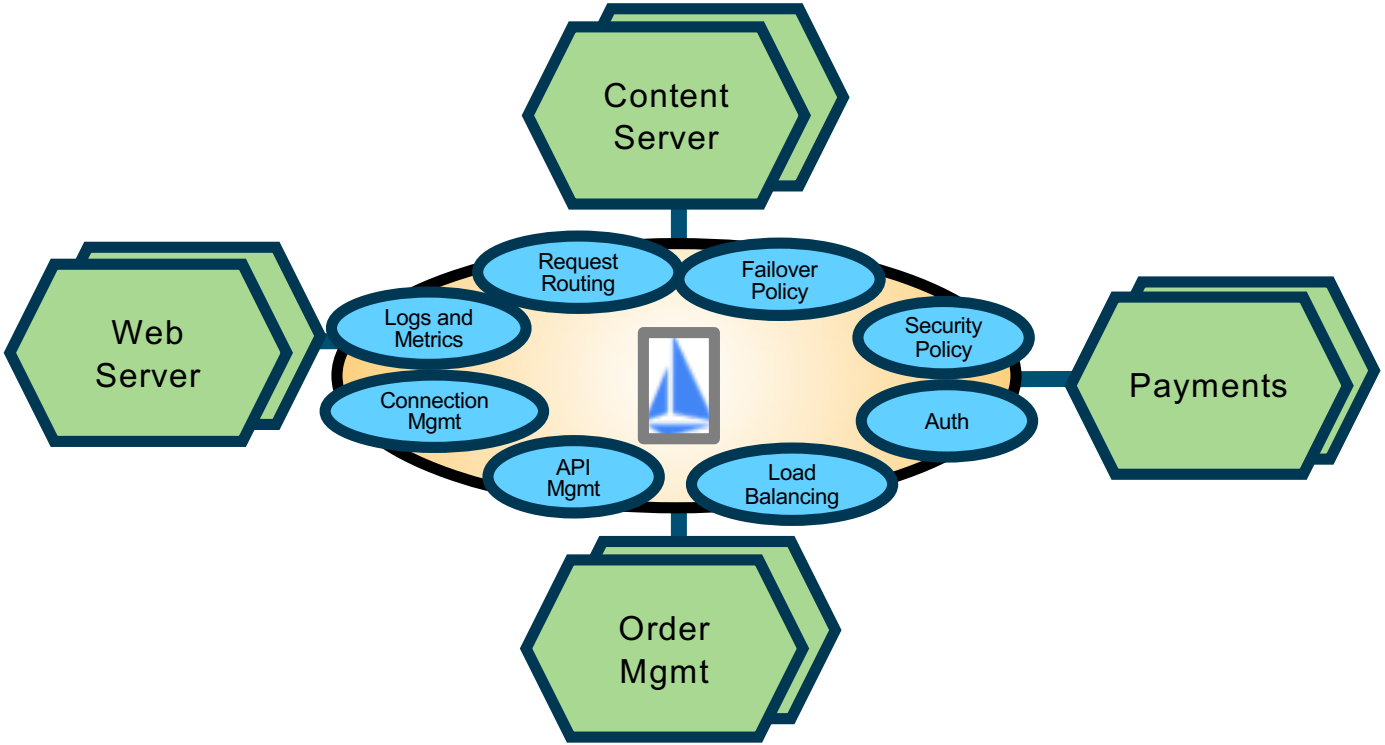
Traffic management

Security and Policy

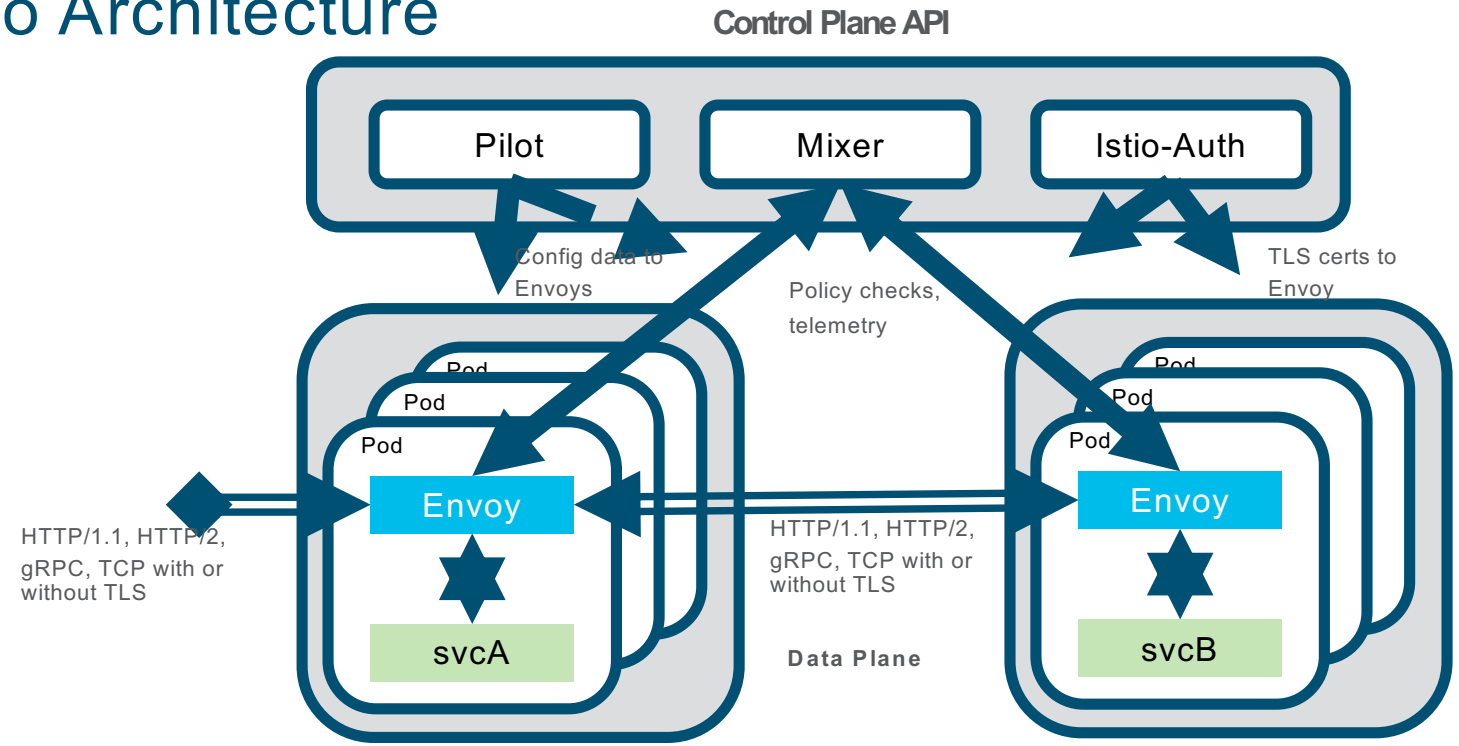
Services should be simple but get complicated fast



Hand-off routing, authentication, and other parts to a policy-driven, secure service mesh service



Istio Architecture



Several different service mesh options for developers

Our sidecar of choice - Envoy

- A C++ based L4/L7 proxy
- Low memory footprint
- Battle-tested @ Lyft
  - 100+ services
  - 10,000+ VMs
  - 2M req/s

Plus an awesome team willing to work with the community!

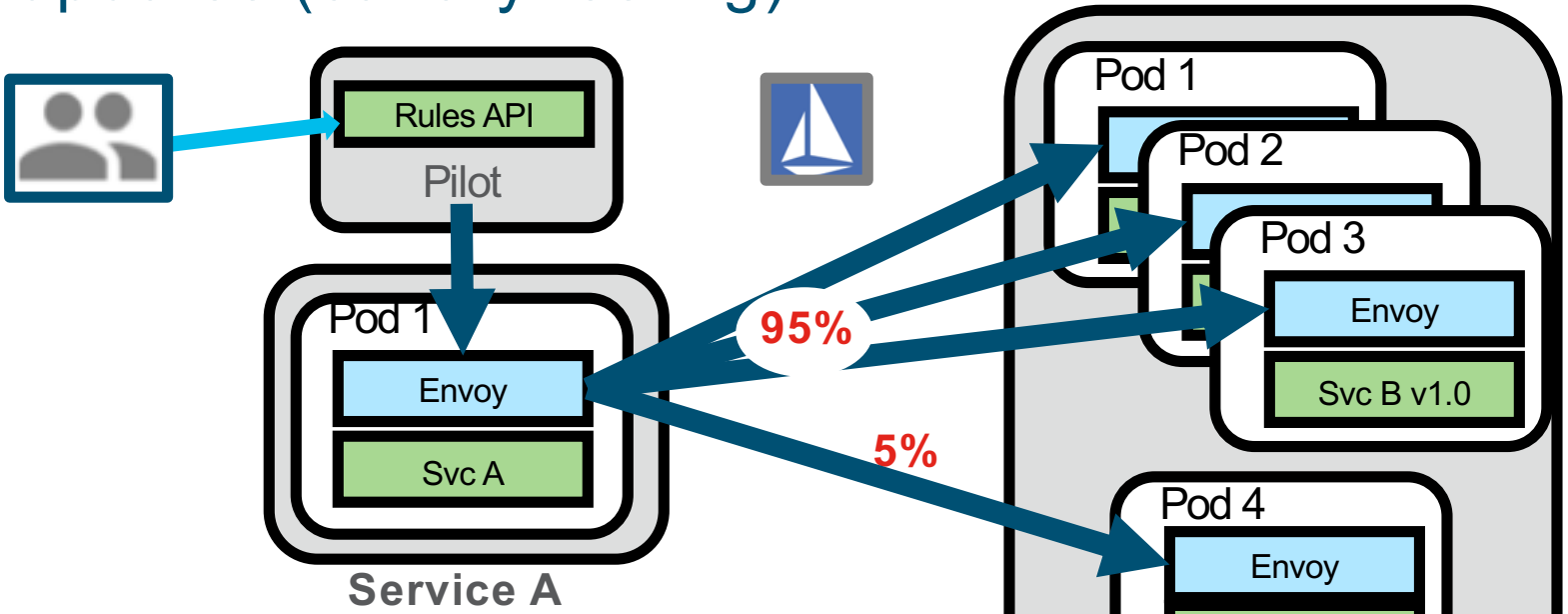
Goodies:

- HTTP/2 & gRPC
- Zone-aware load balancing w/ failover
- Health checks, circuit breakers, timeouts, retry budgets
- No hot reloads - API driven config updates

Istio's contributions:

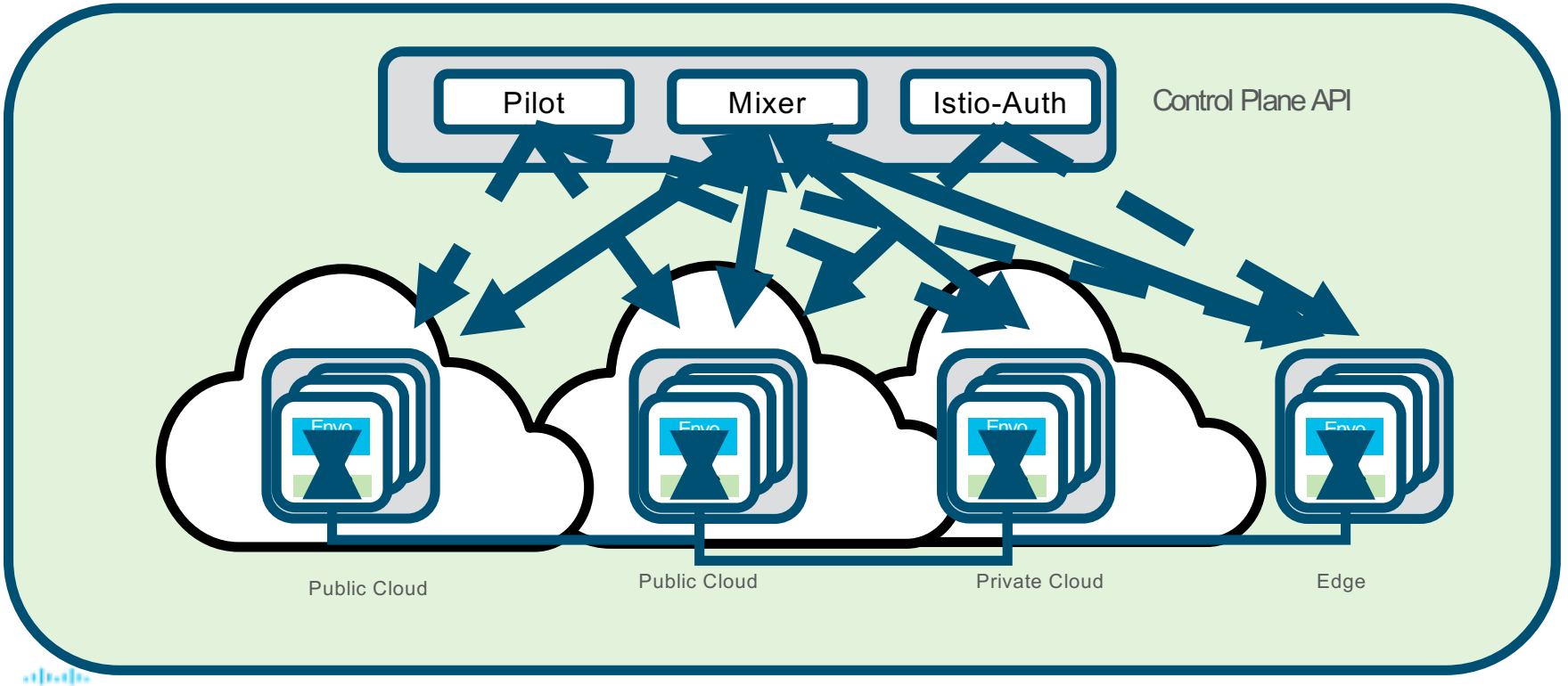
- Transparent proxying w/ SO_ORIGINAL_DST
- Traffic routing and splitting
- Request tracing using Zipkin
- Fault injection

Simple example: traffic splitting for rolling out service updates (canary testing)



Requires only a change in policy
Services remain the same
Networking infra remains the same

Stretching Istio Across Public, Private Clouds and Edge



Using a service mesh is radically different

- Abstracts away details of service-to-service communications
- Consistent policy, load balancing, encryption, authentication, traffic steering across services
- Easy way to connect, manage and secure microservices ***without changes in the service code***
- Easier IT-Ops with better observability, monitoring of traffic between microservices
- Kubernetes orchestrates containers, Istio orchestrates communication between services.

cisco

Istio

Biggest Impact: Changing the way we think about application/service development

Bring application development becomes ***assembly*** of ready-made, highly-scalable, proven services running anywhere from the edge to the cloud.


CISCO