Internet of Things and Services
Service-oriented architectures

Service Mesh

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Service mesh: Introduction

- A service mesh manages all service-to-service communication within a distributed (potentially microservice-based) software system.

- It accomplishes this typically via the use of "sidecar" proxies that are deployed alongside each service through which all traffic is transparently routed.

- Proxies used within a service mesh are typically "application layer" aware (operating at Layer 7 in the OSI networking stack).

- A service mesh provides dynamic service discovery and traffic management, including traffic shadowing (duplicating) for testing, and traffic splitting for canary releasing, incremental rollout, and A/B type experimentation.

Service mesh infrastructure

- Data plane: Touches every packet/request in the system. Responsible for service discovery, health checking, routing, load balancing, authentication/authorization, and observability.

- Control plane: Provides policy and configuration for all of the running data planes in the mesh. Does not touch any packets/requests in the system. The control plane turns all of the data planes into a distributed system.

- A service mesh supports the implementation and enforcement of cross cutting requirements, such as security (providing service identity and TLS), reliability (rate limiting, circuit-breaking), observability, such as distributed tracing,…

Service mesh architecture (Istio)
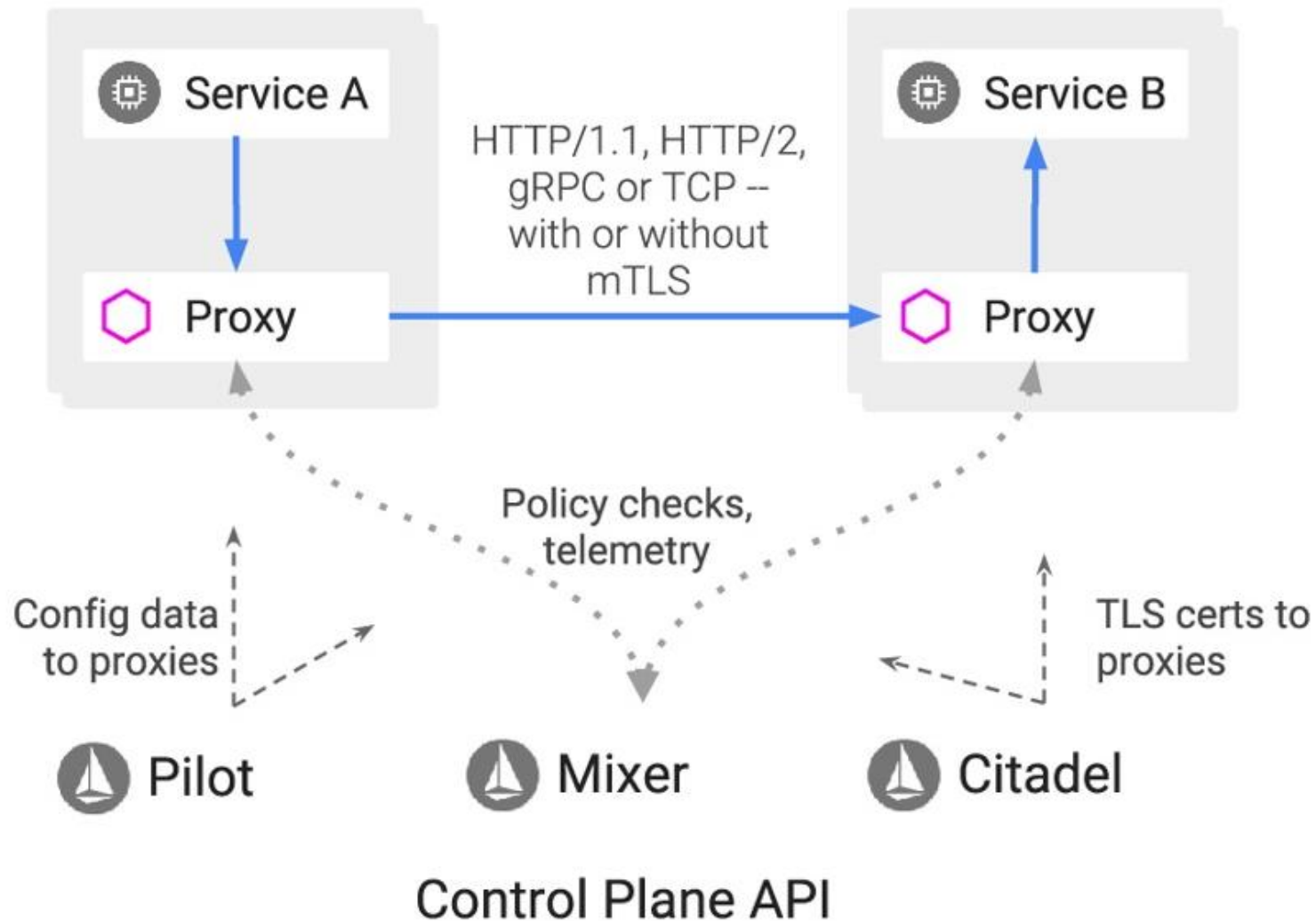
Service Mesh

Service mesh technologies

- There are clear benefits provided by the use of a service mesh, but the tradeoffs of added complexity and the requirement of additional runtime resources should be analyzed.

- Service mesh technology is rapidly becoming part of the (cloud native) application platform "plumbing."

- Popular service meshes include: Linkerd, Istio, Consul, Kuma, and Maesh.

- Supporting technologies within this space include: Layer 7-aware proxies: Envoy, HAProxy, NGINX, MOSN,…

- Service mesh orchestration, visualization, and understandability tooling: SuperGloo, Kiali, Dive,...

References

- Service Mesh Ultimate Guide: Managing Service-to-Service Communications in the Era of Microservices
  - https://www.infoq.com/articles/service-mesh-ultimate-guide/
- Service Mesh Comparisons, Open Infrastructure Summit, Denver, 2019 Mirantis, Inc.
- Service Mess to Service Mesh
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