



KubeCon



CloudNativeCon

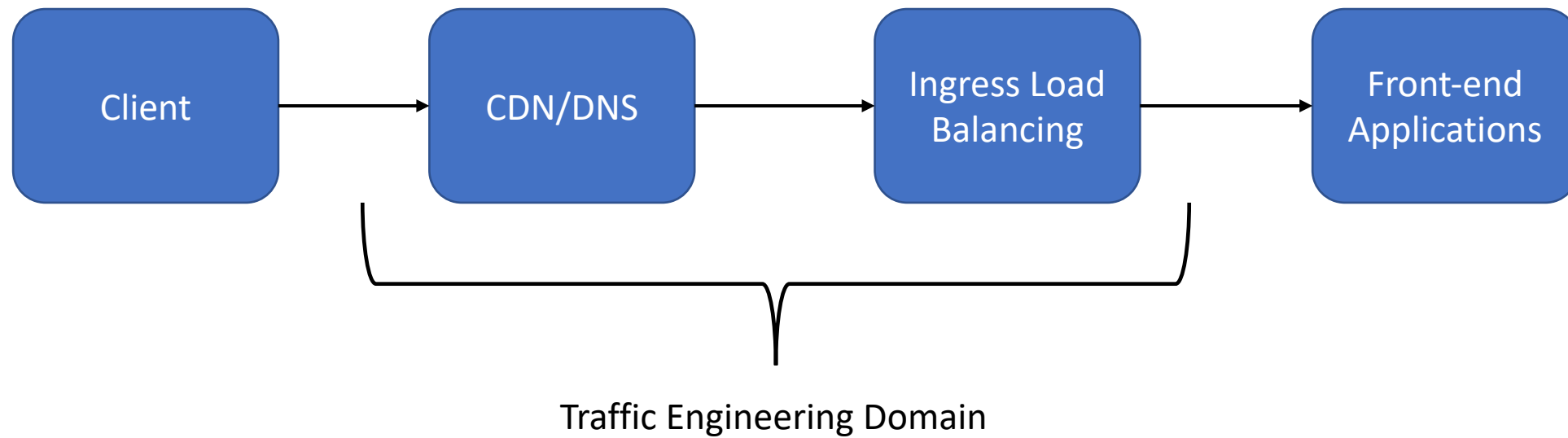
Europe 2020

Building a Service Mesh from Scratch: The Pinterest Story

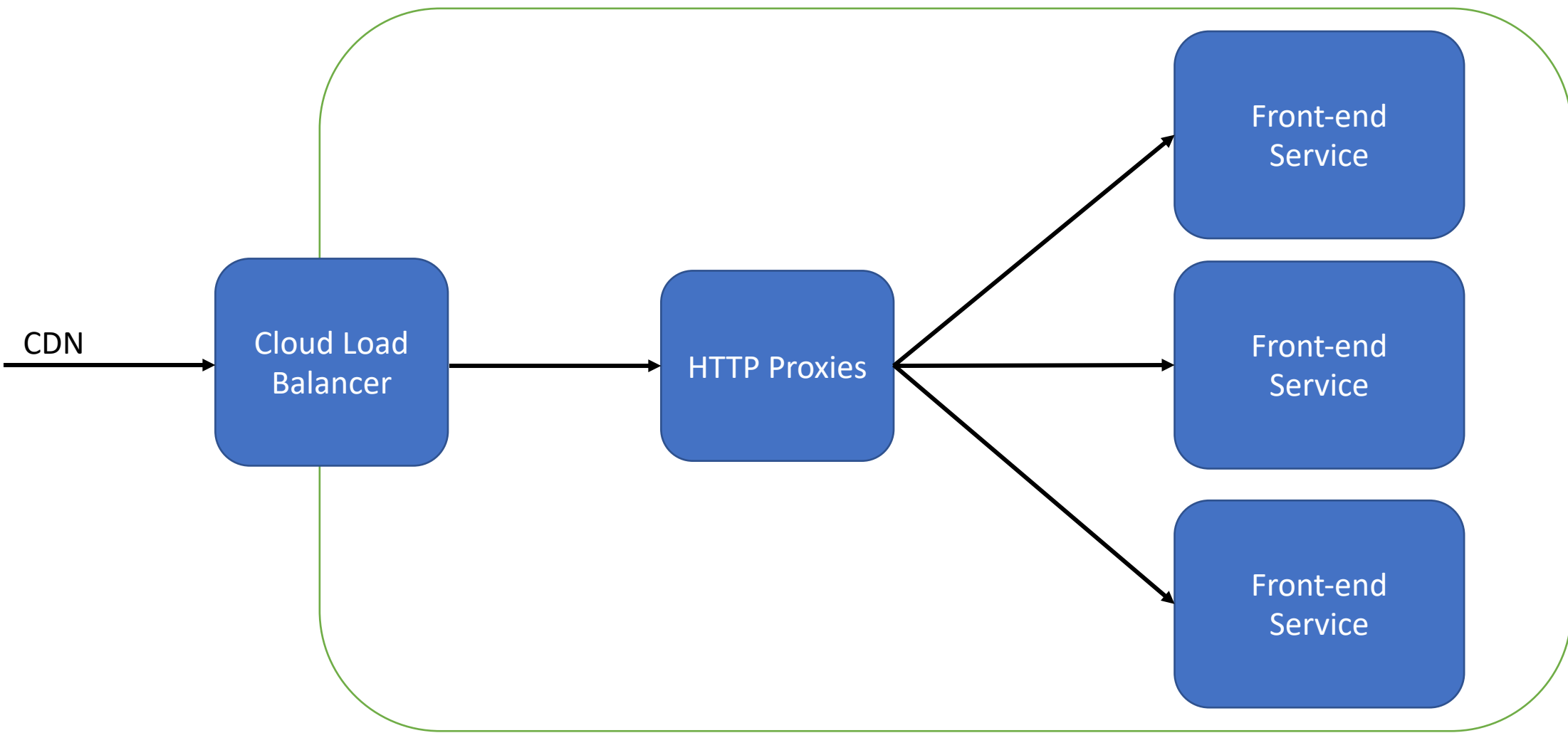
Virtual

Derek Argueta

Pinterest Traffic Engineering



Pinterest Ingress Load Balancing



Preparing Envoy



- Fast & Robust Deployments
- CI/CD
- Monitoring dashboards & alerts prepared
- Multiple Envoy extensions implemented to match existing ingress behavior *precisely*
- Upstream pull requests

Pinterest

Launch announcement: Envoy load balancer

The Great mTLS Migration

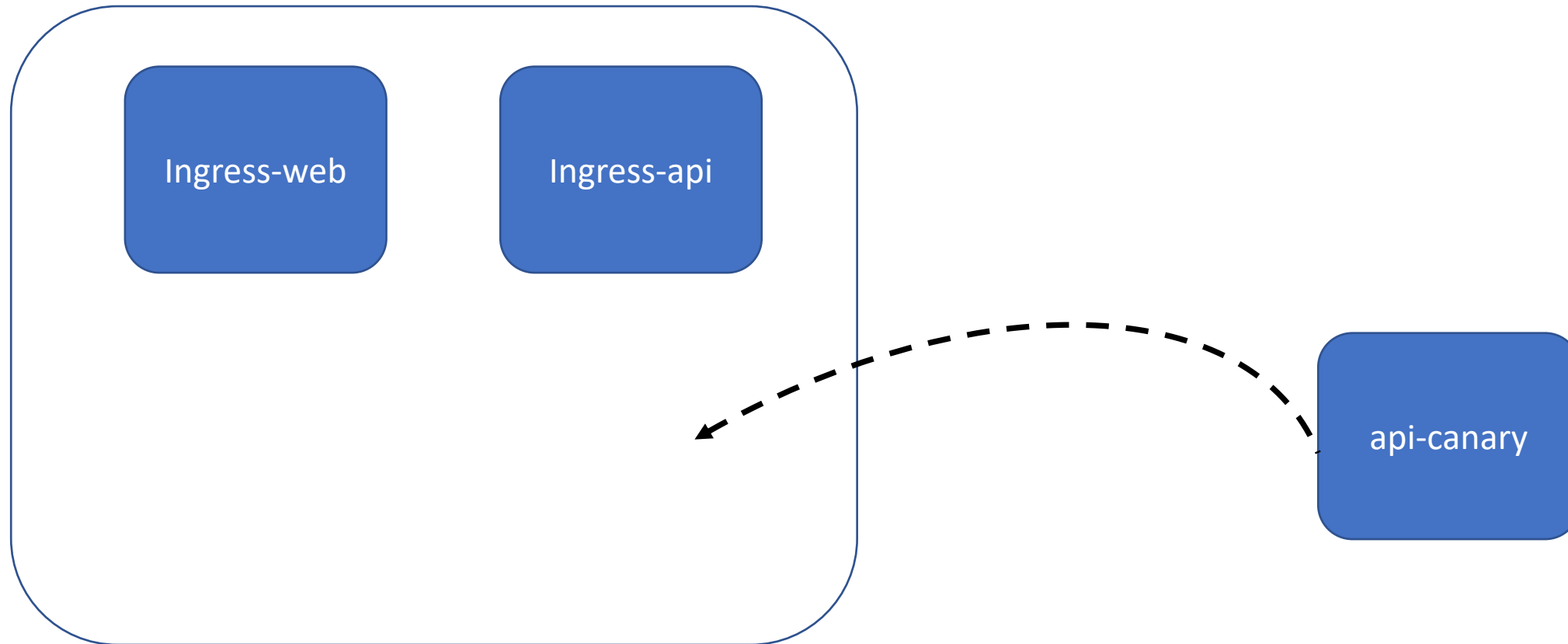


- Started with Java Service Framework
 - SSL bug fix in Netty C code
 - Local patch for Java8
 - Massive coordination effort
- Repeat for...
 - Python
 - Node
 - C++
 - Elixir
 - Go

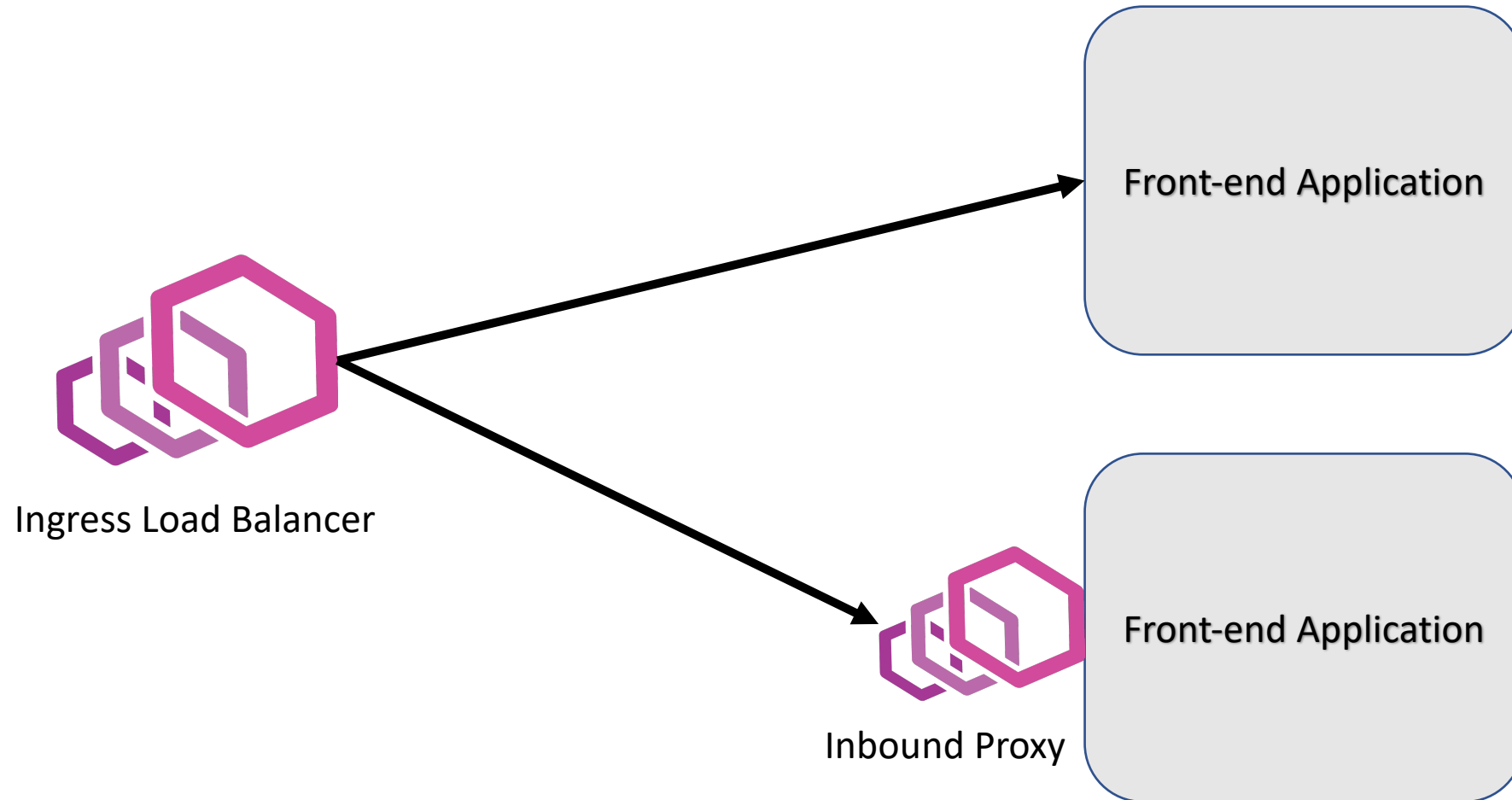
Deploying Envoy Elsewhere



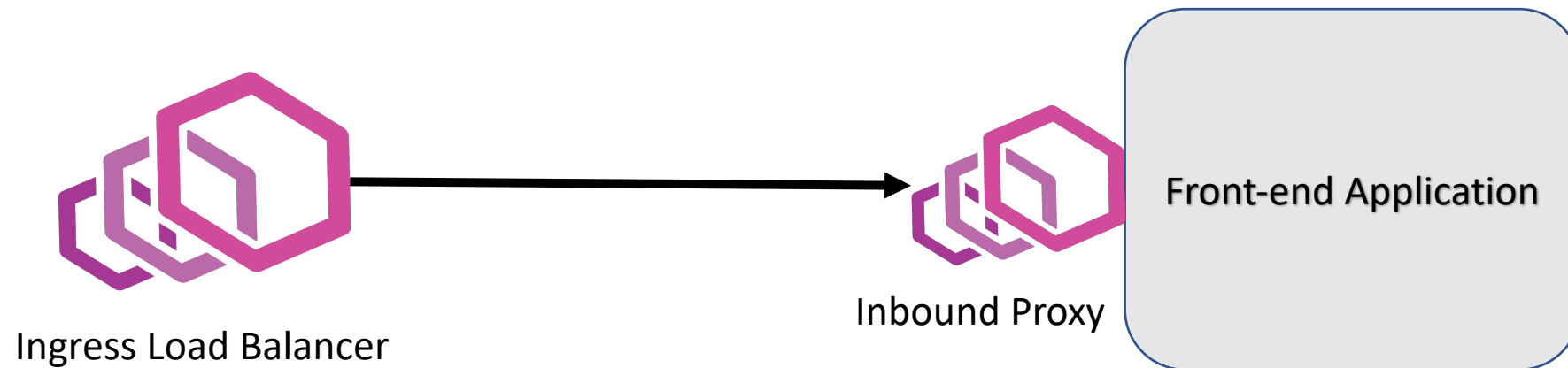
Envoy Deployment Group



1's a Load Balancer, 2's a Mesh?



1's a Load Balancer, 2's a Mesh?





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Meshify

Verb

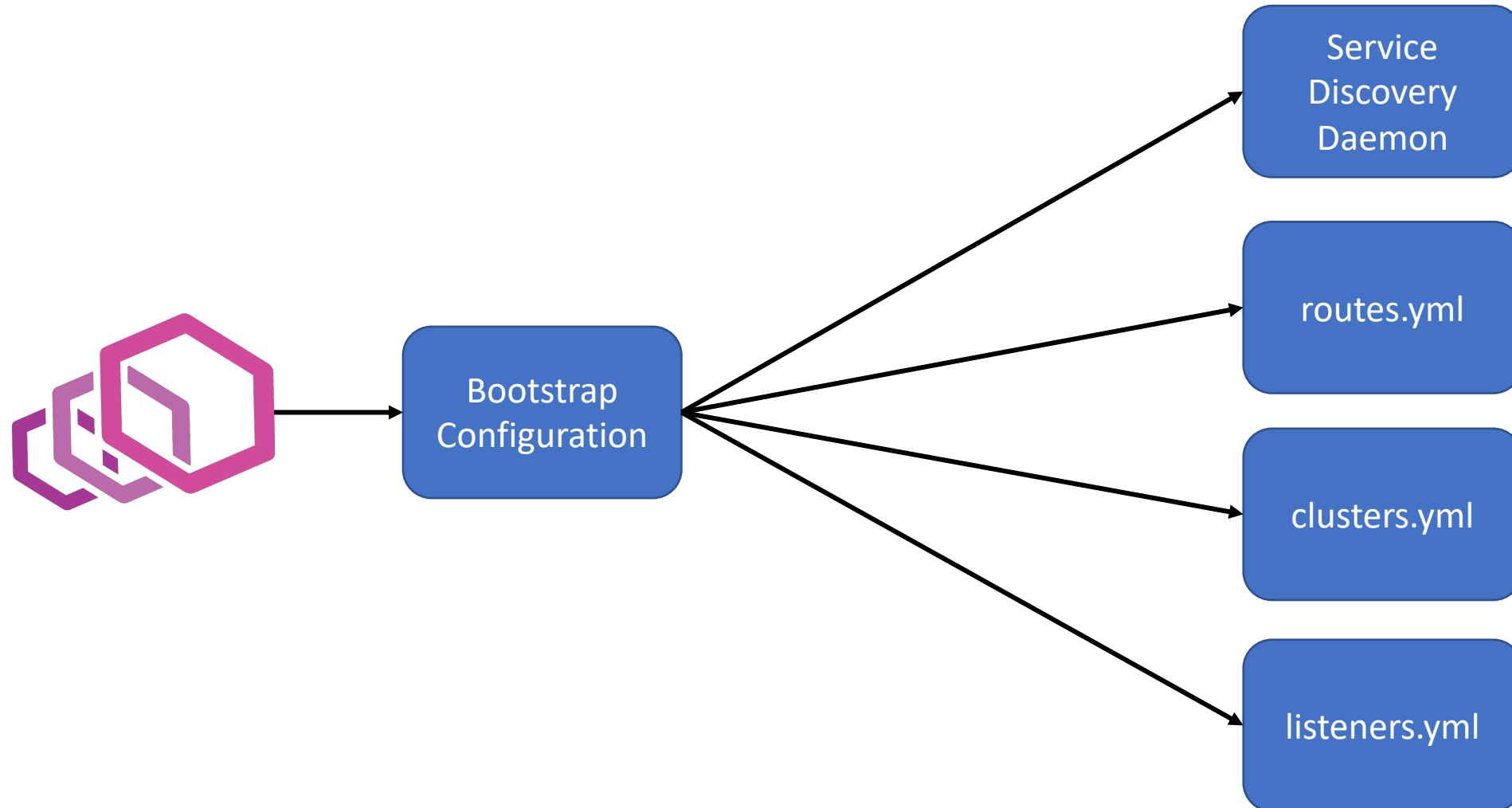
1. To deploy a proxy in front of a service for inbound and outbound application traffic.

Meshified

adjective

1. Being a part of a service mesh.

The Control Plane



The Control Plane

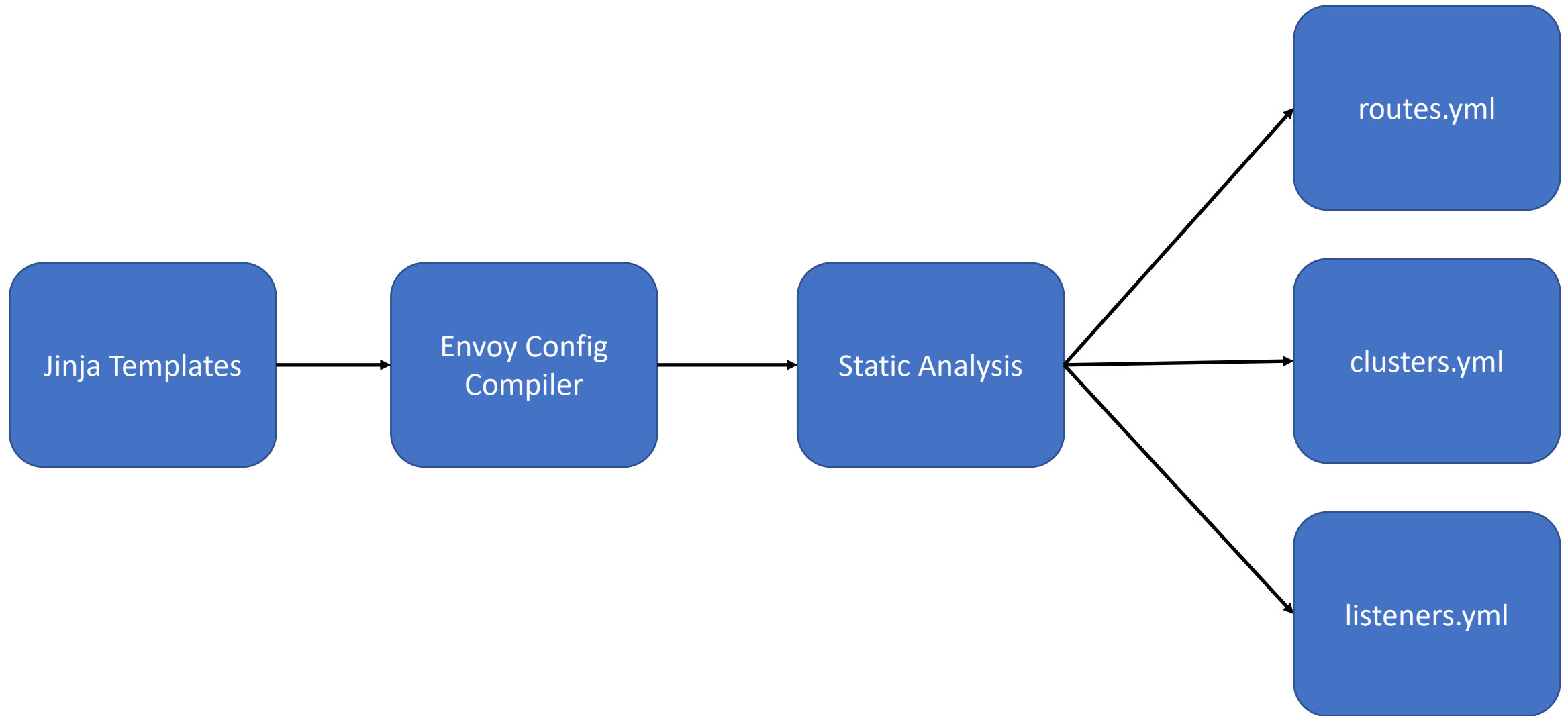


```
{% import 'mesh_macros.jinja' as mesh %}
```

```
mesh.http_service("my_website", 8080, healthcheck="/status")
```

```
mesh.cluster("some_service", 9000)
```

The Control Plane



The Fundamentals



- Ability to deploy Envoy to any service
- Ability to configure Envoy for any service
- Templates to simplify the configuration interface – able to write raw Envoy when needed
- A build system that allowed us to write C++ extensions, apply patches, and regularly sync with upstream
- A static analysis system that caught most mistakes locally or on CI

Internal Web Envoy



- Envoy deployment with Jinja macros targeting:
 - TLS termination
 - Clickjacking and XSS prevention headers
 - CSRF
 - CORS
- *Just* another node in the mesh
- Runs in front of all internal web services
 - Phabricator
 - Jenkins
 - Teletraan (deployment tool)
 - Etc.

New Mesh Use-Cases



- Web Infrastructure Team – Advanced Infrastructure-Specific Routing
- Site Reliability Engineering Team – Generic SLI Monitoring for Error Budget tracking
- Privacy & Legal Team – HTTP Cookie Monitoring

“How did we get here?”



- Solving business problems first
- Incremental progress
- Delivery at each step
- Unification of Traffic and Service Framework
- Envoy extensions
- Buy-in from other teams and organizations



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Thank You!

