Developer-Led Automation

Consul, Terraform, and a Little Magic

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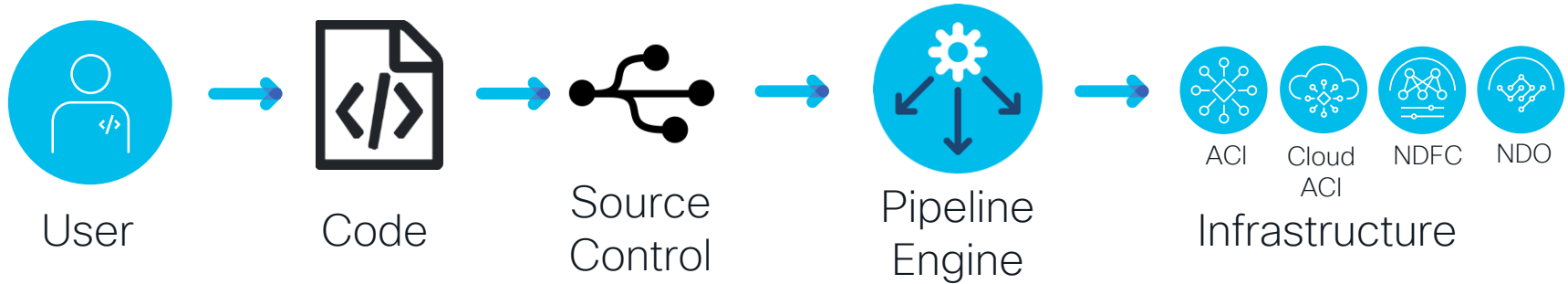
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Agenda

- Introduction

- Infrastructure as Code

- CI/CD to ADC (NIA)

- Tooling Background
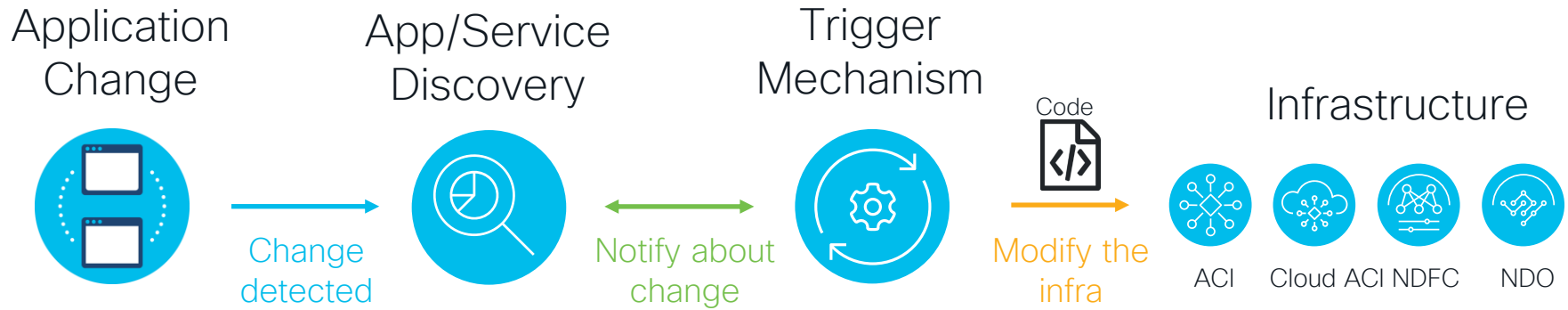
- Demo/Hands-On

- Conclusion

Infrastructure as Code (IaC) – What/Why/How

- Automate the provisioning and management of the technology stack

- Translate manual tasks into reusable, robust, distributable code

- Rely on practices that have been successfully used for years in software development (version control, automated testing, release tagging, continuous delivery, etc.)

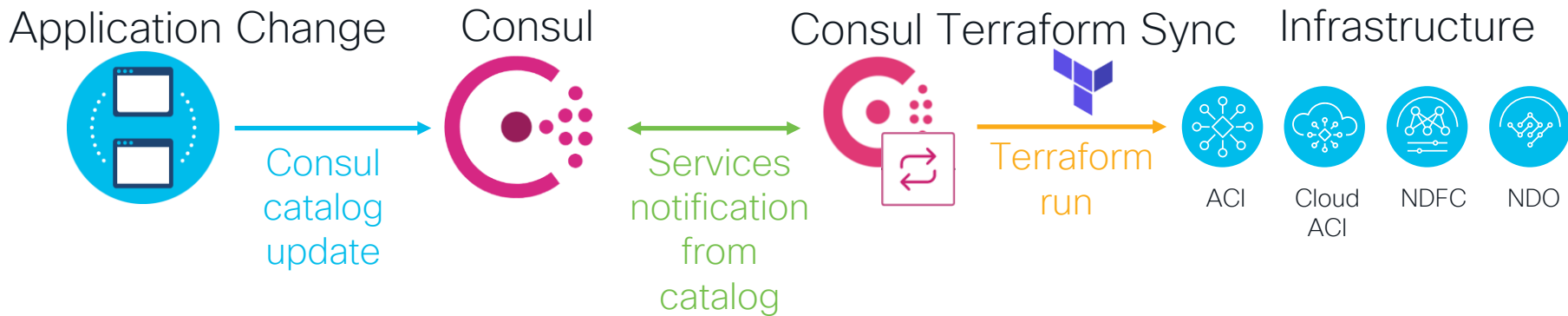- Benefits: much higher delivery speed; significant reliability boost

The Infrastructure as Code journey

User → Code → Source Control → Pipeline Engine → Infrastructure

Infrastructure: ACI, Cloud ACI, NDFC, NDO

Application derivative changes

Application Change → Change detected → App/Service Discovery ← Notify about change → Trigger Mechanism → Code → Modify the infra → Infrastructure

ACI   Cloud ACI   NDFC   NDO

HashiCorp Network Infrastructure Automation (NIA)

Application Change → Consul catalog update → Consul ← Services notification from catalog → Consul Terraform Sync → Terraform run → Infrastructure

ACI   Cloud ACI   NDFC   NDO

What is HashiCorp Consul?

- Consul is a distributed service discovery and registration tool, a key-value store and a Service Mesh with micro-segmentation capabilities.

- Distributed control-plane in a hierarchical client-server model with
  - Cluster membership (gossip, SWIM, Serf)
  - Consensus (Raft) and service registration

- Maintains a central catalog where all services are synchronized and provides distributed health checking with edge triggered updates (agent)

- The catalog is accessible using DNS, REST API or CLI

- Supports multi-datacenter, multi-cloud, service federation, encryption and identity management.
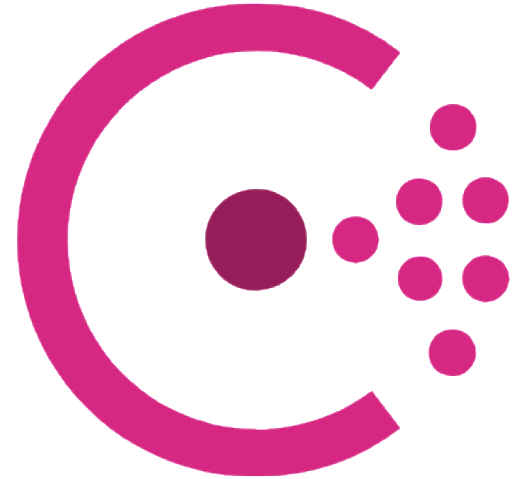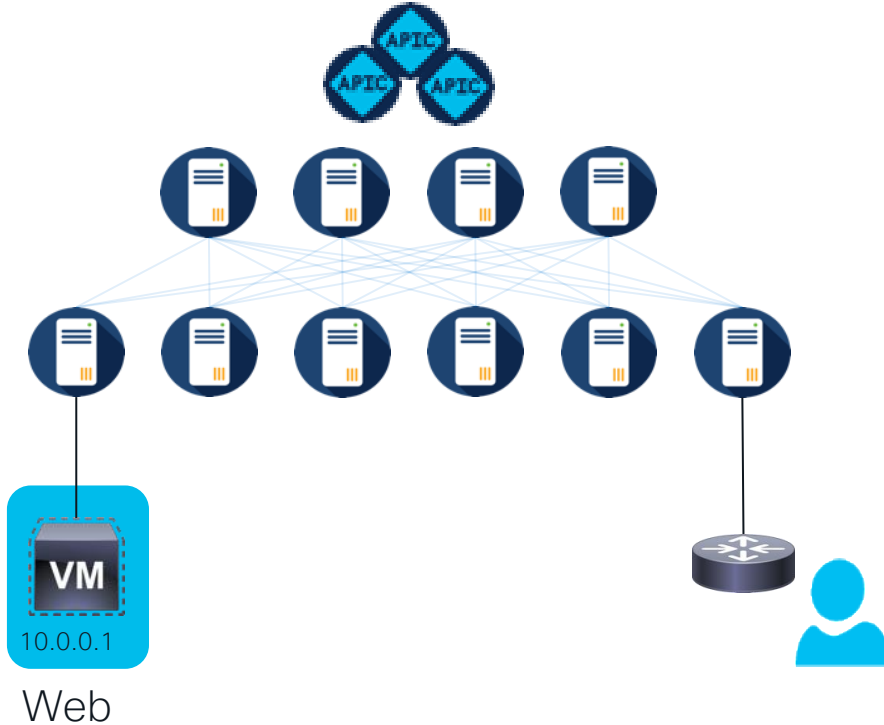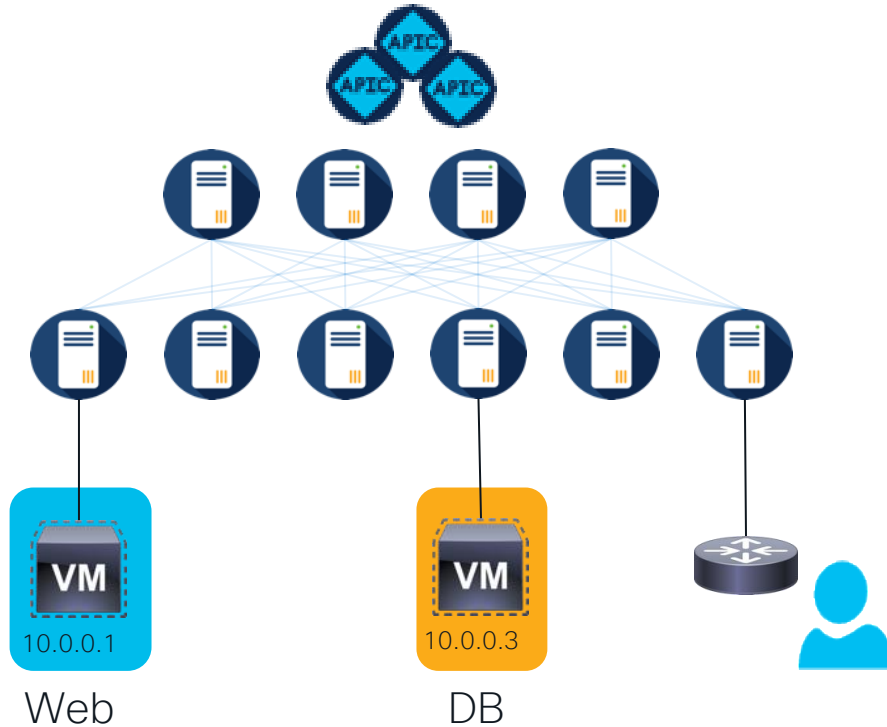
What is HashiCorp Terraform?

- Open-source Infrastructure Provisioning Tool

- Commercial support from HashiCorp

- Declarative and idempotent

- Immutable infrastructure concept

- Can manage a wide range of systems:
  - VMs, network devices, cloud instances, etc.

- Agentless, single binary file

- Zero server-side dependencies

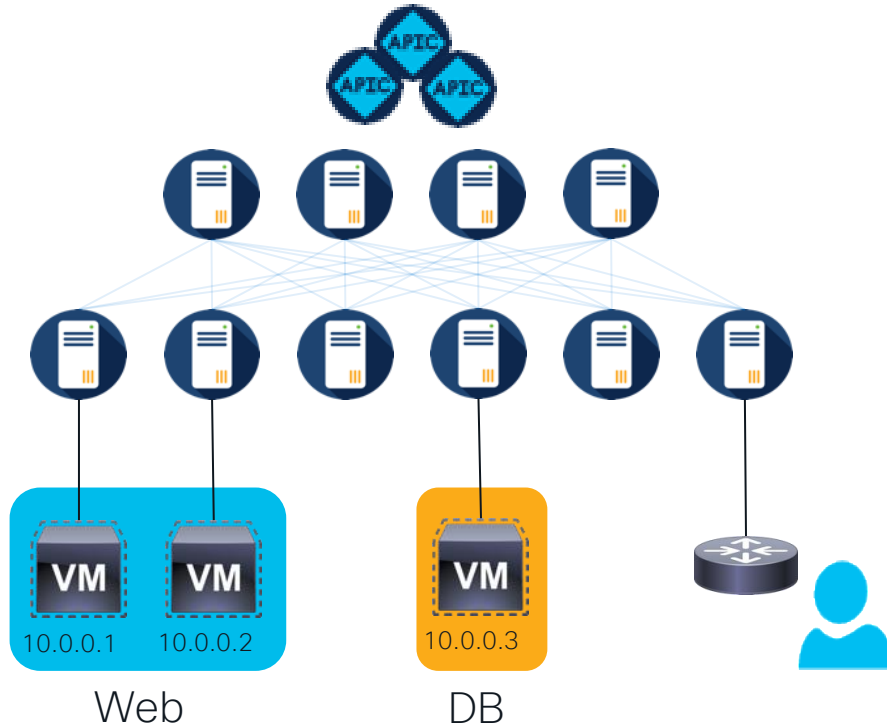# Use Case: Microsegmentation with ESG

- ACI Endpoint Security Group (ESG)

- Enforce Service Micro Segmentation in network

- Consul-Terraform-Sync automates

  - ESG and ESG Selector

  - Contracts

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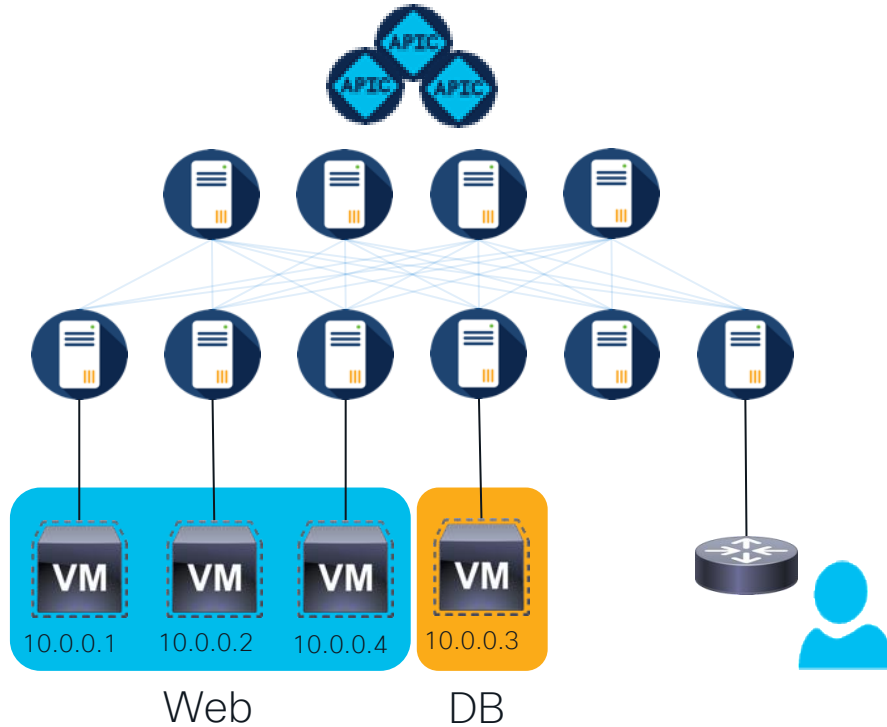
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Web   DB

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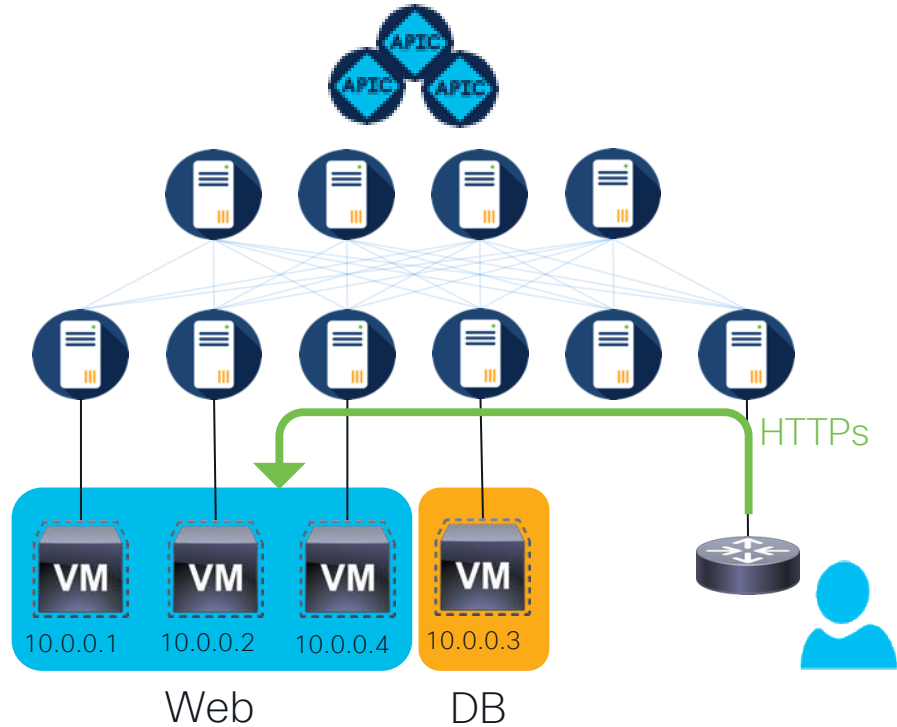# Use Case: Microsegmentation with ESG

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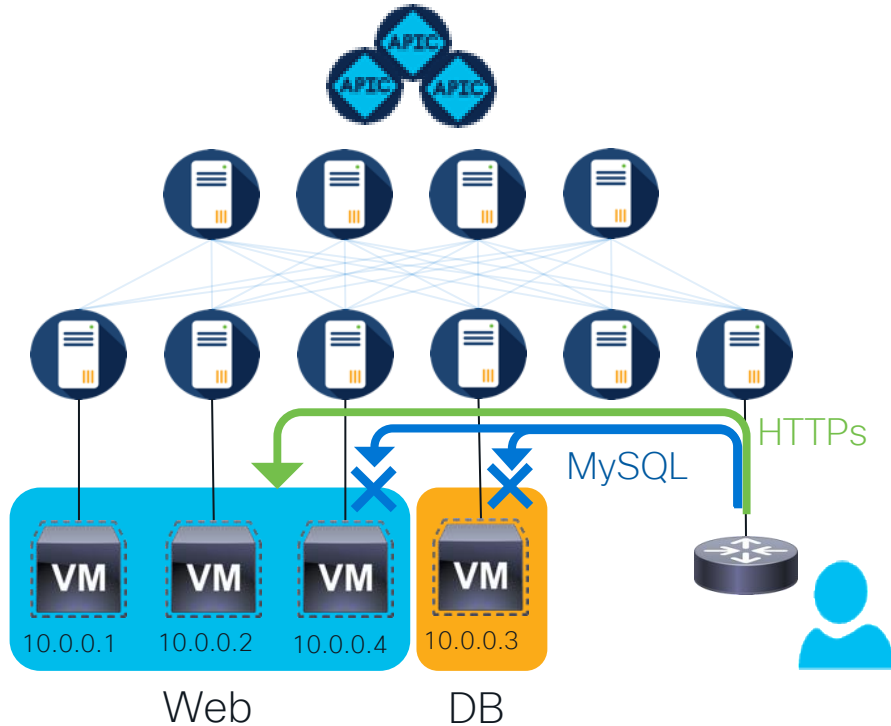
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Use Case: Microsegmentation with ESG

MySQL

HTTPs

10.0.0.1   10.0.0.2   10.0.0.4   10.0.0.3

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