



# SERVICE MESH ACCELERATOR ON AZURE

Customizable Service Mesh deployment  
utilizing Infrastructure as Code and  
Automation

Microsoft  
Partner



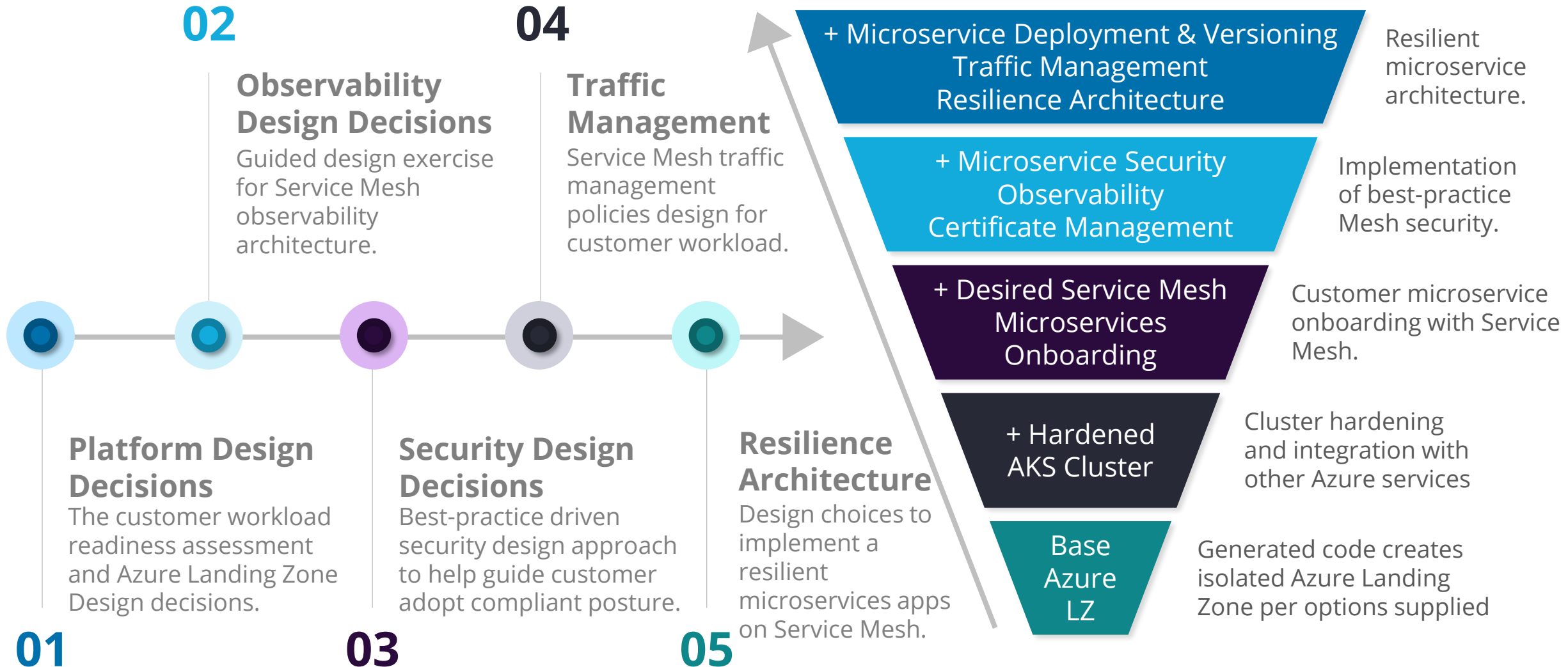
2021 Partner of the Year Winner  
Financial Services Award  
Global SI Digital Transformation Award  
Analytics Award



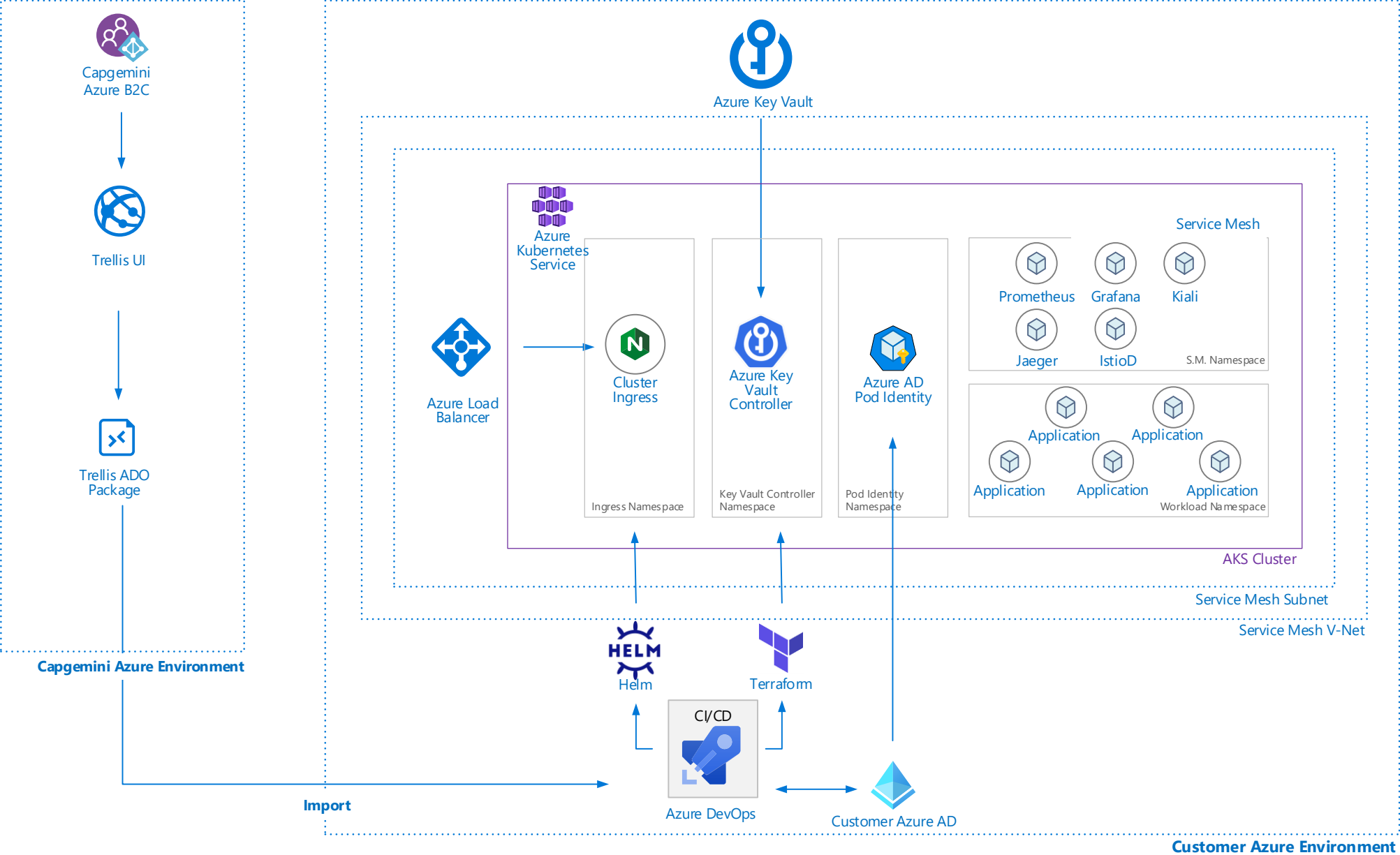
# ENGAGEMENT PROCESS AND OUTCOMES



Capgemini Service Mesh Accelerator engagement model uses the pre-determined set of design decision templates to guide customer thru the step-by-step process in each one of the 5 key areas of Service Mesh architecture.



# SERVICE MESH REFERENCE ARCHITECTURE



# BUSINESS CASE: FINANCIAL COMPANIES MIGHT FEEL OVERWHELMED BY COMPLEXITY ADOPTING SERVICE MESH FOR AKS



**Our solution addresses some of the common difficulties customer face when adopting a Service Mesh at Azure Kubernetes Services. Customers can implement Service Mesh to increase observability, traffic control and security around their complex microservices architecture. The solution offers a repeatable automated solution to deploy Service Mesh on the Cluster.**

## CHALLENGES

Service Mesh adoption is a challenging endeavour for financial service organization:

- What design choice to consider.
- Understanding the need for Service Mesh in your environment.
- How to onboard and offboard a microservice app on Service Mesh.
- How to avoid code modifications.
- How to manage and leverage Service Mesh security.

## IDEAL SOLUTION

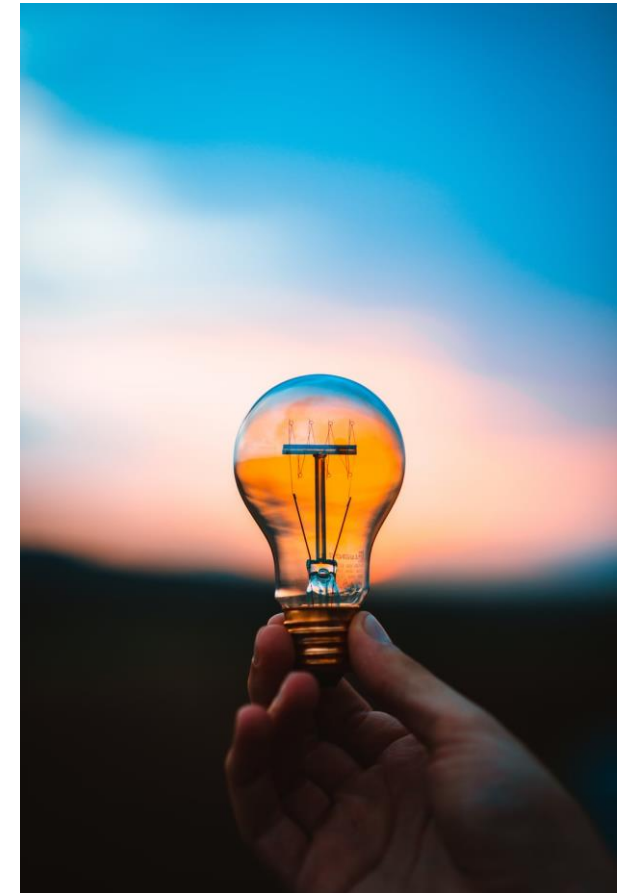
Using highly integrated, automated solution, we help address the challenges financial customers face:

- A CLI that enables customization for Azure AKS and Service Mesh.
- Option to deploy multiple Service Meshes – OSM or Istio.
- GitOps style downloadable code that includes IaC and ADO pipelines YAML.
- All Cloud resources work in unison to create an end-to-end solution.

## DESIRED OUTCOMES

Some of the benefits our solutions offers are:

- Significantly reduced implementation time with multiple Service Mesh options.
- High observability: Prometheus, Grafana and Kiali and more tools deployed out of box.
- Reduced complexity with automated orchestration.
- Sample application that represent a microservice architecture.





# CAPGEMINI SERVICE MESH ACCELERATOR: VALUE PROPOSITION

<b>S</b> SAVES TIME Saves up to 6 sprints of effort.	<b>M</b> MODELED Comes with an engagement model for Mesh implementation.	<b>A</b> ADAPTABLE Highly adaptable code-based approach.	<b>S</b> SIMPLIFIED Abstracts complexity for quick value realization.	<b>H</b> HARDENED Follows security best-practice with highly integrated AKS.
<p>Capgemini's Service Mesh Accelerator incorporates best-practice design decisions and allows a straight-line approach to Mesh adoption.</p> <p>Customer saves 4 - 6 sprints worth of time on innovation, rediscovering, and reinventing</p>	<p>The accelerator provides a 6-week representative engagement model (Azure Board) that guides the customer thru a model-based design approach to onboard actual microservices workload.</p> <p>The engagement model allows for customization of Service Mesh implementation that fits the customer requirements.</p>	<p>The accelerator enables adaptability by Azure Kubernetes Service with built-in microservices security, observability, deployment, versioning, and traffic management capabilities.</p> <p>By incorporating samples, it exemplifies these features out of box for easy adoption with the actual customer workload.</p>	<p>Easy to install CLI enables the customer to customize and generate fully functional code that includes plethora of tools.</p> <p>CLI performs basic validation and ensures all pre-requisites are met. The code-based approach allows for flexibility and reusability while abstracting complexity.</p>	<p>Capgemini's Service Mesh Accelerator embodies Service Mesh on a fully hardened Azure Kubernetes Cluster.</p> <p>It delivers secured, fully integrated AKS Cluster with key Azure services so that the customer can launch their microservice workload saving precious discovery cycles.</p>



# CAPGEMINI SERVICE MESH ACCELERATOR: WHAT'S IN THE OFFER

Capgemini offers a well-rounded end-to-end automation solution to deploy Microsoft Open Service Mesh (OSM) or Istio Service Mesh on Azure Kubernetes Services.

## Access To Accelerator UI

Customer is provided secure access to the downloadable Trellis CLI. The App generates the Infrastructure as Code and Azure AD Pipeline YAML. Customer can customize their deployment for the Azure networking, Kubernetes Cluster, Service Mesh and Cloud security.

## Hardened Azure Kubernetes Cluster

The generated code encapsulate the customizations for the Azure Kubernetes cluster. The options include Kubernetes version, VM Size, Node count, private vs. public cluster, advance networking, and RBAC. The fully managed cluster enables quick iterations of microservices apps.

## Service Mesh and Integrated Tools

The accelerator comes with options of multiple service meshes - Microsoft Open Service Mesh and Istio. Service mesh comes integrated with tools and manifests that enable Service Mesh visualization, traffic management, security, and resilience features.



# CAPGEMINI SERVICE MESH ACCELERATOR: WHAT'S IN THE OFFER

Our solution provides a kick-start platform to launch highly secured Service Mesh solution on the Azure Kubernetes Service including all the necessary Azure services and integrations to innovate with microservice.

## Azure Key Vault Integration with Cluster

Following the Azure best practices for security, the generated code includes Azure Key vault that is fully integrated with the cluster. A sample self-signed TLS certificates are provided for end-to-end traffic encryption and mTLS implementation in service mesh.

## Pod Identity For Securing Workload

Azure AD Managed Identity is a widely accepted security trend for deploying customer workload on in Azure. Our solution includes Azure AD Pod Identity components that enables the customer to adopt managed identity-oriented RBAC paradigm in their applications.

## Ingress for Internal or External Traffic

Our solution incorporates NGINX Ingress Controller / Istio Ingress to allow cluster workloads to be securely accessible from an external endpoint. With TLS encryption in place, this architecture can be easily extended for actual workloads in the customer environments.

# SERVICE MESH ENGAGEMENT ARTIFACTS



The Service Mesh Accelerator also generates importable Azure Board. This templated, ready-to-use plan speeds up the delivery. The board highlights the key decisions to be made in Service Mesh adoption and workload onboarding process.

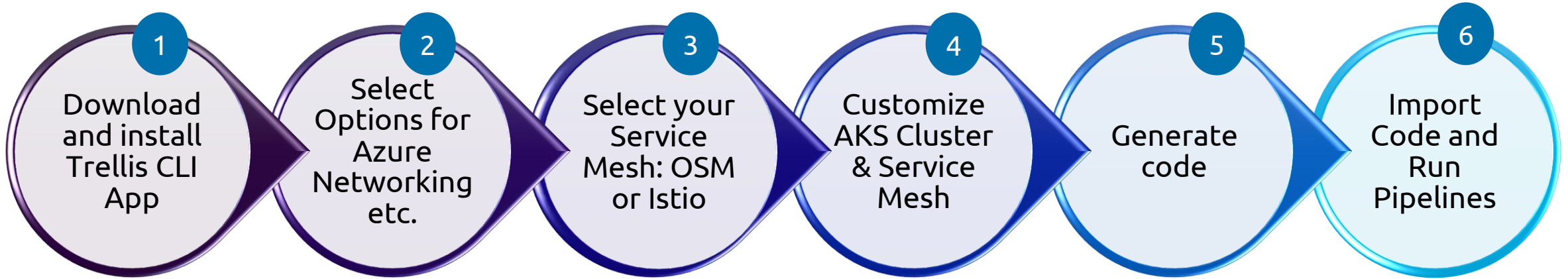
+ -	Order	Work Item Type	Title	State
		Epic	▼  Service Mesh Implementation	● New
		Feature	>  Discovery and Onboarding	● New
		Feature	>  Customer Microservice Workload	● New
		Feature	>  Platform Architecture AKS	● New
		Feature	>  Observability Architecture	● New
		Feature	>  Security Architecture	● New
		Feature	>  Traffic Management Architecture	● New
		Feature	▼  Resilience Architecture	● New
		User Story	Circuit breakers	● New
		User Story	Timeouts	● New
		User Story	Retry's	● New
		User Story	Fault Injection	● New
		User Story	latency-aware load balancing	● New
		User Story	Service Mesh resilience design	● New
+		Feature	>  Trellis rollout	● New



# CAPGEMINI SERVICE MESH ACCELERATOR - CODE GENERATION



Capgemini Service Mesh Code Generator – a downloadable CLI tool and IaC based automation to provision Open Service Mesh or Istio Service Mesh on Azure Kubernetes service and generate artifacts like Repos and YAML pipelines.



1 Download and install the pre-packaged CLI tool in your environment.

2 Provide options to create V-Net and Subnets that host the AKS cluster.

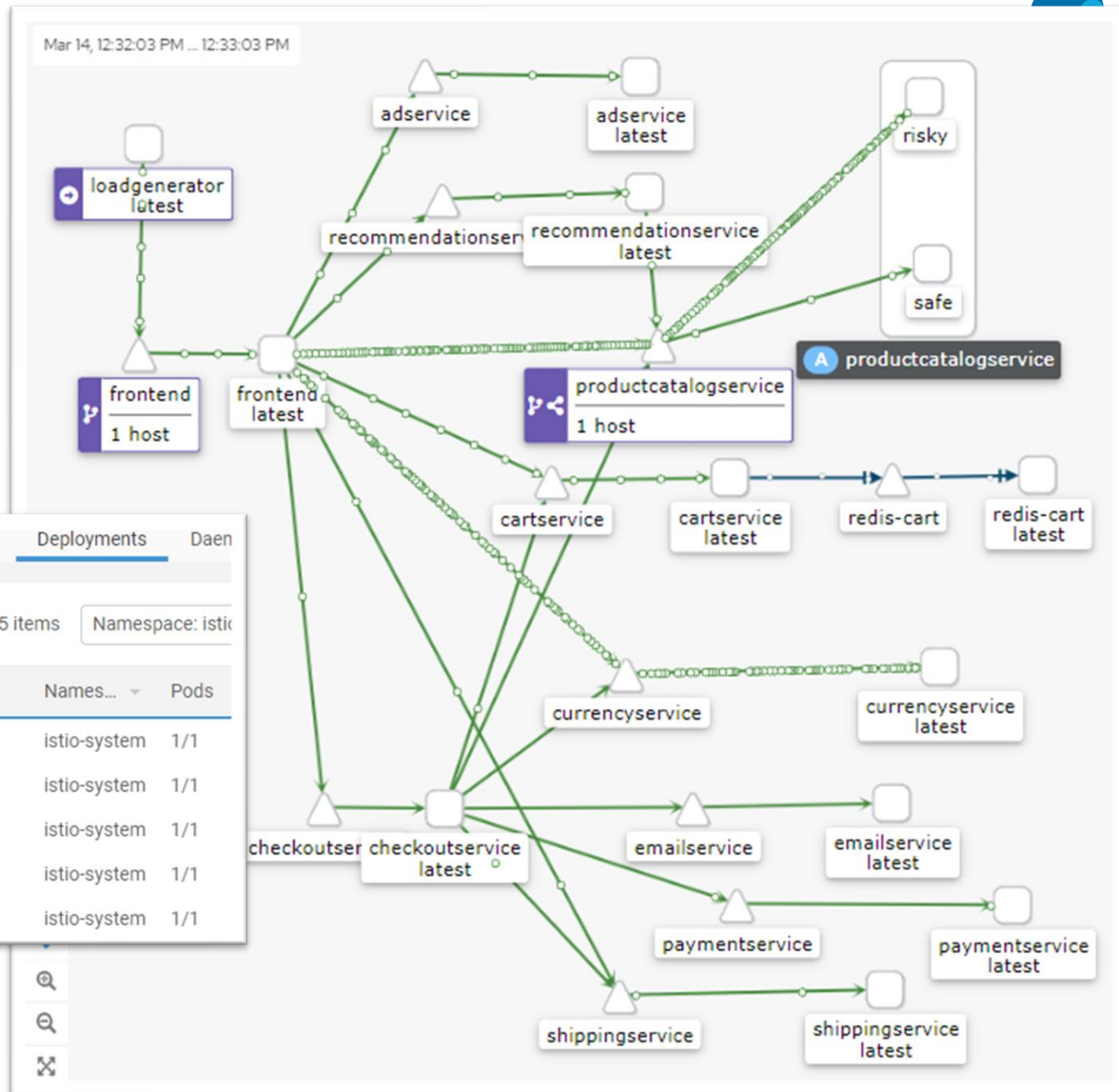
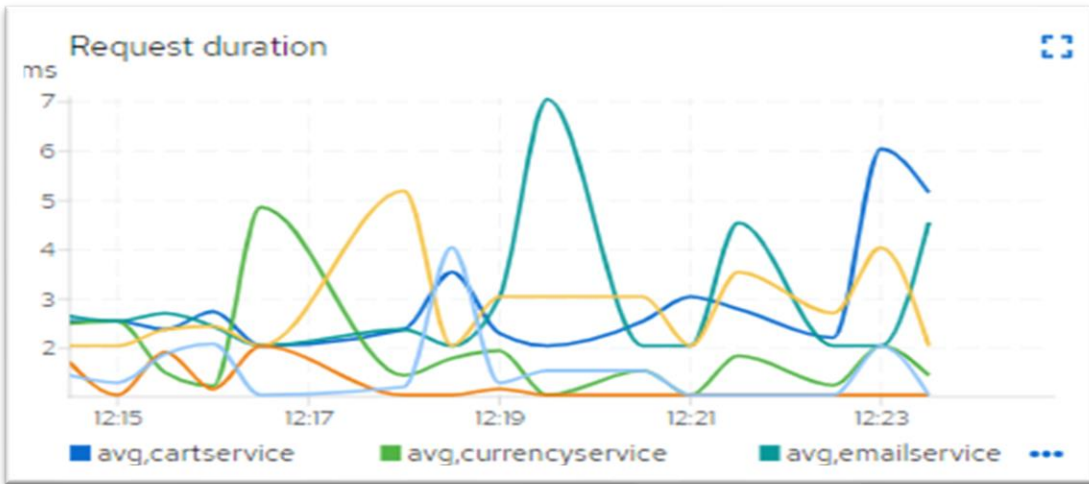
3 Select your choice of Service Mesh – Microsoft Open Service Mesh or Istio

4 Choose options to customize your AKS cluster such as size, # of nodes etc.

5 Generate code. This generates a zip file that contains IaC and YAML files for ADO Pipelines.

5 Customer will securely import the package in their ADO organization/Project. With a few prerequisites, these Pipelines produce the complete Service Mesh infrastructure.

# ACCELERATOR DEMO



Trace Details Spans Details

Workload Filter by Workload

2 Spans 2 Apps involved 0 Spans with error

Timeline App / Workload Summary

Application: checkoutservice  
Workload: checkoutservice  
Operation: paymentservice.ns-boutique.svc.cluster.local:50051/\*  
Component: proxy  
Duration: 2.26ms

Application: paymentservice  
Workload: paymentservice  
Operation: paymentservice.ns-boutique.svc.cluster.local:50051/\*  
Component: proxy  
Duration: 1.51ms

Overview Pods Deployments Daen

Deployments 5 items Namespace: istio

Name	Names...	Pods
<input type="checkbox"/>	grafana	istio-system 1/1
<input type="checkbox"/>	istiod	istio-system 1/1
<input type="checkbox"/>	jaeger	istio-system 1/1
<input type="checkbox"/>	kiali	istio-system 1/1
<input type="checkbox"/>	prometheus	istio-system 1/1



## About Capgemini

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