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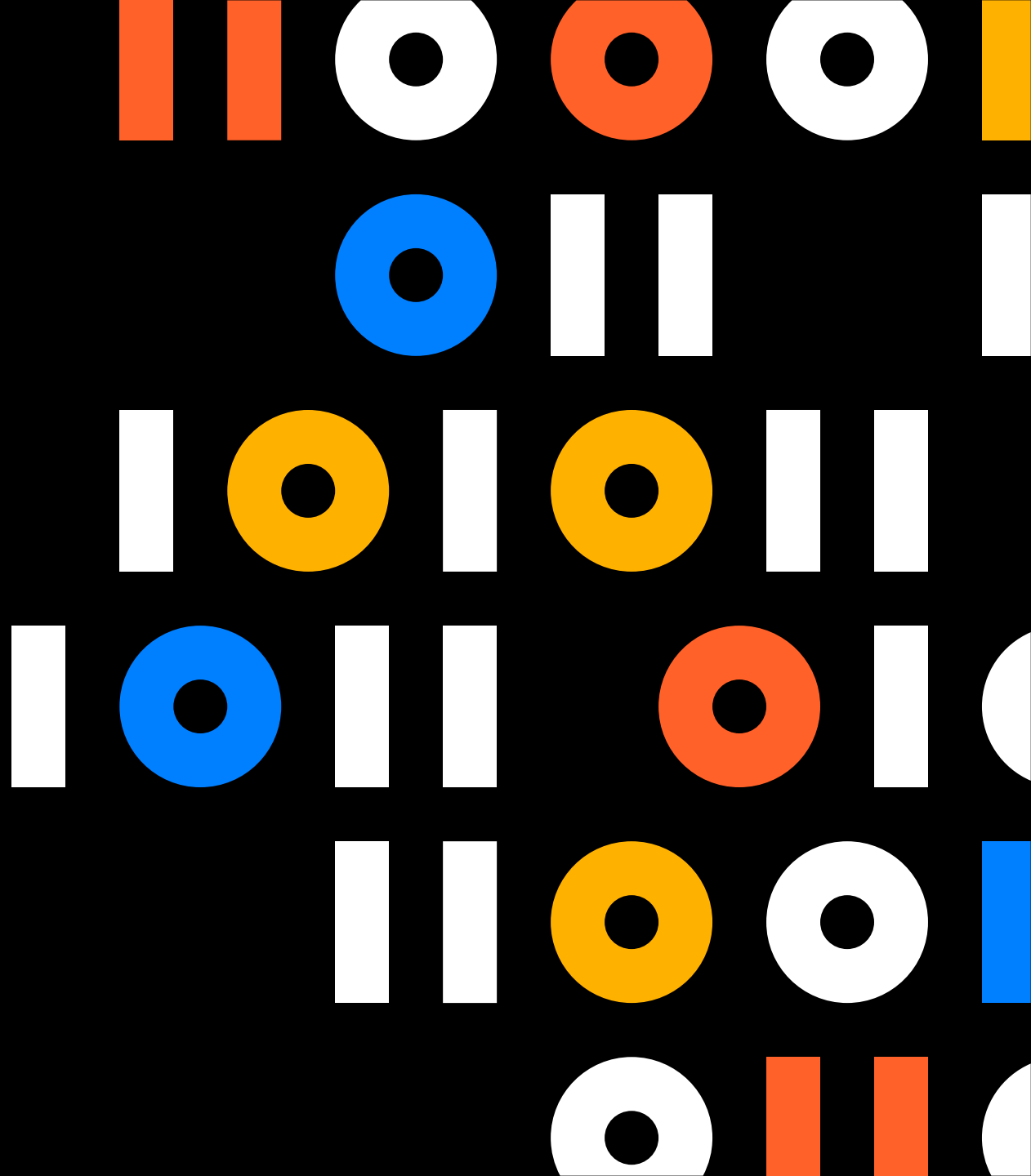
# Private Cloud & Security Lab

*powered by Lenovo*



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# Agenda

| Godzina | Temat |
| --- | --- |
| 9:30-10:00 | Rozpoczęcie spotkania i wspólne śniadanie. |
| 10:00-10:15 | Uroczyste otwarcie i przecięcie wstęgi. |
| 10:15-10:55 | Chmura prywatna na przykładzie Nutanix i VMware. |
| 10:55-11:25 | Przestrzeń Nomios Private Cloud & Security Lab powered by Lenovo. Architektura i możliwości wykorzystania. |
| 11:25-11:40 | Plan wykorzystania środowisk. |
| 11:40-12:00 | Czas na Q&A i networking. |
| 12:00 | Zakończenie spotkania. |

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# Private Cloud

## VMware VCF
## Nutanix NCP

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TODAY'S REALITY

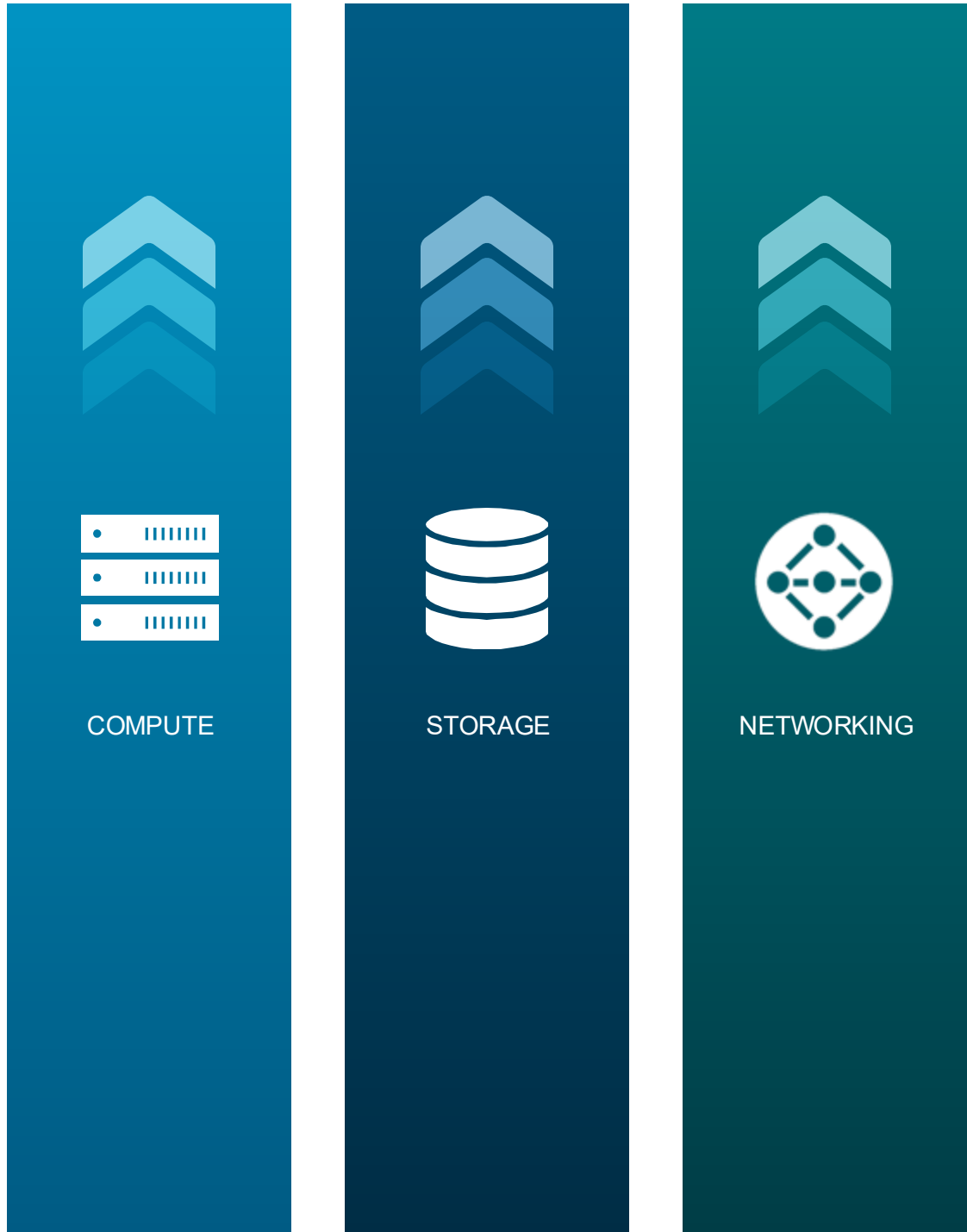
# Data Center Silos Slow Innovation

**42%** HIGHER COST OF OPERATIONS

**40%** ADDITIONAL PHYSICAL SERVER FOOTPRINT

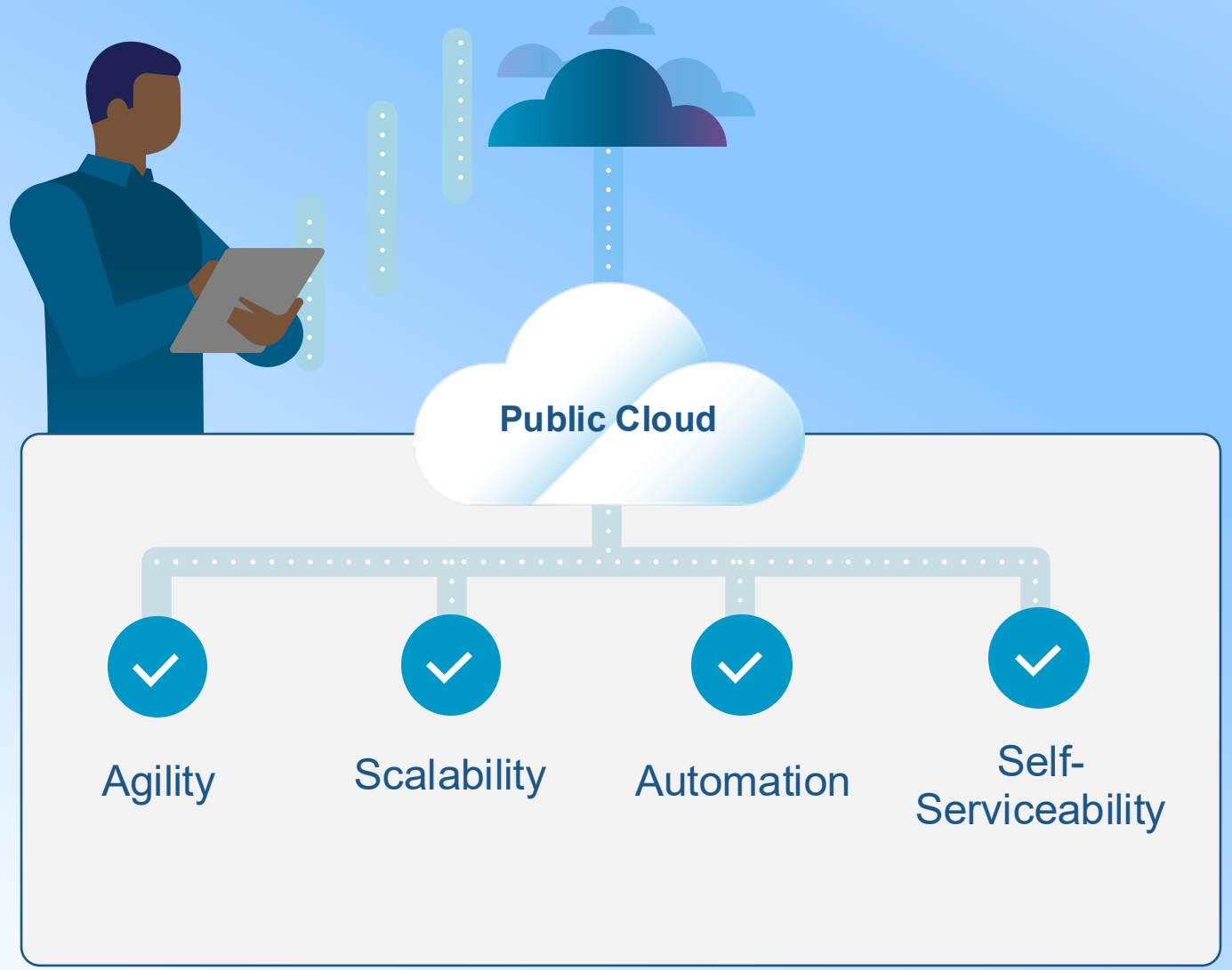
**34%** HIGHER INFRASTRUCTURE COST

Source: IDC. "Business Value of VMware Cloud Foundation" White Paper, sponsored by Broadcom. August 2024. IDC #US52312224



PUBLIC CLOUD

# Unified the Silos

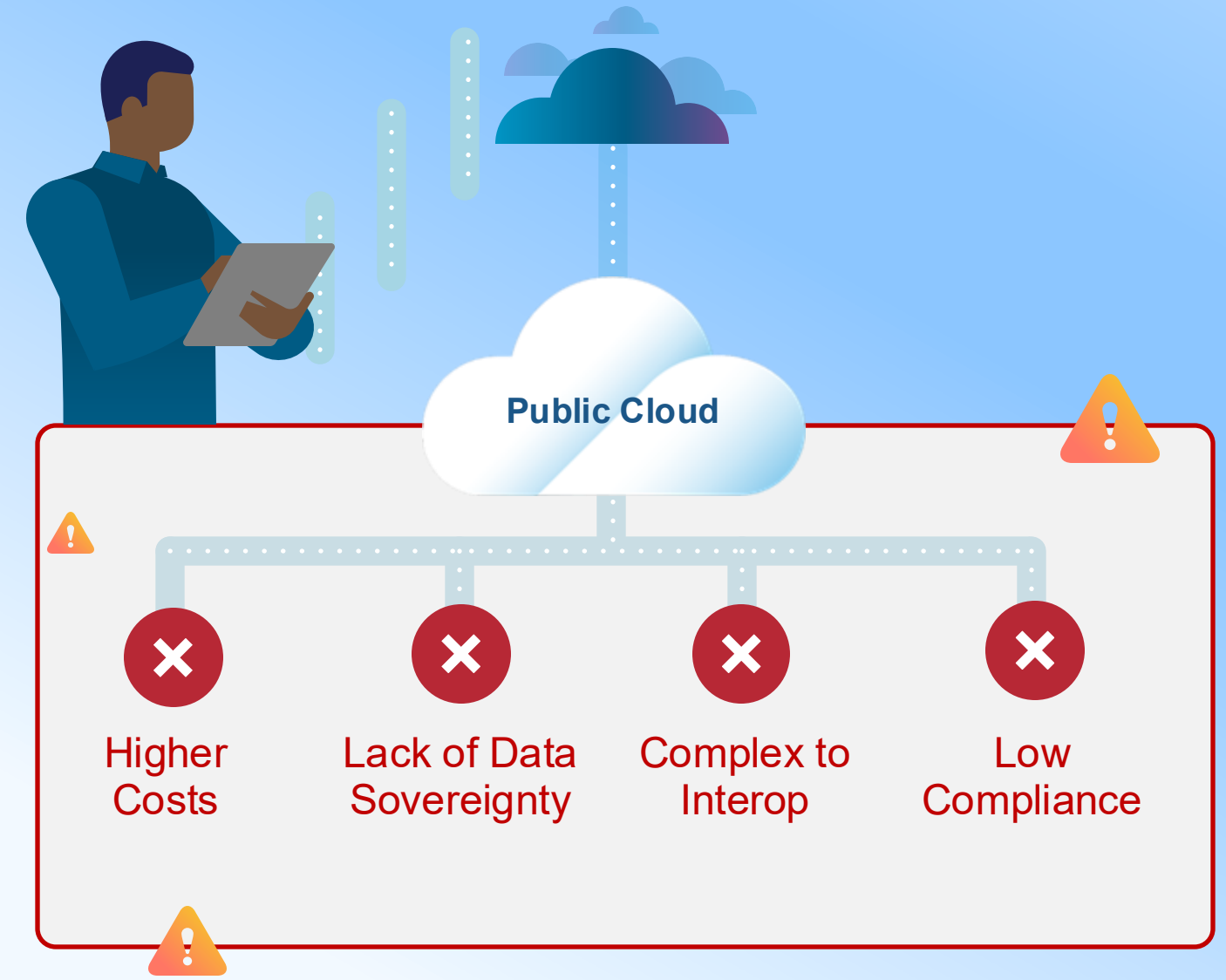


PUBLIC CLOUD

# Unified the Silos but..

**39%** Customers say cloud migrations expensive and complex to manage[1]

**51%** Customers are concerned With privacy[2]




[1]IDC White Paper, sponsored by VMware by Broadcom, The Business Value of VMware Cloud Foundation, doc #US52312224, August 2024
[2] Forrester Research.- Cloud Security — Reality Strikes After Migration

# Modern Private Cloud

The best of both worlds

All the benefits of Public Cloud

- Cost Control
- Agility
- Security
- Scalability
- Resilience
- Automation
- Sovereignty
- Self-serviceability

All the benefits of the Data Center

PRIVATE CLOUD IS NOT A LOCATION.

# It's a way of working - an operating model.

### Software-Defined Infrastructure

Compute, storage, network, security, data protection

### Self-Service and Automation

Consumption-focused with tenant control and automation

### Workload Agnostic

Modern, traditional, and AI workloads

### Location Agnostic

On-prem, hyper-scaler, edge, sovereign/CSP

### Security and Governance

Resiliency, cost control, automated LCM and policy enforcement

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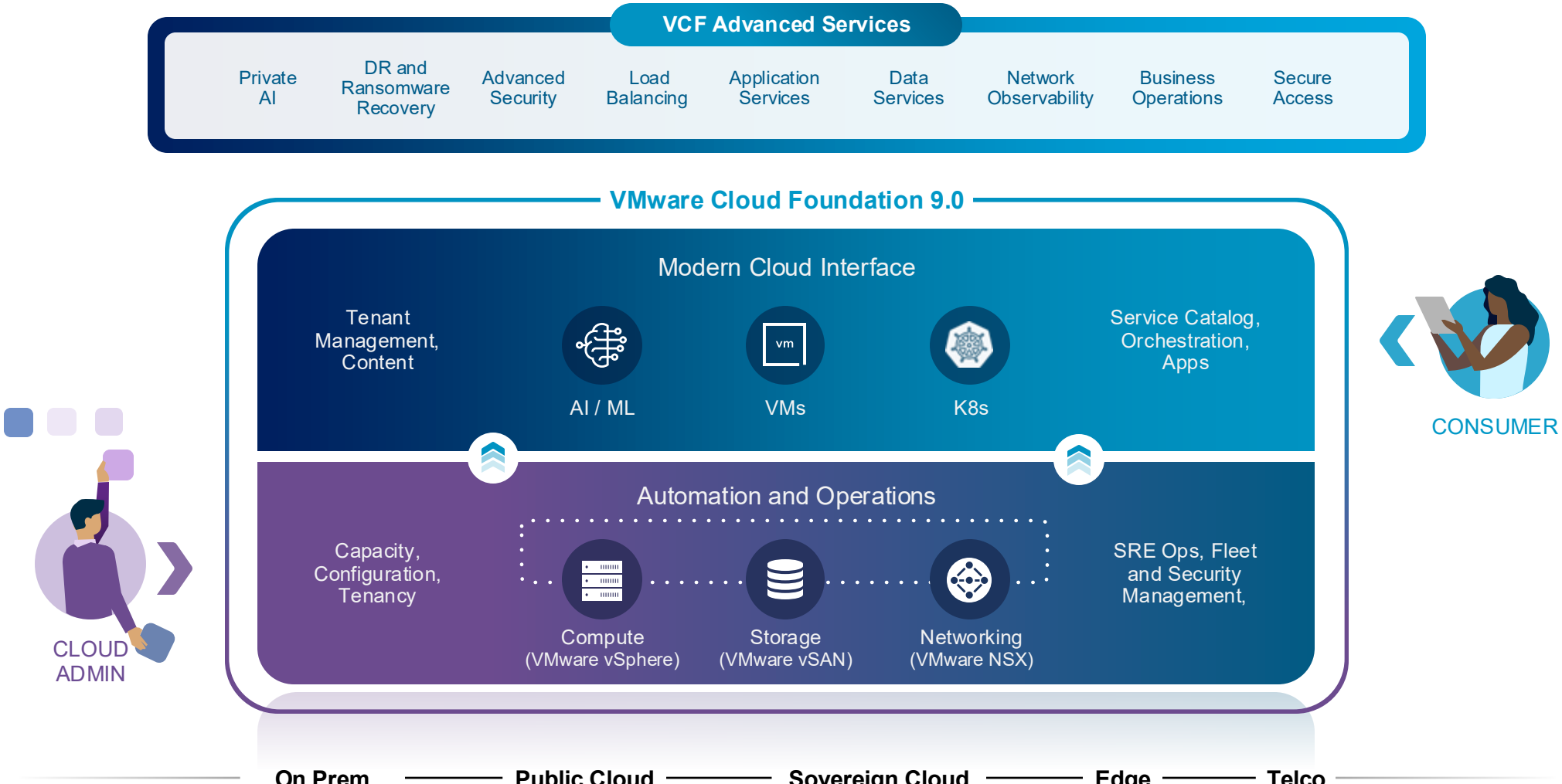
# VMware Cloud Foundation

# Delivering the Modern Private Cloud

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# The Fundamental Shift in VMware Cloud Foundation 9.0

## One Interface

to private cloud operations

## One Interface

for a cloud consumption experience

## Run VMs and containers/K8s

for AI, modern, and traditional applications

## Sovereign And Secure

as a platform

## Cost Control

private cloud cost transparency

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# A Robust Catalog of Advanced Services

## Private AI

VMware Private AI Foundation with NVIDIA

## DR and Ransomware Recovery

VMware Live Recovery

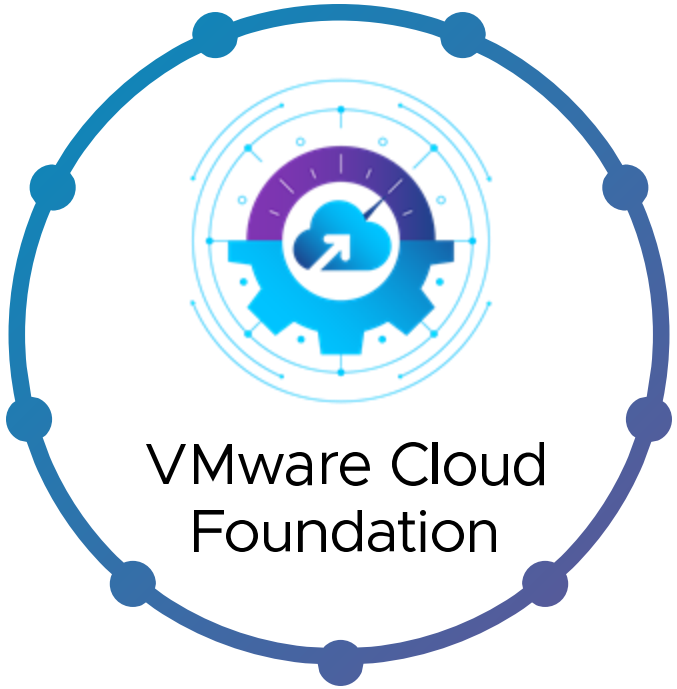
## Advanced Security

VMware vDefend Firewall

VMware vDefend Firewall w/ATP

## Load Balancing

VMware Avi Load Balancer




## Application Services

VMware Tanzu Platform

VMware Tanzu Spring Essentials

VMware Tanzu App Catalog

## Secure Access

Identity Access Management

Privileged Access Management

## Business Operations

Automic Automation by Broadcom

ValueOps by Broadcom

## Network Observability

Network Observability by Broadcom

## Data Services

VMware Data Services Manager

VMware Tanzu Data Suite

VMware Data Services

VMware Tanzu Rabbit MQ

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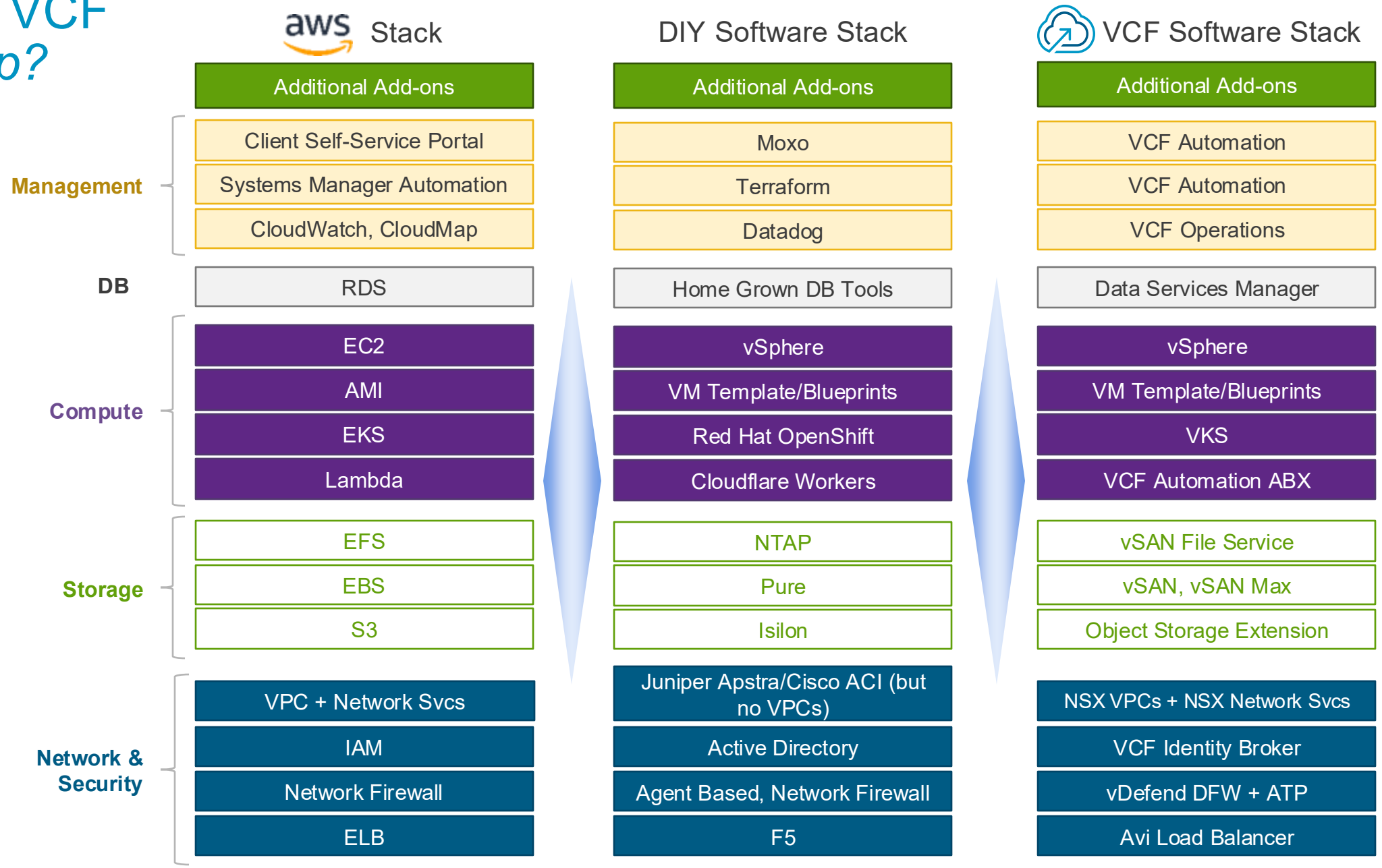
# How Does VCF *Stack up?*

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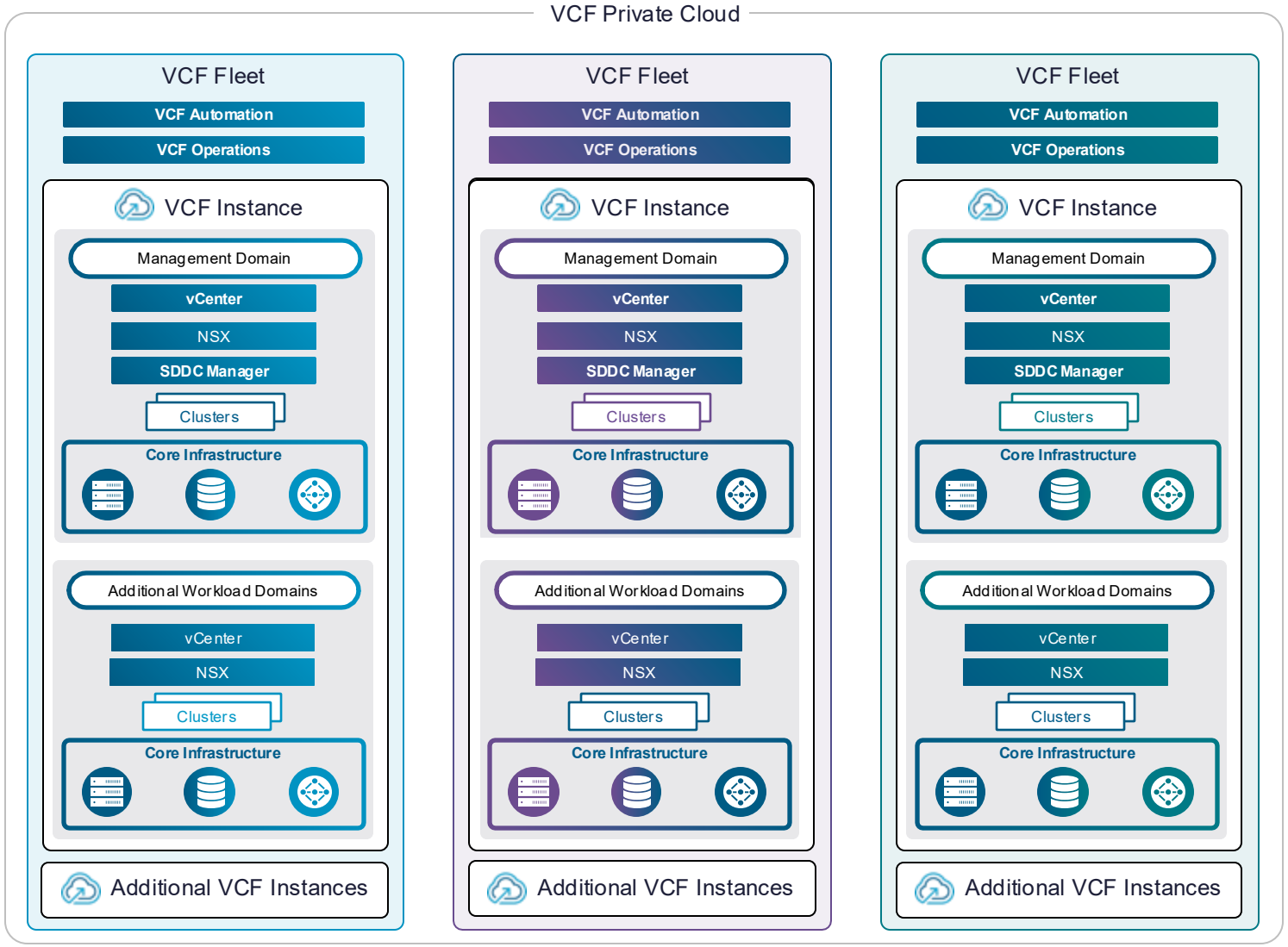
# Private Cloud Constructs within VMware Cloud Foundation




## VCF Instance

- Management Domain
- Workload Domains

## VCF Fleet

- One or more VCF instance
- Common VCF Operations instance
- Common VCF Automation Instance

## VCF Private Clouds

- One or more VCF Fleets

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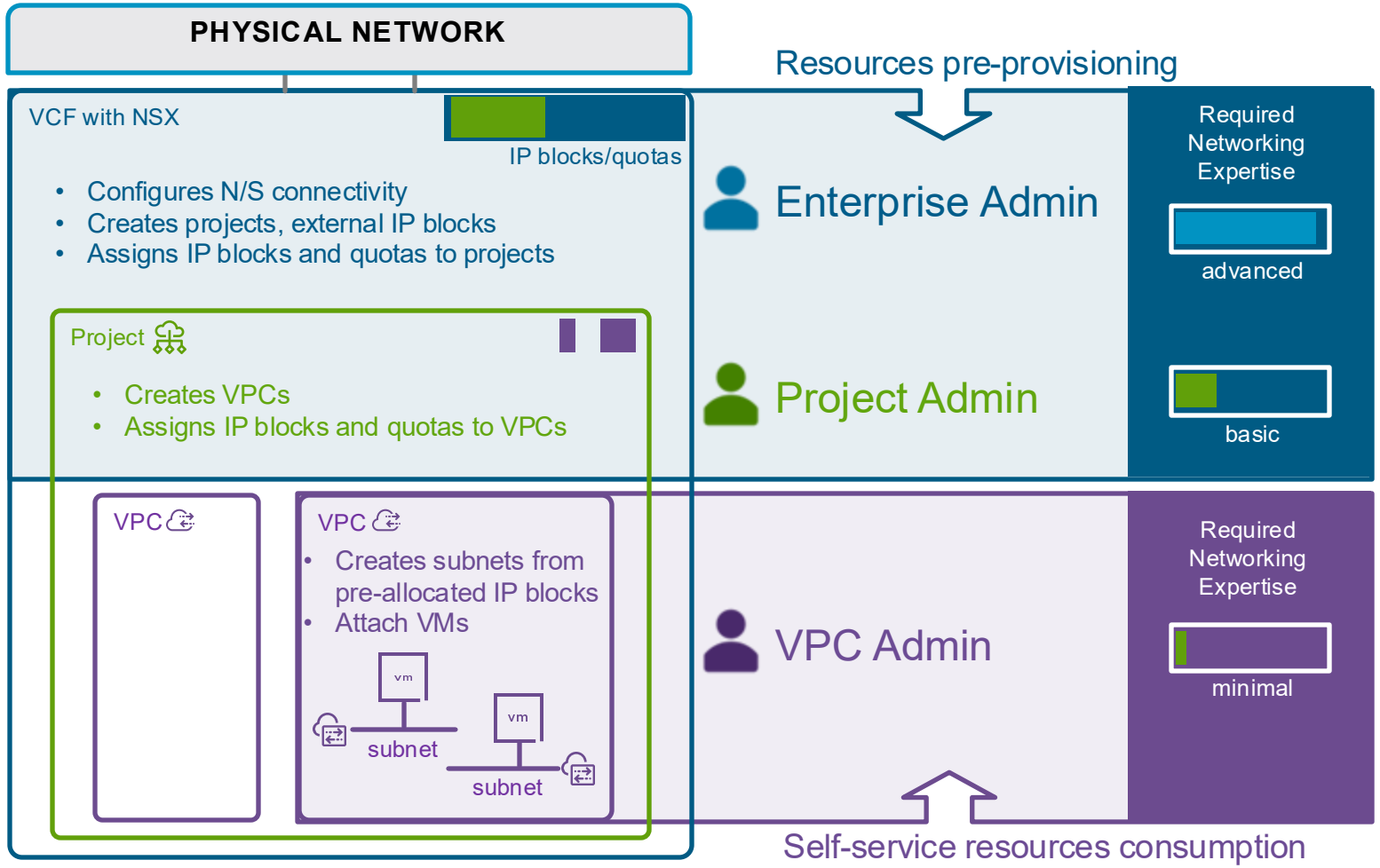
# Simple Networking with Virtual Private Clouds (VPCs)

## Consistent implementation of Virtual Private Clouds (VPCs) across the platform




Clear role definition allows self-service networking

**Enterprise Admin:**

- Owns the physical infrastructure

**Project Admin:**

- A tenant
- No direct access to physical network

**VPC Admin:**

- End user
- Simple, self-service networking

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# Network Virtualization is Required to Deliver a Modern Private Cloud

## Network Virtualization

### Integrated SDN

Self-service networks with Virtual Private Cloud

Virtual distributed switching & routing

Consistent networking policies across sites

## Modern Apps Networking

### Simplified K8s Networking

Comprehensive network policy model

K8s platform agnostic

Integration with NSX offers a single pane of glass

## Network Visibility and Troubleshooting

### Powerful Monitoring

Pre-deployment assessment

Application discovery

Network topology and metrics visualization

## Workload Mobility

### Large-scale Mobility

Any-to-any vSphere version

Zero-downtime migration

Various migration modes

## Lateral Security*

### E-W Traffic Protection

Stateful L7 Distributed FW

ATP with IDS/IPS, Network Sandbox, NTA/NDR

Security analytics and rule recommendations

*Add-on advanced services not included with VCF

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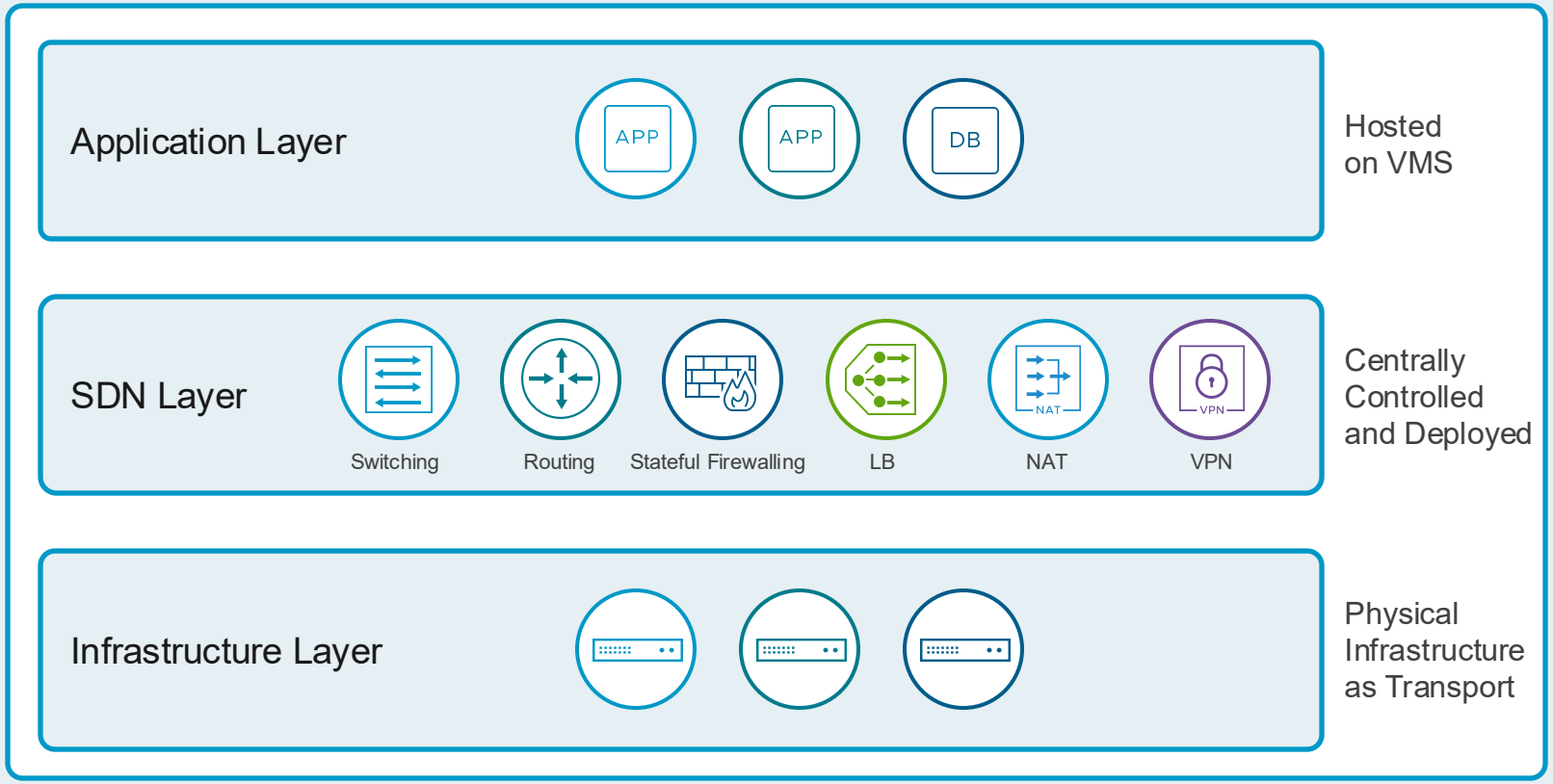
# Software Defined Networking in VMware Cloud Foundation

Networking has changed…

## Software-Defined Networking is Built for the Application




### Applications in Focus

Building a repeatable infrastructure for applications

Abstracts the hardware layer and virtualizes network resources

### Operations

Policy-based enforcement based on application behavior

Enforcement at application level and not at multiple points in the infrastructure

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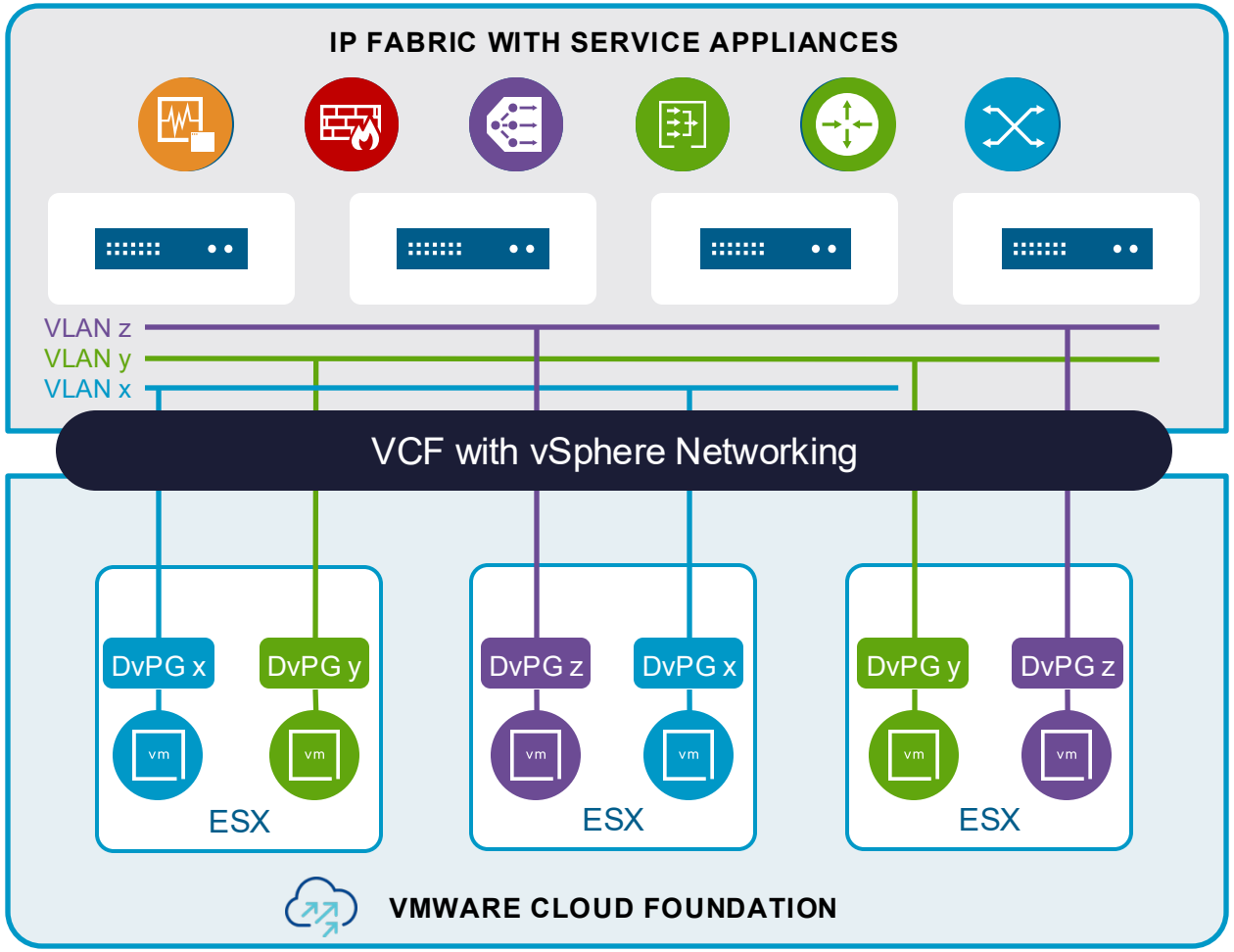
# VCF with Physical Networking




Vendor #1 configuration/API — Switching

Vendor #2 configuration/API — Routing/NAT

Vendor #3 configuration/API — Load Balancing

Vendor #4 configuration/API — Firewall, IDS/IPS, ATP

Vendor #5 configuration/API — Monitoring and Analytics

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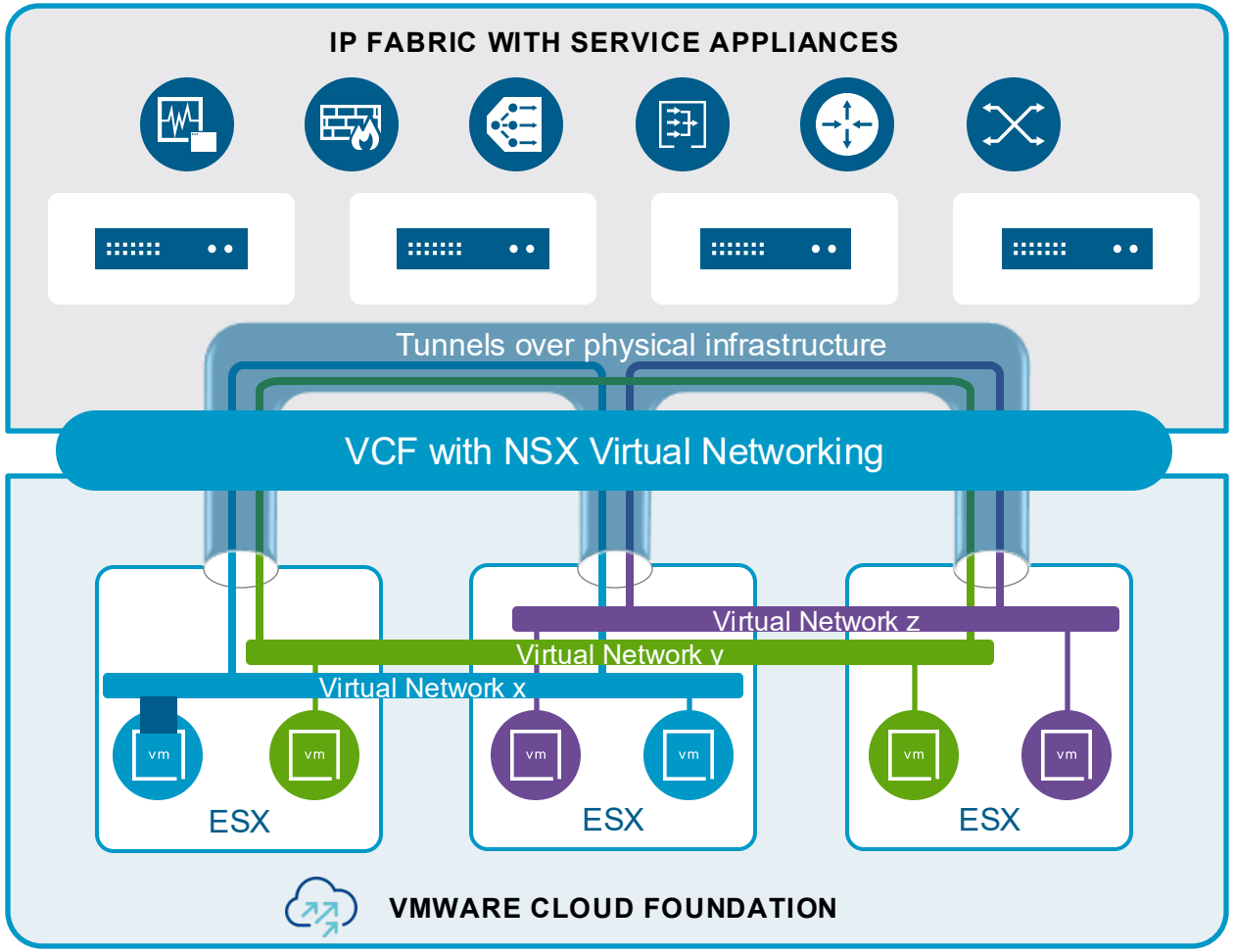
# VCF with NSX Virtual Networking

## Independent of the physical infrastructure

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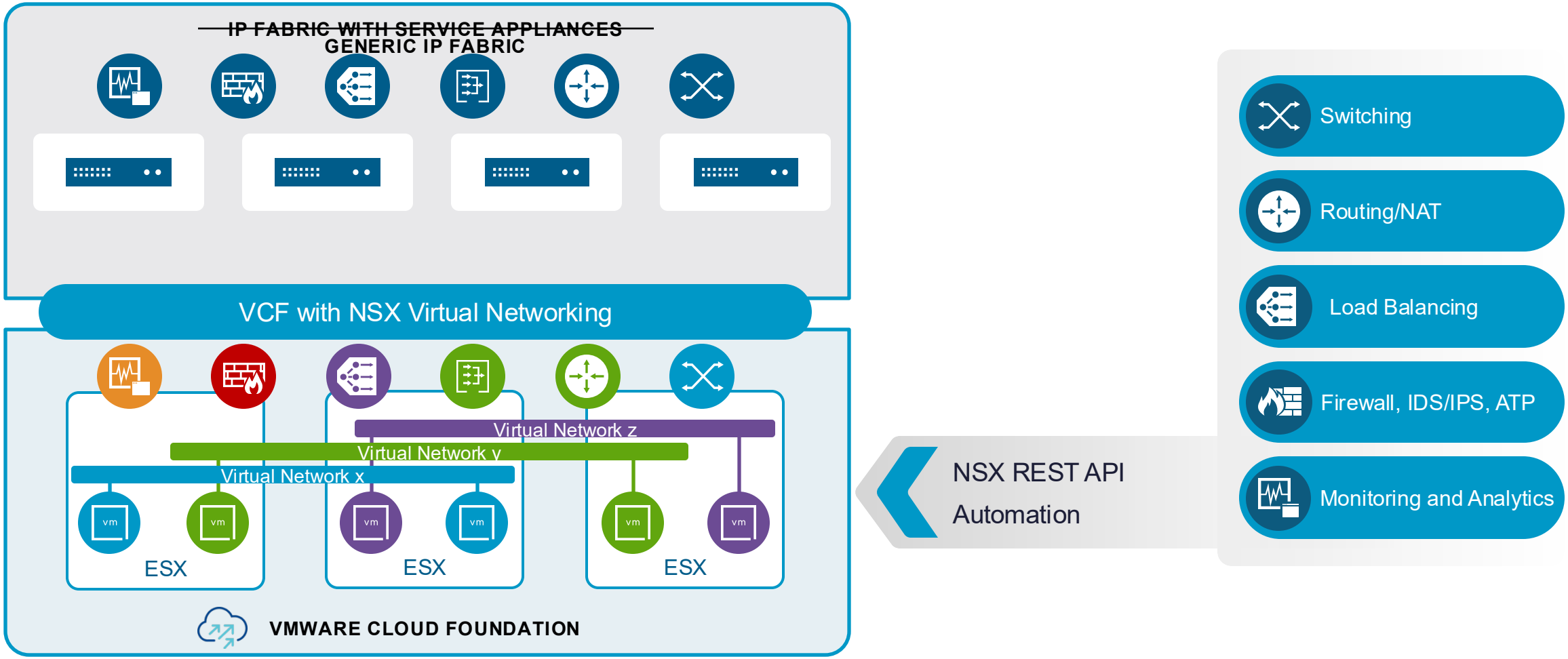
# VCF with NSX Networking

## The whole networking stack is virtualized

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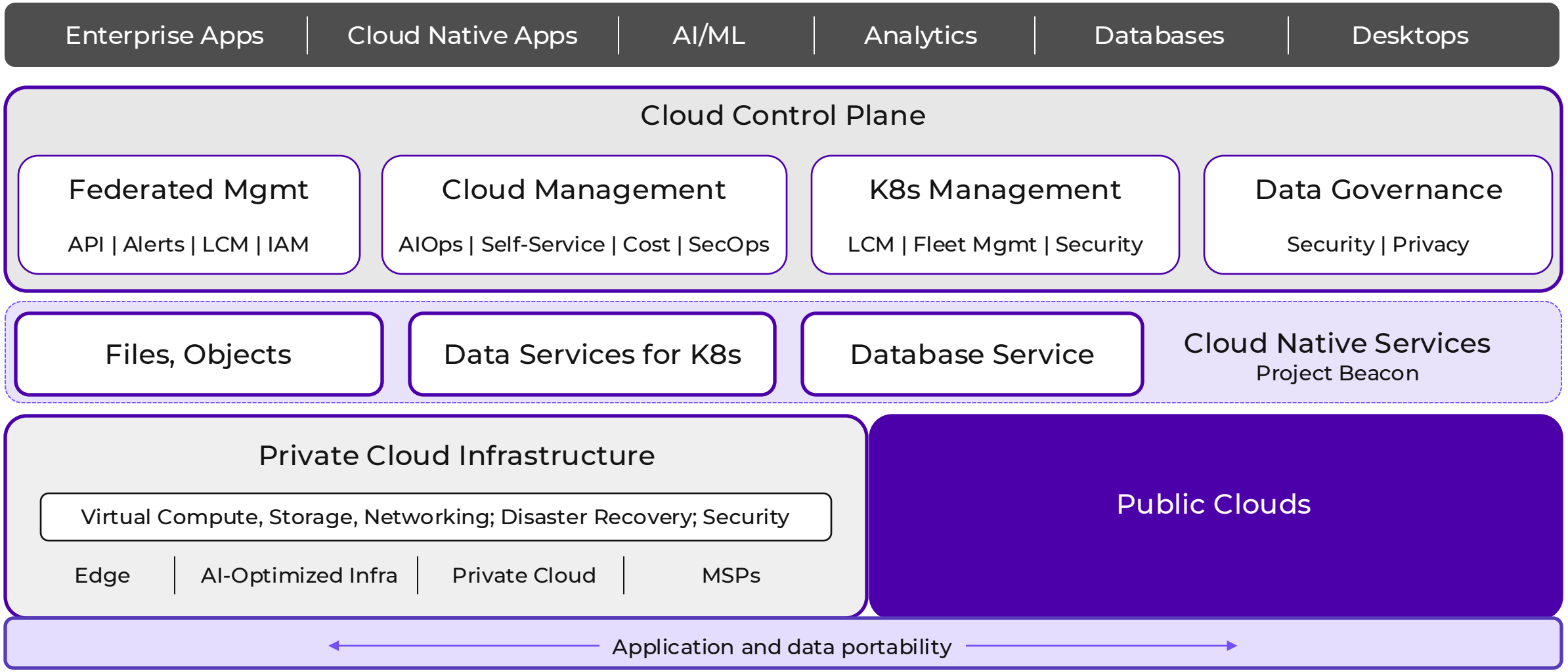
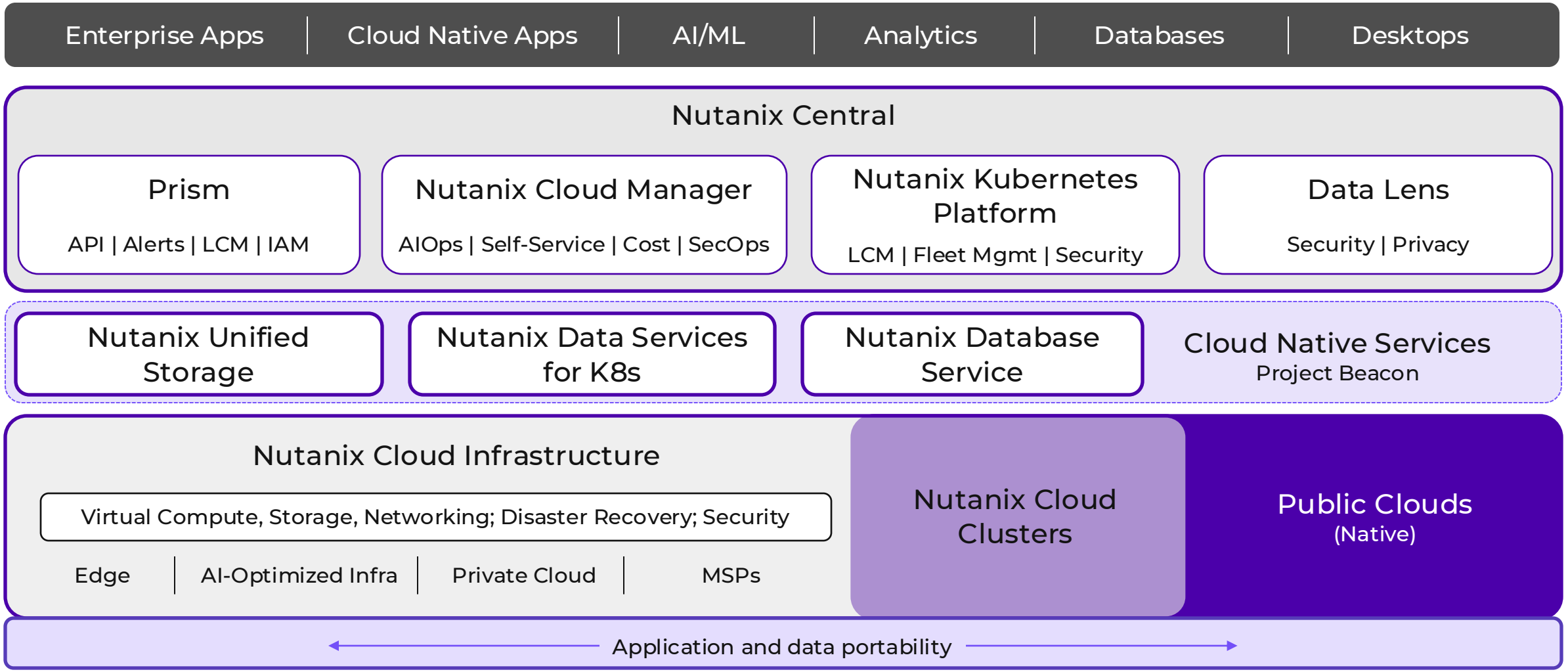
# Nutanix Cloud Platform

# Nutanix Cloud Platform: One Platform for Hybrid Multicloud



# Nutanix Cloud Platform: One Platform for Hybrid Multicloud



# Nutanix Flow Products

Nutanix Cloud Infrastructure

## Flow

Platform-integrated network and security that enables a consistent security cyber-resilience posture anywhere.

### Flow Network Security

- **Flow Network Security (FNS)**
  Basic microsegmentation for workloads, including VMs
- **Flow Network Security Next-Gen (FNS NG)**
  Next-generation microsegmentation including a many-to-one policy model across clouds
- **Security Central**
  A NetSecOps dashboard for all your security workloads and microsegmentation planning

**Platform-Integrated Network and Security Across Clouds**

**Enable a Consistent Cyber-Resilient Security Posture**

**Leverage an Extensive Partner Ecosystem for Defense-In-Depth**

### Flow Virtual Networking

- **Flow Virtual Networking VPCs**
  Software-defined networking fabric enabling overlay networks and VPCs across clouds

# Flow Virtual Networking: Features

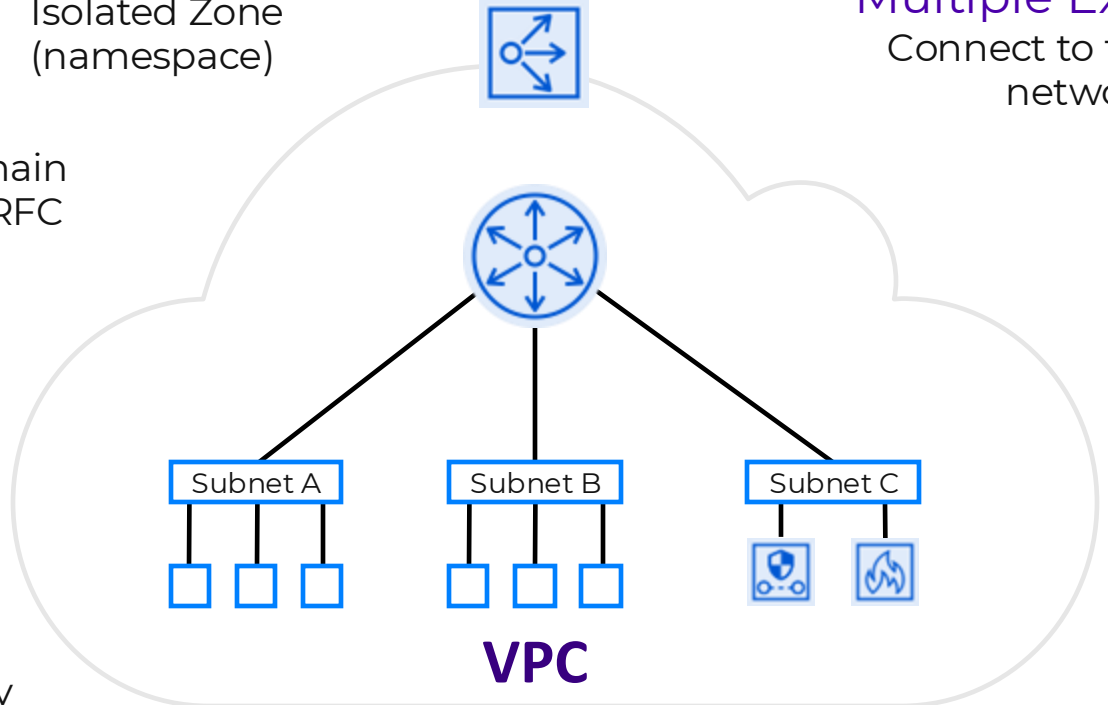
## External Connectivity
NAT and/or No-NAT

## VPC
Isolated Zone (namespace)

## Subnet
Broadcast domain w/IP Prefixes (RFC 1918)

## Hybrid Cloud Connectivity
Stretched Layer 2 to other VPCs

## Network ACLs
Policy to allow or deny between subnets




## Multiple External Networks
Connect to two different external networks at the same time

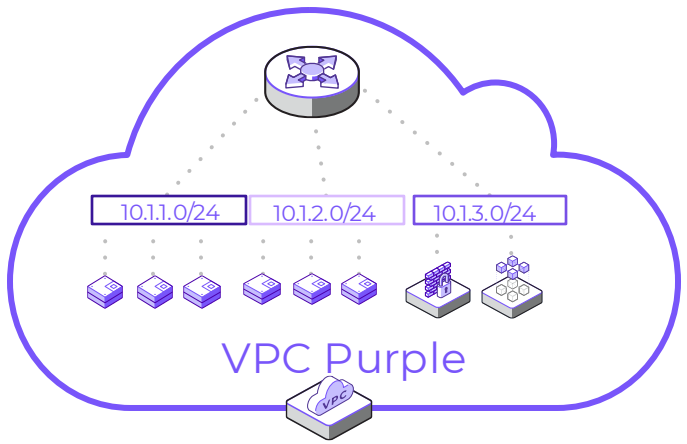
## Floating IP
External IP 1:1 NATted to UVM on VPC

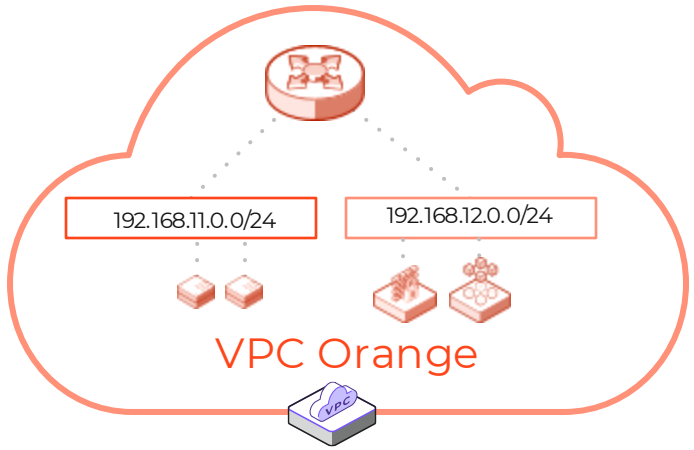
## Policy-based Routing
Route or Redirect traffic between subnets

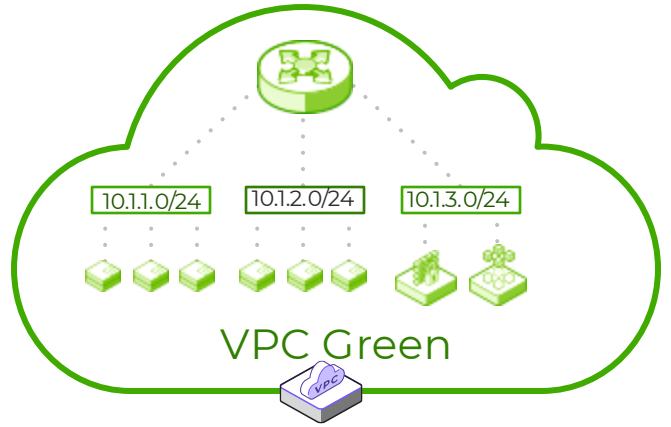
## VPN
Encrypted connection to remote site or VPC

# Flow Net – Logical / Physical

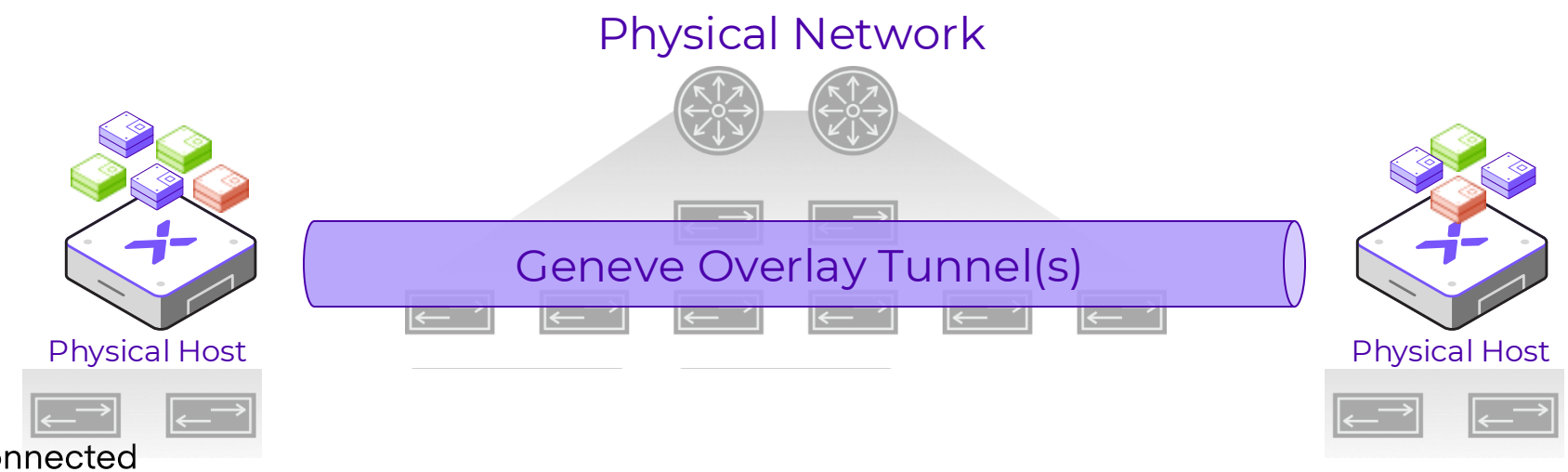
Logical View



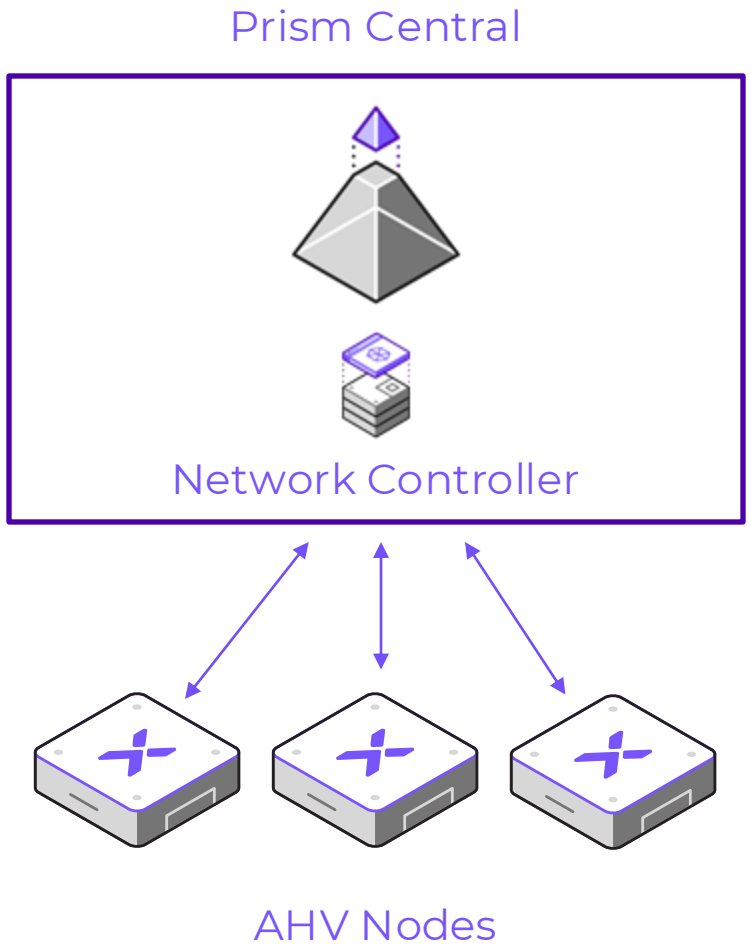




Physical View



# Flow Virtual Networking: Architecture Overview

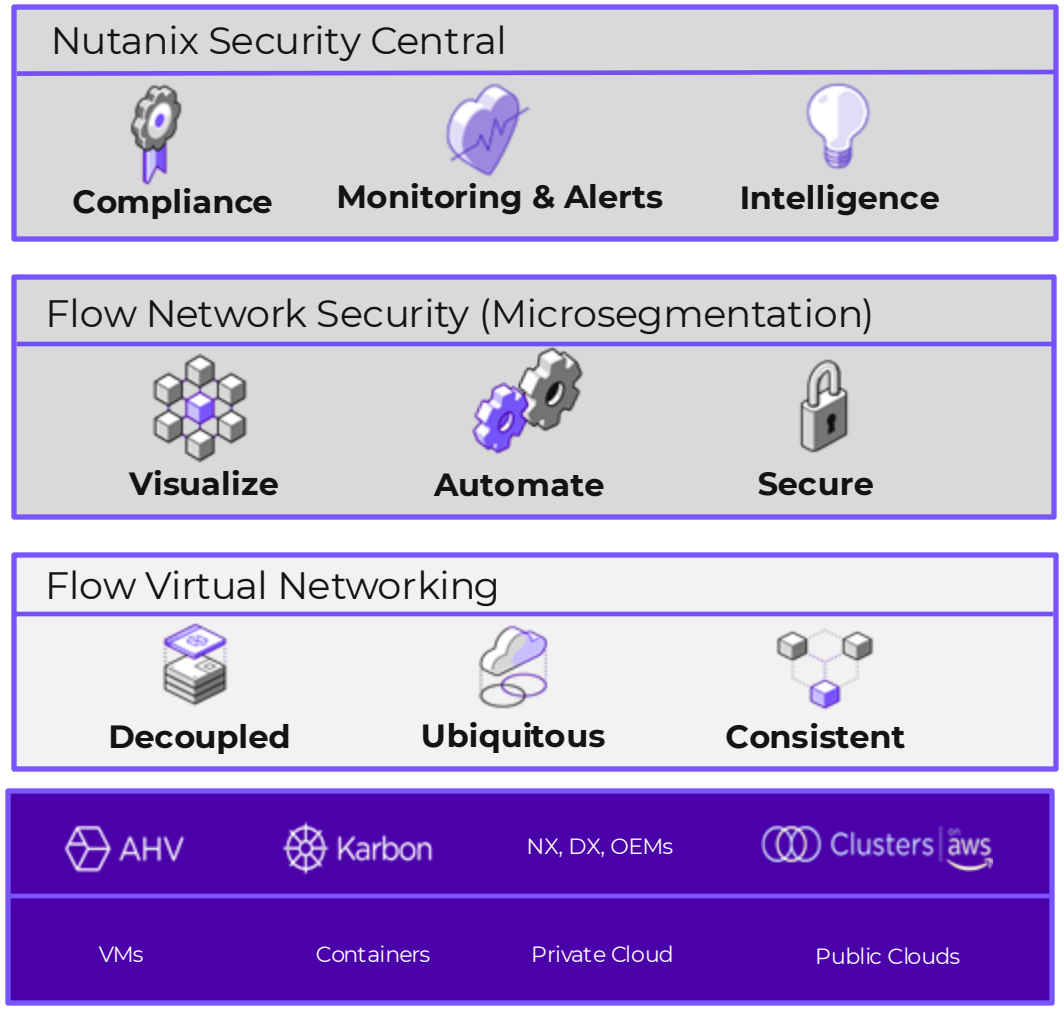



Management Plane → Provides RESTful APIs and UI to users and applications

Control Plane → Programs datapath in AHV nodes according to configuration and policy

Data Plane → Process and forward packets

# Flow Network Security




### Ease of Security Operations

- Security Planning and Dashboards
- GovCloud Support
- Multi-Cloud Compliance
- Query Language and Network

Anomaly

- Findings & Threat Alerts

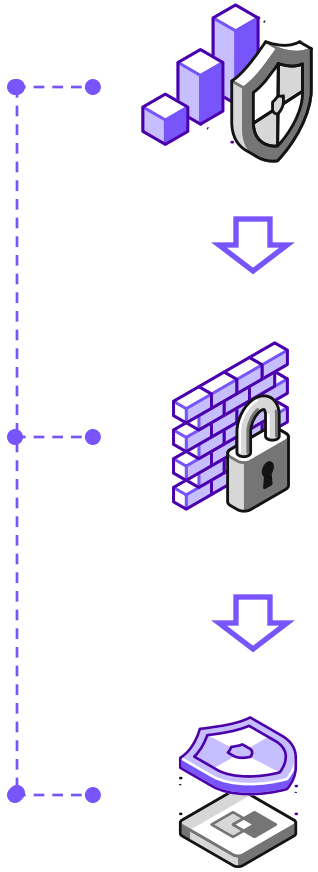
### Enterprise Grade Security and DevOps

- Microsegmentation for App, VDI and ROBO
- Policy Visualization
- Remote Syslog/SIEM Integration
- ID Based Firewall
- Visualization: Search and Filter
- Default VDI Policy
- Calm Blueprint for Service Chains

### Network Fabric for Hybrid Cloud

- VPC (Network Virtualization)
- Multi-tenant self-service networks
- Multiple Ext Networks
- NAT and No-NAT (Routed)
- Secondary IP

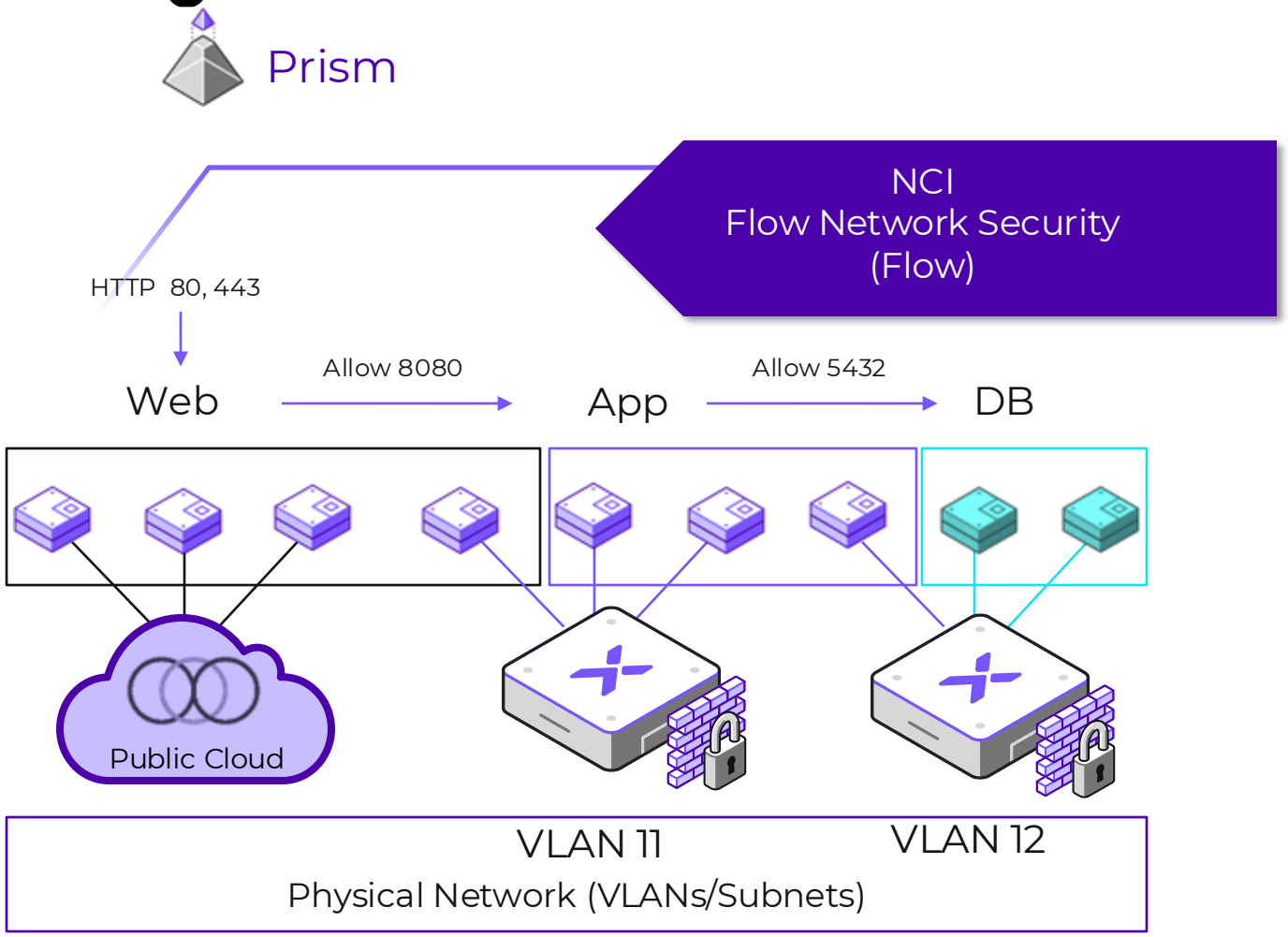
# Flow Network Security: Microsegmentation

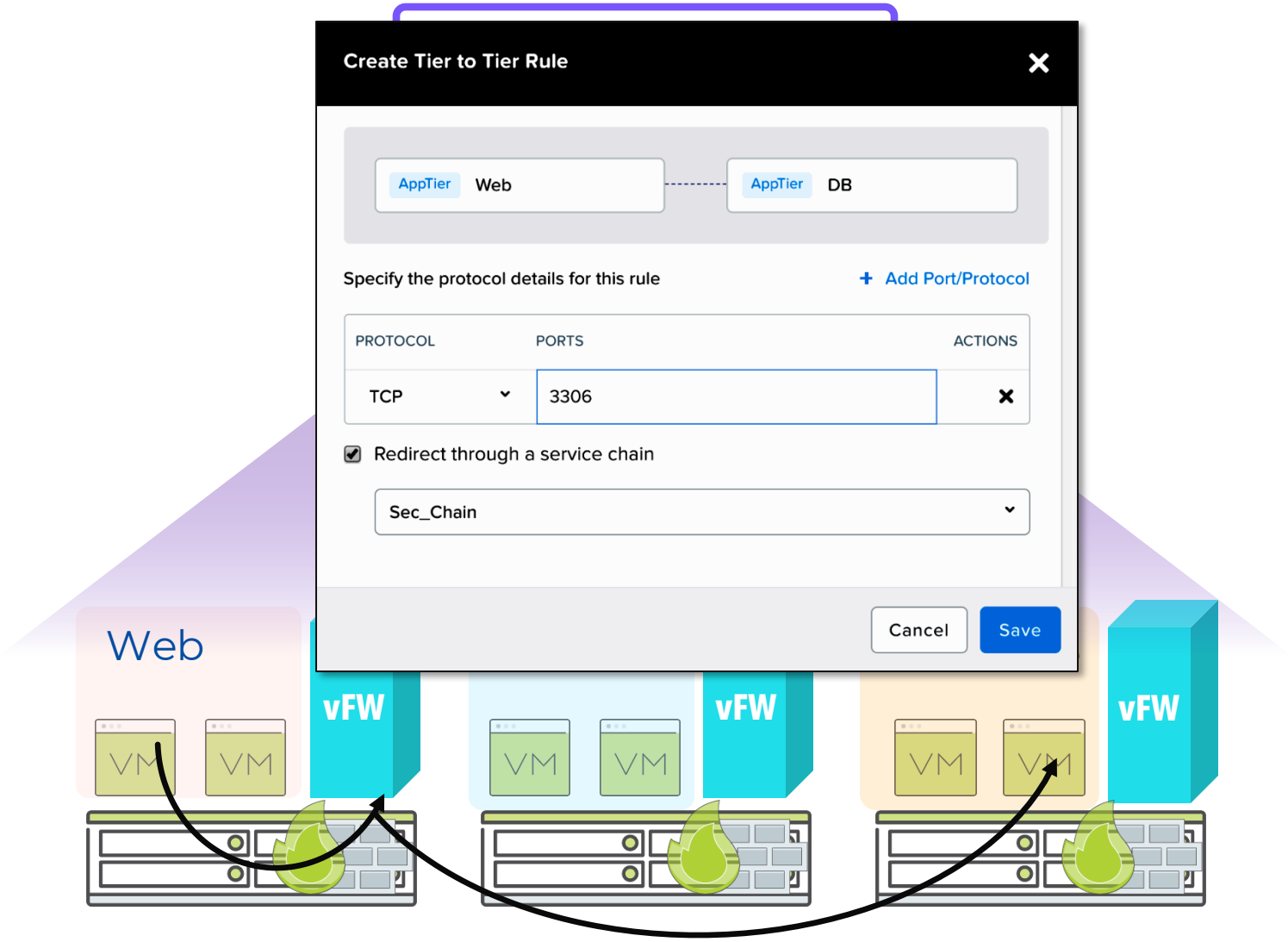


Visualize and Discover apps and their network connectivity

Segment apps and virtual networks; no hardware or complex networking

Secure applications, prevent data loss and support compliance goals






- Cluster wide deployment of service chains with CALM
- Multiple Services Per Chain
- Policy Based Selective Traffic Redirection
- L7/ DPI / Advanced Security with third party Virtual Appliance

## Service Chains with Flow and Calm

**Virtual FW on AHV**

FortiGate-VM

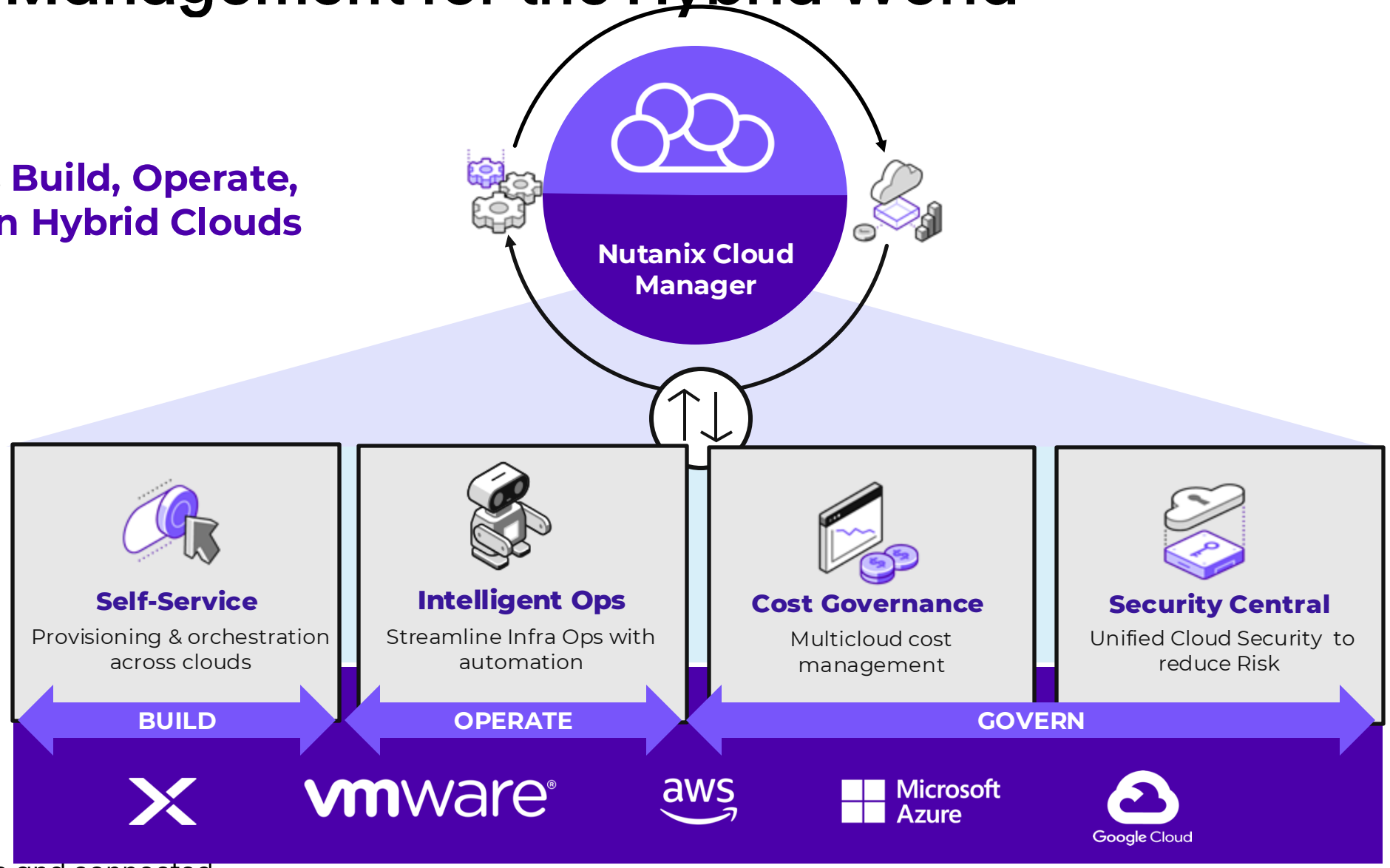
VM-Series

Cloud Guard VE

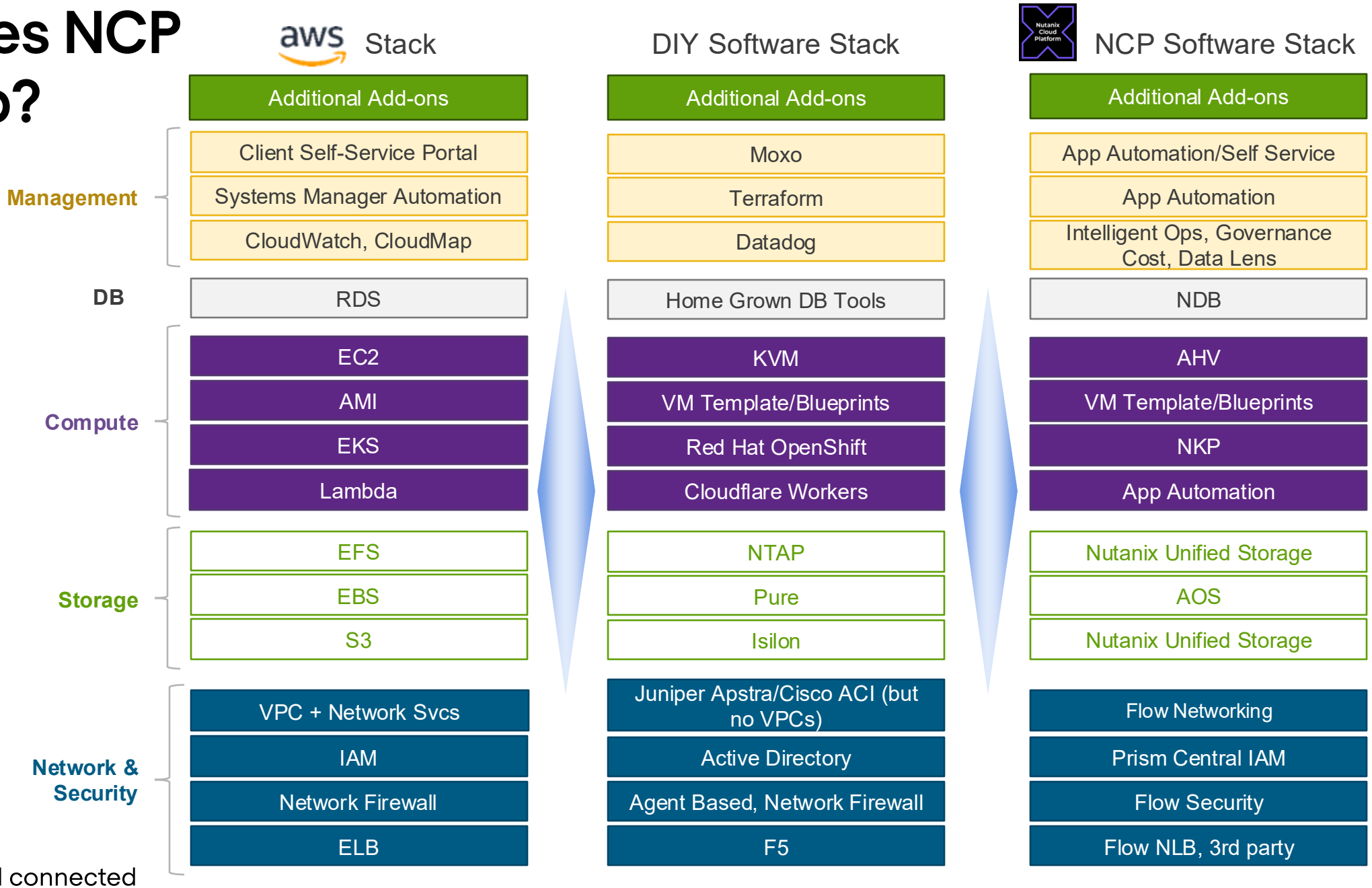
**Virtual Appliance AHV Certified for L3 & vWire mode, Service Chain Certification**

# Cloud Management for the Hybrid World

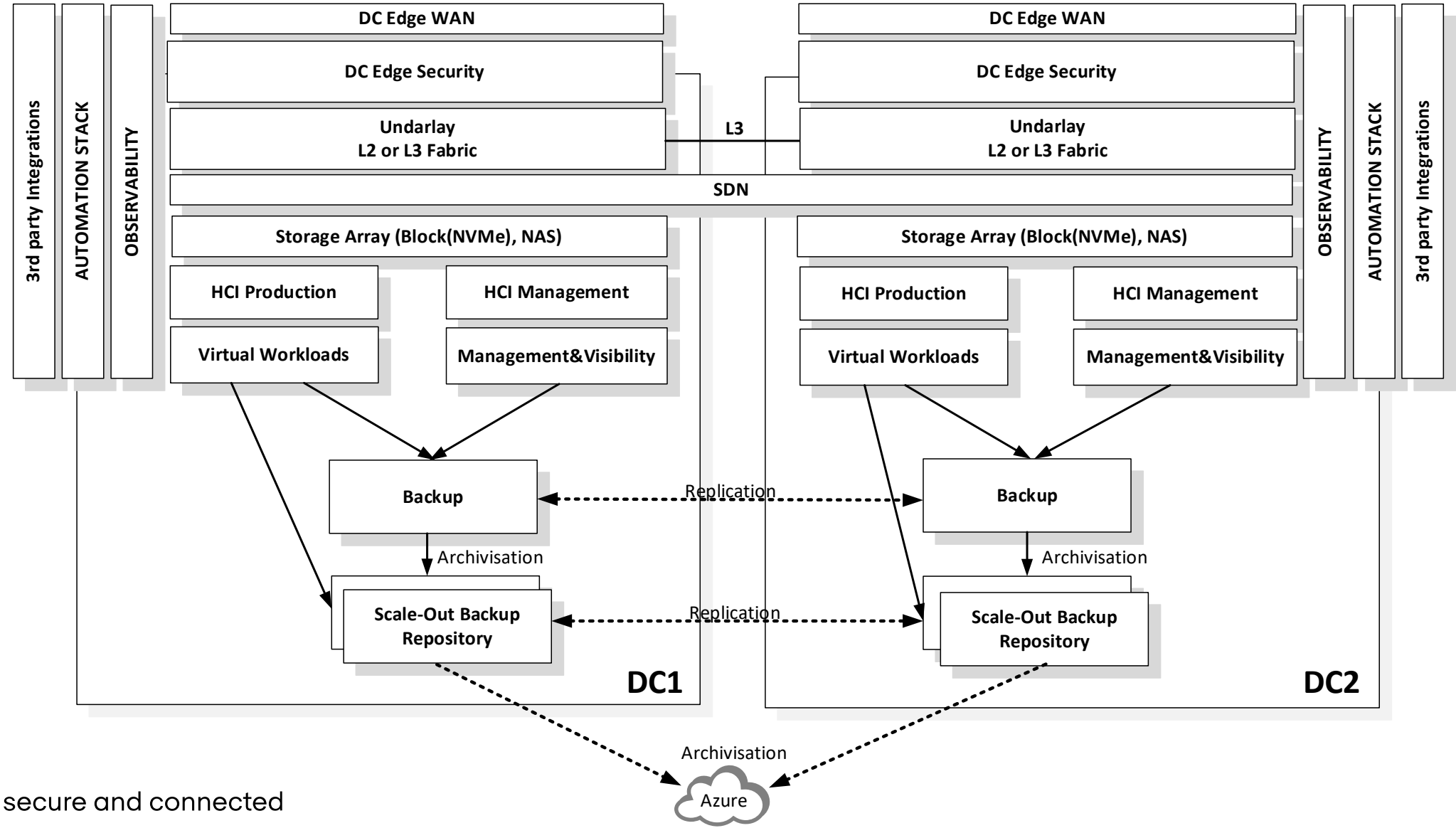
NCM helps **Build, Operate, and Govern Hybrid Clouds**



# How Does NCP Stack up?



# Chmura prywatna, DataCenter



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Thank you!