SANGFOR | **SANGFOR HCI**

Sangfor Hyper-Converged Infrastructure

The Best Building Block for Your Future-Proof IT

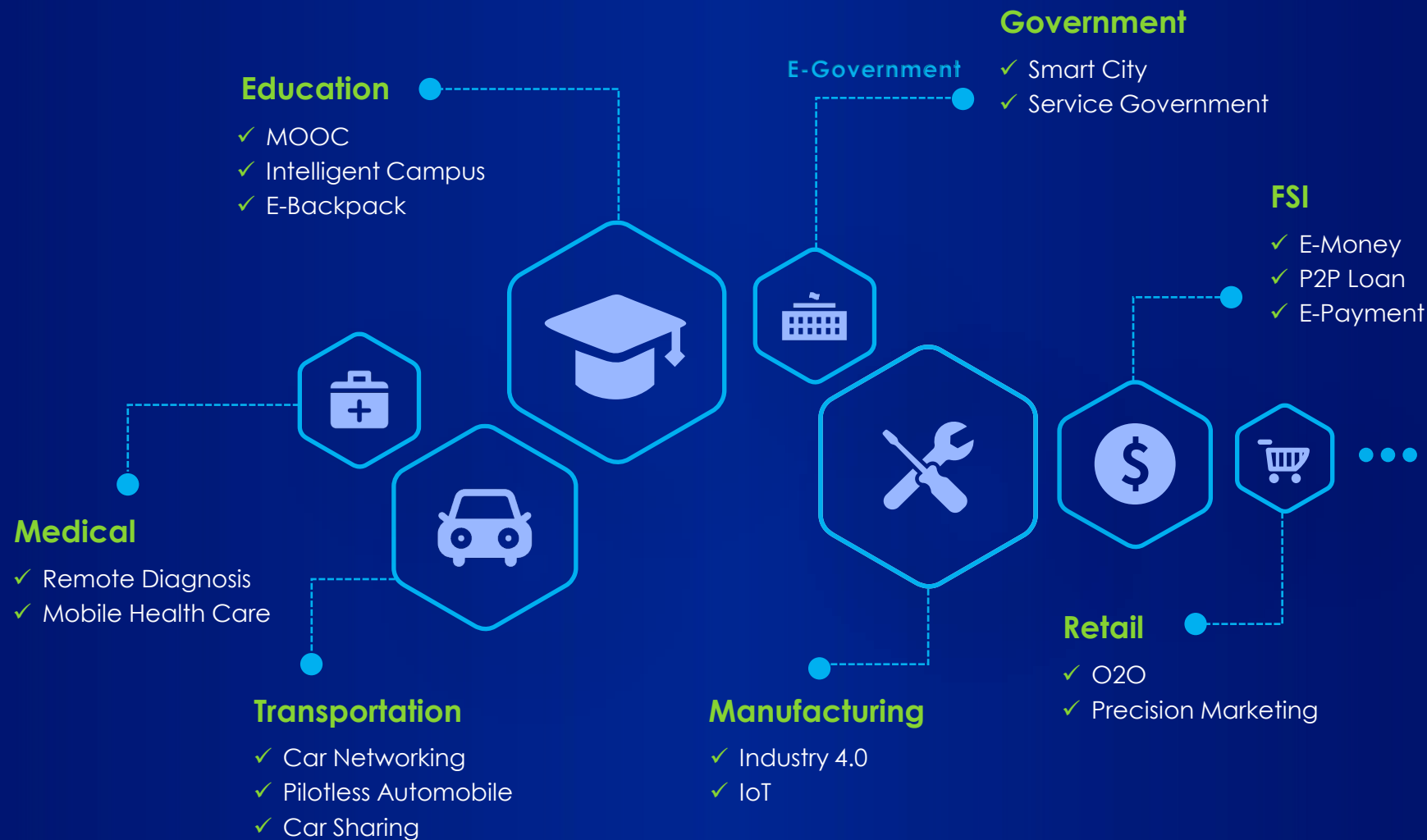Sangfor Technologies

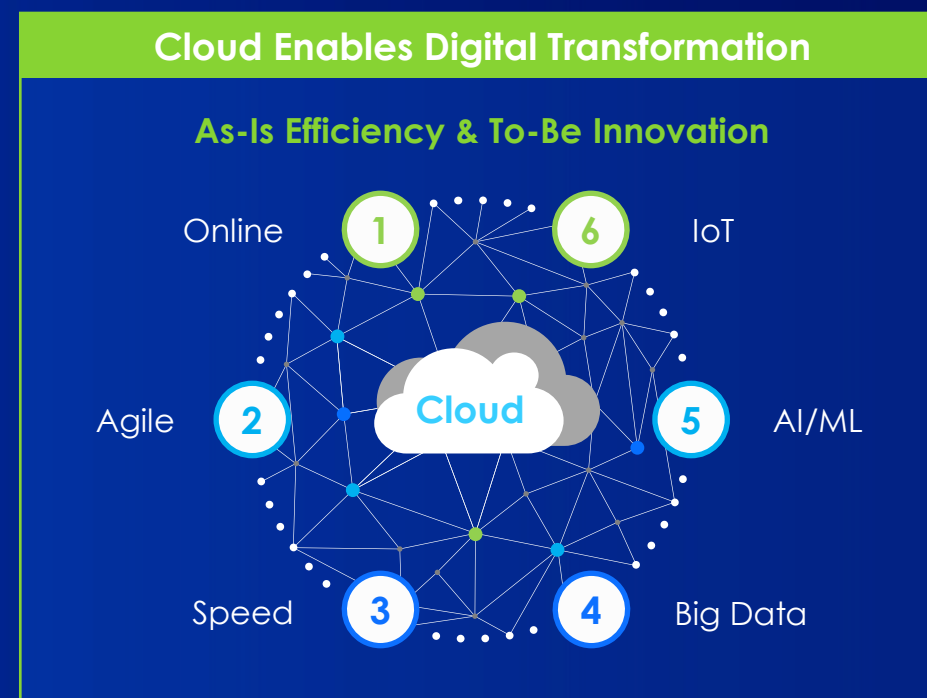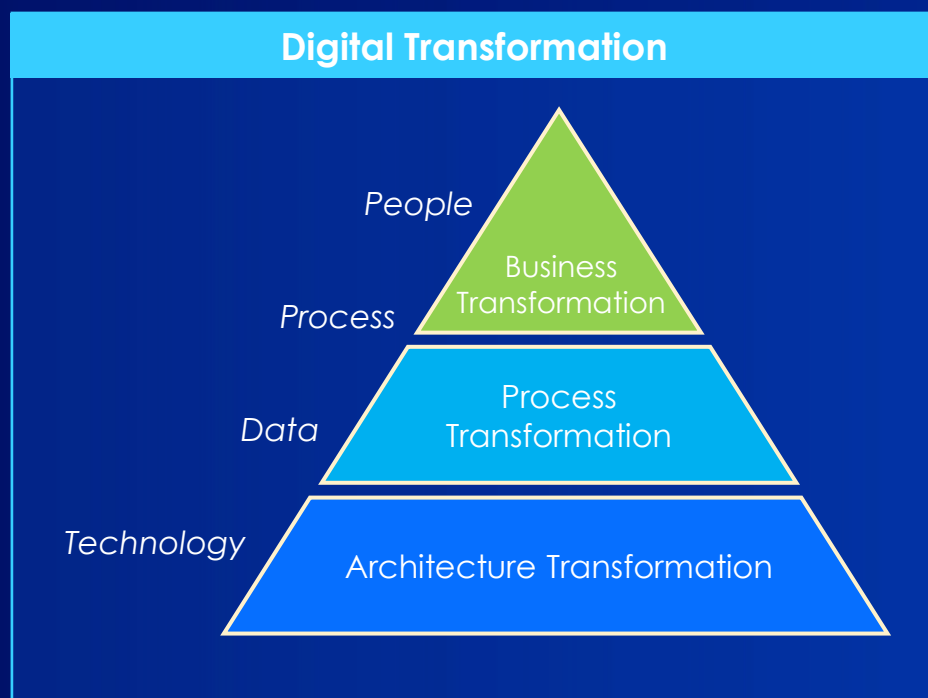**Amar**
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Cloud Enables Digitalization

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➤ 50% of Fortune 500 companies disappeared from 2000 – 2016 due to digital disruption and experienced 5% revenue drop in 2020 due to COVID, the largest since 2016.

➤ 69% of corporate directors want to accelerate enterprise digital strategies and implementations to help deal with the ongoing disruption. *(2021 Gartner Board of Directors survey)*
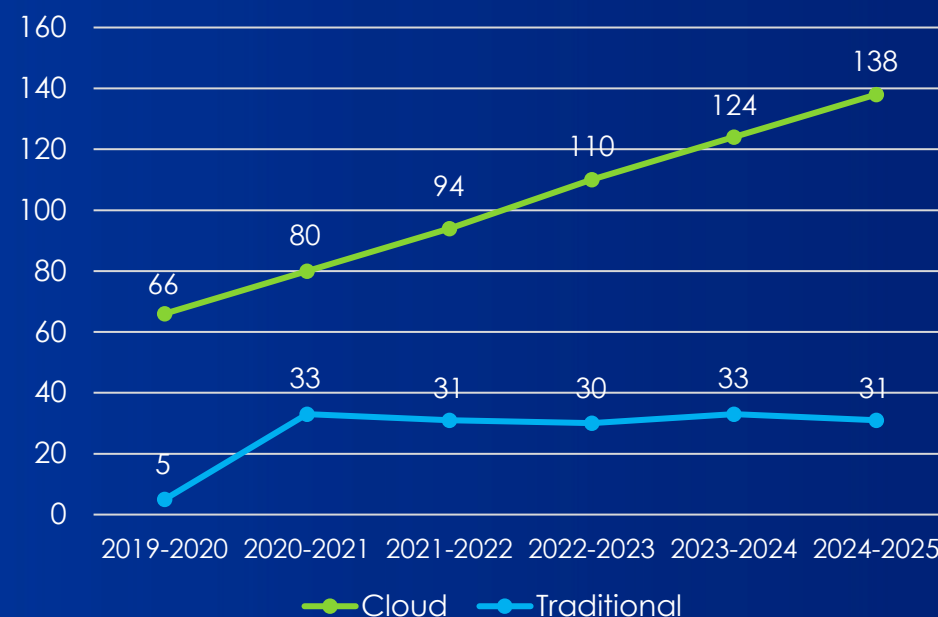
Digital Transformation

People

Business Transformation

Process

Data

Process Transformation

Technology

Architecture Transformation

Cloud Enables Digital Transformation

As-Is Efficiency & To-Be Innovation

Online — 1   6 — IoT

Agile — 2   **Cloud**   5 — AI/ML
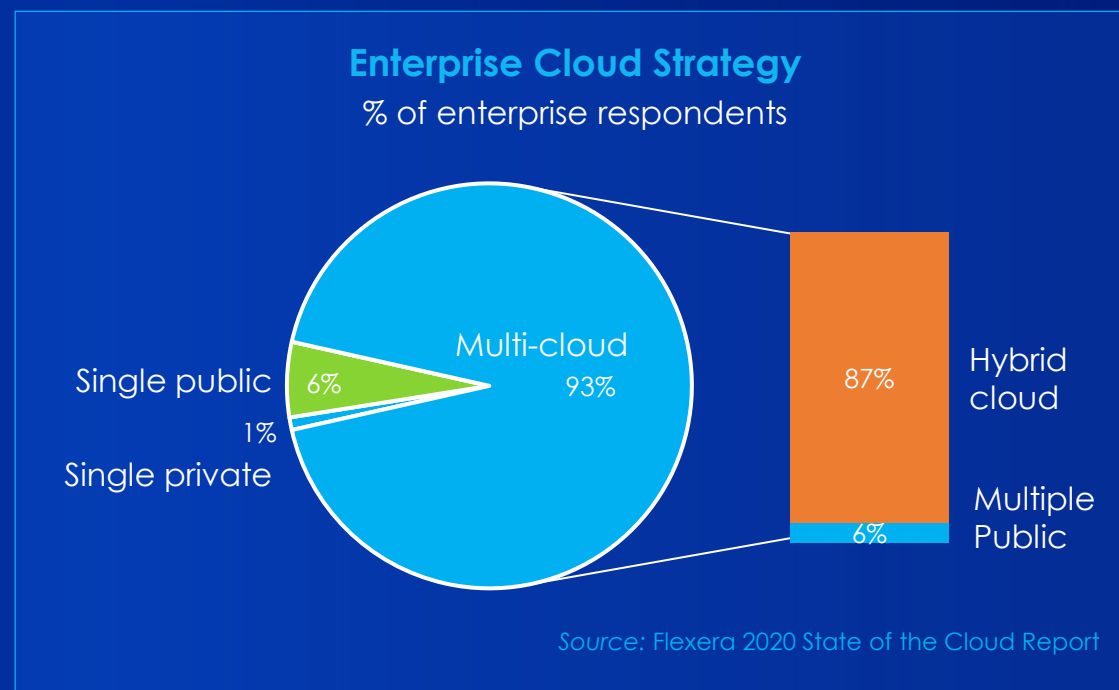
Speed — 3   4 — Big Data

Enterprise Cloud Strategy Trend: Hybrid Cloud

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Enterprise Cloud Strategy

- 87% enterprises adopts **Hybrid Cloud** in their Cloud Strategy.
- It addresses the **Cloud Adoption Challenges** better compare to other Cloud Strategies.

"Hybrid cloud platforms enable enterprises to select the right infrastructure for the right workload, thereby enabling them to make efficient workload placement decisions that help better meet requirements while controlling cost."

IDC 2020

Enterprise Cloud Strategy
% of enterprise respondents

Single public — 6%
Single private — 1%
Multi-cloud — 93%

Hybrid cloud — 87%
Multiple Public — 6%

Source: Flexera 2020 State of the Cloud Report

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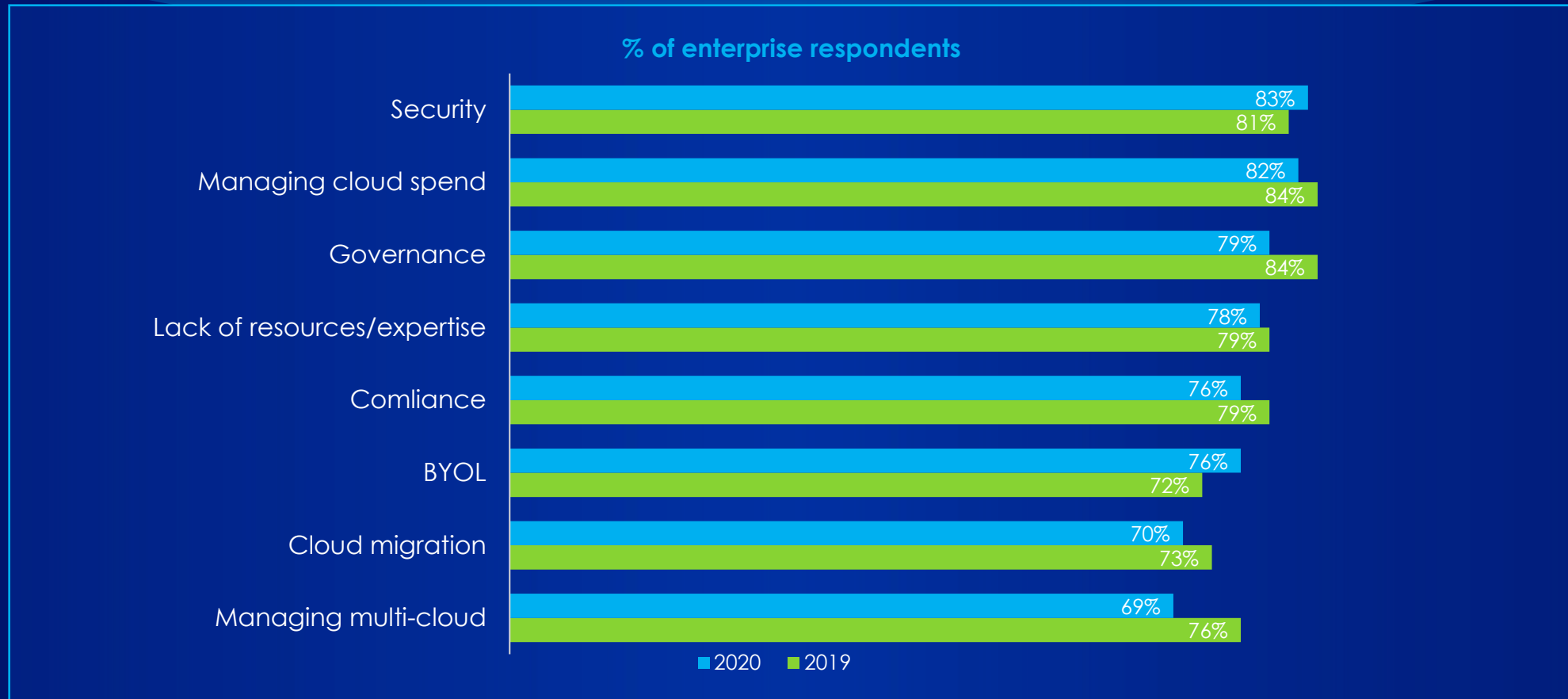# Containerization Is Trending

APPLICATION
CONTAINERIZATION

➢ Containerization allows applications to be easily transported between platforms. Gartner predicts that by 2023, **70 percent** of global organizations will be running more than two containerized applications in production, up from less than 20 percent in 2019.

Cloud Adoptions Challenges

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Top Enterprise Cloud Challenges YoY

% of enterprise respondents

Challenge	2020	2019
Security	83%	81%
Managing cloud spend	82%	84%
Governance	79%	84%
Lack of resources/expertise	78%	79%
Comliance	76%	79%
BYOL	76%	72%
Cloud migration	70%	73%
Managing multi-cloud	69%	76%

■ 2020   ■ 2019

Source: Flexera 2020 State of the Cloud Report

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Sangfor Offerings: Transform Your Cloud Journey

Cloud Stacks Domain	On-Prem HCI-SDDC	On-Prem Private Cloud	Sangfor Hybrid Cloud	Off-Prem Managed Cloud Services (MCS)
Consultancy			Lightweight Consultancy (FREE)	
Management	HCI SDDC (FREE)	Sangfor Cloud Platform(SCP)	SCP (manage both Private Cloud & MCS)	Sangfor Cloud Center (SCC)
Backup/ DR		aSC (Active-Active)		Managed Backup/ DR Services
		CDP		
	aDR/ hDR (Active/Standby DR)	aDR/ hDR		BaaS/ DRaaS
Security		*Cyber-Guardians SOC Services		Managed Security Services
	aSEC (vSecurity)	aSEC		SECaaS
HCI Infrastructure	aNET (vNetwork)	aNET		KubeMgr Container
	aSAN (vStorage)	aSAN	Nano Cloud (ROBO appliance)	IaaS (Shared/ Dedicated)
	aSV (vCompute)	aSV		
	aServer/ 3rd-Party	aServer/ 3rd-Party		
	aDesktop (VDI)	Ent Dist Storage (EDS)	SD-WAN	SkyOps

Legacy Physical	Virtualization	Private Cloud	Hybrid Cloud	Multi-Cloud

Remarks: Cloud Evolution & Cloud Stacks design variance by actual business case. *Cyber-Guardians SOC Services only available in Malaysia now.
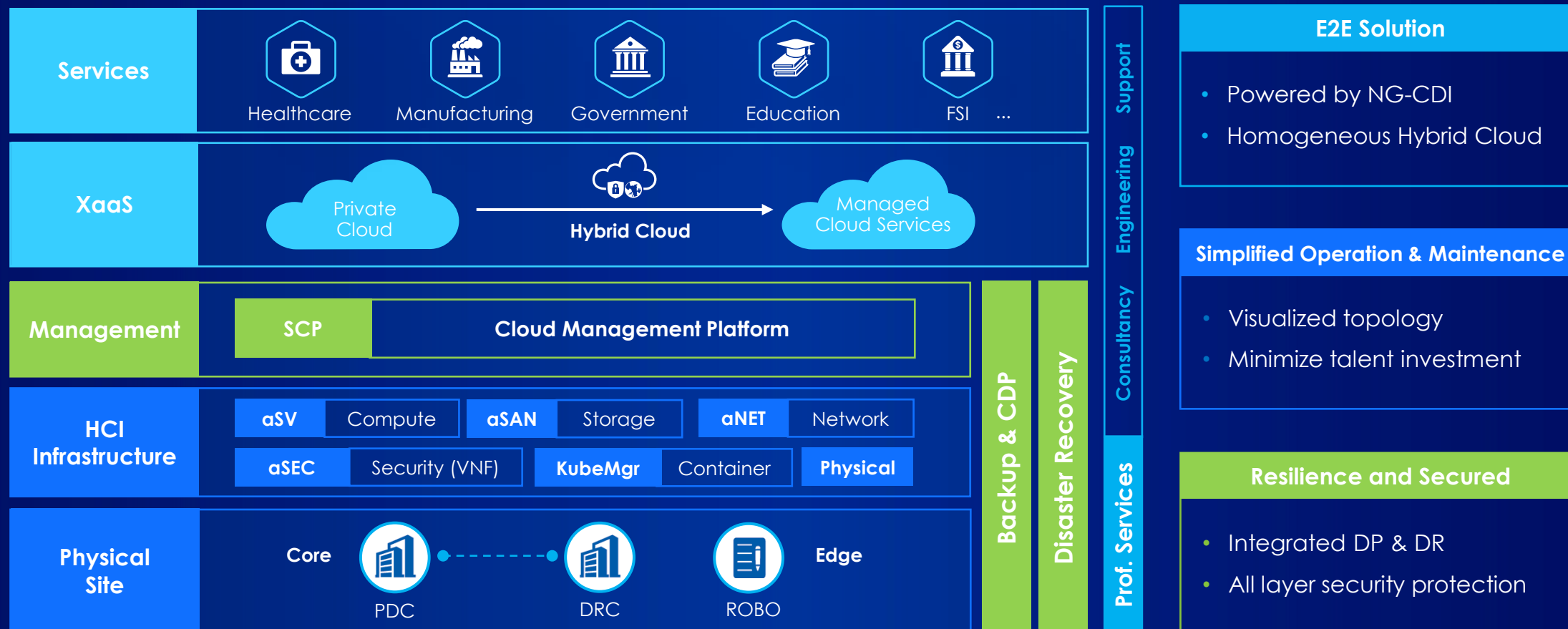
Cloud Evolution

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Sangfor Cloud Solution Overview

➢ Simplified, Secured and Value Optimized.

Services	Healthcare	Manufacturing	Government	Education	FSI ...

XaaS

Private Cloud → **Hybrid Cloud** → Managed Cloud Services

Management

SCP	Cloud Management Platform

HCI Infrastructure

aSV	Compute	aSAN	Storage	aNET	Network
aSEC	Security (VNF)	KubeMgr	Container	Physical	

Physical Site

Core — PDC ---- DRC — ROBO — Edge

Backup & CDP · **Disaster Recovery**

Support · **Engineering** · **Consultancy** · **Prof. Services**

E2E Solution
- Powered by NG-CDI
- Homogeneous Hybrid Cloud

Simplified Operation & Maintenance
- Visualized topology
- Minimize talent investment

Resilience and Secured
- Integrated DP & DR
- All layer security protection

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Key Business Requirements for IT Infrastructure

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Simplified

Stable

Secure

Easy-to-Use

Sangfor HCI is Consolidating 3-tier IT
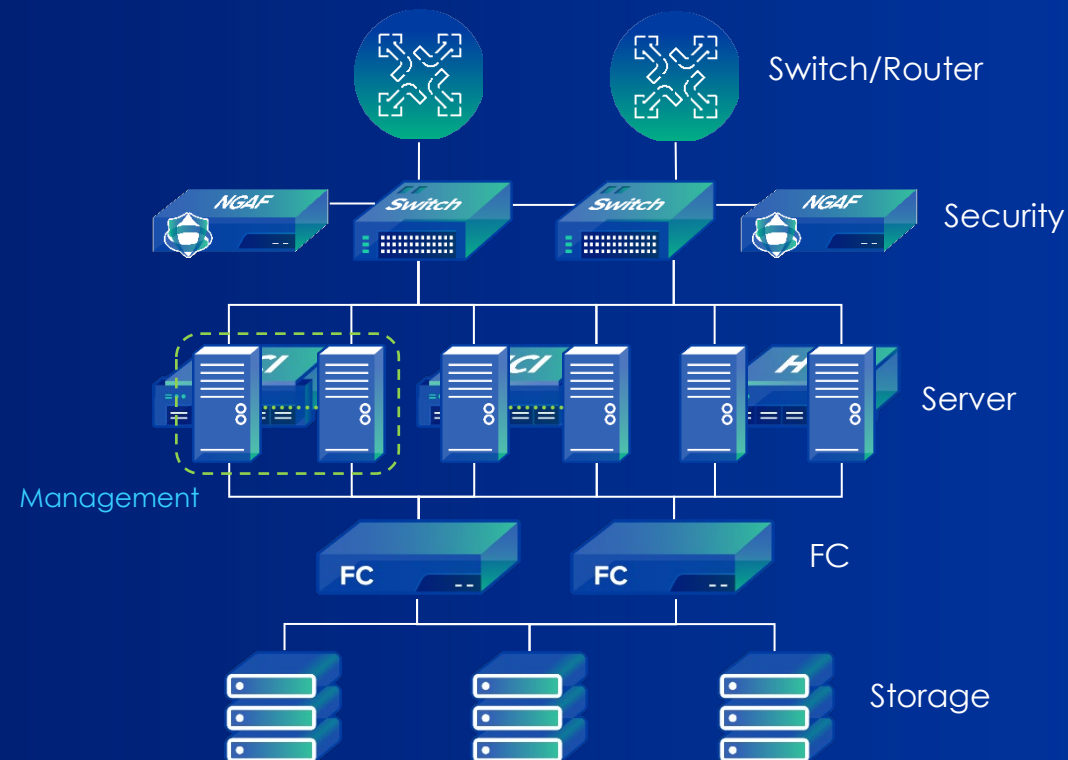
Based on 3rd Gen HCI with Full Convergence

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Compute

Storage

Networking

Security

1st Gen HCI

2nd Gen HCI

3rd Gen HCI
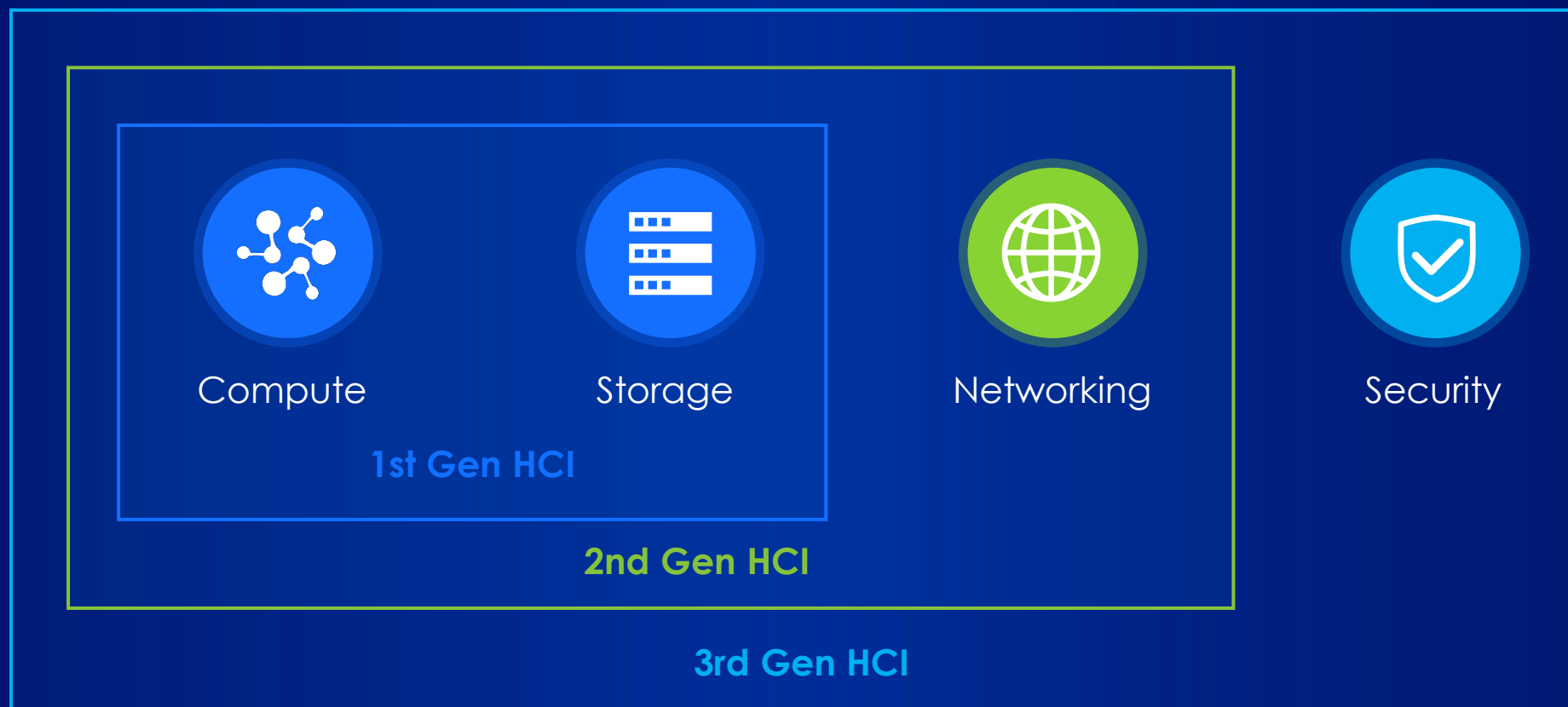
Sangfor HCI offers a one-stop software-defined infrastructure that enables customers to smoothly transition to a unified cloud that is ultra-simplified, highly performing, comprehensively secured and extremely resilient.

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The Cloud Infrastructure That Can Support Any App

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| DB | Containers | SAP HANA | Big Data | AI |

Next Generation Hyper-converged Infrastructure

Simplified

Easy Scale-out

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Switches

Switches

HCI Servers

Switches	Switches	Switches
Switches	Switches	Switches
Cabinet	**Cabinet**	**Cabinet**
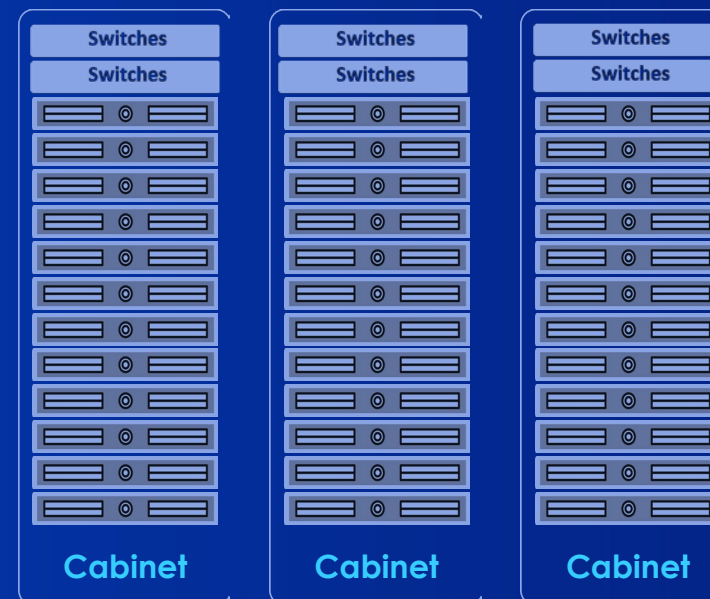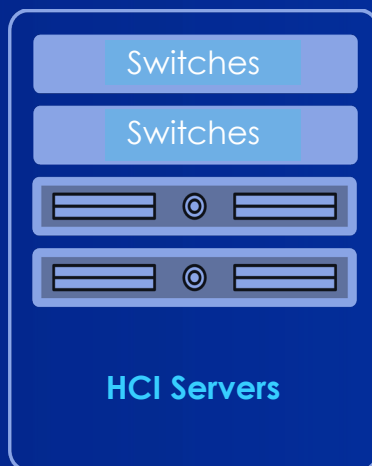
☹ Pre-investment 3-5 years in advance

☹ Data migration for expansion

☹ Performance bottle neck

☺ Start with only 2 nodes

☺ Expansion without down time

☺ No capacity limitation

Specific Design for Critical Apps

6 steps to launch Oracle RAC cluster
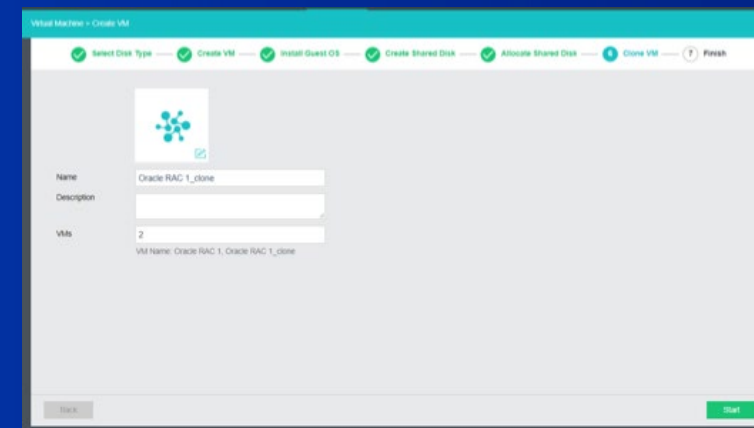
Built-in VMware Management & Backup

LAN/WAN

VMware environment

Sangfor HCI
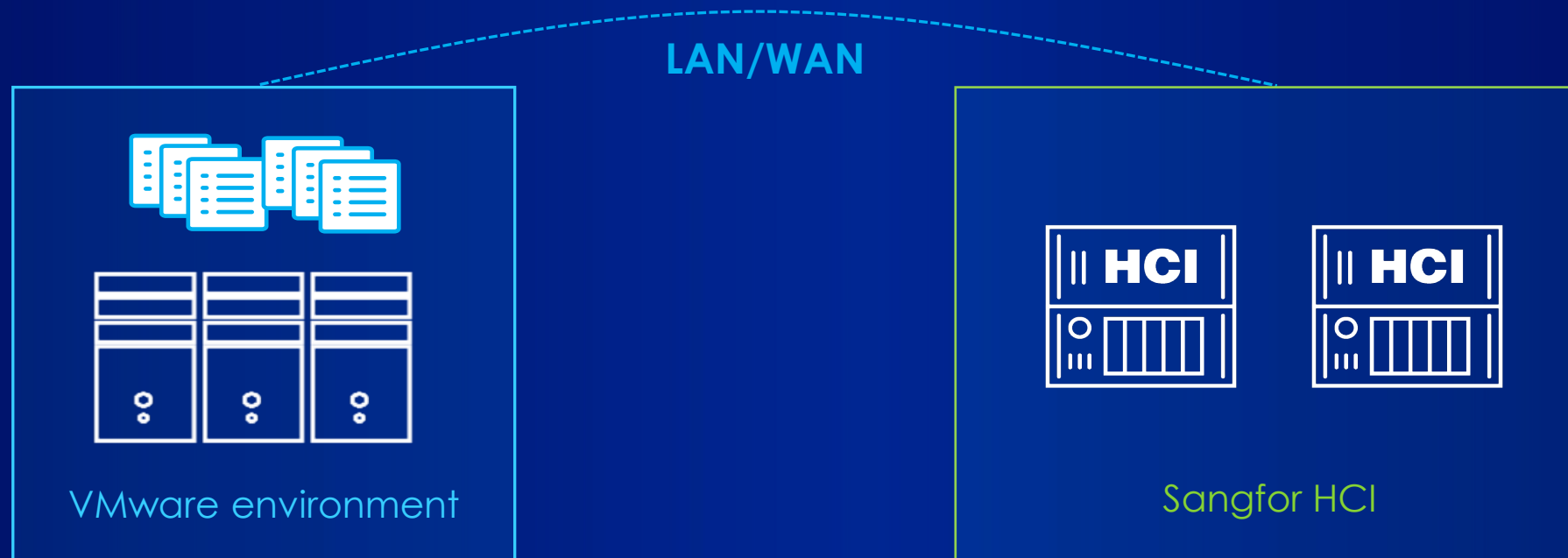
🙂 Built-in VMware lifecycle management

🙂 Bi-directional migration

🙂 Built-in backup from VMware to Sangfor & instant recovery

🙂 VMware vSphere 7.0 Support
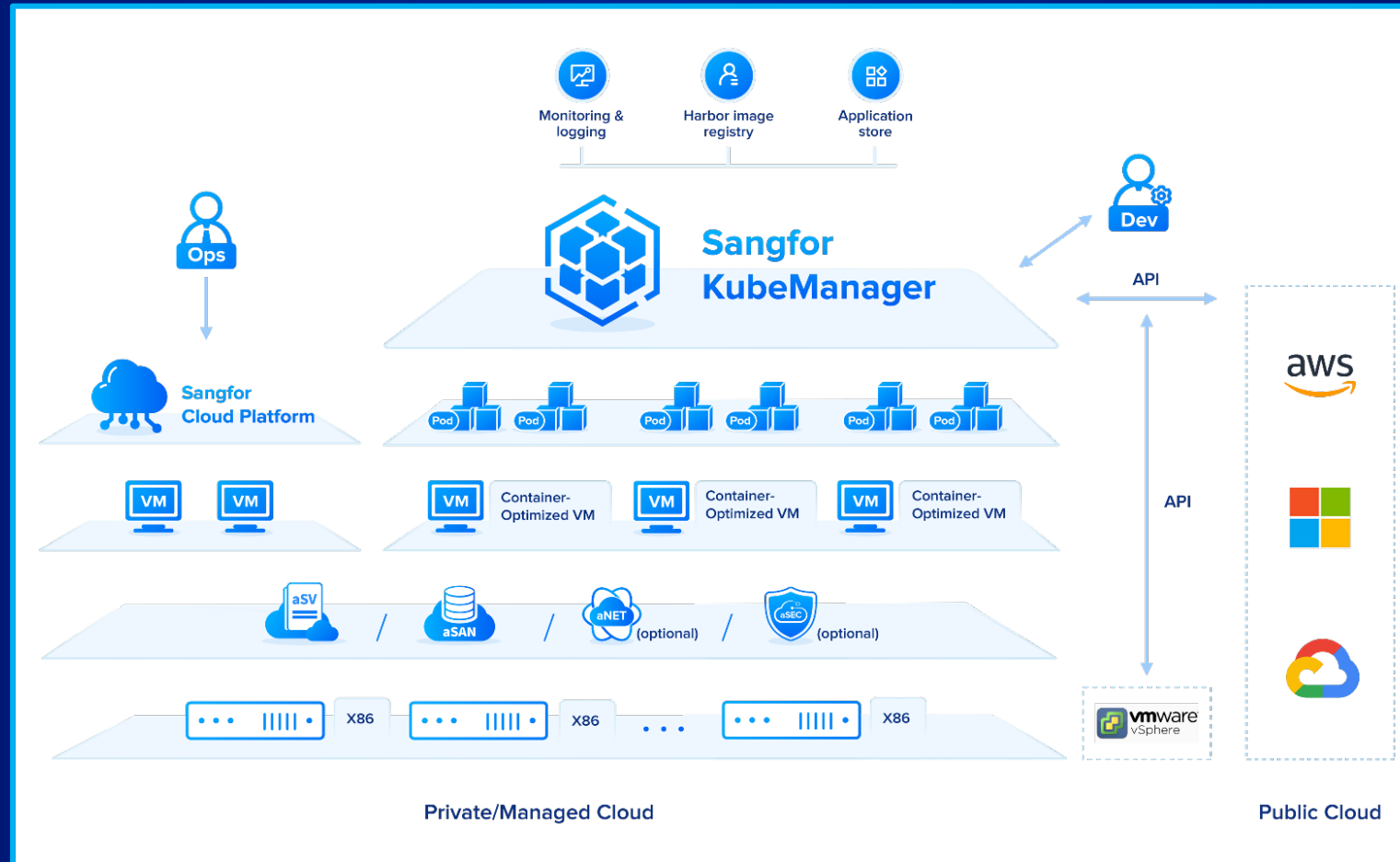
Data Center at Your Fingertip

GPU Resource Visualization
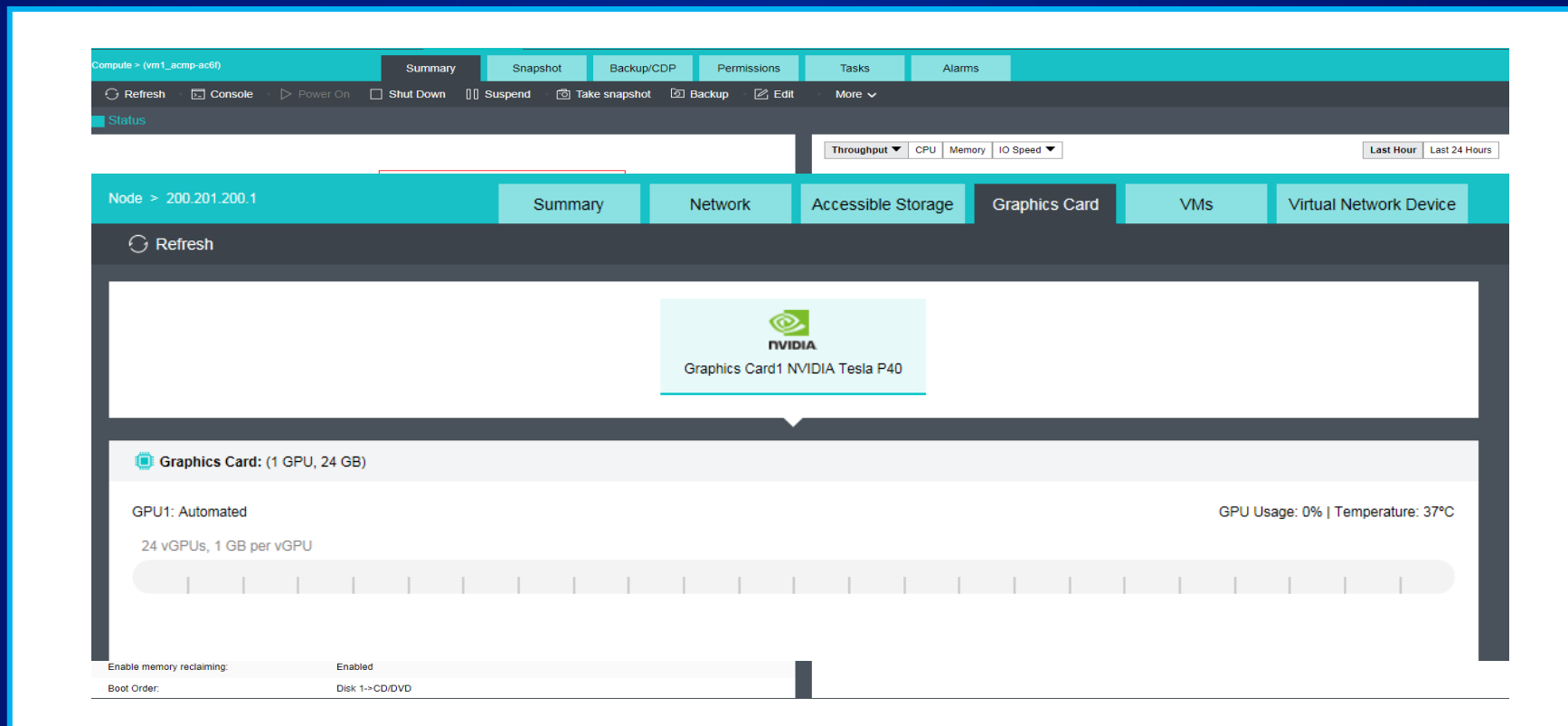
1. Visualized management for GPU, demonstrating GPU utilization in real-time
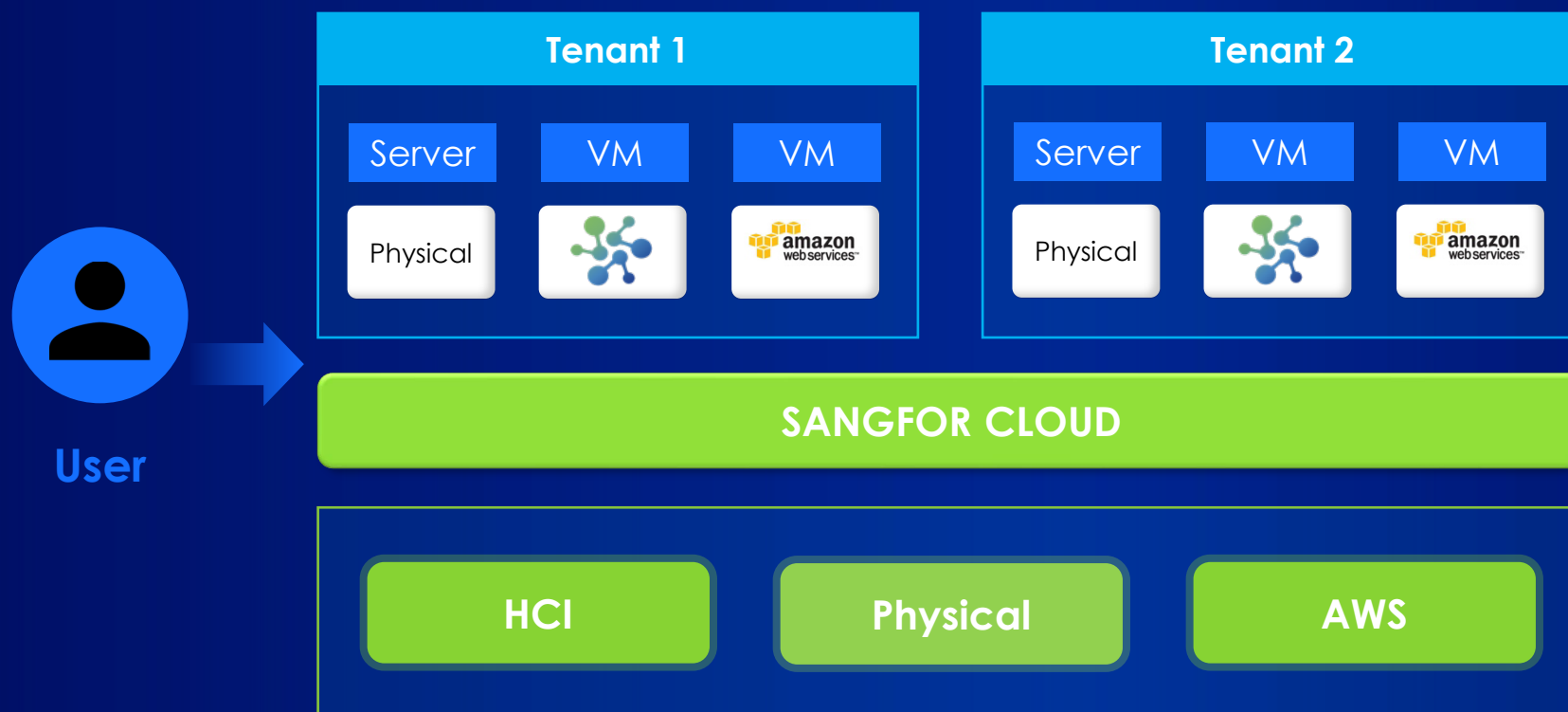2. Dynamic display of current GPU's resource assignment to optimize distribution and utilization

Unified Platform for Both VM and Container

Unified Management for Physical, AWS and HCI

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Tenant 1

Server	VM	VM
Physical		amazon web services

Tenant 2

Server	VM	VM
Physical		amazon web services

User

SANGFOR CLOUD

HCI	Physical	AWS

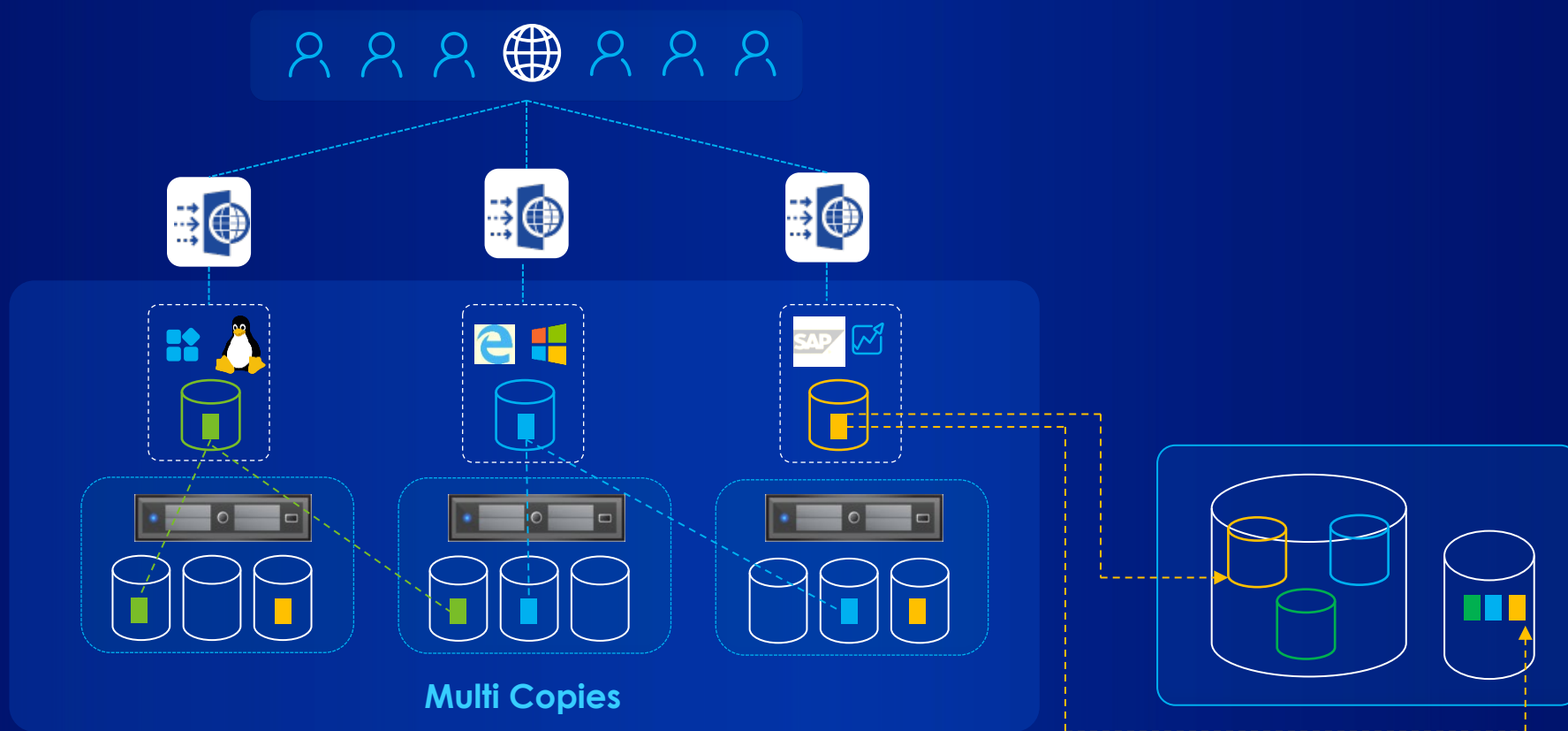**Unified mgmt. for hybrid cloud and multi-cloud:**

- Consistent IaaS user experience between physical, private cloud and public cloud.

- Each tenant can only see and manage its own cloud resource, simplified O&M with guaranteed isolation

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Stable

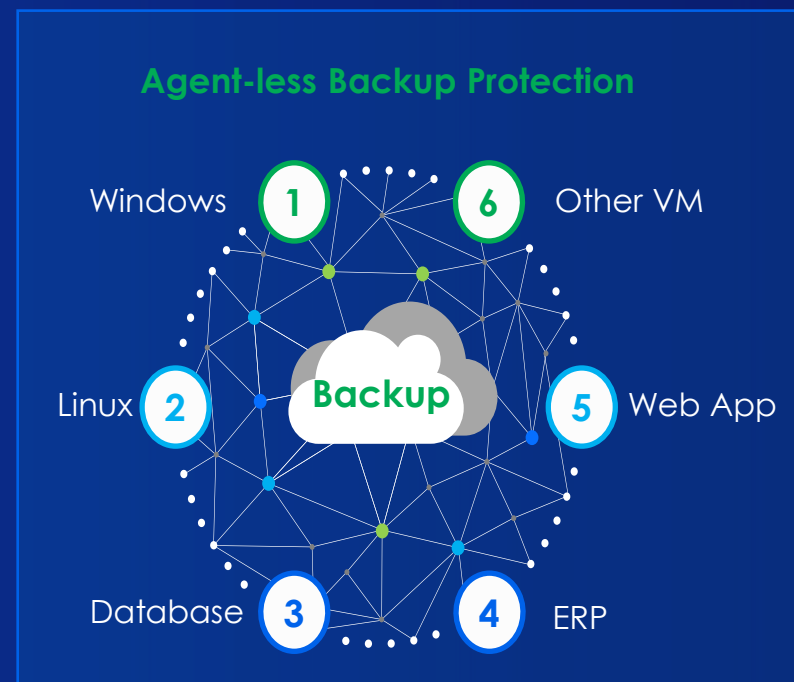# Multi Copies – No Single Point of Failure

Multi Copies

☹ Single point of failure

☹ Additional backup software required

☺ Inherent multi copies design
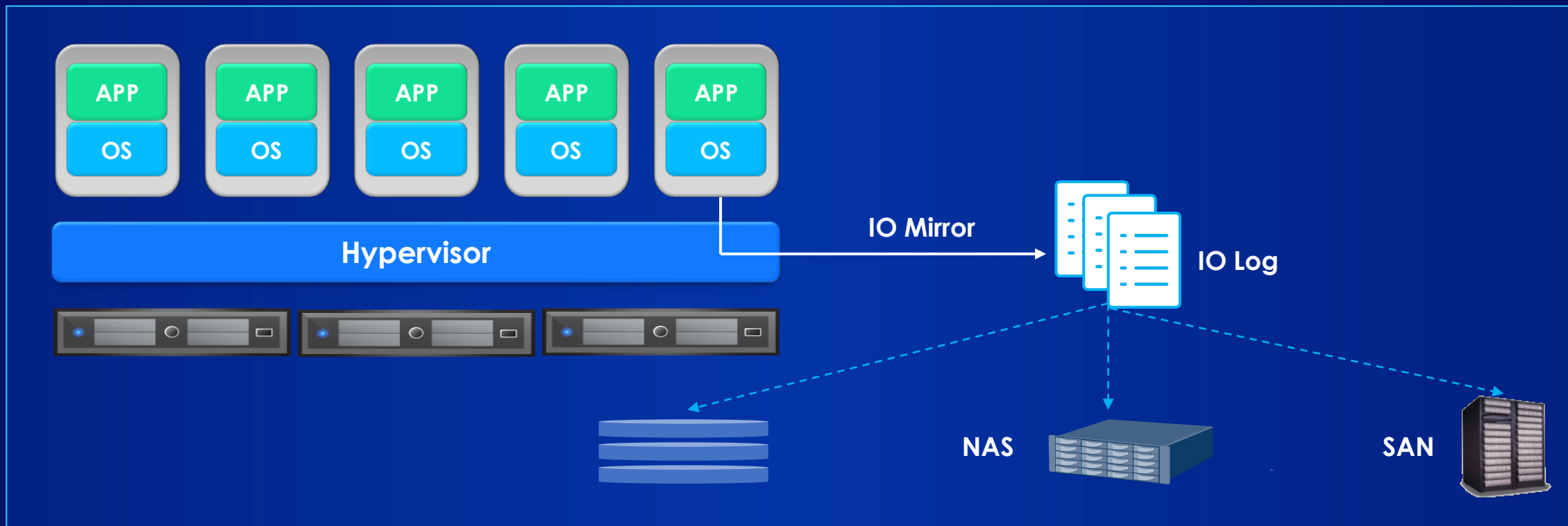
☺ 2 Copies / 3 Copies

Built-In Backup Solution

- Free of Cost
- VM / File Level Backup
- Automated Schedule VM Backup
- Minimum RPO with 1 Hour (Hourly, Daily, Weekly)
- Incremental Backup Technology (Difference Backup)
- Instant VM Recovery Technology
- iSCSI, Fibre Channel (FC), Network File Sharing (NFS)
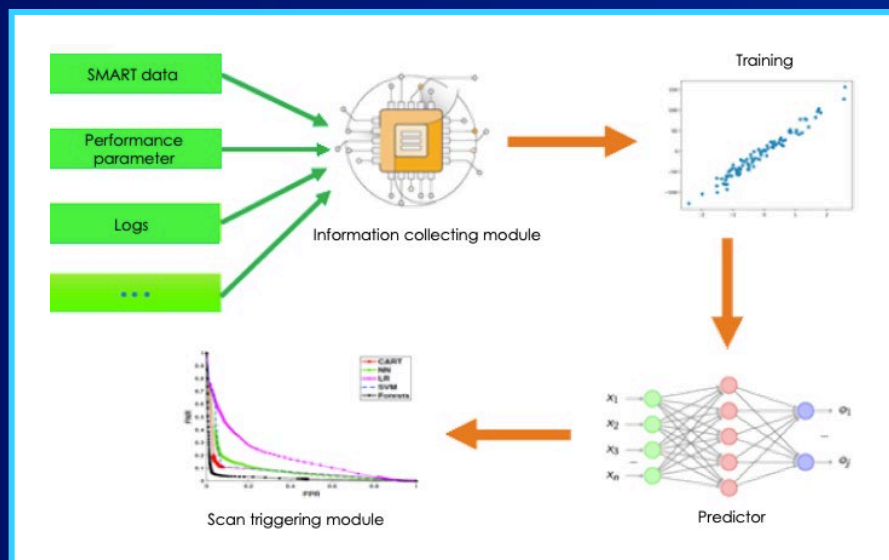- Multiple Destination Backup (External Storage or Virtual Storage)

Agent-less Backup Protection

Windows ① ⑥ Other VM

Linux ② **Backup** ⑤ Web App

Database ③ ④ ERP

CDP: Data Time Machine

☺ Built-in advanced data back up

☺ RPO≈0. RTO≤5 Min

Disk Bad Sector Prediction And Repair (with aSAN)

Prediction

Result output:
A bad sector will occur on disk A in 7 days

Scanning

Disk A will be scanned in priority in the daily scanning task

Repair

Data is repaired once the bad sector is confirmed

➤ The time it takes to discover bad sector is reduced from **weeks** to **1 day**, minimizing data loss risk.
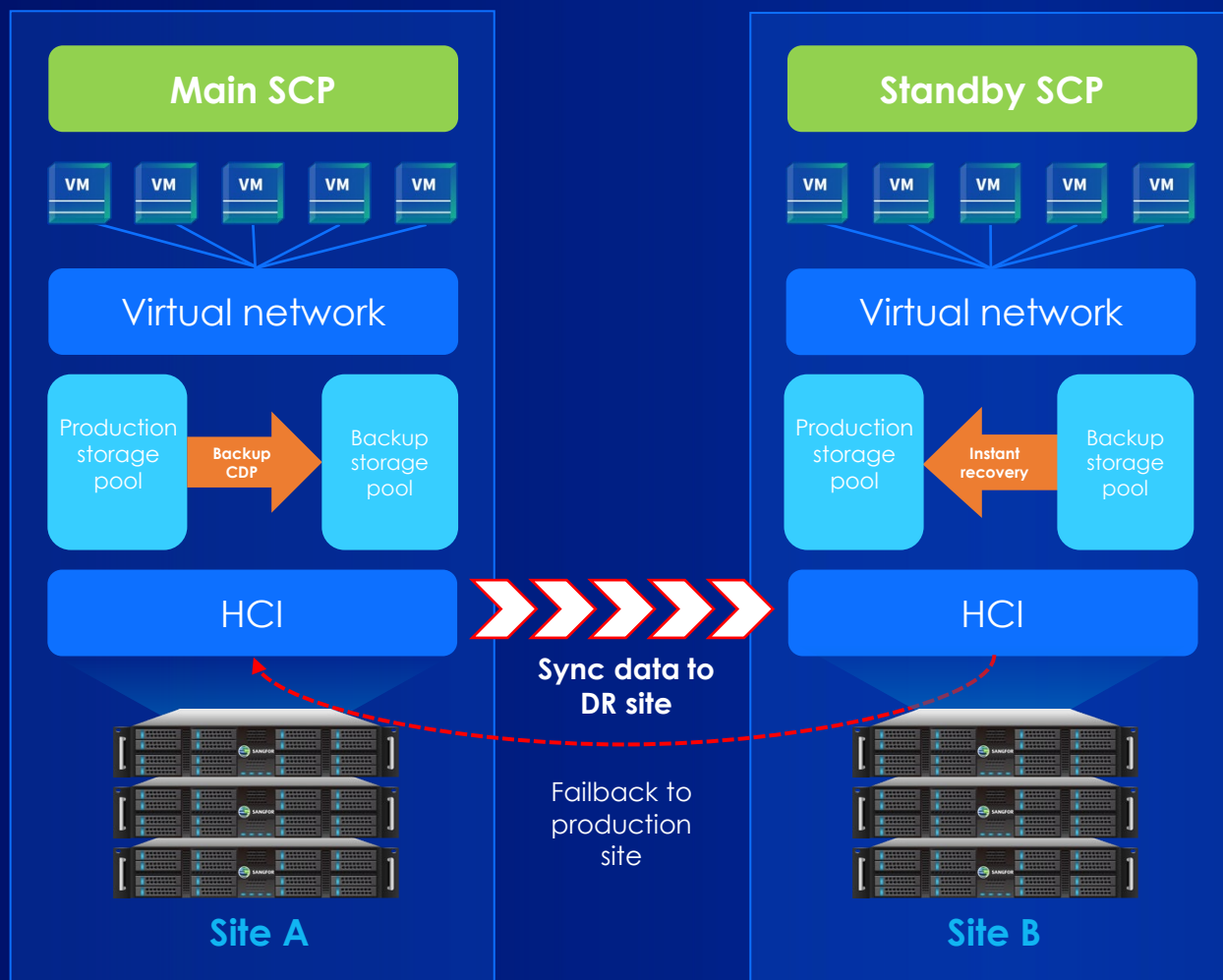
Sangfor Disaster Recovery Management (DRM)

On-Premise DR	Cloud DR	Planned Migration	Disaster Avoidance	Planned Downtime	Inter-site Load Balancing
Active-passive disaster recovery		Active-passive disaster recovery		Active-active stretched cluster	
Heterogeneous DR (hDR)		aDR		aSC	
hDR Management		SCP			
3rd-party Server/ Hypervisor/ Cloud		Sangfor aSV/aSAN/aNET/aSEC			
x86	x86	x86	x86	x86	x86

Site 1   Site 2

A-A

Active-Passive

Site 3

City A

City B
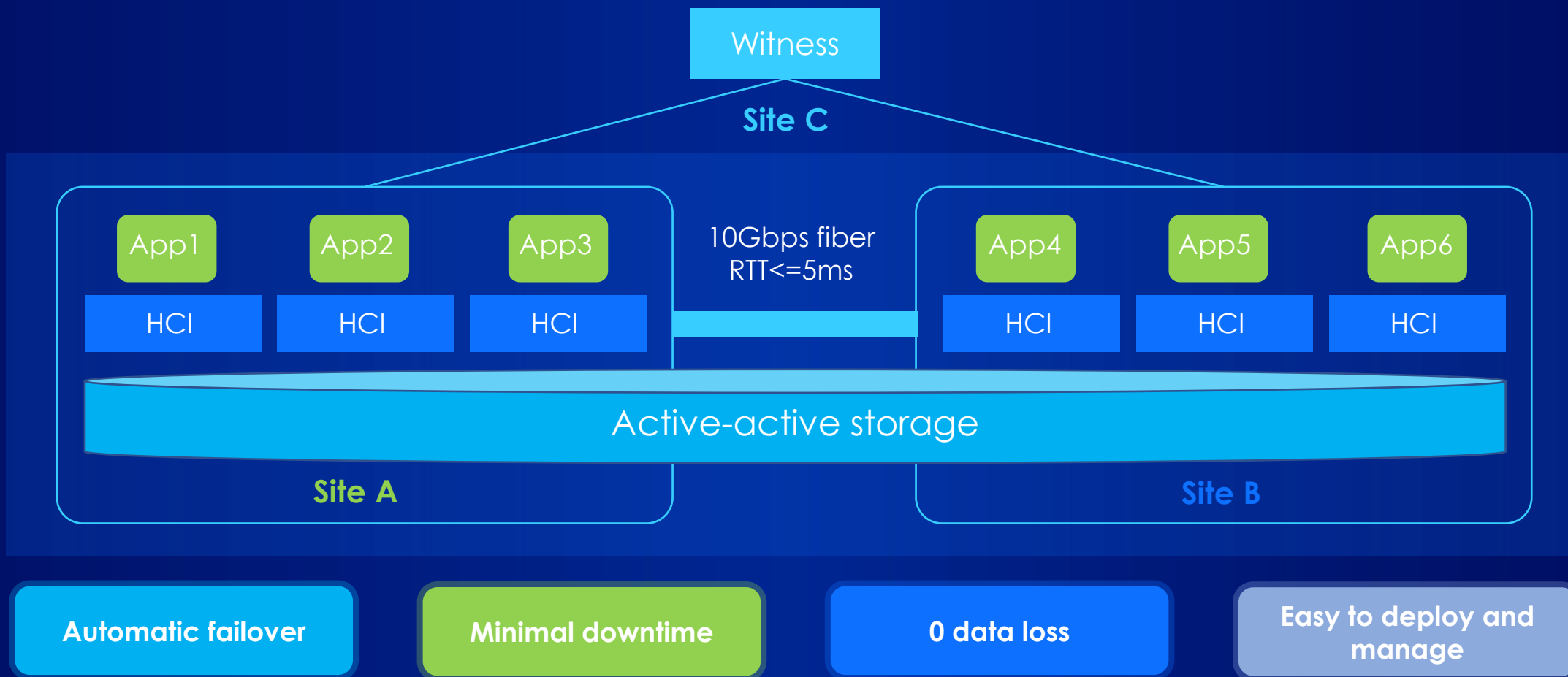
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Sangfor Active-Passive Disaster Recovery

- Integrated and easy to use

- Local backup + remote replication

- Flexible RPOs, min. 1s

2 Nodes + 1 Witness Node

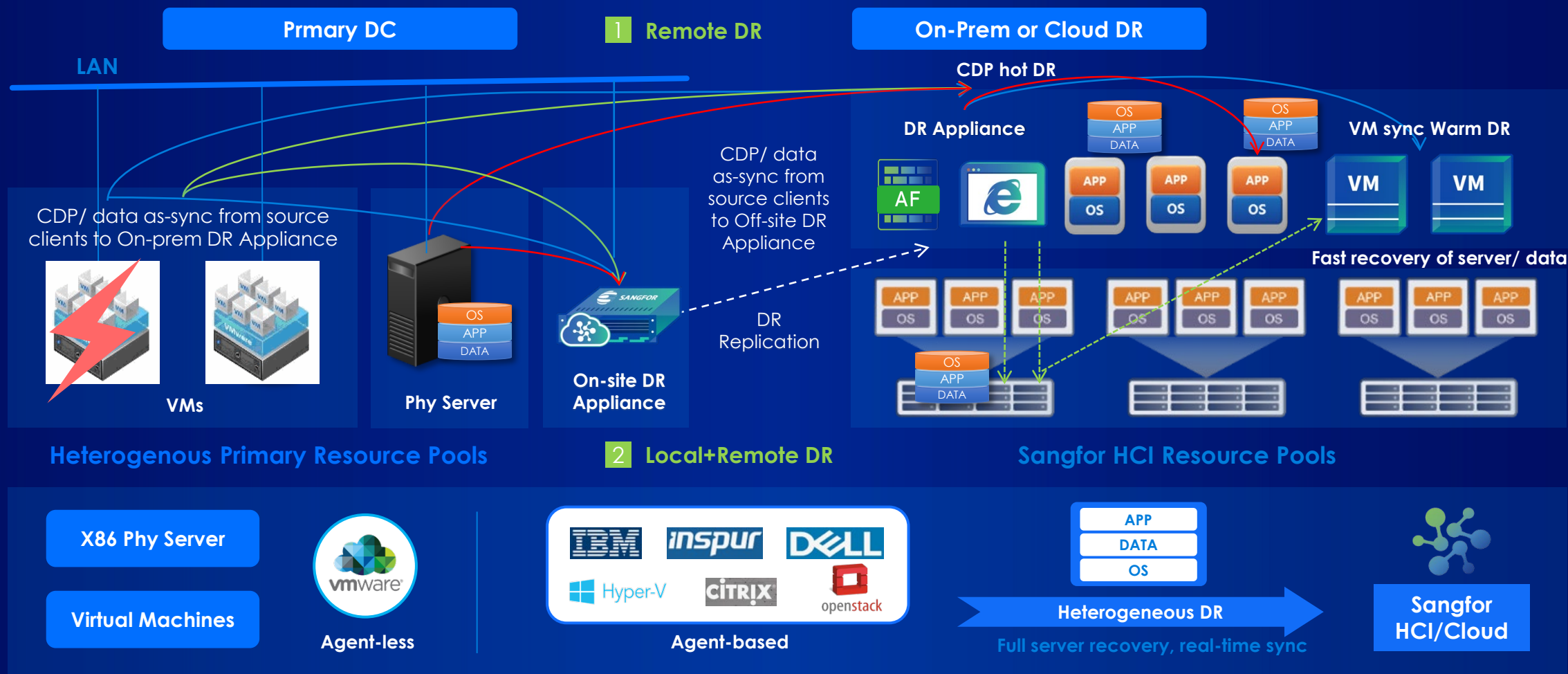Witness VM

➢ Solve Split-brain issue in 2 nodes mode

➢ Use thin client or VM as witness node

➢ Support scale to 3 or more nodes without interruption

➢ Witness VM: 4 Cores, 16G RAM, 64G Disk, 1 Port. Support deploy on VMware or Sangfor HCI

Secure

Key Points For Network Security

Isolation

- Zone design
- External/internal attacks detection
- Boarder: network/server/VM
- Security policy based on applications/users/content
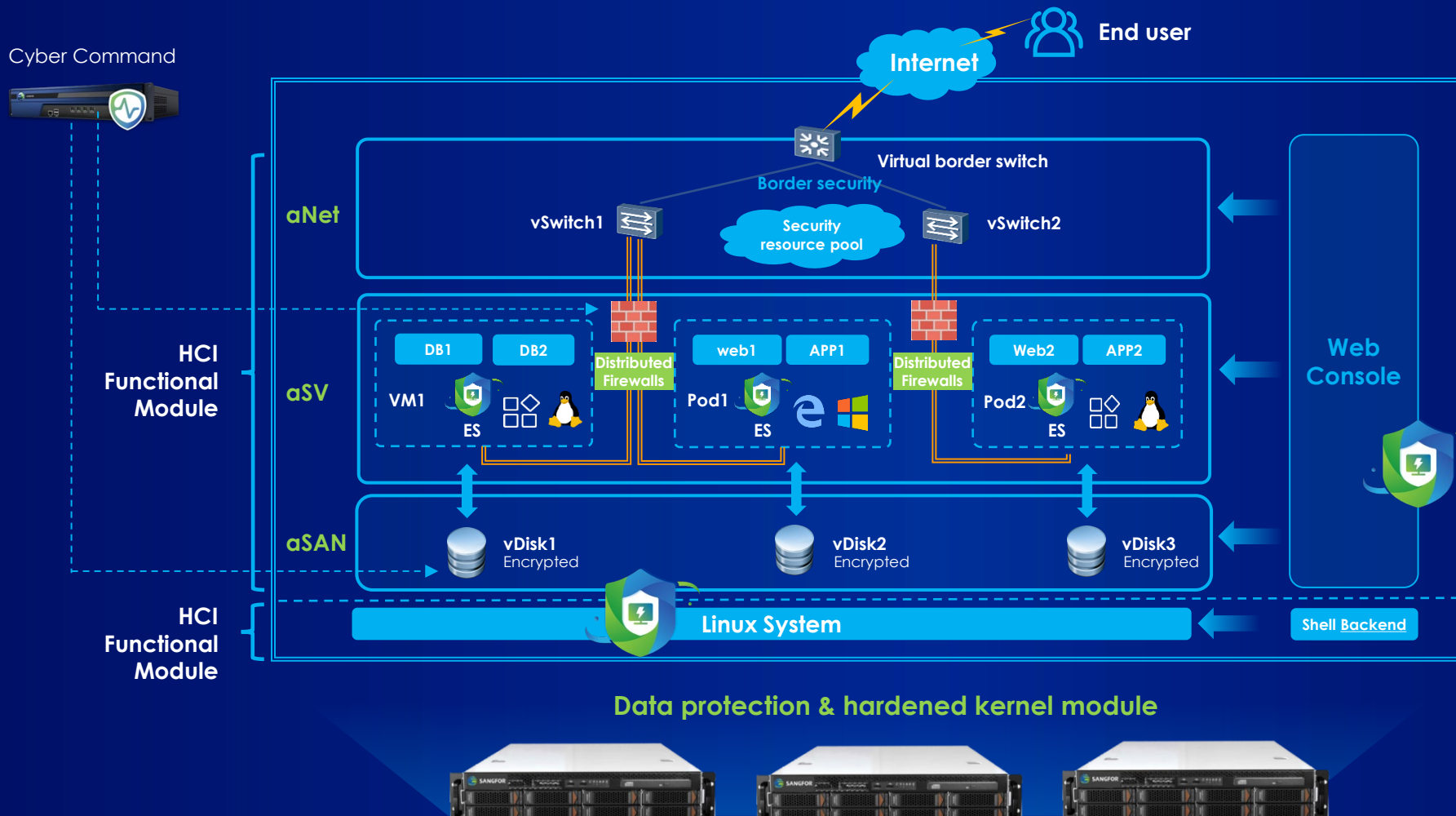
Access Control & Isolation

Threat Protection

- External threat: NGFW
- Internal threat: policy control and audit

Threat Detection

Maximized Security, Inside out

Working Together with Cyber Command
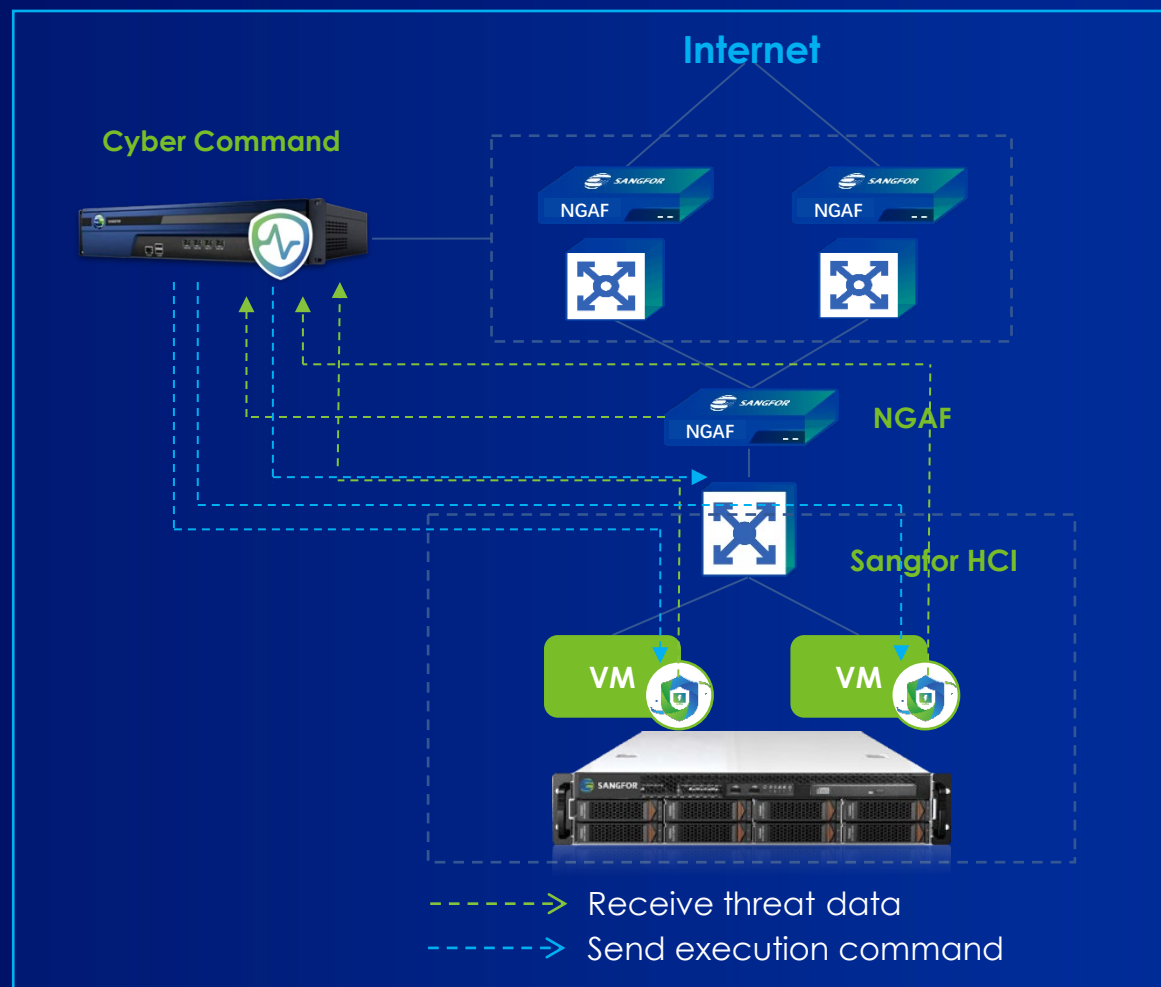
CC detects security threats through network traffic analysis, NGAF and ES, and then takes action based on different threats:

- For scenarios like zombie network, CC works with distributed firewall to quarantine infected cloud host automatically

- In ransomware scenario, CC leverages storage snapshot API to take snapshot of the infected VM to minimize loss

- For mining scenario, CC sends command to power off/ suspend the mining VM to avoid unnecessary resource consumption

- Manual/automated policy: policy can be issued manually on CC

Automatic Endpoint Protection
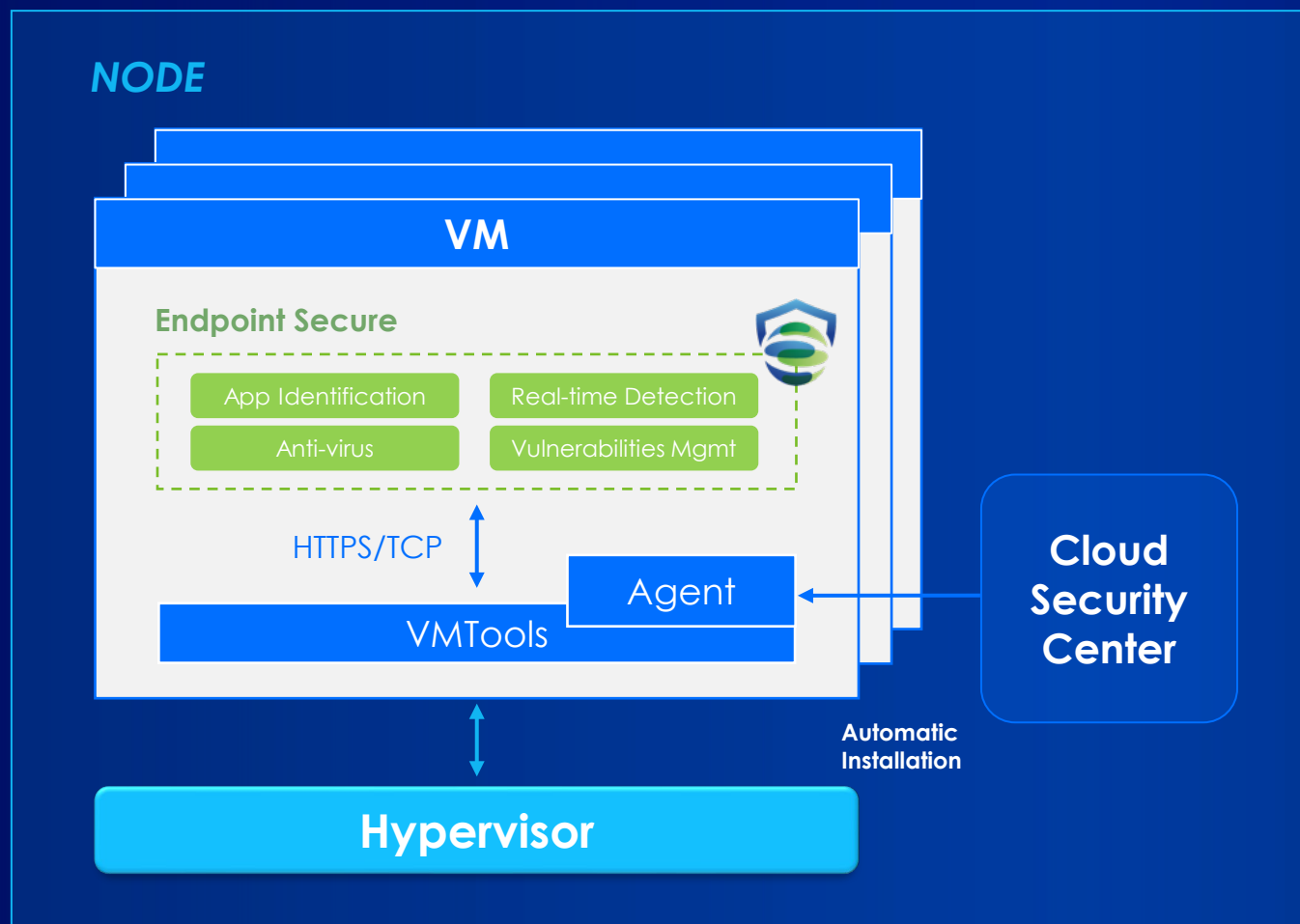
- Automatic Agent Installation

- Built-in Endpoint Secure Capabilities

- Low Resource Consumption

- File-level Protection for Linux

aSEC 2.0 with Distributed IPS
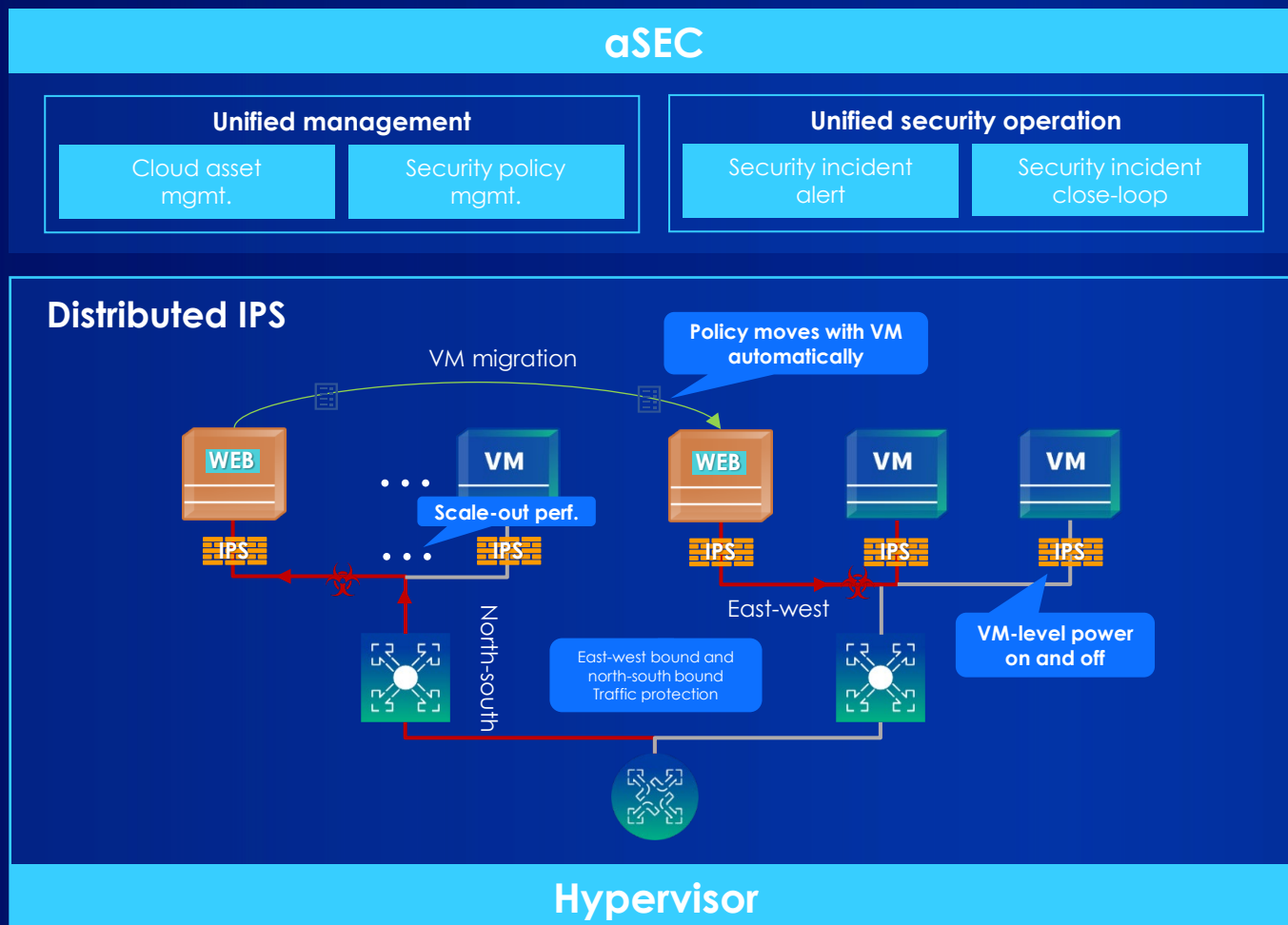
Business is secured once it's online

- No additional deployment and configuration is required, 1-click security policy application.

Adaptive security policy

- The security policy automatically follows the dynamic state of VMs.

Unified management

- Unified management for both security and cloud resource.

Flexible and scalable

- VM-level control granularity
- Scale out with business

Sangfor HCI Security Architecture

Platform Security

- HTTPS Login
- Anti-blasting
- 2FA Login
- Weak pwd detection
- Idle session timeout
- Resource Access Mgmt
- IP/MAC Whitelist
- Built-in WAF

Platform Security

aSEC-NFV

- NGAF
- IAG
- AD
- Log Audit (LAS)
- Database Audit
- BVT
- OSM

aSEC
Built-in Cloud Security Center

- Host Protection
- Asset Identification
- Event Mgmt
- Vulnerability Mgmt
- Built-in Network Security*

Monitoring

- Operation Log
- Audit Log Backup
- Risky Behavior Alert
- Security Event Monitoring
- Security Monitoring Dashboard

Coding Security

SDL	Code Obfuscation	Code Vulnerability Scanning	Penetration Testing	Dependency Mgmt

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Disk Data Encryption
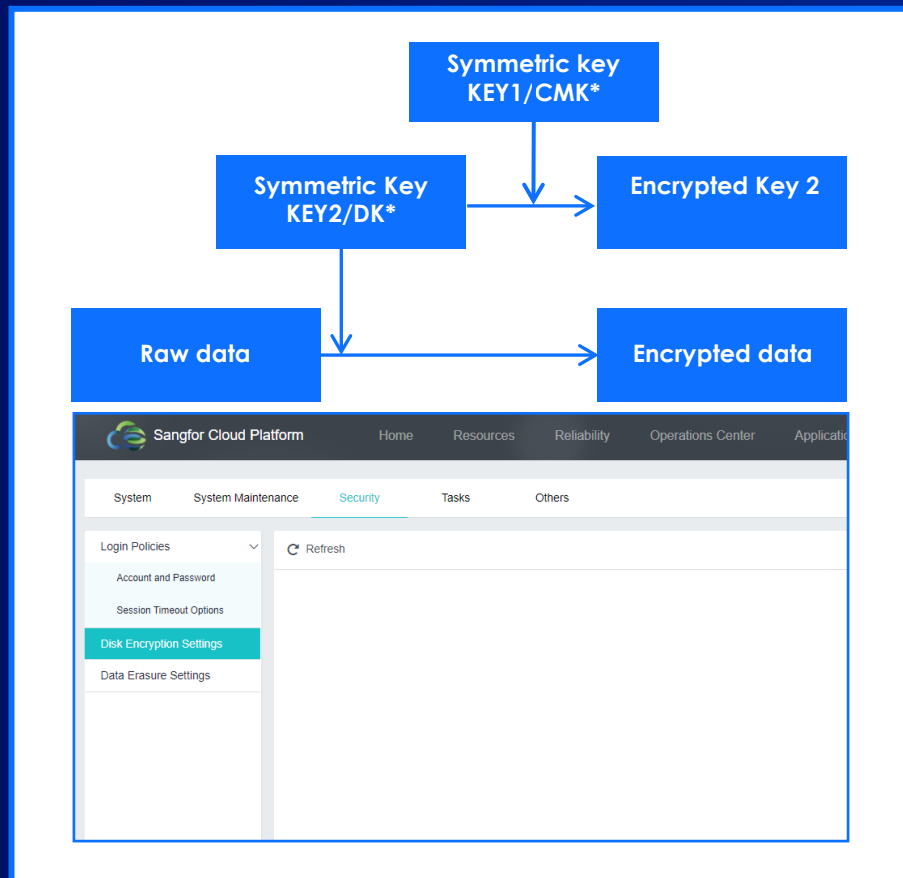
Scenario

➢ Realizing the encryption of images and snapshoots based on VM disk encryption.

Feature

➢ **Encryption algorithm:** AES-256, SM4.

➢ **Range:** one VM with one encryption module.

➢ **Key:** one VM with one key.

Disk Data Erasure
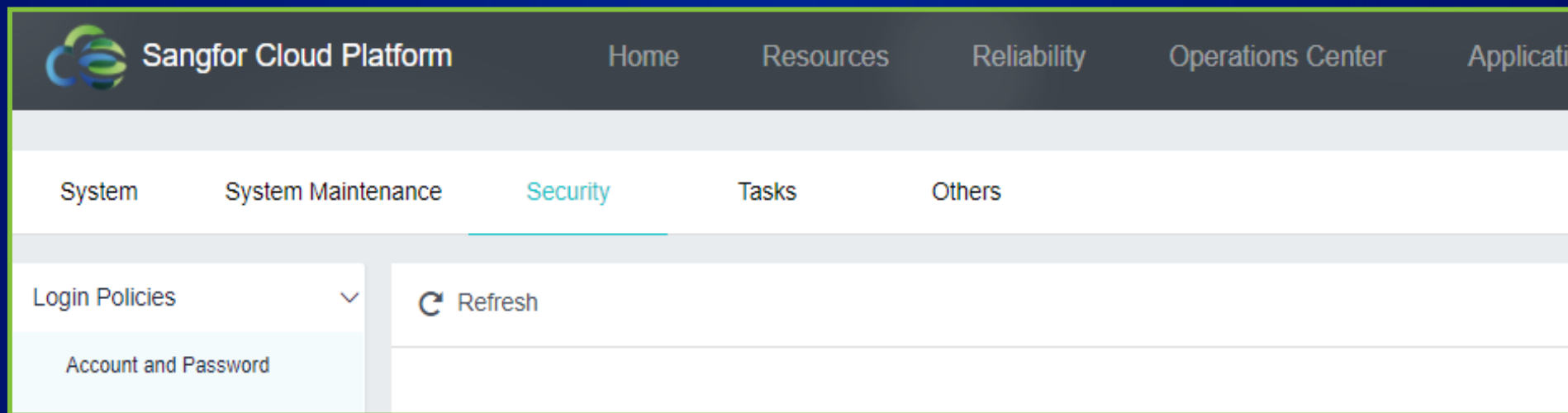
Scenario

- Ensuring the deleted data is completely wiped from the disk when recycling storage resource.

Feature

- Wiping disk data thoroughly.
- Customized overwriting strategy.
- Supporting specific rate of overwriting and erasure for different cluster.

Note

- Users' business system will be interfered in data erasure process because of occupancy of Disk I/O and CPU capacity.
- The wiped data cannot be recovered.

High Performance

Panorama of High Performance Capabilities

Infrastructure

- CPU
- GPU
- Memory
- High performance network card
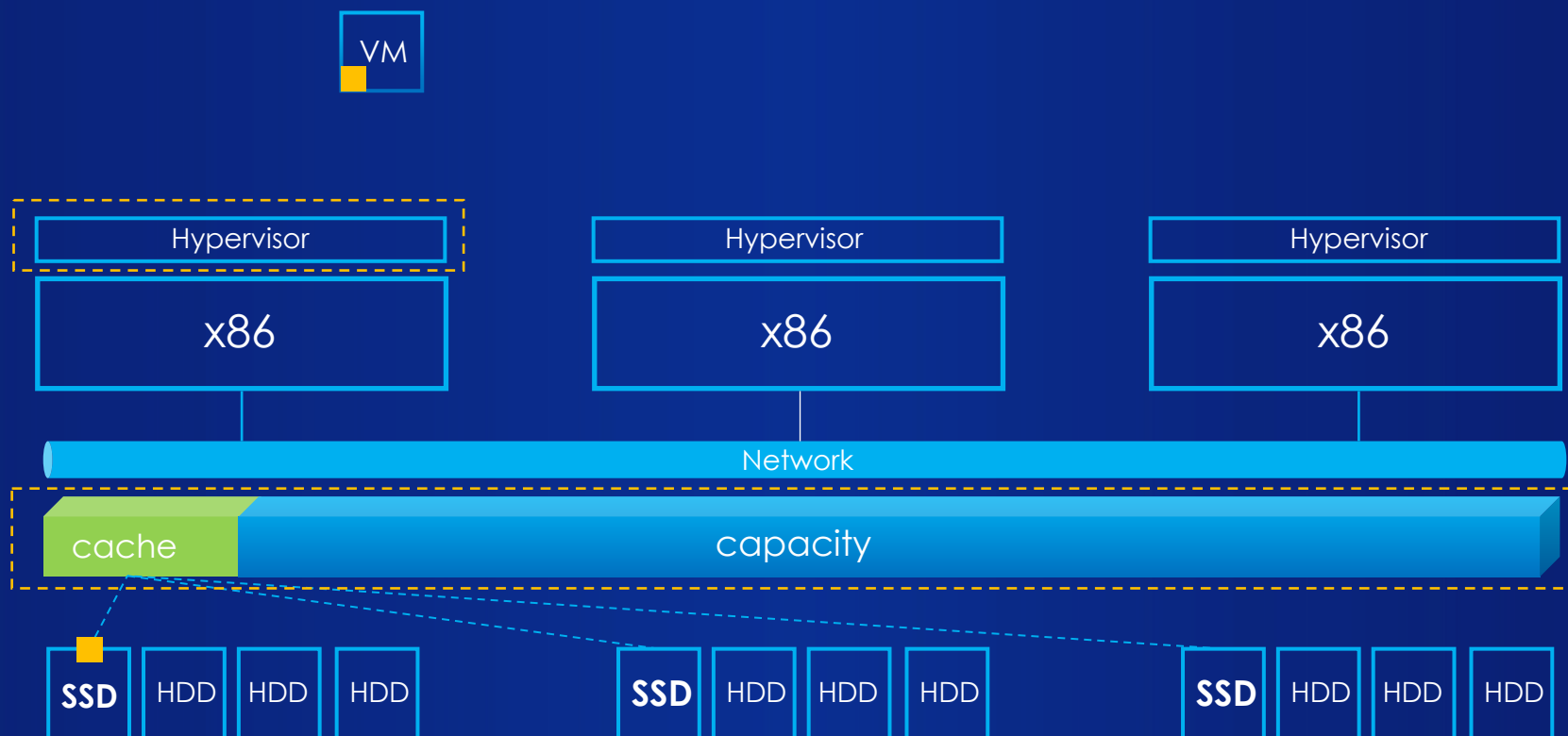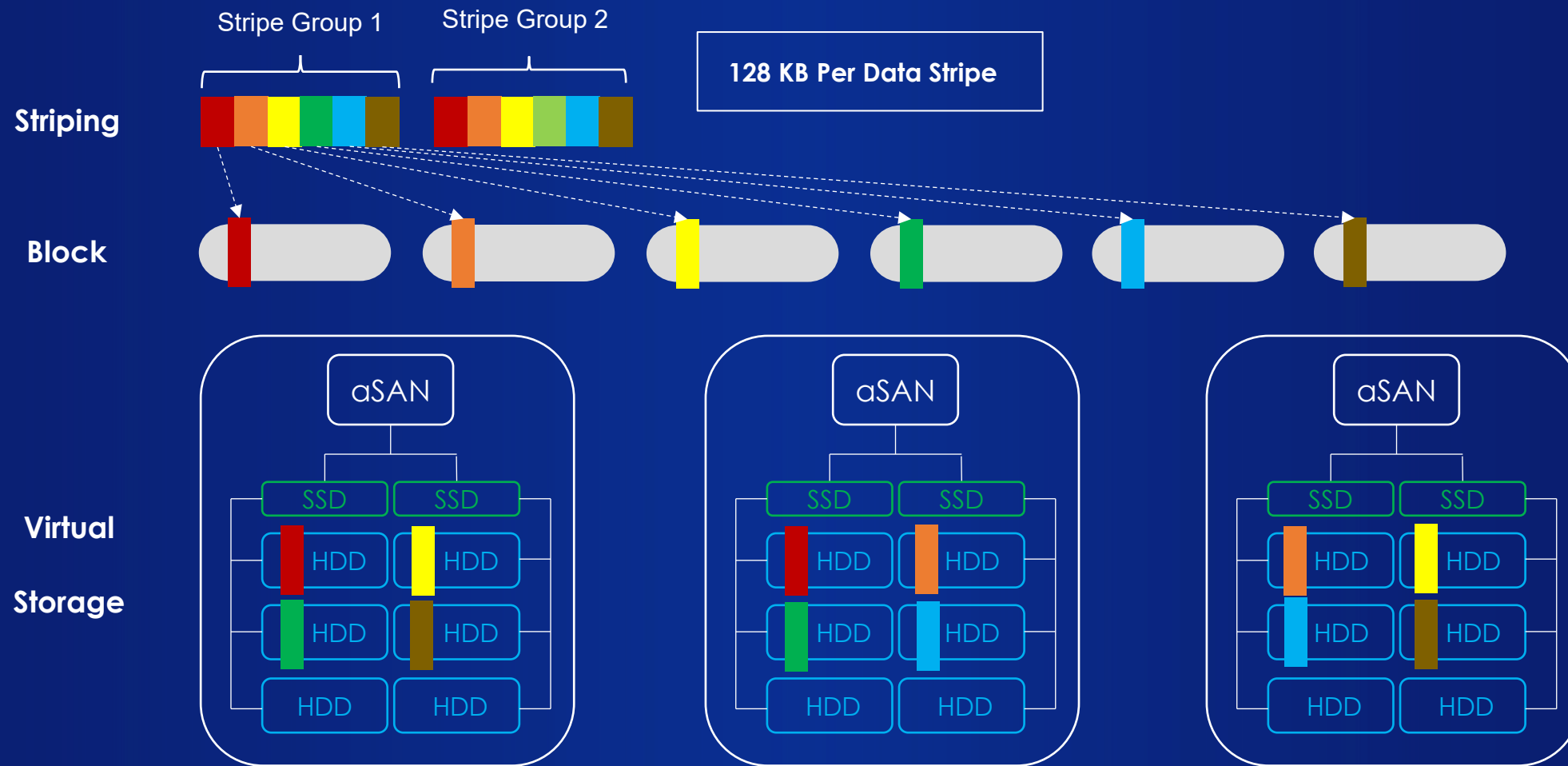- Hard disk
- Switching network

Application Layer High Performance

| Shared disk optimization | Intelligent resource engine based on AI analysis | Database Best Practices Deployment | Database performance optimization assistant |

Compute Layer High Performance

| I/O path optimization | NUMA technology optimization | Huge page memory | KMS memory coalescing |

Network Layer High Performance

| Low Latency Optimization | Network Zero Copy Technology | Independent Forwarding Core Design | DPDK | Network card interrupt binding |

Storage Layer High Performance

| Data tier-ing | I/O localization | Adaptive Cache Replacement Algorithm | Cross-host read cache |
| Data sharding | Adaptive Striping | Data multi-copy distribution | Data Balancing |

Performance monitoring

- Cache hit ratio
- Traffic real-time monitoring
- Disk sub-health detection
- Latency real-time analysis
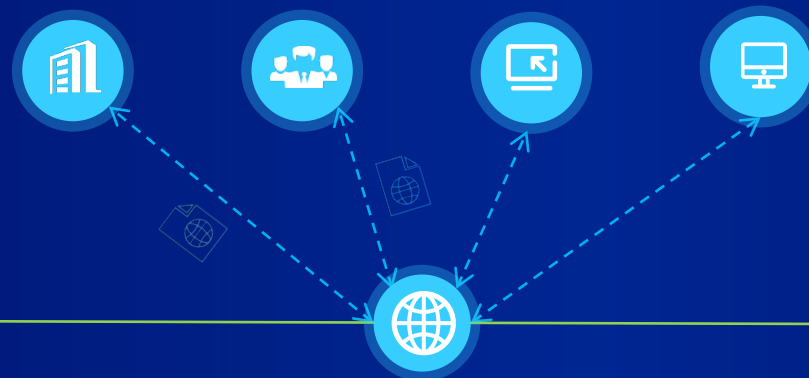- One-click performance analysis

The Best Building Block for Your Hybrid Cloud
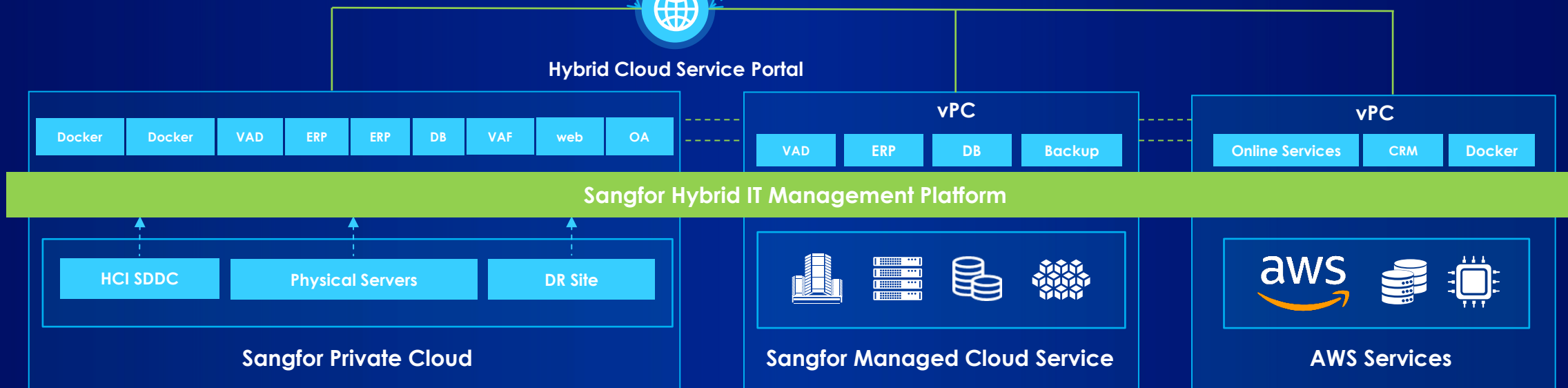
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Homogeneous Hybrid Cloud

- ✓ Unified management
- ✓ Security consistency
- ✓ Simple and easy start
- ✓ Cost effective

Subsidiary   Sub-Department   Remote Access   Branch (VDI)

Sangfor MCS

- ✓ Managed Private Cloud
- ✓ Critical Applications
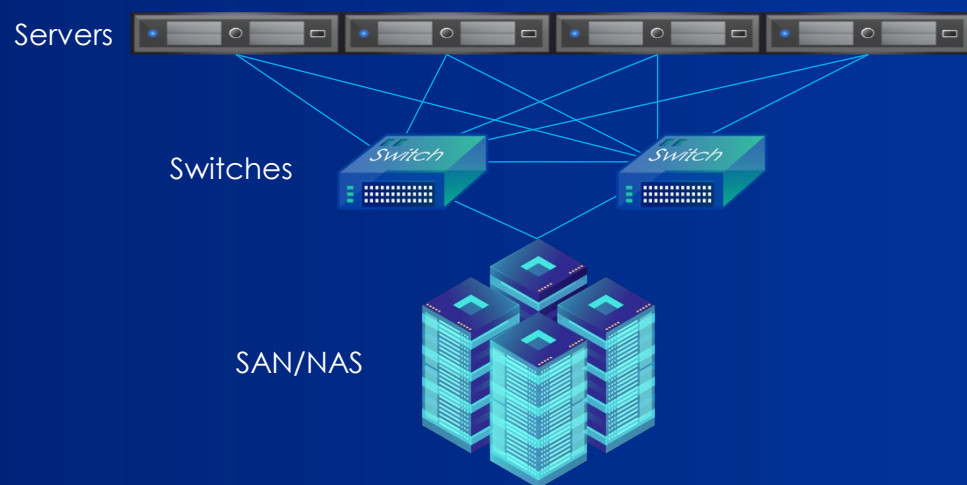- ✓ Backup & DR Services
- ✓ Hybrid Cloud Managed Services

Hybrid Cloud Service Portal

Docker	Docker	VAD	ERP	ERP	DB	VAF	web	OA

vPC

VAD	ERP	DB	Backup

vPC

Online Services	CRM	Docker

Sangfor Hybrid IT Management Platform

HCI SDDC	Physical Servers	DR Site

Sangfor Private Cloud

Sangfor Managed Cloud Service

aws

AWS Services

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Sangfor HCI vs Traditional 3-tier Infrastructure

Traditional 3-tier infrastructure

Servers

Switches

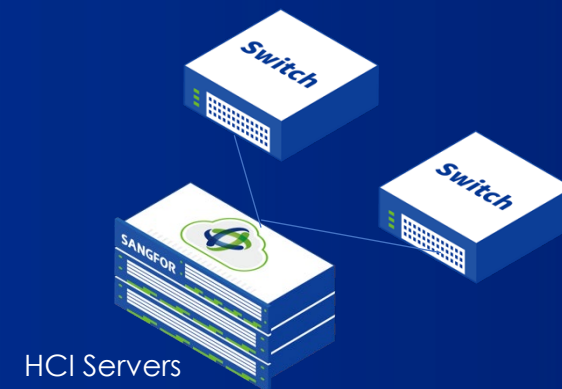SAN/NAS

- Rigid architecture, not built to scale out
- Resource silos, multiple vendors' products and support
- Complex O&M with multiple management planes
- Requires IT professional
- High TCO

Sangfor HCI

HCI Servers

- Distributed architecture, built to scale out
- Unified resource pool, single vendor solution and support
- Single-pane-of-glass management with intuitive GUI
- Only requires IT generalist for O&M
- Low TCO

Business Benefits Brought By Sangfor HCI

Up to **70%** TCO

Reduction

50%

TTM Reduction

30%

Higher Performance

Customers Who Chose Sangfor HCI