HUAWEI CLOUD Architecture

Foreword

This chapter introduces the architecture and key services of HUAWEI CLOUD.

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Objectives

- After completing this course, you will:

  - Understand the overall architecture of HUAWEI CLOUD.

  - Know the key services of HUAWEI CLOUD, including Elastic Cloud Server (ECS), Auto Scaling (AS), Elastic Volume Service (EVS), Volume Backup Service (VBS), Object Storage Service (OBS), Virtual Private Cloud (VPC), Elastic Load Balance (ELB), Anti-DDoS, Vulnerability Scan Service (VSS), Web Application Firewall (WAF), Identity and Access Management (IAM), Cloud Eye, DevCloud, Enterprise Intelligence (EI), and APIs.
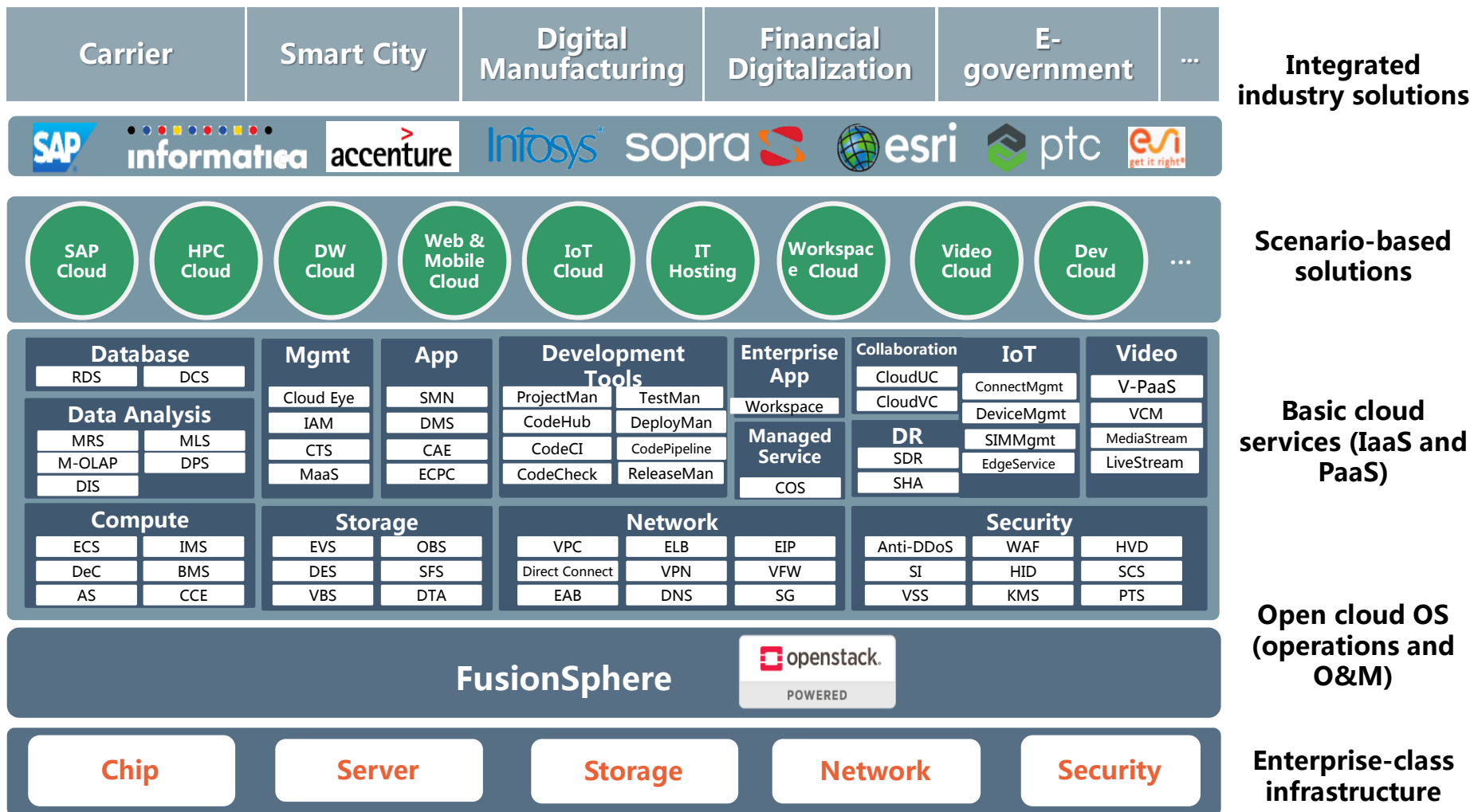
Contents

1. **HUAWEI CLOUD Service Architecture**
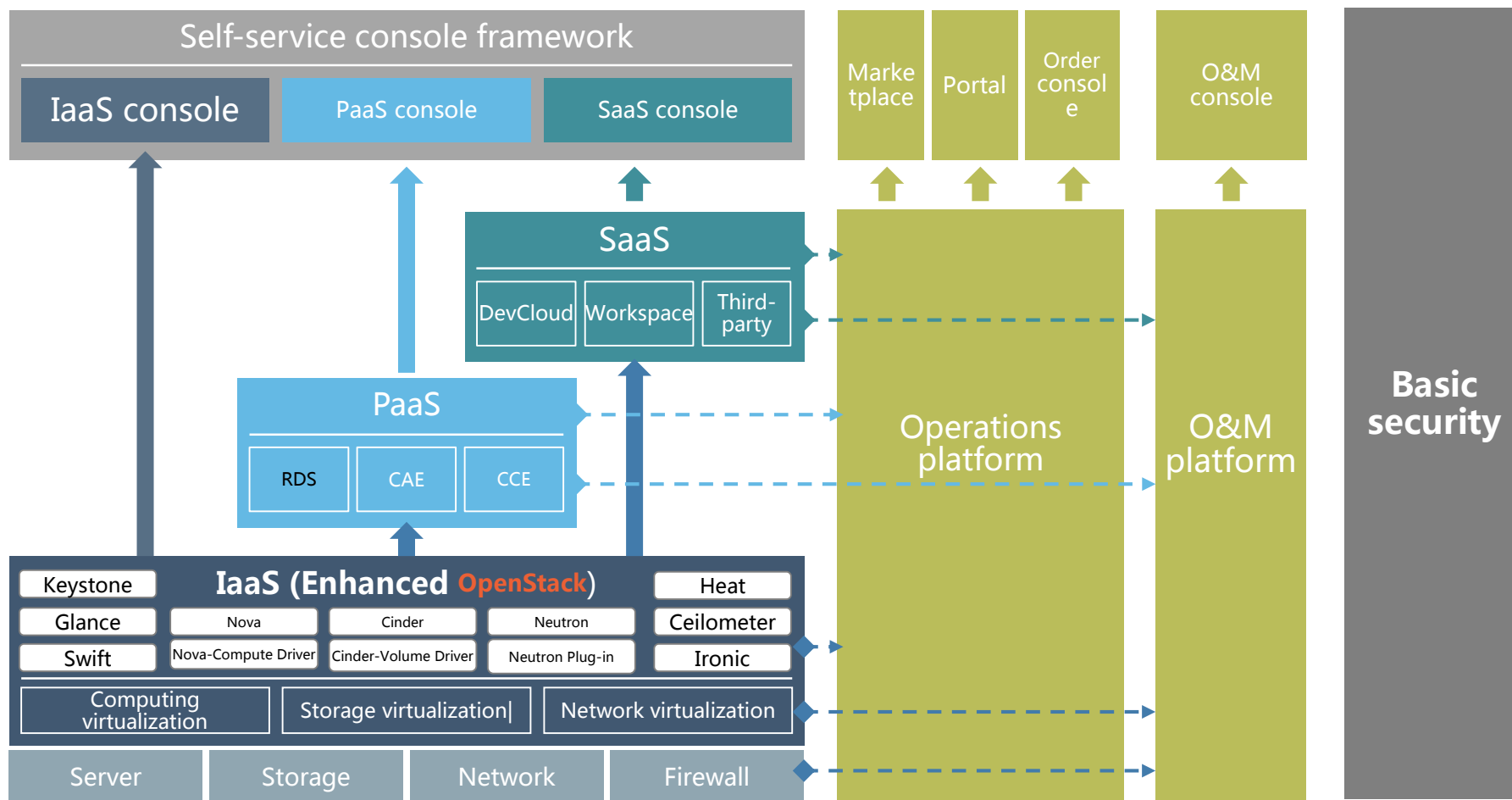
2. HUAWEI CLOUD Key Services

# HUAWEI CLOUD Full-Stack Solutions Promote Digital Transformation

Carrier	Smart City	Digital Manufacturing	Financial Digitalization	E-government	…

Integrated industry solutions

SAP · informatica · accenture · Infosys · sopra · esri · ptc · esi get it right

Scenario-based solutions

(SAP Cloud) (HPC Cloud) (DW Cloud) (Web & Mobile Cloud) (IoT Cloud) (IT Hosting) (Workspace Cloud) (Video Cloud) (Dev Cloud) …

Basic cloud services (IaaS and PaaS)

Database
RDS	DCS

Data Analysis
MRS	MLS
M-OLAP	DPS
DIS	

Mgmt
| Cloud Eye |
| IAM |
| CTS |
| MaaS |

App
| SMN |
| DMS |
| CAE |
| ECPC |

Development Tools
ProjectMan	TestMan
CodeHub	DeployMan
CodeCI	CodePipeline
CodeCheck	ReleaseMan

Enterprise App
| Workspace |

Managed Service
| COS |

Collaboration
| CloudUC |
| CloudVC |

DR
| SDR |
| SHA |

IoT
| ConnectMgmt |
| DeviceMgmt |
| SIMMgmt |
| EdgeService |

Video
| V-PaaS |
| VCM |
| MediaStream |
| LiveStream |

Compute
ECS	IMS
DeC	BMS
AS	CCE

Storage
EVS	OBS
DES	SFS
VBS	DTA

Network
VPC	ELB	EIP
Direct Connect	VPN	VFW
EAB	DNS	SG

Security
Anti-DDoS	WAF	HVD
SI	HID	SCS
VSS	KMS	PTS

Open cloud OS (operations and O&M)

FusionSphere · openstack POWERED

Enterprise-class infrastructure

Chip	Server	Storage	Network	Security

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HUAWEI CLOUD Architecture

Self-service console framework

| IaaS console | PaaS console | SaaS console |

Marketplace | Portal | Order console | O&M console

SaaS

DevCloud | Workspace | Third-party

PaaS

RDS | CAE | CCE

Operations platform

O&M platform

Basic security

IaaS (Enhanced OpenStack)

Keystone | Heat
Glance | Nova | Cinder | Neutron | Ceilometer
Swift | Nova-Compute Driver | Cinder-Volume Driver | Neutron Plug-in | Ironic

Computing virtualization | Storage virtualization | Network virtualization

Server | Storage | Network | Firewall

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HA Resource Architecture Model

A global resource pool model is formulated based on regions or availability zones (AZs), providing standard computing pools for customers to run applications with various availability requirements.
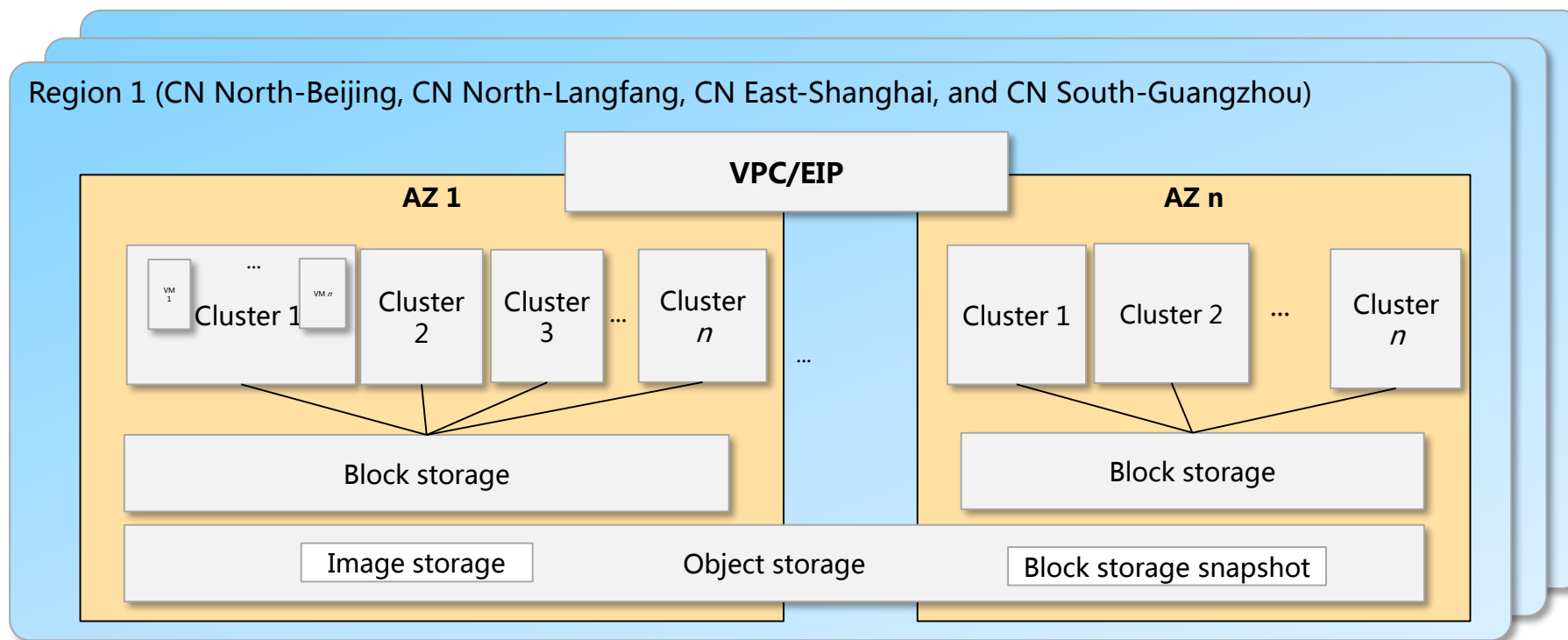
Contents

1. HUAWEI CLOUD Service Architecture

2. **HUAWEI CLOUD Key Services**

Standard HUAWEI CLOUD Product System

50+ Solutions

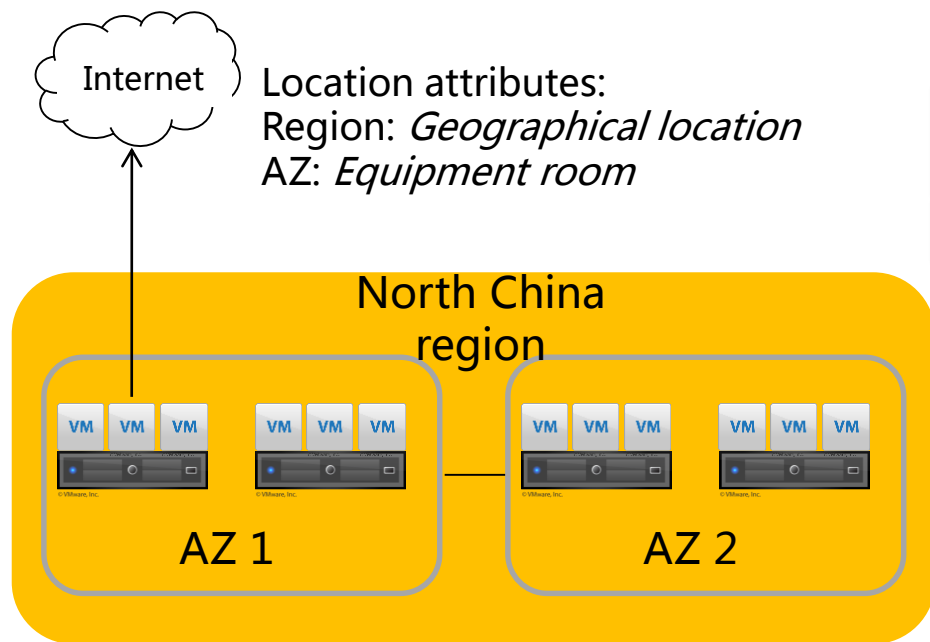|							
HPC Cloud	Web & Mobile	E-Commerce	Gaming	SAP Cloud	IoT	Cloud Security	Backup and Archive	E-Commerce Dual-Delivery
Manufacturing	Oracle to Cloud	Multiplex Dedicated Cloud	Cloud Office	Cloud Migration	Enterprise Cloud Box	Medical Image Archiving	Biomedicine
Software Training	Graded Protection	Game Security	Brute Force Attack Prevention	Game Development	Financial Services	Retail	IoV

100+ services

Enterprise Application — Workspace

Cloud Communications — IM, Meeting, CloudIPCC, VoiceCall, MSGSMS

Application — SMN, ServiceStage, FunctionStage, DDM, DMS

Management & Deployment — CRS, Cloud Eye, IAM, CCS, ICMS, CTS, LTS

DevCloud — Collaboration, CloudIDE, CloudRelease, CloudBuild, CodeCheck, CloudPipeline, MobileTest, ProjectMan, CodeHub, CloudDeploy, TestMan

IoT — IoT Platform

EI Enterprise Intelligence — MRS, DPS, DIS, MLS, DWS, CDM, UQuery, OCR Forms

Database — DCS, RDS, DDS

Security — Anti-DDoS, AAD, VSS, KMS, WAF, ARS, SSA, HIDS, SIS, SAS, HVD, SCS, HWAF, WTP, DBSS

Compute — ECS, AS, IMS, BMS, DeC, DeH, CCE

Storage — EVS, OBS, VBS, DES, SFS, DESS, CDN, CSBS

Network — VPC, ELB, DNS, Direct Connect, VPN

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Standard HUAWEI CLOUD Product System

An **Elastic Cloud Server (ECS)** is a cloud server that provides scalable, on-demand computing resources. ECSs help you build reliable, secure, flexible, and efficient application running environments, enabling stable and continuous services and improving O&M efficiency.

Internet

Location attributes:
Region: *Geographical location*
AZ: *Equipment room*

North China region

VM VM VM   VM VM VM
AZ 1

VM VM VM   VM VM VM
AZ 2

ECS

| CPU | Memory | Image | System disk | Data disk | NIC |

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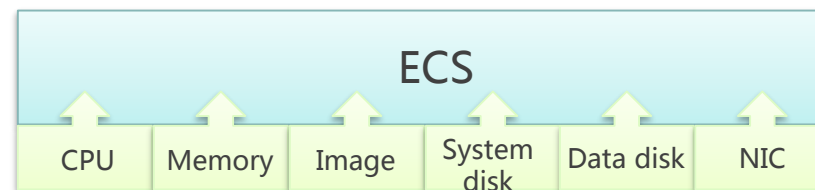
Compute Service - GPU-accelerated ECS
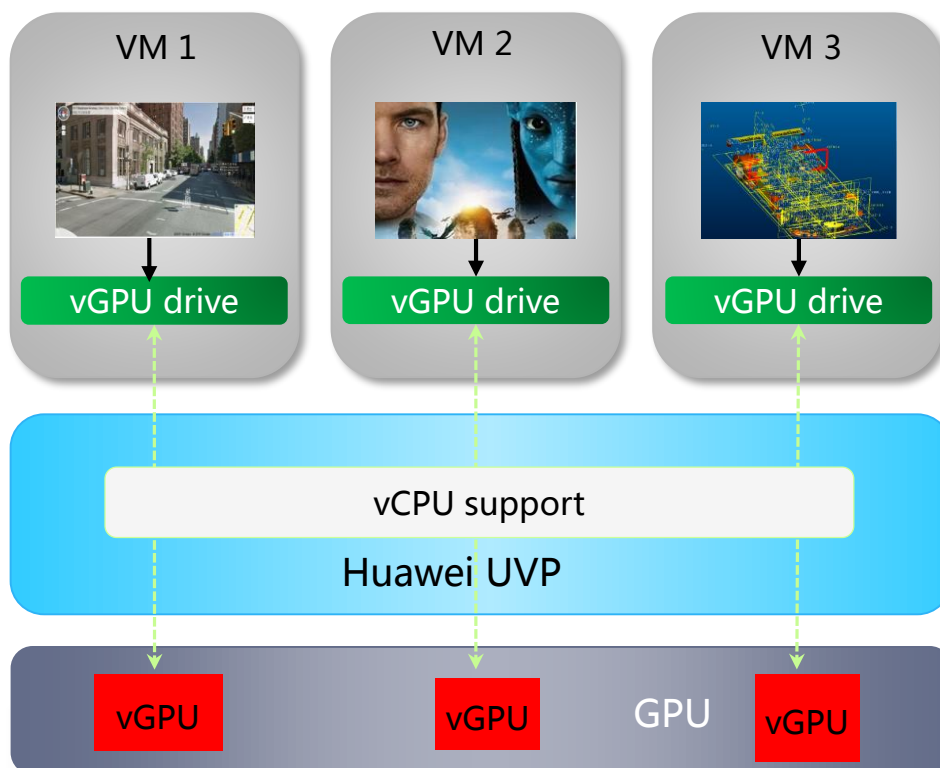
- **Technical Principles**
  - ▫ A physical GPU is virtualized into multiple vGPUs. The VMs with associated vGPUs can access physical GPU resources.

- **Application Scenarios**
  - ▫ Graphics rendering, engineering drawing, cloud desktop

- **Customer Benefits**
  - ▫ Provide users with better experience in virtual environments through high-performance graphics and videos.

Compute Service - Auto Scaling

Auto Scaling (AS) automatically adjusts computing resources based on service requirements and configured AS policies. This allows the number of ECSs to change with service traffic, ensuring stable service running.

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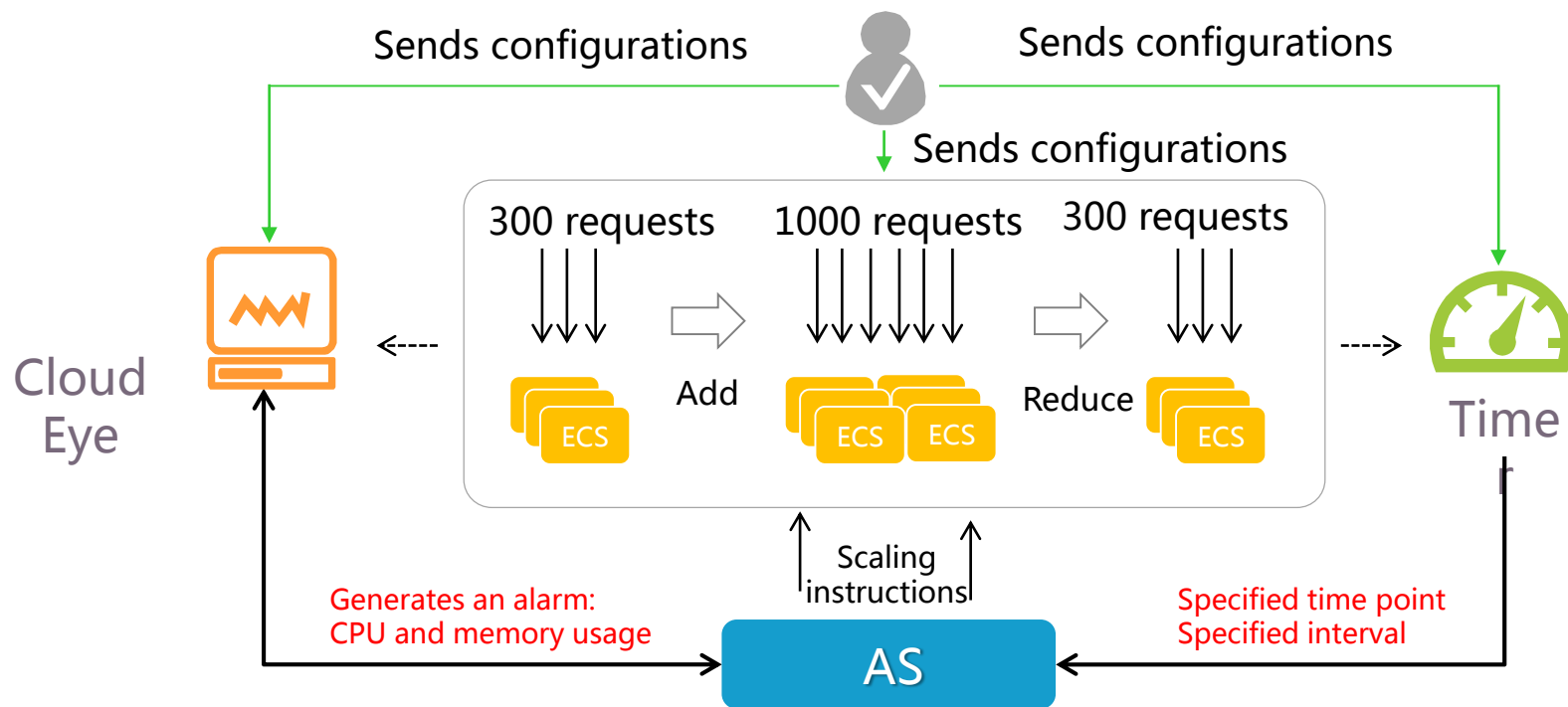
Storage Service - Elastic Volume Service

Distributed storage architecture
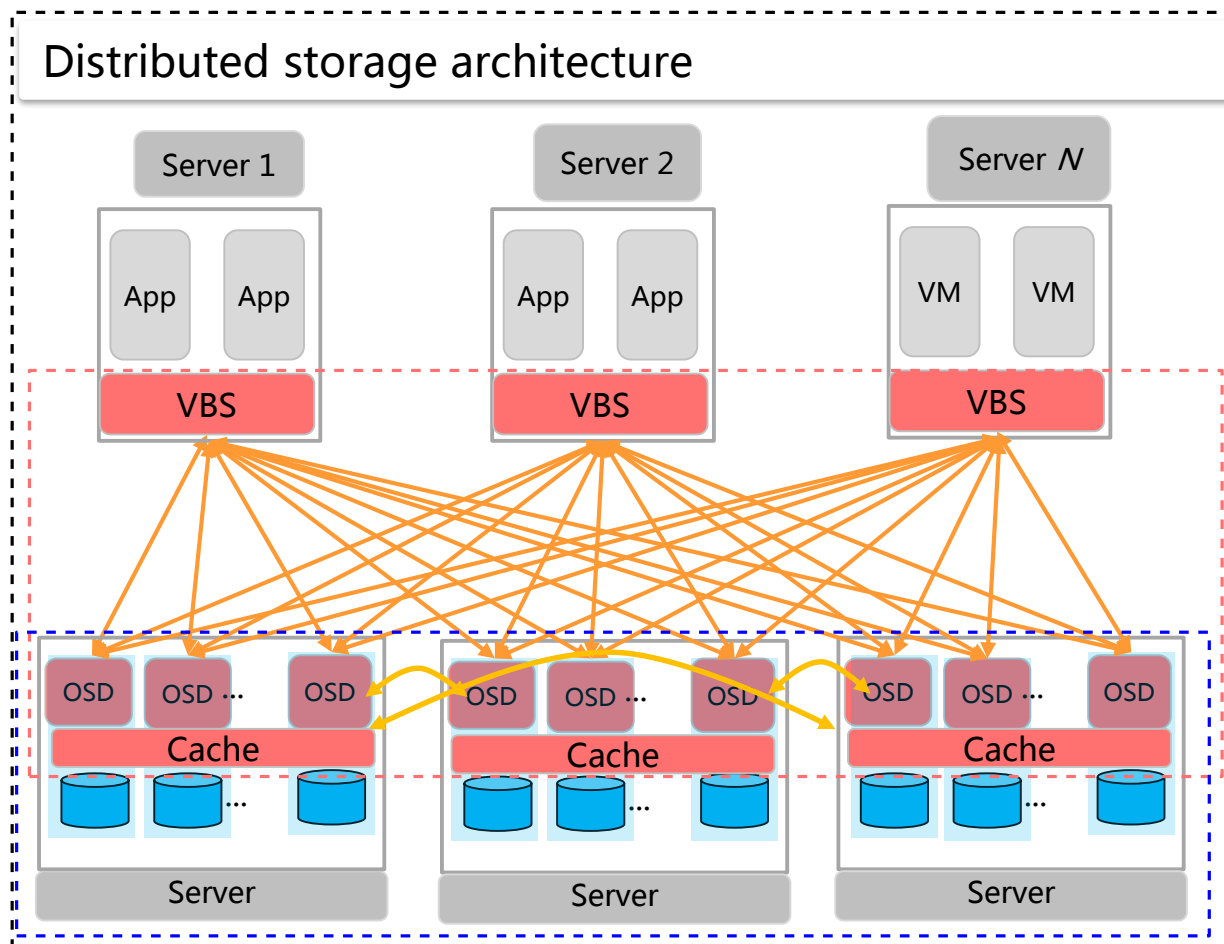
Elastic Volume Service (EVS)

Provides scalable virtual block storage based on a distributed architecture. EVS disks feature high data reliability and I/O throughput. EVS disks are similar to physical servers' hard disks. You can attach EVS disks to ECSs, format them, create file systems on them, and store data on them.

Storage Service - Volume Backup Service

Volume Backup Service (VBS) backs up EVS disks and uses the backups to restore original EVS disks, ensuring user data accuracy and security.

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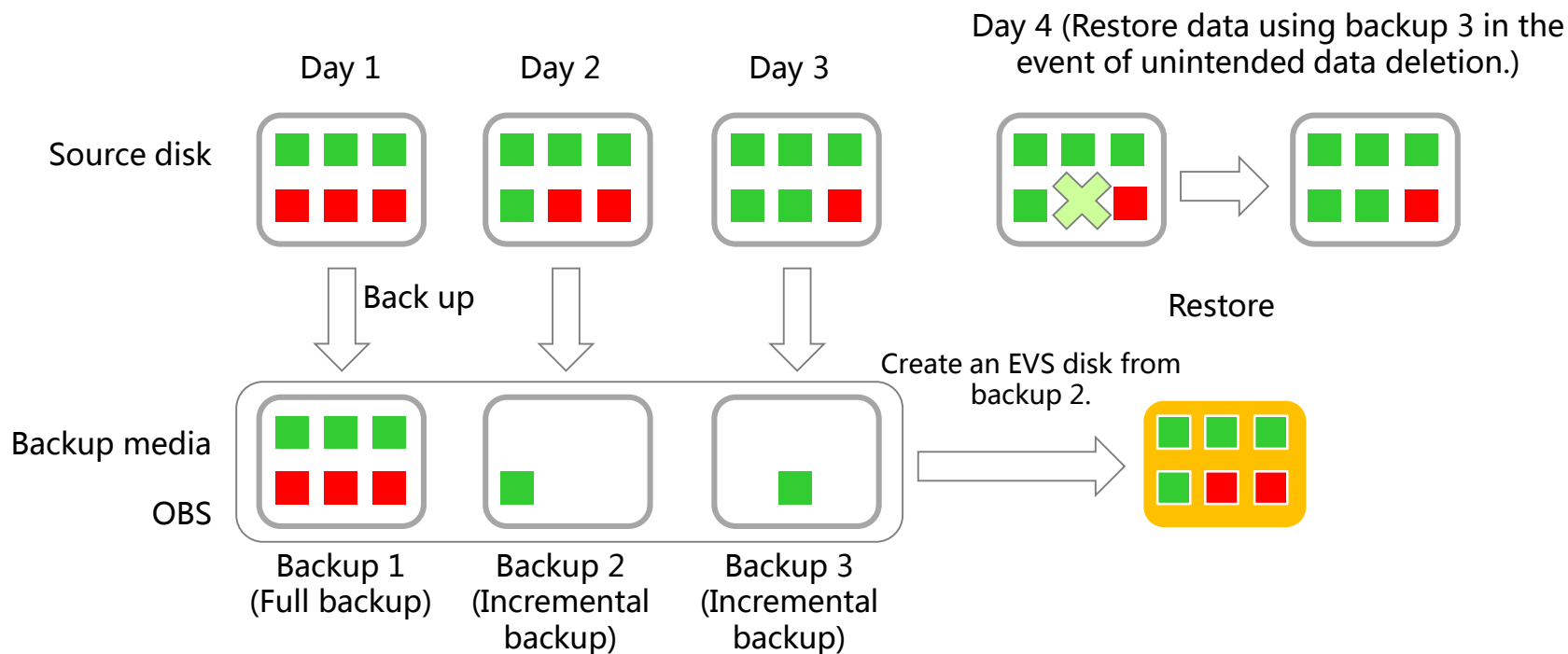
Storage Service - Object Storage Service

Object Storage Service (OBS) is an object-based storage service providing massive, cost-effective, highly reliable, and secure data storage. OBS is easy to use and applies to various scenarios, such as massive storage resource pools, static website hosting, big data analytics, backup and archiving, and cloud storage.
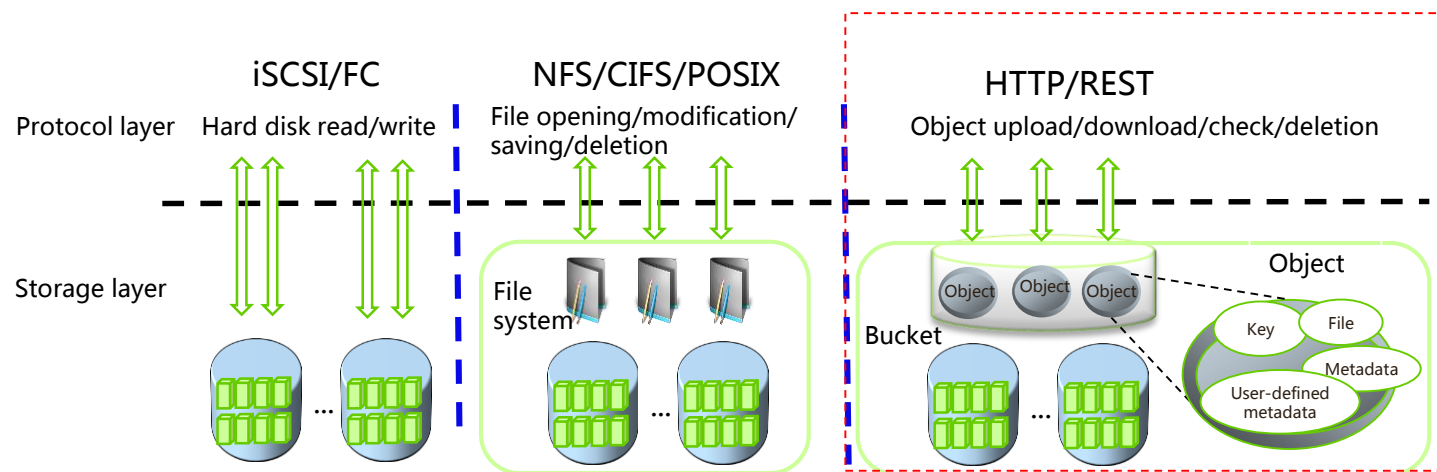
- **High availability:** Eleven nines data durability and four nines availability

- **Low cost**: Massive storage provided at low cost and support for elastic scaling

- **Easy to use:** Flexible service access using the native S3 APIs, web-based management console, OBS client, and SDK

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Network Service - Virtual Private Cloud

A **Virtual Private Cloud (VPC)** is an isolated virtual network environment created on HUAWEI CLOUD. You have complete control over your VPC, including creating subnets and security groups, assigning elastic IP addresses (EIPs), allocating bandwidth, and configuring DHCP. You can also use Direct Connect or a VPN to connect your VPC to a physical data center for flexible resource consolidation.
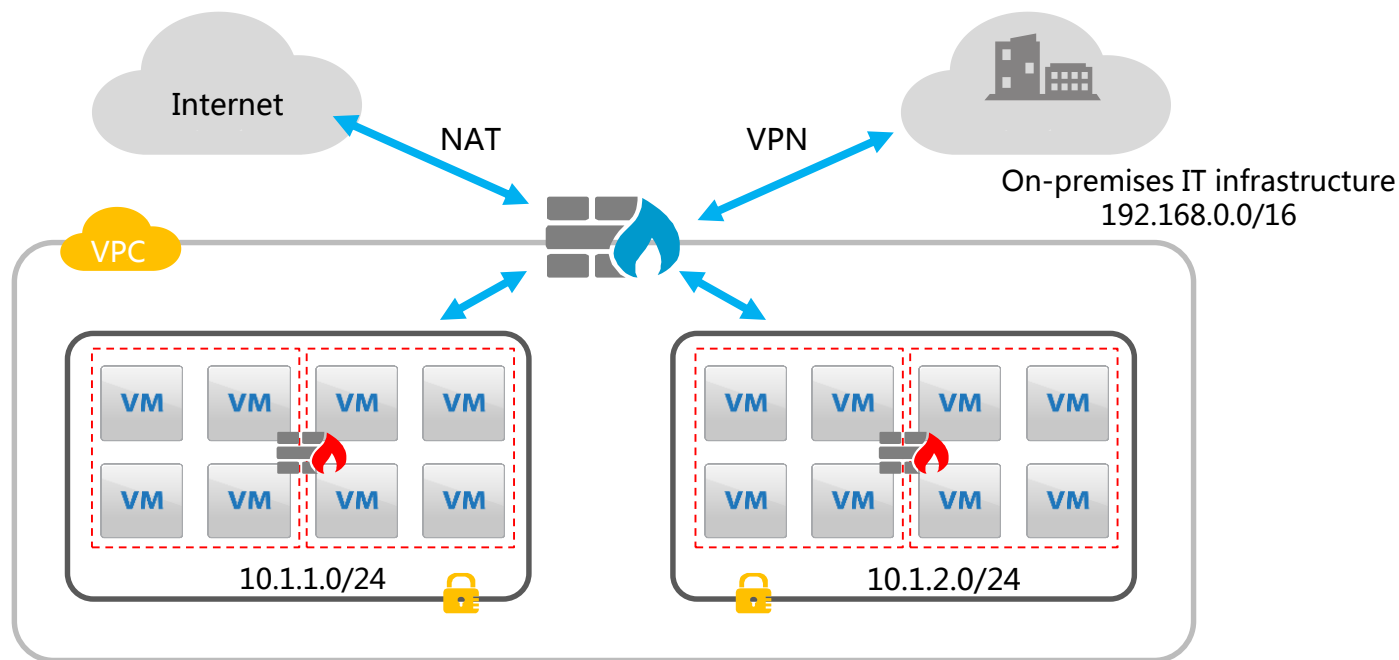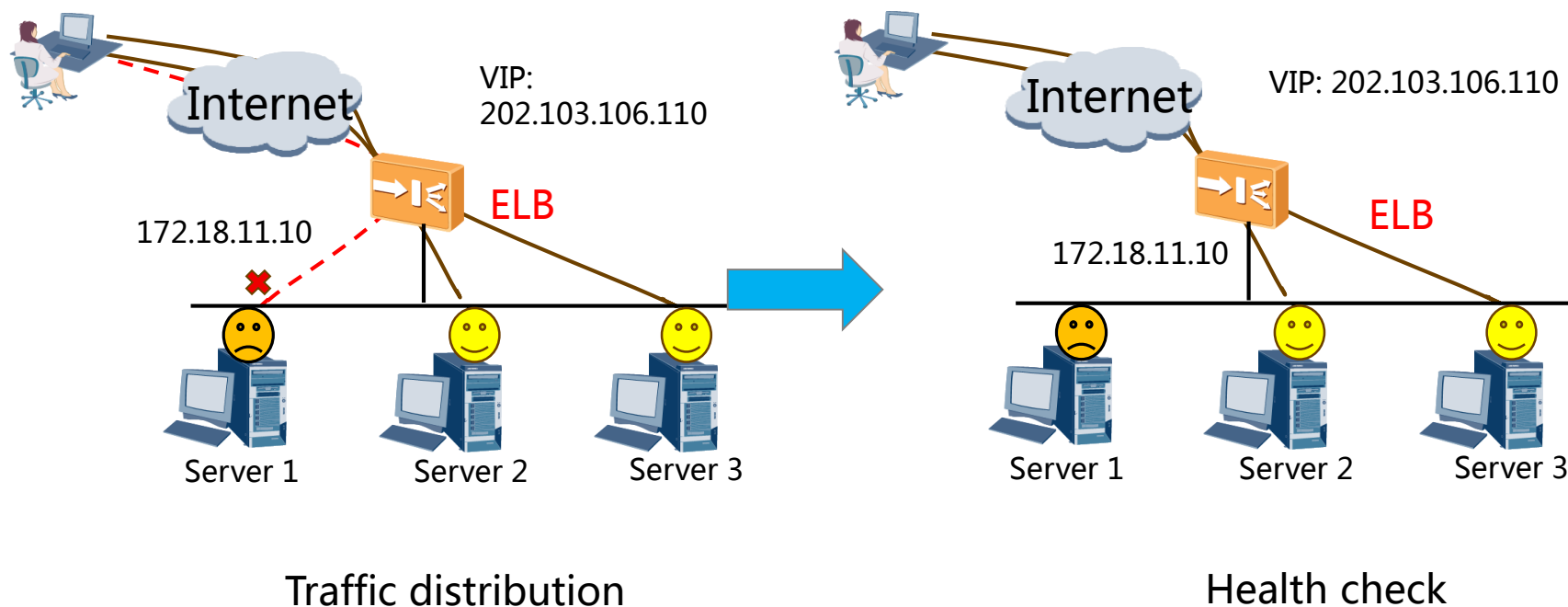
Network Service - Elastic Load Balance

Elastic Load Balance (ELB) automatically distributes incoming traffic across servers to balance their workload, increasing the service capabilities and fault tolerance of your applications.

Traffic distribution

Health check

Security Service - Anti-DDoS

Anti-DDoS uses professional anti-DDoS devices to protect your online applications from DDoS attacks, such as CC, SYN flood, and UDP flood. You can configure parameters to specify the DDoS threshold based on the bandwidth and service model. If the system detects a DDoS attack, it immediately notifies users of attack defense.
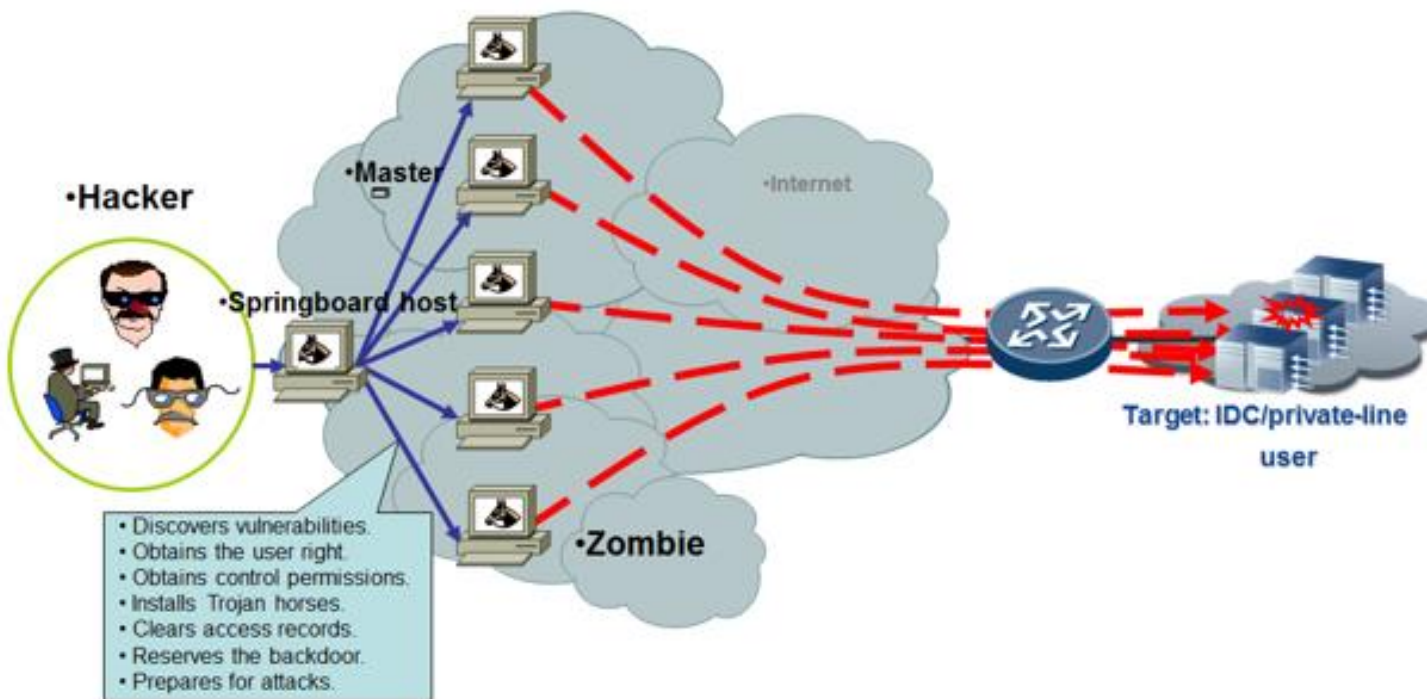
Security Service - Vulnerability Scan Service

Vulnerability Scan Service (VSS) is a security diagnosis service that uses weakness detection and intelligent correlation analysis to identify security risks in your websites or servers. VSS also provides vulnerability details and professional suggestions for fixing them.
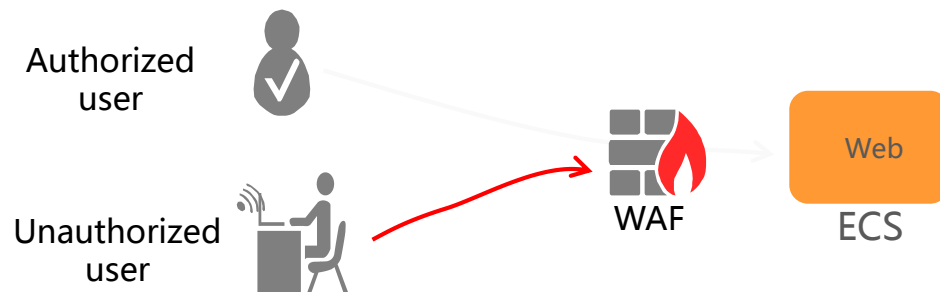
Key Features:

- New users using VSS for the first time can scan their websites before domain name authentication to estimate website risks.

- Supports scan for multiple server vulnerabilities.

- Can detect the OWASP* top 10 security risks.

- Supports vulnerability scan of third-party open-source software and scan for zero-day vulnerabilities.

- Covers multiple web fingerprints and host fingerprints.

- Provides professional suggestions for fixing each type of detected vulnerability.

* Open Web Application Security Project (OWASP)

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Security Service - Web Application Firewall

Web Application Firewall (WAF) is expertly designed to secure your website. It checks HTTP requests for anomalies and prevents intrusions, such as web page tampering, information leakage, and Trojan horses.

Authorized user

Unauthorized user

WAF

Web

ECS

Key Features:

- Supports a wide range of Windows and Linux OSs, more than any other anti-virus product in the industry.
- Provides in-depth comprehensive security protection, including:
  - Detecting and blocking attacks, including SQL injection, XSS, server vulnerabilities, information leakage, privilege escalation, unauthorized command execution, web shells, and third-party vulnerability exploits
  - Hiding the elastic IP addresses of ECSs to protect them from attacks
  - Caching static resources of websites so that required resources can be obtained from the WAF without redirecting the access requests to the sources, accelerating website access

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Management and Deployment: Identity and Access Management

Identity and Access Management (IAM) is a web service that you can use to manage users and user permissions on HUAWEI CLOUD. It enables you to centrally manage users and security credentials (such as access keys), and control user permissions for accessing HUAWEI CLOUD resources.

Key Features:

- User and security credential management: On HUAWEI CLOUD, you can create, change, and delete security credentials (such as access keys) of each user under your account.
- User access control: You can control access permissions and access modes of users under your account.
- User group management: Under your account, you can create user groups and assign users (such as administrators and developers) to different groups to control user permissions. After a user is added to a group, the user has all the permissions of the group. To control user permissions, you can change the user group of a user.
- Support for Huawei managed service: You can use the entrusted registration function to have HUAWEI CLOUD customer service personnel register HUAWEI CLOUD accounts for your enterprise and perform maintenance operations on your behalf using the registered accounts.
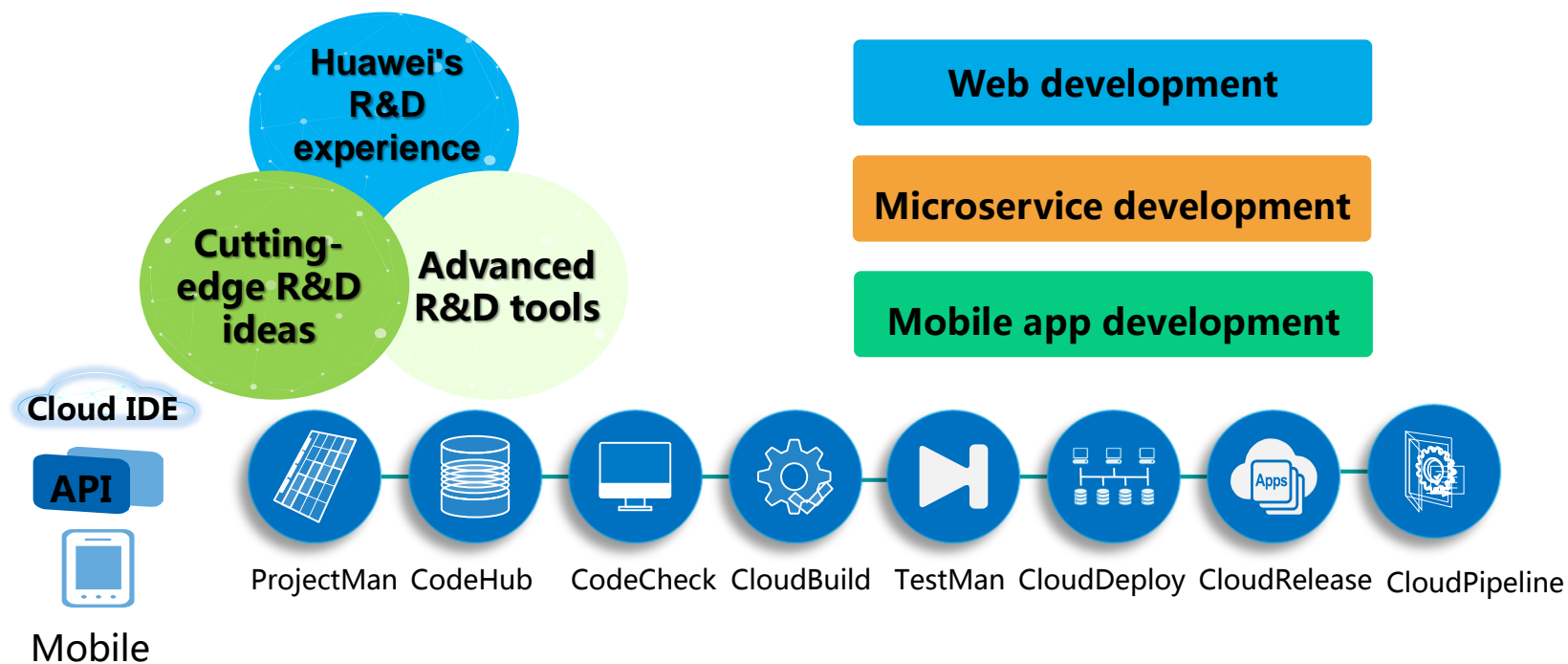
Management and Deployment: Cloud Eye

Cloud Eye is a multi-dimensional resource monitoring platform. It provides real-time monitoring, alarm reporting, notification, and personalized monitoring visualizations, simplifying your product and resource status monitoring.
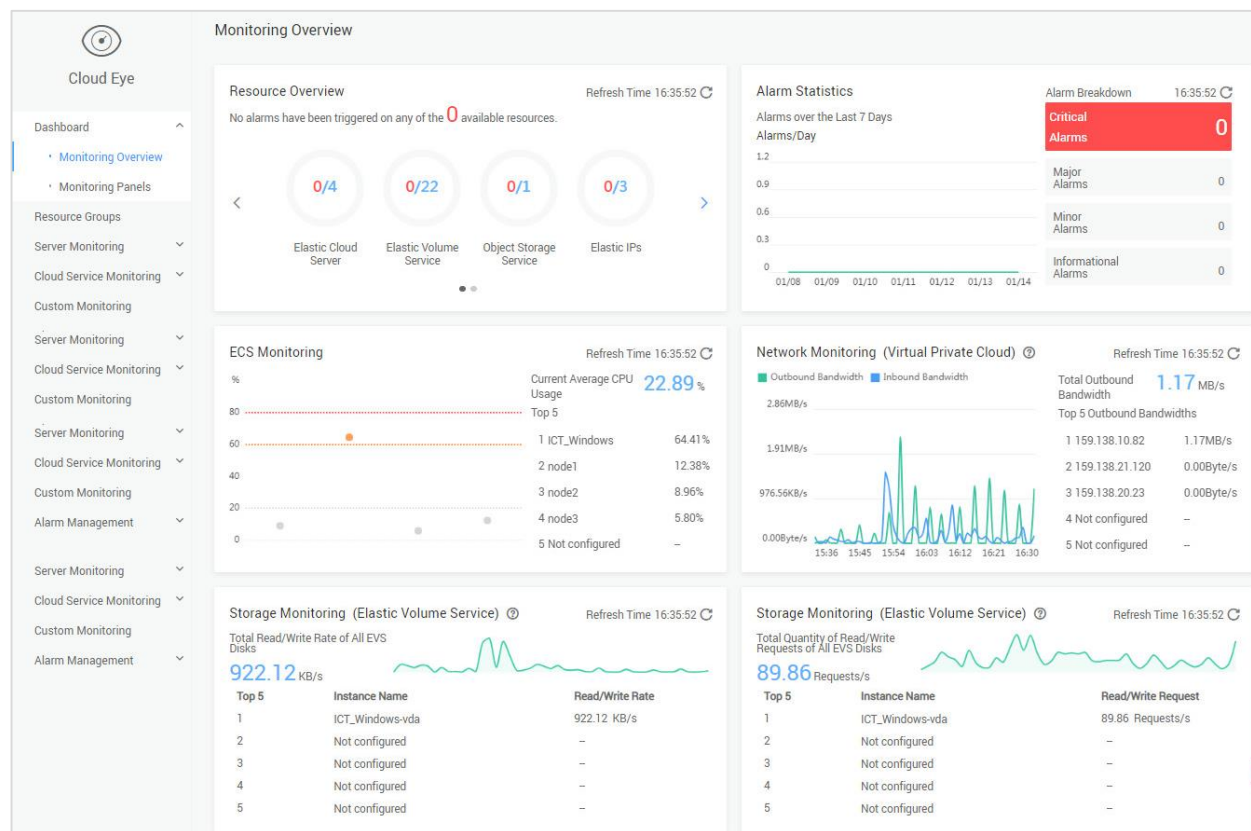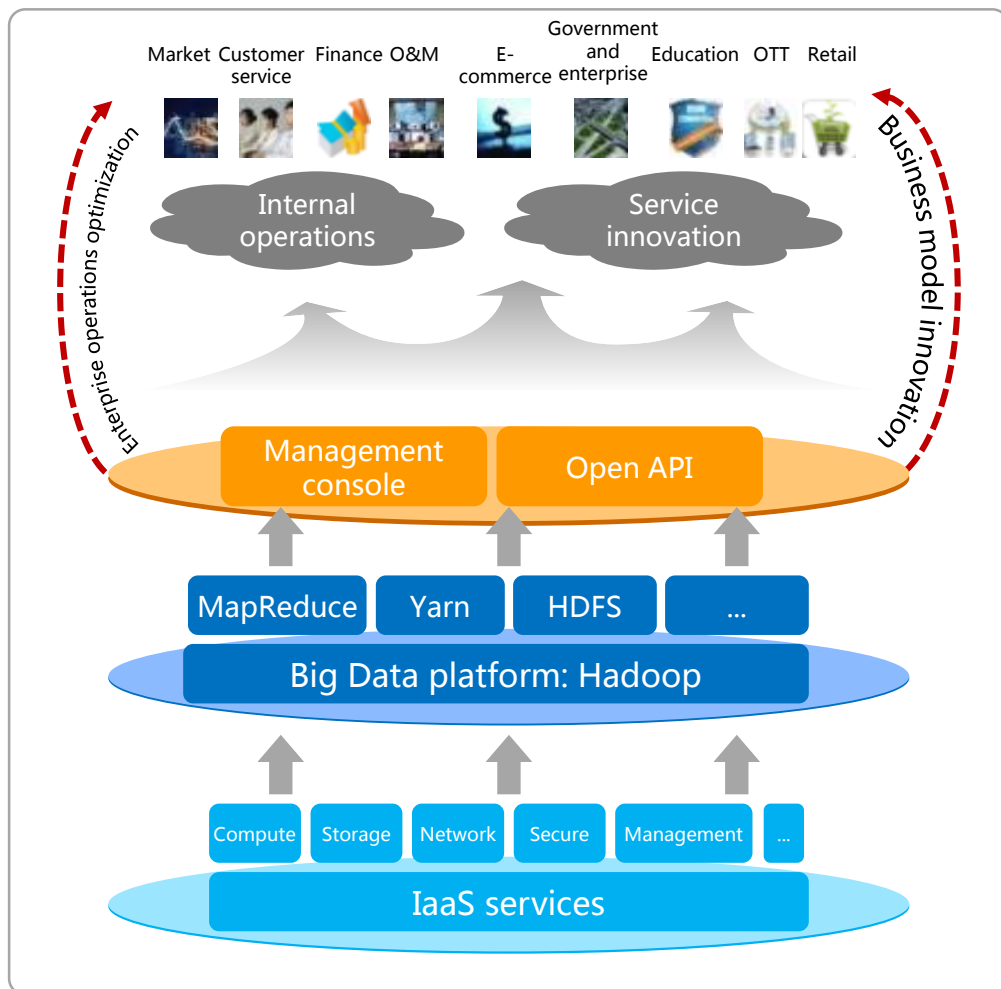
DevCloud - One-Stop DevOps Platform on the Cloud

DevCloud is a cloud-based development platform that integrates Huawei's R&D experience, cutting-edge R&D ideas, and advanced R&D tools. It provides developers with a full R&D suite, making software development easier and more efficient.

Huawei's R&D experience

Cutting-edge R&D ideas

Advanced R&D tools

Web development

Microservice development

Mobile app development

Cloud IDE

API

Mobile

ProjectMan CodeHub CodeCheck CloudBuild TestMan CloudDeploy CloudRelease CloudPipeline

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Big Data on the Cloud – Intelligence for Agile Business

Customer Benefits

Professional

Experience accumulation and continuous optimization

- Secure and reliable: HA for all components
- Excellent performance: HDFS and MapReduce performance improved fivefold
- Community contribution: First in Asia and fourth globally

Ease of use

Quick provisioning and lightweight O&M

- Intuitive self-service console
- One-stop purchase of software and hardware
- Multi-dimensional monitoring and convenient O&M.

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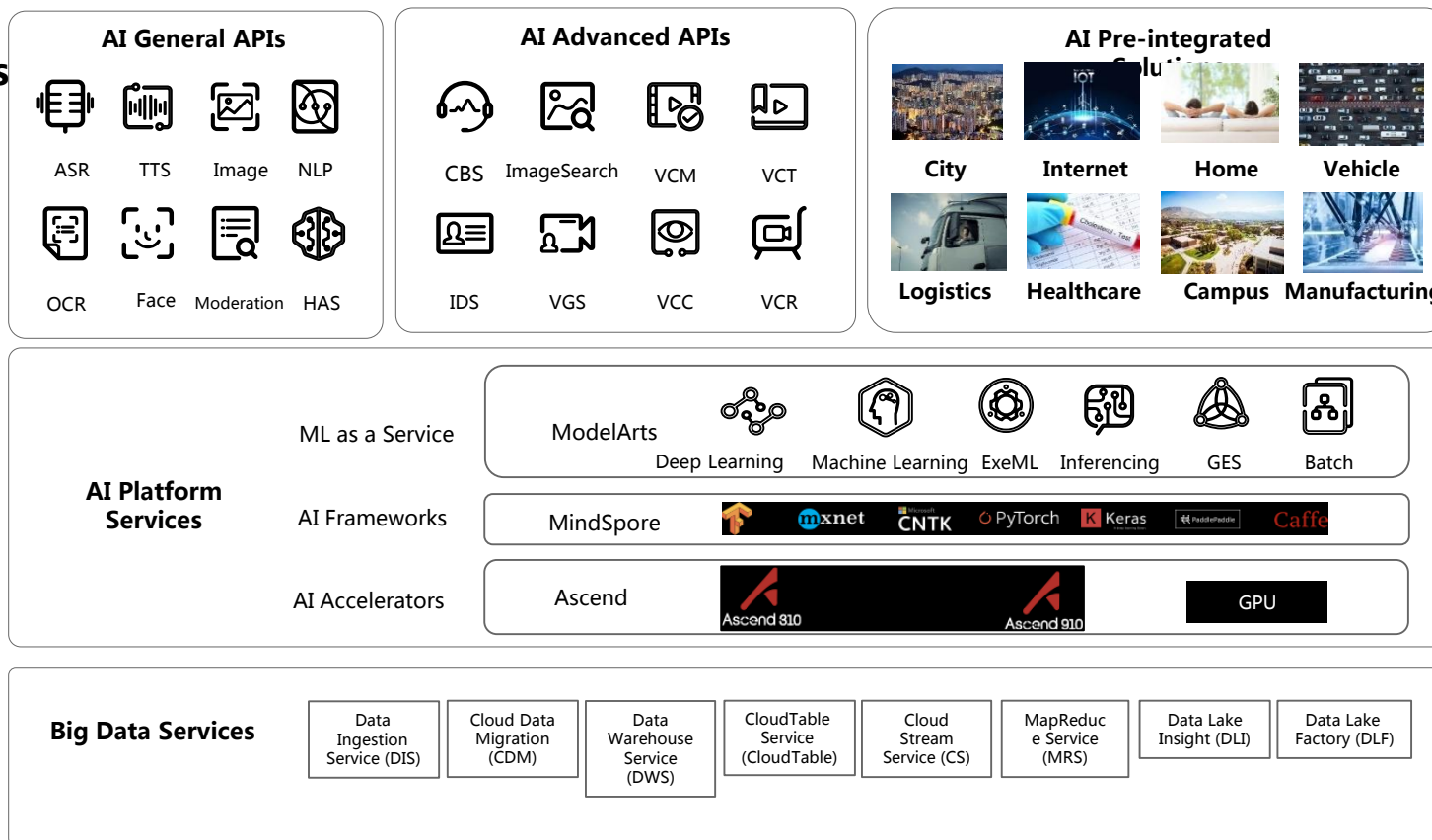# HUAWEI CLOUD EI - Full-Stack Enablement for All Scenarios

45 services

142 functions

AI General APIs

ASR	TTS	Image	NLP
OCR	Face	Moderation	HAS

AI Advanced APIs

CBS	ImageSearch	VCM	VCT
IDS	VGS	VCC	VCR

AI Pre-integrated Solutions

City	Internet	Home	Vehicle
Logistics	Healthcare	Campus	Manufacturing

18 platform services

15 visual services

8 language services

4 decision-making services

36 platform-related functions

98 APIs

8 pre-integrated solutions

AI Platform Services

ML as a Service — ModelArts: Deep Learning, Machine Learning, ExeML, Inferencing, GES, Batch

AI Frameworks — MindSpore: mxnet, CNTK, PyTorch, Keras, PaddlePaddle, Caffe

AI Accelerators — Ascend: Ascend 310, Ascend 910, GPU

Big Data Services

Data Ingestion Service (DIS)	Cloud Data Migration (CDM)	Data Warehouse Service (DWS)	CloudTable Service (CloudTable)	Cloud Stream Service (CS)	MapReduce Service (MRS)	Data Lake Insight (DLI)	Data Lake Factory (DLF)

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Quiz

1. Which of the Following Compute Services Does HUAWEI CLOUD Provide?

    A. Elastic Cloud Server (ECS)

    B. Auto Scaling (AS)

    C. Image Management Service (IMS)

    D. Elastic Volume Service (EVS)

Quiz

1. Which of the Following Compute Services Does HUAWEI CLOUD Provide?

   A. Elastic Cloud Server (ECS)

   B. Auto Scaling (AS)

   C. Image Management Service (IMS)

   D. Elastic Volume Service (EVS)

Summary

- Describes the diversity of HUAWEI CLOUD services.

- Introduces basic information about key HUAWEI CLOUD services.

Recommendations

- Huawei learning website:

  - http://support.huawei.com/learning/Index!toTrainIndex

- HUAWEI CLOUD official website:

  - https://intl.huaweicloud.com/?locale=en-us

Thank You
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