Introduction to Cloud Computing

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Agenda

- What is Cloud Computing?

- Definition from NIST

- Actual Service Models

- What can we use?

- How to use?

What is Cloud Computing?

- "**云计算**（英语：**cloud computing**），是一种基于互联网的计算方式，通过这种方式，共享的软硬件资源和信息可以**按需求提供**给计算机各种终端和其他设备。"

  —— 云计算, Wikipedia

- "简单地说，云计算就是计算服务的提供（服务器、存储、数据库、网络、软件、分析、智能等）- 通过 Internet（云）提供快速创新、弹性资源和规模经济。对于云服务，通常你只需使用多少支付多少，从而帮助降低运营成本，使基础设施更有效地运行，并能根据业务需求的变化调整对服务的使用。"

  —— 什么是云计算？, Microsoft Azure

- "云计算是通过 Internet 云服务平台按需提供计算能力、数据库存储、应用程序和其他 IT 资源，采用按需支付定价模式。"

  —— 什么是云计算？, Amazon Web Services

Definition from NIST

Information Technology Laboratory

COMPUTER SECURITY RESOURCE CENTER

CSRC

PUBLICATIONS

Available at:

https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

SP 800-145

The NIST Definition of Cloud Computing

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Date Published: September 2011

Author(s)

Peter Mell (NIST), Tim Grance (NIST)

Abstract

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

Keywords

Cloud Computing; SaaS; PaaS; IaaS; On-demand Self Service; Reserve Pooling; Rapid Elasticity; Measured Service; Software as a Service; Platform as a Service; Infrastructure as a Service

Control Families

None selected

DOCUMENTATION

Publication:

⤢ SP 800-145 (DOI)

📄 Local Download

Supplemental Material:

📄 SP 800-145 (EPUB) (txt)

📄 Press Release (other)

Related NIST Publications:

SP 500-325

TOPICS

Security and Privacy

planning

Technologies

cloud & virtualization

Laws and Regulations

Definition from NIST

- "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models."

—— The NIST Definition of Cloud Computing

- 云计算是一种模型，用于实现对可配置计算资源（例如，网络，服务器，存储，应用程序和服务）的共享池的无处不在，方便的按需网络访问，这些资源可以通过最少的管理工作快速配置和发布，或者 服务提供者互动。该云模型由五个基本特征，三个服务模型和四个部署模型组成。

Essential Characteristics

- On-demand self-service

- Broad network access

- Resource pooling

- Rapid elasticity

- Measured service

Service Models

- Software as a Service (SaaS)

- Platform as a Service (PaaS)

- Infrastructure as a Service (IaaS)

Deployment Models

- Private Cloud

- Community Cloud

- Public Cloud

- Hybrid Cloud

Actual Service Models

SaaS: Software as a Service

FaaS: Function as a Service

BaaS: Backend as a Service

PaaS: Platform as a Service

CaaS: Container as a Service

IaaS: Infrastructure as a Service

IaaS – Infrastructure as a Service

Amazon Elastic Compute Cloud (EC2)

Microsoft Azure Virtual Machine

Google Cloud Platform Compute Engine

Alibaba Cloud Elastic Compute Service (ECS)

Huawei Cloud Elastic Cloud Server (ECS)

VMware vSphere

OpenStack

Eucalyptus

CaaS – Container as a Service

Amazon Elastic Container Service (ECS)

Microsoft Azure Container Instances

Google Cloud Platform Kubernetes Engine

Alibaba Cloud Container Service

Huawei Cloud Container Instance (CCI)

Kubernetes

Apache Mesos

Docker Swarm

PaaS – Platform as a Service

Microsoft Azure App Service

Google Cloud Platform App Engine

Red Hat OpenShift Online

Pivotal Cloud Foundry (PCF)

Heroku

OpenShift OKD

Cloud Foundry

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BaaS – Backend as a Service

Firebase

LeanCloud

Bmob

MaxLeap

...

存储

数据

☁ 创建 Class　　　…

Class Name	
_Conversation	1
_File	0
_Followee	0
_Follower	0
_Installation	0
_Role	0
_User	1
Todo	**7**

统计

设置

云引擎

消息

Play

分析

组件

设置

添加行　删除行　添加列　查询　刷新　其他 ▾

	objectId STRING	ACL ACL	done BOOLEAN	content STRING	user POINTER	creat
☐	5c010a141eac2d001abcefdd	{"5c00fec11ea… 编辑	true	哈哈哈	5c00fec11eac2d001abceba5	2018-
☐	5c010a611eac2d001abceff9	{"5c00fec11ea… 编辑	false	gg	5c00fec11eac2d001abceba5	2018-
☐	5c010a5e1eac2d001abceff7	{"5c00fec11ea… 编辑	false	今天还没做 Ingress mission	5c00fec11eac2d001abceba5	2018-
☐	5c010a541eac2d001abcefef	{"5c00fec11ea… 编辑	false	Mesos 还没看完	5c00fec11eac2d001abceba5	2018-
☐	5c010a4e1eac2d001abcefee	{"5c00fec11ea… 编辑	false	试试?	5c00fec11eac2d001abceba5	2018-
☐	5c010a091eac2d001abcefdc	{"5c00fec11ea… 编辑	true	第一个 todo	5c00fec11eac2d001abceba5	2018-
☐	5c010a031eac2d001abcefd8	{"5c00fec11ea… 编辑	false	哈哈哈	5c00fec11eac2d001abceba5	2018-

Todo · 共 7 条 · 第 1 页 · 每页 20 条　← 前一页　后一页 →

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FaaS – Function as a Service

AWS Lambda

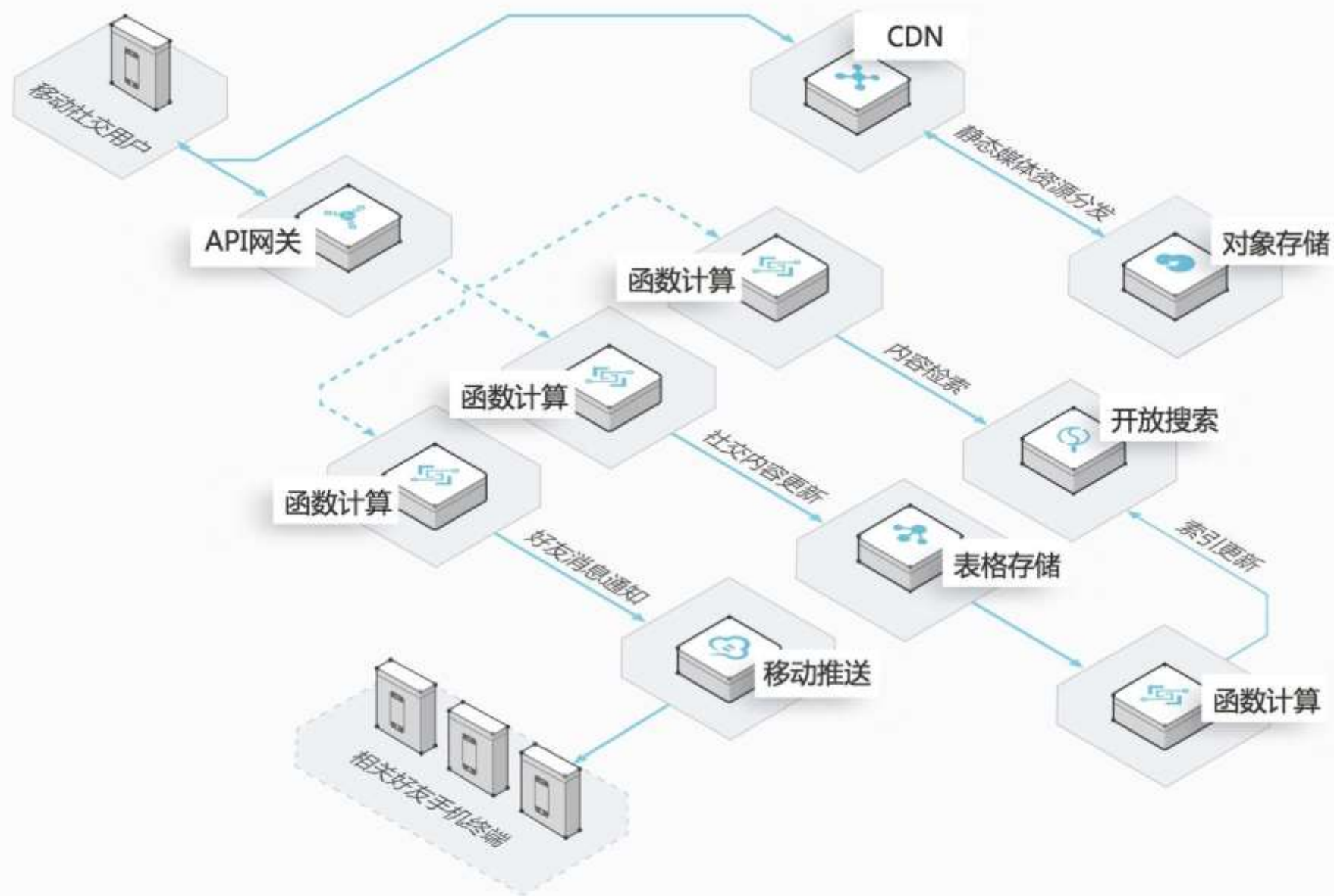Microsoft Azure Functions

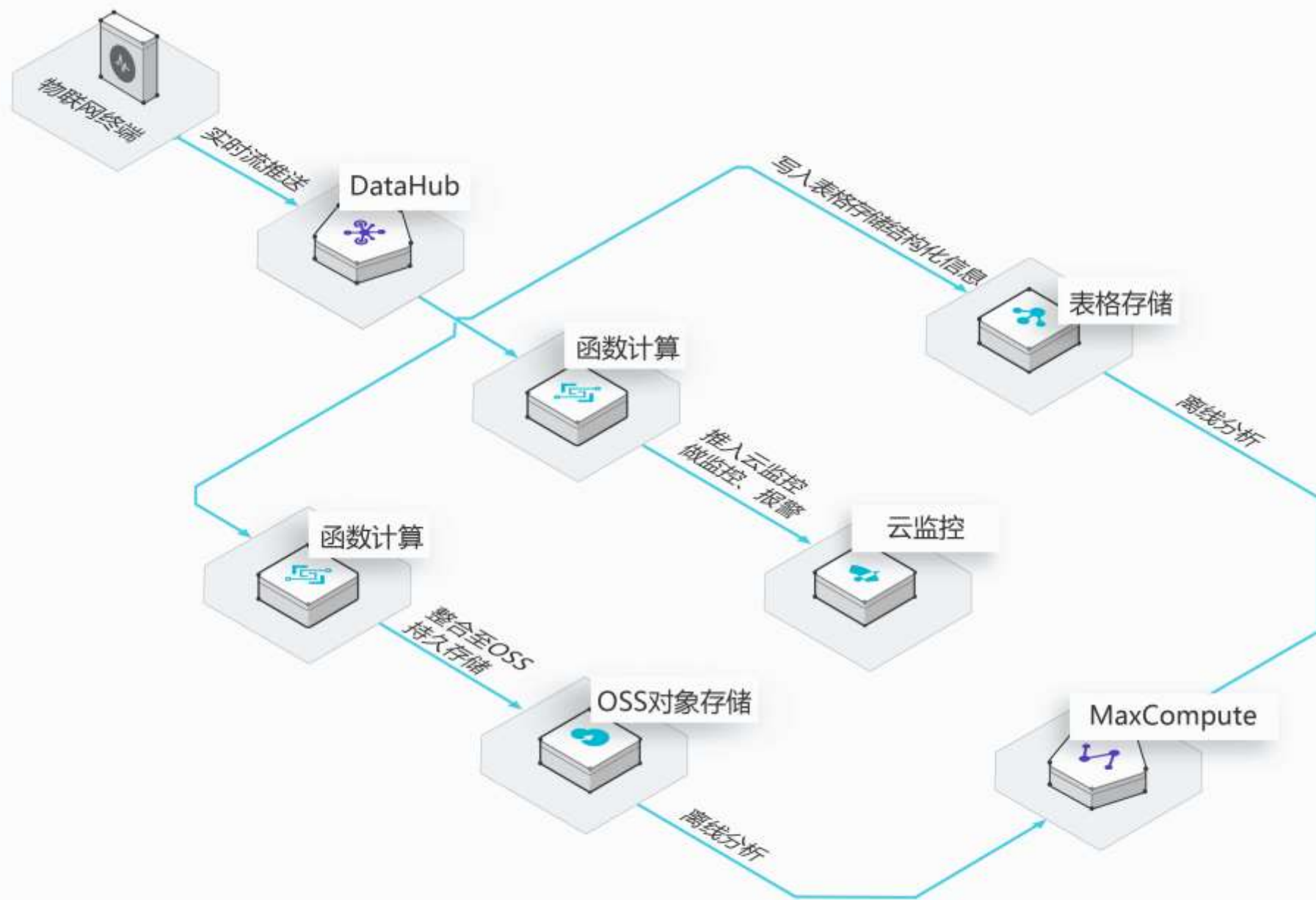Google Cloud Platform Cloud Functions

Alibaba Cloud Function Compute

Huawei Cloud FunctionGraph

Tencent Cloud Serverless Cloud Function

物联网终端 —实时流推送→ DataHub

DataHub —写入表格存储结构化信息→ 表格存储

DataHub —→ 函数计算

函数计算 —推入云监控 做监控、报警→ 云监控

DataHub —→ 函数计算

函数计算 —整合至OSS 持久存储→ OSS对象存储

表格存储 —离线分析→ MaxCompute

OSS对象存储 —离线分析→ MaxCompute

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SaaS – Software as a Service

- WordPress

- Drupal

- Discuz!

- Coding Cloud Studio

- 等各种软件服务……

What can we use?

- 上面所提及的所有服务，都可以通过互联网获得；
- 后端开发：
  - IaaS
  - CaaS
  - PaaS
  - BaaS
  - FaaS

- 商业应用：
  - SaaS（解决方案）

How to use?

- 买买买！

- 根据自己的业务需求和安全限制，合理选择服务；
  - 业务需求
    - 开发时限
    - 峰值流量
    - blablabla
  - 安全限制
    - 数据

Thanks for listening

Discussion Time

Q & A **Freely**