INTRODUCTION TO CLOUD COMPUTING

Gergely Magyar, PhD.
Center for Intelligent Technologies
Department of Cybernetics and Artificial Intelligence
Technical University of Košice

DCAI
Department of Cybernetics and Artificial Intelligence

CIT
Center for Intelligent Technologies

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- Is cloud computing new?
- What is cloud computing?
- Why cloud computing?
- Applications of cloud computing in CIT

UTILITY COMPUTING

“If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility.”

- John McCarthy, 1961

UTILITY COMPUTING (2)

"Utility computing is a service provisioning model in which a service provider makes computing resources and infrastructure management available to the customer as needed, and charges them for specific usage rather than a flat rate."

TIME-SHARING

"Time-sharing is the sharing of a computing resource among many users by means of multiprogramming and multi-tasking at the same time."

“Cloud computing is a general term for the delivery of hosted services over the Internet.”

- definition on WhatIs.com

“Cloud computing is a type of computing that relies on **sharing computing resources** rather than having local servers or personal devices to handle applications.”

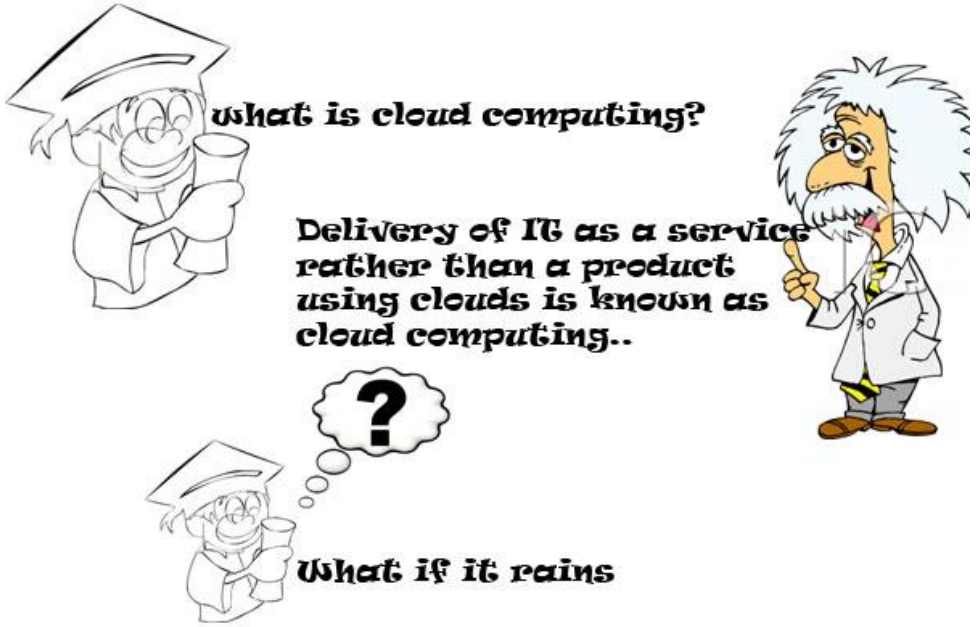
- definition on webopedia

“… cloud computing means storing and accessing data and programs over the Internet instead of your computer’s hard drive.”

- definition on PCMag

OTHER DEFINITIONS BY

- International Organization for Standardization (ISO)
- IEEE Standards Association (IEEE-SA)
- Amazon
- Microsoft
- IBM
- Verizon
- HP
- Cisco
- …



“… a model for enabling 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.”

- definition by NIST

5 ESSENTIAL CHARACTERISTICS OF CLOUD COMPUTING

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

ON-DEMAND SELF-SERVICE

A consumer can unilaterally provision computing capabilities (…) automatically without requiring human interaction with each service provider.

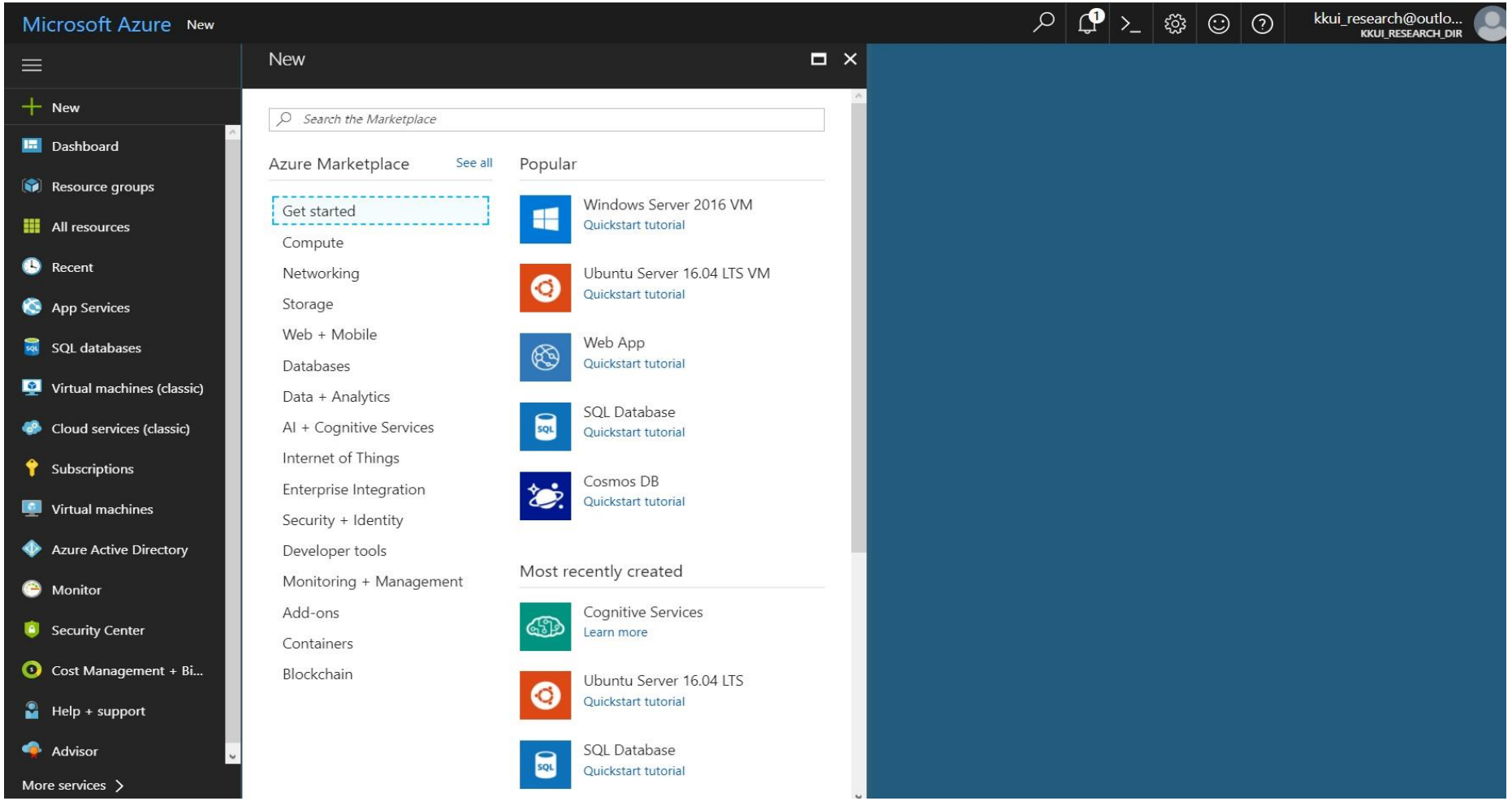
BROAD NETWORK ACCESS

Capabilities are available over the network and accessed through standard mechanisms.

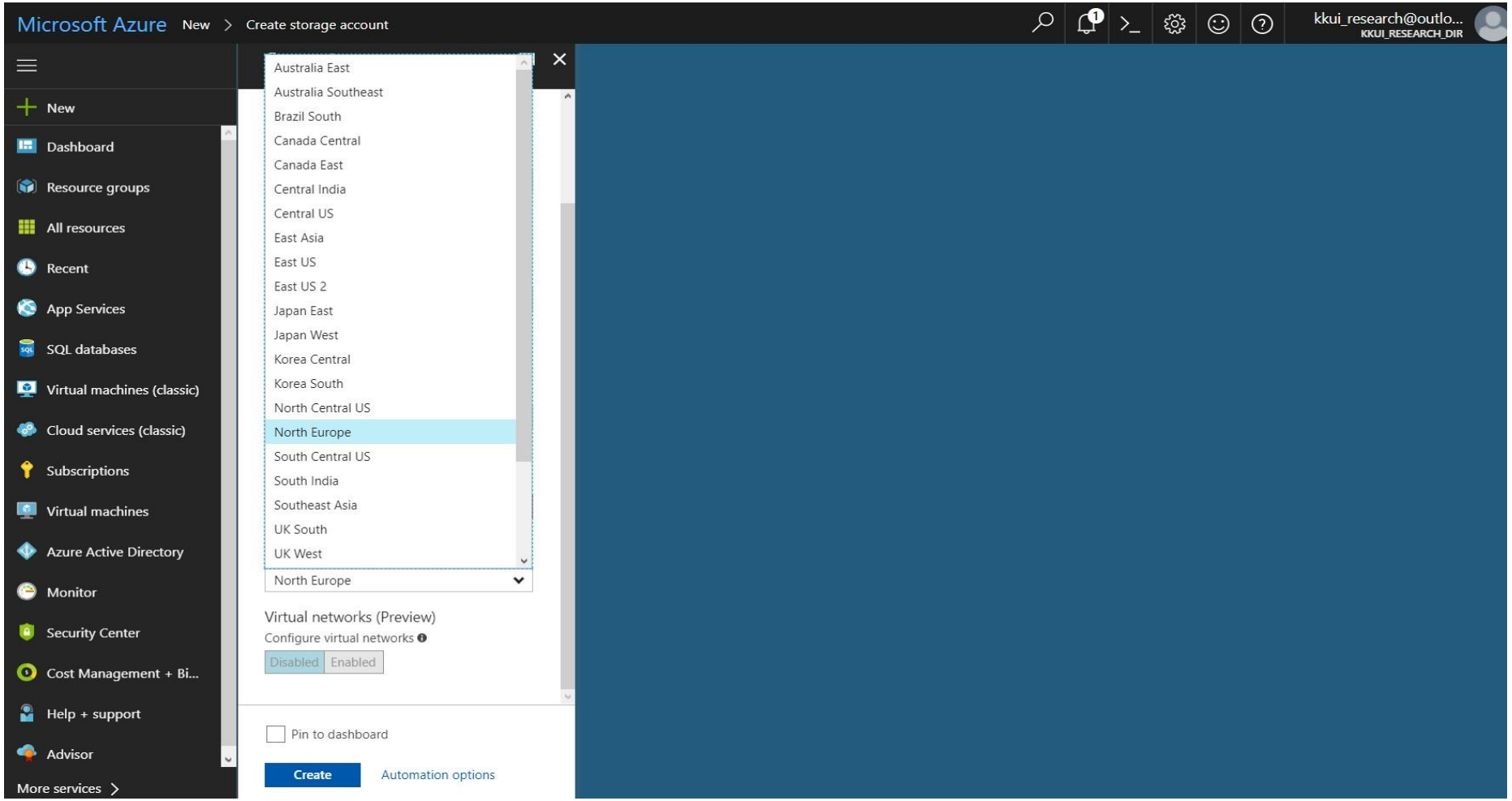
RESOURCE POOLING

The provider’s computing resources are pooled to serve multiple consumers (…) according to consumer demand.

RESOURCE POOLING (2)



RESOURCE POOLING (3)



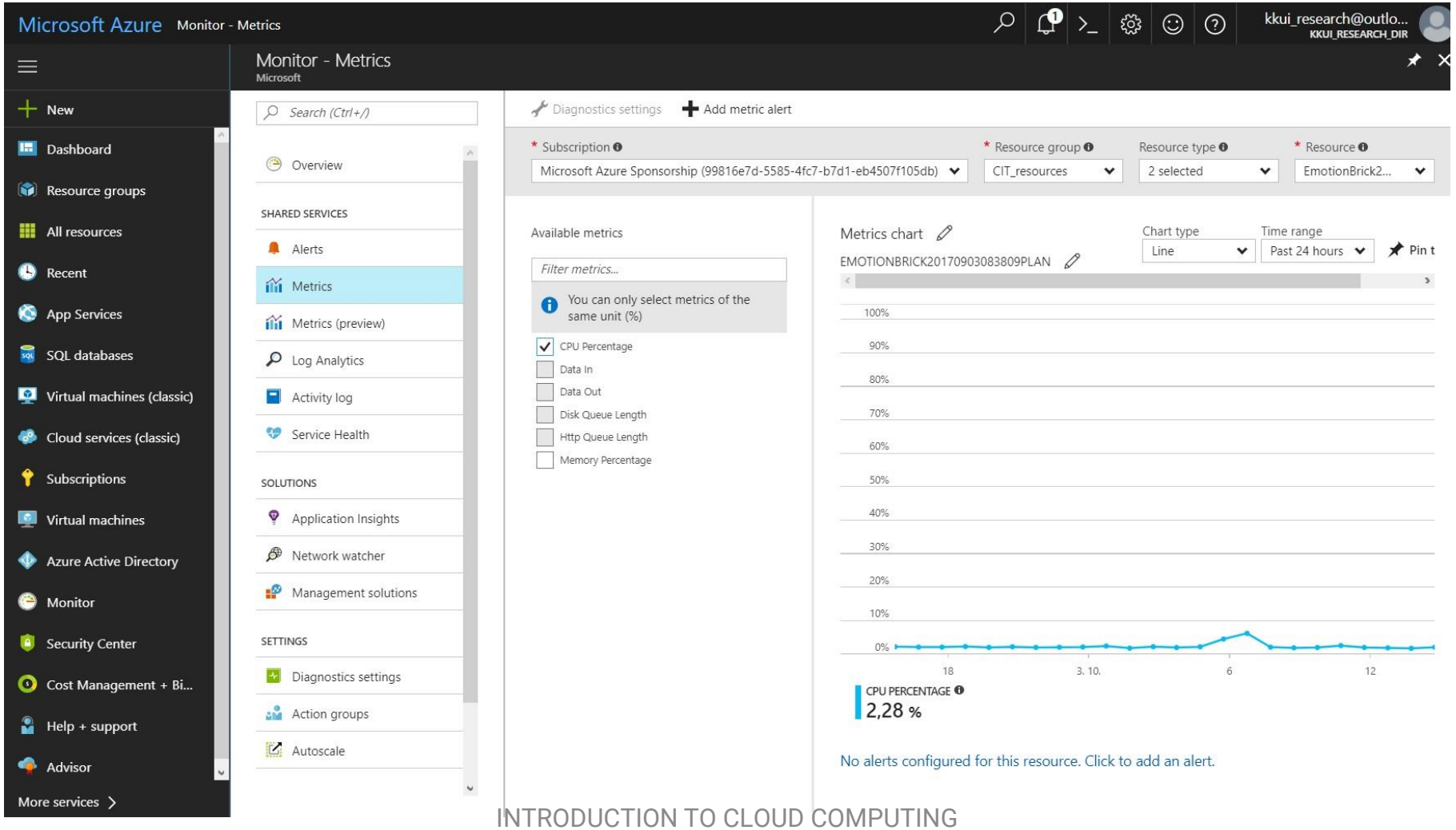
RAPID ELASTICITY

Capabilities can be elastically provisioned and released, to scale rapidly outward and inward commensurate with demand.

MEASURED SERVICE

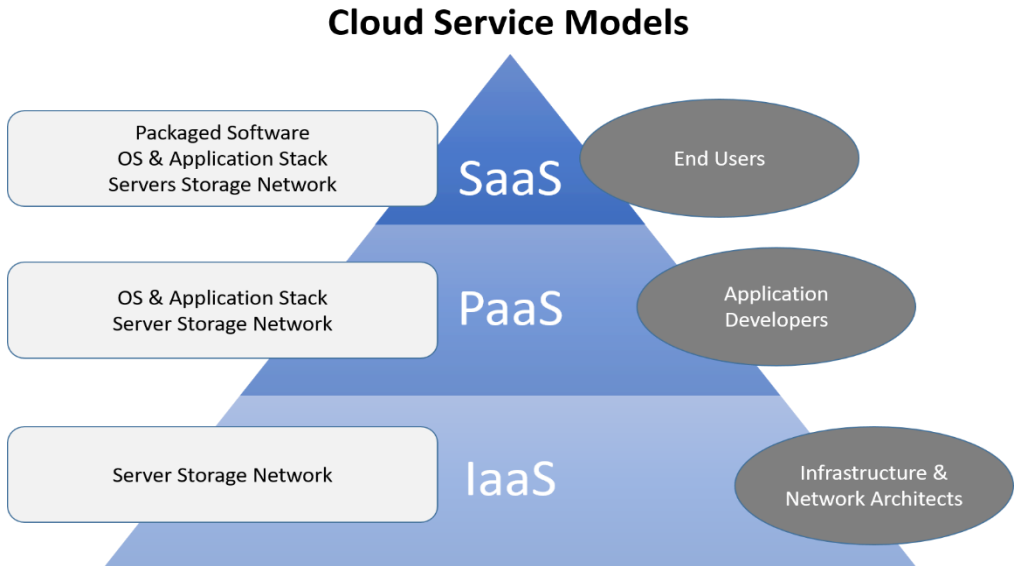
Cloud systems automatically control and optimize resource use by leveraging a metering capability.

MEASURED SERVICE (2)



SERVICE MODELS

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)



SOFTWARE AS A SERVICE

"The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure."

SOFTWARE AS A SERVICE (2)

- Salesforce.com
- Microsoft Office 365
- Google Apps
- Dropbox
- Slack
- …

PLATFORM AS A SERVICE

"The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications."

PLATFORM AS A SERVICE (2)

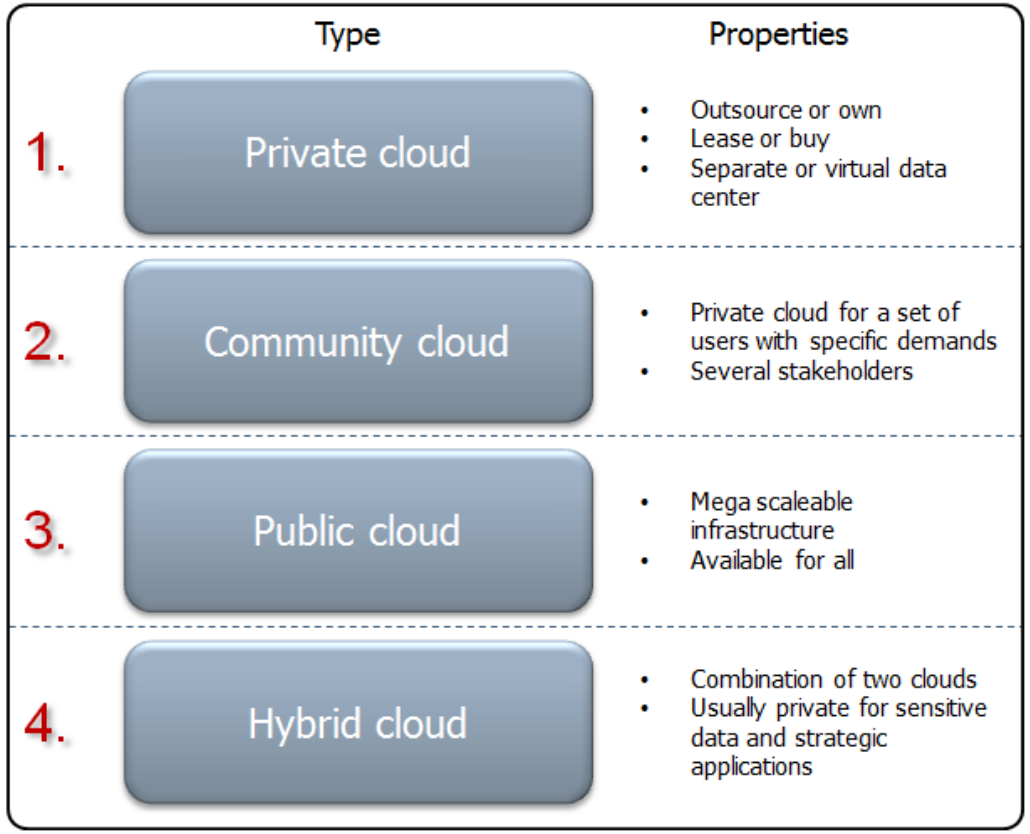
- Microsoft Azure
- Google App Engine
- Amazon Web Services
- Heroku
- …

INFRASTRUCTURE AS A SERVICE

"The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resource."

DEPLOYMENT MODELS

- Private
- Community
- Public
- Hybrid



PRIVATE CLOUD

"The cloud infrastructure is provisioned for exclusive use by a single organization."

COMMUNITY CLOUD

"The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns."

PUBLIC CLOUD

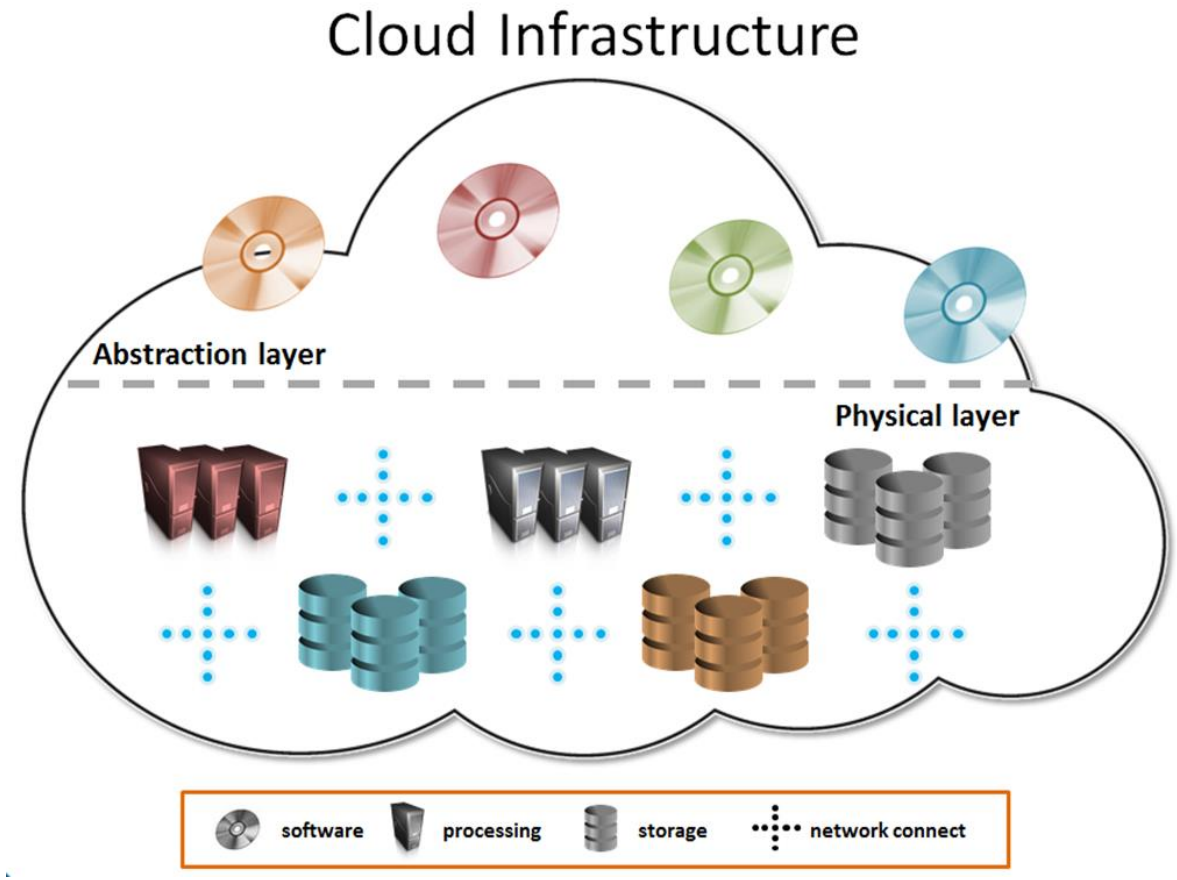
"The cloud infrastructure is provisioned for open use by the general public."

HYBRID CLOUD

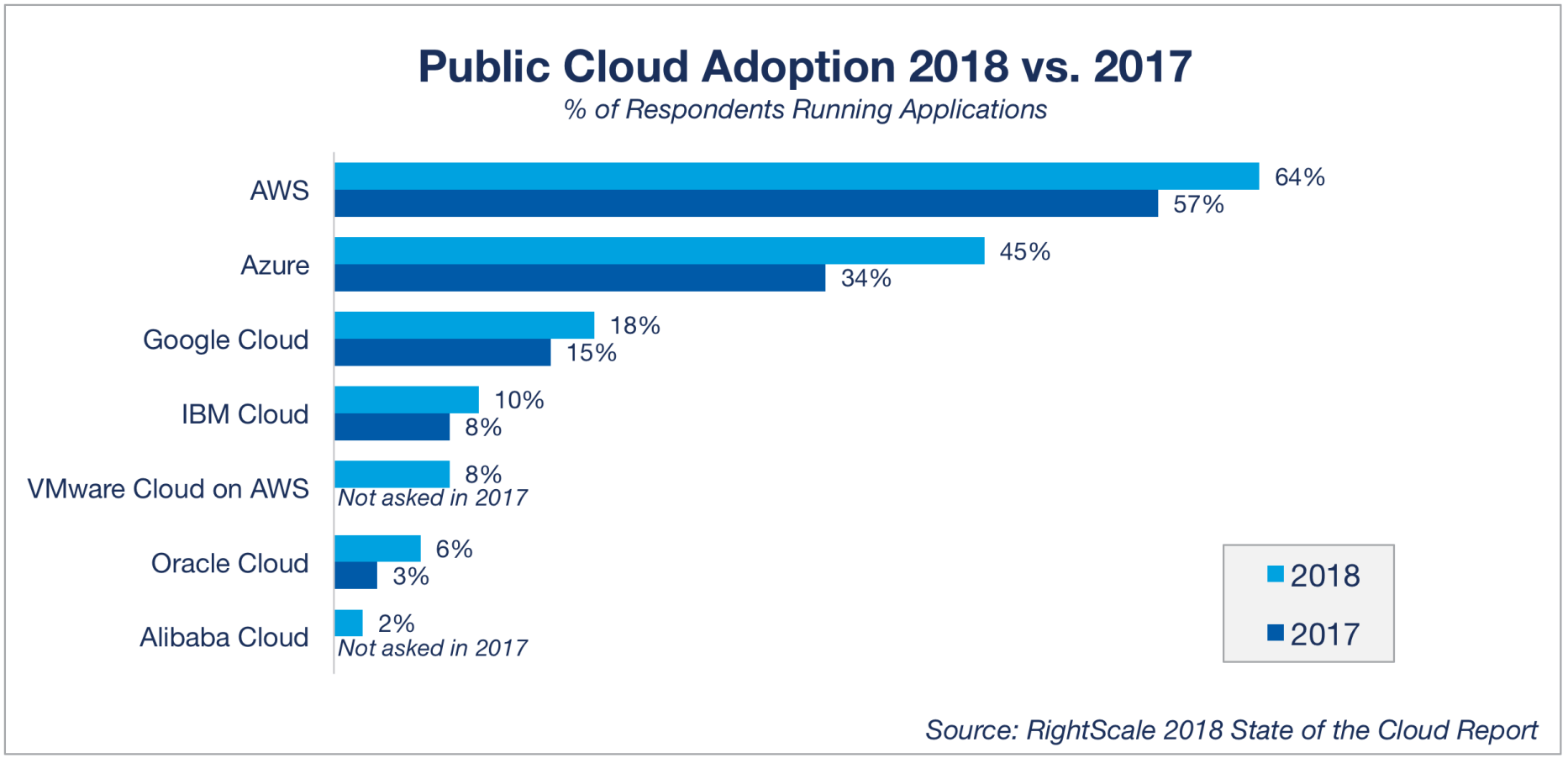
"The cloud infrastructure is a composition of two or more distinct cloud infrastructures."

CLOUD INFRASTRUCTURE

- Abstraction layer
- Physical layer



CLOUD PROVIDERS



WHY CLOUD COMPUTING?

- Value to customers
- Value to vendors
- New revenues and jobs

WHAT TO REMEMBER?