Curso de Especialização em Aprendizagem de Máquina em Inteligência Artificial

Disciplina: Computação em nuvem

Aula 02

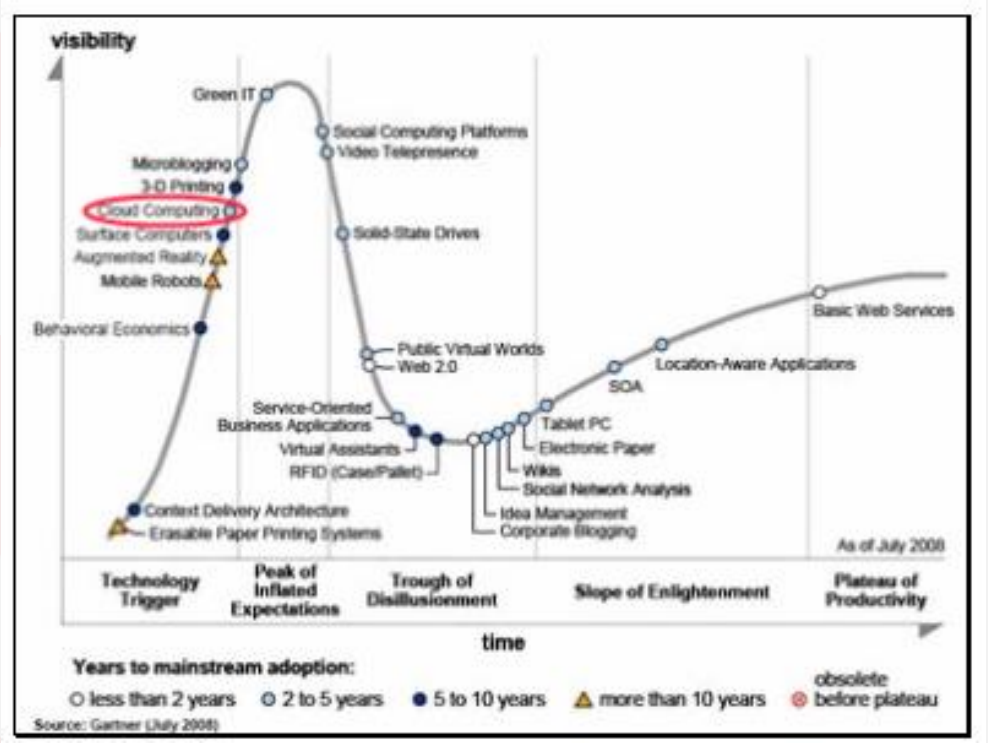
Prof. Dr. Renato Manzan

20 de agosto de 2020

Cloud Computing – Aula 02

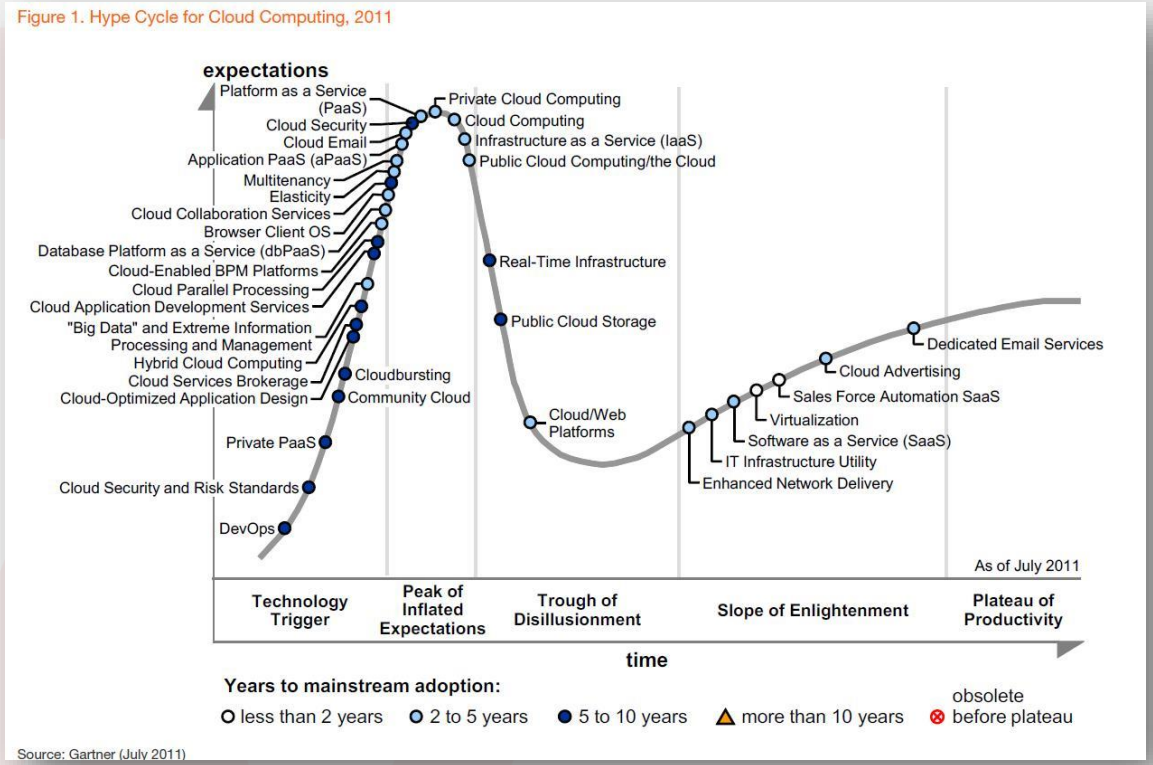
1. Evolução de Cloud Computing segundo *Gartner* Hype-Curve
2. Definição e características essenciais
3. Modelos de Serviços
4. Parte Prática: Modelos de Deployment (Iaas): Criação de Máquina Virtual
5. Atividade para a próxima aula

Evolução de Cloud Computing – 2008



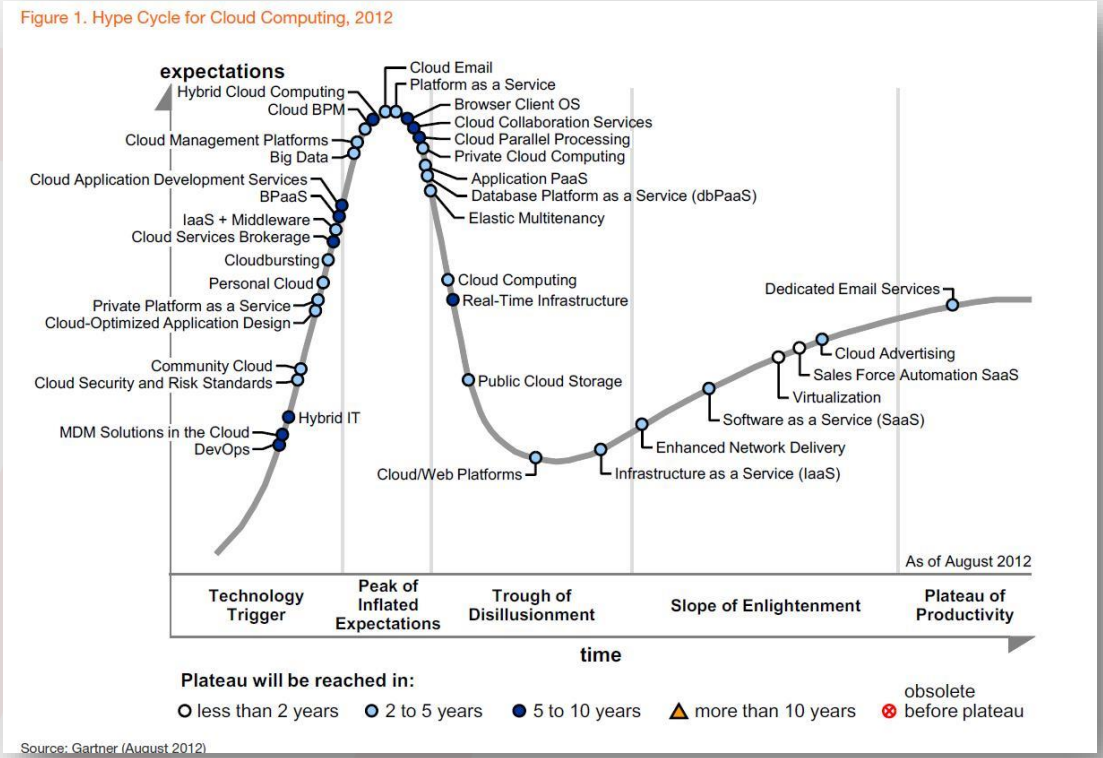
Fonte: Gartner – Hyper Cycle – July 2008

Evolução de Cloud Computing – 2011



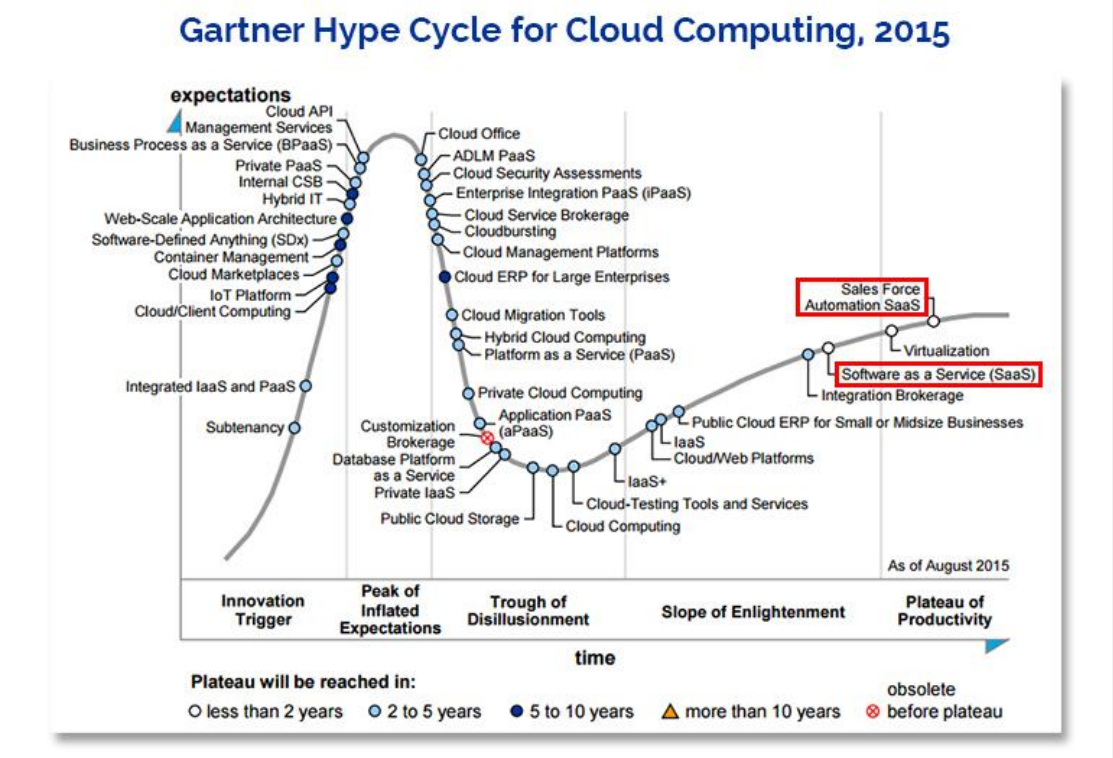
Fonte: Gartner – Hyper Cycle – July 2011

Evolução de Cloud Computing - 2012



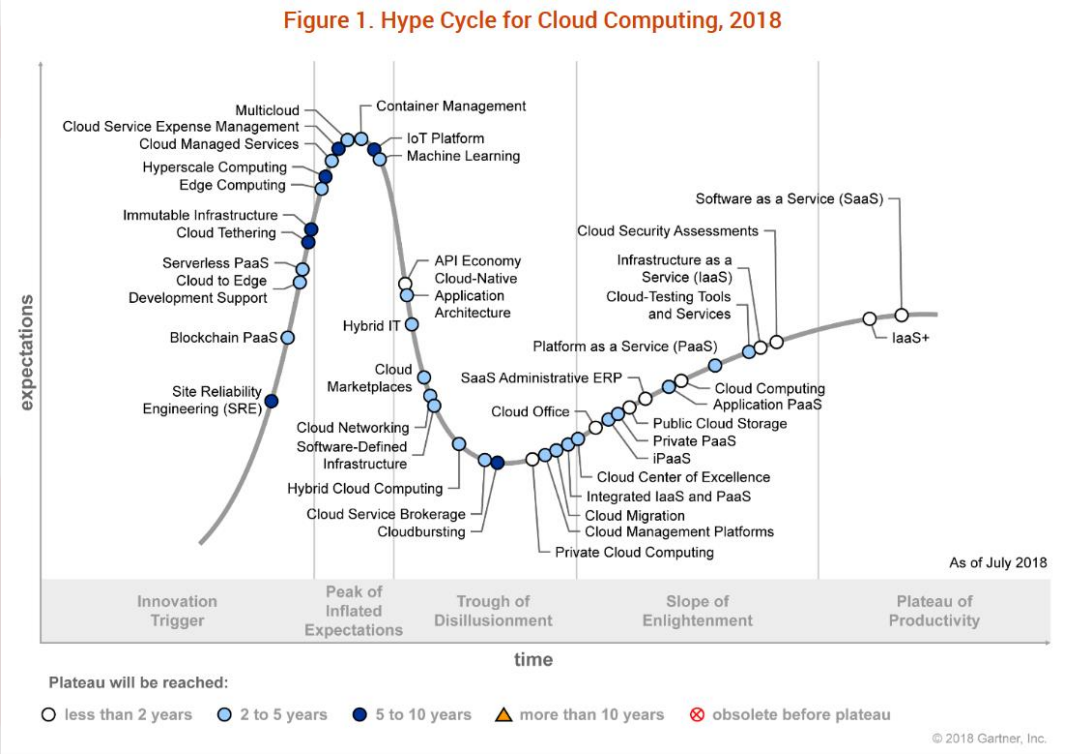
Fonte: Gartner – Hyper Cycle – July 2012

Evolução de Cloud Computing - 2015



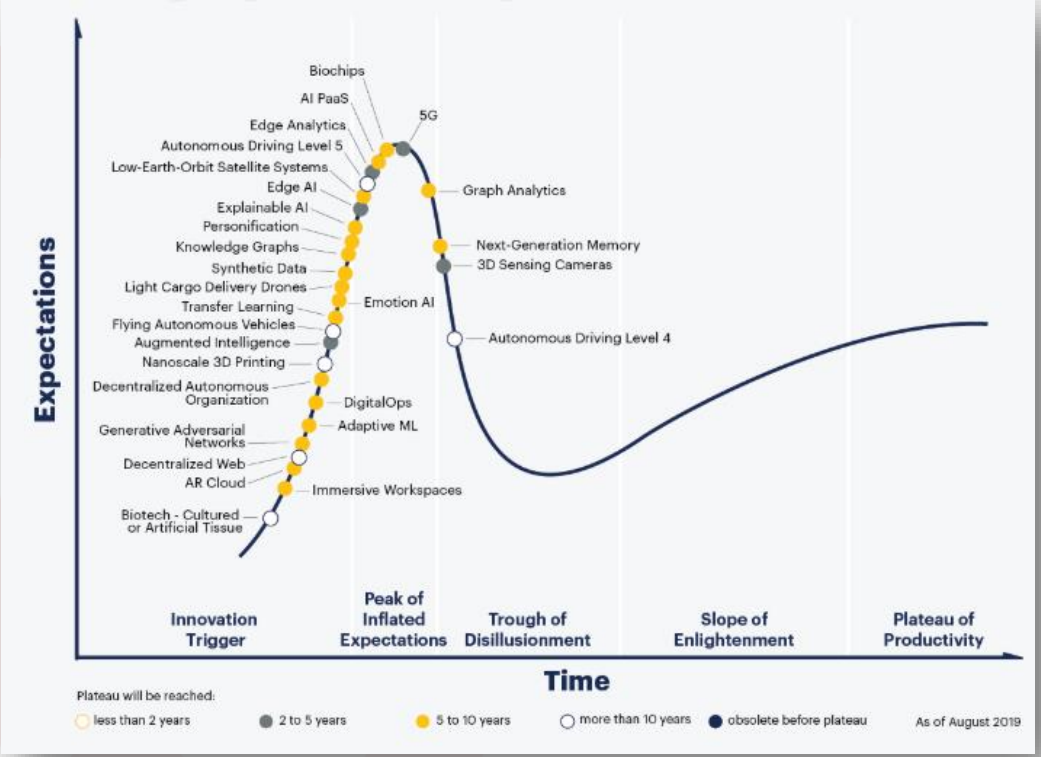
Fonte: Gartner – Hyper Cycle – July 2015

Evolução de Cloud Computing - 2018



Fonte: Gartner – Hyper Cycle – July 2018

Emerging Technologies - 2019



Fonte: Gartner – Hyper Cycle – August 2019

Definição de *Cloud Computing*

"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.".

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Características essenciais de *Cloud Computing*

On-demand self-service. *A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.*

Broad network access*. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).*

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Características essenciais de *Cloud Computing*

Resource pooling. *The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.*

There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter).

Examples of resources include storage, processing, memory, and network bandwidth.

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Características essenciais de *Cloud Computing*

Rapid elasticity. *Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.*

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Características essenciais de *Cloud Computing*

Measured service. *Cloud systems automatically control and optimize resource use by leveraging a metering capability (*) at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service*.

(*) Typically this is done on a pay-per-use or charge-per-use basis

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Modelos de Serviços segundo o NIST

Infrastructure as a Service (IaaS). *The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications.*

The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Modelos de Serviços segundo o NIST

Platform as a Service (PaaS). *The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider.*

The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Modelos de Serviços segundo o NIST

Software as a Service (SaaS). *The capability provided to the consumer is to use the provider's applications running on a* ***cloud infrastructure****.*

The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g.,web-based email), or a program interface.

The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Cloud Infrastructure

A cloud infrastructure is the collection of hardware and software that enables the five essential characteristics of cloud computing.

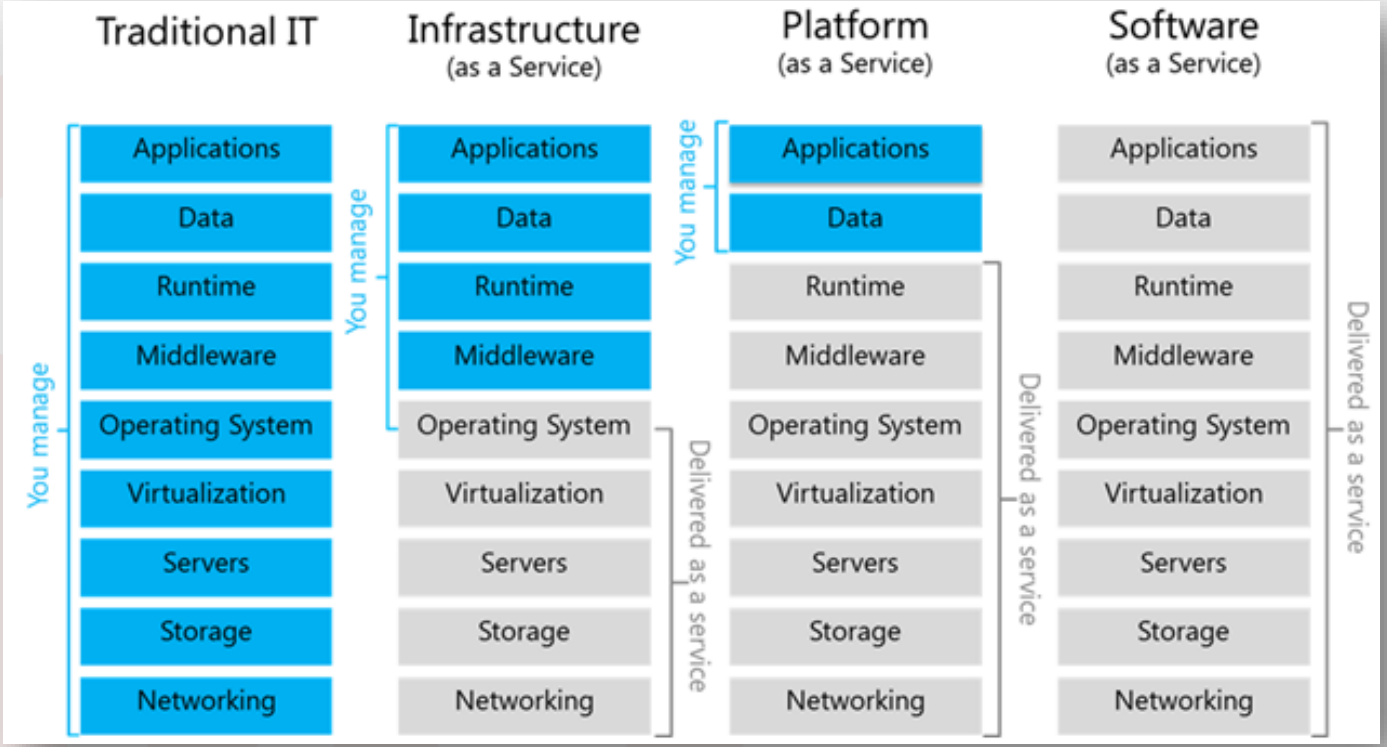
The cloud infrastructure can be viewed as containing both a physical layer and an abstraction layer.

- *The physical layer consists of the hardware resources that are necessary to support the cloud services being provided, and typically includes server, storage and network components.*
- *The abstraction layer consists of the software deployed across the physical layer,which manifests the essential cloud characteristics. Conceptually the abstraction layer sits above the physical layer.*

.

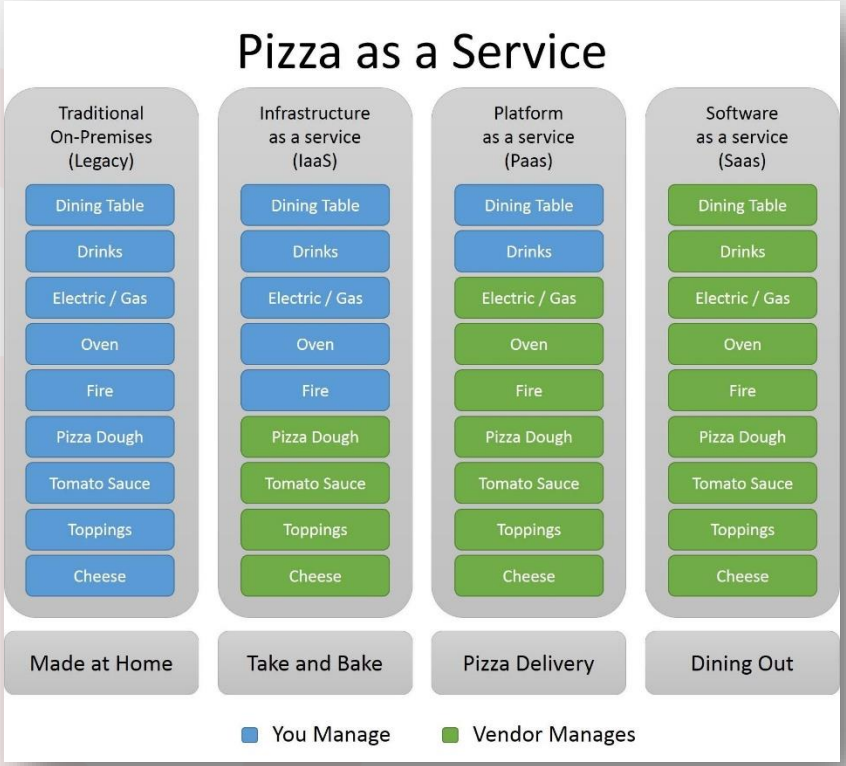
Fonte: NIST (National Institute of Standards and Technology): https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Cloud Services Models



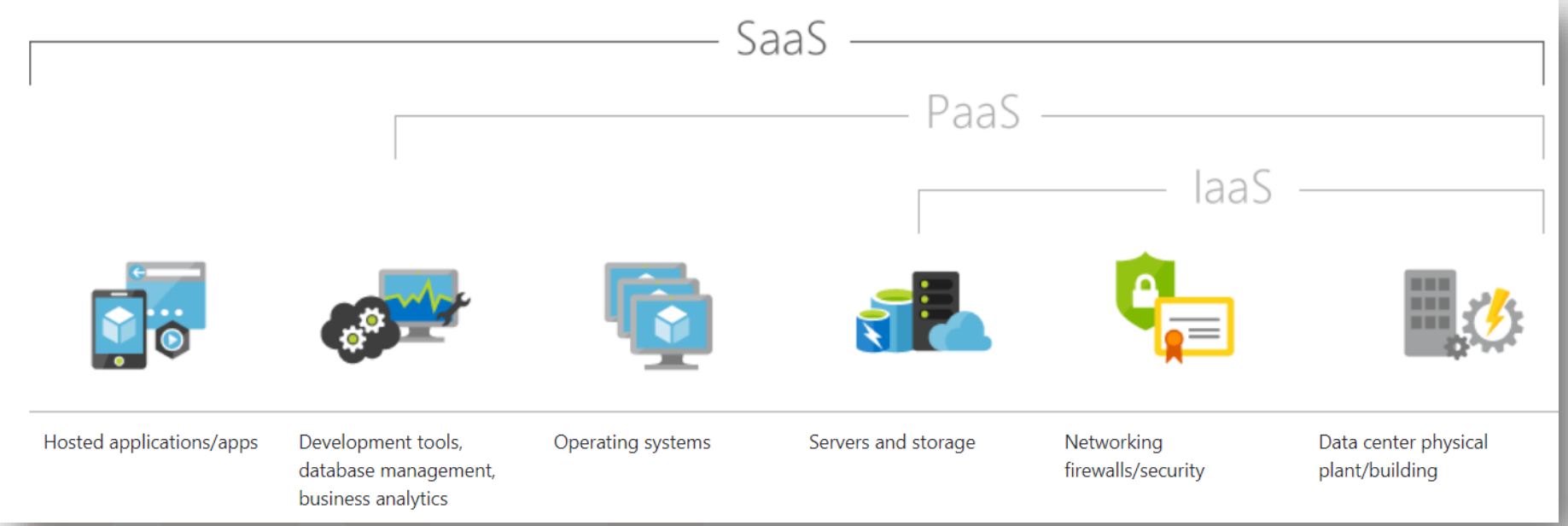
Fonte: https://blogs.msdn.microsoft.com/dachou/2018/09/28/cloud-service-models-iaas-paas-saas-diagram/

Analogia – Cloud Pizza



Fonte: https://miro.medium.com/max/1759/1*bl4PsuSnNz7xHpri5uqaow.jpeg

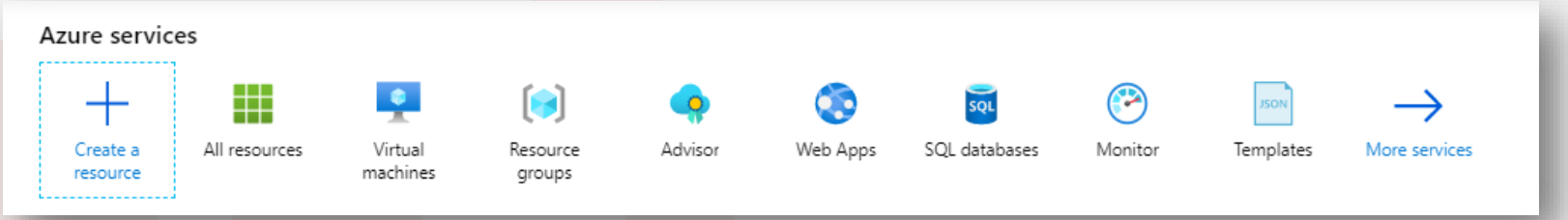
IaaS → PaaS → SaaS



Fonte: https://azure.microsoft.com/en-us/overview/what-is-saas/

Parte Prática – Modelo de Deployment (IaaS)

- Plataforma de Nuvem (Azure): https://portal.azure.com
- Catálogo de Serviços (https://azure.microsoft.com/en-us/services/)
- Criação de Máquina Virtual



Entrega Parcial 01 – Data de Entrega: até 26/08/2020 – 18:00

Dado o processo de negócio de sua empresa ou cliente e seus sistemas computacionais críticos (que apoiam os processos de negócio críticos), elaborar um resumo de no máximo 2 páginas elencando os seguintes pontos:

A. Possibilidade de uso de *Cloud Computing* ? Justificar.
B. Que problema o uso de *Cloud Computing* poderia resolver ?
C. Que modelo de serviço (IaaS, PaaS ou SaaS) adotaria para aplicar *Cloud Computing* no problema descrito no item B;
D. Descrever 2 riscos;
E. Descrever 2 benefícios.

Forma de entrega: enviar por email para *manzan@uol.com.br* até a data de entrega.

Observação importante: respeitar NDAs e informações sensíveis da empresas e/ou clientes. Caso necessário, descaracterize as informações.

Até a próxima aula

Muito Obrigado!

Feedbacks ?