COURSEWARE

Infrastructure-as-a-Service (IaaS)

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Overview

Infrastructure-as-a-Service (IaaS) is a computing infrastructure that can be provisioned and managed over the internet.
You pay for what you use and IaaS allows quick scaling up or down of the infrastructure.

Description

One of the most lucrative reasons that attract companies to migrate to IaaS is that the burden of buying and managing physical infrastructure is eliminated.

Rather than installing physical servers, companies can provision the infrastructure they need from a Cloud provider.

Each service component is a different service altogether, allowing you to use the specific resources that you require for exactly as long as necessary.

There are three main *IaaS* providers:

- Google Cloud Platform
- Amazon Web Services
- Microsoft Azure

IaaS typically is aimed at developers.

For instance, a user would have root access and/or administrator privileges on any provisioned **Virtual Machines (VMs), hence configuring the **Operating System (OS)**, installing applications, etc., becomes possible.

Unlike in traditional systems architecture, the Cloud provider takes the responsibility for the infrastructure.
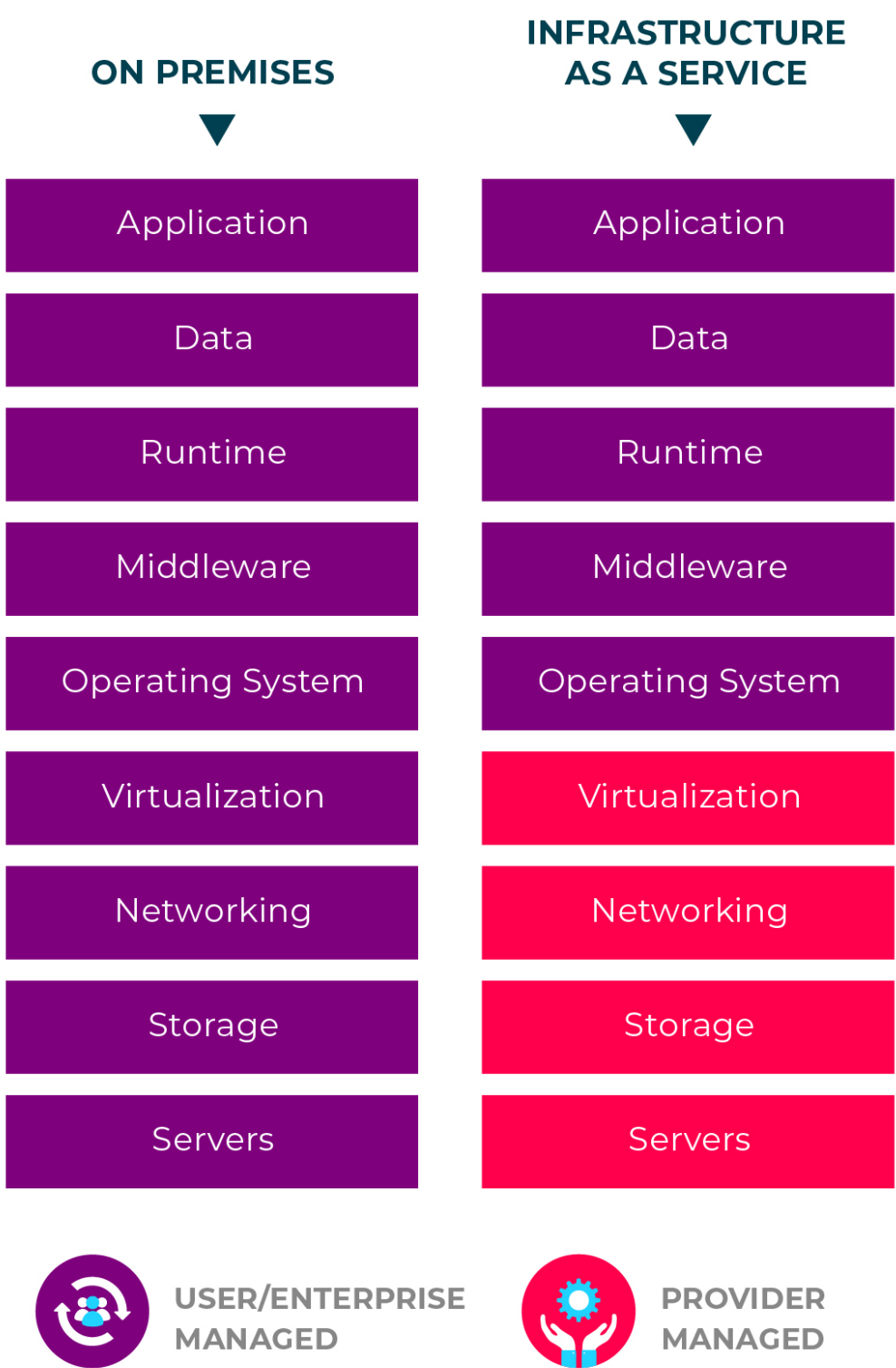
However, you are still responsible for:

- Software
  - *Installation*
  - *Configuration*
  - *Management*
- Middleware
- Applications

There is no possibility to have access to the physical resources.

In the following picture we can see the responsibilities of the vendor and client when comparing IaaS against on-premises hosting:

ON PREMISES ▼   **INFRASTRUCTURE AS A SERVICE** ▼

ON PREMISES	INFRASTRUCTURE AS A SERVICE
Application	Application
Data	Data
Runtime	Runtime
Middleware	Middleware
Operating System	Operating System
Virtualization	Virtualization
Networking	Networking
Storage	Storage
Servers	Servers

USER/ENTERPRISE MANAGED   **PROVIDER MANAGED**

Note that this diagram does not include the actual physical premises involved.

Business scenarios

Here are some typical business case scenarios where IaaS is applicable:

- **Testing and development** work, where environments used for testing can be provisioned and disposed of quickly.
  Additionally these environments can be scaled up or down, saving you money.
- **Website hosting** Hosting a website through IaaS could be less expensive than doing it the traditional way.
- **Storage, backup and recovery** Takes away the need for data storage to be managed and secured by skilled staff.
  Handles unpredictable demand and growing storage needs automatically or manually.
  Simplifies the management and planning of backup and recovery systems.
- **Web Apps** have the support, storage, servers and networking provided to deploy them.
  Allows quick deployment with scalable structure based on demand, especially useful when demand is unpredictable.
- **Performance computing** that requires millions of variables or calculations is supported, such as for weather and climate simulation.
- **Big Data** is a popular term in the modern IT industry and has enjoyed significant media coverage.

It refers to data sets that contain potentially valuable patterns, trends or have any associations,
Mining these data sets in order to locate these hidden patterns is computationally intensive, and can be done through IaaS.

Advantages

Here are some of the main advantages of IaaS:

- **No capital expense and reduction in costs.**
  There are no upfront costs as you pay for what you use.
  An attractive solution for start-ups.
- **Business continuity and disaster recovery.**
  Typically in order to achieve high availability, disaster recovery and business continuity requires a significant investment in both technology and staff.
  With the right **Service Level Agreement (SLA)** on IaaS you could reduce the costs while achieving the previously mentioned functionality.
- **Rapid innovation** the infrastructure is ready in minutes or hours for you to launch a product compared to days or weeks when done internally.
- **Rapid response** to demand with scaling up and down, e.g. to accommodate holiday spikes, and scaling down, which saves money.
- **More focus on business** time saved on not requiring to care for the IT infrastructure can be spent on other business needs.
- **Stability, reliability and supportability** can be achieved with the right SLA with the provider.
  Things like: software updates, hardware, troubleshooting or equipment problems could be taken care of by the provider freeing up the time to focus on the business.
- **Security** through the service provider can be better in most cases than what you may be able to achieve in-house, though this will depend on the SLA you choose.

Tutorial

Try answering the following questions:

▶ What is the cloud providers responsibilities?
▶ What are your responsibilities?

Exercises

There are no exercises for this module.