1.3 IaaS vs PaaS vs SaaS

▼ Shared Responsibility Model

- Delivery of computing services over the Internet using a pay-as-you-go pricing model
    - In other words: a way to rent compute power and storage from someone else’s data center

▼ Infrastructure-as-a-Service (IaaS)

- Instant computing infrastructure, provisioned and managed over the internet
- Aims to give you the most control over the provided hardware that runs your application
- Ex: VMs, storage, and OS
- Rent hardware instead of buying
- Ensuring that a service is up and running is a shared responsibility
    - cloud provider ensures the cloud infrastructure is functioning correctly
    - customer ensures the service they are using is
        - configured correctly
        - up to date
        - available to their customer
- Common IaaS use cases
    - Migrating workloads: Managed similar to on-prem infrastructure & provides easy migration path
    - Test and Dev: Teams can quickly set-up & dispose test/dev environments with fast & economical scaling

    - Storage, backup and recovery: Organizations avoid the capital outlay and complexity of storage management
        - Useful for managing unpredictable demand and steadily growing storage needs
        - can also simplify the planning and management of backup and recovery systems

---

▼ Platform-as-a-Service (PaaS)

- Provides an environment for building, testing, and deploying software applications
    - Can add features such as authentication
- Aims to help creating an application quickly without managing the underlying infrastructure
    - Ex: Web app/ Azure SQL DB - You don’t need to install OS, webserver, or system updates
- Resources are purchased on a pay-as-you-go basis and accessed over a secure internet connection
- Common PaaS use cases
    - Development framework
        - Allows developers create applications using built-in software components
        - Cloud features such as scalability, high-availability, multi-tenant are included
        - Reducing the amount of coding that developers must do
    - Analytics or business intelligence
        - Tools provided as a service with PaaS allow organizations to analyze and mine their data

        - They can find insights and patterns, and predict outcomes to improve business decisions such as forecasting, product design, and investment returns

---

▼ Serverless Computing

- Lets you run application code without creating, configuring, or maintaining a server
- Your application is broken into separate functions that runs when triggered by some action/event
- Good for automation ex: serverless process that automatically sends an email confirmation after a customer makes an online purchase
- Pay for the processing time used by each function as it executes
    - On contrast, VMs and containers are running even if the applications on them are idle

▼ Software-as-a-Service (SaaS)

- Software that is centrally hosted and managed for the end customer
- Usually based on architecture where one version of the application is used for all customers
- Usually licensed through a monthly or annual subscription
- Ex: Office 365, Skype, Dynamics CRM Online

▼ Cost and Ownership

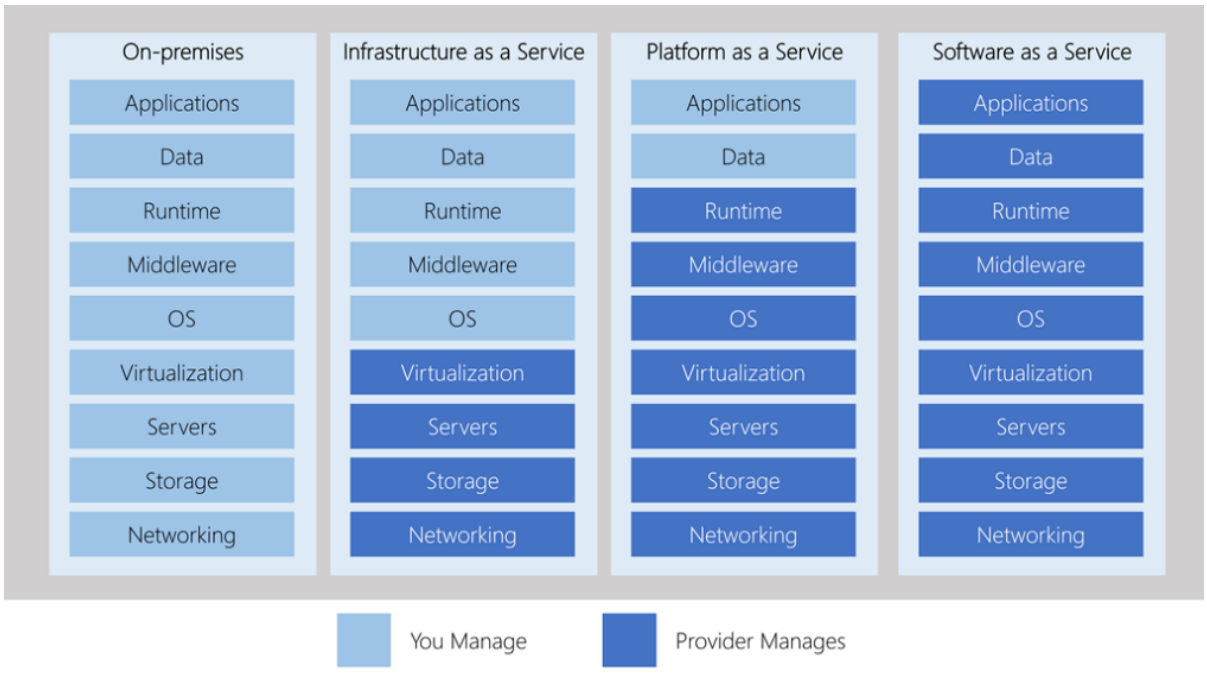
	IaaS	PaaS	SaaS
Upfront costs	None, pay for what you use	None, pay for what you use	None, monthly / annual subscription

	IaaS	PaaS	SaaS
User ownership	purchase, installation, configuration, and mgmt of their own software, OS, middleware, and applications	development of their own applications	not responsible for any maintenance or management of that software
Cloud provider ownership	underlying cloud infrastructure (such as VM, storage, networking) is available for the user	OS management, network, and service configuration. Typically everything except user application	provision, management, and maintenance of the application software

---

▼ Management Responsibilities

- These categories are layers on top of each other
  - Abstraction order: SaaS > PaaS > IaaS
  - Abstraction = Hide details, quicker production but less control over the underlying hardware
- IaaS: user is responsible for managing the OS, data, and applications
- PaaS: user is responsible for the applications and data they run and store
- SaaS: user just uses the software


On-premises
Applications
Data
Runtime
Middleware
OS
Virtualization
Servers
Storage
Networking
Infrastructure as a Service
Applications
Data
Runtime
Middleware
OS
Virtualization
Servers
Storage
Networking
Platform as a Service
Applications
Data
Runtime
Middleware
OS
Virtualization
Servers
Storage
Networking
Software as a Service
Applications
Data
Runtime
Middleware
OS
Virtualization
Servers
Storage
Networking
You Manage
Provider Manages