IoT services

* IOT devices have sensors and they collect information that can be converted into reports or alerts

* Azure IOT central
* **Builds on top of IOT hub** to provide a dashboard to manage IOT devices. You can also send alerts that send notifications when a device needs maintenance, or push firmware updates.
* Provides starter templates for common scenarios across various industries such as retail , energy, healthcare.

* Azure Sphere
* Creates an end to end solution for hardware, to secure communications. Has built in communication and security features for iot devices.
  + Microcontroller unit (MCU): responsible for processing OS and signals from sensors.
  + OS: handles communication with the security device
  + Azure sphere security service (AS3): handles authentication to prevent compromise of device
* Good for custom solution where security is critical.

* IOT hub
* Central messaging hub - most lightweight IOT solution. It is used in IOT central

IOT hub < IOT central < Azure sphere

AI services

* **Azure Cognitive Services**: A collection of domain-specific pre-trained AI models that can be customized with your data. They are categorized broadly into vision, speech, language, and search.
  + **Personalised** service predicts behaviour and provides relevant experience.
* **Azure Machine Learning service**: Provides a cloud-based environment you can use to develop, train, test, deploy, manage, and track machine learning models (python, tensorFlow, scikit-learn). The Azure Machine Learning service can auto-generate a model and auto-tune it for you. It will let you start training on your local machine, and then scale out to the cloud. When you have the right model, you can easily deploy it in a container such as Docker in Azure. --> More customisable

Serverless technologies

* **Azure functions**
* **Logic apps**

Devops

* **Azure devops service vs github:** 
  + Azure devops has more granular permissions
  + Github uses tags but devops uses custom fields to capture metadata
  + Github is better for Open source software

* **Azure devtest lab services:**

Management tools

* **Azure portal:** Web based management interface
* **Azure mobile app:** Android and iOS access to monitor health, status, alerts, and run azure cli/azure powershell commands
* **Azure PowerShell:** Execute cmdlets to manage resources - PS
* **Azure CLI:** Same as Azure PowerShell, but syntax is different - BASH
* **ARM templates:** Infrastructure as code - describes resources you want to use in declarative format. Template is verified before any code is written -> repeatable and reliable
* Azure Cloud shell: Browser based CLI

Monitoring tools

* **Azure advisor:** Gives recommendations on:
  + Availability: Ensure business continuity
  + Security: Detects threats and vulnerabilities
  + Performance: Improve speed of applications
  + Cost: Optimize and reduce your overall Azure spending
  + Operational excellence: Achieve process and workflow efficiency, resource manageability and best practices

* **Azure monitor:** Collecting, analyzing and taking action based on logging data from Azure env, on every layer - from application to OS and network. This data can be used to react to critical alerts delivered via SMS/email etc.

* **Azure service health:** Personalised view of the health of azure services and regions. Alerts on Service issues, such as outages, planned maintenance, and health advisories which require you to act to avoid service disruption.