**Identify the product options**

1. **IoT** **enables** **devices** to **gather** and then relay **information** for data analysis
2. **Smart** **devices** are equipped with **sensors** that collect data
3. A few common sensors:
   1. **Environmental** **sensors** that capture temperature and humidity levels
   2. **Barcode**, **QR** code, or optical character recognition (OCR) scanners
   3. **Geo**-**location** and proximity sensors
   4. **Accelerometer** and tilt sensors
   5. **Flow**, level, and pressure sensors
   6. etc
4. Using **Azure** **IoT** **services**, devices with sensors can **connect** to the **internet** and **send** **data** **via** a **message**
5. **Message's** **data** is then **collected** and **aggregated**, and it can be **converted** **into** **reports** and **alerts**

## **Azure IoT Hub**

1. Is a **managed** **service** that's **hosted** in the **cloud** and that acts as a **central message hub** for **bi-directional communication** between your IoT **application** and the **devices** it manages
2. You can **connect** virtually **any device** to your IoT hub
3. **Supports communications** both **from** the **device** to the **cloud** and from the **cloud** to the **device**
4. Supports multiple messaging patterns:
   1. Device-to-cloud telemetry
   2. File upload from devices
   3. Request-reply methods
5. From a cloud-to-device perspective, IoT Hub allows for **command and control**. This means **either** **manual** or **automated remote control**
6. **Track** events such as **device creation, device failures, and device connections**

## **Azure IoT Central**

1. Builds on top of IoT Hub, by adding a **dashboard** that allows you to connect, monitor, and manage your IoT devices
2. User interface (UI) makes it easy to quickly connect new devices
3. You can watch the overall performance across all devices, set up alerts and push firmware updates.
4. To help you get up and running quickly, IoT Central **provides** **starter** **templates**
5. You then customize the design starter templates
6. You can use the UI to control your devices remotely

## **Azure Sphere**

1. Creates an **end-to-end, highly secure** IoT solution
2. For customers that **encompasses everything from the hardware and operating system** on the device
3. Azure Sphere has built-in communication and security features for internet-connected devices
4. Azure Sphere comes in three parts:
   1. **Azure Sphere micro-controller unit (MCU):** responsible for processing the operating system and signals from attached sensors
   2. **Customized Linux operating system (OS):** Handles communication with the security service
   3. The third part is **Azure Sphere Security Service**, also known as **AS3**. Makes sure that the device has not been maliciously compromised. When the device attempts to connect to Azure, it first must authenticate itself, using certificate-based authentication. AS3 checks to ensure that the device hasn't been tampered with.

# Analyze the decision criteria

## **Is it critical to ensure that the device is not compromised?**

1. YES, because no manufacturers or customers want their devices to be maliciously compromised
2. When security is a critical consideration in your product's design, the best product option is Azure Sphere
3. Azure Sphere ensures a secure channel of communication between the device and Azure by controlling everything from the hardware to the operating system and the authentication process
4. This ensures that the integrity of the device is uncompromised

## **Do I need a dashboard for reporting and management?**

1. If you merely want to connect to your remote devices to receive telemetry and occasionally push updates then you can implement **Azure IoT Hub** by itself
2. However, if you want a pre-built customizable user interface with which you can view and control your devices remotely, you might prefer to start with **IoT Central**
3. IoT Central integrates with many different Azure products, including IoT Hub, to create a dashboard with reports and management features.

# Use IoT Hub

1. **Scenario:** The devices will not require remote control. They will merely be sending their telemetry data for analysis and pro-active maintenance

## **Which service should you choose?**

1. It's preferable, but not critical, that the devices aren't compromised - No
2. Do I need a dashboard for reporting and management? – No
3. So, given the responses to the decision criteria, Azure IoT Hub is the best choice in this scenario. IoT Central is not needed

## **Why not use Azure IoT Central?**

1. Azure IoT Central provides a dashboard that allows companies to manage IoT devices individually and an aggregate, view reports, and set up error notifications via a GUI
2. In this scenario, Tailwind Traders wants to integrate the telemetry it collects

## **Why not use Azure Sphere?**

1. Azure Sphere provides a complete solution for scenarios where security is critical
2. In this scenario, security is preferred but not critical

# Use IoT Central

1. **Scenario**: The company is looking for a complete logistics solution that takes data sent from an on-board vehicle computer and turns it into actionable information
2. Furthermore, shipments can be outfitted with sensors from a third-party vendor to collect and monitor ambient conditions.
3. The company would prefer a **pre-built solution** to collect the sensor and vehicle computer data, and provide a **graphical user interface** that displays **reports** about shipments and vehicles

## **Which service should you choose?**

1. Does Tailwind Traders need a dashboard for reporting and management? Yes, a reporting and management dashboard is a requirement.

## **Why not use IoT Hub?**

1. The company would need to do a lot of custom development to build its own cloud-based dashboards and management systems on top of Azure IoT Hub.

## **Why not use Azure Sphere?**

1. Azure Sphere provides a complete solution for scenarios where security is critical
2. In this scenario, security is ideal, but not a critical priority

# Use Azure Sphere

1. Tailwind Traders wants to implement a touchless point-of-sale solution for self-checkout. The self-checkout terminals should be, above all else, **secure**
2. Each terminal must be impervious to malicious code that could create fraudulent transactions

## **Which service should you choose?**

1. First, is it critical to ensure that the device or, in this case, each point-of-sale terminal, is not compromised? Absolutely
2. Next, does Tailwind Traders need a dashboard for reporting and management? Yes, the company requires a reporting and management dashboard
3. So, given the responses to the decision criteria, the IoT engineering firm will build a platform on top of both Azure IoT Central and Azure Sphere

## **Why not choose IoT Hub?**

1. By using IoT Central, Tailwind Traders would actually be using Azure IoT Hub behind the scenes as well

## **Knowledge Check**

https://docs.microsoft.com/en-us/learn/modules/iot-fundamentals/7-knowledge-check

# Identify the product options

1. **AI** is a broad classification of computing that allows a software system to **perceive** its **environment** and **take** **action**
2. A **goal** of **AI** is to create a software system that's **able** to **adapt**, or **learn** **something** on its **own**
3. There are two basic approaches to AI:
   1. Deep learning system that's modeled on the neural network of the human mind
   2. Machine learning, a data science technique that uses existing data to train a model, test it, and then apply the model

## **Azure product options**

1. Three primary product offerings:
   1. **Azure Machine Learning:** Is a **platform** for **making** **predictions**. Consists of tools and services that allow you to connect to data to train and test models to find one that will most accurately predict a future result. After you've run experiments to test the model, you can deploy and use it in real time via a web API endpoint. **Choose** **Azure** **Machine** **Learning** when your **data** **scientists** **need** **complete** **control** over the design and training of an algorithm using your own data With Azure Machine Learning, you can:
      1. **Create a process** that defines how to obtain, handle and split data
      2. **Train and evaluate predictive models** by using tools and programming language
      3. Create **pipelines**
      4. **Deploy** the **best**-**performing** **algorithm** as an API
   2. **Azure Cognitive Services: Provides** **prebuilt** **machine** **learning** **models** that enable applications to **see**, **hear**, **speak**, **understand**, and even begin to reason.  Use Azure Cognitive Services to solve general problems, such as analyzing text for emotional sentiment or analyzing images to recognize objects or faces.  You don't need special machine learning or data science knowledge to use these services. Azure Cognitive Services can be divided into the following categories:
      1. **Language**
      2. **Speech**
      3. **Vision**
      4. **Decision**
   3. **Azure Bot Service:** Creating **virtual** **agents** that understand and reply to questions just like a human.  Azure Bot Service is a bit different from Azure Machine Learning and Azure Cognitive Services in that it has a specific use case. The bot you build uses other Azure services, such as Azure Cognitive Services, to **understand** what their **human** **counterparts** are **asking** **for**

# Analyze the decision criteria

1. Are you building a virtual agent that interfaces with humans via natural language? - **Azure Bot Service**
2. Do you need a service that can understand the content and meaning of images, video, or audio, or that can translate text into a different language? - **Use Azure Cognitive Services**
3. Do you need to predict user behavior or provide users with personalized recommendations in your app? - **Azure Cognitive Services Personalizer**
4. Will your app predict future outcomes based on private historical data? **Azure Machine Learning**
5. Do you need to build a model by using your own data or perform a different task than those listed above? **Azure Machine Learning with deep learning**

# Use Machine Learning for decision support systems

1. **Scenario:** E-commerce website allows its customers to browse and purchase items that can be delivered or picked up from a retail store nearest to their location. The Marketing team is convinced that it can increase sales dramatically by suggesting add-on products that complement the items in a shopper's cart at the point of checkout. Additionally, the suggestions could be influenced by product availability, product profitability, and other factors.

## **Which service should you choose?**

1. Is Tailwind Traders building a virtual agent that interfaces with humans via natural language? No
2. Second, does Tailwind Traders need a service that can understand the content and meaning of images, video, audio, or translate text into a different language? No
3. Third, does Tailwind Traders need to predict user behavior or provide users with personalized recommendations? Yes
4. Fourth, will the Tailwind Traders app predict future outcomes based on private historical data? Yes
5. Finally, it sounds like the Marketing team already employs some data science experts, and the team is willing to make at least a year-long commitment to building, testing, and tweaking the models to be used.

# Use Cognitive Services for data analysis

1. **Scenario:** With the company website, only 80% of the customers speak English. The team sees the addition of multiple languages as a wonderful opportunity to serve non-English speakers with the same online e-commerce experience as English speakers.

## **Which service should you choose?**

1. First, is Tailwind Traders building a virtual agent that interfaces with humans via natural language? No
2. Second, does Tailwind Traders need a service that can understand the content and meaning of images, video, audio, or translate text into a different language? Yes
3. Third, does Tailwind Traders need to predict user behavior or provide users with personalized recommendations? No
4. Finally, will the Tailwind Traders app need to predict future outcomes based on private historical data? No

# Use Bot Service for interactive chat experiences

1. The Customer Service team has long asked for a virtual agent to handle the vast majority of questions it gets asked. The team wants shoppers to feel as though they're interacting with a real human. When it becomes clear that the virtual agent can't provide an answer, the chat session should be transferred to a human.

## **Which service should you choose?**

1. First, is Tailwind Traders building a virtual agent that interfaces with humans via natural language? Yes
2. Second, does Tailwind Traders need a service that can understand the content and meaning of images, video, audio, or translate text into a different language? Possibly, yes
3. Third, does Tailwind Traders need to predict user behavior or provide users with personalized recommendations? No
4. Finally, will the Tailwind Traders app need to predict future outcomes based on private historical data? No

## **Knowledge Check**

https://docs.microsoft.com/en-us/learn/modules/ai-machine-learning-fundamentals/7-knowledge-check

# Identify the product options

1. The term **serverless** **computing** is a **misnomer**. After all, there is a server
2. The key idea is that you're **not** **responsible** for setting up or maintaining the server
3. You create an instance of the service, and you then add your code
4. Respond to events
5. An event could be a **REST endpoint,** **a periodic timer**, or even a **message received** from another Azure service
6. Serverless computing is ordinarily used to **handle back-end scenarios**

## **Azure Functions**

1. With **Azure** **Functions**, you can **host** a **single** **method** or function by using a popular programming language in the cloud
2. Written in many common programming languages, such as C#, Python, JavaScript, Typescript, Java, and PowerShell
3. Azure Functions **scales** **automatically**, and charges accrue only when a function is triggered
4. An Azure function is a **stateless** environment, a function behaves as if it's restarted due to an event
5. Ideal when you're **concerned** **only** with the **code**

## **Azure Logic Apps**

1. **Low**-**code**/**no**-**code** development platform
2. The service helps you automate and orchestrate tasks, business processes, and workflows
3. Logic Apps **simplifies** how you **design** and **build** scalable solutions,
4. This solution covers app integration, data integration, system integration, enterprise application integration (EAI), and business-to-business (B2B) integration
5. Azure Logic Apps is designed in a **web**-**based** **designer** and can execute logic that's triggered by Azure services
6. **Without** **writing** any **code**
7. You build an app by **linking** **triggers**

## **What are the differences between these services?**

1. Primary difference is their intent
2. **Azure** **Functions** is a **serverless**,  **Azure** **Logic** **Apps** is intended to be a **serverless** **orchestration** **service**
3. The two services are **priced** differently
4. ***Azure Functions*** ***pricing*** is based on the ***number of executions*** and the ***running time*** of each execution
5. ***Logic Apps pricing*** is based on the ***number of executions*** and the ***type of connectors that it utilizes***.

# Analyze the decision criteria

1. **Do you need to perform an orchestration across well-known APIs?**
   1. **Logic** **Apps** excels at connecting a large array of **disparate** **services** via their APIs
   2. **Azure** **Logic** **Apps** has already **componentized** these **API** calls so that you supply only a few details
   3. It's possible to create the same workflow by using Azure Functions, but it might take a considerable amount of time
2. **Do you need to execute custom algorithms or perform specialized data parsing and data lookups?**
   1. With **Azure** **Functions**, you can use the full expressiveness of a programming language in a compact form
   2. This lets you concisely build complex algorithms, or data lookup and parsing operations
   3. **You** **would** be **responsible** for **maintaining** the **code**
   4. Although Azure Logic Apps can perform logic (loops, decisions, and so on), if you have a logic-intensive orchestration
3. **Do you have existing automated tasks written in an imperative programming language?**
   1. If you already have your orchestration or business logic expressed in a popular programming language, it might be easier to port your code into **Azure** **Functions** function app than to re-create it by using Azure Logic Apps
4. **Do you prefer a visual (declarative) workflow or writing (imperative) code?**
   1. Developers – Functions
   2. IT professionals and business analysts – Logic Apps

# Use Azure Functions

1. **Scenario:** 
   1. Retrieve the messages.
   2. Parse the JSON.
   3. Perform a lookup across multiple databases to find additional product information.
   4. Potentially, send notifications to the purchasing department so that they can reorder quantities that fall below certain levels.
2. In this case port it to an Azure function
3. Why not choose Azure Logic Apps:
   1. Team has already invested time in building the service in C#, it can use the same code in an Azure function

# Use Azure Logic Apps

1. **Scenario:**
   1. Unfortunately, no Tailwind Traders developer resources are available to take on this project. But the customer service team works with several cloud and IT professionals who might be able to construct a solution.
   2. **Which service should you choose?**
      1. Because Azure Logic Apps is a low-code/no-code service, no developers are needed
   3. **Why not choose Azure Functions?**
      1. This approach might be a challenge if no software developers can be committed to this project
      2. This is an ideal scenario for Azure Logic Apps

# Knowledge Check

<https://docs.microsoft.com/en-us/learn/modules/serverless-fundamentals/6-knowledge-check>

# Understand your product options

1. **DevOps** is a **new** **approach** that helps to **align** **technical** teams as they work toward common goals
2. Organizations employ practices and processes that seek to automate the ongoing development, maintenance, and deployment of software systems
3. **Aim** is to **expedite** the **release** of **software** **changes**, ensure the ongoing deployability of the system, and ensure that all changes meet a high quality bar
4. When done correctly, DevOps practices and processes **touch** **nearly** **every** **aspect** of the **company**
5. DevOps requires a fundamental mindset change from the top down

### **Azure DevOps Services**

1. **Azure Repos:** centralized source-code repository
2. **Azure Boards:** Agile project management suite that includes ***Kanban******boar*ds**, ***reporting***, and ***tracking*** ***ideas***
3. **Azure Pipelines:**  CI/CD pipeline automation tool (CD – Continuous Delivery)
4. **Azure Artifacts:** Repository for hosting artifacts, such as compiled source code
5. **Azure Test Plans:** Automated test tool

### **GitHub and GitHub Actions**

1. Most popular code repository for open-source software
2. Git is a **decentralized** **source**-**code** **management** **tool**, and GitHub is a hosted version of Git
3. Following functionality:
   1. Shared source-code repository
   2. Facilitates project management, including Kanban boards
   3. Supports issue reporting, discussion, and tracking
   4. Features CI/CD pipeline automation tooling
   5. Includes a wiki
   6. Can be run from the cloud or on-premises
4. GitHub Actions enables workflow automation with triggers for many lifecycle events, eg ***ToolChain***
5. A **toolchain** is a **combination** of **software** tools that **aid** in the **delivery**, **development**, and **management** of **software** **applications** throughout a **system's** **development** **lifecycle**

### **Azure DevTest Labs**

1. **Azure** **DevTest** **Labs** provides an automated means of managing the process of ***building***, ***setting*** up, and ***tearing*** down virtual machines ***(VMs)***
2. This way, **developers** and **testers** can **perform** **tests** across a variety of **environments** and **builds**
3. Anything you can deploy in **Azure** **via** an **ARM** template (Azure Resource Manager)
4. Suppose you need to test a new feature on an old version of an operating system. Azure DevTest Labs can set up everything automatically upon request

# Analyze the decision criteria

1. **Do you need to automate and manage test-lab creation?**
   1. Consider choosing Azure DevTest Labs
   2. It's the only one that offers this functionality
2. **Are you building open-source software?**
   1. GitHub has long been the preferred host for open-source software
3. **Regarding source-code management and DevOps tools, what level of granularity do you need for permissions?**
   1. Azure DevOps has a much more granular set of permissions over GitHub
4. **Regarding source-code management and DevOps tools, how sophisticated does your project management and reporting need to be?**
   1. Azure DevOps excels here over GitHub
5. **Regarding source-code management and DevOps tools, how tightly do you need to integrate with third-party tools?**
   1. DevOps tools create hooks or APIs that can be used by both Azure Pipelines and GitHub Actions

# Use Azure DevOps to manage the application development lifecycle

1. **Scenario:**  The team needs to give project sponsors and managers executive level ***reporting***, including **burndown** ***charts***, track progress against epics, and track custom information that's specific to Tailwind Traders in each work item and ***bug*** ***report***.
2. **Which services should we choose?**
   1. First, does Tailwind Traders need to automate and manage test lab creation? ***No***. So, in this scenario, Azure DevTest Labs is not a candidate
   2. Second, is Tailwind Traders building open-source software? ***No***
   3. Third, what level of granularity does Tailwind Traders need for permissions? ***Yes.*** Therefore Azure DevOps is the leading candidate
   4. Fourth, does Tailwind Traders require a sophisticated project management and reporting solution? ***Yes*** – Therefore use DevOps
   5. Fifth, does Tailwind Traders require tight integration with any third-party DevOps tools? Not specified – Use Azure DevOps or GitHub

# Use GitHub to contribute to open-source software

1. **Scenario:** Tailwind Traders hopes to publish an API. The team needs a platform to share example code, collect feedback on the API, allow contributors to report issues, and build a community around feature requests.
2. **Which service should you choose?**
   1. First, does Tailwind Traders need to automate and manage test lab creation? ***No***
   2. Second, is Tailwind Traders building open-source software? ***Yes – GitHub***
   3. Third, what level of granularity does the Tailwind Traders team need for assigning permissions? ***Not stated.*** Permissions needs are basic, therefore ***GitHub*** is fine
   4. Fourth, does Tailwind Traders require a sophisticated project management and reporting solution?
   5. Fifth, does Tailwind Traders require tight integration with any third-party DevOps tools? Not specified

# Use Azure DevTest Labs to manage testing environments

1. **Scenario:** Team has concerns around the costs of a more automated test environment. Wants to make sure that the QA professionals are not wasting time configuring the testing environment to match the production environment.
2. **Which service should you choose?**
   1. First, does Tailwind Traders need to automate and manage test lab creation? ***Yes*** - Azure DevTest Labs

# Knowledge Check

https://docs.microsoft.com/en-us/learn/modules/azure-devops-devtest-labs/7-knowledge-check

**TOOLS FOR MANAGING THE AZURE ENVIRONMENT**

# Identify the product options

1. Two broad categories of management tools:
   1. **Visual tools:** Visual tools provide full, visually friendly access to all the functionality of Azure. Might be **less** **useful** when you're trying to set up a **large** **deployment** of resources
   2. **Code-based tools:**  Attempting to **quickly** **set** **up** and **configure** **Azure** resources, a code-based tool is usually the better choice. Although it might **take** **time** to **understand** the right **commands** and parameters at first, after they've been entered, they can be saved into files. Code that performs setup and configuration can be stored, versioned, and maintained, known as infrastructure as code.
   3. **There are two approaches to infrastructure as code:**
      1. Imperative *code:*  Details **each** individual **step**
      2. *Declarative code:* Details only a **desired** **outcome**. Declarative code can provide a more robust approach to deploying dozens or hundreds of resources simultaneously and reliably.

## **Tools to Manage the Cloud Environment:**

1. **The Azure portal:** By using the Azure portal, a **web**-**based** **user** **interface**, you can access virtually every feature of Azure. Provides a friendly, graphical UI to view all the services. The Azure portal is how most users first experience Azure. As your Azure usage grows, you'll likely choose a more repeatable code-centric approach.
2. **The Azure mobile app:** Provides **iOS** and **Android** **access** to your Azure resources. With it you can: 1) Monitor the health and status of resources. 2) Check for alerts, quickly diagnose and fix issues. 3) Run the Azure CLI or Azure PowerShell commands
3. **Azure PowerShell:**  Available for **Windows**, **Linux**, and **Mac**, and you can access it in a web browser via Azure Cloud Shell. Developers and DevOps and IT professionals can execute commands called **cmdlets.** Cmdlets can be executed independently or combined into a script file to:
   1. For routine setup, teardown, and maintenance
   2. Deployment of an entire infrastructure
4. **The Azure CLI:** Executable program with which a developer, DevOps professional, or IT professional can execute commands in **Bash.**
5. **ARM templates:** Although it's possible to write imperative code in Azure PowerShell or the Azure CLI, there is a better way. With (ARM templates), you can describe the resources you want to use in a declarative **JSON** **format**.

# Analyze the decision criteria

1. **Do you need to perform one-off management, administrative, or reporting actions?**
   1. ***Azure PowerShell*** and ***the Azure CLI*** are Azure management tools that allow you to ***quickly*** ***obtain*** the ***IP address*** of a ***virtual machine (VM)*** you've deployed, ***reboot*** a VM, or ***scale*** an app
   2. ***Azure CLI and PowerShell, Azure Resource Manager*** templates (ARM templates) define the infrastructure requirements in your application for ***repeatable*** ***deployments***
   3. The ***Azure portal*** can perform most, if not all, management and administrative actions.  If you're just learning Azure.
   4. For advanced users, Azure CLI or PowerShell will give you the most flexibility
   5. ***Azure mobile app***, which you can access via an ***iOS*** or ***Android phone*** or ***tablet***
2. **Do you need a way to repeatedly set up one or more resources and ensure that all the dependencies are created in the proper order?**
   1. ***ARM templates*** define your application's infrastructure requirements for a ***repeatable deployment*** that is done in ***a consistent manner***
   2. However it is possible to use **PowerShell** or the **Azure** **CLI** to set up all the resources for a deployment, but there is **no** **validation** **steps**.
3. **When you're scripting, do you come from a Windows administration or Linux administration background?**
   1. Windows – PowerShell
   2. Linux **–** Azure CLI

# Use the Azure portal to visually understand and manage your cloud environment

1. **Scenario:** Managers or CTO would be able to see the data displayed visually, but also be able to run custom reports in real time.
2. **Which service should you choose?**
   1. First, in this scenario, does Tailwind Traders need to perform one-off management, administrative, or reporting actions? **Yes – Azure Portal**
   2. The next two decision criteria don't apply to this scenario, because the director of cloud operations and the CFO won't be deploying or configuring any resources.

# Use Azure PowerShell for one-off administrative tasks

1. **Scenario:** The team comes from a Windows development, and moved its applications to the cloud, and it now needs a way to perform **one-off testing**, **management**, and **administrative tasks** in its intranet environment
2. **Which service should you choose?**
   1. First, in this scenario, does the Tailwind Traders team need to perform one-off management, administrative, or reporting tasks? **Yes**.
   2. Second, in this scenario, does Tailwind Traders need a repeatable and reliable means of deploying its entire infrastructure? **No**
   3. Due to theWindows administration background – **PowerShell**

# Use the Azure CLI for one-off administrative tasks

1. **Scenario**: This team has a Linux administration background and need to perform administrative tasks related to the health of the cloud environment
2. **Which service should you choose?**
   1. The Azure CLI

# Use the Azure mobile app to manage Azure on the go

1. **Scenario:** Director wants to relax this requirement and allow employees to spend these dates with their families. Is there a product that can help support this scenario?
   1. First, does Tailwind Traders need to perform one-off management, administrative, reporting actions? **Yes**
   2. The real question is, how? A phone or tablet solution could help key employees keep an eye on the health of the cloud environment
   3. The Azure mobile app is the right choice.

# Use ARM templates to deploy an entire cloud infrastructure

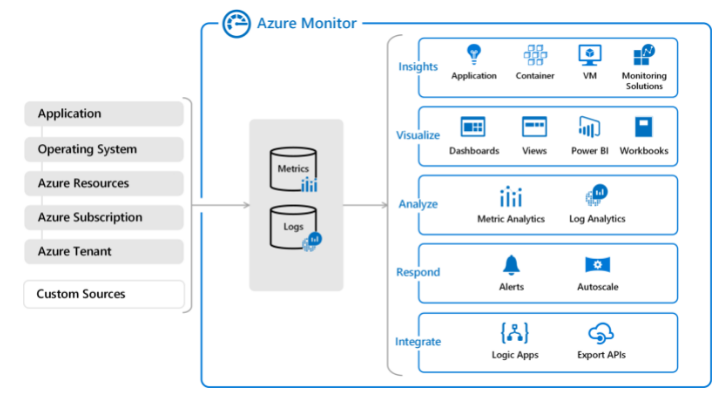
1. **Scenario**: The Company needs a repeatable, reliable way to scale its operations during peak sales periods. The company needs a repeatable, reliable way to scale its operations during peak sales periods. Creates all dependencies in the correct order. Can be used without worrying that it failed in the middle.
2. **Which service should you choose?**
   1. First, in this scenario, does Tailwind Traders need to perform one-off management, administrative, or reporting actions? This time, we're not looking to support one-time or one-off management or administration tasks. We're looking for a technology to automate
   2. Second, does Tailwind Traders need a repeatable and reliable way to deploy its entire infrastructure? **Yes – ARM Templates**
   3. The third decision criterion assumes that you need to write a script by using imperative code. However, when you use ARM templates, you define your infrastructure declaratively by using **JSON** **code**.

# Knowledge Check

https://docs.microsoft.com/en-us/learn/modules/management-fundamentals/9-knowledge-check

### [Choose the best monitoring service for visibility, insight, and outage mitigation](https://docs.microsoft.com/en-us/learn/modules/monitoring-fundamentals/?ns-enrollment-type=LearningPath&ns-enrollment-id=learn.az-900-describe-core-solutions-management-tools-azure)

# Identify your product options

1. At a high level, there are three primary Azure monitoring offerings:
2. **Azure Advisor:**
   1. Evaluates your Azure resources and makes **recommendations** to help improve **reliability**, **security**, and **performance**, achieve operational **excellence**, and **reduce** **costs**
   2. Designed to help you **save** **time** on cloud optimization
   3. Actions include **right** **away**, **postpone**, or **dismiss**
   4. Recommendations are available via the Azure portal and the API
   5. The recommendations are divided into five categories:
      1. **Reliability: For mission critical**
      2. **Security: Detect threats and vulnerabilities**
      3. **Performance: Speed up applications**
      4. **Cost: Reduce spending**
      5. **Operational Excellence: Achieve best practices**
3. **Azure Monitor**
   1. Platform for **collecting**, **analyzing**, **visualizing**, and potentially **taking** **action** based on the **metric** and **logging** **data** from your entire **Azure** and **on**-**premises** environment
   2. 
   3. On the left is a list of the sources. In the centre, you can see how the logging and metric data. On the right, the data is used in a number of ways
   4. React to critical events in **real** **time**, through alerts delivered to teams via **SMS**, **email**, and so on
   5. **Azure** **Application** **Insights**, a service for sending **telemetry** information from application source code
   6. With **Application** **Insights**, your **developers** can take advantage of the powerful data-analysis platform to gain deep insights into an **application's** **operations** and **diagnose** **errors** without having to wait for users to report them
4. **Azure Service Health**
   1. **Personalized** **view** of the health of the **Azure** **services**, **regions**, and **resources**
   2. **Service** **Health** provides official **incident** **reports**, called **root** **cause** **analyses** **(RCAs)**
   3. Service Health helps you keep an eye on several event types:
      1. **Service issues:**  Problems in Azure, such as outages, that affect you right now
      2. **Planned maintenance:** Events can affect your availability
      3. **Health advisories:** Require you to act to avoid service interruption

# Analyze the decision criteria

1. **Do you need to analyse how you're using Azure to reduce costs? Improve resilience? Harden your security?**
   1. Choose Azure Advisor
2. **Do you want to monitor Azure services or your usage of Azure?**
   1. Choose Azure Service Health
3. **Do you want to measure custom events alongside other usage metrics?**
   1. Choose Azure Monitor
4. **Do you need to set up alerts for outages or when auto scaling is about to deploy new instances?**
   1. Use Azure Monitor

# Use Azure Advisor

1. **Scenario:** Tailwind Traders wants to optimize its cloud spend. Concerned about security breaches. Tighten up its cloud spend and security practices.
2. **Which service should you choose?**
   1. First, in this scenario, does Tailwind Traders need to analyse its Azure usage for the sake of optimization? **Yes**
   2. Second, in this scenario, does Tailwind Traders want to monitor the health of Azure service **No**
   3. Third, in this scenario, does Tailwind Traders want to measure custom events alongside other usage metrics? **No**
   4. Fourth, in this scenario, does Tailwind Traders want to set up alerts for outages or when autoscaling is about to deploy new instances? **No**

# Use Azure Monitor

1. **Scenario:** The Tailwind Traders e-commerce website is experiencing intermittent errors.  Team is unsure of the cause.
2. **Which service should you choose?**
   1. First, in this scenario, does Tailwind Traders need an analysis of its Azure usage for the sake of optimization? **No**
   2. Second, in this scenario, does Tailwind Traders want to monitor the health of Azure services that affect all customers or the resources deployed on Azure? **Only Intermittent**.
   3. Third, in this scenario, does Tailwind Traders want to measure custom events alongside other usage metrics? **Yes**
   4. Fourth, in this scenario, does Tailwind Traders want to set up alerts for outages or for when autoscaling is about to deploy new instances? **No**

# Use Azure Service Health

1. **Scenario:**  Specifically, its cloud operations team wants to let stakeholders know about upcoming planned downtime in advance
2. **Which service should you choose?**
   1. First, in this scenario, does Tailwind Traders need to analyze its Azure usage for the sake of optimization? **No**
   2. Second, does Tailwind Traders want to monitor the health of Azure services that affect all customers or the resources deployed on Azure? **No**
   3. Third, in this scenario, does Tailwind Traders want to measure custom events alongside other usage metrics? **No**
   4. Fourth, in this scenario, does Tailwind Traders want to set up alerts for outages or when autoscaling is about to deploy new instances? **No**

