Modern software systems running in the cloud are complex. Gaining visibility into the health and performance of your application hosting environment across all of its layers of services is challenging. Fortunately, there are several solutions from Microsoft that can help you react :

* Quickly to outages,
* research intermittent issues,
* optimize your usage and
* be proactive in handling future planned downtime.

Tailwind Traders, a traditional brick and mortar retailer, is now experiencing explosive growth by selling products online. The company is seeking to tighten and operationalized control of its Cloud environment. It faces several challenges, from needing to optimize its Cloud spinned and security posture, to tracking intermittent issues and planning ahead for upcoming outages. However, the company needs help with choosing the right product option for each of these scenarios.

In this lesson, you'll learn about the several Microsoft monitoring solutions, and you will analyze decision criteria that experts use to select the right service for a specific scenario. When you have completed it, you'll be able to choose the Cloud monitoring service that best addresses your company's business challenges.

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When identifying their product options, several basic questions or concerns face all companies that use the Cloud.

1. **Performance**, Are we using the Cloud correctly? Can we squeeze more performance out of our Cloud spend?
2. **Cost,** Are we spending more than we need to?
3. **Security,** Do we have our systems properly secured?
4. **Resilience,** How resilient are our resources? If we experience a regional outage, could we fail over to another region?
5. **Diagnostic,** How can we diagnose and fix issues that occur intermittently?
6. **Outage causes,** How can we quickly determine the cause of an outage? How can we learn about planned downtime?

Fortunately, by using a combination of monitoring solutions on Azure, you can gain answers, insights, and alerts to help ensure that you've optimized your Cloud usage. As certain the root cause of unplanned issues. Prepare ahead of time for planned outages.

At a high level, there are three primary Azure monitoring offerings :

1. Azure Advisor,

* Evaluate resources
* Make Recommendations

This offering evaluates your Azure resources and makes recommendations to help improve reliability, security, and performance, achieve operational excellence and reduce costs. Advisor is designed to help you save time on Cloud optimization. The recommendation service includes suggested actions you can take right away, postpone or dismiss. The recommendations are available via the Azure Portal and the API, and you can set up notifications to alert you to new recommendations.

A screenshot of a computer

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When you're in the Azure portal, The advisor dashboard displays personalized recommendations for all your subscriptions and you can use filters to select recommendations for specific subscriptions, resource groups, or services.

The recommendations are divided into five categories (It is not used to set up alerts for outages.):

* **Reliability**, used to ensure and improve the continuity of your business-critical applications.
* **Security,** used to detect threats and vulnerabilities that might lead to security breaches.
* **Performance,** used to improve the speed of your applications.
* **Cost,** used to optimize and reduce your overall Azure spending.  Cost reduction is one of the many things you can achieve with Azure Advisor.
* **Operational excellence,** used to help you achieve process and workflow efficiency, resource manageability and deployment best practices.

1. Azure Monitor,

Azure Monitor, as a platform for collecting, analyzing, visualizing, and potentially taking action based on the metric and logging data from your entire Azure and on-premises environment.

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This diagram illustrates just how comprehensive Azure Monitor is.

* On the left is a list of the sources of logging and metric data that can be collected at each layer in your architecture, from application to operating system and network.
* In the center, you can see how the logging and metric data is stored in central repositories.
* On the right, you can see how the data is used. You can view real-time and historical performance across each layer of your architecture, or aggregated and detailed information. The data is displayed at different levels for different audiences.

You can view high-level reports on the Azure Monitor dashboard or create custom views by using Power BI, and coastal queries. Additionally, you can use the data to help you react to critical events in real-time through alerts delivered to Teams via SMS, email, and so on or you can use thresholds to trigger auto-scaling functionality to scale up or down to meet the demand.

Some popular products such as :

* Azure application insights, a service for sending telemetry information from application source code to Azure, uses Azure Monitor under the hood. With Application Insights, your application developers, can take advantage of the powerful data-analysis platform in Azure Monitor to gain deep insights into an applications operation, and diagnose errors without having to wait for users to report them.

Azure Monitor does give you the capability to use data to help you react to critical events in real-time, through alerts delivered to teams via SMS, email, and so on.

1. Azure Health Service,

You can use Azure Service Health to view the current status of the Azure services you rely on. Azure Service Health is best for monitoring the current status of the Azure services you rely on. You can use Azure Monitor to keep track of the performance or issues related to your specific VM or container instances, databases, your applications, and so on.

Azure Service Health notifies you about Azure service incidents and planned maintenance so you can take action to mitigate downtime. Azure Service Health provides a personalized view of the health of the Azure services, regions, and resources you rely on*. The status.Azure.com* website, which displays only major issues that broadly effect Azure customers, doesn't provide the full picture. But Azure service health displays both major and smaller localized issues that affect you. Service issues are rare, but it's important to be prepared for the unexpected. You can set up alerts that help you triage outages and planned maintenance. After an outage, Service Health provides official incident reports called Root Cause Analysis or RCA's, which you can share with stakeholders. Service Health ,helps you keep an eye on several event types :

* **Service issues** are problems in Azure, such as outages that affect you right now. You can drill down to the affected services, regions, updates from your engineering teams and find ways to share and track the latest information.
* **Health advisories** are issues that allow you to act in advance to avoid service interruption, including service retirements and upcoming changes. Health advisories are announced for an advance to allow you to plan.
* **Planned maintenance**, Finally, with Azure Service Health, you can keep track of planned maintenance events that can affect your availability. You can drill down to the affected services, regions and details to show how an event will affect you and what you need to do. Most of these events occur without any impact to you and aren't shown here.

In the rare case that a reboot is required, Service Health allows you to choose when to perform the maintenance to minimize the downtime.

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Now you'll analyze the criteria that experts employ when they choose an Azure monitoring service for a specified business need. By understanding the criteria, you can better assess the nuanced differences among the products.

If cost reduction, improving resilience, or hardening your security are important considerations for your project, Azure Advisor can help you to achieve your goals. You can use Azure Advisor to analyze your deployed resources. It analyzes the configuration and usage of your resources and provide suggestions on how to optimize them for reliability, security, performance, costs, and operations, based on expert’s best practices.

You can use Azure Service Health to :

* **Monitor services and regions**, to keep tabs on Azure itself, especially the services and regions you depend on.
* **Upcoming planned outages,** You can view the current status of the Azure services you rely on, upcoming planned outages, and
* **Services that will be sunset.**
* **Alerts for incidents and downtime,** You can set up alerts that help you stay on top of instance and upcoming downtime without having to visit the dashboard regularly.

You can use Azure Monitor to :

* **Track your VM performance**, keep track of the performance or issues related to your specific VM or container instances, databases, your applications, and so on. You can visit Azure monitor, and create reports and notifications to help you understand how your services are performing, or diagnose issues related to your Azure usage.
* **Measure custom events,** Azure Monitor is also the best option if you are choosing a service to measure custom events alongside other usage metrics.
* **Setup alerts for outages,** If you need to set up alerts for outages, or when autoscaling is about to deploying new instances, again, you can use Azure monitor to do this. It can set up alerts for key events that are related to your specific resources.
* You can use Azure monitor when you want to measure custom events alongside other collected telemetry data. Custom events such as those added in the source code of your software applications could help identify and diagnose why your application is behaving a certain way.

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Tailwind Traders want to optimize its Cloud spinned. Also, the organization is concerned about security breaches because it stores customer data and historical purchase data and cloud-based databases. As the organization ramps up it's Cloud expertise, it wants to better understand its use of the Cloud, better understand best practices and pinpoint easy wins where it can tighten up its Cloud spinned and security practices.

1. To determine which service you should choose, you can apply the decision criteria you learned about earlier to find the right option (**COST, SECURITY**) .

Tailwind Traders understands that it might be spending too much. It's concerned about its security practices, and wants to have its Cloud usage analyzed against industry best practices. Therefore, **Azure advisor is the best option for this scenario**.

Although you might have found the right product option, let's continue evaluating the decision criteria for this scenario.

1. Second, in this scenario, do you think Tailwind Traders needs to monitor the health of Azure services that affect all customers or the resources that are deployed in Azure? No, it doesn't. This scenario isn't concerned with Operations. However, Azure advisor does analyze and provide recommendations for achieving operational excellence.
2. The third consideration in this scenario. Does Tailwind Traders want to measure custom events alongside other usage metrics? No. Measuring custom events isn't mentioned as a requirement and isn't a consideration in this scenario.
3. Fourth. In this scenario, does Tailwind Traders want to set up alerts for outages or when auto-scaling is about to deploy new instances? Again, this scenario isn't concerned with operations. However, Azure advisor does analyze and provide recommendations for achieving operational excellence.

Azure advisor your advisor is the right product option to help Tailwind Traders better understand and optimize both its Cloud spinned and it's Cloud security posture. This product might help the organization, with other areas of Cloud usage as well.

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The Tailwind Traders e-commerce website is experiencing intermittent errors, and the team is unsure of the cause. Because of the nature of the errors, the team suspects that it's either a database or a caching issue. What are the circumstances surrounding the errors? Does it happen only during peak usage times? What is the stage of the team's Azure SQL instance? How can it trace the issues to a root cause?

Just as before, you should apply the decision criteria that you learned about earlier to find the right option (Because this issue happens **intermittently,** it's likely that a logic issue exists somewhere in their e-commerce website code, or another issue around the database.)

1. First, in this scenario, does Tailwind Traders need an analysis of its Azure usage for the sake of optimization. No, optimization isn't the team's objective in this scenario, so Azure Advisor isn't a candidate. AZURE ADVISOR X
2. Because this issue happens intermittently, it's unlikely to affect an entire Azure region or service. It's more likely that a logic issue exists somewhere in their e-commerce website code, or another issue is causing database failures or caching locks. In this scenario, the team could use Azure Monitor to pinpoint a specific user session and look at the performance of each service that's involved in the issue. **AZURE MONITOR V**
3. The third decision in this scenario is, does Tailwind Traders want to measure custom events alongside other usage metrics? Yes. Software developers can send additional information about the stage of the web application via application insights, to help locate the root cause of the issue. Application insights relies on the Azure Monitor platform to store custom event information. **APPLICATION INSIGHTS WITH AZURE MONITOR V**
4. Fourth, in this scenario, does Tailwind Traders want to set up alerts for outages or when auto-scaling is about to deploy new instances. No, alerting isn't their objective in this scenario. AZURE ADVISOR X

Azure Monitor is the best option for helping Tailwind Traders track this intermittent issue. The team can use a wealth of tools to help it gain insight into the application's performance at a high level and deep dive into specific issues.

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Tailwind Traders wants to operationalize its cloud environment. Specifically, it's cloud operations team, wants to let stakeholders know about upcoming planned downtime, in advance. The team also wants its solution architects to be forewarned about any Microsoft plans to sunset services, so it can re architect it's software products accordingly. When outages do happen, the team wants to quickly ascertain whether the issue is specific to their services, or a service interruption that affects many Azure customers. The team also wants to provide key stakeholders with reports that explain how and why the incident occurred and so on.

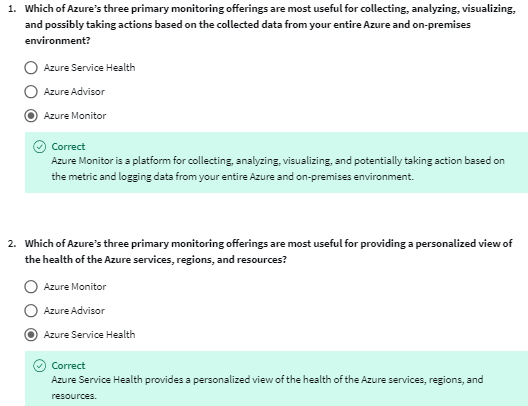
Again, apply the decision criteria you learned about earlier to find the right product.

1. **Analyze for Optimization**, **NO** First, does Tailwind Traders need to analyze its Azure usage for the sake of optimization? No, so as your advisor isn't a candidate for this scenario.
2. **Monitor health of services**, **YES,** Second does Tailwind Traders want to monitor the health of Azure services that affect all customers, are their resources deployed on Azure? Yes..The requirement is to stay abreast off upcoming plan downtime, additionally, the team wants to capture official incident reports. For this reason, Azure service health is the strongest candidate to choose for this scenario. Although it's likely that you would choose as your service health, let's continue evaluating the remaining decision criteria.
3. **Measure custom events,** **NO,** Third, does Tailwind Traders want to measure costume events alongside other usage metrics. No, measuring custom events isn't mentioned as a requirement and isn't a consideration in this scenario.
4. **Set up alerts, NO** Setting up alerts for outages is a requirement, but creating alerts for other events such as auto scaling, are not in scope.

You can use Axure service health to set up alerts that are specific to Azure outages that affect all Azure customers. Or you can use Axure monitor to set up alerts for outages and other events that affect only your specific resources.

In this scenario, Azure service health is the correct option to choose. Our goal in this, lesson was to help Tailwind Traders explore several monitoring service offerings from Azure, to apply to a variety of business scenarios. We identified three product options and their capabilities, Azure advisor, Azure monitor, and Azure service health. We analyze decision criteria for choosing one option over another for certain scenarios. Then we applied those decision criteria to three different challenges faced by Tailwind Traders, helping them find the best service option, for the scenario.

Without monitoring services, Tailwind Traders would spend more money on its cloud environment, be unsure about its cloud security posture. Have difficulty pinpointing issues in its application logic and be unable to plan ahead for outages or supply formal outage reports to stakeholders. Azure monitoring services  provide a comprehensive array of features, to help improve your cloud operations

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1. Azure Monitor is a 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. Azure Monitor is a platform for collecting, analyzing, visualizing, and potentially taking action based on the metric and logging data from your entire Azure and on-premises environment.
3. Azure Service Health provides a personalized view of the health of the Azure services, regions, and resources.
4. Azure Advisor evaluates your Azure resources and makes recommendations to help you improve reliability, security, and performance, achieve operational excellence, and reduce costs.

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By using Azure management tools, administrators, developers and managers can interact with the cloud environment to perform such tasks as, :

* **Deploy resource**s, deploying dozens or hundreds of resources at a time.
* **Configuring services,** Configuring individual services, programmatically,
* **View repots,** viewing rich reports across usage, health costs and more.

Microsoft Azure provides a collection of management tooling options to choose from, depending on the situation.

Tailwind Traders, a traditional brick and mortar retailer, is now experiencing explosive growth by selling products online. The company owes much of its success to an ability to quickly and efficiently manage its cloud environment. As it began its cloud journey, Tailwind Traders initially had to choose the right management tools for its business needs.

In this lesson, you'll explore the array off Azure management tools and the decision criteria that experts use to select the right ones for their specific scenarios. After completing this lesson, you'll be able to choose the Azure management tools that best address your organization's technical needs and challenges

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At a high level, there are two broad categories of management tools:

1. **Visual tools** is provide visually friendly access to all the functionality of Azure

Visual tools provide visually friendly access to all the functionality of Azure. However, visual tools might be less useful when you're trying to set up a large deployment of resources with interdependencies and configuration options.

1. Code based tools is quickly setup and configure resources, Code Management and reapply commands&parameters

When you're 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'd been entered, they can be saved into files and used repeatedly as needed. Also, the code that performs setup and configuration can be stored, versioned and maintained along with application source code in a source code management tool, such as Git. This approach to managing hardware and Cloud resources which developers use when they write application code is referred to as infrastructure as code.

There are two approaches to **infrastructure as Code** :

* 1. Imperative code details

 Imperative code details, each individual step that should be performed to achieve a desired outcome.

* 1. Declarative code details

By contrast, declarative code details only a desired outcome, and it allows an interpreter to decide how to best achieve that outcome. This distinction is important because tools that are based on declarative code can provide a more robust approach to deploying dozens or hundreds of resources simultaneously and reliably.

Microsoft offers a variety of tools and services to manage your cloud environment, each aimed at different scenarios and users.

By using the Azure portal :

* A web-based user interface, you can access virtually every feature of Azure.
* The Azure portal provides a friendly graphical UI to view all the services you're using, create new services, configure your services, and
* View reports. The Azure portal is how most users first experience Azure but as your Azure usage grows, you'll likely choose a more repeatable, code centric approach to managing your Azure resources.

The Azure mobile app provides iOS and Android access to your Azure resources when you're away from your computer. With this, you can :

* Monitor the health and status of your Azure resources,
* check for alerts or fix issues, quickly diagnose and fix issues and restart a web app or virtual machine.
* Run the Azure CLI or Azure PowerShell commands to manage your Azure resources.

Azure PowerShell is a shell with which developers and DevOps and IT professionals can :

* **Execute commands called cmdlets**. These commands called the Azure REST API to perform every possible management task in Azure. Cmdlets can be executed independently, are combined into a script file and executed together to orchestrate the routine setup, tear down, and maintenance of a single resource or multiple connected resources.
* The deployment of an entire infrastructure which might contain dozens or hundreds of resources from imperative code.

Capturing the commands in a script makes the process repeatable and automatable. Azure PowerShell is available for Windows, Linux, and Mac, and you **can access it in a web browser via Azure Cloud Shell.** Windows PowerShell has helped windows-centric IT organizations automate many of their on-premises operations for years and these organizations have built up a large catalog of custom scripts and cmdlets as well as expertise.

The Azure CLI is an executable program with which a developer, DevOps Professional or IT professional can:

* **Execute commands in Bash**. The commands called the Azure rest API to perform every possible management task in Azure. You can run the commands independently or combined into a script and execute it together for the routine setup, tear down, and maintenance of a single resource or an entire environment.

In many respects, the **Azure CLI is almost identical to Azure PowerShell** in what you can do with it. Both run on Windows, Linux, and Mac, and can be accessed in a web browser via Cloud Shell**. The primary difference is the syntax you use**. If you are already proficient in PowerShell or Bash, you can use the tool you prefer. Although it's possible to write imperative code in Azure PowerShell or the Azure CLI to setup and tear down one Azure resource is orchestrates and Infrastructure comprising hundreds of resources. There's a better way to implement this functionality.

By **using Azure Resource Manager (ARM) templates**, you can :

* Describe the resources you want to use in a declarative JSON format.
* Verify template, The benefit is that the entire ARM template is verified before any code is executed to ensure that the resources will be created and connected correctly.
* Create resources in parallel, The template then orchestrates the creation of those resources in parallel. That is, if you need 50 instances of the same resource, all 50 instances are created at the same time.

Ultimately, the developer, DevOps professional, or IT professional needs only to define the desired state and configuration of each resource in the ARM template and the template does the rest. **Templates can even execute PowerShell and Bash scripts before or after the resource has been set up.**

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Next, you get a chance to analyze the criteria that experts employ to help them decide which Azure management tools to use to address their business needs. Understanding the criteria can help you better understand the nuance differences among the products.

1. Do you need to perform one-off management, administrative, or reporting actions? Using their Azure PowerShell or the Azure CLI if you need to quickly
   1. Obtain the IP address of a virtual machine you've deployed,
   2. Reboot a VM, or
   3. Scale an app.

You might want to keep custom scripts handy on your local hard drive for certain operations that you perform occasionally. By contrast, Azure Resource Manager templates (ARM templates) :

* Express the infrastructure requirements for your application for a repeatable deployment.
* ARM templates aren't intended for one-off scenarios, but depending on the scenario, it's possible to use them for this purpose. In these instances, you should prefer PowerShell, Azure CLI scripts, or the Azure Portal.
* Also, ARM templates can include PowerShell or Azure CLI scripts,  which can trigger the execution of ARM templates.

This gives you flexibility in choosing the right tool for your particular needs**. You could perform most if not all management and administrative actions via Azure Portal.**

* **Setup and manage resources**, If you're just learning Azure, you need to set up and manage resources in frequently, or
* **View reports,** prefer a visual interface for viewing reports, it makes sense to take advantage of the visual presentation that the Azure Portal offers.
* **Less efficient for cloud management or admin role,** However, if you're in a Cloud management or administrative role, it's less efficient to rely solely on visual scanning and clicking. To find the settings and information you want to work with, it's often quicker and more repeatable to use the Azure CLI or PowerShell.

The last option in this case is the Azure mobile app :

* Which you can access via an iOS or Android phone or tablet.
* Because it's full featured, it's likely the best choice when a laptop isn't readily available and you need to view and triage issues immediately.

Now, if you need a way to repeatedly set up one or more resources and ensure that all the dependencies are created in the proper order**, you can use ARM templates**. In a way, they can express your application's infrastructure requirements **for a repeatable deployment.** A validation step ensures that all resources can be created, so that the resources are created in the proper order based on dependencies in parallel and item potent.

By contrast, it's entirely possible to use either PowerShell or the Azure CLI to set up all the resources for a deployment. However, there's no validation step in these tools if a script encounters an error, the dependency resources can't be rolled back easily. Deployments happen serially and only some operations are item potent.

When you're scripting, do you come from a Windows administration or Linux administration background?

* If you or your Cloud administrators come from a Windows administration background, it's likely you'll prefer PowerShell.
* If you or your Cloud administrators come from a Linux administration background, it's likely you'll prefer the Azure CLI. In practice, either tool can be used to perform most one-of administration tasks.

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Tailwind Traders uses Azure extensively throughout its entire organization. To make sure that both the technical and executive teams are aware of the company's Cloud spent, the director of Cloud operations will begin to meet weekly with the chief financial officer to talk about their Cloud spent.

Conversations might begin at a high level, but the two officers might want to deep dive joined the meeting to gain more insight into how Azure resources are being used. Ideally, they would be able to see the data displayed visually, but also be able to run customer ports in real-time. You will decide which tool they can use during their meeting.

To determine which service you should choose, you can apply the decision criteria you learned about earlier to find the right option.

1. First, in this scenario, do you think Tailwind Traders need to perform one-off management, administrative, or reporting actions? Yes, and given the requirement to view data visually and create custom reports during the meeting**, the Azure portal is the best choice**. The meeting attendees can quickly find answers to their questions by using a wealth of reporting options.
2. The next two decisions you need to make or is there a way to repeatedly settled one or more resources and is you are scripting background in Windows or Linux? These questions don't apply to this scenario because the director of Cloud operations and the CFO won't be deploying or configuring any resources. Therefore, the Azure portal is the correct product option for this scenario.

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Tailwind Traders employs technologists with many different skills. A team of developers and administrators builds and maintains a collection of intranet applications that are vital to the business. The team members have strong backgrounds in Windows development and network administration.

The team moves its applications to the cloud, and it now needs a way to perform one-off testing, management, and administrative tasks in its intranet environment. The team quickly realized that managing Azure from the portal takes too much time and is *not repeatable*. Which tool should the company use for one-off tasks? As you did before, apply the decision criteria you learned about to find the right option.

1. First, in this scenario, does the Tailwind Traders team need to perform one-off management, administrative, or reporting tasks? Yes. However, the team already knows that it doesn't want to rely on the Azure portal for these one-off actions. Therefore, both Azure PowerShell and the Azure CLI are good options. We'll hond in on which tool the team should use in a moment.
2. Second, in this scenario, does Tailwind Traders need a repeatable and reliable means of deploying its entire infrastructure? No, not in this scenario, therefore Azure Resource Manager (ARM) templates are not the right choice.
3. When the Tailwind Traders team is doing scripting, does it come from a Windows administration or Linux administration background? This team has a Windows administration background. It would likely be most comfortable using Azure PowerShell because this tool allows it to use the syntax it's most comfortable with to perform one-off administration tasks.

Did you work it out? Azure PowerShell is the best choice for this scenario.

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As we noted before, Tailwind Taders employs technologists with many different skills. The Devops team is primarily concerned with keeping external systems, such as the company's e-commerce site, up and running. This team has a Linux administration background. It frequently needs to perform administrative tasks related to the health of the cloud environment. The team quickly realized that managing Azure from the portal takes too much time and isn't repeatable. Which tools should it use for one of tasks.

Once again applied the decision criteria you learned about earlier to find the right option.Because this scenario is almost identical to the one before you can skip over the first two criteria. In other words, you can quickly eliminate the Azure resource manager templates and the Azure portal as viable options for this scenario. So, let's go to the third decision criterion. Choosing the right option in this scenario should be determined by the team's background.Because this team has a Linux administration background, it would likely be most comfortable using the Azure CLI. The Azure CLI allows the team to use the bash shell and its syntax to perform one of administration tasks. The Azure CLI is the best choice for this scenario.

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Tailwind Traders experiences surges and e-commerce traffic that coincide with national holidays and weekends. In the company's first few years, managers of critical systems had to convine at the office of the director of cloud operations during these important periods.

However, now the Tailwind Traders has successfully operationalized most critical systems, the director wants to relax this requirement and allow employees to spin these dates with their families. Is there a product that can help support this scenario?

* The first question you need to ask in this scenario is, does Tailwind Traders need to remotely monitor and administer services? Yes, it does. But the real question is how? A phone or tablet solution could help key employees keep an eye on the health of the cloud environment when they're out of the office. The Azure mobile app is likely a good compromise. Because it lets employees be away from work and still perform essential one of management and administrative tasks. We can skip the rest of the decision criteria in this unique scenario.

The Azure mobile app is the right choice

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Tailwind Traders want to operationalize their cloud deployments. The company needs a repeatable, reliable way to scale its operations during peak sales periods.

* **Can create resources in parallel**, because you'll be choosing a process for scaling your production environment, you need to ensure that your chosen service is: efficient and can potentially create many resources in parallel.
* **Creates all dependencies in the correct order,**
* **Can be used confidently**, can be used without worrying that it failed in the middle of provisioning the necessary infrastructure.

Let's run through the decision criteria one more time.

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 the deployment of an entire infrastructure as needed.
2. Second, does Tailwind traders need a repeatable and reliable way to deploy its entire infrastructure? Yes, this is exactly what the company needs. Our decision criteria lead us to choose Azure Resource Manager templates for this scenario.
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. In some instances, you still might need imperative code for configuration or cleanup tasks. In these cases, you can trigger the execution of scripts by using either Azure PowerShell or the Azure CLI to perform these tasks. In this scenario, to scale production environment, ARM templates are the correct choice.

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1. ARM Templates are useful for repeatable and reliable deployments of an entire infrastructure.
2. The Azure mobile app running on a phone or tablet could help key employees keep an eye on the health of the cloud environment. The Azure mobile app is a good compromise in this scenario, it allows employees the freedom to be away from the office while still being able to perform one-off management and administrative tasks.
3. Azure PowerShell is available for Windows, Linux, and Mac, and can be accessed in a web browser via the Cloud Shell.
4. The Azure CLI (Command Line Interface) is an executable program that allows developers, DevOps, and IT professionals execute commands using bash.
5. Given the requirement to view data visually and create custom reports the Azure portal is the best choice. You can quickly find answers to questions using a range of reporting options.

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1. Azure Advisor evaluates your Azure resources and makes recommendations to help you improve reliability, security, and performance, achieve operational excellence, and reduce costs
2. The Azure mobile app running on a phone or tablet could help key employees keep an eye on the health of the cloud environment. The Azure mobile app is a good compromise in this scenario, it allows employees the freedom to be away from the office while still being able to perform one-off management and administrative tasks.
3. Azure CLI is more beneficial to those with a Linux administration and scripting background who wish to perform one-off management or administrative actions.

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Our goal in this module was to help Tailwind traders choose the right Cloud management tools from Microsoft for its various technical needs. We identified a variety of product options and their capabilities, including the Azure portal, the Azure mobile app, Azure PowerShell, the Azure CLI, and Azure Resource Manager templates. We analyzed decision criteria for choosing one option over another in specific scenarios. We then applied those decision criteria to three different Tailwind traders initiatives, helping the company find the best service option for each scenario. Without a full suite of management tools, the company would be severely limited in how it interacts with Azure. Fortunately, Azure provides a powerful mix of visual management tools, imperative scripting tools, and declarative infrastructure as code tools.