With Azure, you have the freedom to manage and customize your environment – whether that’s setting your own maintenance windows, or ensuring a holistic hybrid view across your datacenter.

Azure offers a combination of granular controls and a high-level of visibility through powerful native analytics. This helps you to:

- Configure and maintain your virtual machines at scale using robust management tools
- Monitor the health and performance of applications, infrastructure, and network
- Troubleshoot issues as they arise with live telemetry
- Optimize resource utilization and manage costs in Azure

**VIRTUAL MACHINES**

Once you’ve created and provisioned Virtual Machines (VMs) in Azure, you can get an operational view of a specific VM from the Azure Portal with information derived directly from the running VM. From here, you can also perform management operations against your VMs. For example, you can take inventory of everything that’s running on the VM from software and files, to Windows Registry and Windows Services.

In addition, you can check inventory across all of your VMs by selecting “Manage Multiple Computers”. This experience is consistent for Linux VMs as well.
**CHANGE AND UPDATE MANAGEMENT**

Most operational issues are caused by changes in the Virtual Machine ecosystem. From within your VM, you can pinpoint operational issues by identifying configuration changes from files to registry keys.

Through Change Tracking, you can investigate what changed in a specific timeframe and the nature of the change. As before, you can track changes across all of your VMs with the Manage Multiple Computers view.

Update Management in Azure allows you to keep current with recommended updates and quickly apply them. For example, you can view and track all missing updates for Linux and Windows and schedule them accordingly. In addition, you can select which updates you want to deploy, such as critical updates, and choose your maintenance window.

Once you gain more operational insights, there's a number of things you can do. By leveraging Azure Backup and building additional redundancy into your environment, you can create a backup of your VMs at specified time intervals. There may be other post-deployment configuration steps to perform. For example, to configure a VM for a specific task, one of the most efficient ways to achieve this within the Azure Portal is via Cloud Shell. Cloud Shell supports two of the most popular scripting languages: Bash and PowerShell. With this feature, you are then able to bring in your existing scripts and run them natively on your Azure resources. In addition, it persists what you’ve stored for Cloud Shell, even as you move between computers. Lastly, it is efficient for remote management because you have the additional option of executing Azure Cloud Shell remotely on your mobile device if you are away from your PC.

Alternatively, Azure automation can be leveraged to run tasks on a schedule or to sequence multiple tasks. You can create your own, or choose from the gallery of existing operational tasks and execute them based on your triggers from commands entered into the Azure Portal. These can be based on graphical runbooks or scripts. Within the Azure Portal, you are able to monitor your resources across applications in your subscription in order to view their health and performance in real-time.

**MONITORING YOUR VMS**

You can configure your own custom operational dashboards within the Azure Portal and pin reporting tiles across your Azure resources that are important to you. Additionally, Azure Monitor allows you to check Azure service resources, monitor change activity, and query for additional resources, such as the health of hosting services in your region. Azure Monitor comprises a highly scalable and reliable telemetry pipeline that collects metrics, logs, health, and service events from your Azure Services.

**TROUBLESHOOTING**

Azure Log Analytics creates timelines of all activity occurring in your environment. This is critical for troubleshooting issues and maintaining an accurate audit trail for compliance. You can query these logs, get insights across your workloads and systems to ensure availability, and meet desired performance levels.

Selecting the Advanced Log Analytics capability, with language similar to SQL, enables you to do more sophisticated querying. All of these alerts and outputs can also be integrated with your preferred IT service management solutions and existing processes. Azure’s core capabilities are great for managing, monitoring, and troubleshooting. These core capabilities also give you options to help optimize resource consumption and configure your App environments within Azure.

**OPTIMIZATION**

Azure Advisor analyzes the usage patterns of your resources, your configuration of your resources, and then offers personalized recommendations to help you avoid potential issues. For example, Azure Advisor can help ensure business continuity of your mission critical applications by detecting deployments containing single points of failure, identify resources that aren’t configured to meet SLAs, and suggest high availability recommendations. Azure Advisor can also help to manage your Azure resources. With Azure Advisor, you can view underutilized virtual machines, the potential cost savings for each VM, and draw conclusions to shut down or resize if needed.
To manage costs across all of your Azure subscriptions, Azure Cost Management can track VM sizing, corresponding resources, and can give recommendations to optimize costs for free.

Lastly, as additional resources are created, Azure Policy allows you to enforce specific policies for enabling resources. Azure Policy is able to set up “initiatives” which are comprised of multiple policies that you can enforce and track. For example, this is efficient in requiring minimum OS versions and security controls, or policy-scoping VM disk and CPU attributes. You can define your own policy or customize policies based on built-in policy definitions. Also, in the Compliance blade, you can view resources that are compliant with the initiatives and policies you defined.

All of this ensures that your resources meet utilization, cost, compliance, and other stated needs.

Managing your VMs and Resources

**Demo Topics**

**MANAGING VIRTUAL MACHINES**

VM’s are a logical starting point to consider operational management since on-premise infrastructure has the same building blocks. Azure offers multiple VM management capabilities like views of all Virtual Machines you have access to filterable by name, subscription, resource group, type and location. You can also apply grouping to the overall view, add tags to groups of VMs in one action and see individualized information for each VM whether Windows or Linux.

**CHANGE AND UPDATE MANAGEMENT**

By enabling Change Tracking, you can track changes to files and Windows registry keys on your virtual machines. Identifying configuration changes can help you pinpoint operational issues. The Update Management solution in OMS allows you to manage operating system security updates for your Windows and Linux computers deployed in Azure, on-premises environments, or other cloud providers. You can quickly assess the status of available updates on all agent computers and manage the process of installing required updates for servers.

**AUTOMATION**

Azure Automation provides complete control during deployment, operations, and decommissioning of workloads and resources. As seen with the Update, Change Tracking and Inventory features, Azure Automation delivers a cloud-based automation and configuration service that provides consistent management across your Azure and non-Azure environments. Along with inventory, change management and update management it supports process automation in the form of desired state configurations and runbooks.

**POST-DEPLOYMENT MANAGEMENT**

Azure Backup is built into the platform so you don’t need to license and configure an additional service. Backups live in what is called a Recovery Services vault which contains the status, policies and configuration for backups within that vault. Like all Azure resources, you can control access to vaults on a per-user or group basis. Another component is shell access to your resources. While running Powershell locally is a common method of accessing resources, Microsoft also provide an interactive, browser-based Cloud Shell. It gives you the flexibility of choosing the shell experience that best suits the way you work. Azure Monitor provides base-level infrastructure metrics and logs for most services in Microsoft Azure. Along with all these management tools, Azure provides various services such as Azure Advisor, Cost Management, and Azure Policy to assist in managing resource consumption.
ADDITIONAL RESOURCES

Azure has built-in capabilities to efficiently manage your virtual machines and resources. Take advantage of additional learning experiences and tools with these useful resources:

HANDS-ON LABS

Deploying VMs in an ARM Template

VM Disk Encryption from build & encrypting existing VM Disks

AZURE LEARNING PATHS

Azure Administrator

MICROSOFT MECHANICS

Virtual machine migration to Azure: Step-by-step guide for migrating from VMware to Azure

End-to-end updates for securing and managing your virtual machines in Azure