**Azure Portal**

* **Web-based, graphical interface for managing all Azure resources.**
* **Supports resource creation, configuration, monitoring, and deletion.**
* **Provides dashboards, wizards, and a unified hub for documentation and training.**
* **Allows personalization (custom dashboards, favorites).**
* **Mobile app available for on-the-go management.**
* **Integrates with Cloud Shell for command-line access.**
* **Ideal for one-off tasks, initial setup, and visual monitoring.**
* **Role-Based Access Control (RBAC) and activity logs are accessible for security and auditing.**
* **Resource Graph Explorer enables advanced querying of resources.**

**2. Azure Resource Manager (ARM) Templates**

* **JSON-based files that define infrastructure and configuration for Azure resources.**
* **Use declarative syntax: specify *what* to deploy, not *how*.**
* **Enable infrastructure as code (IaC), supporting version control and repeatable deployments.**
* **Idempotent: deploying the same template multiple times yields the same result.**
* **Support parameters, variables, functions, outputs, and modularization.**
* **Allow complex deployments (multiple resources, dependencies, conditions, loops).**
* **Validation before deployment to catch errors early.**
* **Can be integrated with CI/CD pipelines for automated deployments.**
* **Best practices: modularize templates, use parameters for flexibility, and store templates in source control.**

**3. Azure Policy**

* **Governance tool to enforce organizational standards and assess compliance at scale.**
* **Uses policy definitions (JSON) to describe business rules (e.g., allowed regions, required tags).**
* **Initiatives (policy sets) group multiple policies for easier management.**
* **Assign policies at management group, subscription, resource group, or resource level.**
* **Effects include Audit, Deny, Append, Modify, and DeployIfNotExists.**
* **Compliance dashboard provides aggregated and drill-down views.**
* **Supports automatic and bulk remediation of non-compliant resources.**
* **Extends to on-premises and multi-cloud via Azure Arc.**
* **Best practices: use parameters for flexibility, keep policies simple, document ownership, and regularly review compliance.**

**4. Azure Backup**

* **Cloud-native backup solution for Azure and on-premises workloads.**
* **Protects VMs, databases, files, and more.**
* **Recovery Services vault and Backup vault are core components.**
* **Supports application-consistent, crash-consistent, and log backups.**
* **Granular restore options: file-level, VM-level, database-level.**
* **Retention policies for short-term and long-term backups.**
* **Geo-redundant storage for disaster recovery.**
* **Automated backup policies and built-in Azure Policies for backup governance.**
* **Centralized monitoring via Backup Center.**
* **Automation via PowerShell, CLI, REST API, and integration with Logic Apps.**
* **Security features: encryption at rest, soft delete, multi-user authorization for critical operations.**

**5. Bicep Templates**

* **Domain-specific language (DSL) for Azure resource deployment.**
* **Simpler, more readable syntax than ARM JSON templates.**
* **Supports modularization, loops, conditions, and automatic dependency detection.**
* **Compiles to ARM templates for deployment (full compatibility).**
* **IntelliSense and validation in Visual Studio Code.**
* **Easier to maintain and scale for large environments.**
* **Recommended for new infrastructure-as-code projects on Azure.**

**6. Azure Cloud Shell**

* **Browser-based, interactive shell for managing Azure resources.**
* **Supports Bash and PowerShell environments.**
* **Pre-installed tools: Azure CLI, Azure PowerShell, kubectl, Terraform, Ansible, Git, editors (Vim, Nano, Monaco), and more.**
* **Automatic authentication with your Azure account.**
* **Persistent storage via Azure Files share (mounted as clouddrive).**
* **Accessible from: Azure Portal, shell.azure.com, VS Code extension, and Azure mobile app.**
* **Session-based (times out after 20 minutes of inactivity).**
* **Integrated Monaco text editor for editing scripts directly in the shell.**
* **Use cases: quick scripting, automation, troubleshooting, and resource management from any device.**

**7. Azure CLI**

* **Cross-platform command-line tool for managing Azure resources.**
* **Written in Python, available on Windows, macOS, and Linux.**
* **Commands are grouped by service (e.g., az vm, az storage).**
* **Supports interactive and scripting modes.**
* **Ideal for automation, DevOps, and repeatable tasks.**
* **Can be used in Cloud Shell or installed locally.**
* **Tab completion, help system, and output formatting (JSON, table, TSV).**
* **Best for users familiar with Bash or other CLI tools.**
* **Integrates with CI/CD pipelines and supports REST API calls.**

**8. Azure PowerShell**

* **PowerShell module (Az) for managing Azure resources.**
* **Available on Windows, macOS, and Linux (PowerShell Core).**
* **Cmdlets follow verb-noun convention (e.g., Get-AzVM, New-AzResourceGroup).**
* **Supports both interactive and scripting use.**
* **Ideal for Windows administrators and complex automation.**
* **Can be used in Cloud Shell or installed locally.**
* **Supports advanced scripting, error handling, and integration with other PowerShell modules.**
* **Best for users with PowerShell experience or needing deep automation.**

**9. Storage Tools**

**Azure Storage Explorer**

* **Free, cross-platform desktop application for managing Azure storage resources.**
* **Supports Azure Blob Storage, File Shares, Tables, Queues, Data Lake Storage, and managed disks.**
* **Upload, download, view, edit, and manage data across multiple subscriptions and accounts.**
* **Configure permissions, access controls, and storage tiers.**
* **Preview data (JSON, images, PDFs) without downloading.**
* **Works offline with local emulators (e.g., Azurite).**
* **Extensible with plugins (e.g., Data Factory, App Configuration).**
* **Secure access via Microsoft Entra ID, RBAC, and ACLs.**
* **Accessibility features: screen reader support, high contrast themes, hotkeys.**

**Data Box**

* **Physical device for transferring large volumes (terabytes to petabytes) of data to/from Azure.**
* **Order via Azure Portal, receive device, copy data, and ship back to Microsoft.**
* **Supports both import and export scenarios.**
* **Multiple models: Data Box, Data Box Disk, Data Box Heavy.**
* **Secure, encrypted transfer; data is wiped after upload.**
* **Ideal for initial migrations, disaster recovery, or limited connectivity scenarios.**

**Import/Export Service**

* **Service for transferring data using hard drives (customer-supplied or Azure-supplied).**
* **Supports Azure Blob and File storage.**
* **Create import/export jobs in Azure Portal.**
* **Track status and manage jobs through the portal.**
* **Useful for bulk data movement when network transfer is impractical.**

**AzCopy**

* **Command-line utility for high-performance data transfer to/from Azure Storage.**
* **Supports parallel, resumable transfers.**
* **Works with blobs, files, and tables.**
* **Ideal for automation and scripting.**

**10. Network Tools**

**Network Watcher**

* **Suite of tools for monitoring, diagnosing, and visualizing Azure network resources.**
* **Topology viewer: visualize network resources and relationships.**
* **Connection monitor: end-to-end monitoring between Azure and hybrid endpoints.**
* **Packet capture: capture and analyze network traffic for troubleshooting.**
* **IP flow verify: check if traffic is allowed/denied by NSG rules.**
* **NSG diagnostics: analyze security rules and troubleshoot filtering issues.**
* **Next hop: determine routing paths for packets.**
* **Effective security rules: view all security rules applied to a network interface.**
* **VPN troubleshoot: diagnose VPN connectivity issues.**
* **Integrated with Azure Monitor for alerting and logging.**
* **No additional cost for enabling; pay for diagnostics and logs as used.**

**11. Virtual Machine Tools**

**Azure Continuity Center**

* **Ensures business continuity and disaster recovery for Azure VMs.**
* **Manages backup, replication, and failover.**
* **Integrated with Azure Site Recovery for automated failover and failback.**

**Bastion**

* **Provides secure, seamless RDP and SSH connectivity to Azure VMs directly from the Azure portal.**
* **No public IP required on VMs, reducing attack surface.**
* **Session is browser-based and encrypted.**
* **Supports file transfer and session recording.**

**RDP (Remote Desktop Protocol)**

* **Protocol for remote graphical access to Windows VMs.**
* **Requires network connectivity and permissions.**
* **Can be secured with Just-In-Time (JIT) access and NSG rules.**

**SSH (Secure Shell)**

* **Protocol for secure command-line access to Linux VMs.**
* **Supports key-based and password authentication.**
* **Can be used with Bastion, Cloud Shell, or direct network access.**

**12. App Services Tools**

**Application Insights**

* **Application Performance Management (APM) service for monitoring live applications.**
* **Automatic detection of anomalies and failures.**
* **Distributed tracing for microservices and serverless architectures.**
* **Powerful analytics and dashboards for usage, performance, and diagnostics.**
* **Custom telemetry and alerting.**
* **Integrates with Azure Monitor and Log Analytics.**