Migrate to the cloud and track your progress with Azure Migrate
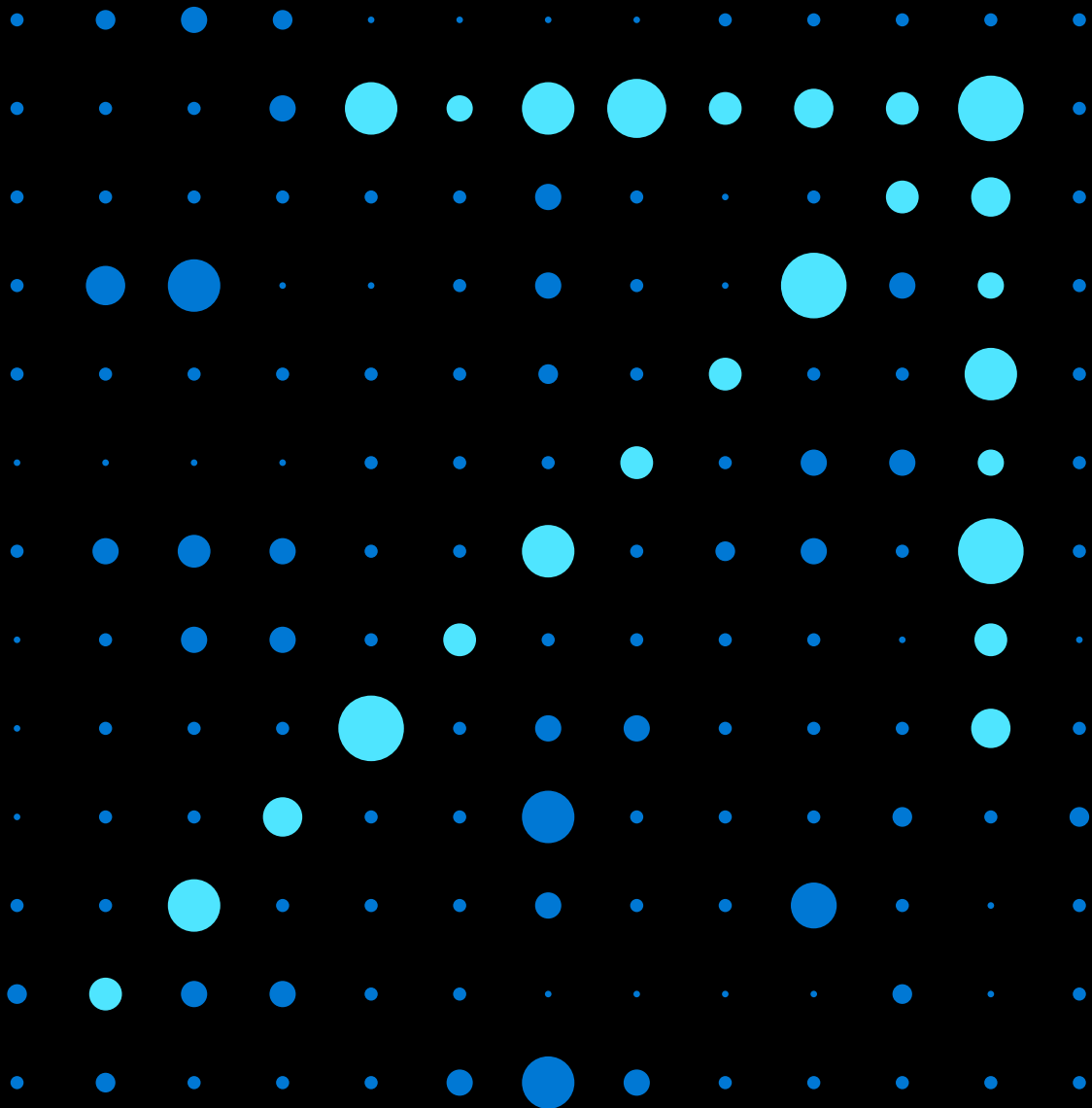
Azure Migrate

As public cloud computing has matured, more organizations are migrating their existing on-premises data and applications to the cloud. Reasons to migrate include the ability to achieve improved governance, security and cost efficiencies. In the past, migration required a sense of adventure and a pioneering spirit. The process was daunting, and complexity increased dramatically without first-party tools and a central location to control migration steps. That's why Microsoft introduced Azure Migrate. The service represents a better approach to migration.

This guide helps you understand the capabilities of Azure Migrate—the one-stop migration service from the company that knows Azure best. We'll help you get answers to these questions:

- What resources and tools does Microsoft offer to support my migration?

- How can one service work for workloads that are so different?

- How can I remove some of the complexity from the migration process?

Azure Migrate highlights

1st party service — built by Microsoft.

16 migration tools brought together in a single service.

35k servers can be discovered and assessed at once.

55 global Azure regions to choose from.

A better approach to migration

Migration to the cloud has become a business priority. It is no longer a question of "if" or "when," the question today has become "how?" Organizations are digitally transforming themselves to drive business value and enhance customer experiences. Companies are moving workloads to the cloud for cost savings and to take advantage of cloud innovations. Many are creating new applications in the cloud. Microsoft developed Azure Migrate to help remove cost and complexity from the migration process for common customers scenarios:

- Windows and Linux servers

- SQL and non-SQL databases

- Web apps

- Virtual desktop infrastructure

- Data

Azure Migrate provides a central hub of tools to start, run, track, and analyze your migration journey to Azure. Azure Migrate is a free Microsoft service, with tools for each scenario available without any additional licensing costs. The Azure Migrate hub integrates Azure services and partner solutions to maximize your options and inform your decisions.

Using the hub, you can keep all your migration data in one place for a comprehensive view across workloads and tools.

Why choose Azure?

Organizations often discuss cloud adoption in the context of digital transformations. Whatever your motivating forces for using cloud services, Microsoft Azure capabilities are built to help you realize your goals:

Be future-ready. Continuous innovation from Microsoft supports your development today, and your product visions for tomorrow.

Build on your terms. Benefit from the Microsoft commitment to open source, and support for all languages and frameworks.

Operate hybrid seamlessly. Integrate and manage your environments with services designed for hybrid cloud. Use familiar tools and skills on-premises, in the cloud, and at the edge.

Trust your cloud. Depend on security built into every stage from the gound up, backed by a team of experts, and proactive compliance trusted by enterprises, governments, and startups.

# Use Azure Migrate to build and execute your migration plan

Azure Migrate offers a unified migration platform to migrate on-premises servers, applications, and data. It covers multiple scenarios, offers diverse capabilities, and provides centralized visibility. You get one place to examine your options across various workloads, from services options to Azure destinations.

| Scenario	Assessment tools	Migration tools	Azure destinations
Windows and Linux servers (includes VMware and Hyper-V virtual machines, VMs running on other clouds, and physical servers)	Azure Migrate: Server Assessment Movere **Partner tools:** Cloudamize Corent Technology Device 42 Flexera Turbonomic UnifyCloud	Azure Migrate: Server Migration **Partner tools:** Carbonite Corent Technology RackWare RiverMeadow Zerto	Azure Virtual Machines
SQL and non-SQL databases	Azure Migrate: Database Assessment **Partner tools:** UnifyCloud: CloudPilot	Azure Migrate: Database Migration Service	Azure SQL DB Azure SQL Managed Instance
Web apps (.NET and PHP apps)	Azure Migrate: Web App Assessment	Azure Migrate: Web App Migration	Azure App Service
Virtual desktop infrastructure	**Partner tools:** Lakeside: SysTrack	Azure Migrate: Server Migration	Azure Virtual Desktop
Data		Azure Data Box	Azure Storage

Review migration activity in one place

Ensure more successful migrations by using Azure Migrate to track your efforts from start to finish. Starting with assessment details, the service delivers insights into your environment and dependencies. It continues tracking throughout the migration process—adding information from all tools in use. Simply access any tool from within Azure Migrate to keep all migration project details in one place.

- Visualize progress with a dashboard across discovery, assessment, and migration phases.

- Centralize data and insights for specific migration projects.

- Create migration projects for different business areas.

- Create and store multiple assessments for server groups.
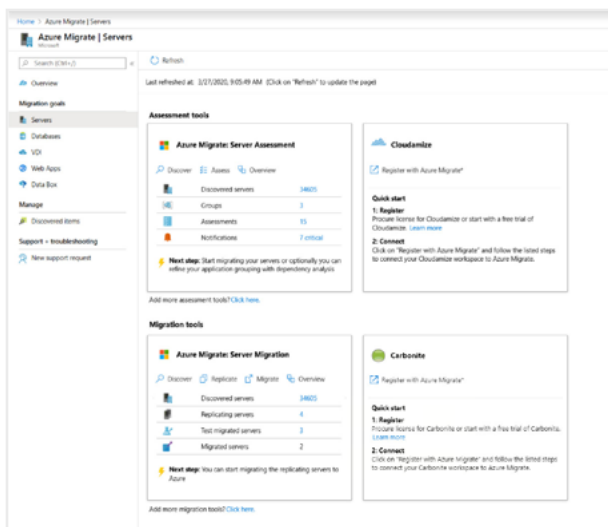
Track your progress in the Azure Migrate hub.
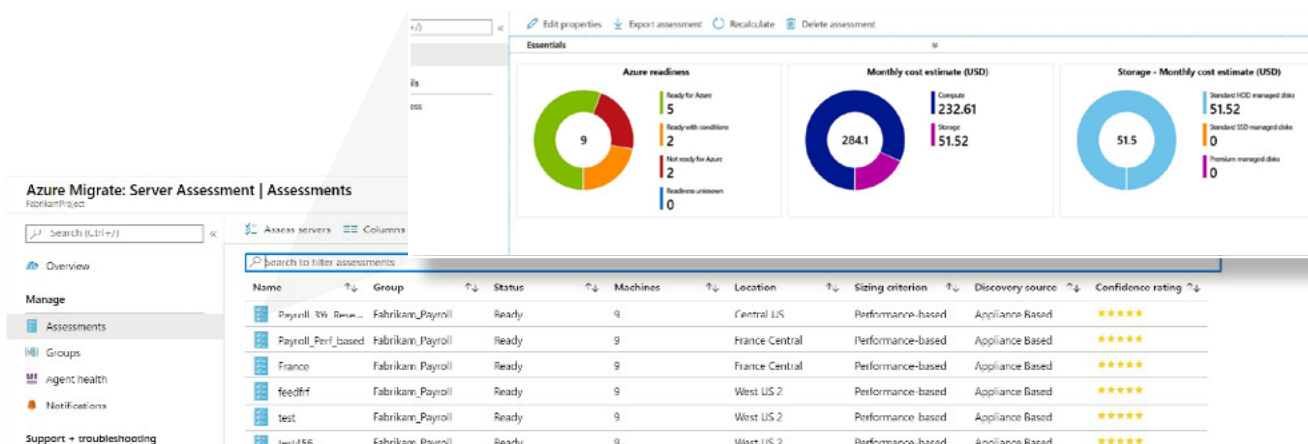
Identify Azure readiness and estimated costs for assessed servers.

How Azure Migrate fits into your migration journey

Migration capabilities have improved dramatically in recent years. Not that long ago, disconnected tools in different places left organizations with bad migration headaches. Today, you can walk through all the steps of a migration using Azure Migrate in the Azure portal, with a scenario-based guided experience to help you select the right tools for your needs at each step. Azure Migrate focuses on simplifying three steps in the cloud migration process: Discover, Assess, and Migrate. These three steps fit within a broader, proven cloud adoption framework that starts with Strategy and Plan and incorporates Manage and Govern. (See "Your migration journey" section on this page).

Your migration journey

While each organization will have its own journey to adopt the cloud, there are six main stages that hold true for most organizations: strategy, plan, ready, adopt, govern, and manage. To learn more, review proven guidance available in the Microsoft Cloud Adoption Framework for Azure.

Here's a look at the entire process and where the Azure Migrate service fits.

Strategy: Define business justification and expected outcomes.

Plan: Align cloud adoption plan to business outcomes.

Ready: Prepare the cloud environment for planned changes.

Adopt: Implement the desired changes across IT and business processes.

Discover, Assess, and Migrate with Azure Migrate as part of this stage.

Manage: Implement operational baselines and best practices.

Govern: Benchmark and implement governance best practices.

Discover and Assess

Azure Migrate offers a hub of tools that help you plan your migration. Choose agent-based or agentless methods to discover machines and applications in your environment and understand how they interact with each other. Choose from Microsoft or partner solutions based on your needs.

Once you have gained a physical count of your environment, review details about your workloads that can help you plan. For servers, for example, review data about Azure readiness, cost estimation, performance-based rightsizing, and app dependency modeling.

Migrate

After you assess your workloads, you can easily accomplish small or large-scale migrations and track progress. Migrate Windows and Linux operating systems, SQL databases, web apps, virtual desktop infrastructure (VDI), and massive amounts of data from on-premises or other clouds like Amazon Web Services (AWS) or Google Cloud Platform (GCP). Once the migration is complete, you can review the migration data collected to verify that all identified workloads made it into Azure and that they are operational.

A comprehensive view of your workloads helps reduce the complexity of migrating multiple types of workloads simultaneously. When you use multiple tools with Azure Migrate, it brings back data that would otherwise be isolated from other assessment and migration tools.

Discover and assess your environment with Azure Migrate

The first major step in any migration is to determine exactly what you have in your compute environment. An assessment will help you determine whether it makes sense to migrate to Azure and which application or system dependencies to consider prior to your decision. Azure Migrate offers multiple tools to help you discover and assess a wide range of technologies and platforms.

Based on your needs, you can take advantage of native capabilities across all scenarios, except for VDI assessment, which uses a partner tool. In the next few pages, you will learn how the various processes works. All native capabilities are available with your Azure subscription, with no additional licensing required. As detailed in the table on page 4, you can choose partner options for several scenarios, as well. When you access any partner tool from within Azure Migrate, you can collect the assessment or migration data in Azure Migrate for centralized visibility.

Here is a look at capabilities available to you in the native Azure Migrate: Server Assessment tool.

Server. To optimize the assessment process and discover servers in your compute estate, choose to deploy the Azure Migrate Appliance to the on-premises environment or use CMDB information to import into Azure Migrate via CSV. This enables you to identify the servers and workloads you need to assess, including:

- VMware VMs, Hyper-V VMs, physical servers

- XEN and KVM systems, with first-party Movere or partner tools. Movere is now part of Microsoft

- Cloud-to-cloud workloads, with Azure Migrate: Server Assessment and Movere or partner tools

Assessment tools

- Azure Migrate Tools (server, database, data, web app)

- Cloudamize (server)

- Corent Technology (server)

- Device 42 (server)

- Flexera (server)

- Lakeside (VDI)

- Movere (server)

- Turbonomic (server)

- UnifyCloud (server, database)

Use details from discovery to assess essential migration issues

The process of discovery generates a wealth of information you can use to assess the status of workloads you want to migrate. Use Azure Migrate to run a comprehensive assessment and answer critical questions like these:

Is your VM or server ready to run on Azure?

For example, are there configurations that are not suitable for Azure such as an unsupported operating system or disk size? You may see these results: Ready for Azure, Ready with conditions, Not ready for Azure, and Readiness unknown—with reasons given for each rating and recommendations on how to correct. This type of granular information can help you avoid issues with the migration.

What size of Azure VM will you need?

Most organizations want to understand the size of the Azure VM in Azure needed to efficiently run the workload, because sizing helps you predict costs. Azure Migrate takes the guesswork out of calculations and translates CPU, disk, and memory of an on-premises system to an equivalent environment in Azure. The service recommends a specific size of VM and disk type based on performance data. During large scale migrations, this single feature can deliver significant value.

How much will running in Azure cost?

An Azure Migrate Assessment provides the estimated monthly costs for compute and storage for running the servers in Azure.

Can I see my application and system dependencies?

Visibility into app and system dependencies can make or break a migration to the cloud. If you use Server Assessment with [dependency analysis](#), you can effectively identify cross-server dependencies, and optimize strategies for moving interdependent servers to Azure. The identification of dependencies can be done with agents on each virtual machine, or it can be done agentless in VMware environments. When using an agent-based solution, the data is sent to Azure Log Analytics so you can analyze the data in extreme detail to find pesky hidden dependencies that might otherwise escape detection.

Database. Before you can move databases to Azure, Azure Migrate helps you undertake a process similar to server migration. First, as part of the overall assessment you need to discover the databases in your environment. To do this, create a migration project in the Azure Migrate hub, then choose the first-party or partner tool. If you choose the first-party Azure Migrate: Database Assessment tool, you will download and launch Data Migration Assistant, which can discover and assess the following databases:

- SQL Server 2005

- SQL Server 2008

- SQL Server 2008 R2

- SQL Server 2012

- SQL Server 2014

- SQL Server 2016

- SQL Server 2017

The Database Assessment tool connects into your Azure Migrate dashboard to bring back critical decision-making information to support migration planning across the following scenarios:

Migration scenario	How Database Assessment helps
On-premises SQL Server instance(s) migrating to Azure SQL database(s)	Identifies blocking issues and provides detailed guidance to resolve them. • Compatibility issues and recommendations. • Partially supported or unsupported features, recommendations, and alternative approaches available in Azure. Identifies new features in the target SQL Server platform that the database can benefit from after an upgrade. • Performance • Security • Storage

Migration scenario	How Database Assessment helps
On-premises SQL Server Integration Services (SSIS) package(s) migrating to Azure SQL Database or Azure SQL Database managed instance	Identifies blocking issues and provides detailed guidance to resolve them. • Compatibility issues and recommendations. • Partially supported or deprecated features in the source package(s).

Assessed databases

Columns

Subscription: Azure Migrate Demo Subscription   Migrate project: FabrikamProject (FabrikamProject)

Databases

Name	Database size (GB)	Target in Azure	Migration blockers	Breaking changes count	Ready for Azure SQL DB	Ready for Azure SQL VM	Compatibility level
ContosoIT	0.007	Azure SQL Database Manag...	0	1	Yes	Yes	100
ReportServer	0.009	Azure SQL Database Manag...	0	0	Yes	Yes	110
ContosoHR	0.006	Azure SQL Database Manag...	0	0	Yes	Yes	90
ReportServerTempDB	0.005	Azure SQL Database Manag...	0	0	Yes	Yes	110
ContosoPayroll	0.004	Azure SQL Database Manag...	0	0	Yes	Yes	110

Assessment data helps you understand which SQL Server databases are ready for Azure and compatibility with various Azure service options.

 Web application. Azure Migrate helps you assess whether it makes sense to move a web application into Azure. First, create a migration project in the Azure Migrate hub, add the Azure Migrate: Web Application Assessment tool, then download the App Service Migration Assistant and run it in the server hosting the application to discover and document the .NET and PHP apps. The tool scans the public endpoint of your applications to determine which technologies the application uses and delivers a pre-migration readiness check. After you upload the App Service Migration Assistant summary results to Azure Migrate, the system compares your data with other sites and apps that are hosted on the Azure App Service to deliver a unique assessment report you can use to determine the viability of your web app on Azure App Service.

VDI. Azure Migrate helps you find out whether your VDI environments can easily run in Azure Virtual Desktop. Discover, assess, and document VDI resources across platforms, including:

- Microsoft VDI environments.

- Citrix VDI environments

- VMware VDI environments

To start, create a migration project in Azure Migrate hub to access a solution from Lakeside, a Microsoft partner. Download the cloud-connected tool, Lakeside's Azure Virtual Desktop Assessment, powered by Digital Experience Monitoring solution, SysTrack. The tool relies on agent-based technology that you can easily deploy with no impact on the end-user experience. Within 24 hours, you will be able to view a dashboard and customized report to understand IT performance and usage data on your environment, including operating system types and the most commonly used applications. Because not every virtual desktop environment is the same, the tool also delivers recommendations based on your environment's readiness for Azure Virtual Desktop. After you run an assessment in Lakeside, connect to Azure Migrate to bring back the assessment details.

Migrate assets to Azure with Azure Migrate

After you complete the assessment phase and decide what you will be moving to Azure, get ready to start migrating your assets. Your next steps depend on the technology you are migrating and tool options for that environment. As the official Microsoft migration service, Azure Migrate provides a wealth of guidance, tools, reporting, and integrated partner options to assist with even large-scale migrations. Let's look at server migration first.

Server. Use Azure Migrate: Server Migration tool to migrate servers of any hypervisor or cloud. These include on-premises VMware VMs, Hyper-V VMs, physical servers, other virtualized machines, and VMs on clouds other than Azure.

- **VMware VMs.** Azure Migrate enables you to choose between [two approaches](): an agentless approach or one that requires an agent in each VMware virtual machine. Agentless migration may be a little easier because you do not need to install agents on each VM.
 In certain cases, you might need to create multiple projects and use agentless or agent-based with different groups of VMs. Azure Migrate reporting and analysis offers details about the entire migration effort for both options.

- **Hyper-V VMs.** During the assessment step, you used Azure Migrate to discover and register the Hyper-V hosts. The next step is to easily replicate and then migrate the servers into Azure by using the migration tools in the Azure Migrate hub. Use the Azure Migrate: Server Migration tool to install replication software on Hyper-V hosts or cluster nodes to orchestrate and replicate data to Azure Migrate.

- **Physical servers.** Migrate physical servers to Azure from several platforms as if they were individual machines using the Azure Migrate Server Migration tool. This capability opens up entirely new migration scenarios for organizations that want to consolidate or move workloads into Azure.

Migration tools

- Azure Migrate Tools (server, database, web app, data, VDI)

- Carbonite (server)

- Corent Technology (server)

- Rackware (server)

- Rivermeadow (server)

- Zerto (server)
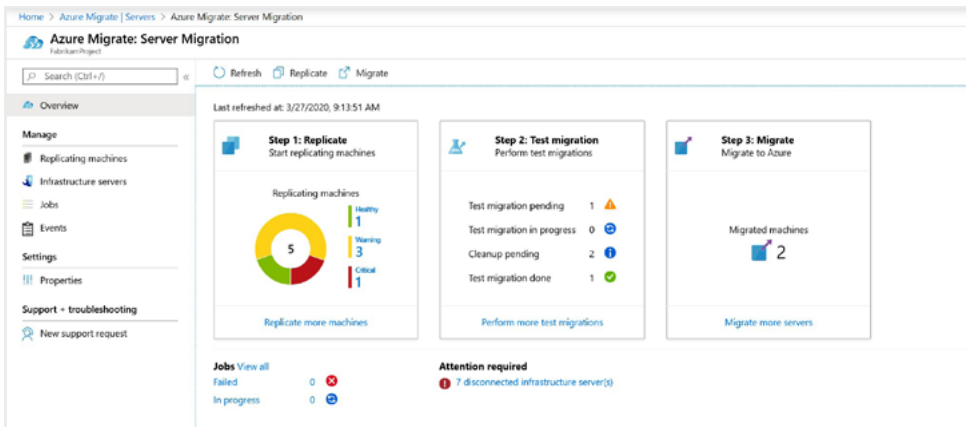
The Azure Migrate user interface walks you through the migration process and confirms your success.

Database. To migrate the databases you assessed using the database assessment tool, add Azure Migrate: Database Migration to your Azure Migrate project and follow instructions to launch the Database Migration Service. The assessment information helps you understand compatibility before you migrate on-premises SQL Server instances to a modern SQL Server solution. Choose the Azure destination based on your need for scalability, uptime guarantees, and how much support you want to assign to Microsoft. For example, SQL Server running on a virtual machine requires more care and feeding than a managed instance. Destination options are:

- Azure SQL Database managed instance

- Azure SQL Database single database

- SQL Server running on an Azure Virtual Machine

After a successful migration, your applications will connect to the target SQL Server databases seamlessly. Your migration workflow brings over the following components:

- Schema of databases

- Data and users

- Server roles

- SQL Server and Windows login

VDI. Once you have used the Lakeside solution to assess your VDI environment, it's time to choose your migration path:

- Migrate from your existing host infrastructure to new Azure Virtual Desktop host infrastructure on Azure and tailor your VDI images to the new environment—this is optimal for shared virtual machines, for example.

- Replicate existing persistent virtual machines to the new infrastructure, which works well for user-dedicated, personal VMs.

In most cases, you won't be bringing your existing standard images as-is from your current VDI environment. The details from the Lakeside assessment will help inform how to compose your desktop images, including approaches for provisioning applications, security components and controls, connecting to services, and matching appropriate desktop and app resources to end users based on their current usage patterns.

If you are moving persistent and dedicated personal virtual machines into Azure, choose the Azure Migrate: Server Migration tool to migrate virtual machines in a similar way to migrating virtual servers.

Web application. Migrate .NET or PHP web apps to Azure App Service using the App Service Migration Assistant tool. After you review the Assessment Report created during the assessment phase, use App Migration Assistant to complete the migration. Log into Azure, configure your Azure options, create a hybrid connection, and then migrate the web app to Azure App Service. Your web application typically is available to access immediately. Sync migration data back into the Azure Migrate: Web App Migration tool to track the progress of your web app migrations.

Large scale data migration. To move massive amounts of data to Azure for inexpensive, long term storage—or as part of a larger migration initiative—use Azure Data Box. The Microsoft-designed data transfer devices enable you to easily move data when you're limited by time, network availability, or costs. You can use common copy tools such as Robocopy, all data is AES-encrypted, and the devices are wiped clean after upload, in accordance with NIST Special Publication 800-88 revision 1.

The Data Box solutions are available via the Azure Migrate hub. Order the physical device based on size needs—Microsoft ships the device, you load your data on it, and ship it back. Alternatively, choose Data Box Gateway, which is simply a download for your virtualized environment. Azure Data Box is available in several sizes:

- Data Box Disk for smaller data migration needs. Azure Data Box Disk is built on an 8 TB SSD with a SATA/USB interface and has 128 bit encryption. Easily customizable for your needs and comes in packs of up to five for a total of 40 TB per package.

- Data Box for larger data loads. Azure Data Box is a ruggedized device with 100-TB capacity that uses standard NAS protocols and common copy tools. It features AES 256-bit encryption for safer transit.

- Data Box Heavy for very large amounts of data transfer. Azure Data Box Heavy is a ruggedized, self-contained storage device with 1-PB storage capacity.

- Data Box Gateway for organizations that want to use an on-premises device that connects into Azure. The Azure Data Box Gateway is a virtual device provisioned in your hypervisor that supports both Hyper-V and VMware systems and is used as an online storage gateway into Azure.

Microsoft continues to demonstrate its commitment to help simplify the once-arduous task of moving workloads and data to the cloud. Significant investments by Microsoft and its partners have resulted in a more comprehensive, integrated, and extensible set of migration tools and technologies—all available from a single Azure Migrate hub location in the Azure portal.

- Discover machines in your environment using agent-based or agentless (appliance or CSV upload) methods.

- Use assessment features including readiness, cost estimation, performance based right-sizing, and app dependency modelling.

- Auto-populate migration projects using assessment data.

- Migrate machines using agent-based or agentless methods with near-zero downtime.

- Get a better view of your situation with end-to-end tracking and insights across a range of telemetry, including from partner tools.

[Get started](#)

Run a free assessment and start your migration project.

Learn more

Azure Migration and Modernization Program

Azure Migrate documentation

Azure Migrate learning path

Azure Migration blogs

Database assessment tool documentation

Database migration tool documentation

Partner tools

▶   Azure Migrate overview

▶   VMware and virtual machine migration

▶   VDI migration

▶   Web app migration

▶   Azure Migrate demos

Microsoft Azure