

Successful Data Migration Whitepaper.



■ Migrate with ease!



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Overview:

Migrating your existing applications and IT assets to the Amazon Web Services (AWS) Cloud presents an opportunity to transform the way your organization does business. It can help you lower costs, become more agile, develop new skills more quickly, and deliver reliable, globally available services to your customers. Our goal is to help you to implement your cloud strategy successfully.

AWS has identified key factors to successful IT transformation through our experience engaging and supporting enterprise customers. We have organized these into a set of best practices for successful cloud migration. Customer scenarios range from migrating small, single-applications, to migrating entire data centers with hundreds of applications. We provide an overview of the AWS migration methodology, which is built on iterative and continuous progress. We discuss the principles that drive our approach, and the essential activities that are necessary for successful enterprise migrations.

Migrating to AWS is an iterative process that evolves as your organization develops new skills, processes, tools, and capabilities. The initial migrations help build experience and momentum that accelerate your later migration efforts. Establishing the right foundation is key to a successful migration. Our migration process balances the business and technical efforts needed to complete a cloud migration. We identify key business drivers for migration and present best strategies for planning and executing a cloud migration.



Why Data Migration is Important?

Data migration is the process of transferring data from a source system to a target system. It is a core task for any data storage professional.

Data migration is important because it is a necessary component to upgrading or consolidating server and storage hardware, or adding data-intensive applications like databases, data warehouses, and data lakes, and large-scale virtualization projects. Data migration may also occur within systems built on HDD or SDD, or between in-house systems and cloud storage.



No matter what industry you work in, there's a high chance that your company will need to transfer large sets of data from one platform to another at some point. Known as data migration, this process can help your company store a larger amount of data at a time, maintain the integrity of said data, and boost productivity.

When it comes to strategizing data migration, you will probably need to hire some external help. Some companies might be tempted to handle it by themselves, but this can lead to decreased efficiency and increased costs down the road. If your company is preparing to migrate large sets of data, it's imperative that you research best practices for successfully completing the process.

Why do you choose AWS over Azure?

Your IT infrastructure is ready to make the big move—from on-premises to the public cloud. Or perhaps you're already in the cloud, but it's time for a change to a new platform provider.

AWS provides the most experience in delivering public cloud services, entering the market first after initially launching in 2002 and then relaunching in 2006. Microsoft announced Azure in 2008 and then formally launched the service in 2010.

So, your next step is to decide which cloud platform provider is best for your IT environment. For many, the choice comes down to the two market leaders—Amazon Web Services (AWS) and Microsoft Azure. Amazon Web Services owns nearly half of the world's public-cloud infrastructure market (47.8%) followed by Microsoft Azure at a distant second, with 15.5%.



AWS continuously invests heavily in its data centers. AWS server capacity is about six times larger than the next 12 competitors combined. AWS also has more availability zones—42 with eight on the way, compared to 34 (and four more on the way) for Azure.

Amazon has had a better relationship with the open-source community, so there are more open-source integrations available in this platform, including Jenkins and GitHub. It's also friendlier to Linux servers. AWS has more cost effective solution and it will reduce your overall Infrastructure cost.

IT pros agree that AWS offers a lot of power, flexibility, customization room with support for many third-party integrations. But there is a learning curve with AWS. If you're a Windows admin, Azure will be easier to use out of the box because it is a Windows platform and doesn't require learning something new.

AWS Cloud Adoption Framework (AWS CAF)

AWS developed the AWS Cloud Adoption Framework (AWS CAF), which helps organizations understand how cloud adoption transforms the way they work.

The following table presents a description of each Perspective and the common roles involved.

Perspective	Description and Common Roles Involved
 BUSINESS	Business support capabilities to optimize business value with cloud adoption. Common Roles: Business Managers; Finance Managers; Budget Owners; Strategy Stakeholders
 PEOPLE	People development, training, communications, and change management. Common Roles: Human Resources; Staffing; People Managers.
 GOVERNANCE	Managing and measuring resulting business outcomes. Common Roles: CIO; Program Managers; Project Managers; Enterprise Architects; Business Analysts; Portfolio Managers.
 PLATFORM	Develop, maintain, and optimize cloud platform solutions and services. Common Roles: CTO; IT Managers; Solution Architects.
 SECURITY	Designs and allows that the workloads deployed or developed in the cloud align to the organization's security control, resiliency, and compliance requirements. Common Roles: CISO; IT Security Managers; IT Security Analysts; Head of Audit and Compliance.
 OPERATIONS	Allows system health and reliability through the move to the cloud, and delivers an agile cloud computing operation. Common Roles: IT Operations Managers; IT Support Managers.

AWS Organizational Change Management (OCM)

The AWS OCM Framework guides you through mobilizing your people, aligning leadership, envisioning the future state of operating in the cloud, engaging your organization beyond the IT environment, enabling capacity, and making all of those changes stick for the long term. You can find additional information on this topic in the Resources section of this paper.

Table 1: Organizational change management to accelerate your cloud transformation

	1. Mobilize Team 2. Align Leaders	3. Envision the Future 4. Engage the Organization	5. Enable Capacity 6. Make It Stick
Tag Lines	This change is critical and will succeed! We are all leaders of this change!	This is the vision, where we are going! This is how we get there together!	This is how we make it happen! Are we where we want to be?
Objectives	<ul style="list-style-type: none"> Confirm sponsorship Secure resources, expertise Form strong coalition of leaders Build momentum 	<ul style="list-style-type: none"> Articulate vision and roadmap for transition to Cloud Mobilize organization, build commitment, create change urgency Establish communication channels to gain and maintain buy-in, support and participation throughout entire transition 	<ul style="list-style-type: none"> Ensure successful transition to Cloud Align IT org structure, roles, processes with AWS Cloud platform Ensure all IT staff/key stakeholders can operate in new environment Ensure Cloud benefits and objectives are achieved
Key Actions	<ul style="list-style-type: none"> Form team to lead change – executive sponsors, stakeholders, line leaders, PMO, change management, communication, training, etc. Establish program charter, roles, milestones Build guiding coalition, mobilize leadership Shape program governance structure Assess and align change leadership roles 	<ul style="list-style-type: none"> Leaders communicate future Cloud vision (via comprehensive messaging plan) Impacted business leaders reinforce new op model (process/tech/org) Identify/assess impacted stakeholders Enlist and mobilize Change Champion Network Drive ongoing communication, feedback – two-way conversations Address “How does this impact me?” Celebrate progress and control issues 	<ul style="list-style-type: none"> Identify change impacts to IT roles, policy, org structure, process, etc. Modify IT roles, org structure, job descriptions and processes (if needed) to support AWS Cloud Align IT staff to new operating model Develop and implement targeted training Setup measurement structures Measure and evaluate outcomes Course correct where needed

Business Drivers

The AWS Cloud provides more than 90 services including everything from compute, storage, and databases, to continuous integration, data analytics and artificial intelligence. Common drivers that apply when migrating to the cloud are:

Operational Costs – Operational costs are the costs of running your infrastructure. They include the unit price of infrastructure, matching supply and demand, investment risk for new applications, markets, and ventures, employing an elastic cost base, and building transparency into the IT operating model.

Workforce Productivity – Workforce productivity is how efficiently you are able to get your services to market. You can quickly provision AWS services, which increases your productivity by letting you focus on the things that make your business different, rather than spending time on the things that don't, like managing data centers. With over 90 services at your disposal, you eliminate the need to build and maintain these independently. We see workforce productivity improvements of 30%-50% following a large migration.

Cost Avoidance – Cost avoidance is setting up an environment that does not create unnecessary costs. Eliminating the need for hardware refresh and maintenance programs is a key contributor to cost avoidance. Customers tell us they are not interested in the cost and effort required to execute a big refresh cycle or data center renewal and are accelerating their move to the cloud as a result.

Operational Resilience – Operational resilience is reducing your organization's risk profile and the cost of risk mitigation. With 16 Regions comprising 42 Availability Zones (AZs) as of June 2017, With AWS, you can deploy your applications in multiple regions around the world, which improves your uptime and reduces your risk-related costs. After migrating to AWS, our customers have seen improvements in application performance, better security, and reduction in high-severity incidents. For example, GE Oil & Gas saw a 98% reduction in P1/P0 incidents with improved application performance.

Business Agility – Business agility is the ability to react quickly to changing market conditions. Migrating to the AWS Cloud helps increase your overall operational agility. You can expand into new markets, take products to market quickly, and acquire assets that offer a competitive advantage. You also have the flexibility to speed up divestiture or acquisition of lines of business. Operational speed, standardization, and flexibility develop when you use DevOps models, automation, monitoring, and auto-recovery or high-availability capabilities.

Migration Strategies

This is where you start to develop a migration strategy. You want to consider where your cloud journey fits into your organization's larger business strategy and find opportunities for alignment of vision. A well-aligned migration strategy, with a supporting business case and a well-thought out migration plan, sets the proper groundwork for cloud adoption success.

One critical aspect of developing your migration strategy is to collect application portfolio data and rationalize it into what we refer to as the **6 R's: Re-host, Re-platform, Re-factor/Re-architect, Re-purchase, Retire, and Retain**. This is a method for categorizing what is in your environment, what the interdependencies are, technical complexity to migrate, and how you'll go about migrating each application or set of applications. Using the "6 R" Framework, outlined below, group your applications into Re-host, Re-platform, Re factor/Re-architect, Re-purchase, Retire and Retain. Using this knowledge, you will outline a migration plan for each of the applications in your portfolio. This plan will be iterated on and mature as you progress through the migration, build confidence, learn new capabilities, and better understand your existing estate.

The complexity of migrating existing applications varies, depending on considerations such as architecture, existing licensing agreements, and business requirements. For example, migrating a virtualized, service-oriented architecture is at the low-complexity end of the spectrum. A monolithic mainframe is at the high-complexity end of the spectrum. Typically, you want to begin with an application on the low-complexity end of the spectrum to allow for a quick win to build team confidence and to provide a learning experience. This will help build momentum.

It is important to choose an application that has some business impact. You want to build momentum with each migration; which is difficult to accomplish if you select an application business owners fail to see value in.



Which Migration Strategy is Right for Me?

Choosing the right migration strategy depends on your business drivers for cloud adoption, as well as time considerations, business and financial constraints, and resource requirements. Re-platform if you are migrating for cost avoidance and to eliminate the need for a hardware refresh. Figure 3 shows that this strategy involves more effort than a Re-host strategy but less than a Re-factor strategy. Re-host the majority of your platform and Re-factor later if your data center contract will end in 12 months and you do not want to renew.



Figure 3: Comparison of cloud migration strategies

Consider a phased approach to migrating applications, prioritizing business functionality in the first phase, rather than attempting to do it all in one step. In the next phase, optimize applications where the AWS Platform can make a notable difference in cost, performance, productivity, or compliance. For example, if you are migrating an application that leverages an Oracle database and your strategy includes replacing Oracle with Aurora PostgreSQL, the best migration approach may be to migrate the application and stabilize it in the migration phase. Then execute the database change effort in a subsequent phase. This approach controls risk during the migration phase and focuses on the migration business case and value proposition.

Which Migration Strategy is Right for Me?

There are common objectives that will improve application performance, resilience, and compliance across the portfolio that should be included in every migration. They should be packaged into the migration process for consistent execution.

Your migration strategy should guide your teams to move quickly and independently. Applying project management best practices that include clear budgets, timelines, and business outcomes supports this goal. Your strategy should address the following questions:

- Is there a time sensitivity to the business case or business driver, for example, a data center shutdown or contract expiration?
- Who will operate your AWS environment and your applications? Do you use an outsourced provider today? What operating model would you like to have long-term?
- What standards are critical to impose on all applications that you migrate?
- What automation requirements will you impose on applications as a starting point for cloud operations, flexibility, and speed?

Will these requirements be imposed on all applications or a defined subset? How will you impose these standards?

The following are examples:

- We will drive the migration timeline to retire specific facilities and use savings to fund the transformation to cloud computing. Time is very important, but we will consider any changes that can be done quickly and safely while creating immediate savings.
- We will insource core engineering functions that have been historically outsourced. We will look at technology platforms that remove operational barriers and allow us to scale this function.
- Business continuity is a critical driver for our migration. We will take the time during the migration to improve our position.

Where application risk and costs are high, we will consider a phased approach: migrate first and optimize in subsequent phases. In these cases, the migration plan must include the second phase.

A case for migration

IT leaders understand the value that AWS brings to their organization, including cost savings, operational resilience, productivity, and speed of delivery. Building a clear and compelling migration business case provides your organization’s leadership with a data-driven rationale to support the initiative.

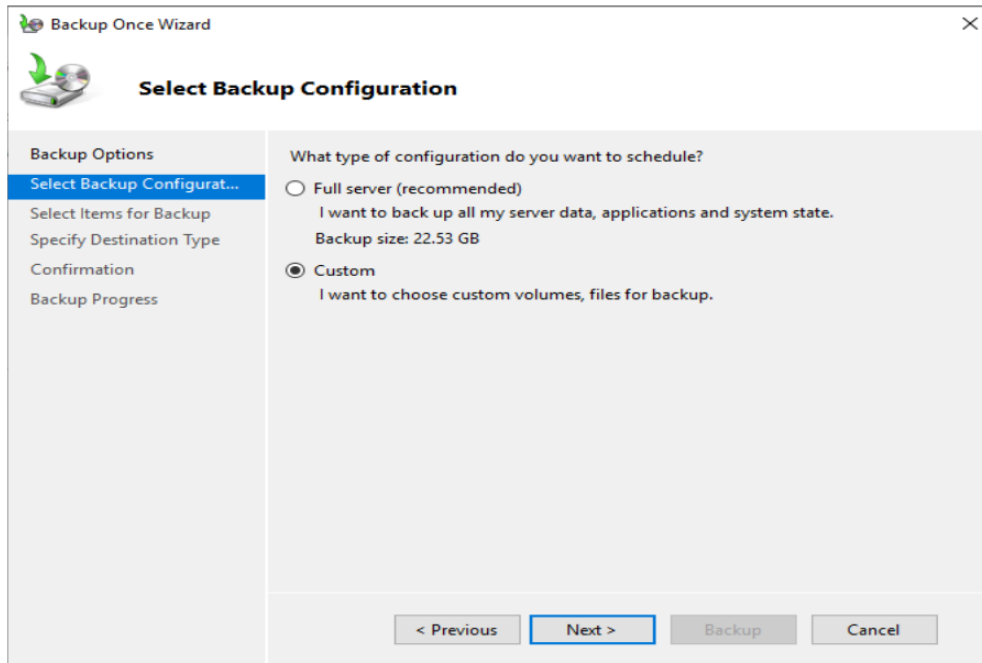


Table 2 : A case for migration

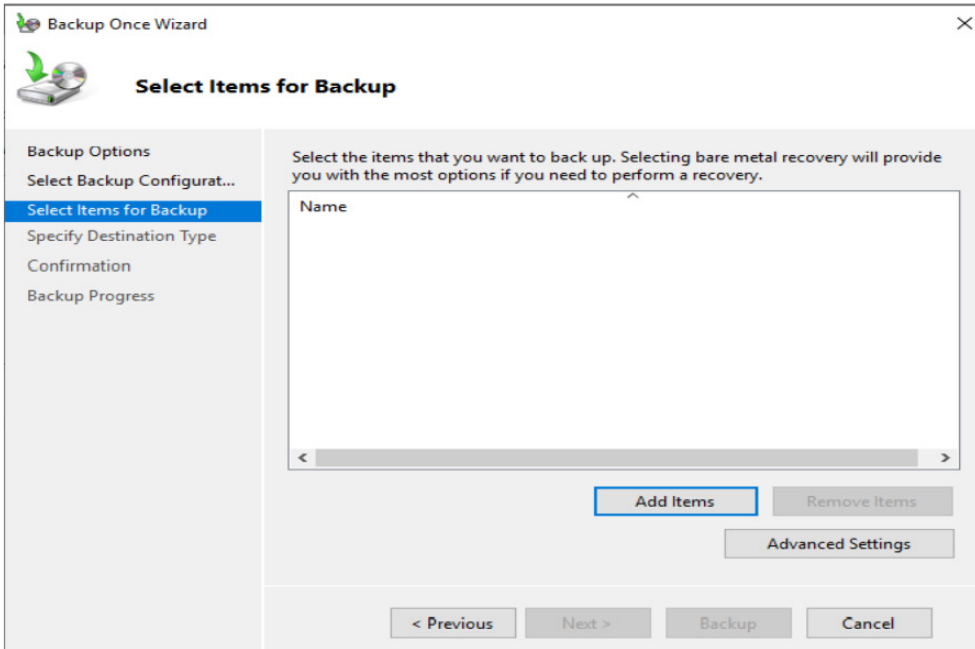
BUSINESS AGILITY	OPERATIONAL RESILIENCE	COST AVOIDANCE	WORKFORCE PRODUCTIVITY	OPERATIONAL COSTS
77% faster to deliver business applications	98% reduction in P1/P0's	52% average TCO savings	15 automated bots developed	35% reduction in compute assets (792)
Rapid experimentation	Improved security posture	80% cloud first adoption	8 cloud migration parties	50 applications decommissioned
Reduced technical debt	15 cloud services created		Shift to self-service culture	\$14M YOY savings
Streamlined M&A activity	Improved performance		DevOps in practice	
\$14.2M Investment + 18 Months + Focus = 300+ Apps Migrated & \$14M YOY Savings				

Backup Once Wizard Select Backup Configuration

Cognatic will help you to Setup and
**Migrate your AD Server for
your business.**

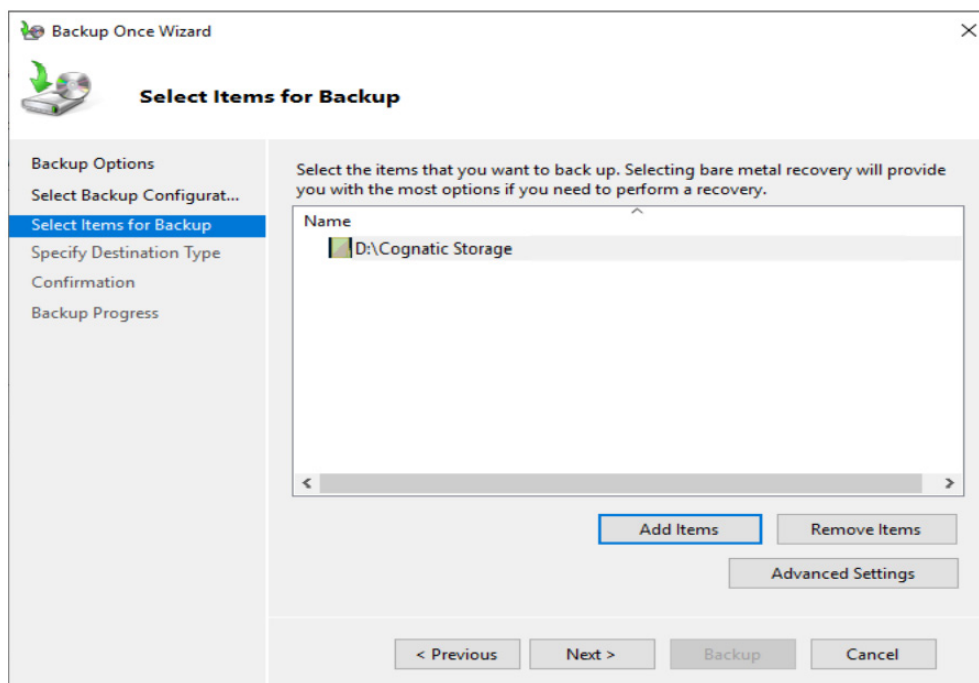
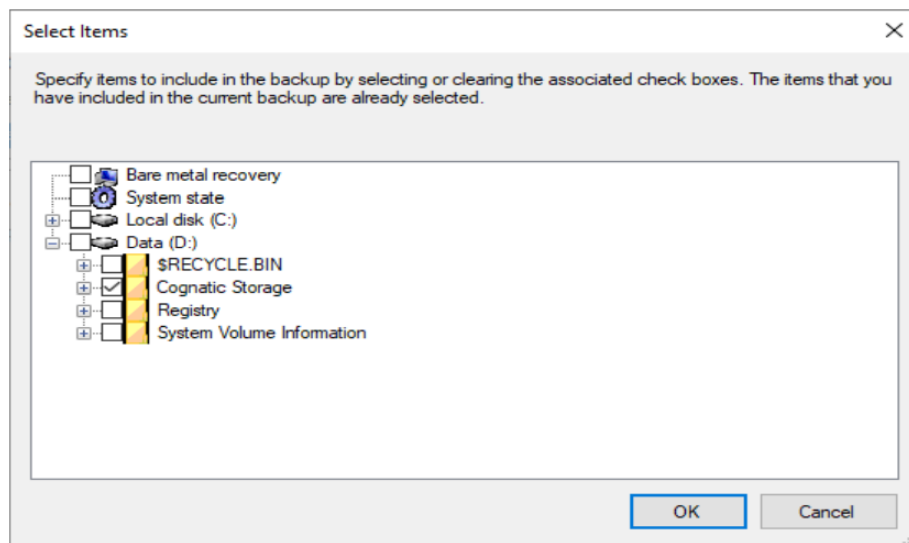


The screenshot shows the 'Backup Once Wizard' window with the title bar 'Backup Once Wizard' and a close button. The main title is 'Select Backup Configuration'. On the left, there is a sidebar with 'Backup Options' and a list of steps: 'Select Backup Configurat...', 'Select Items for Backup', 'Specify Destination Type', 'Confirmation', and 'Backup Progress'. The first step is selected. The main area asks 'What type of configuration do you want to schedule?' with two radio button options: 'Full server (recommended)' (with subtext 'I want to back up all my server data, applications and system state. Backup size: 22.53 GB') and 'Custom' (selected, with subtext 'I want to choose custom volumes, files for backup.'). At the bottom are buttons for '< Previous', 'Next >', 'Backup', and 'Cancel'.

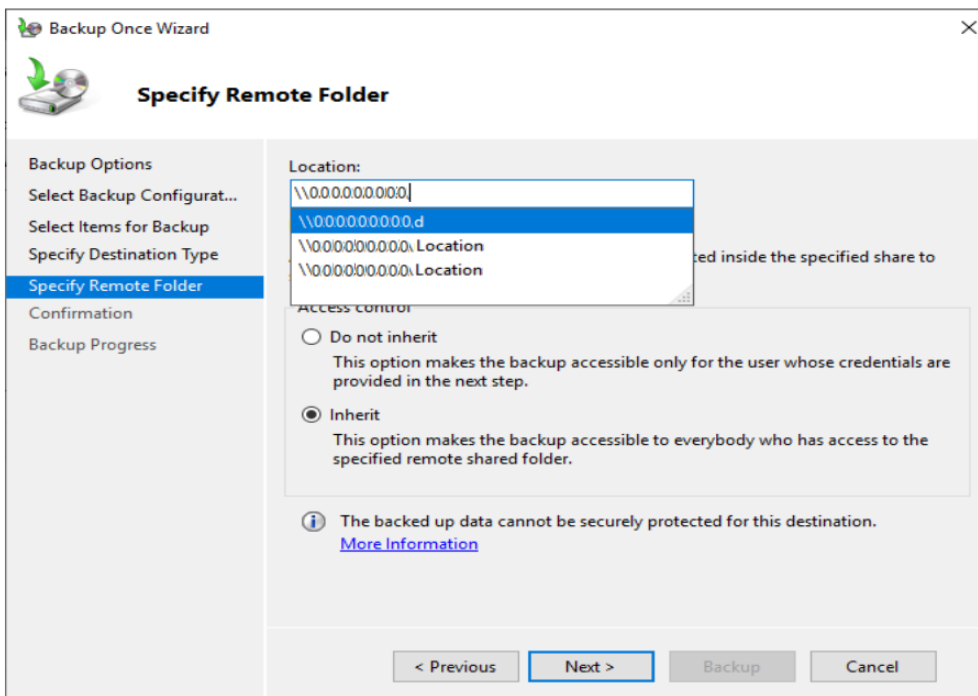
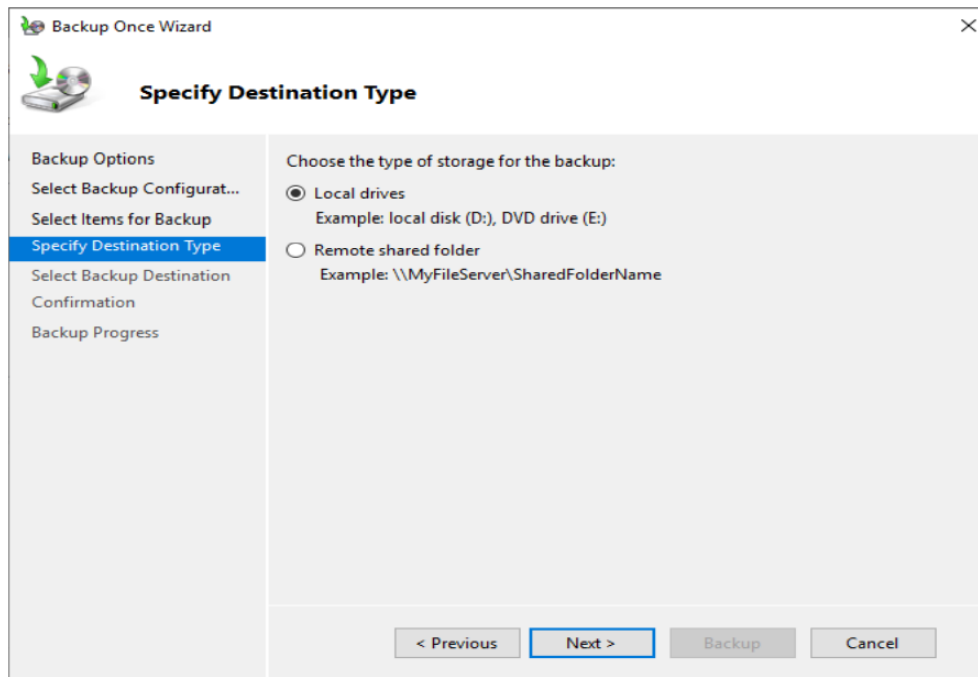


The screenshot shows the 'Backup Once Wizard' window with the title bar 'Backup Once Wizard' and a close button. The main title is 'Select Items for Backup'. On the left, the sidebar shows the same list of steps, but 'Select Items for Backup' is now selected. The main area contains the text 'Select the items that you want to back up. Selecting bare metal recovery will provide you with the most options if you need to perform a recovery.' Below this is a list box with the header 'Name' and an empty list. At the bottom right of the list box are buttons for 'Add Items' (highlighted), 'Remove Items', and 'Advanced Settings'. At the very bottom are buttons for '< Previous', 'Next >', 'Backup', and 'Cancel'.

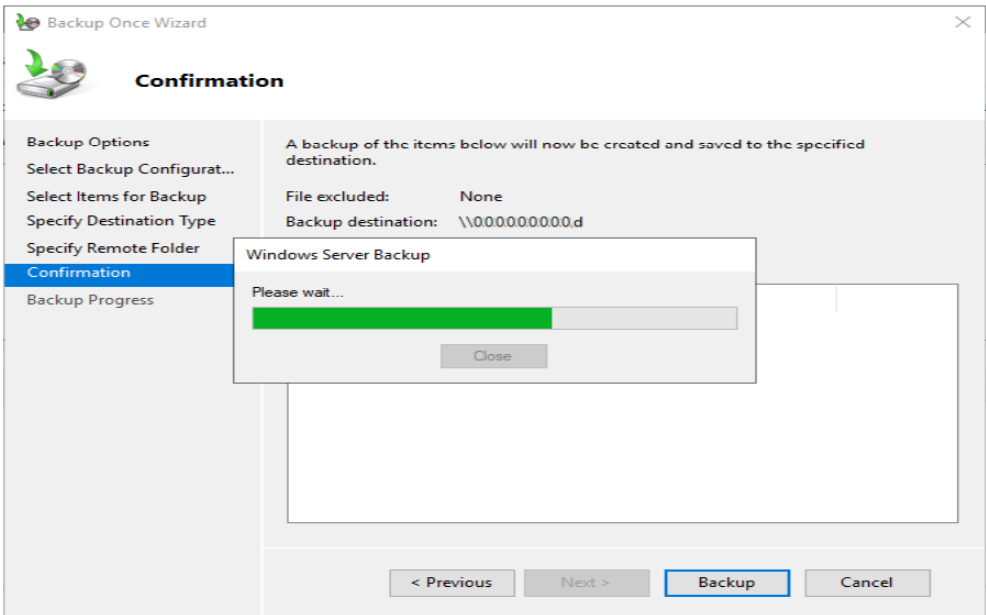
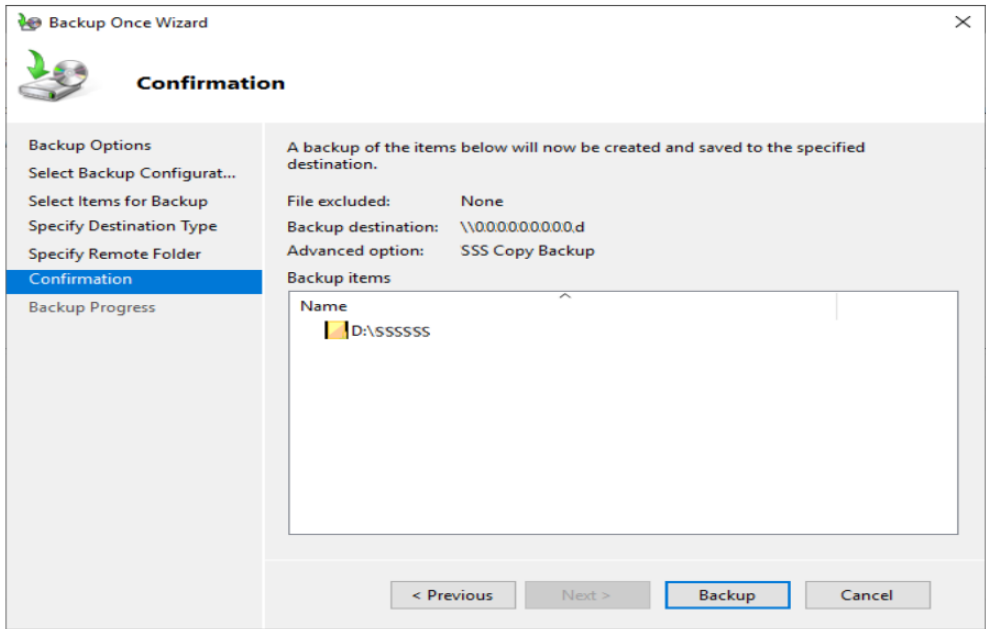
Select Items for Backup



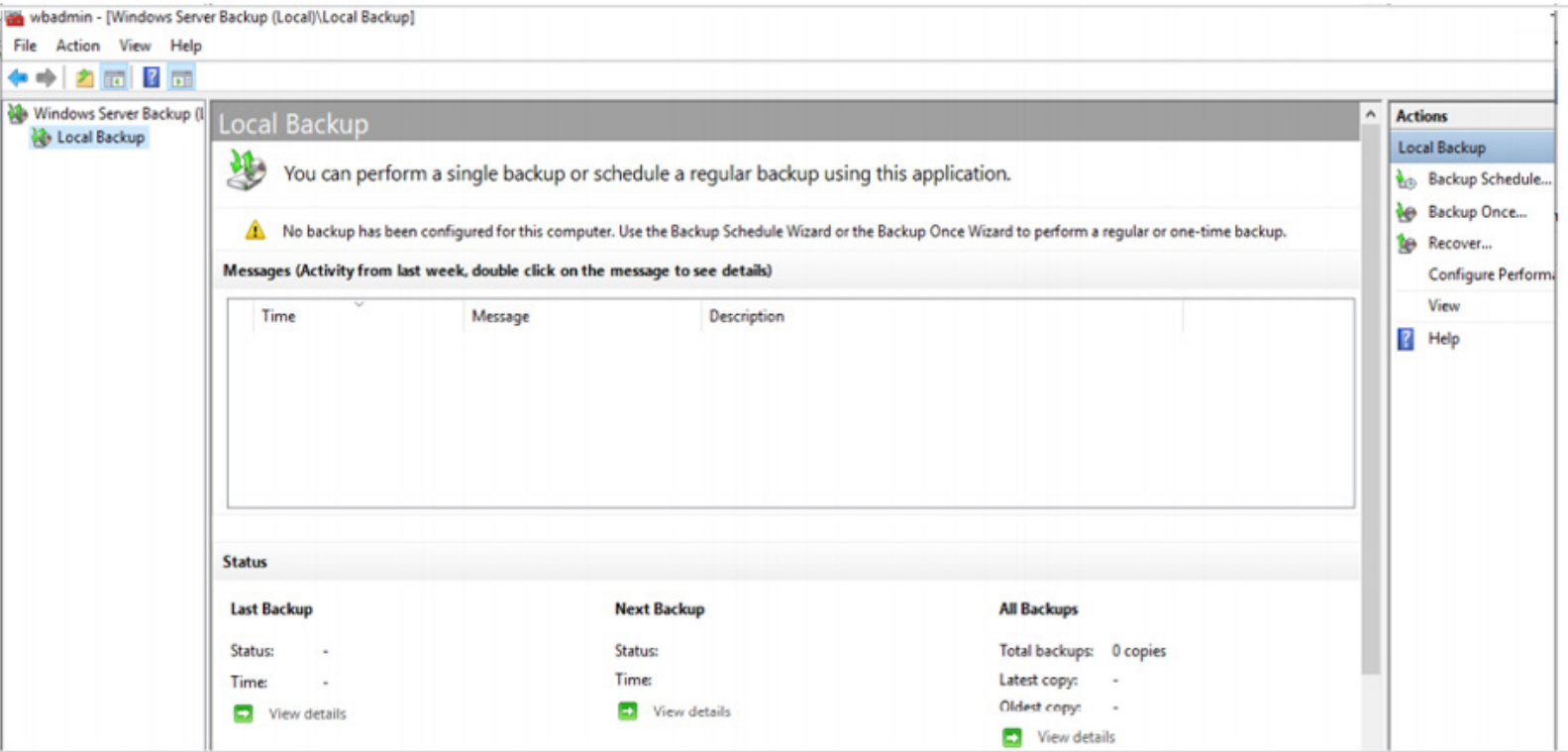
Specify Destination Type



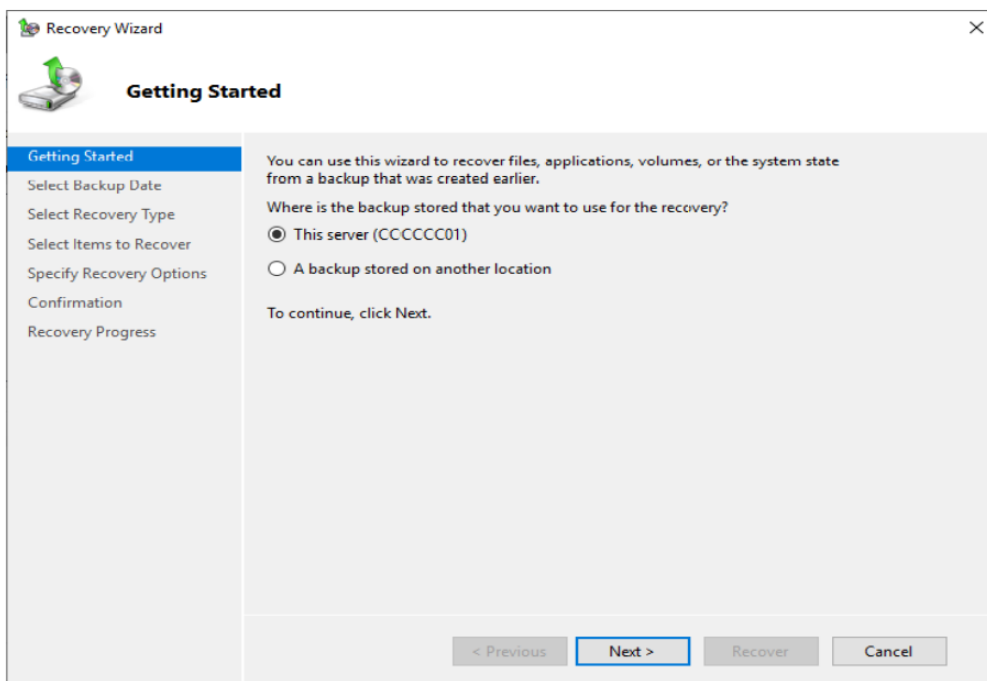
Confirmation



Restore Backed up Data



Getting Started



Recovery Wizard

Getting Started

You can use this wizard to recover files, applications, volumes, or the system state from a backup that was created earlier.

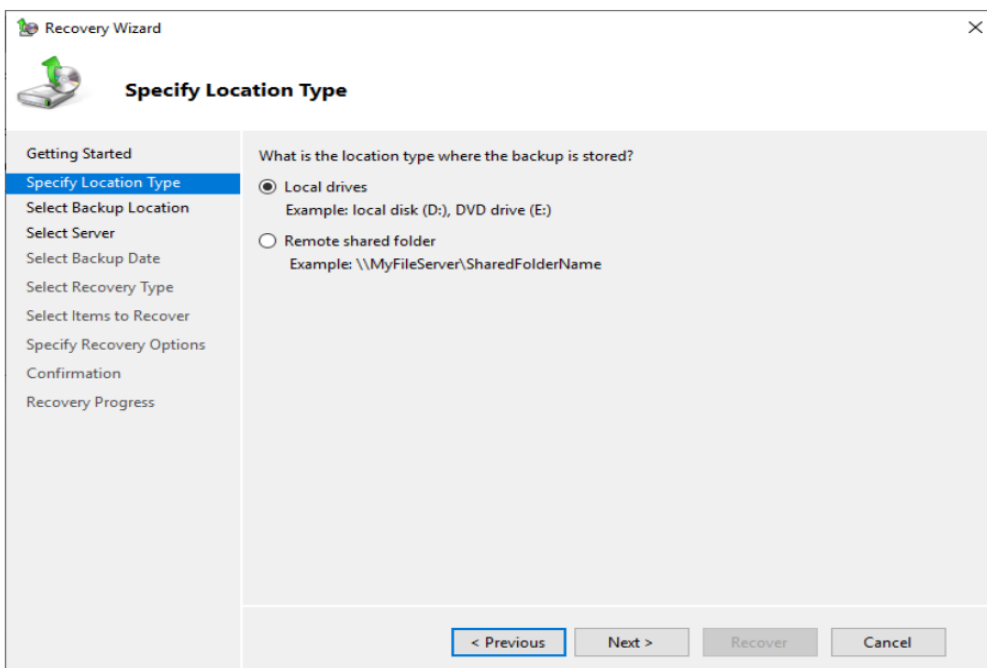
Where is the backup stored that you want to use for the recovery?

☒ This server (CCCCC01)

☐ A backup stored on another location

To continue, click Next.

< Previous **Next >** Recover Cancel



Recovery Wizard

Specify Location Type

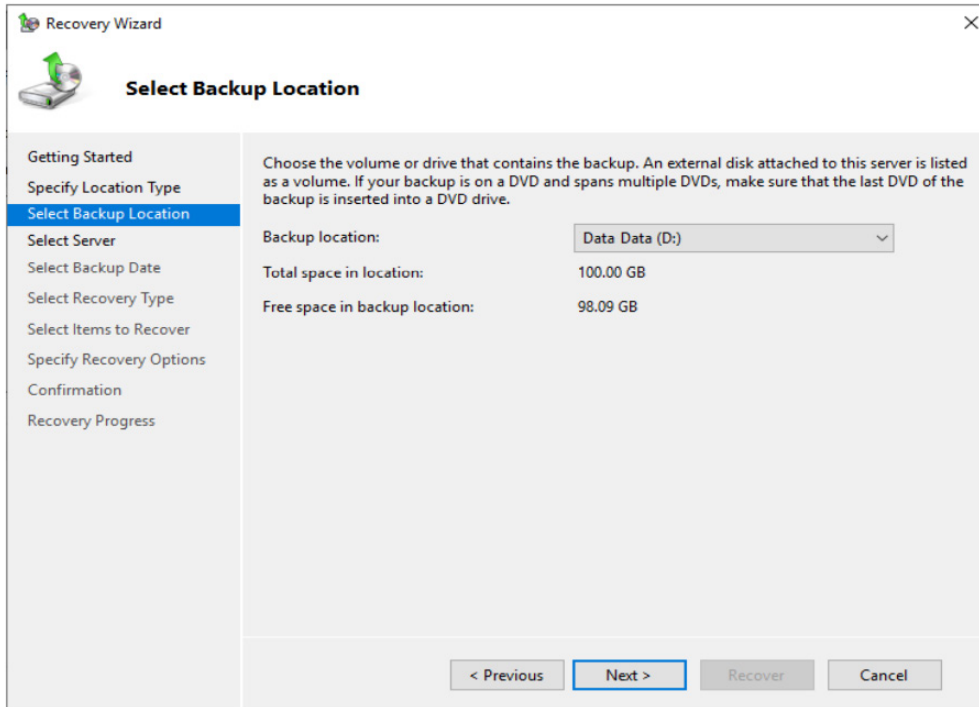
What is the location type where the backup is stored?

☒ Local drives
Example: local disk (D:), DVD drive (E:)

☐ Remote shared folder
Example: \\MyFileServer\SharedFolderName

< Previous **Next >** Recover Cancel

Select Backup Location



Recovery Wizard

Select Backup Location

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

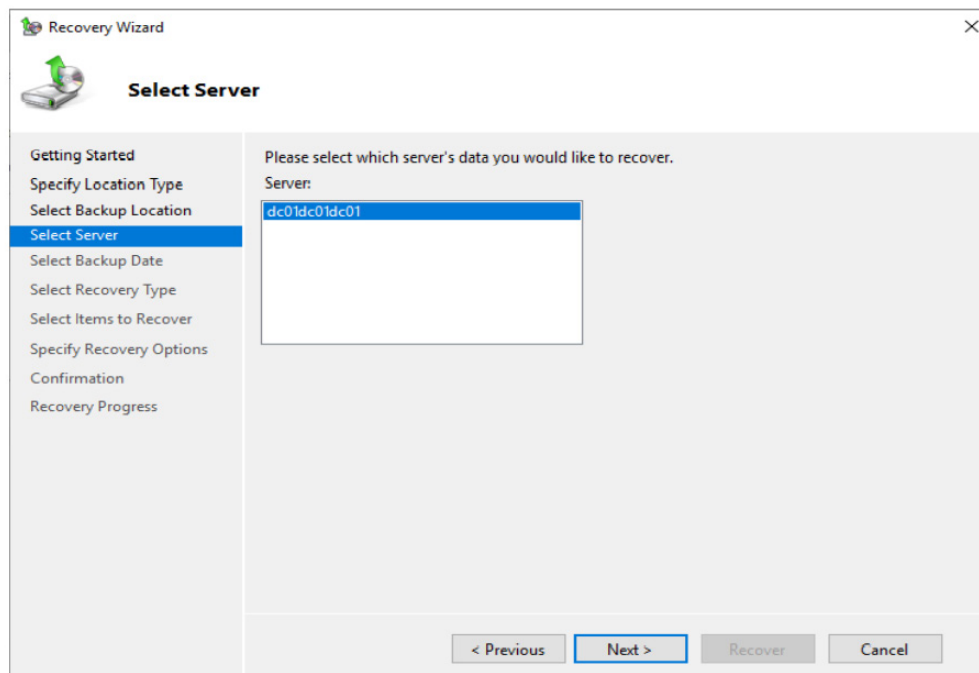
Choose the volume or drive that contains the backup. An external disk attached to this server is listed as a volume. If your backup is on a DVD and spans multiple DVDs, make sure that the last DVD of the backup is inserted into a DVD drive.

Backup location: Data Data (D:) ▼

Total space in location: 100.00 GB

Free space in backup location: 98.09 GB

< Previous **Next >** Recover Cancel



Recovery Wizard

Select Server

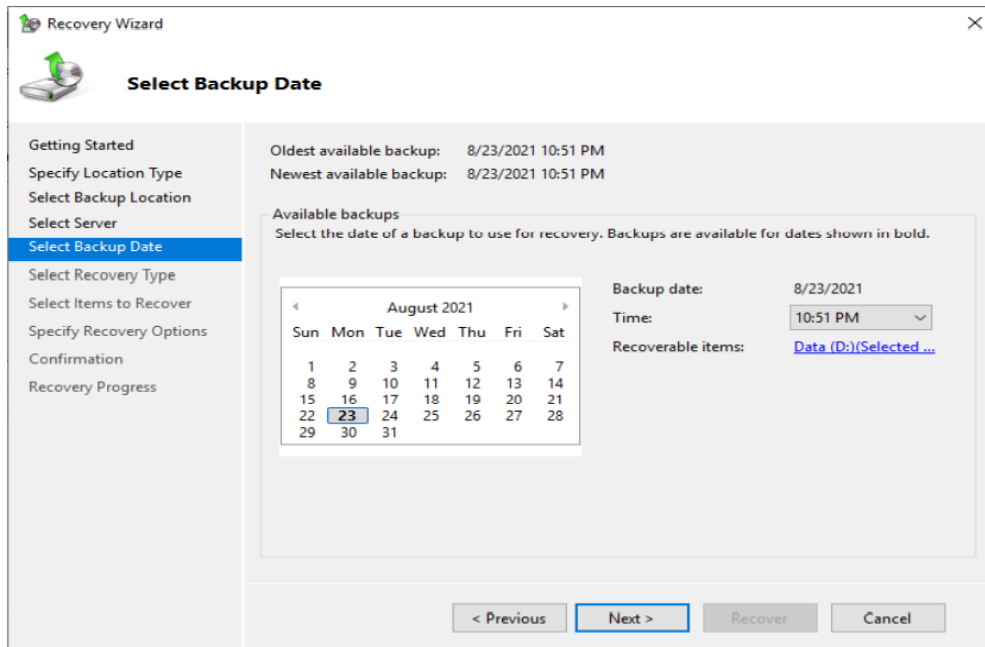
Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

Please select which server's data you would like to recover.

Server:
dc01dc01dc01

< Previous **Next >** Recover Cancel

Select Backup Date



Recovery Wizard

Select Backup Date

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

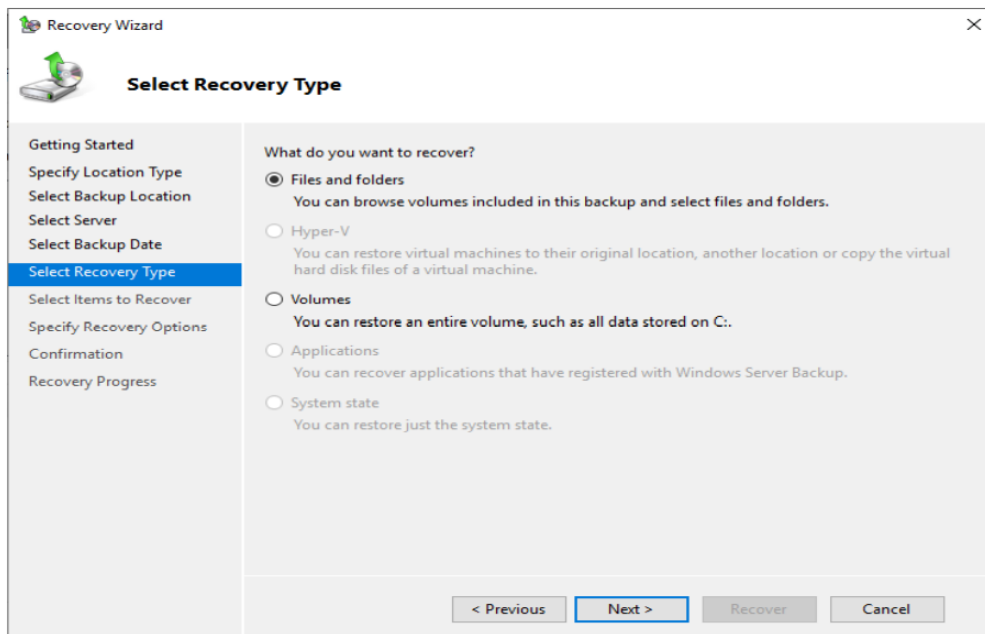
Oldest available backup: 8/23/2021 10:51 PM
Newest available backup: 8/23/2021 10:51 PM

Available backups
Select the date of a backup to use for recovery. Backups are available for dates shown in bold.

August 2021						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Backup date: 8/23/2021
Time: 10:51 PM
Recoverable items: [Data \(D:\) \(Selected ...\)](#)

< Previous **Next >** Recover Cancel



Recovery Wizard

Select Recovery Type

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

What do you want to recover?

☒ **Files and folders**
You can browse volumes included in this backup and select files and folders.

☐ **Hyper-V**
You can restore virtual machines to their original location, another location or copy the virtual hard disk files of a virtual machine.

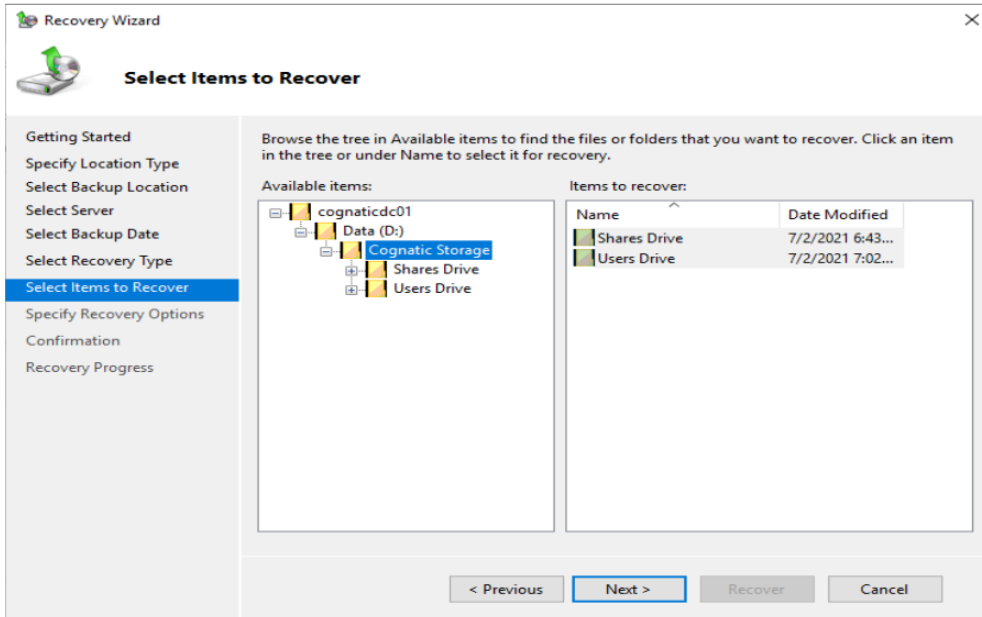
☐ **Volumes**
You can restore an entire volume, such as all data stored on C:.

☐ **Applications**
You can recover applications that have registered with Windows Server Backup.

☐ **System state**
You can restore just the system state.

< Previous **Next >** Recover Cancel

Select Items to Recover



Recovery Wizard

Select Items to Recover

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

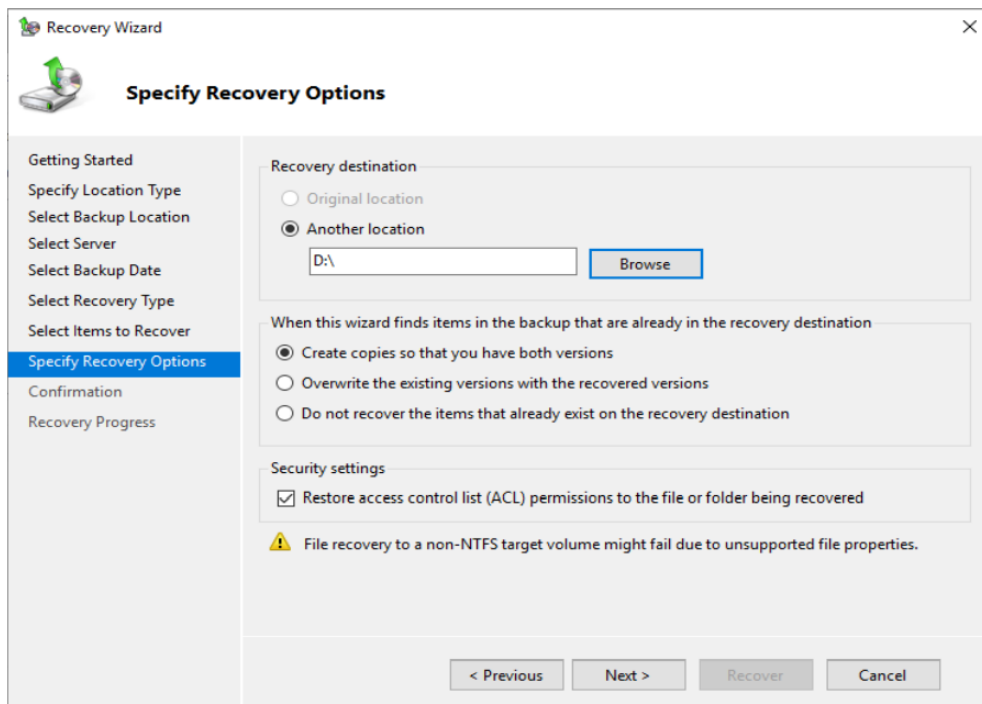
Browse the tree in Available items to find the files or folders that you want to recover. Click an item in the tree or under Name to select it for recovery.

Available items:

- cognaticdc01
 - Data (D:)
 - Cognatic Storage**
 - Shares Drive
 - Users Drive

Items to recover:

Name	Date Modified
Shares Drive	7/2/2021 6:43...
Users Drive	7/2/2021 7:02...



Recovery Wizard

Specify Recovery Options

Getting Started
Specify Location Type
Select Backup Location
Select Server
Select Backup Date
Select Recovery Type
Select Items to Recover
Specify Recovery Options
Confirmation
Recovery Progress

Recovery destination

☐ Original location

☒ Another location

D:\

When this wizard finds items in the backup that are already in the recovery destination


☒ Create copies so that you have both versions

☐ Overwrite the existing versions with the recovered versions

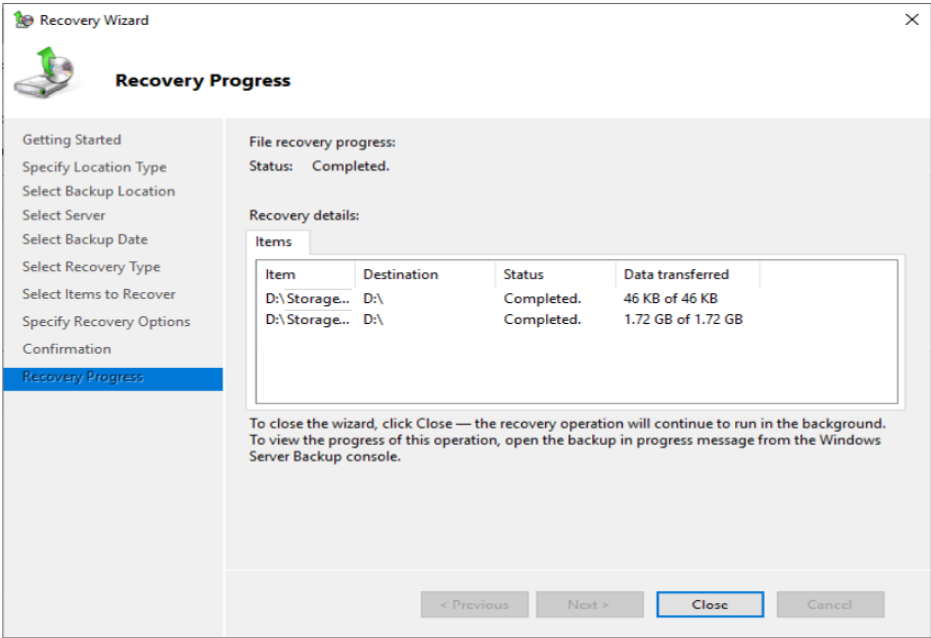
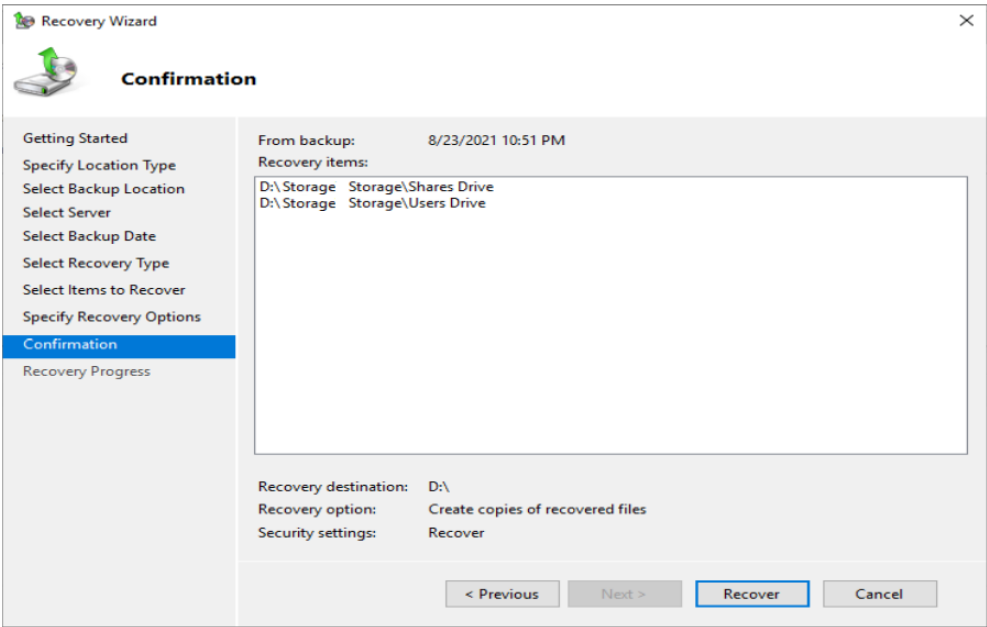
☐ Do not recover the items that already exist on the recovery destination

Security settings

☒ Restore access control list (ACL) permissions to the file or folder being recovered

 File recovery to a non-NTFS target volume might fail due to unsupported file properties.

Confirmation



Successful Data Migration Whitepaper.



✓ Save on additional bandwidth cost with our hassle free data migration.

