

WHITEPAPER

# Migration into the Cloud

## Useful Strategies for the Best Results



# Table of Contents

- Executive Summary**.....3
  
- Introduction: The Cloud and Data migration**.....3
  
- Features vs. Goals**.....4
  - Storage Native Migration.....4
  - Command-line & Handwritten Tools .....5
  - Data Management Platforms.....5
  - What to look for.....6
  
- Azure File Migration Program**.....7
  - Azure for Finance.....8
  - Azure for Healthcare.....8
  - Azure File Migration for Energy.....9
  - Azure File Migration for Manufacturing.....9
  
- Azure File Migration Program and Data Dynamics' StorageX**.....9

# EXECUTIVE SUMMARY

Data Dynamics has worked with various customers from diverse industries to accelerate their digital journeys. With more than a decade of experience, we have seen the Cloud revolutionize the IT industry. The Cloud is being widely adopted for its financial benefits and its ability to help organizations quickly and efficiently adopt newer technologies and transform their business compared to traditional IT architectures. Aligning organizational business goals to market needs and scaling up existing technologies is not always easy. And finding the right strategy and partner is one of many decisions companies must make. The first and most difficult step in that journey is migrating on-premises data into the Cloud. Having worked with some of the fortune 500 companies for migrating their data to the Cloud, we have created this white paper that compiles all the factors that companies need to consider as they move their data to the cloud.

## INTRODUCTION: THE CLOUD AND DATA MIGRATION

Enterprises across all industries and geographies are moving to the Cloud to reap financial, operational, and technology benefits. Cloud strategy for each enterprise could vary according to their business goals and digital strategy. Most of them adopt the Cloud for improving efficiency, performance, and agility in the system. At the same time, others are focused on innovation and technological expansions. This topic could fill volumes, but we can summarize it with this SWOT analysis approach:

Strengths	Weakness
<ul style="list-style-type: none"><li>Extremely fast implementation</li><li>Wide variety of solutions</li><li>Expense vs. Capital</li><li>Predictable costs once established</li></ul>	<ul style="list-style-type: none"><li>Complexity of integration</li><li>Requires training of resources</li><li>High Bandwidth needed</li><li>Legacy Systems compatibility</li><li>Lack of billing understanding</li></ul>
Opportunity	Threats
<ul style="list-style-type: none"><li>Respond to business change</li><li>New tech with less risk</li><li>Save Money/tiering/lifecycle</li><li>Reduce Corporate Physical Footprint</li><li>Data Reorg</li></ul>	<ul style="list-style-type: none"><li>Cost overruns</li><li>Consistent Methodology</li><li>PII Data Exposure</li><li>Less downtime means higher billing</li></ul>

As with every technological change, the IT ecosystem demands change. There will be changes from the purchase process to the deallocation and retirement of storage and compute. This is an opportunity for good change, especially in data organization and rationalization. A major component of moving to the Cloud is migrating the data. Just as important can be the evaluation of unstructured data file assets. Data organization and rationalization should be considered in the move. Questions frequently asked by the business might be:

- ⇒ Can I use tiering? If so, what levels are available, and how do we implement that?
- ⇒ Why do I need to move everything?
  - ◇ I don't want to move certain data; how can we filter that?
  - ◇ What about old data? Project or employee data.

◇ Are files with content that can't move due to regulations?

⇒ Can I Combine or split directories?

If you don't move your data on a regular basis, you may not know the list of questions or the requirements to be successful.

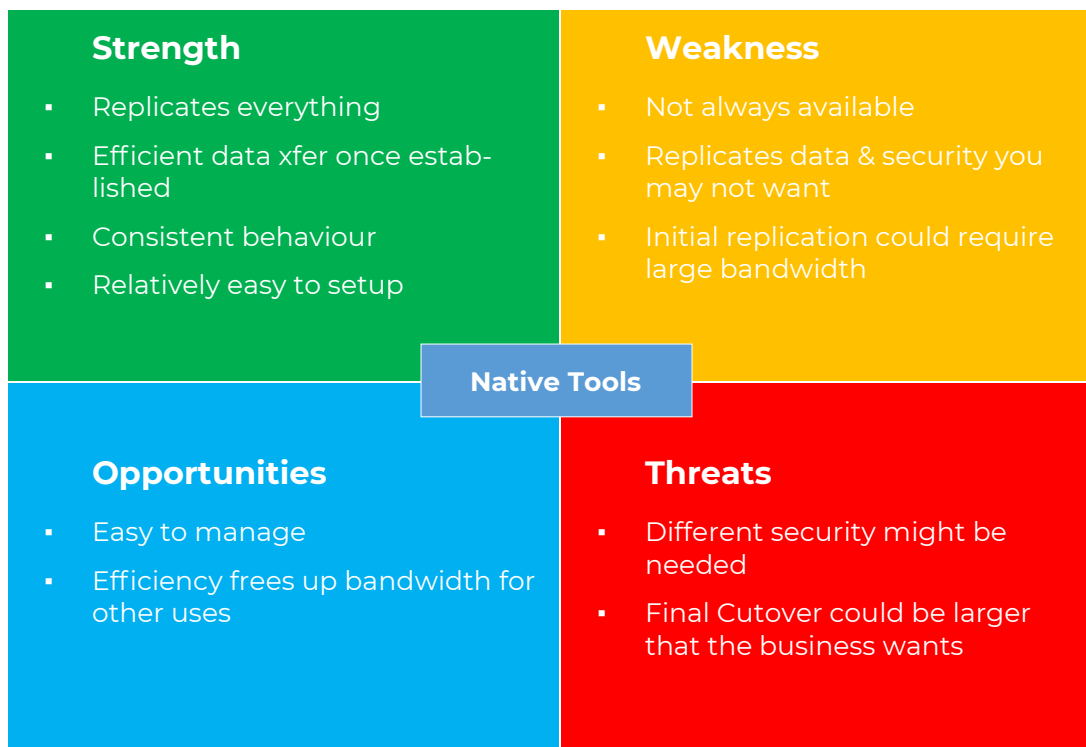
## FEATURES VS. GOALS

Of course, the goal is to get into the Cloud as quickly as possible. It would help if you also considered what you move and the corresponding tier (i.e., cost). Security, access, and compatibility are also key considerations. Let's see what features and approaches you need to consider before making a move.

## STORAGE NATIVE MIGRATION

These are tools like SyncIQ from Dell and Snapmirror from NetApp. The great thing about these is their ability only to move the blocks that have changed. A ten thousand block file might only have three blocks changed, and the replication will only impact those.

Additionally, the files are an exact copy in both data and security. The limitations are that the source and target must be of the storage type as well as they must be offered in the target Cloud. This may not be possible in all cases, especially when choosing lower performance tiers.



## COMMAND-LINE & HANDWRITTEN TOOLS

We at Data Dynamics have seen many attempts at using command lines and scripts to move data through the years. The numbers from the field are not good on the success of large projects. The number varies from publication to publication. Headlines like "Why do 70% of cloud migrations fail?" and "83% of data migrations fail or exceed their budget" are out. We have personally helped customers who are stuck in their migrations. One thing is clear, if you're migrating more than 10TB, you don't want to do it by hand. Scripts are error-prone, hard to track, and logging can be inconsistent.

Tools include Robocopy, Rsync, and several others. There are also some free tools from vendors, but they are only good for small migrations. Care must be taken to double-check the data status when it lands. We have seen cases where the data made it, but the created date became the date of the copy.

Example:

- ⇒ Created 3-sep-2021 11:13am
- ⇒ Modified 2-aug-2017 10:49pm
- ⇒ Accessed 4-sep-2021 10:43am

According to us, this is corruption. What happens when it's time to age that file out? I'm not saying they all fail and have problems, but again, if you're migrating large amounts of data choosing one of the paid-for migration platforms may be a better fit.

## DATA MANAGEMENT PLATFORMS

Cloud migration can add complexities if not planned well to ensure timeliness, cost-effectiveness, and security. Multiple factors need to be taken into consideration before strategizing a cloud plant. One of which is a selection of the right data management platform. Data Management platforms can do more than migrate data from point A to point B. Choosing the right one can be a critical part of your journey to the Cloud. The most common benefits of data management platforms leveraged by enterprises include:

- ⇒ **Centralized Control**
- ⇒ **One Interface**
- ⇒ **Most do multiple protocols**
- ⇒ **Centralized logging**
- ⇒ **Many have multiple options for customizing the migration**

There are several data management platforms in the market today, and the process of selecting the right partner can be a daunting task. By mapping requirements with the business objectives and testing, one can easily choose if the platform meets these needs. To check the vendor lock-in clause is important to ensure the flexibility of testing the solution before making the enterprise-wide transformation.

To deliver maximum flexibility to organizations in their journey to the cloud, Data Dynamics' unified unstructured data management platform delivers policy-driven data management without vendor lock-in. This platform tightly integrates our unique solutions to address an organization's need for data mobility, analytics, security, and compliance. Read more about the platform [here](#).

## WHAT TO LOOK FOR

Some of the key points to consider that should be available on the platform and there should be no need to go to the Storage management interface for these are below:

### 1. Assessment capabilities – understanding the environment is the key to planning

- a. Ability to report on Shares and Exports
  - i. This gives the admins the capability to create reports and plan the move forward
- b. Ability to perform baselining.
  - i. Admins should be able to see what's changed week over week.
  - ii. Should report on multiple items, not only shares or exports, but also volumes, and management setup
- c. Assess files and folders and their metadata
  - i. Scan Shares and apply tags
  - ii. Analyze scans grouped by tag or individual scans.
  - iii. Standard graph reports
    1. Number/size by last access time
    2. The number of files by size range
    3. Number/size by create date
    4. Graph of file type count/size
    5. Top owners
    6. Percent of files from the query
- d. Each analysis can query any aspect or combination of the file metadata. E.g., owner modified time,
- e. Each analysis can be output to a CSV file and generates graphs mentioned
- f. Analyzations can be put in manually or by restful APIs.
- g. Scans can be scheduled.

### 2. Automation and customization

The migration policies should be able to be scheduled at a minimum. Several other areas that you should look for include:

- a. Advanced scheduling. Have multiple schedules by minute, hour, day, etc.
- b. Ability to limit the time of replication. This can be critical if you are migrating a loaded system or network. E.g., Limit the replication to 3 hours.
- c. Filtering either by inclusion or exclusion of items. Filtering by last access or modified can help reduce the amount of data you write to the Cloud
- d. Configure security
  - i. By mapping SIDs. This can be critical in mergers or changing ownership for the cloud destination
  - ii. Eliminating security. It sounds scary, but many people create a different security scheme and use inheritance to clean up their data.
  - iii. Remapping bit settings

- e. Batch files. You should be able to have custom batch files that can be created generically and understand the parameters of the migration policy (e.g., Source and Target)
- f. Differential Replication that can replicate the portions of files that have changed. This lowers the Bandwidth needed to keep the replication going once the baseline is done.

### 3. **Data Continuity**

Providing proof of the data arriving is important when you first get started. Most of my customers stop worrying when they see StorageX run and deliver 100% of their files successfully.

- a. The product should have settings to do an md5 hash on the files to make 100% sure they arrive.
- b. A listing of all files and what we moved should be available.
- c. File count/folder count and sizing of source and target.

### 4. **Scalability**

Perhaps the most important ability you need is the ability to scale. If migration takes two years, that's two years of data center costs plus cloud costs. You should be able to add components as needed and remove them when done. I'm working with a large company, deployed worldwide, with multiple data centers. We deploy a single server in small deployments and retire it when done. In a larger environment, we can scale up so we can move a Petabyte a month.

At Data Dynamics, we have ensured all these key features while designing the StorageX platform. Read more about StorageX [here](#). Further Data Dynamics recently partnered with Microsoft to accelerate cloud adoption with Azure File Migration Program at zero license cost of migrations into Azure! Let's dig deeper into Azure File Migration Program further in this volume.

## **AZURE FILE MIGRATION PROGRAM**

File-heavy workloads are often stored on-premises, and moving data between disparate storage platforms is difficult. Microsoft is announcing the Azure File Migration program to address this need and reduce the time, effort, and risk involved in the mass migration of file data – Microsoft is announcing the Azure File Migration program.

Microsoft has partnered with Data Dynamics to bring their best-of-breed file migration solutions to Azure customers and partners at no cost through the Azure File Migration program. These tools make it possible to migrate tens of terabytes to petabytes of files with distributed copy engines, centralized control, and automated processes. No need for scripting, babysitting processes, or difficult troubleshooting.

Engaging in the Azure File Migration program is easy. Simply click [here](#), fill out the registration form, and you will be contacted by the ISV, who will guide you through the fundamentals to get you started. This program is helping their customers in simplifying, customizing, and accelerating their digital cloud transformation journey.

Here's a detailed industry-specific application of how Azure is helping businesses reap significant business benefits. In this whitepaper, we have focussed on three industries that have witnessed tremendous transformation with Azure - Finance, Energy, and Healthcare.

## AZURE FOR FINANCE

Microsoft Azure has come to the rescue of every financial enterprise to overcome challenges, give a technological edge, and transform the financial businesses to a new level. With Microsoft Azure's intelligent sales processes, financial enterprises can improve client relationships and boost sales by acquiring and maintaining customers at scale. Using machine learning and predictive analytics to enhance the banking customers' experience assists financial enterprises in growing and differentiating their business. Let's explore in what ways does Microsoft Azure enable intelligent banking, modernize trading, and personalize insurance systems:

1. **Providing differentiated experiences:** As Microsoft Azure and its partners like Data Dynamics integrate disparate data sources, they can obtain a 360-degree view of the customer and manage customer experience across all channels. Provides deep insight into each client interaction to engage them on their preferred channel and manages service expeditions across channels using sentimental analysis to reduce churn and time to resolution. It recognizes key patterns and recommends actions at the right time and via the appropriate channel based on those patterns in real-time.
2. **Risk management across the enterprise:** Azure Cloud empowers companies to adapt to rapidly changing requirements. It provides the analytics and collaboration capabilities to identify trends and a seamless framework for risk management processes. Azure offers data sourcing, visualization, and reporting through its connections to multiple applications. This gives risk management teams a complete picture of risks. It provides insight, modeling, and regulatory reporting to improve risk management through scalable compute and analytics.
3. **Streamline data management and optimize costs:** Utilizing Azure's technologies and strategies, data ingestion, processing, archiving, and deletion can be optimized. With Azure, data is ingested easily and stored in various data stores depending on its type, structure, and other factors. Third-party databases are available in addition to SQL Server and SQL Azure.
4. **Modernize the core system and payments:** Microsoft Azure helps modernize payments and core systems to reduce costs and accelerate new product development to meet customer needs more quickly.
5. **Streamline security and compliance:** Azure offers the broadest compliance coverage of any cloud provider, along with the latest security innovations. The approach to regulatory compliance is simplified with a dedicated program for financial services compliance. Azure supports the right to audit, transparency in operations, automated audits, and self-reporting.

## AZURE FOR HEALTHCARE

The Healthcare industry is seeing an accelerated transformation, especially after the outbreak of COVID-19. Keen observers in the industry are a catalyst by recommending ideas to improve the system, such as care access, critical care, the safety of the patients and caregivers, and more. Microsoft Azure is working with healthcare customers along with the partners like Data Dynamics to set a course for recovery and resiliency in an ever-changing environment. Let's explore the ways in which Microsoft Azure is accelerating healthcare transformation.

1. **Help protect health information:** Azure helps ensure the protection of sensitive data to enhance the security and privacy of the customers. It also helps in managing the evolving compliance regulations while improving data governance.
2. **Improve clinical and operational insights:** Azure integrates the data across various systems to provide one single source of truth that is leveraged to extract insights for predicting risks and improving patient care, quality assurance, and operational efficiencies.
3. **Enhance patient and provider engagement:** Microsoft Azure ensures the secure flow of



data through all the data points, virtual and in-person, that helps elevate the patient's experience, easy diagnostics, and improve health conditions.

4. **Accelerate research and development innovation:** Azure helps in driving faster advancements by modernizing discovery, development, and quality system process to support rapid modeling, improve clinical trial management and accelerate innovation.
5. **Enhance collaboration:** Azure accelerates the adoption of digital technologies that drive collaboration among healthcare team members for secured coordination and simplified workflow management.

## AZURE FILE MIGRATION FOR ENERGY

Azure tools and services are leveraged globally by companies from various industries to build custom solutions that aid their digital transformation journey. Microsoft Azure helps optimize the customer experience, modernize the workflows, improve operational efficiencies, and reduce costs. Azure for the Energy industry helps build customized and innovative cloud solutions to tackle their digital challenges and prepare for the future. Let's dig deeper into the topic and see how Microsoft Azure is helping the Energy industry with this transformation:

1. **High-performance computing (HPC):** Azure HPC cloud solution is a fully managed system that helps the customer in the Energy segment visualize reservoir simulations to increase drilling hit rates and form making informed decisions.
2. **Advanced analytics for better decision making:** Azure cloud analytics solution helps improve time to insights for better decision-making and reservoir production using IoT drilling sensors and advanced analytics.
3. **Predictive maintenance:** Azure IoT solution accelerators help manage and extend the asset life cycles with the help of predictive analytics that allows to detect future downtimes and plan maintenance activities accordingly.
4. **Digital model of the environment:** Azure digital twins solution helps in creating a comprehensive digital model of the entire environment for extracting better insights to drive customer experience, optimize costs, and improve efficiencies.

## AZURE FOR MANUFACTURING

Digital footprints are multiplying rapidly as the manufacturing sector adopts newer technologies like IoT, AI, and ML in the supply chain, manufacturing operations, packaging and distribution, logistics management, and many more. The fundamental issue these manufacturing companies are dealing with is the need for clear insight into their data footprints to safeguard, govern, and use that data as an asset to make strategic business decisions. In addition to addressing these issues, Microsoft Azure is collaborating with data management enterprises and partners like Data Dynamics to offer a comprehensive data management tool that will aid in the modernization of their data and the extraction of value from it.

A fourth industrial revolution is here thanks to Microsoft Azure's manufacturing solutions that enable the following:

1. **Build supply networks that are more profitable and resilient:** Through intelligent planning and execution, demand sensing, and traceability, Microsoft Azure helps to improve end-to-end supply chain visibility, agility, and profitability. By understanding what data manufacturing enterprises have across their infrastructure and managing this data comprehensively, these enterprises can create a data-driven culture. Data-driven supply chain

management uses data strategically to predict real-time production and inventory changes. The result is faster and more intelligent decision-making.

- 2. Digitally empowering manufacturing operations:** The Azure Digital Twins platform lets enterprises digitally represent real-world things, places, processes, and people through the Internet of Things (IoT). This way, companies can create breakthrough customer experiences, optimize operations and costs, and drive better product development.
- 3. Build futuristic agile factories:** Microsoft Azure offers continuous asset discovery, vulnerability management, and threat detection to assist manufacturing organizations in protecting industrial IoT and OT environments. It gives operators a 360-degree picture of the entire plant's systems and workflow, enabling them to assess issues and improve workflow efficiency. To increase throughput, quality, and delivery while lowering costs, Microsoft Azure also aids in developing agile factories and smart manufacturing processes using predictive technologies, IoT, and mixed reality.
- 4. Accelerate time to value in a comprehensive and scalable manner:** Data generated by smart factories can reach 1 petabyte per day. This data offers opportunities for creating novel services and business models. Most companies are not utilizing 1% of their data, much less developing effective business models based on it. Enterprises require Microsoft Azure's capabilities that enable intelligence at the edge and in the cloud to fully comprehend any manufacturing enterprise data estate and generate its desired results.

## AZURE FILE MIGRATION PROGRAM AND DATA DYNAMICS' STORAGEEX

While Azure Migrate hub offers various tools and services from Microsoft and ISV partners to automate and simplify database and server migration, and the current offerings do not address unstructured file data. Hence, Microsoft Azure has partnered with Data Dynamics to bring onboard the best data migration solution to their customers. Azure is sponsoring the use of Data Dynamics' StorageX Migrations to migrate data into Azure.

StorageX is Data Dynamics' award-winning unstructured data management solution that delivers policy-based data management with no vendor lock-in. It uses an automated, scalable, and policy-based engine to ensure intelligent and swift petabyte-scale migrations into Azure at ZERO license cost. It comes with robust security features such as automated access control and file security management. Organizations can now migrate their unstructured files, Hadoop, and object storage data into Azure at zero additional cost to the customer and no separate migration licensing. Having migrated over 400 petabytes of data encompassing hundreds of trillions of files without a single byte of data lost, Storage is trusted by several Fortune 500 enterprises. Here are 11 reasons why.

# StorageX Vs. Traditional Migration Tools

## A comparative study

Parameters	Conventional Migration	StorageX Migration
 <p><b>Petabyte Scalability Across Heterogeneous Environments</b> StorageX is built for petabyte-scale as well as smaller environments, while most of the solutions available in the market are only suited for smaller environments of 100TB or less. The Platform is purpose-built for the modern enterprise with the ability to scale out to meet performance needs and have the flexibility to adapt to complex hybrid, multi-cloud, and legacy environments.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Versatile Azure Support</b> Ability to create policies intelligently to move certain data into different cloud storage tiers including Azure Files (Premium, TX Optimized, Hot, Cool), Azure NetApp Files (Ultra, Premium, Standard), Azure Blob (Premium, Hot, Cool)</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Single-Software Data Management</b> It is a more robust and fully-featured platform, where each solution is architected from inception to specifically meet a data challenge for data management and governance personas.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Zero Cost Migration into Azure</b> Azure is sponsoring the use of StorageX to help organization migrate unstructured file and object storage data into Azure at no additional zero license cost of migration*. Customers only need to register their migration project information with Data Dynamics and start the data migration process.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Data Enrichment using Analytics</b> Along with metadata discovery and tagging, StorageX also helps with data enrichment by providing capabilities to discover, classify and use custom tags. This helps in intelligent data classification and cataloging.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Automated, Policy-Based Data Migration</b> The platform uses automated, policy based file data migration from heterogeneous storage into Azure storage ensures minimal to no risk with automatic access control and file security management.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>Automated access control and file security management</b> Policy-based and robust file permissions management including preserving, repermissioning, and security reassignments vis SID Mapping.</p>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 <p><b>Data Replication</b> Unlike other solutions, StorageX enables migration in phases preserving the original copies and performing baseline and incremental copies to ensure replication of new, locked, or recently modified files on the source to the destination and allows the verification of the migration completion</p>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 <p><b>Automated Cutover</b> StorageX namespace management abstracts a physical data storage environment into a logical view used in conjunction with migration policies to automatically update DFS namespace links that reference the old source to the new destination during the cutover phase.</p>	<input type="radio"/>	<input checked="" type="radio"/>
 <p><b>API Integration</b> StorageX's robust API ecosystem provides unique API based automation and orchestration for process and workflow modernization.</p>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 <p><b>Stubless / Always Direct Native Access to Data</b> StorageX delivers a solution where there is nothing in the way of your data. There is No Gateway, No File Virtualization, No Proprietary Namespace, and No Stubs.</p>	<input type="radio"/>	<input checked="" type="radio"/>



No capability



Partial capability



Full capability

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