AvePoint®

Proven Practices for Upgrading or Migrating to Microsoft® SharePoint® 2016

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Executive Summary:

Despite the architectural enhancements and feature-rich components of cloud platforms and services, many organizations remain in on-premises deployments due to industry and government regulations. Because Microsoft recognized, while collaboration software is trending toward the cloud, there are organizations in more restrictive industries that want the latest capabilities packaged in a form they can host on their own private infrastructure or in a hybrid environment, they created SharePoint 2016.

Most likely your organization is in one of those industries, and that's why migrating to SharePoint 2016 isn't a matter of "if," but "when" and "how." This white paper is your prescriptive guide to navigating the challenges and best practices for making your move to SharePoint 2016. In the following pages, you'll get a comprehensive understanding of the following tenets fundamental to successfully completing a SharePoint 2016 migration.

Architecture: Which service is right for you? Not all businesses have the same exact requirements. The type of service you select – whether it is SharePoint Server, SharePoint Online, or a hybrid model – will make a tremendous difference. Learn what those differences are, and how to select the right model that fits your needs.

Strategy & Planning Recommendations: You wouldn't simply purchase a home by pulling up to the first house you come across with a "For Sale" sign you see with a bag of cash, would you? The same applies to your migration. We'll share the people, processes, and technology that are necessary to understand before you take the plunge.

Readiness Assessment: It's vital you have a clear understanding of the content and information architecture in your legacy environment before you move to SharePoint 2016. We'll explain your different options for assessing which content is cloud-ready (for hybrid deployments), what should be kept on premises, and what you need to watch out for in order to limit business disruption.

Migration Considerations: You're almost ready to make the move to SharePoint 2016. Before you do, learn about the changes in SharePoint Server and Office 365 – SharePoint Online as well as performance limits and challenges so you approach your migration with the right information.

Selecting the Right Migration Option: Not all migrations are created equal. This section highlights the removal of in-place upgrade methodology and introduces the three migration options (manual, scripted, and third party), highlighting each key benefits and differences in order to help you evaluate which path is best for your business.

Recommended Methodology: This is your blueprint for kicking off a successful SharePoint 2016 migration – from translating customizations all the way to transitioning your users.

Migration vs. Connecting: When migration is not a viable option for your file system content due to company or native SharePoint limitations, what can you do? In this section, we will cover two of

AvePoint's solutions that integrate and connect externally hosted content to your SharePoint 2016 deployment.

Available Solutions & Services: Discover proven third-party solutions and services that help automate and ease the path for your migration from start to finish.

Architectural Considerations: Which Service is Right for You?

Many organizations begin planning a migration strategy with which SharePoint 2016 features they want before anything else. If that's the case for you, this plan is already destined to fail. The core focus for IT should be to understand the problems the business is facing in the field today. You can begin to align pains with solutions ***after*** you understand the problems. Let's take a look at two examples of putting the technology before identifying the root problem:

- Immediately thinking about whether or not to implement Box, Dropbox, or OneDrive for Business is a path to failure. Backtrack to the core issue or experience of file sync and share. This is a business problem – a core issue employees face every single day and commonly ask, "How do I quickly access my content across devices?" and "How do I share this document with a partner?"
- "Social" is another buzzword too casually tossed around the boardroom. Again, starting with the solution – picking between Yammer, Jive, and Salesforce Chatter – is your quickest path to failure. Think about the core issues faced by your business users, who commonly ask "How do I share success with other members of my team?", "How do I evangelize ideas in my global organization?", and "How do I find answers to the questions I have on my own?"

It's not about deciding what technology platform you want to embrace. Rather, the platform of choice is dictated by what your organization ***needs***. You need to understand the pains of your organization in order to understand the drivers to SharePoint 2016. Before planning your migration strategy with our helpful guide below, ensure that you have an intimate understanding of the problems your organization faces, because this will be critical in making the right technology decision.

Choosing Your SharePoint Service

As with any enterprise technology, solutions require planning, design, and management to ensure it meets the needs of the business and is functionally robust. Many of us have either heard stories or experienced first-hand early SharePoint implementations set up in proof of concept environments, then after some basic hardware and configurations testing, moved into production without further consideration of the goals behind implementing the platform. These platforms unfortunately become unstructured dumping grounds for business-critical data. Oftentimes this data either becomes redundant through sprawl or lost through poor information architecture and improper classification. The technology is then rejected by business workers and poorly adopted, resulting in a failed investment. It is a sad reality that many will undoubtedly experience in the coming years when history repeats itself with SharePoint 2016.

SharePoint technology has evolved significantly since its beginnings in 2001, and today you have a multitude of deployment options for consuming the platform, each with its own pros and cons which could apply differently to your organization. What's most important is to differentiate the experience from the delivery mechanism. SharePoint is the technology or experience, while the infrastructure that

presents it to the end user is the mechanism. In this sense you really only have two “flavors” of the SharePoint experience: SharePoint Server and SharePoint Online. Understanding these options makes the decision process much easier for your organization. This is the first “fork” in your technology process. The second, and slightly less important one, is then deciding on the ultimate delivery mechanism with which you’ll consume that experience.

The following are the most common options available to organizations for deploying SharePoint:

1. **SharePoint 2016** – This is the SharePoint most of us are accustomed to: SharePoint physically resides within the organization’s on-premises data center. The data resides within the organization’s walls, servers are physical or virtual, and the platform is managed by your organization’s operations team. Hardware (servers, storage, and network) is either purchased or leased from your hardware vender(s) and software is purchased under a licensing agreement with Microsoft.
2. **Office 365** – Is a rich offering of Office applications such as SharePoint Online, Exchange Online, Word Online, PowerPoint Online, Excel Online, Delve (for front end search), OneNote, and Sway (to create interactive documents). As a Software-as-a-Service (SaaS) offering, Microsoft owns and manages the platform, which includes the data centers and servers as well as storage, network, and management tools. Your organization administers access, licensing, and manages data.
3. **SharePoint Online (Stand Alone)** – This is the standalone, cloud-based version of SharePoint available from Microsoft. Unlike Office 365, this version does not include Delve, OneNote, and Sway. Similar to Office 365, Microsoft owns and manages the platform, which includes the data centers, servers, and storage, network, and management tools. Your organization administers access, licensing, and manages data.
4. **Hybrid** – This is generally a blend of options 1, 2 and 3. Your organization has an on-premises installation of SharePoint 2016 in addition to a SharePoint Online tenancy. The environments are connected through a trust, sync service, and proxy so that accounts can be managed and search results are integrated across both the on-premises and online environments.

Deciding which SharePoint deployment to implement will require a lot of information gathering from all sides of a business. Upgrading to SharePoint 2016 is not just taking advantage of the latest and greatest – it’s aligning your migration goals with critical business needs. Clarifying and agreeing on what those necessities are involves a few steps which will be covered in the next section, but if you already know what you need, check out Table ID: 1 in Appendix A for further guidance on which option is right for your organization.

Pre-Migration: Strategy and Planning

Unless you're planning on starting fresh with your new SharePoint implementation, you will need to decide how much of your existing content and applications actually need to be migrated. The most important phase of any migration is discovery and planning. Implementing a new SharePoint deployment without implementing the **people, processes, and technologies** required to support the platform will make your investment both difficult and expensive to support going forward.

It is also worth noting that regardless of the option chosen, your organization will require an internal migration team to be involved for the entirety of the project. The question is not whether or not the team will be involved, it is how much of the work for which they will be responsible. Let's first take a look at those individual components for a successful migration.

People: Business Alignment & Creation Implementation Team

When introducing a new IT system to an organization, it is essential to understand the business requirements that are driving the IT requirements and ensure they are aligned. This will involve engaging with business stakeholders throughout organization to gain a comprehensive understanding of strategies for the use of SharePoint 2016.

By increasing your organization's level of involvement, however, the commitment of internal resources will increase. That said, it will ultimately lower the overall cost of the migration project, as you are working with pre-existing resources. Conversely, outsourcing the entire migration would be the most convenient option – but also the most expensive. Most migrations fall somewhere in the middle of these two extremes, and it is vital you balance your organization's cost and effort.

Once the scope is determined, your organization will require an implementation team. Preferably, the overall implementation will need to be led by your organization's core SharePoint team working with a project manager. However, the individual activities and sub-projects can be assigned to task-specific implementation teams if necessary resources aren't available.

For the task-specific teams, your organization must review each activity within the scope of the implementation, determine the resources required, and recruit individuals that match the matrix of required resources.

Despite the strength of your organization's SharePoint team, it is recommended that you consider supplementing that team with outside resources. This can both enhance the depth of the implementation team and alleviate some of the workload.

Communication is fundamental – from the project team to leadership as well as to the user community. Effective and timely communication is critical to ensure users understand the changes that are occurring and are engaged with the project. Throughout the roadmap, communication is only included in a few key places such as the content discovery and user on-boarding phase. However, it is expected by all parties that communications will occur throughout the project.

Process: Project Planning & Implementation Mapping

This white paper provides an overview and a sample framework. However, there isn't enough information available for your specific environment to map your unique implementation in full detail. This is an activity that appears simple, but actually involves some degree of complexity. It will consider the scope of the Implementation Phase, the different tasks and sub-projects that need to be completed, the available pool of resources, and the external components required. It then combines these elements into a detailed plan for the actual implementation.

Why is this activity important? Migration involves a significant development effort, and completing the systematic migration of the teams and departments using the existing collaboration environment is essentially changing the way they work and the technology they use. This must be done without interrupting the business functions users perform on a daily basis.

Do not underestimate this phase, as it requires appropriate diligence from your organization to successfully complete the migration project.

Technology: The Role of Migration Software

At its core, migration software is used to provide automation, increase the capability of the migration team, create consistency, provide visibility, record progress, and allow mid-migration restructuring. Let's quickly expand on each of the core benefits as it relates to a SharePoint 2016 migration project.

Provide Automation

Software should defray the manual effort often necessary to complete migrations. While assessment and planning should still be completed by the migration team, you should utilize migration software for actually moving content and implementing all necessary changes.

Increase the Capability of the Migration Team

Software enables the migration team to support more business scenarios and use cases than would be possible if the entire migration was completed manually. This allows the migration team to truly be a strategic arm of the enterprise rather than simply performing resource and time-consuming tasks. As an example, it's difficult to manually replace column, content type, and site templates during a migration – but with software, the process is exponentially easier.

Create Consistency

Besides the fact that performing migrations manually takes a great deal of time and resources, it also increases the risk of human error and inconsistencies when moving from a source to target environment. Using migration software enables you to perform every migration job the exact same way, which ultimately results in an extremely high degree of consistency in the target environment.

Provide Visibility and Record Progress

Without the use of migration software, it's hard to see "the forest from the trees" as it pertains to the overall status of a project. Software can help you granularly track each migration job, identify where any errors may have occurred, and ultimately help roll up these individual job reports into an overall status update of the entire project that can be shared with key stakeholders. In this way, you can rectify any small errors before they threaten the entire migration project, as well as look for opportunities to improve performance and efficiency throughout the migration project.

Restructuring Content During Migration

Migrations have the potential to be a significant threat to ongoing business productivity as most content is being used as the project takes place. Because of this, organizations will often wish to wait until a migration project begins to restructure content. Software allows you this flexibility to make changes to SharePoint and test them as part of the migration process. Some examples of what this could look like in a real-life scenario include substituting site templates and content types; remapping columns and metadata attributes; and translating security principles and SharePoint permissions based on mapping tables.

The Final Word on Migration Software

If you plan to perform the entire migration with your own team – without third-party services– we strongly recommend you evaluate and ultimately select a migration software to support your migration team. It's important that your organization complete a formal evaluation of several third-party migration software solutions to ensure you select the right one for your specific needs.

Microsoft Recommendations: Third-Party Solutions

This section will provide an overview of the two SharePoint content migration methods – the old, database attach method and the new, ISV-based method – along with benefits of the independent software vendor (ISV) method and links to more information. According to Microsoft, third-party, ISV solutions for migrating content to SharePoint 2016 have the following benefits over the database attach method:

1. Simplify the process
2. Reduce training needs and technical resources required
3. Reduce the time and effort required to migrate content
4. Reduce the instances of failed migrations due to file corruption and other causes

Other benefits can be found in Table ID: 2 in Appendix A.

Readiness Assessment: Are You Ready to Migrate?

Pre-Migration Content Assessment:

Challenges*:*

- **Relying on human review alone:** In a study comparing automated relevance assessment to relevance assessments made by human reviewers, the software, on average, identified more than 95% of the relevant documents compared to an average of 51.1% in the human review.
- **Assessing any current risk:** How do you attain a comprehensive assessment identifying at-risk content or data breaches, including SharePoint or file share content/user access that can potentially violate your compliance policy.
- **Converting custom solutions:** SharePoint 2016 will continue to support full-trust solutions when running on-premises farms, but it is recommended that you re-evaluate the importance of each solution and transition them as time and budgets permit. This is because of the complexity of migrating full-trust solutions as opposed to solutions built with the new app model. Some examples of solutions that are written with full trusted code include custom and third party workflow, publishing, compliance, and Business Connectivity Services (BCS) solutions.

Best Practices: Inventory Your Data

When we're gearing up for a migration, it's pretty common to put on our engineering hats and start looking at the migration in terms of speeds and feeds: How fast can we move our data and how quickly can we get users trained on the new features? However, you can't simply bulldoze your data to a new environment and hope that your SharePoint 2016 will be a great success. You can inventory your data before or after you migrate, but either way this step will be crucial to success for the following reasons:

- Determining what you own dictates how much of a hybrid environment you use in your SharePoint 2016 rollout. For instance, a migration of International Traffic in Arms Regulations (ITAR) or export regulated data might slow down or prevent your rollout of hybrid search connectors or Delve in 2016.
- Identifying the types of data you own and regulations that govern them will help you create a stronger SharePoint 2016 information architecture. Segregation of data by policy with well-defined governance rules will help you create the right containers with the right security in our destination.

It goes without saying that the majority of information that supports the decision making process in migration projects is around the source content. Key questions include:

1. How much information do you have?
2. How much is old or ready for archival?
3. How much is existing SharePoint content?
4. How much is from legacy content systems you want to decommission?
5. How do you assess my existing content to understand its value, risk, and information management requirements prior to migration?

If you're thinking of a hybrid SharePoint 2016 deployment, you also need to consider:

- What content is "cloud-ready" and what should stay on-premises?
- Is all of your content in appropriate format for the cloud (think file characters and sizes)?

Pre-Migration Light-Scanning Assessment

Challenges

- Determining the scope of the project through a better understanding of your source environment in order to see whether or not the migration aligns with your original plan.
- Identifying potential problems that may cause migration failure by scanning and exploring your source environment prior to migration. Generate detailed reports which can be exported to a database or comma separated value (CSV) file to allow for deeper analysis.

Best Practices: AvePoint's Discovery Tool

AvePoint's Discovery Tool helps lighten the load of the initial discovery phase of your migration and ensures that you are more knowledgeable about the customizations, workflows, information architecture, and amount of content your source environment contains. In this way, you can ensure whether your current migration project goals are achievable or if they need to be adjusted before you begin the migration process.

Pre-Migration Deep-Scanning Assessment

Challenges

- While a light scan can give you a better high-level understanding of your source environment and the work that would go into a migration, it doesn't take into account the metadata that is inside of the documents, and the content itself.
- Before starting a migration, it's important to look inside of documents through a deep scan. File names alone cannot determine how, what, or when content should be moved to your new platform.
- Classifying information is tricky, and managing electronically stored information across network file shares and legacy platforms is time consuming and overwhelming for most workers.
- By not capturing sufficient metadata to describe the information objects for future recovery and production, official records are left unprotected outside of authorized repositories and the investment in content management technologies is severely compromised.
- Implementing governance architecture with technical enforcement in order to efficiently tag, classify, purge, quarantine, or archive content to support information management requirements.

Best Practices: AvePoint Compliance Guardian

AvePoint Compliance Guardian helps prepare your source environment for migration by taking an assessment of content and sites, and creating a heat map report that specifically targets violations that have been identified, and plots them by farm so chief privacy officers (CPOs) can identify the largest

areas of risk. The data can also be divided up according to access policies so individual business units can manage their own risk corresponding to their sites.

When applied pre-migration, Compliance Guardian allows you to set the right level of protection for unstructured or misplaced data across SharePoint farms, file systems, and other legacy systems. Compliance Guardian can also automatically tag new and existing files based on content, context, and ownership, standardizing taxonomy and classification so that it's easier to manage and restructure data in your environment. This is an activity we recommend doing before you move, but can also be performed post-migration in your new environment.

Best Practices: AvePoint File Analysis Solution

By discovering, mapping, and classifying the unstructured data on file shares, organizations can make more informed decisions regarding which data to keep and remove. This way, the use of existing storage repositories, and the transition to SharePoint 2016 are optimized. The AvePoint File Analysis Solution reduces risk of privacy or sensitive information breaches by identifying which files reside where and who has access to them. It also creates the opportunity to take advantage of the full potential of the "big data" stored in vast, existing repositories.

Pre-Migration Application and Feature Assessment

One of the biggest pains encountered during a migration is the lack of understanding when it comes to legacy applications. This could be anything, ranging from a custom solution written in Microsoft Office SharePoint Server (MOSS) 2007 which helped IT provision sites for business users to a rich video portal created to supplement a company's Learning Management System (LMS) – or the entire LMS itself could be an application built on top of SharePoint. Whatever the application may be, just like content, they are subject to scrutiny and the possibility of being left behind. There are a number of reasons to leave legacy applications behind:

RISK: This is the most important factor to consider. Older systems rely on technologies which are not as up to date on security patches and updates. There may be legacy vulnerabilities easily exploited through your legacy application's code.

COST: The engineers who first designed the application may not be with your organization anymore, or it is just poorly documented. The cost of maintaining legacy systems is growing by the day. Whenever a migration occurs, you'll always have to verify if the new platform can support your legacy application. If it cannot do so, there will most certainly be a cost in maintaining the old infrastructure or investment in refactoring your old code.

LACK OF FOCUS: Many applications are built to support a business operation. They are not directly associated with your primary line of business. Workflow, video portals, and CRM are supplementary components of many organizations. While it may have been valuable to build these features in-house in the past, various organizations specialized in each of these areas are building fully supported and feature-rich applications today that integrate with each of these and more.

- Building and maintaining a workflow engine is far less effective than implementing a solution from third-party providers such as Nintex or K2
- Cisco, Kaltura, and even Microsoft provide feature-rich video portals today
- Microsoft Dynamics CRM and Salesforce CRM are just two of many robust CRM platforms in the marketplace today

UNUSED: Survey your teams, and check logs for activity. The simplest way of discovering if an application is being used is to investigate. Oftentimes, solutions were built years ago for a specific business case. Sometimes, through natural churn, the application itself is no longer used by new staff and is completely forgotten. If the legacy application has no ownership or recent activity, there is a very high chance it can be decommissioned without disruption to the business.

All of these aforementioned factors should be considered when evaluating legacy applications in order to either decommission or replace them.

Pre-Migration Checklist:

Now you should be able to build a Pre-Migration checklist using our basic methodology and customizing it to meet your organization's specific needs:

1) Ensure a detailed and agreed upon vision has been established for your new platform.
    a. What is the purpose of SharePoint Online, Server, or Hybrid?
        i. Intranet
        ii. External Collaboration
        iii. Client Portal
        iv. Records Management
        v. Social Platform
        vi. Project Sites
        vii. Other
2) Identify and take inventory of all legacy content, repositories and applications.
    a. Readiness Assessment
3) Identify which teams/business units are ready to migrate.
    a. Identify applications complexity
    b. Identify existing workflows/in-progress
    c. Identify customized sites
4) Prioritize and classify all content and applications.
    a. Content must be properly tagged with metadata, including:
        i. Created by
        ii. Modified by
        iii. Business unit
        iv. Other relevant metadata
    b. Prioritize applications based on the following criteria:
        i. Business Critical
        ii. Important
        iii. Nice to Have
            1. Are they replaced by native functionality?
            2. Are they still necessary?
            3. What is the cost of maintenance?
5) Archive and delete redundant and legacy data.
    a. Classified as having no value or outdated
    b. Archived for compliance purposes
    c. Kept on premises due to regulatory requirements (not cloud ready)
6) (Optional) Build destination information architecture.
    a. Security
    b. Structure
        i. Managed paths, quotas, etc.
        ii. (SharePoint 2016 Specific) Pre-Provision ODFB and SharePoint Sites
    c. Configurations
        i. Features, settings, templates, look and feel
7) Begin migration project.

Executing Your Migration: SharePoint 2016 Requirements

Performing the move to SharePoint 2016 from previous versions of SharePoint may require several important upgrades of your hardware, operating systems, and databases in addition to the actual software upgrade of SharePoint. Let's review the key requirements to ensure your baseline environments are primed for the latest release.

Hardware Requirements

For SharePoint 2016, the absolute minimum requirements for web front-end and application servers are 12-16 GB RAM and four 64-bit cores to power small environments. In our experience, there are a few fundamental aspects of SharePoint that will not function without additional memory. Therefore, we advise you equip production servers with no less than 16-24 GB RAM. For larger environments, it's best to increase your CPU cores up to eight.

With SharePoint 2016, stretched farm designed architecture is supported and the following prerequisites must be met to achieve a maintained high-availability solution:

- There is a highly consistent intra-farm latency of <1 ms one way, 99.9 percent of the time over a period of 10 minutes. Intra-farm latency is commonly defined as the latency between the front-end web servers and the database servers.
- The bandwidth speed must be at least 1 gigabit per second.

Software Requirements

SharePoint 2016 will run on a 64-bit edition of Windows Server 2012 R2 or Windows Server 2016 Technical Preview. The table below summarizes the minimum version of .NET framework required.

Supported Operating Systems	Minimum Version of .NET Framework Required
Windows Server 2012 R2	4.5.2
Windows Server 2016 Technical Preview	4.6

Note: Starting January 13, 2016 Microsoft will only support .NET Framework 4.5.2 or higher.

Database Requirements

SharePoint 2016 requires its database server to be a 64-bit version running either Microsoft SQL Server 2014 or Microsoft SQL Server 2016.

It's important to note organizations that are currently using SQL Server 2008 R2 or SQL Server 2012 with SharePoint 2013 must upgrade their database server to SQL Server 2012 or SQL Server 2014 before upgrading to SharePoint 2016. However, since a new SharePoint 2016 farm must be created, it is

recommended to build new database servers during this time, rather than trying to upgrade legacy database servers.

Deployment Scenarios

SharePoint 2016 introduces a new feature called MinRoles to deploy the appropriate infrastructures and roles based on the needs of the farm. This feature allows you to define the role of a SharePoint 2016 server and help you maintain the best performance of the desired server role by only installing what's required. This ensures that all servers that belong to each role are compliant.

You can find a more detailed look at the different Server Roles and functions from Table ID: 3 in Appendix A.

Upgrading vs. Migrating to SharePoint 2016

For organizations already utilizing a previous version of SharePoint – such as MOSS 2007, SharePoint 2010, or SharePoint 2013 – the two main options for moving to SharePoint 2016 are upgrade and migration. An upgrade involves using natively available tools from Microsoft, while a migration requires the use of a tool from a third-party vendor.

With that said, it's important to mention that certain considerations must be taken into account when deciding whether upgrading or migrating is appropriate for your organization. The key is to first determine the business objective for the SharePoint 2016 deployment.

Depending on the business objective, requirements for SharePoint 2016's physical and information architecture may fundamentally change. For instance, if SharePoint 2010 is in use today as a collaboration platform with various team sites but your organization wishes to launch enterprise content management and application development initiatives in SharePoint 2016, the architecture will need to be evaluated to determine if it can currently scale to support the new requirements.

If re-architecting SharePoint is a goal for the move to SharePoint 2016, then tools supporting a granular migration approach – allowing for re-architecture in tandem with migration or simply moving content into the desired destination architecture – could be a requirement but is not supported in the native upgrade methods discussed in the following section.

Outside of factors unique to your business, you should also know:

- **SharePoint 2016 does not support in-place or gradual upgrade methods.** You should also be aware that if your current deployment is operating with in-place upgrades, you will need to have all back and front end functionality set to SharePoint 2013 in order to use Microsoft's native upgrade option.

- **Microsoft-provided upgrade options do not allow upgrade beyond a single version of SharePoint at one time.** Organizations that are currently running SharePoint 2010, MOSS 2007, or prior versions of SharePoint must first plan and implement an upgrade to SharePoint 2013 before being able to perform a native upgrade capabilities to SharePoint 2016.

SharePoint 2016 Upgrade Options

Options for migrating from other legacy systems to SharePoint 2016 will be discussed in an upcoming section of this paper. For now, we will examine the various built-in or native upgrade options available. Your upgrade options will depend on the current version of SharePoint you are running today. Again, it's important to remember that Microsoft only provides a direct upgrade path from the previous SharePoint version.

Database Attach: The Native Upgrade

This upgrade option is the native method provided by Microsoft, which involves taking existing content databases, "detaching" them from SharePoint 2013 and "attaching" them to SharePoint 2016. As they are attached, your content databases will be upgraded and the contents of the database made available through SharePoint 2016.

The native upgrade option is only supported from SharePoint 2013. More specifically, it's only supported for SharePoint 2013 environments that have database versions of 15.0.4481.1005 or higher. It also requires that all site collections in each attached database are in SharePoint 2013 mode, which is also known as compatibility level 15.

For those looking at the database attach methods, here are some key technical considerations you should know about the process:

- A new farm must be built and any custom code or third-party solutions that are currently in use should be applied to the new farm.
- Database attach upgrade will not fix any corrupt or orphaned web sites or site collections.
- You can only upgrade from the previous SharePoint version.
- Upgrading is done on a database-by-database basis. You cannot upgrade individual sites or site collections.
- Depending on the speed of your servers – in particular your SQL server(s) – you may be able to upgrade multiple database concurrently. This process is called parallel database upgrade.
- Upgrading to SharePoint 2013 or SharePoint 2016 is done with PowerShell, using the Mount-SPContentDatabase cmdlet.
- You have the option of testing the upgrade using the Test-SPContentDatabase cmdlet. This process does not modify the source database and only reports back on the compatibility of the database against the new farm.
- To help minimize downtime between the source and destination farm, it is common to set databases in the source farm to read-only. This allows users to read content from the source farm while it is being upgraded. This can be done at the database level using SQL Server Management Studio or at the site collection level using Central Administration, provided you set each site collection in the database as read only.

Site Collection Upgrade

As mentioned previously, all sites need to be upgraded to the 2013 version before a SharePoint Server 2013 database can be mounted on a SharePoint Server 2016 farm. The new features in SharePoint

Server 2016 should seamlessly upgrade from your existing 15 mode sites without having go through an elaborate site upgrade process.

SharePoint Server 2016 site collections will always have to be in the latest version when being used as there is no compatibility mode and no “evaluation site” creation or testing required. You must be running the latest version at all times.

There are three options to upgrade a site collection, summarized below:

With Database Upgrade (Default option in V2V upgrades)	Uses the Mount-SPContentDatabase cmdlet to upgrade the databases Uses the Upgrade-SPContentDatabase cmdlet to upgrade the site collections. To delay the sites upgrade, you can use the SkipSiteUpgrade parameter Ideal for databases with small number of sites and for customers who use most of their current sites.
Manual Triggers (Default option in B2B upgrades)	Uses the Upgrade-SPSite cmdlet to manually upgrade the site collections. Ideal for databases with large number of sites and for customers who use only a subset of all their sites.
First Browse (After Database Upgrade)	Sites requiring an upgrade will automatically get upgraded at first browse after database upgrades (always true). Most site collections should complete upgrades in seconds to minutes, depending on size and complexity. During the validation period, the site will be read-only for end users.

Upgrade Considerations

The previous methods noted for upgrading from older versions of SharePoint to SharePoint 2016 assume that organizations have already conducted the steps necessary to ensure their hardware, operating systems, and databases are already up-to-date and ready to support Microsoft’s latest platform release. If not, then there are other actions that must take place prior to any upgrade method. There may be additional steps that need to be taken, depending on the previous configuration and whether this is compatible with SharePoint 2016. Some such scenarios include:

- Upgrading an environment utilizing forms-based authentication
- Migrating from classic to claims-based authentication
- On SQL Server, versions earlier than 2014, SQL Express, or standalone SharePoint installations you will need to upgrade to the minimum database requirement
- Upgrading environments with heavy customizations (for example, custom master pages or CSS) or custom code
- Any SharePoint 2013 14.5 Site Collections effectively running in SharePoint 2010 mode, will need to be brought forward to SharePoint 2013 before they can be migrated to SharePoint 2016. Those SharePoint 2013 sites will then need to be migrated directly to SharePoint 2016 or you can use the database attach methodology.

Consequently, there are also time and space requirements that must be determined before deciding on an upgrade approach such as:

- Overall database size number of SharePoint items
- Hardware (in particular on the database servers)
- Pre-upgrade steps required – including health checks, cleanups or performing backups
- Post-upgrade steps required – including verifying sites, creating service applications, conducting people/search crawls, upgrading site collections, end-user training, leveraging new features such as social
- System downtime communication and coordination with end users

Database transaction logs grow to very large sizes due to the upgrade process being very transaction-log heavy. To mitigate this problem, the recommended practice is to set database recovery level to “Simple” during the upgrade and reset to “Full” upon completion. This can be done using SQL Server Management Studio.

SharePoint 2016 Migration Options

The second option for moving content into SharePoint 2016 is through migration. Whereas upgrade projects are performed using Microsoft’s native upgrade capabilities, migration projects are implemented using other approaches. At the core however, both update content to SharePoint 2016.

Typically, there are three methods by which an organization can perform a migration to SharePoint, be it from previous releases of the platform or from other legacy content repositories: Manual Migration, Scripted Migration, Third-Party Migration Solution. Let’s take a look at these options in more detail.

Manual Migration

This migration method starts with the SharePoint administrator installing SharePoint 2016 on separate hardware, then creating and configuring the new farm. Once the environment is ready, users are tasked with manually moving over their content. In some cases, Power Users or Site Owners are given responsibility for migrating over larger sets of content or recreating new web sites in the destination farm.

With a manual migration, a farm administrator does not have much control over when the migration occurs, which lengthens the amount of time that both environments need to be maintained. In most cases, unless a firm deadline is set and enforced, the migration will drag on indefinitely. In many cases, users must be trained on how to migrate their own data. The migration can cause confusion or frustration as users work with both systems and possibly create duplicate sets of content (e.g. if content is copied from source to destination and both are edited going forward.) There are very few ways to simplify this manual migration effort. Files are usually migrated one by one and subsequently previous versions, audit history, metadata, and permissions are usually lost.

You can review the proper situation, benefits, and potential consequences for a manual migration in Table ID: 4 in Appendix A.

Scripted Migration

In this method, a developer writes the scripts necessary to perform the migration in an automated way. Since SharePoint runs as a platform with rich Application Programming Interfaces (APIs) and PowerShell cmdlets, this is a very robust option. Depending on the legacy source system, the custom script may also integrate with that system to ensure a more complete migration while preserving configuration and content metadata.

While powerful, fully taking advantage of this option requires a developer who is highly skilled in SharePoint development (APIs and/or PowerShell scripting). Since the code is custom, a high degree of testing (whether automated or manual) is necessary to ensure migrated results meet user and organizational expectations. Migrations of this type have been known to take several months of development and testing time, requiring several iterative migrations until the process is honed to a degree where it is fully trusted and runs consistently.

The proper situation, benefits, and potential consequences for a scripted migration can be found in Table ID: 5 in Appendix A.

Third-Party Migration Solutions

In this method, a SharePoint farm administrator will install the new version of SharePoint 2016 on separate hardware or a separate farm. Instead of requiring users to manually migrate content or relying on developers to automate the migration using scripts, a third-party solution is used instead. The steps necessary for migrating from legacy content repositories onto SharePoint 2016 with a third-party solution are similar to the ones necessary for upgrading from prior SharePoint releases. These steps include:

1. Building a generic SharePoint 2016 farm.
2. Installing the third-party migration software. Depending on the vendor and product, this may need to be on both source and destination environments.
3. As needed, mapping all permissions, configurations, and other customizations from legacy repositories.
4. Performing a trial migration.

5. Validating the migration to ensure the proper transfer of content, configurations, and permissions.
6. Adjusting migration settings as needed and re-test.
7. Iteratively performing the migration on live content per a pre-determined migration schedule.

Consider AvePoint's ***DocAve Migrator for SharePoint,*** which enables organizations to conduct full fidelity content migration at the item, subsite, or site level, as well as the opportunity to map legacy content metadata into SharePoint 2016 Managed Metadata. DocAve Migrator also offers a direct migration from SharePoint 2007 or SharePoint 2010 environments to SharePoint 2016, which is unavailable using Microsoft's native upgrade methods.

Companies wishing to migrate content from legacy content repositories can also do so with DocAve, as it supports the following sources:

- Any HTTP/HTTPS-accessible Web content
- Documentum eRoom v6.0 and above
- EMC Documentum v6.5 and above
- Exchange Public Folders
- File Systems
- Lotus Notes v6.5 and above
- Network File Shares
- Open Text Livelink 9.5 and above
- Open Text Vignette up to v7.2
- Oracle Stellent v7.x and above

Using DocAve Migrator as an example, we've created a summation of the different ways in which third party migration software can optimize your migration project.

Migration Process	Third Party Software (ie. DocAve Migrator)
Build a generic SharePoint 2016 farm	DocAve Migrator utilizes organizations' existing infrastructure from a single, Web-based interface. Job configuration and administration can be easily performed through a centralized management console, enabling administrators to access the console interface from anywhere and perform any migration task remotely if necessary.
Install the third-party software	
Map all permissions, configurations, and other customizations from MOSS 2007, SharePoint 2010, or SharePoint 2013 to SharePoint 2016	DocAve Migrator automatically moves content from legacy source SharePoint instances to their mapped elements in SharePoint 2016. Critical information is kept intact, so no data is lost during the transfer. All folder structures, document properties, metadata, and permissions are retained with full fidelity.

	DocAve's Pre-Migration Scanner detects and notifies administrators of any illegal characters, user permissions, user names, user domains, and other legacy elements that must be mapped in order to migrate successfully into SharePoint 2016.
Perform the migration - either Full or Incremental	DocAve Migrator offers the following features for organizations wishing to have control over the method and timing of migration: • Granular or bulk content migration as well as flexible job scheduling ensures administrators can plan migration jobs according to their specific business needs, thereby reducing the impact on functioning production environments. • Live migration offers an on-the-fly, drag-and-drop process for transferring data to SharePoint 2016. Live SharePoint content can be selectively chosen to cut over to the SharePoint 2016 farm instantly, or scheduled in order to minimize the impact on the SharePoint environment. • Reuse existing backups of existing SharePoint environments to upgrade to SharePoint 2016. Administrators then will not have to recreate source content selection, minimizing the migration effort.
Validate the proper transfer of content, configurations, and permissions	DocAve Migrator offers the following features to ensure proper transfer: • Maintain platform co-existence with incremental migration approach to ensure proper transfer of all SharePoint content, configurations, and users before redirecting users to the new platform. • Reorganize or create new folders upon migration to clean up existing clutter. • Rollback capability enables administrators to roll back to the existing SharePoint product environment if the scheduled job does not meet the organization's specific needs. This way, the migration process can be reassessed to ensure a properly-executed migration task with minimal errors.

Migrating vs. Connecting

A very common migration strategy is for organizations to move documents located in file shares on file servers or Network Attached Storage (NAS) devices into SharePoint. While file shares can be migrated into SharePoint 2016 using any of the three migration approaches covered previously, there tends to be a high degree of stale and duplicate content on these systems. Another issue that arises when moving file share content into SharePoint is 10 GB maximum threshold for content hosted on the platform.

You can always use the pre-migration phase of your project to find, classify, and archive stale content, effectively focusing the scope of your file share migration. However, accessing this content may still be imperative to your end users, and as of now there is no way to migrate content to SharePoint above the 10 GB threshold. In either case, two significant problems arise:

1. Cluttering your new environment with duplicate content
2. Requiring end users to access that content from their desktops instead of SharePoint

In contrast, the ability to provide access to file share content through SharePoint allows organizations to reap a number benefits such as versioning, web (HTTP) access (very important for mobile users), and having a single, unified location for all documents.

Recognizing this need, AvePoint provides two solutions that enable organizations to access those features without having to migrate content from legacy file servers.

DocAve Connector presents and manages files (including large media files and documents) via SharePoint without the need to upload or migrating into SharePoint. At a basic level, SharePoint presents file share content to users as though they are stored inside a document library.

Virtually every SharePoint function – including check-in/check-out, versioning, managing permissions, auditing, and metadata – can be applied to these files, even though the files reside in the file share. New files that are uploaded or created are stored in the file share along with the reference pointer that is placed in the SharePoint library. DocAve Connector also supports streaming of video content.

DocAve File Share Navigator is also an option. With DocAve File Share Navigator, users can continue to access content located within file shares from SharePoint (and SharePoint Online through DocAve File Share Navigator Online). However, the full SharePoint feature set such as check-in/check-out and versioning is not available. This is a nimble solution that provides some features unavailable in DocAve Connector such as the ability to preview files without having to download them and a direct link to where externally hosted files live.

To get a better understanding of the differences between content migration and connection software, view Table ID: 6 in Appendix A.

Recommended Migration Methodology

Regardless of which migration method you decide to use, we've created a table outlining the critical activities you will need to perform as you execute your migration.

Activity	Description
Transition of customizations	This activity involves either re-designing, re-coding, or re-building each customization that is required in the target environment.
Content mapping	This activity establishes the alignment between the format and layout of the content in the source environment, and the information architecture in the target environment. Column and content type mappings, templates, filters, and permissions are mapped as a part of this activity.
Migration planning	This activity breaks the migration down into a series of batches or phases to understand the business implications of the migration. It also coordinates the necessary resources, trains the migration team, and schedules all migration activities. It also considers whether data clean-up is required and if so, whether it will occur pre-migration, in-flight during the migration, or post-migration.
Pilot migration	This activity establishes a set of migration scenarios which are representative of the production data set. It then tests each scenario in a non-production environment using a representative sample of data. This confirms the technical feasibility of the migration, identifies any gaps that must be addressed, and provides the migration team to walk through an end-to-end content migration. In addition to the actual migration of content, the "end-to-end" migration tests permissions and access, verifies success, captures and addresses any errors, documents results, and gathers migration statistics. It also provides an opportunity to optimize the migration activities and should include rollback testing.
Production migration	This activity migrates content to the target environment. It is repeated for each batch of the migration.
Testing and validation	This activity validates the success of the migration from the perspective of whether or not the target environment meets the requirements of the business it supports. The results obtained at this time should be consistent with the results obtained during the pilot migration, and any discrepancies can be addressed at this time. This activity is repeated for each batch of the migration.
Synchronization of changes	This activity captures any changes to the source environment that occurs between the initial migration and completion of the user transition, and ensures they are reflected in the target environment. This activity is repeated for each batch of the migration.
Transition of users	This activity involves 'freezing' the source environment, performing one final synchronization of changes, and transitioning users to the target environment so it becomes their primary environment going forward. This activity is repeated for each batch of the migration.

Appendix A: Tables

Table ID: 1

Which SharePoint Service is Right for You?

Option	When to Select	When Not to Select
SharePoint 2016	Organizational policy (e.g. security, data doesn't permit use of cloud services). You have the budget, staff, data center, hardware, and software required to maintain an environment on premises. You don't require aces to SharePoint beyond your organization's walls (e.g. mobile workforce or access for customers and business partners). You have customizations not supported in the cloud.	Data center capacity not available. You are not equipped with a data center at all. You have no available budget for servers, network, storage, and staffing. You require access to SharePoint beyond your organization's walls.
Office 365	You don't have available productivity tools or are using mixed toolsets and want to standardize. You don't want to manage software distribution and updates. Standardized on thin client model to end user computing.	Your policy doesn't permit use of cloud services. You don't require access to SharePoint beyond your organization's walls. You have customizations not supported in the cloud.
SharePoint Online	Your policy permits the use of cloud services. You don't have the budget for staff, data center, hardware, or software. You require access to SharePoint beyond your organization's walls. You don't have customizations or third party software not supported in cloud.	Policy doesn't permit use of cloud services. You don't require access to SharePoint beyond your organization's walls. You have customizations not supported in the cloud.

Hybrid	Your policy permits the use of cloud services. You have budget to maintain status quo but must expand offering. You require access to SharePoint beyond your organization's walls. You have customizations not required to run in the cloud.	

Table ID: 2

Benefits of ISV Solutions

Simplicity	An ISV solution is as simple to use as copy and paste.
Efficiency	You can migrate SharePoint sites, lists, and libraries between servers quickly and with full fidelity.
Active Sources	You can migrate content from live sites and unattached content databases.
Direct Migrations	There is no longer a need to upgrade the on-premises environment to match the version of the hosted service.
Legacy Migrations	You can upgrade directly from SharePoint 2003, SharePoint 2007 and SharePoint 2010 to SharePoint 2016
Re-Architecting	Migrating provides an opportunity to re-organize or re-template your SharePoint content.
Minimal Business Disruptions	You can manage your migrations with zero downtime, no change windows, and no prior planning.
Cost Savings	You can migrate to the cloud or hosted SharePoint environments and thereby reduce infrastructure costs.

Table ID: 3

Min Role Servers

Server Role	Description of Function
Front-End	Service applications, services, and components that serve user requests. These servers are optimized for low latency.
Application	Service applications, services, and components that serve backend requests (such as background jobs or search crawl requests). These servers are optimized for high throughput.

Distributed cache	Service applications, services, and components that are required for a distributed cache.
Search	Service applications, services, and components that are required for searching
Custom	Custom service applications, services, and components that do not integrate with MinRole. The farm administrator has full control over which service instances can run on servers assigned to the Custom role. MinRole does not control which service instances are provisioned on this role.
Single server-Farm	Service applications, services, and components required for a single machine farm. A single-server farm is meant for development, testing and limited production use. A SharePoint farm with the single server-farm role cannot have more than one SharePoint server in the farm.

Table ID: 4

Manual Migration: Benefits and Challenges

Best For…	Benefits	Challenges/Risks
Environments with a very high percentage of content that doesn't need to be migrated. Migrating to SharePoint from a different platform. *(Documentum, Lotus Notes)*	A large number of users helping with the migration may speed up the process. Migrates only relevant content to avoid import of old data. Legacy environment is retained. Virtually no downtime, requiring user switch to new environment.	Manual, resource-intensive process; motivating users and enforcing migration deadlines. Does not preserve prior versions, audit history, item metadata, or unique permissions. Requires willing participants and training. Requires additional steps to retain original URLs Requires new server farm and additional SQL Server storage space for new content

Table ID: 5

Scripted Migration: Benefits and Challenges

Best For…	Benefits	Challenges/Risks
Environments that are highly customized or need very precise migration methods to preserve context between source and destination. Situations where manual or third-party migration are not viable.	Most flexibility in deciding migration details such as what content gets migrated, when, and how. Can be developed to be fully automated without involving users. Legacy environment can be retained. Virtually no downtime, requiring user switch to new environment.	Manual, resource-intensive process; motivating users and enforcing migration deadlines. Does not preserve prior versions, audit history, item metadata, or unique permissions. Requires willing participants and training. Requires additional steps to retain original URLs Requires new server farm and additional SQL Server storage space for new content

Table ID: 6

Migration Solutions vs Integration Solutions

Migration	Integration
Data is available in SharePoint	Data is available in SharePoint
Data is migrated into SharePoint	Data is left in source (legacy) systems
SharePoint replaces the file system	Gives file systems a second life by increasing its value
Burden of storage is on SharePoint (more expensive)	Burden of storage is on file system (more affordable)
Changes are saved in SharePoint content database	Changes to file are propagated back to the source system
Migrate and decommission	Connect and forget

Appendix B: Exclusive Promotion

About AvePoint

AvePoint is the Microsoft Cloud expert. Over 15,000 companies and 3 million cloud users worldwide trust AvePoint to migrate, manage, and protect their Office 365 and SharePoint data. AvePoint's integrated cloud, hybrid, and on-premises software solutions are enhanced by 24/7 support and award-winning services. Organizations across six continents and all industries rely on AvePoint to ease transition to the Microsoft Cloud, increase IT administrator productivity, and satisfy governance and compliance objectives.

A two-time Microsoft Partner of the Year Award winner, AvePoint has been named to the Inc. 500|5000 six times and the Deloitte Technology Fast 500™ five times. AvePoint is a Microsoft Global ISV Partner, Gold Application Development Partner, Gold Cloud Platform Partner, Gold Collaboration and Content Partner, and US Government GSA provider via strategic partnerships. Founded in 2001 and headquartered in Jersey City, NJ, AvePoint is privately held and backed by Goldman Sachs.