Administrator for Office 365 Migration Suite for SharePoint

Performance and Optimization Guide

Legend

⚠ CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

⚠ WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.

ⓘ IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

Contents

Introduction

Administrator for Office 365 Enterprise allow users to migrate their data into SharePoint Online and also to backup both SharePoint and Office 365 data (OneDrive for Business and Exchange Online).

(i) **NOTE: Migration Suite for SharePoint is a migration only version of Administrator for Office 365 Enterprise, so most of the guidance in this document applies to this edition as well.**

This goal of this document is to help provide several best practices for performance optimization around migration and backup using Administrator for Office 365 Enterprise. These topics include: hardware, host, software and network recommendations.

The following should be considered as guidance to optimize performance and throughput using this solution. For information about usage or features of the software, please refer to the User Manual found in the software's Help menu or visit the following links:

> http://documents.software.dell.com/administrator-for-office-365/

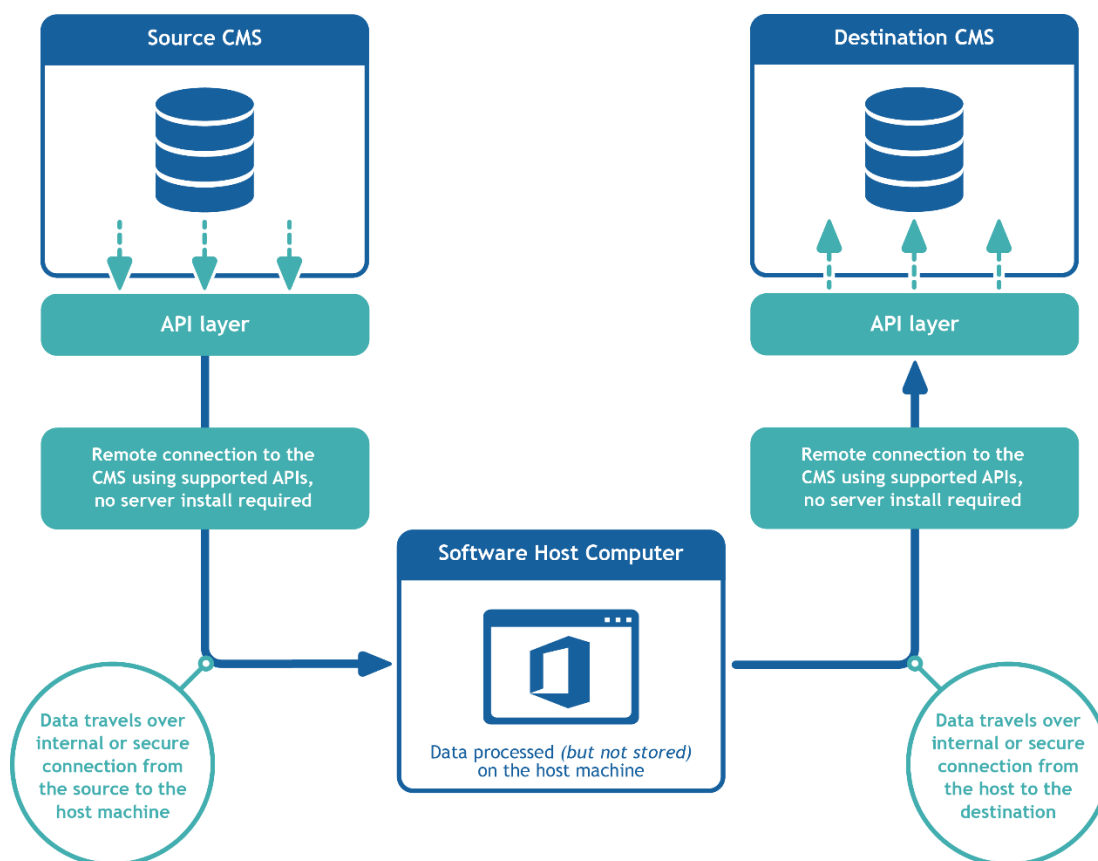> http://documents.software.dell.com/migration-suite-for-sharepoint/

Understanding the Architecture

Before we begin describing methods that can be used to improve migration and backup performance, it is important to briefly understand the architecture of the Administrator for Office 365 solution.

Firstly, the solution is a client side application which means that it needs to be installed to either a physical or virtual computer to run. From this host computer, all operations will be performed and all data will pass through. Think of the software as sitting between your source and destination locations, whether that be an on premise SharePoint you are migrating to SharePoint Online or a OneDrive for Business site in Office 365 that is being backed up to Azure storage.

The diagram below provides a basic example of how Administrator for Office 365 communicates. This simple example places the software between source and destination and highlights the data flow during a migration or backup operation.

Source CMS

API layer

Remote connection to the CMS using supported APIs, no server install required

Software Host Computer

Data processed *(but not stored)* on the host machine

Data travels over internal or secure connection from the source to the host machine

Destination CMS

API layer

Remote connection to the CMS using supported APIs, no server install required

Data travels over internal or secure connection from the host to the destination

As we will discuss a little later, any obstacles or hurdles that sit in the process of this data flow (load balancers, firewalls, antivirus scanners, VPN, etc.) may have a negative impact on throughput. Wherever and whenever possible, we want to establish a path of least resistance.

To summarize, the typical deployment of Administrator for Office 365 is to install it on a host machine that sits between source and destination, allow the source data to pass through this host on its journey to the target. Now, let's begin to explore if this typical deployment is the optimal deployment to maximize performance.

Requirements

If you wish to explore all possible or recommended steps, then be prepared to become close friends with your IT department as permissions or exceptions may need to be granted in a few areas. In general, typical deployments only require minimal permissions on the host machine and lower level SharePoint permissions, however optimized deployments can require slightly more.

Permissions and Security

To begin on the path to optimization, you should be prepared to have local Admin permissions to the host machine, Site Collection Admin permissions to any SharePoint site and possibly permissions to alter or create exceptions in any antivirus scanner, firewall or load balancer in your network. Please discuss with your IT department before making any changes as Dell Software cannot provide support for any issues that may have resulted from an improper or unauthorized modification outside of the Administrator for Office 365 software.

Hardware Recommendations

The first consideration and the lifeblood of all software is the hardware in which it is running on and this is where your first optimization decision is made; physical vs virtual vs cloud. From a software perspective, Administrator for Office 365 can be installed and run from any of those environments without sacrificing functionality however which one is ideal depends on your environment and requirements.

Physical vs Virtual vs Cloud

The general rule is to install the Administrator for Office 365 software closest to your data repositories. For example, if you are migrating from a SharePoint on-premises to SharePoint Online, deploy Administrator for Office 365 closer to your source within your network. If you are migrating Google Drive to OneDrive for Business, consider deploying Administrator for Office 365 to a cloud computing service like Azure or Amazon EC2 where the benefit of not downloading and uploading through your network can be realized. Keep in mind cloud computing can be a costly operation when considering this an option.

> **NOTE:** If you do explore the option of cloud computing in Azure be sure to provision your Azure instance in the same data region as your Office 365 tenant. If you are unsure about your tenant's region, please contact Microsoft support for assistance.

Computer Specifications

Regardless of your hardware location, machine specs are also of importance and can be broken into four basic categories; CPU, memory (RAM), hard disk space and network.

- CPU: Recommendation is any "modern" dual core 64-bit CPU with hyper threading enabled. Most CPUs manufactured in the past 3 years will be more than sufficient.
- Memory: We recommend having at least 4GB of available memory on this hardware. Available memory meaning memory not being consumed by other processes rather than total amount of physical memory installed. You may have 4GB installed on the hardware, but other processes like Windows may consume 50% or more of that amount. This will be crucial when talking about multi-threaded or parallel operations in the coming sections.
- Hard Disk Space: While the data during a migration is only stored temporarily, other dependencies like installation, logs and backup data can consume disk space. Please be sure that at least 10GB of disk space is available to be consumed by Administrator for Office 365. If disk space reaches zero, expect performance and other issues. If you are creating a backup, make sure you have enough disk space (local or cloud) to store the totality of your backup plus an additional 5% for overhead.
- Network: The faster the better. Any stable connection will do, but a fast 1Gbps hard wired network connection is ideal.

Host Recommendations

Now that the hardware is setup and ready to go, let's discuss the host configuration. When we mention "host", we are talking specifically about the computer that Administrator for Office 365 is installed to and any software settings or configurations that can affect performance.

64-bit Architecture

Windows 64-bit architecture is strongly recommended due to the advancement in memory allocation over 32-bit. A 64-bit architecture will allow memory allocation to the Administrator for Office 365 software greater than the 1.5GB maximum from old, so please be sure that both your hardware and software are 64-bit compatible.

Network Connection

We mentioned it the Hardware section and we will mention here again, a stable network connection is important. Avoid at all costs any migration or backup over VPN or unstable Wi-Fi connections. If you login using a VPN and notice frequent lost connections or slowdowns, don't expect these operations to work any more smoothly for you.

Antivirus Scanners and Exceptions

Antivirus scanners, an unfortunate reality of today's world. These applications are great for keeping bad things out, but not so great when you are running operations that move large amounts of data quickly (i.e. migrations and backup). If at all possible, disable all antivirus and malware scanners that are actively monitoring this host machine. If a complete disable is not possible, please strongly consider adding exceptions to the following locations:

- Administrator for Office 365 Enterprise installation directory. By default, this is C:\Program Files\Dell\Administrator for Office 365 or C:\Program Files (x86)\Dell\Administrator for Office 365
- Administrator for Office 365 Enterprise workspace directory. By default, this is C:\Users\{UserDirectory}\Dell
- Administrator for Office 365 Enterprise temporary directory. By default, this is C:\Users\{UserDirectory}\AppData\Local\Temp
- Administrator for Office 365 Enterprise backup location. If you are storing backups locally, please add this location(s) to the exception list as well.

Other Software

This should go without saying, but if possible please dedicate the entire host machine to running the migration and/or backup only. If you are running the Administrator for Office 365 software on your laptop while you are also running Outlook, web browser sessions or any other software, they will all compete for system resources

thus leading to performance degradation. Whenever possible, the minimal amount of software should be running on the host.

Deployment Location

Earlier in the Architecture section we outlined how Administrator for Office 365 sits "between" source and destination repositories, but that may not always be the optimal deployment. Although Administrator for Office 365 operates as a "no server side" install piece of software, there may be instances when installing it to your source or destination server or SharePoint WFE may provide a substantial performance increase. If you reference the Architecture diagram, you will notice the data flows from source through Administrator for Office 365 (on the host) and then ultimately to the destination, but what if Administrator for Office 365 was deployed on to the source or destination directly? That would minimize one entire network transfer from the operation leading to a more direct source to destination content move. As you can imagine, in some environments this can lead to very impressive performance gains and if possible, one of our more strongly recommended configurations.

Administrator for Office 365 Configuration

Moving on past the hardware and host, we arrive at the software itself and how best to configure Administrator for Office 365 to optimize performance.

Threads and Parallel Operations

Multi-threading and parallel operations are key ingredients to an optimal performance driven migration or backup, but that comes with caveats. The more operations that are being processed in parallel (either using threads or parallel jobs) the more resources that are consumed. This means CPU cycles, large amounts of memory, disk space and network traffic, so if you want to push this area please be sure not to skimp out on the earlier hardware recommendations.

Memory Allocation

Memory allocation to Administrator for Office 365 is vital to a successful multi-threaded or parallel run operation. Each instance of the software will consume additional memory and each additional thread has the potential to do so as well. Please be conscious of the relationship between the total amount of system memory physically available on your host machine, how much is being consumed by other resources and how much is left to allocate to Administrator for Office 365. We do not recommend allocation more than 50% of total physical system memory to the application. This is certainly an area where trial and error may be required to find the ideal spot between optimization and overreach, but using a 50/50 ratio is a good starting point to begin.

- To configure the amount of memory allocated to Administrator for Office 365, please go to Help > Profile Manager > Memory Management. Please note that an application restart is required after modifying this value.
- To configure increased thread count for operations, please go to Help > Profile Manager >Global Variables and change the value in the Max Threads for Copy field. Please note that an application restart is required after modifying this value.

> (i) **NOTE: When adjusting Memory Allocation please be aware that this will be the amount of memory consumed for every running instance of the application on this host computer. For example, if you configure 4GB of memory and run 3 parallel instances (i.e. scheduled backups), the combined total memory consumption of all instances is now up to 12GB. This may be much more than what is available on your host machine and can lead to an increased number of failed events, premature termination, failed jobs or any number of related issues. Administrator for Office 365 is designed to consume as much resources as possible to maximize performance and responsiveness per instance, so in some cases running multiple operations (threads) in a single instance is preferable to running a single operation in multiple, concurrent instances.**

A quick example to determine memory allocation would be to take the total physical amount of memory on your host machine and divide that in half. Then divide that remaining value by the number of concurrent instances (migration or backup) that you wish to perform. The remaining value is what you should use as a starting point for the Memory Allocation value.

16GB / 2 = 8GB of usable memory.

8GB / 3 concurrent or parallel instances (migration or backups) = 2.67 GB rounded down to 2560MB.

In this example, your starting point would be to select 2560MB for memory allocation and since that is more than a 32-bit application permits, please be sure to take advantage of 64-bit architecture.

SharePoint and Office 365 Permissions

A quick mention to make sure you are providing the software with an adequate level of permissions for all SharePoint and Office 365 operations. If the user account provided does not have access to certain locations or objects (sites, lists, mailboxes, groups, etc.), this will result in any number of failures and connection issues which will decrease performance. When possible, always provide the highest level of permissions available, this means Site Collection Admin for SharePoint and Global Administrator for Office 365.

Scripts and Schedules

Scripting and potentially scheduling operations provide essential benefits to a migration and backup plans but they also have the added benefit of minimizing resource consumption. If the software's user interface is not being rendered, refreshed with a progress bar or status, caching elements and everything else that comes with displaying a view, then that is less resources that are being consumed on the host. Less resources for a visual presentation means that more resources can be used for the operation. Please remember the previous section where issues may arise if too many concurrent instances or parallel operations are running.

Azure Turbo Mode (migration only)

When performing a migration into SharePoint Online or OneDrive for Business in Office 365, the use of the Azure Turbo Mode option can provide a measurable (in most cases) performance increase for minimal configuration time and effort. Please review the Azure Turbo Mode section of the user manual to learn more about what is does and how it is configured.

Migration and Backup Options (less can be more)

Like most people who are presented with a series of checkbox options, I tend to check them all, unless of course there is a cost associated to them. However, when trying to squeeze out every last bit of optimization from a backup or migration you should be aware that the more options included, the more operations and processing that takes places and unfortunately the longer it will take to complete. Therefore, it is important to understand all the available options, what they are designed to do and whether or not they are critical to the success of your project. If they are not, then you may consider leaving a few unchecked (as much as this may pain you to do so).

Here is a small list of a few options that can take a considerable amount of time to complete:
- Design and Master Page customizations (migration)
- Include All Mailboxes or Include All OneDrive for Business sites (backup)
- Include All Versions (migration and backup).
- Item level permissions (migration or backup)
- SharePoint Designer Objects (migration)

Network Recommendations

Continuing on to the next part takes us to your network, which in most cases can mean your internet connection. If you are migrating to or backing up from Office 365 then all that data is obviously traveling through your internet connection. If you have a maximum download or upload connection through your Internet Service Provider of 10Mbps, then it is not realistic to expect you will have any performance or throughput greater than that number. Time tables and expectations need to be set appropriately based on how much data can be uploaded or downloaded using the internet connection provided.

Off Peak

Because highly optimized migrations and backups can and will consume as much network traffic as they are allowed, it is important to understand what level of impact this may have on your business during normal hours. If you are attempting a migration during peak business hours, there may not be enough bandwidth available to maximize performance or worse it may consume precious little bandwidth available and have a negative impact on your daily business operations. Therefore, time of day as well as network considerations should be taken into account before any operation is started. If you want to take full advantage of your network or internet connection, then scheduling for off peak or after hour is ideal and strongly recommended.

Firewalls and Load Balancers

Earlier on we briefly discussed hurdles and obstacles between source, host and destination and the potential impact they may have on moving content. The more that stands between these systems, the more time and potential negative impact it will have on throughput. While we are not suggesting to open your network "free and clear" to the internet, we are recommending that you bypass or add exceptions to as many of these hurdles as safely as possible. It can be quicker and more efficient to go around a firewall or balancer then through it in some configurations. As always, consult with your IT department first before making any changes.

Content Data Flow

This is a good place to remind you that the Architecture of the software means that your content (migration or backup) will travel through the Administrator for Office 365 as it is deployed on its host machine. Keep that in mind when you are looking into your network bandwidth. If you are backing up a SharePoint Online site to Amazon S3 storage, that content is being downloaded to the host machine (temporarily) and then uploaded to your Amazon S3 storage, so both download and upload operations to consider for bandwidth allocation.

Frequently Asked Questions and Scenarios

Here is a collection of questions and scenarios that users have sent us over the years.

Q: How many copies of Administrator for Office 365 can I run at one time? Is there a performance benefit?

A: You can run as many copies (instances) as your host system can support, however it is important to understand the host's limitations (CPU, memory, hard disk space, network bandwidth) before running additional instances. While it can provide a performance increase, the preferred approach would be to run parallel operations within the same, single instance of Administrator for Office 365 as resources can be conserved and allocated as required.

Q: Does running more than one copy of Administrator for Office 365 cause instability?

A: It can if the host computer runs low on system resources. When Windows runs low on resources (memory, disk space, etc.) this software like any other can become unstable or unresponsive. If you plan to run multiple, concurrent instances please be conscious of the resource availability on the host.

Q: For memory allocation, how much is enough? How much is too much?

A: For maximum performance, as much as you can allocate using the following guidelines. Do not exceed 50% of the total physical memory in the host. If the host machine has 8GB of total memory, do not allocate more than 4GB to Administrator for Office 365. And remember, if you run 2 instances of Administrator for Office 365 configured with 4GB of memory, then you may actually consume a total of 8GB which is 100% of the host's total resources. This can and probably will lead to instability.

Q: How many parallel operations can I run in a single instance? Is there a performance gain from this configuration?

A: Similar to running several copies of Administrator for Office 365, a performance gain is certainly possible. Multi-threaded operations like these are the preferred method since the software can better handle the resource consumption of the host. You still need to be conscious of the total resource availability, however the software will not consume more than what it has been configured.

Conclusion

This guide is designed to provide you with a "self-service" approach to answering some frequently presented scenarios we have encountered over the years. Due to the complex nature of everyone's unique environmental configuration we cannot possibly address every situation, although we do hope it serves as a valuable resource to improve your migration and backup performance or at least help you consider some area that you may have otherwise overlooked.

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Contacting Dell

For sales or other inquiries, visit http://software.dell.com/company/contact-us.aspx or call 1-949-754-8000.

Technical support resources

Technical support is available to customers who have purchased Dell software with a valid maintenance contract and to customers who have trial versions. To access the Support Portal, go to http://support.software.dell.com.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. In addition, the portal provides direct access to product support engineers through an online Service Request system.

The site enables you to:

- Create, update, and manage Service Requests (cases)
- View Knowledge Base articles
- Obtain product notifications
- Download software. For trial software, go to http://software.dell.com/trials.
- View how-to videos
- Engage in community discussions
- Chat with a support engineer