Master Veeam Tricks

Volume 1

By Veeam Vanguards:

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Foreword by: Rick Vanover aka RICKATRON

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Foreword by: Rick Vanover

The idea for this book started on a whim, and the community delivered. A quick request to Dave and Cristal Kawula to share some community insights to the gathering of the Veeam Vanguards — and this book idea was born. I'm honored to write the forward to this book for a number of reasons. The first is that I love that the Vanguards stepped up to contribute to this book. The second is that there is a gap in books about Veeam technologies. And the third is that the work to get this book out will be light, the Vanguards know their stuff.

The Product Strategy Technology team at Veeam casually refers to the Vanguards as the Vannies, and the Vannies are one of the most visible aspects of our team.

The idea of this book is great — a collection of tips from the best. This is just another resource for the community to benefit from. The topics covered will outline how to use Veeam products, as well as practical ways to go about using features and seeking performance gains along the way.

Veeam products are inherently easy to use and required to be that way right from our co-founder. However, there is a need for advanced use cases. In fact, this is an interesting characteristic for one backup product (especially for virtual machines) that can work with the smallest and largest enterprises. It is one of those scenarios where the smallest organizations can indeed just "throw it in" and have a good experience, but the largest deployments do not enjoy the same flexibility due to requirements, size of data, and the amount of time involved to move data.

This book will guide readers through use cases, providing perspective from experts who have gone through many situations with Veeam products. One other interesting aspect about the Vannies is that many of them are some form of Veeam partner. Veeam has partnerships in its DNA. Whether it is a reseller partner, a technology alliance partner, a service provider partner, an integration partner, a service partner or a distribution partner (and there are more!) — the Vannies bring perspectives bigger than just their own.

As you read this book, engage with the authors. They are active on social media. They are very approachable, and they will respond to you. This is one of the key aspects of the Vannies; they are stewards of what the Product Strategy Technology team drives in the community — and one of the reasons this group continues to keep Vanguard status.

Each Vannie comes in their own way. I know Dave Kawula well, but differently than the others who contribute to the content. I also challenge that you too can nominate to be a Veeam Vanguard. Look for the nominations to be open on the Veeam blog and on social media.

I will leave you where I started, honored to write this forward. Engage with the Vanguards, share your feedback (critical for subsequent volumes!), and go forth with better usage of Veeam products in your environment.

Respectfully,

Rick W. Vanover

Director Product Strategy, Veeam Software

Acknowledgments

From Dave

Cristal, you are my rock and my source of inspiration. For the past 20 + years you have been there with me every step of the way. Not only are you the "BEST Wife" in the world you are my partner in crime. Christian, Trinity, Keira, Serena, Mickaila, Mackenzie, and Rycker you kids are so patient with your dear old dad when he locks himself away in the office for yet another book. Taking the time to watch you grow in life, sports, and become little leaders of this new world is incredible to watch.

Thank you, Mom and Dad,, (Frank and Audry) and my brother Joe. You got me started in this crazy IT world when I was so young. Brother, you mentored me along the way both coaching me in hockey and helping me learn what you knew about PCs and Servers. I'll never forget us as teenage kids working the IT Support contract for the local municipal government. Remember dad had to drive us to site because you weren't old enough to drive ourselves yet. A great career starts with the support of your family, and I'm so lucky because I have all the support one could ever want.

Last but not least, the MVPDays volunteers, you have donated your time and expertise and helped us run the event in over 20 cities across North America. Our latest journey has us expanding the conference worldwide as a virtual conference. For those of you that will read this book, your potential is limitless just expand your horizons, and you never know where life will take you.

About the Authors

Dave Kawula – MVP / Veeam Vanguard

Dave is a Microsoft Most Valuable Professional (MVP) with over 20 years of experience in the IT industry. His background includes data communications networks within multi-server environments, and he has led architecture teams for virtualization, System Center, Exchange, Active Directory, and Internet gateways. Very active within the Microsoft technical and consulting teams, Dave has provided deep-dive technical knowledge and subject matter expertise on various System Center and operating system topics.

Dave is well-known in the community as an evangelist for Microsoft, 1E, and Veeam technologies. Locating Dave is easy as he speaks at several conferences and sessions each year, including TechEd, Ignite, MVP Days Community Roadshow, and VeeamOn.

Recently Dave has been honored to take on the role of Conference Co-Chair of TechMentor with fellow MVP Sami Laiho. The lineup of speakers and attendees that have been to this conference over the past 20 years is fantastic. Come down to Redmond or Orlando in 2018, and you can meet him in person. Checkout his speaking site at www.davekawula.com

He recently tied for 1st place out of 1800 speakers at the Microsoft Ignite Conference in Orlando.

As the founder and Managing Principal Consultant at TriCon Elite Consulting, Dave is a leading technology expert for both local customers and large international enterprises, providing optimal guidance and methodologies to achieve and maintain an efficient infrastructure.

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Cristal Kawula – MVP / Veeam Vanguard

Cristal Kawula is the co-founder of MVPDays Community Roadshow and #MVPHour live Twitter Chat. She was also a member of the a Technical Advisory board and is the President of TriCon Elite Consulting. Cristal is also only the 2nd Woman in the world to receive the prestigious Veeam Vanguard award.

Cristal can be found speaking at Microsoft Ignite, MVPDays, and other local user groups. She is extremely active in the community and has recently helped publish a book for other Women MVP's called Voices from the Data Platform.

This year at Microsoft Ignite she lead community meetups for various topics such as: Women in IT, Parenting in IT, Diversity in Tech, and becoming a Community Rockstar.

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Ian Sanderson – VMware vExpert / Veeam Vanguard

Ian has over 15 years' experience working with Windows server and virtualisation technology supporting organisations of varying size. Ian cut his teeth in the virtualisation space using Hyper-V 2008 but has been primarily focused on the VMware stack since 2010.

Ian is a Veeam Vanguard, vExpert and a member of NetApp United as well as being one of the Veeam User Group UK leaders and can be found presenting at events round the UK.

Ian can be found on social media at the following locations:

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Blog: https://www.snurf.co.uk

Veeam User Group UK: https://veeamug.uk/

Karl Widmer – VMware vExpert / Veeam Vanguard

Karl is a Veeam Vanguard and VMware vExpert with 15+ years of experience in the IT industry. He started his career as an IT support technician and worked for several years at small IT company with many vendor partnerships.

After a year in the military (Swiss national service with the achievement of the officer rank) he went back to the IT, to be more precisely to a software vendor and was responsible for the internal IT systems and support for several years.

However, Karl wasn't a software-type of guy. He liked, and still likes, to get the hands-on the hardware. So he switched the job again after several years, back to the hardware sector, again at an IT support company. He worked the ladder up from an IT supporter to the Engineering and was responsible for the biggest customers of that company. All kinds of support, up to cloud offerings and virtual infrastructure went over his desk.

After many years of customer support and consulting he decided to switch the job again, but this time he went to the customer side. At a global acting company, Karl is now responsible in the virtualization team for all things about the cloud, from private to public cloud, and also for everything that he calls «basic infrastructure» like on-premises HCI systems and ESXi hosts.

Karl is also very active in the vCommunity as a VMUG leader, he writes blog posts with a focus on products from Veeam and VMware, and also for solutions if there is an issue to solve. He has been awarded twice Veeam Vanguard and also VMware vExpert, and he holds several certifications in IT.

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Rhys Hammond – VMware vExpert / Veeam Vanguard

My name is Rhys Hammond, and this blog is a collection of tips and tricks for solving issues that I've encountered designing, installing and supporting Veeam solutions for various clients.

I learned early on that what motivates me is working with technologies and products that I truly believe in. I am truly passionate about helping organizations make the most of the best backup & disaster recovery product available today.

Currently, I am working at Data#3 as a Senior Systems Engineer specializing in Veeam solutions. One of my goals is to help the IT community understand more of what Veeam can offer, as part of that effort, I maintain https://rhyshammond.com, a Veeam and Virtualization-centric weblog providing information, insight, and technical knowledge on all things Veeam related.

In 2017, I was awarded VMware VExpert for having demonstrated significant contributions to the community and a willingness to share expertise with others. VMware grants the VExpert as an honorary title for advocates of the company's products.

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Markus Kraus – VMware vExpert / Veeam Vanguard

Markus is living the IT Pro live since more than 10 years as a consultant, Architect and Systems Engineer. He is focusing on virtualization and automation technologies. In addition to his second Vanguard nomination, he was 2016-2018 awarded as a VExpert.

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Mike Conjoice – VMware vExpert / Veeam Vanguard

Mike is a Veeam Vanguard and vExpert with over 17 years' experience in IT. Working from the humble beginnings of a helpdesk, Mike has worked at a range of companies, from Start-ups, to Multinational Corporations.

Mike's experience is primarily in the Microsoft ecosystem, moving through Infrastructure, Unified Comms, and now to Azure. He has a strong passion for PowerShell and will automate as much as he can throughout the day.

Mike now works as a Solution Architect at Bupa Dental Care, one of the UKs largest dental chains, helping lead the strategy and architecture design for the business through a vast change of Digital Transformation.

Along with his technical work, Mike has a love of teaching and sharing knowledge, speaking at many events across the globe, including VeeamON and Gartner in not only technical sessions, but business and strategy forums.

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Craig Dalrymple – VMware vExpert / Veeam Vanguard

With over 25 years experience within the IT industry, Craig Dalrymple is one of the original members of the Veeam Vanguard program and was select as VMware vExpert 2018.

Craig has been involved with implementing and providing support for systems ranging from the early days of x386 to present day, with a background predominantly in field engineering. Nowadays dealing primarily with virtualization technologies.

Craig is also one of the founding leaders of the Veeam User Group UK and can be found presenting at these events from time to time.

Away from technology Craig helps run the vGamers discord channel and on the odd occasion can be found playing a game of rugby now and then.

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Didier Van Hoye – MVP / Veeam Vanguard

Didier Van Hoye is an IT veteran with over 20 years of experience and accumulated hands on expertise in ICT. He specializes mainly in Microsoft technologies (storage, virtualization, networking, cloud) to design and build highly available, high performance solutions that scale both efficiently and effectively without breaking the budget. He works mainly as a subject matter expert advisor and infrastructure architect in Wintel & Hybrid Azure environments, often leveraging DELL EMC hardware to deliver exceptional value for the money. As a Microsoft MVP in Cloud and Datacenter, a member of the Microsoft Extended Experts Team in Belgium, a DELL TechCenter Rockstar and a Veeam Vanguard he contributes his experience and knowledge to the global community. He's a trusted adviser, blogger, writer and public speaker on his areas of expertise.

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Eugene Kashperovetskyi – MVP / Veeam Vanguard

Affectionately known as Eugene K, is a highly experienced web hosting professional with over a decade of hosting solutions support, design, implementation and automation, primarily focused on Cloud Platforms, Business Continuity and Security Services at INAP. Whether performing minor system optimizations or handling big projects with different unknowns involved, Eugene believes there is always a way to make it run smoothly, seamlessly and at a high rate of automation applied for routinely performed operations. He likes to be challenged with the tasks and do the research to approach the goal desired.

Technical Editors

Emile Cabot - MVP

Emile started in the industry during the mid-90s working at an ISP and designing celebrity web sites. He has a strong operational background specializing in Systems Management and collaboration solutions and has spent many years performing infrastructure analyses and solution implementations for organizations ranging from 20 to over 200,000 employees. Coupling his wealth of experience with a small partner network, Emile works very closely with TriCon Elite, 1E, and Veeam to deliver low-cost solutions with minimal infrastructure requirements.

He actively volunteers as a member of the Canadian Ski Patrol, providing over 250 hours each year for first aid services and public education at Castle Mountain Resort and in the community.

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Cary Sun – Microsoft MVP / Cisco Champion

Cary Sun is CISCO CERTIFIED INTERNETWORK EXPERT (CCIE No.4531) and MCSE, MCIPT, Citrix CCA with over twenty years in the planning, design, and implementation of network technologies and Management and system integration. Background includes hands-on experience with multi-platform, all LAN/WAN topologies, network administration, E-mail and Internet systems, security products, PCs and Servers environment. Expertise is analyzing user's needs and coordinating system designs from concept through implementation. Exceptional analysis, organization, communication, and interpersonal skills. Demonstrated ability to work independently or as an integral part of a team to achieve objectives and goals. Specialties: CCIE /CCNA / MCSE / MCITP / MCTS / MCSA / Solution Expert / CCA

Cary's is a very active blogger at checkyourlogs.net and always available online for questions from the community. He passion for technology is contagious, and he makes everyone around him better at what they do.

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Introduction

North American MVPDays Community Roadshow

The purpose of this book is to showcase the fantastic expertise of our guest speakers at the North American MVPDays Community Roadshow. They have so much passion, expertise, and expert knowledge that it only seemed fitting to write it down in a book.

MVPDays was founded by Cristal and Dave Kawula back in 2013. It started as a simple idea; "There's got to be a good way for Microsoft MVPs to reach the IT community and share their vast knowledge and experience in a fun and engaging way" I mean, what is the point in recognizing these bright and inspiring individuals, and not leveraging them to inspire the community that they are a part of.

We often get asked the question "Who should attend MVPDays"?

Anyone that has an interest in technology is eager to learn and wants to meet other like-minded individuals. This Roadshow is not just for Microsoft MVP's it is for anyone in the IT Community.

Make sure you check out the MVPDays website at www.mvpdays.com. You never know maybe the roadshow will be coming to a city near you.

The goal of this particular book is to give you some fantastic Veeam tips from the amazing Veeam Vanguard Community. Each chapter is broken down into a unique tip, and we hope you find some immense value in what we have written.

Sample Files

All sample files for this book can be downloaded from www.checkyourlogs.net and www.github.com/mvpdays

Additional Resources

In addition to all the tips and tricks provided in this book, you can find extra resources like articles and video recordings on our blog http://www.checkyourlogs.net

Chapter 1

Upgrading a Veeam Backup Repository from Server 2016 to Server 2019 + ReFS DeDuplication

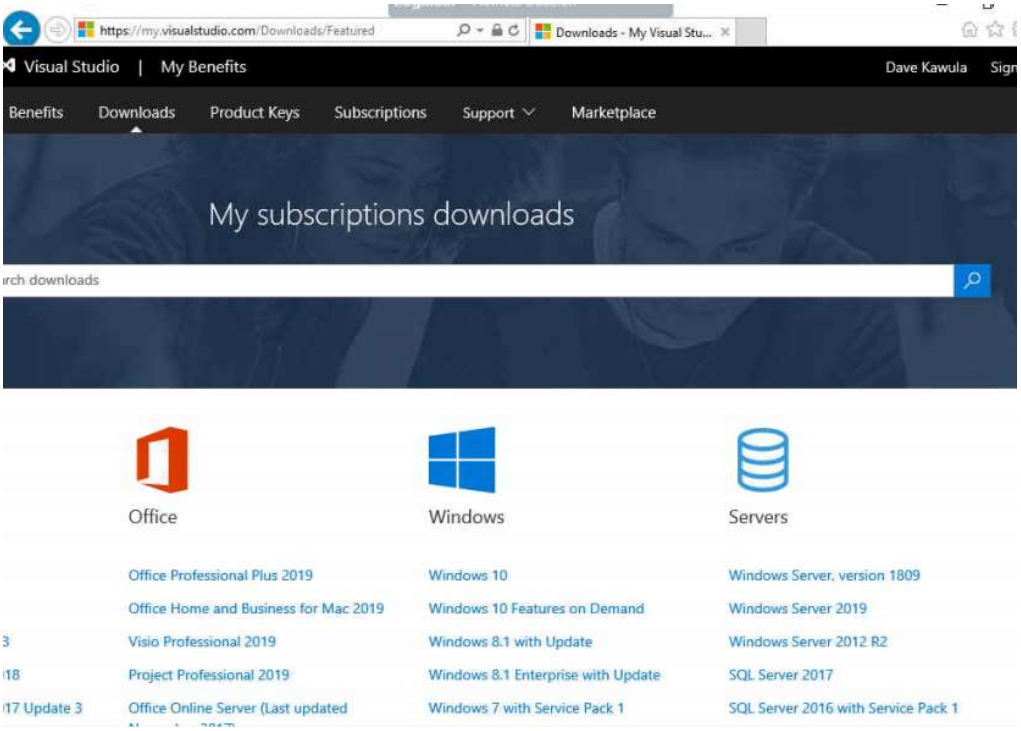
By: Dave Kawula (Microsoft MVP / Veeam Vanguard)

I was working with a customer today, and we are finally ready to upgrade our primary Veeam Backup Repository that is running Microsoft Storage Spaces on Windows Server 2016. The new Operating System will be Windows Server 2019 LTSC, and the whole point of this upgrade is to allow us to use ReFS + Deduplication.

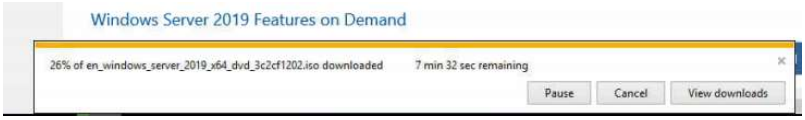
The Deduplication feature is now supported in the LTSC builds of Windows Server and the purpose of this post today is to show you how to upgrade the OS Drives, Install the Deduplication Feature, Enable it and test.

Upgrading to Windows Server 2019

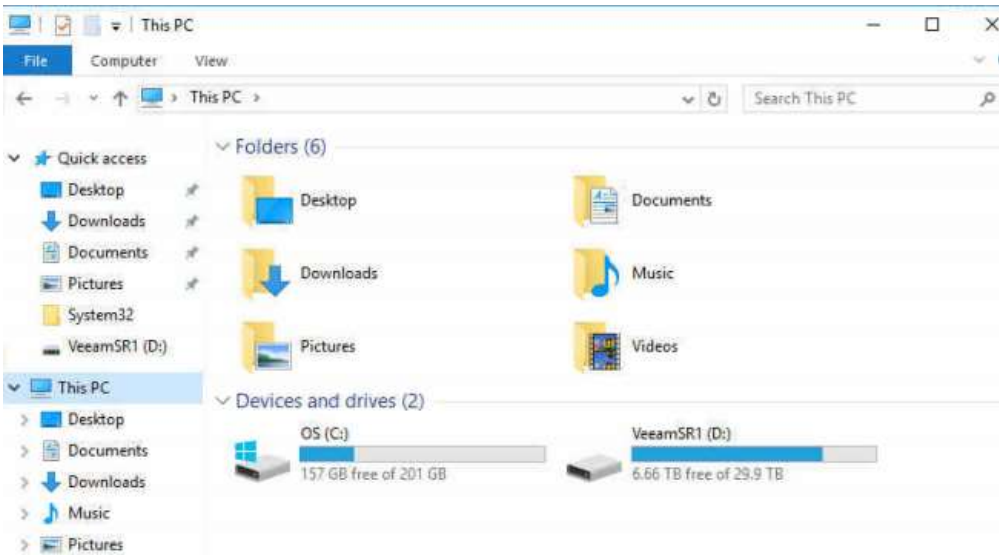
1. Download the media from your Volume License Site (VLK)



2. Mount the ISO in the Target system that you want to be upgraded.

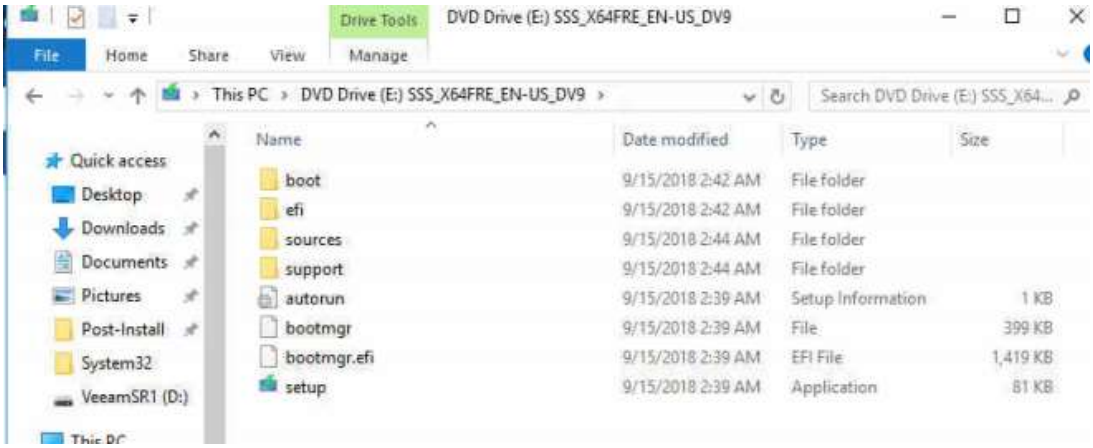


3. Before we pull the trigger on the upgrade, have a look at your Storage Pool's Virtual Disk for a before picture.

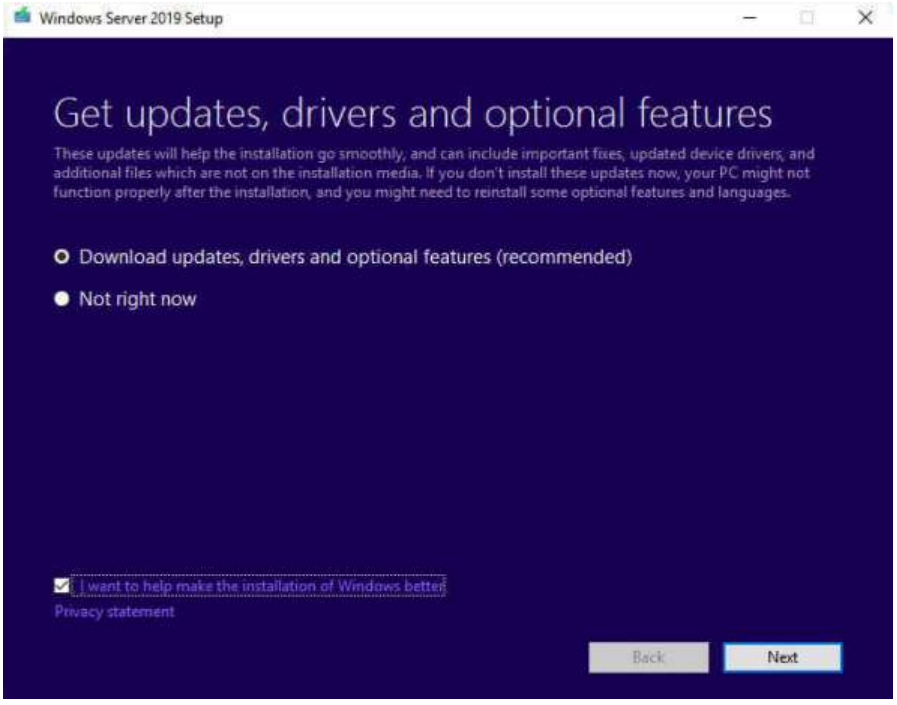


As you can see we have 6.66 TB of 29.9 TB free. We have this Storage Pool setup in a 3-Way Mirror for maximum performance for the Veeam Backup Repository.

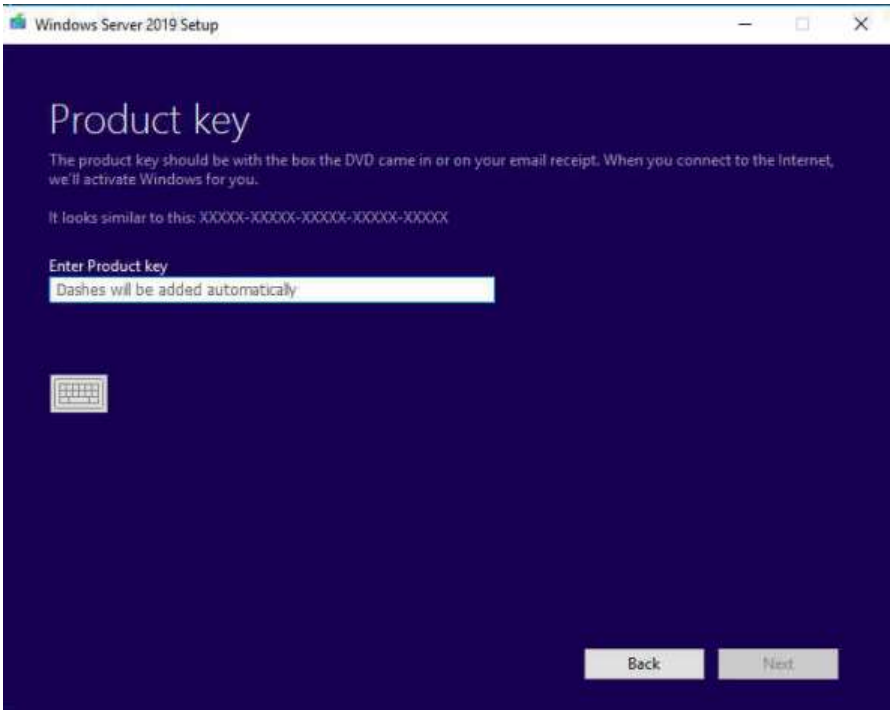
4. Run Setup.exe locally to start the upgrade



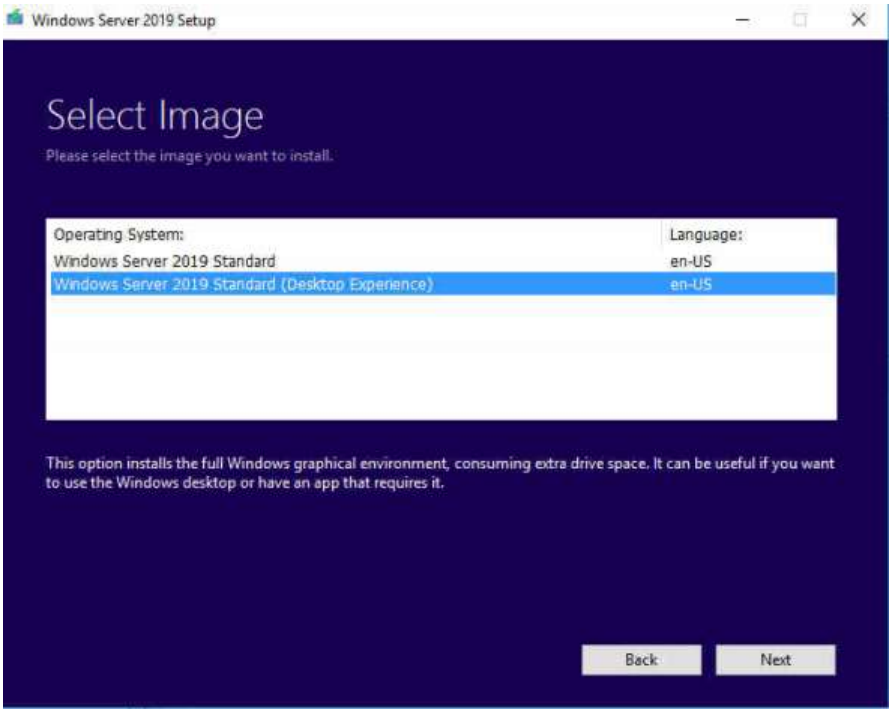
5. Choose Download updates, Drivers, and optional features (Recommended) and select I want to help make the installation of Windows Better checkbox



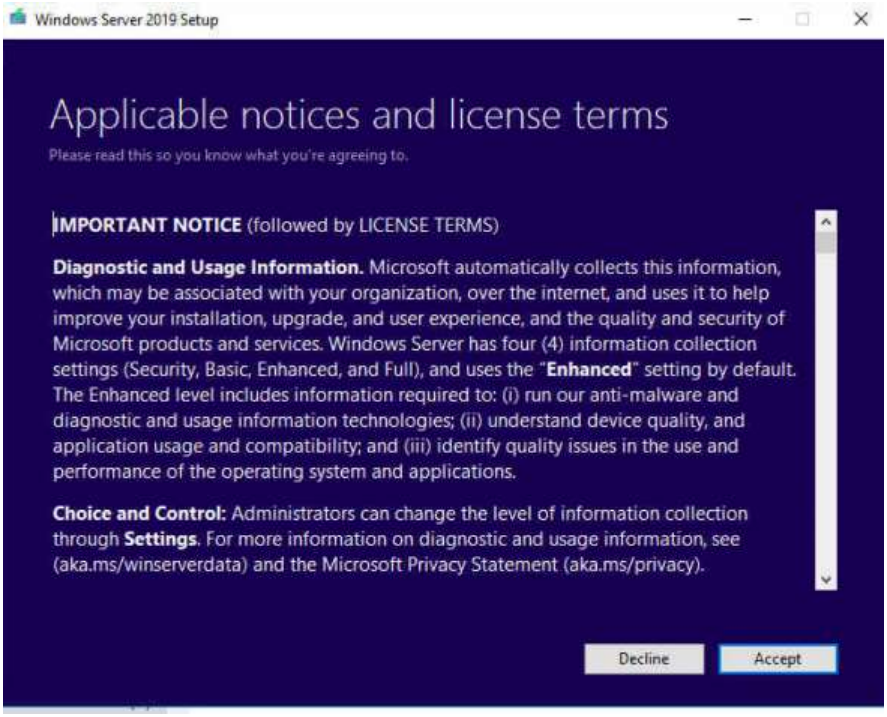
6. Enter your product key



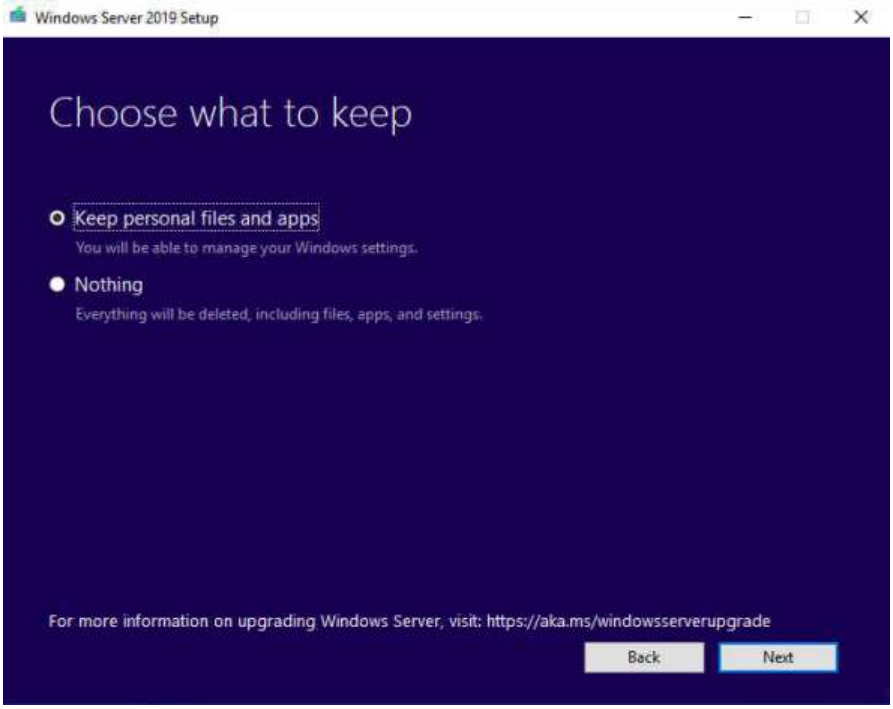
7. Choose your edition



8. Accept the License Agreement

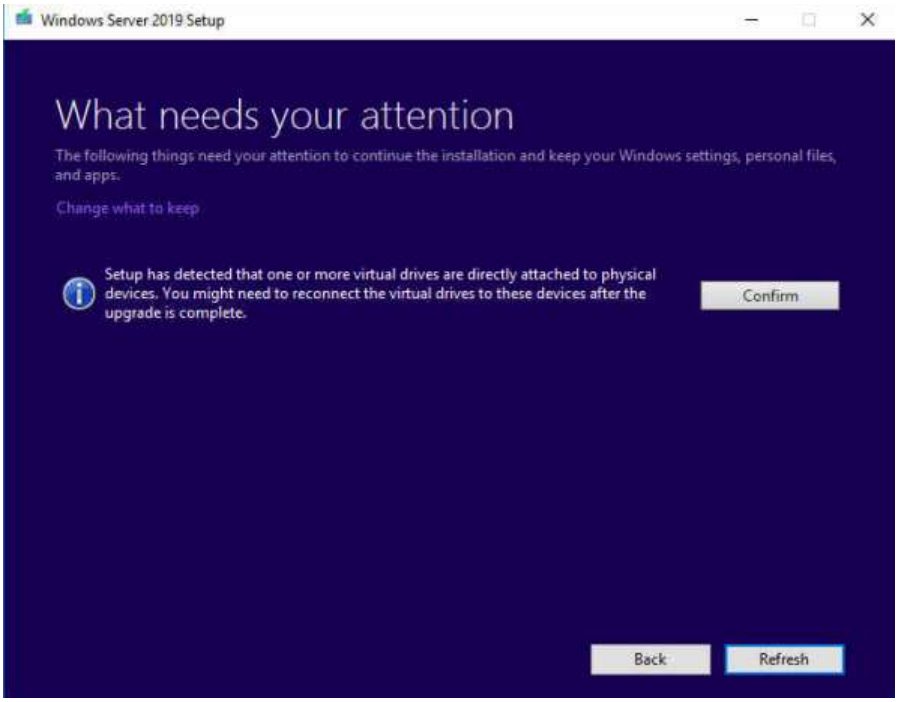


9. Select **keep personal files and apps** (These means do you want to upgrade)

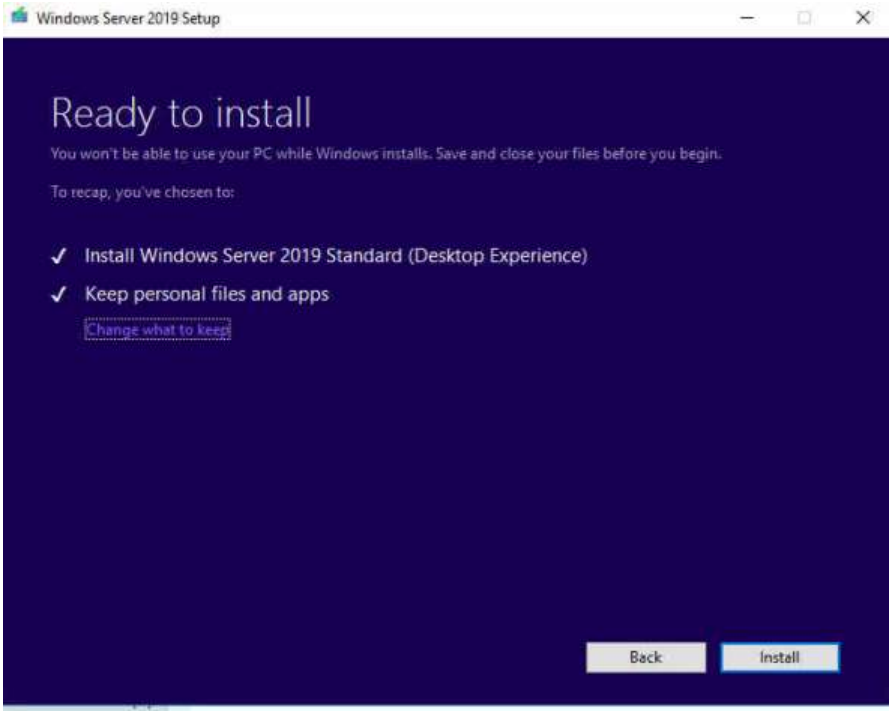


10. Because we are running a Storage Spaces Pool and have a Virtual Disk → Choose Confirm on Setup has detected that one or more virtual drives are directly attached to physical

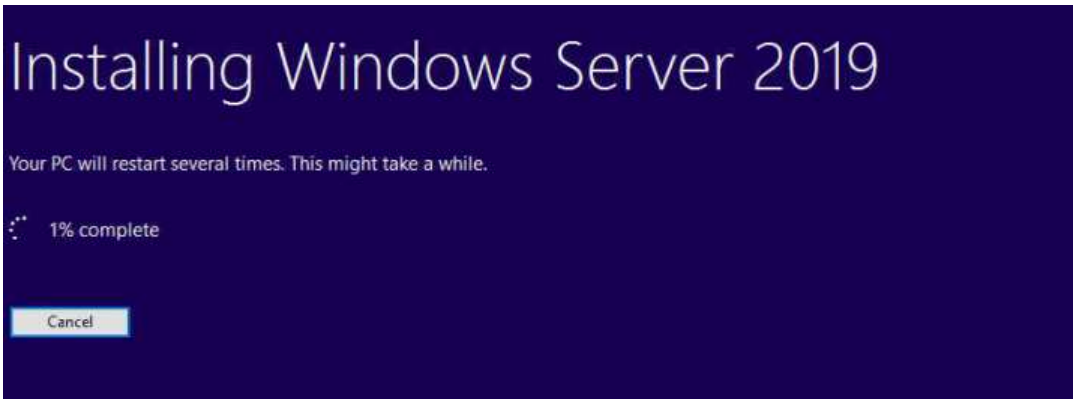
devices. You might need to reconnect the virtual drives after the upgrade is complete.



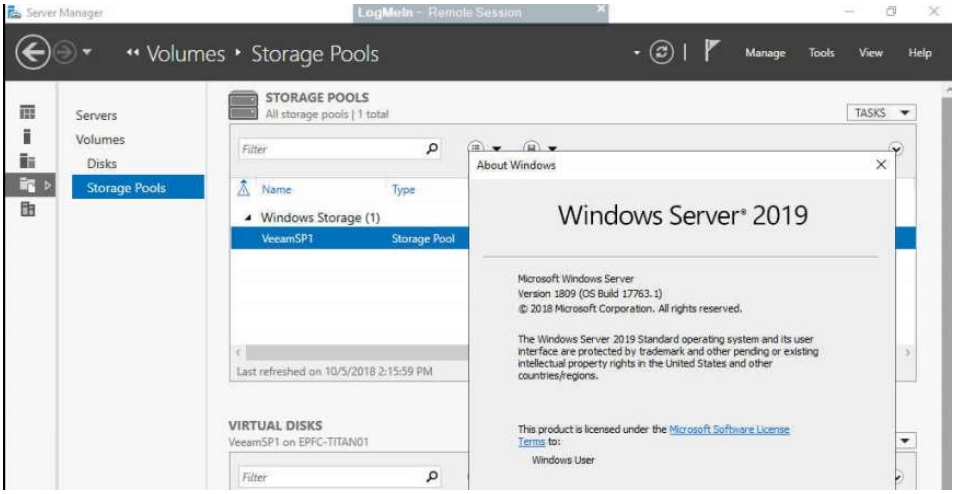
11. On the Ready to Install screen click **Install**



12. Grab a cup of coffee and wait for the upgrade to complete.

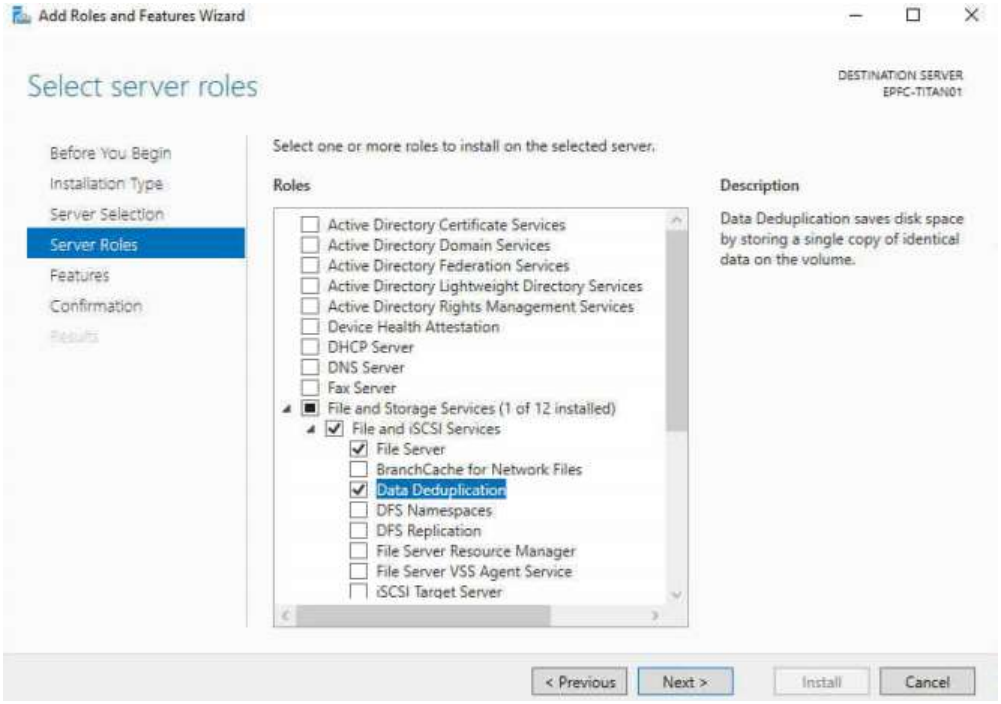


13. 30 minutes later and we are back in business. The good news is our Storage Pool and Volumes all came back online without having to do anything.

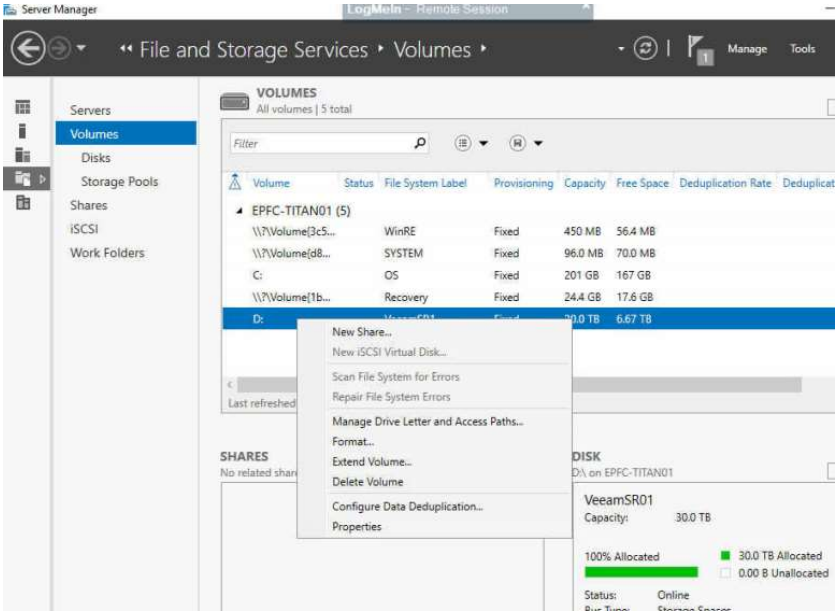


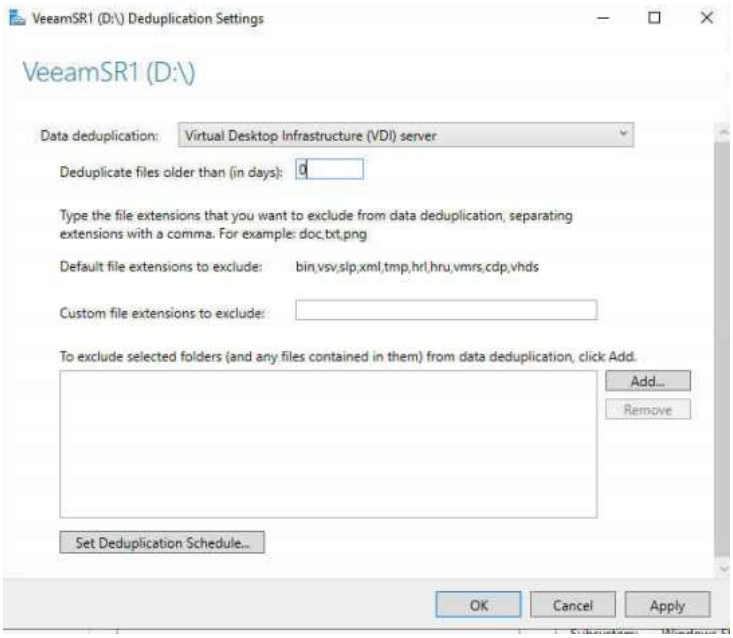
Install and Configure Windows Deduplication

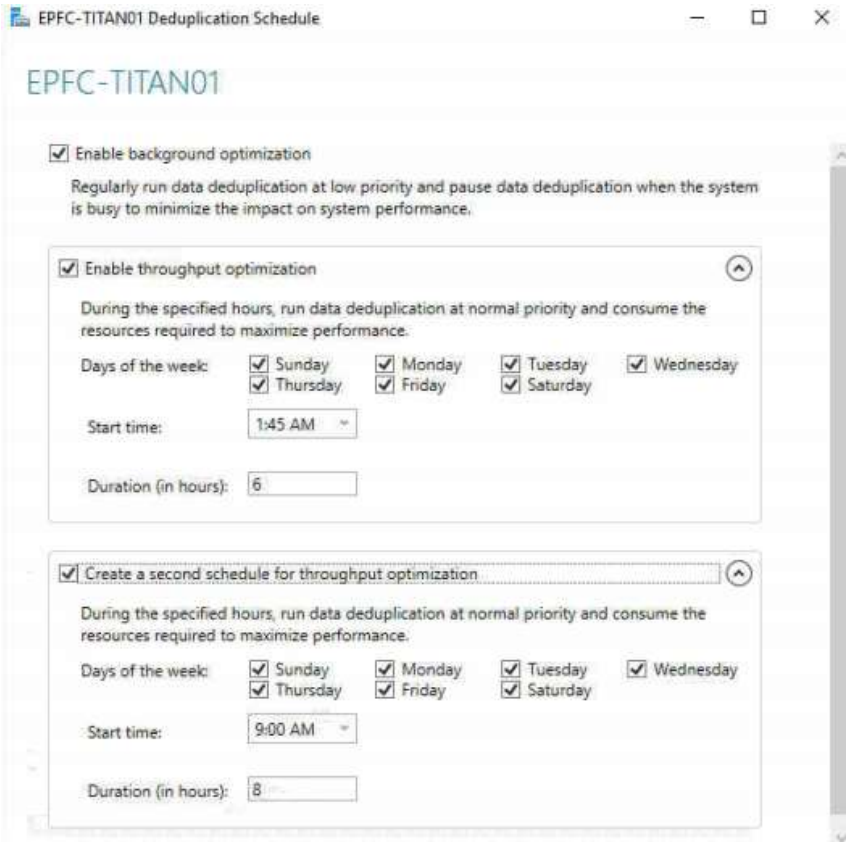
1. Let's Install the Deduplication Feature now



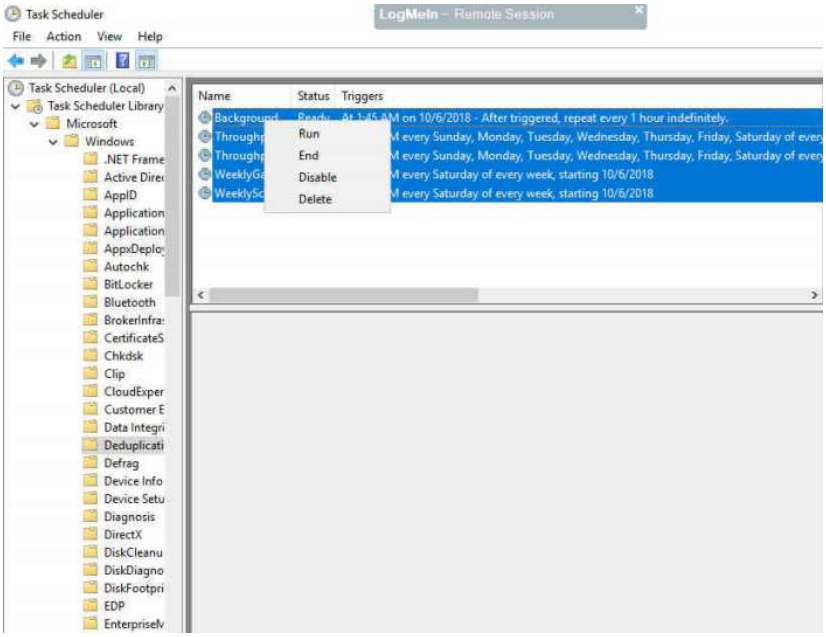
2. Configure Deduplication for your Veeam Repository



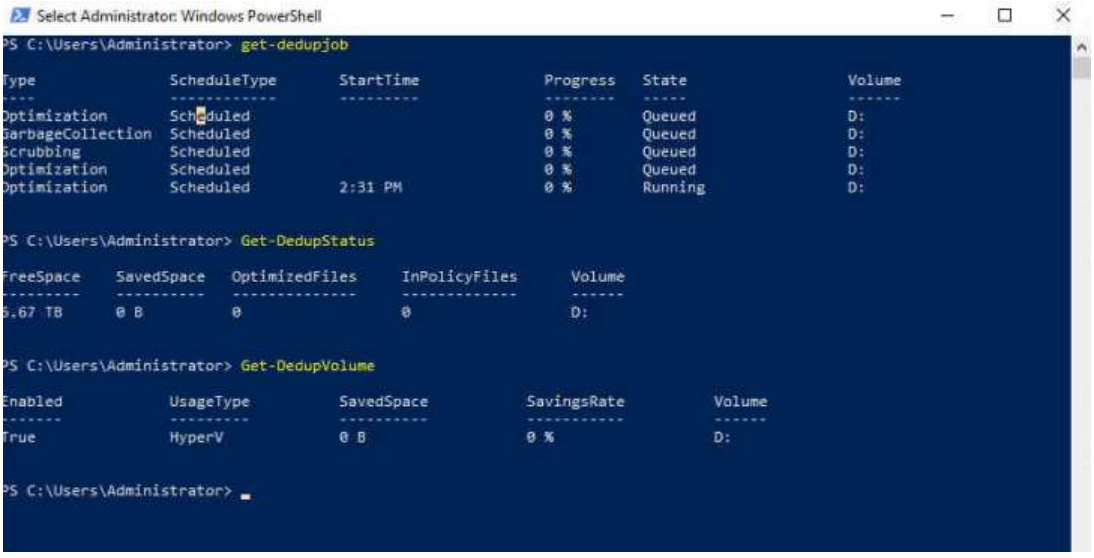

VeeamSR1 (D:\) Deduplication Settings
VeeamSR1 (D:\)
Data deduplication:
Virtual Desktop Infrastructure (VDI) server
Deduplicate files older than (in days):
0
Type the file extensions that you want to exclude from data deduplication, separating extensions with a comma. For example: doc,txt,png
Default file extensions to exclude:
bin,vsv,slp,xml,tmp,hrl,hru,vmrs,cdp,vhds
Custom file extensions to exclude:
To exclude selected folders (and any files contained in them) from data deduplication, click Add.
Add...
Remove
Set Deduplication Schedule...
OK
Cancel
Apply


EPFC-TITAN01 Deduplication Schedule
EPFC-TITAN01
Enable background optimization
Regularly run data deduplication at low priority and pause data deduplication when the system is busy to minimize the impact on system performance.
Enable throughput optimization
During the specified hours, run data deduplication at normal priority and consume the resources required to maximize performance.
Days of the week:
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Start time:
1:45 AM
Duration (in hours):
6
Create a second schedule for throughput optimization
During the specified hours, run data deduplication at normal priority and consume the resources required to maximize performance.
Days of the week:
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Start time:
9:00 AM
Duration (in hours):
8

3. Start the Deduplication jobs via Task Scheduler



4. View the results via Get-DedupJob and Get-DedupStatus and Get-DedupVolume

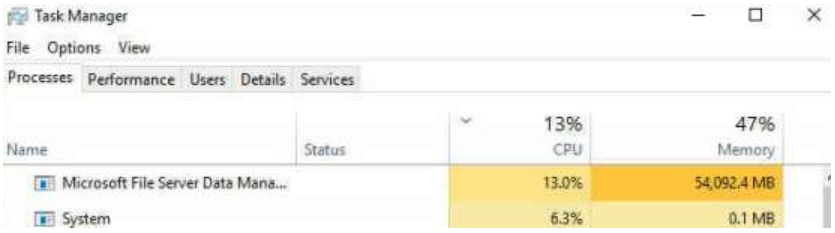


You can continue to view the progress until all of the Deduplication jobs are finished.

So, I would suggest it's coffee time again while you wait.

Tweak Windows Deduplication

1. Monitor the progress. You can also do this by watching it from Task Manager and selecting the Microsoft File Server Data Management Host Process. This is the Deduplication engine running. Interestingly enough this was consuming 20 % of the CPU and 54 GB of RAM during the first pass.

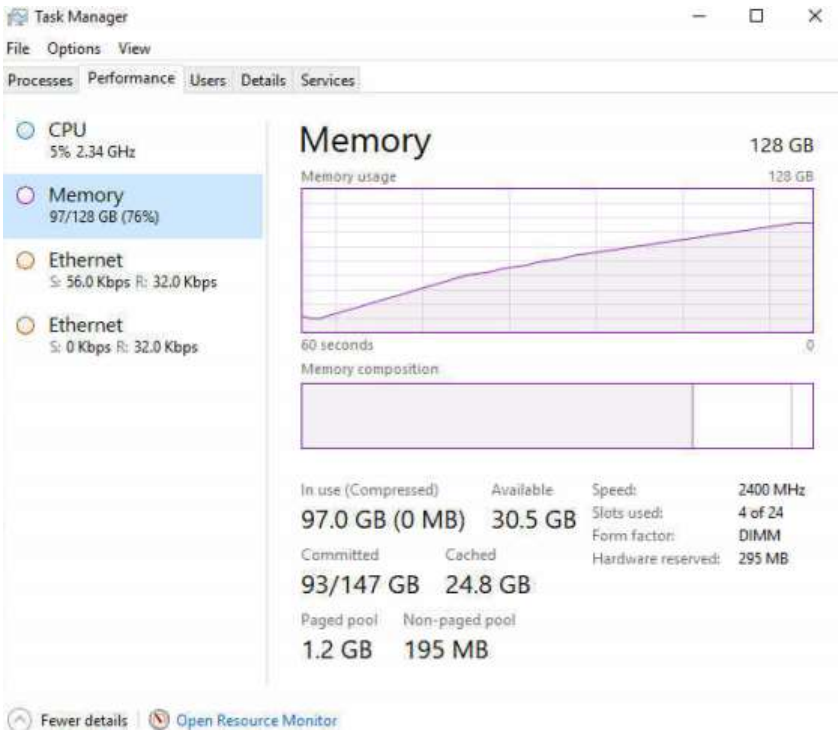


2. View the final results. As a side note, I'm impatient when trying something out, so I wanted to push the system on the first pass to speed it up. The initial 54 GB of RAM wasn't enough, so I did this. I grabbed a piece of code from my friend Mikael Nystrom https://deploymentbunny.com/2017/04/28/powershell-is-king-a-data-deduplication-script-that-run-the-optimizationgarbage-collection-and-scrubbing-in-a-single-sweep-including-progress/

```
Function Wait-VIADedupJob

{

while ((Get-DedupJob).count -ne 0 )

{

Get-DedupJob

Start-Sleep -Seconds 30

}

}
```

```
foreach($item in Get-DedupVolume){

Wait-VIADedupJob

$item | Start-DedupJob -Type Optimization -Priority High -Memory
80

Wait-VIADedupJob

$item | Start-DedupJob -Type GarbageCollection -Priority High -
Memory 80 -Full

Wait-VIADedupJob

$item | Start-DedupJob -Type Scrubbing -Priority High -Memory 80
-Full

Wait-VIADedupJob

}

Get-DedupStatus
```

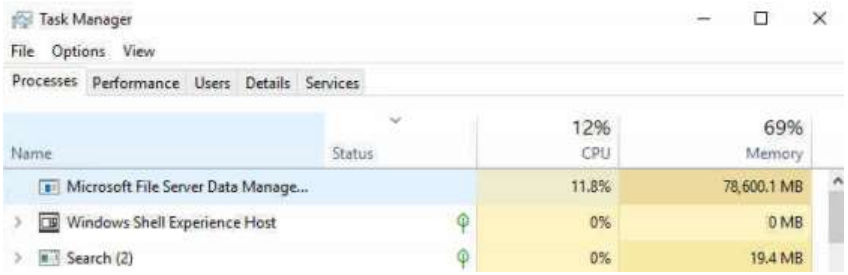
3. There this looks better now:



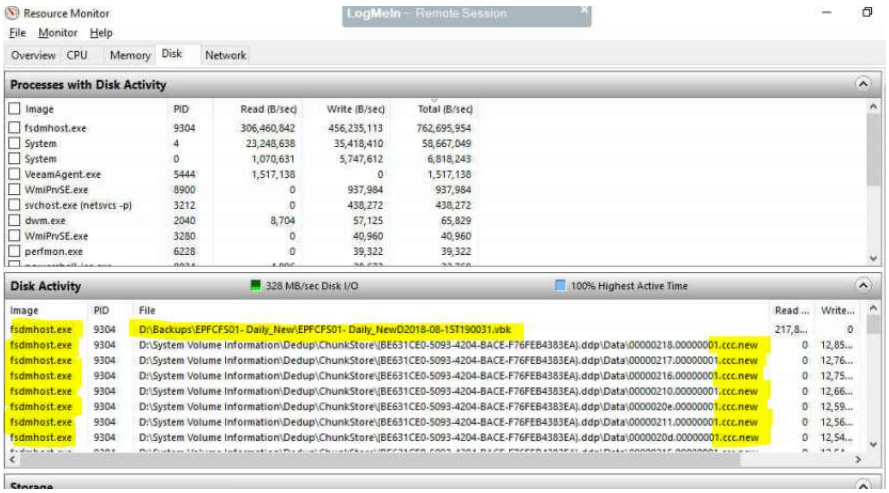

```
foreach($item in Get-DedupVolume){
Wait-VIADedupJob
$item | Start-DedupJob -Type Optimization -Priority High -Memory 95
Wait-VIADedupJob
$item | Start-DedupJob -Type GarbageCollection -Priority High -Memory 95 -Full
Wait-VIADedupJob
$item | Start-DedupJob -Type Scrubbing -Priority High -Memory 95 -Full
Wait-VIADedupJob
}
Get-DedupStatus
```

```
Wait-VIADedupJob
}
Get-DedupStatus

Type              ScheduleType       StartTime            Progress   State
----              ------------       ---------            --------   -----
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
Optimization      Manual             3:49 PM              0 %        Running
```

4. Here is the memory usage for the Microsoft File Server Data Management Process now.



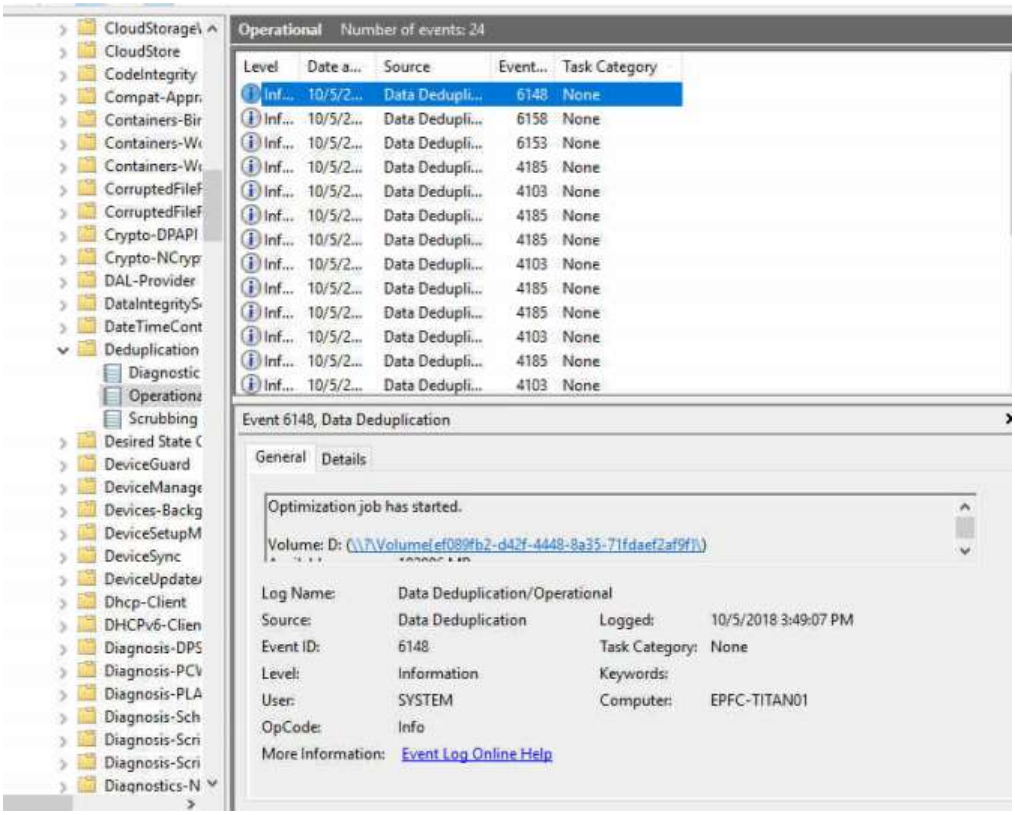
5. If you are curious about what is happening and which file the Deduplication engine is working on your can open Resource Monitor and look for the process that is running **fsdmhost.exe**. You will see the file that is being read and then you will see it being broken up into the **Chuck Store.** In this case, we can see the files floating into the D:\System Volume Information\Dedup\ChunkStore → With an extension of **ccc.new**.



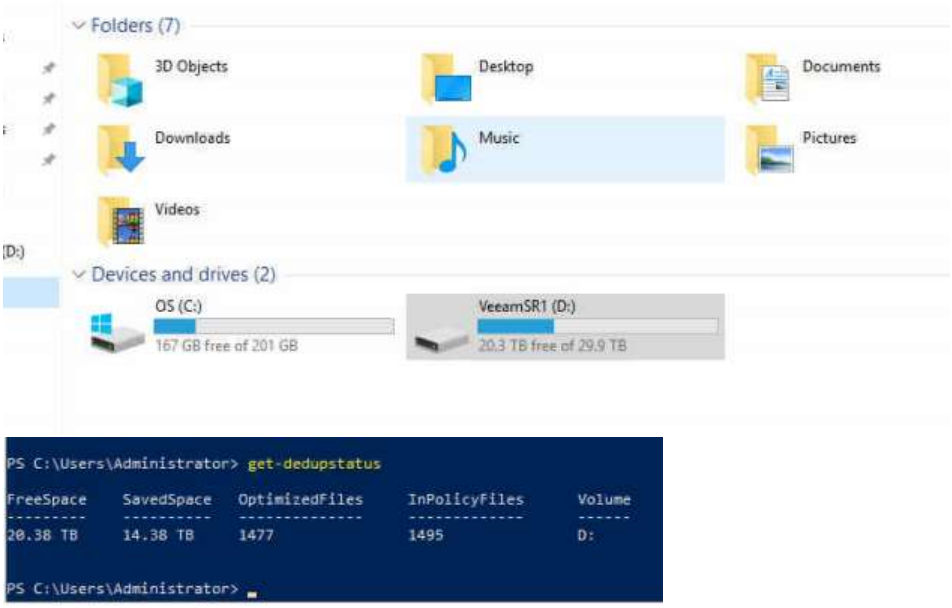
Until I checked this, I thought that the jobs were stalled. I was wrong the Deduplication Engine was working through some very large Veeam Backup.VBK files.

NOTE: My estimates on how long the initial pass will take are as follows. I have seen the Disk MB/Sec running consistently at around 300 MB/sec. Your calculation will look something like this 300MB/sec * 60 Seconds * 60 Minutes = MB Per Hours Processing = Roughly 1 TB per Hour. If there are 24 TB's of data which in our case there is. It will take approximately 24 Hours for the initial pass to complete.

6. You can see the time the job started and stopped by checking in the Deduplication Event Log. Look for Event ID 6148 you will see the message: **Optimization job has started**.



7. We can check for the completion event ID when we come back to this later for the complete duration of the post-processing. Moreover, after one day which was pretty much my estimate the initial pass completed. I've now gained back about 14 TB of space post-Windows 2019 Deduplication.



I hope you enjoyed reading this and happy upgrading to Windows Server 2019 with Deduplication on ReFS.

Dave

Chapter 2

Veeam RESTful API and Postman

By: Craig Dalrymple (VMware VExpert / Veeam Vanguard)

Recently I've been trying to get to grips with RESTful API on a couple of solutions I use at work, and as a relative newcomer to the whole world of RESTful APIs, I was looking for a simple/easy way to query systems and view the responses. One of my colleagues, Matt Thompson, pointed me in the direction of Postman www.getpostman.com.

Postman

Postman is a popular REST client, with an intuitive user interface that allows users to send requests, save responses, add tests and create workflows