

TECHNICAL WHITE PAPER

Protecting Microsoft 365 with FlashArray and Veeam

Protect Microsoft 365 with highly-optimized all-flash storage.

Contents

- Introduction3**
- Introducing Veeam Backup for Microsoft 3654**
 - The Shared Responsibility Model..... 4
- Veeam Deployment and Configuration4**
 - Backup Proxy 4
 - Backup Repositories 5
- Office 365 Configuration6**
 - Veeam Explorer 6
 - Capacity Consumption 7
 - Veeam Compression 8
 - Pure Data Reduction 9
- SafeMode9**
- Pure PowerShell SDK9**
- Purity Protection Groups..... 10**
- Crash-consistent FlashArray//C Snapshots with Veeam Backup for Microsoft 365 10**
- Creating Application-consistent FlashArray//C Storage Snapshots11**
- Additional Resources11**



Introduction

Microsoft 365 has been such a success that most enterprises now run their Exchange email as Exchange Online in Microsoft 365. Microsoft 365 is much more than just email, though. It also includes SharePoint Online for team collaboration, OneDrive for shared online storage, and Microsoft Teams for everything from online meetings to instant messaging.

Microsoft 365 introduces the share responsibility model, where the responsibility for backup and recovery resides with the organization. Backup is important, but equally important is having powerful and flexible recovery options for your Exchange Online, your SharePoint Online, OneDrive for Business and Microsoft Teams.

Additionally, backup and recovery performance are critical to companies facing an ever-growing list of external and internal threats. But cost is still a major factor with IT storage infrastructure, so price and performance must always be in balance.

Veeam Backup for Microsoft 365 can leverage the need to balance price and performance with Pure Storage® FlashArray//C™. FlashArray//C provides an all-flash option for capacity-oriented applications delivering industry-standard performance with lower-TCO. In addition, the extreme scalability of FlashArray//C, up to 7.3PB effective storage in three- to nine-rack units, ensures that making FlashArray//C your Veeam Backup for Microsoft 365 backup and restore target is a smart business decision for today and tomorrow.

Figure 1: Pure Storage and Veeam Backup for Microsoft 365 overview



Introducing Veeam Backup for Microsoft 365

Veeam Backup for Microsoft 365 eliminates the risk of losing access and control and protection over your Microsoft 365 data including Exchange Online, SharePoint Online, OneDrive for Business, and Microsoft Teams so that your data is always protected and accessible.

The Shared Responsibility Model

One of the principals of the Microsoft 365 shared responsibility model is security. You'll see that this is strategically designed as a blended box, not separate boxes—because both Microsoft *and* the IT organization are each responsible for security.

Figure 2: Office 365 shared responsibility model

Microsoft protects Office 365 at the infrastructure level. This includes the physical security of their data centers and the authentication and identification within their cloud services, as well as the user and admin controls built into the Office 365 user interface. The IT organization is responsible for security at a data-level. There's a long list of internal and external data security risks, including accidental deletion, rogue admins abusing access, and ransomware to name a few.

Veeam Deployment and Configuration

As described in Veeam's [Deployment and Configuration Guide](#) installing Veeam Backup for Microsoft 365 and Veeam Explorer for Microsoft Teams, Microsoft Exchange, and Microsoft SharePoint is straightforward and can be completed in a few minutes. Once installed, load the Veeam Backup for Office 365 UI, and prepare to configure the backup infrastructure.

Backup Proxy

The backup proxy is the process that will proxy the data during backup and restore. By default, a backup proxy will be configured on the server where you install Veeam Backup for Microsoft 365. Additional proxies can be added or used instead of the default one, for both scalability and to enable proxy placement near the selected backup repository.



Settings—such as the maximum throughput, number of threads, and whether to utilize an internet proxy—are available for each backup proxy.

Figure 3: Veeam backup proxy

Backup Repositories

A backup repository is a storage system that keeps backups created by the backup jobs. While either the NTFS or ReFS filesystem can be utilized, with ReFS enabling [deduplication](#) is unsupported. In this guide, both NTFS and ReFS were utilized for a data reduction comparison on a Pure Storage FlashArray//C. In addition to the path to the backup repository, an item-level or snapshot-based retention policy can be configured.

Figure 4: Veeam backup repository



Office 365 Configuration

Exchange Web Services, Microsoft Graph, and PowerShell are used to connect to Microsoft 365. These components must be configured in combination with your chosen authentication method.

The following authentication methods can be used to add an Office 365 organization:

- Basic authentication, which uses a user account and password
- Modern authentication with legacy protocols allowed, which allows both a user account and an Azure AD Application
- Modern app-only authentication, which only allows an Azure AD application

Figure 5: Office 365 connection settings

Resources must be configured in many different blades (or a pane in the Azure portal) depending on the authentication method and whether multi-factor authentication is enabled in both Azure and in the Microsoft 365 admin center (admin.microsoft.com). The different blades are on independent development cycles, and most of the published documentation becomes rapidly stale. The Veeam Backup for Microsoft 365 [User Guide](#) is a great place to start.

Veeam Explorer

To restore data, the appropriate Veeam Explorer can be used to select the data and restore it into Office 365 or other locations such as a PST file.

Figure 6: Veeam Explorer for Exchange

The granularity can go down to a single item level, such as an individual email.



Figure 7: Veeam Explorer for Exchange

Capacity Consumption

The publicly available Enron email dataset was seeded into Office 365 to provide a real-world estimate of data reduction at each layer. After ingesting this dataset, Outlook reported 5.38GB of consumed storage.

Figure 8: Outlook folder size for Enron data



Veeam Compression

Veeam Backup for Microsoft 365 compresses data in a Microsoft Jet Database using gzip. The entire backup repository consumed 2.87GB, and the database (.adb) itself was 2.6GB.

Figure 9: Backup repository size

Figure 10: Backup repository database



Pure Data Reduction

The Purity Operating Environment on the FlashArray//C performs both compression and data deduplication. When using NTFS, the FlashArray consumption was 521.52MB versus 2.87GB in Windows. NTFS with a 4KB allocation unit size is the recommended filesystem in [Veeam's Best Practice Guide](#) and we witnessed better data reduction on the FlashArray//C.

Figure 11: Pure volume size with NTFS

When using ReFS, the FlashArray consumption was 561.56MB versus 2.87GB in Windows.

Figure 12: Pure volume size of ReFS

SafeMode

Pure Storage FlashArray//C has a deleted items bucket for both volumes and snapshots. If either are deleted, they can be recovered until a secondary eradication is performed, either manually or automatically by default after 24 hours. When SafeMode™ is enabled, manual eradication is disabled, and the amount of time a deleted item has before eradication can be set to longer than 24 hours. If the Pure Administrator credentials are compromised, and a bad actor encrypts or otherwise destroys data, both volumes and snapshots that are protected with SafeMode can be recovered. Once SafeMode is enabled, it is global for the entire FlashArray protecting all volumes, snapshots, and protection groups. For more details see the [Ransomware Remediation with Veeam Solution Brief](#).

Pure PowerShell SDK

The [Pure PowerShell SDK](#) enables hundreds of cmdlets that map to a particular API version of the Purity Operating Environment. A popular use case involves customers that want a second backup location for their Office 365 backup. Since the data reduction capabilities are so significant, customers may want to leverage Protection Groups and asynchronous replication to a second environment. With NTFS, the original backup repository consumed 2.87GB, whereas the volume on the FlashArray//C consumed 521.52MB, an 82% decrease. Keep in mind this Enron dataset is only the publicly available corporate email dataset and many things can increase or decrease data reduction rates. Encrypted email would get zero data reduction, and emails that have large, already compressed attachments such as video or images would achieve less of a reduction.

Below is an example Pure PowerShell SDK 1.19 command to create a new Protection Group snapshot on ProtectionGroup1 and replicate it immediately while applying the retention policy as defined by the Protection Group.



```
New-PfaProtectionGroupSnapshot -Array $Array -ProtectionGroups ProtectionGroup1  
-ReplicateNow -ApplyRetention
```

Purity Protection Groups

Pure volumes can be added to [Protection Groups](#) to enable a consistent snapshot across all volumes that are added to a particular Protection Group. Protection Groups can have one or more targets, which include cloud storage in AWS, Azure, or Google Cloud, or an NFS server which could include [Pure Storage FlashBlade®](#). These Protection Group snapshots can be manually triggered in the FlashArray UI, or through the Pure PowerShell SDK. Policies can be applied on each Protection Group to automatically create, retain, and replicate snapshots. Whether manual or automatic, the creation of a Protection Group snapshot can be configured to automatically replicate to any configured targets.

Figure 13: Pure Protection Group settings

Crash-consistent FlashArray//C Snapshots with Veeam Backup for Microsoft 365

The snapshots described above are crash-consistent; they were taken without quiescing the Veeam Backup for Microsoft 365 backup repository Jet Database. While recovery from crash-consistent snapshots was successful, there is the possibility of some data loss for any data writes that were in-flight at the time the storage snapshot was created.

We recommend the following for crash-consistent snapshots:

1. Test recovery from storage snapshot in your environment
2. Set up Purity Protection Group snapshots to occur outside of the Veeam Backup for Microsoft 365 backup window.



Creating Application-consistent FlashArray//C Storage Snapshots

With the additional steps below you can ensure that no transactions are lost when creating storage snapshots of your Veeam Backup for Microsoft 365 backup repositories:

1. Stop the Veeam Backup for Microsoft 365 Backup Proxy service
2. Take the Veeam Backup for Microsoft 365 repository disk offline
3. Create a Purity Protection Group storage snapshot
4. Put the Veeam Backup for Microsoft 365 repository disk online
5. Start the Veeam Backup for Microsoft 365 Backup Proxy service

These workflow steps can be executed manually or scripted with PowerShell leveraging both the Pure and Veeam Backup for Microsoft 365 PowerShell SDKs.

Additional Resources

Veeam Backup for Microsoft 365

- [Product Overview](#)
- [User Guide](#)
- [Deployment and Configuration Guide](#)
- [Best Practice Guide for Veeam Backup for Microsoft 365](#)

Veeam Backup and Replication

- [Enterprise Data Protection Solutions from Veeam + Pure Storage](#)
- [Pure Storage Technology Partner Veeam](#)
- [Veeam and Pure Storage Integrated Deployment Guide](#)
- [Pure Storage and Veeam Solutions](#)



Pure FlashArray //C

- [FlashArray//C Overview](#)
- [Pure Storage and Veeam Solutions Datasheet](#)
- [Ransomware Remediation with Veeam Solution Brief](#)
- [Enterprise Imaging with FlashArray](#)
- [Unified Storage for Operational Workloads](#)

Pure and Microsoft Integrations

- [SQL Server Resilience with Hybrid Cloud](#)
- [Microsoft SQL Server and ActiveDR™](#)
- [Volume Shadow Copy Service \(VSS\) Hardware Provider 1.8.0.0](#)
- [Pure Storage FlashArray Management Extension for Microsoft SQL Server Management Studio \(SSMS\) v2.0](#)
- [Pure Storage PowerShell SDK versions 1 and 2](#)
- [Pure Storage FlashArray Management Extension for Windows Admin Center \(WAC\)](#)
- [Pure Storage FlashArray Management Pack for System Center Operations Manager \(SCOM\)](#)
- [Microsoft System Center Virtual Machine Manager](#)

The Pure Storage products and programs described in this documentation are distributed under a license agreement restricting the use, copying, distribution, and decompilation/reverse engineering of the products. No part of this documentation may be reproduced in any form by any means without prior written authorization from Pure Storage, Inc. and its licensors, if any. Pure Storage may make improvements and/or changes in the Pure Storage products and/or the programs described in this documentation at any time without notice.

THIS DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID. PURE STORAGE SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

Pure Storage, Inc.
650 Castro Street, #400
Mountain View, CA 94041

purestorage.com

800.379.PURE

