Technical Report

Hybrid Deployment for Messaging and Collaboration on NetApp Storage

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TABLE OF CONTENTS

LIST OF FIGURES

1 Introduction

This technical report is designed for organizations considering deploying their messaging and collaboration applications on NetApp storage in a hybrid topology with Microsoft Office 365. These organizations are also looking at ways to provide more control and security and to improve productivity with existing investments.

This document is for:

- People familiar with the NetApp® private cloud but who want to deploy a hybrid Office 365 solution
- People familiar with Microsoft Exchange Server, SharePoint, Lync technologies, and Office 365 functionalities and features

1.1 Statement of the Problem

Corporate messaging and collaboration have become mission critical in nearly all organizations. This change in priority has imposed additional constraints on IT departments. Several customers are considering the economics and practicality of externally hosted Exchange or SharePoint solutions as an alternative to on-premises deployment. Customers also are considering the benefits of an on-premises solution and a Microsoft-hosted messaging and collaboration solution with Office 365.

Regarding on-premises solutions, 80% to 90% of NetApp customers are planning private cloud deployments. Some are implementing a hybrid environment, migrating only a small portion of their environment to the cloud and maintaining the rest of the mailboxes, sites, and applications on the premises for security and compliance reasons. Doing so gives customers the flexibility to harness Microsoft's cloud service in an incremental manner without compromising on security, content control, application integration, or the overall flexibility to roll back, if required.

The evolution of a hybrid messaging and collaboration model is leading to new and various optimized deployment models, enabling customers to take a step toward the cloud. However, in today's cloud-oriented world, customers want to first transform their messaging and collaboration infrastructure to the private cloud solution hosted on NetApp storage. Doing so enables timely delivery of collaboration services and applications that meet current requirements and also address future needs.

Figure 1 shows the line-of-business applications distribution.

A recent survey pointed out that on-premises deployment is preferred for most environments and that preference for a hybrid cloud is increasing rapidly. The survey data shown in Figure 1 also confirms that customers are moving to the cloud at a slower pace than some might realize. NetApp storage is ideal for any kind of deployment, providing customers with the most value for their investment.

Figure 1) SaaS and application distribution survey.
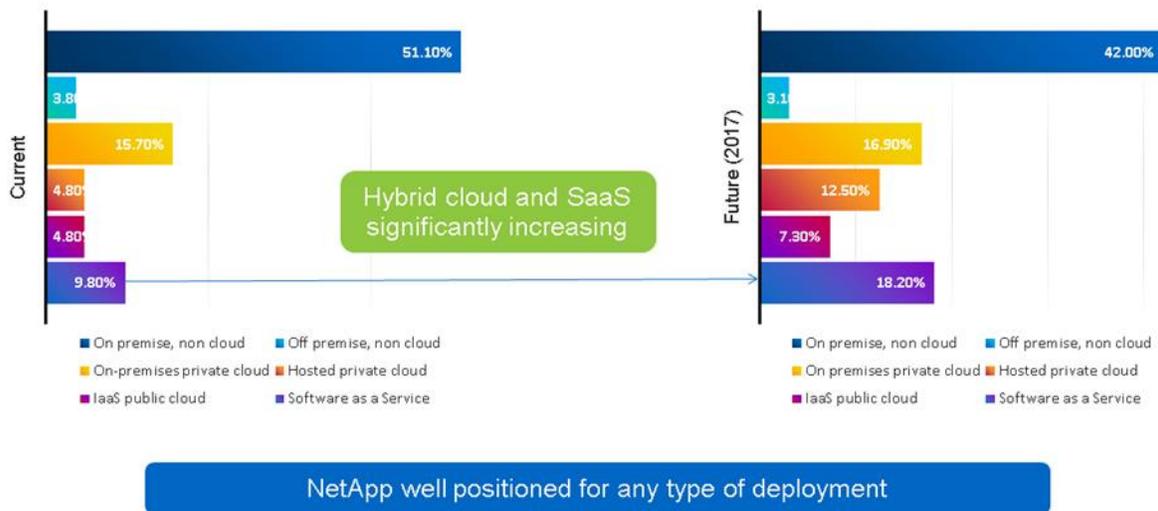
Source: 451 Voice of the Enterprise survey – Q2 2015

2 Deployment Options for Messaging and Collaboration

Several factors need to be considered when deciding on a deployment solution for messaging and collaboration applications that include Microsoft Exchange, SharePoint, and Lync. Microsoft recommends Office 365, the SaaS offering for a collaboration suite, to drive down costs. However, just because Microsoft recommends it doesn't mean that this approach is appropriate for every environment. Organizations planning to replace their on-premises investment for Exchange and SharePoint must understand the pros and cons of different options to decide which option is best suited to their environment.

Typically, companies planning to move to SaaS offerings first ask, "How much is the solution going to cost?" Although cost is a valid concern, the better question is, "Are we making the best decision for the money for a solution that meets our needs?"

Those of you moving from an on-premises Exchange, SharePoint, or Lync deployment should know what you will gain and lose before you start the process. Organizations need to consider the following primary criteria when choosing the best platform for their messaging and collaboration:

- Total cost of ownership (TCO)
- Network bandwidth
- Availability
- Backup and recovery service-level agreements (SLAs)
- Hardware
- Management and control
- Compliance
- Security
- Privacy
- Migration efforts and planning
- Third-party application integration and customizations

NetApp recommends the following deployment options:

- **Option 1**: An on-premises deployment with messaging and collaboration applications running on NetApp storage
- **Option 2**: A hybrid solution that mixes an on-premises solution and Office 365

Another available option is the hosted Exchange or complete Office 365 solution. However, this solution does not work for the majority of medium to large organizations because of concerns about data placement and the overall control structure.

3 NetApp On-Premises Deployment Model

This solution provides a highly available messaging and collaboration environment using a capital expense (capex) financial model with hardware depreciated over five to seven years. Most organizations view messaging and collaboration applications as business critical because they are vital for communication and business productivity. As such, organizations need a highly reliable storage infrastructure that maximizes data availability. In the event of a system outage or disaster, organizations need to be able to rapidly recover their data.

Although cloud alternatives get a lot of visibility, most customers continue to opt for on-premises solutions. Many are opting to deploy a collaboration suite in virtualized server environments in private cloud deployments that leverage the NetApp shared storage infrastructure. This option helps customers keep pace with the ongoing growth of business data. But apart from this, organizations need flexible infrastructure systems that scale easily to keep pace with changing requirements. They also need highly efficient and economical storage systems that can help to keep IT costs under control while providing the level of service that their business users require.

The private cloud brings numerous capabilities to the adopting organization. These capabilities, built on a virtualization foundation, add infrastructure optimization, higher cost savings through increased resource use, and automated provisioning of server and application instances. Although the definitions of a private cloud vary, the following key capabilities highlight its greatest value:

- Enables the deployment of a highly efficient, on-premises collaboration solution at a competitive TCO
- Provides high availability and security; many NetApp customers achieve 99.999% uptime
- Enables fast, secure, and granular data recovery
- Simplifies management with automated policy-management tools

NetApp Private Storage

To add more resiliency and availability to the primary data center, NetApp Private Storage (NPS) can be used to extend the data center along with the on-premises private cloud deployment. NPS can also be used to host copies of the Exchange and SharePoint content database and other relevant server roles. These capabilities eliminate the need for a secondary data center, enabling customers to leverage the storage that is in their control and resides next to the cloud data center with direct connectivity.

3.1 Solution Architecture

This solution is built on NetApp storage with the appropriate virtualization platform (running Exchange Server 2013/2016, SharePoint 2013, and Skype for business). The main component is the NetApp clustered Data ONTAP® operating system, which streamlines operations by nondisruptively performing storage maintenance tasks and providing open infrastructures for disparate workloads. Second is the NetApp OnCommand® Plug-In for Microsoft, which integrates with Microsoft Systems Center 2012 R2, enabling users to manage their unified storage systems. Third is NetApp SnapManager® technology, which enhances the availability, scalability, and reliability of the data and also helps to consolidate virtual environments, providing the flexibility of iSCSI, FC, and FCoE SAN infrastructures.

Figure 2 illustrates the solution architecture.

Note: Customers can choose the servers, hypervisors, and NetApp storage arrays they need when planning this solution based on their capacity and throughput/IOPS requirements.

Note: See TR-4280: Microsoft Exchange Server and SnapManager for Exchange Deployment Guide and TR-4297: Microsoft SharePoint Server and SnapManager for SharePoint Deployment Guide for on-premises or private cloud deployment. Contact NetApp consulting engineers to plan and execute the deployment.

Figure 2) Exchange, SharePoint, and Lync deployed in a private cloud environment on NetApp storage–solution architecture.
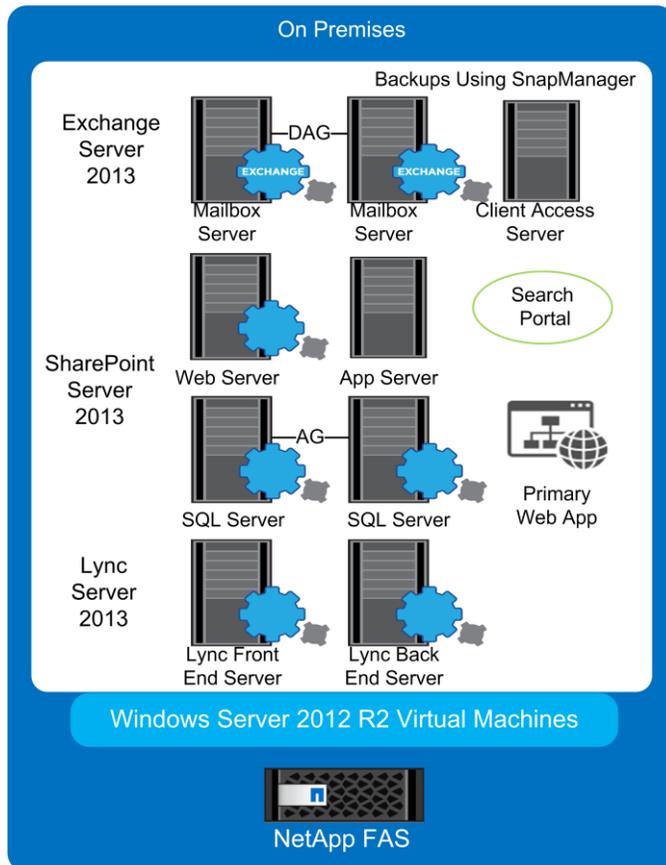
3.2 Solution Advantages

Running Microsoft Exchange, SharePoint, and Lync in a private cloud environment on NetApp storage delivers the following benefits:

- Enables storage efficiency, availability, and scalability
- Reduces IT storage management costs
- Leverages the capabilities of NetApp SnapManager
- Allows full control of hardware
- Enables integration with third-party apps
- Places workload data in your control and location
- Augments an on-premises private cloud with cloud services built on NetApp

4 Hybrid Deployment Solution with Office 365

A hybrid deployment provides a unified experience with Office 365, which theoretically is a challenging deployment and management model. In this use case, the mailbox or site collection placement decisions are typically based on strategic or operational considerations. These considerations include security issues, sensitivity of information stored, geographic dependencies, and the customization required for certain mailboxes or sites to integrate and interact with on-premises applications.

Organizations can configure an Exchange, SharePoint, and Lync hybrid deployment to keep a mix of on-premises and Office 365 mail for a long time. Exchange enables users who have mailboxes in an on-premises Exchange Server environment and users who have Exchange Online mailboxes to find one another in the global address list. They can also send, receive, and reply to e-mail regardless of which system hosts their mailbox. SharePoint can extend the on-premises investment to the cloud by integrating services such as SharePoint Search and Business Connectivity Services. Lync makes it easier to provide Lync or Skype for Business services to an organization's users in different geographic locations or users who connect remotely.

When you deploy a hybrid model with an on-premises deployment on NetApp storage, customers can leverage NetApp capabilities to manage both on-premises and Office 365 deployments.

In short, the hybrid model:

- Integrates cloud services and NetApp storage on the premises
- Distributes the workload between NetApp storage on the premises and the Microsoft cloud offering
- Places a small percentage of users of Exchange, SharePoint, and Lync on Office 365 and retains the rest on NetApp storage on the premises
- Leverages the benefits of multiple clouds
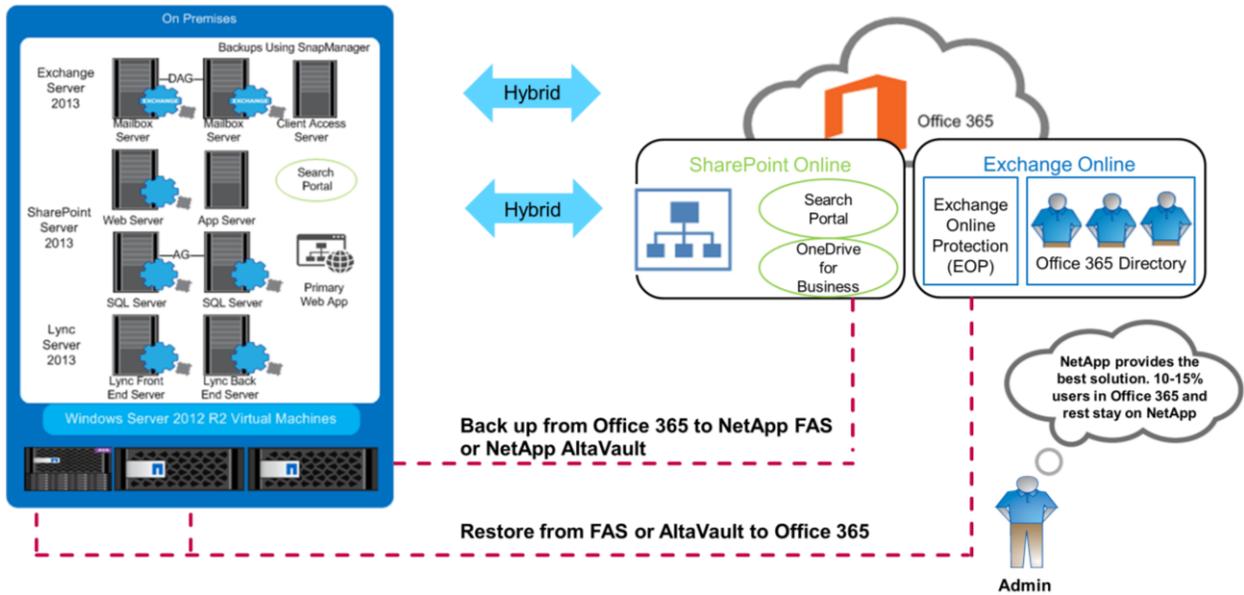
4.1 Hybrid Solution Architecture

In the hybrid solution, the majority of data resides on the premises and about 10% to 20% resides in Office 365. The data residing on the premises leverages all the capabilities provided by NetApp storage, and the backups are performed by using NetApp SnapManager technologies. Item-level recovery is achieved by using Single Mailbox Recovery and SnapManager for SharePoint capabilities. This feature improves efficiency and overcomes operational issues. The Office 365 data is also backed up to on-premises FAS in case you need to recover information from deleted e-mails.

The steps for on-premises and private cloud deployment are familiar to most administrators. To deploy a hybrid model, follow the steps for Exchange Server in this TechNet article; for SharePoint, follow the steps outlined here.

In this type of scenario, you need to decide which data should reside on the premises and which should reside on the cloud. The answers are often debating points within the IT and administrator teams. A good understanding of the environment and needed legal compliance is necessary to finalize the topology based on business goals.

Figure 3 illustrates the hybrid solution architecture.

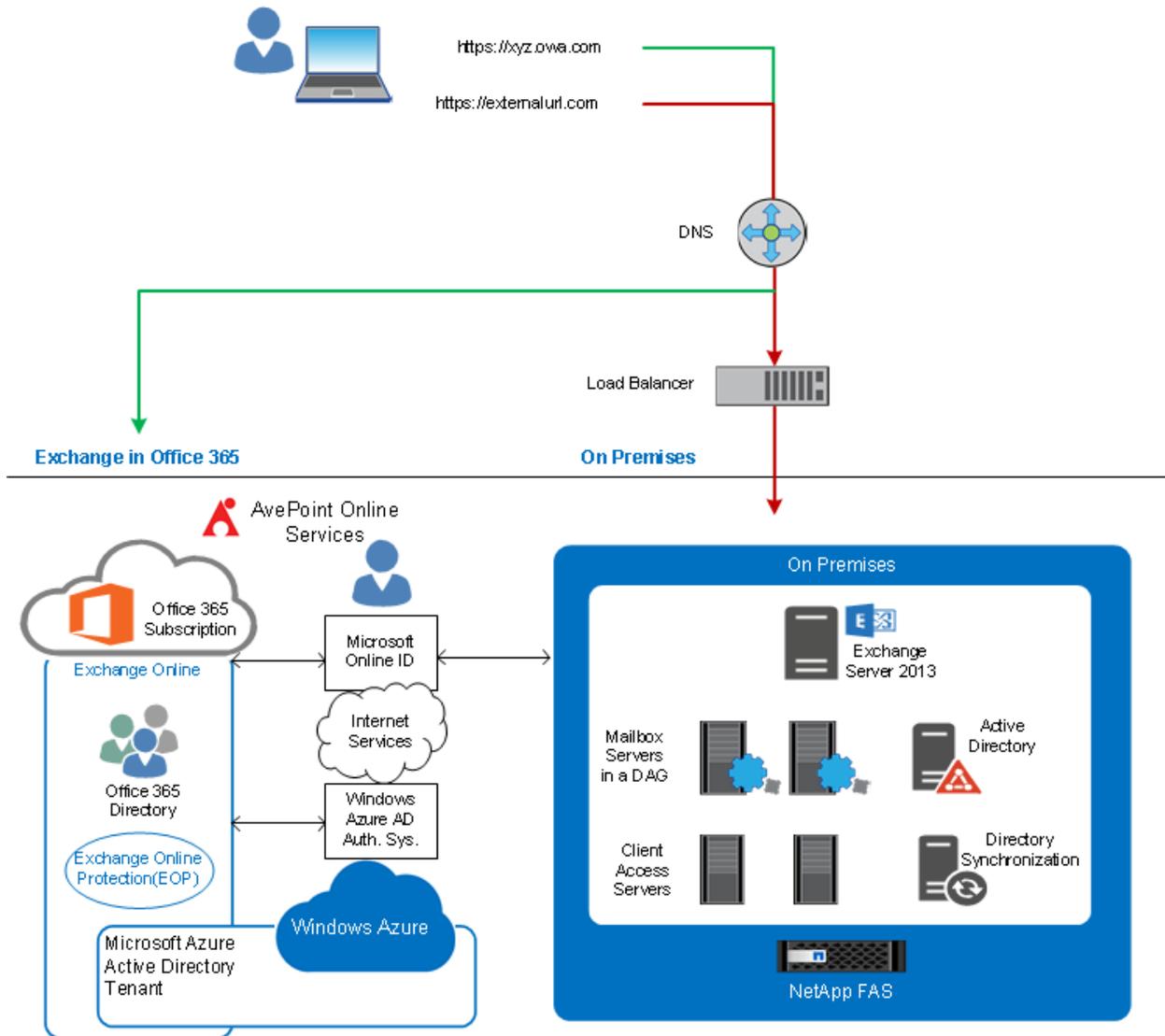**Figure 3) Hybrid solution architecture.**

4.2   Exchange Hybrid Model Solution Architecture

Exchange Online supports hybrid deployments to give the needed flexibility to have the cloud meet each customer's terms. Customers can opt to host archive mailboxes in the cloud with primary mailboxes on the premises with Exchange Online Archiving. They can also opt to maintain a hybrid environment and open up Exchange Online to service low-tier mailboxes while maintaining an on-premises deployment for corporate headquarters for a total return on investment (ROI) from the current infrastructure.

Note: NetApp recommends moving 10% to 20% of the mailboxes to Exchange Online and keeping the rest on premises.

Figure 4 illustrates the Exchange hybrid model solution architecture.

Figure 4) Exchange hybrid model solution architecture.

4.3   SharePoint Hybrid Model Solution Architecture

The hybrid approach for SharePoint allows customers to join the on-premises environment with SharePoint Online running in Office 365. The hybrid solution also enables connecting to an existing investment with SharePoint that does everything in consumable packs, such as Video Portal, Groups for Office 365, and Delve. In addition, the following components can be moved to the cloud based on the technical and business requirements:

• Team sites
• OneDrive for business
• Extranet
• Business intelligence

Figure 5 illustrates the SharePoint hybrid model solution architecture.

Figure 5) SharePoint hybrid model.
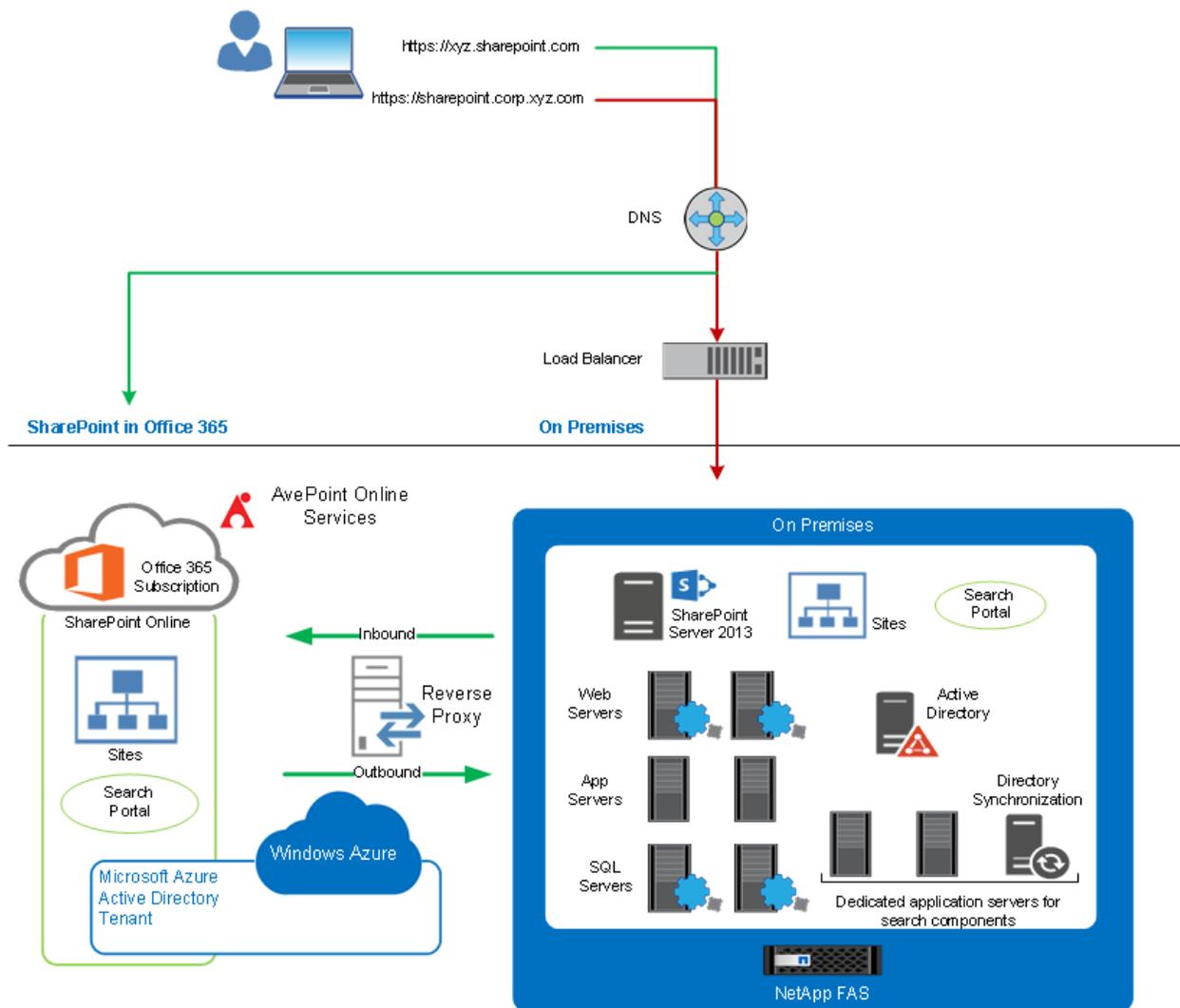
5 Backup and Recovery

Having a second, secure copy of the data is always a best practice. This best practice is true for data residing on-premises as well as in the cloud. Most administrators want control over their data, whether it's on premises or in the cloud. For on-premises deployments, this control is possible with products such as SnapManager to recover data at the database or item level and to meet operational issues or issues when a disaster hits. The on-premises solution provides great flexibility for data recovery by automating data protection, thereby increasing IT staff productivity. NetApp Snapshot® copies use a block incremental approach that limits the associated storage capacity required for the data backups. The copies do this by capturing and storing only the data changes made from one Snapshot copy to the next.

NetApp partnered with AvePoint to deliver a backup and restore solution for Office 365 that provides NetApp FAS as the target. In addition to the on-premises FAS as the storage option, NetApp provides NetApp AltaVault™ cloud-integrated storage as another storage repository, providing global deduplication, WAN optimization, and caching. This solution covers Exchange Online; SharePoint Online, including OneDrive for Business at mailboxes, site collection level, and restores at mailboxes; and site collection and item level. With this solution, AvePoint Online Services (AOS) sends the backup to an FTP or SFTP server. This sever then writes the data to an on-premises CIFS share, to the AltaVault device residing on

premises, or to the AltaVault instance running in Azure on DS3 instance. For the AltaVault VM in Azure, the SFTP VM should be in the same Azure private network where AltaVault VM is running, which is configured to read/write data to the SFTP VM public IP.

For more information, see TR-4508: A Quick Guide to NetApp Data Protection Solutions for Microsoft Office 365.

Figure 6) Office 365 backup solution components.

In a hybrid deployment, NetApp enables you to easily activate automatic daily backups of e-mail, calendars, contacts, tasks, site collections, sites, lists, and OneDrive for Business for all your Office 365 users.

5.1 Solution Benefits

NetApp enables administrators to have complete control over Office 365 data in a hybrid model. The solution:

- Reduces the overall management complexity of Office 365 in a hybrid model
- Provides data protection and monitoring:
  - Backup and restore of entire SharePoint Online, OneDrive for Business, and Exchange Online instances
  - Backup of site collections, sites, lists, mailboxes, and more
  - Item-level recovery for all SharePoint Online, OneDrive for Business, and Exchange Online components
  - Export of Exchange Online backup data as a personal storage table (.pst) file
  - Restore of content directly to storage locations, including NetApp FAS and NetApp AltaVault
  - Same backup SLA in the cloud as on premises

6 Back Up and Restore Office 365 Data

This section describes the steps involved in backing up and restoring Office 365 data hosted in a Microsoft data center.

Register the Office 365 Domain

Before performing backup or restore operations, register the site collections and mailboxes. To do this, complete the following steps:

1. In the Office 365 Credentials dialog box, enter the Office 365 user ID and password. Click Next.

   Note: To scan all site collections and mailboxes in the specified domain, make sure that the specified Office 365 user ID has the global administrator role.
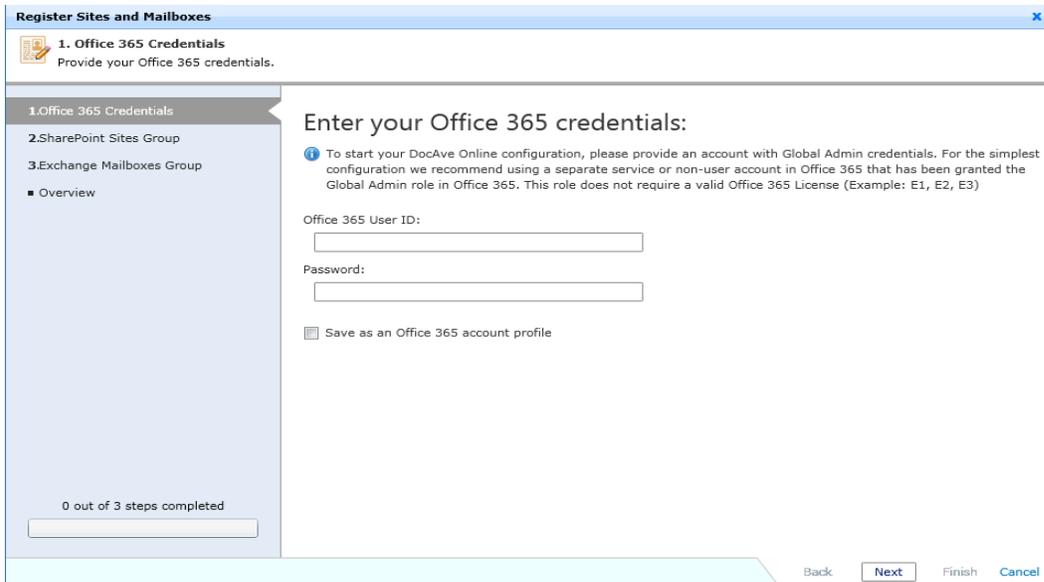
DocAve Online begins the scan. The SharePoint Sites Group section appears after the scan completes.

2. Go to the Exchange Mailboxes Group section and scan for the Exchange mailboxes.

3. Review the configuration steps and click Finish to complete the registration.

Back Up and Restore SharePoint Online (Including OneDrive for Business)

To back up SharePoint Online content, complete the following steps:

1. Navigate to Granular Backup and Restore > Backup.

2. Expand the Source panel tree to display the objects to be backed up.

3. Select a sites group node and use the Plan Builder to create a plan.

Note: Site collections or OneDrive for Business sites that were added recently to a sites group will be included in an existing plan if the sites group is included in the plan.
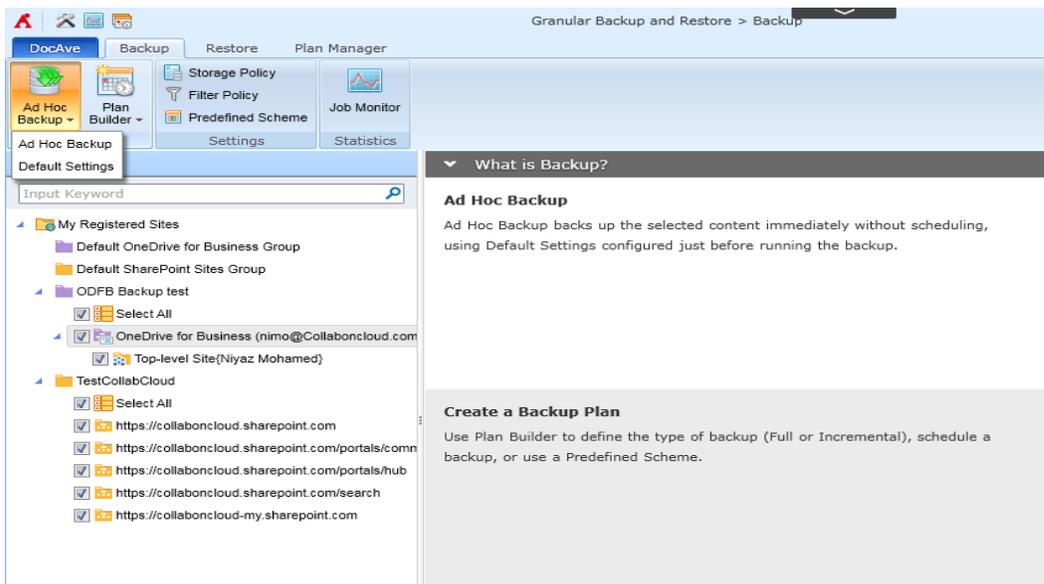
To restore the granular content at list/library/folder/item/file level to the designated storage policy, complete the following steps:

1. Navigate to Granular Backup and Restore > Restore.

2. In the Restore tab, select Restore.

3. In the Job Selection interface, select the backup job that contains the granular content that needs to be restored and click Next. The Data Selection interface appears.

4. Expand the Backup Data tree to select the desired SharePoint Online lists/libraries/folders/items/files. Click Next.

5. In the Restore Type interface, select Restore to Storage Policy to restore the selected lists/libraries/folders/items/files.

6. Select a previously created storage policy as the destination to store the restored granular content. Optionally, select New Storage Policy from the drop-down list to create a new storage policy for the restored granular content.

Back Up and Restore Exchange Online

To launch Exchange Online Backup and Restore and access its functionality, complete the following steps:

1. Log into AvePoint Online Services and navigate to DocAve Online.

    The DocAve tab displays all modules on the left side of the window.

2. From the DocAve tab, click Data Protection to view the backup modules.

3. Click Exchange Online Backup & Restore to launch this module.
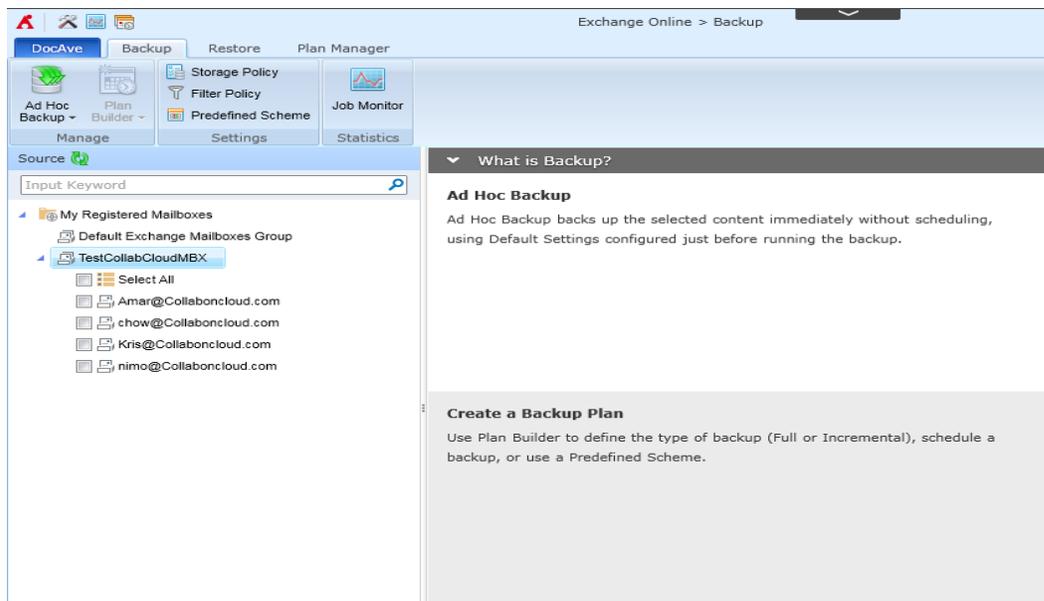
To back up Exchange Online content, complete the following steps:

1. Click the My Registered Mailboxes node containing the relevant registered mailboxes.

2. Select an Exchange Mailboxes group on the tree to build a plan to back up all of the mailboxes included in this group and the mailboxes added to this group in the future. You can select objects throughout the mailboxes, but you cannot select the mailbox group and the mailboxes in the other groups at the same time.

3. Choose to perform either a backup using ad hoc backup or a backup using the plan builder.

The backed-up data can be restored to its original location or another location in Exchange Online or a storage location. To use in-place restore to restore granularly backed-up data to its original location in Exchange Mailbox, complete the following steps:

1. Log into AvePoint Online Services and navigate to DocAve Online.
2. From the DocAve tab, click Data Protection to view the backup modules.
3. Click Exchange Online Backup & Restore to launch this module. Select the appropriate restore type based on where the content will be restored.
4. Specify the restore settings to define the conflict resolution behavior.
    Note: The restore options can be set to in-place restores or to out-of-place restores to different storage locations as .pst files.
5. Click Finish.

For detailed steps, refer to DocAve Online.

7 Summary

NetApp offers compelling solutions for messaging and collaboration to meet customers' business requirements. Regardless of the deployment model you choose, NetApp has the solution portfolio and the expertise to help you navigate the model's lifecycle, from planning and design to implementation, deployment, and management. The value of each solution to your organization depends on your use case and viewpoint, and the right choice might be a hybrid approach. Given the pace of change in both on-premises and cloud-based messaging and collaboration capabilities, a thorough analysis of both options is essential to help you to deliver the right solution for your organization.

The NetApp solution offers a compelling TCO in comparison to that of competing JBOD and SaaS solutions. Many customers are very sensitive to operating costs. The NetApp solution typically consumes less rack space and requires fewer physical disks, which translates into power and cooling savings.

In today's tight fiscal environment, many enterprise customers are evaluating the entire package cost, not just the up-front purchase price. NetApp's strength is in reducing complexity and increasing efficiency and availability while providing the best solution to lower recovery point and recovery time objectives beyond what other options provide in the box. Storage-efficiency features such as deduplication and thin provisioning increase enterprise efficiency and can greatly reduce the cost per user with services such as Exchange, SharePoint, and Virtual Desktop.

8 References

The following documents were referenced in this report:

- TR-4221: Microsoft Exchange Server 2016/2013 and SnapManager for Exchange Best Practices for Clustered Data ONTAP
  http://www.netapp.com/us/media/tr-4221.pdf
- TR-4243: Microsoft SharePoint and SnapManager 8.0 for SharePoint with Clustered Data ONTAP Best Practices Guide
  http://www.netapp.com/us/media/tr-4243.pdf
- TR-4508: A Quick Guide to NetApp Data Protection Solutions for Microsoft Office 365
  http://www.netapp.com/us/media/tr-4508.pdf
- TR-4438: IT as a Service: Simplifying Application and Storage Provisioning Using NetApp OnCommand Workflow Automation and System Center Orchestrator 2012 R2
  http://www.netapp.com/us/media/tr-4438.pdf

- NetApp AltaVault Cloud-Integrated Storage
  http://www.netapp.com/in/products/protection-software/altavault/
- DocAve Online for Microsoft Office 365
  http://www.avepoint.com/assets/pdf/technical_overview/DocAve_Online_Technical_Overview.pdf
- DocAve Online User Guide
  http://www.avepoint.com/assets/pdf/sharepoint_user_guides/DocAve_Online_User_Guide.pdf

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