# Contents

CONTENTS........................................................................................................................................3

CONTACTING VEEAM SOFTWARE ...................................................................................................4
  Customer Support ...........................................................................................................................4
  Online Support ..............................................................................................................................4
  Company Contacts .........................................................................................................................4

INTRODUCTION ..................................................................................................................................5
  PURPOSE ........................................................................................................................................5
  INTENDED AUDIENCE ...................................................................................................................5

SOLUTION OVERVIEW .......................................................................................................................6
  IBM CLOUD AND VEEAM SOLUTIONS = BETTER TOGETHER....................................................6
  VEEAM OVERVIEW .......................................................................................................................6
  IBM CLOUD MASS DATA MIGRATION OVERVIEW ................................................................7
  VALIDATION .....................................................................................................................................8

CONFIGURATION .................................................................................................................................8
  SMB................................................................................................................................................10
  SMB Repository Setup ..................................................................................................................10
  NFS...............................................................................................................................................14
  NFS Repository Setup ..................................................................................................................14
  BACKUP JOB CREATION ..............................................................................................................21

REHYDRATION .................................................................................................................................27
  RECOVERY ENVIRONMENT ............................................................................................................27

USE CASES .........................................................................................................................................28
  BACKUP TO IBM CLOUD ..............................................................................................................28
  DISASTER RECOVERY TO IBM CLOUD .........................................................................................38
  IBM CLOUD LOW RTO VM WORKLOAD MIGRATION ..............................................................47
  IBM CLOUD HIGH RTO VM WORKLOAD MIGRATION ..............................................................47

REFERENCES .....................................................................................................................................48
  VEEAM DR/MIGRATION ..................................................................................................................48
  IBM CLOUD MASS DATA MIGRATION (MDMS) .........................................................................48

ABOUT VEEAM SOFTWARE ............................................................................................................49
CONTACTING VEEAM SOFTWARE

At Veeam Software we value the feedback from our customers. It is important not only to help you quickly with technical issues, but it is our mission to listen to your input and build products that incorporate your suggestions.

Customer Support

Should you have a technical concern, suggestion or question, please visit our Customer Center Portal at cp.veeam.com to open a case, search our knowledge base, reference documentation, manage your license or obtain the latest product release.

Online Support

If you have any questions about Veeam solutions, you can use the following resources:

- Full documentation set at www.veeam.com/documentation-guides-datasheets.html
- Community forum at http://forums.veeam.com

Company Contacts

For the most up-to-date information about company contacts and office locations, please visit www.veeam.com/contacts.html.
Introduction

Purpose

This guide is for new or existing IBM Cloud and Veeam users intending to enhance their data protection resiliency via IBM Cloud. This includes but is not limited to 1) on-premises Veeam users leveraging IBM Cloud for offsite backup copies; 2) on-premises Veeam users leveraging IBM Cloud for DR/BC purposes; 3) Strict RTO VM workload migration to IBM Cloud; 4) High RTO VM workload migration to IBM Cloud. The focus of this document is leveraging IBM Cloud Mass Data Migration (MDMS) to facilitate these use cases.

Intended Audience

This guide is targeted toward vSphere virtualization and / or Veeam backup administrators responsible for evaluating and deploying Veeam Backup & Replication for enhanced availability on IBM Cloud infrastructure. It assumes the reader is generally familiar with virtualization, data protection, and cloud connectivity topics.
Solution Overview

IBM Cloud and Veeam Solutions = Better Together

Veeam’s longstanding partnership with IBM Cloud is an ideal marriage of Veeam’s industry leading availability solution and IBM Cloud’s flexible, scalable IaaS offering. IBM Cloud is the only public cloud that seamlessly integrates Veeam’s full suite of availability features. Full hypervisor-level access in IBM Cloud makes it an ideal platform for Veeam.

This guide’s focus is the use of IBM Cloud Mass Data Migration to facilitate bulk Veeam data migration into IBM Cloud for the use cases previously mentioned.

Veeam Overview

Veeam Backup & Replication is an industry-leading data protection and disaster recovery solution for VMware, Nutanix and Microsoft Hyper-V virtual infrastructures that combines backup, replication, and the fastest item-level recovery, in a single product. Enabling these options from one interface, Veeam Backup & Replication serves to solve the most critical problems of virtual infrastructure management by protecting mission-critical virtual machines (VMs) from both hardware and software failure. With Veeam Backup & Replication, VM environments can publish a compressed and deduplicated backup file as a regular VMDK file, run a VM directly from a backup—without modifying the backup in any way, and automatically create an isolated environment. You can also run a VM directly from a backup file on regular backup storage, eliminating the need to recover the backup to production storage.

Veeam Backup & Replication™ is one of the most powerful solutions for VM backup, replication and recovery in VMware vSphere and Microsoft Hyper-V environments. With Veeam Backup & Replication, VMs can be backed up to disk, archived to low-cost storage or cloud environments and replicated from one host to another. Recovery of VMs can occur in a matter of minutes using Veeam’s patented technology integrated with many popular primary storage vendor solutions.

The major components of Veeam Backup & Replication consist of a management server, proxy servers, backup repository servers and disk-based backup repositories. The backup management server and backup proxy servers are Windows-based installations. The backup repositories can be Windows or Linux based, network attached storage systems or tape. These resources can be virtual or physical depending upon the storage and network topology, desired throughput of backup and recovery data streams, as well as the available server resources.
IBM Cloud Mass Data Migration Overview

IBM Cloud Mass Data Migration (MDMS) is a fast, simple, secure way to physically transfer terabytes to petabytes of data to the IBM Cloud. An alternative to over-the-network options, Mass Data Migration enables clients to use one or multiple devices to accommodate any size workload, overcome common data transfer challenges, and get their data where they really want it - all in a single service.

Each fifty-five-pound Mass Data Migration storage device on wheels offers 120TB usable capacity, inline data compression, and end-to-end security including industry standard AES 256-bit encryption all for an affordable price. A self-service offering by design, IBM ships a pre-configured device to the client for data ingestion and the client ships it back to IBM for offload into IBM Cloud Object Storage (COS). While MDMS currently only offloads to COS, the service is not limited to COS-only clients. MDMS can be used by any customer as a gateway into the IBM Cloud. Once data is offloaded to a client’s COS bucket, clients or client teams can immediately move their data from COS to the IBM Cloud application of their choice.
With superior hardware and technology, Mass Data Migration helps overcome common data transfer challenges including high costs, long transfer times, and security concerns. Whether it’s to free-up on-premises storage space, decommission data centers, or simply pursue a gateway into the IBM Cloud, IBM Cloud Mass Data Migration is a versatile data transfer solution allowing both commercial- and enterprise-level clients in every industry to move large amounts of data to the IBM Cloud in days – securely and affordably.

**Validation**

The test environment utilized for the creation of this document consisted of –
- Veeam Backup and Replication v9.5 U3a
- vSphere 6.0 Update 3
- MDMS storage
  - SMB
  - NFS
- IBM Cloud
  - Windows 2016 VSI Server
    - Veeam compute (data mover)
    - Veeam repository (block storage for rehydrated IBM Cloud Object Storage data)
  - IBM Cloud Object Storage

IBM Cloud MDMS can present either SMB or NFS storage. For this test, both approaches were employed, in turn, to illustrate configuration nuances between the two, relative to an existing Veeam Backup & Replication installation.

Additionally, a Veeam Backup Copy Job was utilized as the means by which Veeam backups were populated onto the MDMS device. Generally speaking this would be the least invasive approach as only the primary Veeam repository would be activated to process the copy job. No production VM storage would be impacted. This does not preclude the creation of a Veeam backup job that backs up from the hypervisor layer directly to MDMS however.

The test cases presented below exercise a small number of moderately sized VM’s and the throughput performance indicated in the attendant screen captures is not intended to indicate maximum performance, rather the purpose of the document is to establish a procedure by which Veeam operates seamlessly with MDMS for data migration into IBM Cloud.

**Configuration**

After successfully staging, cabling and powering on the MDMS according to the IBM Cloud-provided instructions, browse to the designated MDMS IP and login with the username and password specified in the notification email sent from IBM Cloud e.g. –
Next choose “unlock” and enter the “Pool Lock Password” specified in the IBM Cloud setup email –
Now that the storage pool is unlocked and ‘ready’ we can choose a target Veeam repository type. Two options are available – NFS, SMB and we will cover both in turn.

SMB

Given the Windows OS basis for most Veeam software components, targeting the MDMS storage as an SMB repository is the most logical choice and setup is outlined in the steps below.

SMB Repository Setup

In the VBR console navigate to "Backup Infrastructure” → "Backup Repositories” → "Add Repository". Give the new repository a name –

Select “Shared folder” as the repository type –
Enter the path to the MDMS shared folder (no additional credentials are required) –

```
\192.168.15.77\veeamshare
```

Next select the "Advanced" option and specify "Per-VM Backup Files" –
Deselect the “Enable vPower…” option as there is no need to run IVMR or other vPower operations from the MDMS storage –
Finally select “Apply” and then “Finish” –
NFS

While it is possible to use the native Windows NFS client from your Veeam infrastructure, we generally recommend mounting NFS storage to a suitable Linux host and then creating a Linux Veeam repository (general system requirements and specific package dependencies).

NFS Repository Setup

To retrieve the NFS mount details from the MDMS system, navigate to "Network Shares", right click the preconfigured share name, and select "View mount command" –
Select the network share to view, the share path, and mount command.

Network Share: veeamshare
Share path: 192.168.15.77/export/veeamshare
Mount command: sudo mkdir -p /share/video
sudo mount -t nfs 192.168.15.77:/export/veeamshare /share/veeamshare
From the Linux server selected to host the Veeam repository run the above command line e.g. –

```
login as: ronn
ronn@192.168.15.127’s password:
Welcome to Ubuntu 16.04.3 LTS (GNU/Linux 4.4.0-64-generic x86_64)

* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage

490 packages can be updated.
275 updates are security updates.

Last login: Tue Oct 23 09:05:14 2018 from 192.168.15.121
ronn@ubuntu:~$ sudo umount /share/veeamshare
ronn@ubuntu:~$ sudo mkdir -p /share/veeamshare
ronn@ubuntu:~$ sudo mount -t nfs 192.168.15.77:/export/veeamshare /share/veeamshare
ronn@ubuntu:~$
```

Once the MDMS NFS share is successfully mounted to the selected Linux host, return to the Veeam console and navigate to “Backup Infrastructure” → “Backup Repositories” → “Add Repository”. Name the repository –

![New Backup Repository](image)
Next Select “Linux server” as the repository type –

Add the Linux server by IP or name along with administrator level credentials –
Select “Populate” to enumerate the available volumes on the Linux Host –
Select the NFS volume previously mounted –

In the next dialog, select “Advanced” and choose “Use per-VM backup files” –
Deselect "Enable vPower NFS service..." –

Finally, select "Apply" and "Finish" to complete repository setup –
NFS

While it is possible to use the native Windows NFS client from your Veeam infrastructure, we generally recommend mounting NFS storage to a suitable Linux host and then creating a Linux Veeam repository (general system requirements and specific package dependencies).

NFS Repository Setup

To retrieve the NFS mount details from the MDMS system, navigate to "Network Shares", right click the preconfigured share name, and select "View mount command" –
So that we leverage only backup data being deposited into the existing Veeam repository, select “From backups” or “From jobs” depending on organizational preference –

Select the VM’s to copy –

<table>
<thead>
<tr>
<th>Job name</th>
<th>Last restore point</th>
<th>VM count</th>
<th>Restore points count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Backups</td>
<td>10/30/2018 3:02:13 AM</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>vcenter</td>
<td>less than a day ago (3...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>AD</td>
<td>less than a day ago (3...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>CTXS Backups</td>
<td>10/30/2018 4:01:15 AM</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>NSVPX0</td>
<td>6 days ago 4:03 AM</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>XA652K8</td>
<td>12 days ago 4:05 AM</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>XA2008R20</td>
<td>less than a day ago (4...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>XDBroker</td>
<td>less than a day ago (4...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>XD7</td>
<td>less than a day ago (4...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>XA2016</td>
<td>less than a day ago (4...)</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>NSVPX0</td>
<td>less than a day ago (4...)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Dev Backups</td>
<td>10/30/2018 2:01:13 AM</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ubuntu Dev</td>
<td>10/27/2018 10:01:39 PM</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ubu0</td>
<td>2 days ago 10:03 PM</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
Next select the repository (SMB or NFS) using the MDMS device as its storage target –
“Next” through the Direct vs. WAN acceleration dialog –

Specify any processing time window constraints (“Next” if none) –
Finally, select “Finish” –

The job will begin copying the available VM backup data to the MDMS device –
Once the backup copy cycle has completed, all current VM backup data will be present on the MDMS device. Veeam will continue to move new backup data increments to MDMS as long as the backup job is enabled and the MDMS storage is available. To verify, browse to the SMB share presented, or for NFS log onto the Linux host serving as the mount point, and verify the presence of .VBK (full backup) and optionally .VIB (incremental backup) files e.g. –

When verification is completed the MDMS system can be shut down and returned to IBM.
Rehydration

Once the MDMS data has been offloaded to the IBM Cloud Object Storage bucket specified on the device order form, it can then be transferred to block or file storage where it can be readily accessed by Veeam.

Recovery Environment

Since this testing has been conducted at relatively small scale, an IBM Cloud Windows VSI instance with attached SAN disks has been employed as the storage vehicle to deposit the backups from the COS bucket. Note: this server instance will also provide IBM Cloud-side compute for the Veeam use cases outlined in the next section.

Any number of tools (Cyberduck, WinSCP, etc.) could be used to move the data from COS into the Windows storage, however, in our case we’ve chosen CloudBerry Explorer for Amazon.

On the Windows host, create a folder “Backup” (naming is unimportant) to copy the Veeam backup data to. It’s recommended to also create a sub-folder matching the original backup copy job name under “Backup” to place data in as this makes for seamless job remapping to IBM Cloud in cases where the data will serve as a “seed” for backup copies into IBM Cloud.

Using your preferred tool navigate to and then move the data from COS to the designated Windows folder e.g. –

\(^1\) Veeam will soon directly support S3 storage including IBM Cloud Object Storage. This document will be revised accordingly at that time.
Use Cases

Backup to IBM Cloud

The following steps outline the specific tasks required for an on-premises Veeam customer to leverage IBM Cloud for offsite or secondary copies of their local Veeam backup data using the point-in-time data captured by MDMS to "seed" the offsite backups. Only the backup data deltas between the time MDMS was disconnected from the on-premises environment will need to be transferred into IBM Cloud to synchronize the on-premises backup data state.

Refer to Veeam knowledgebase article [KB1729](#) for reestablishing backup continuity for backups moved with IBM Cloud MDMS. After moving the MDMS data to file or block storage accessible by a Windows or Linux server in IBM Cloud (physical or VM) and assuming on-premises VBR server connectivity to this server, we can "re-map" the backup copy job we created to populate the MDMS appliance and begin moving incremental backup data into IBM Cloud.

To begin, create a new Veeam repository pointing to the IBM Cloud server instance hosting the migrated data in the on-premises VBR server e.g. –
In our test case we've utilized a Windows host in IBM Cloud, however, Linux can provide a suitable repository as well –
Add the IBM Cloud target server specifics (IP / hostname along with credentials) –
If the connection from the on-premises Veeam server is successful, the Veeam data mover is automatically installed on the target IBM Cloud host –
Once the IBM Cloud repository host is successfully initialized, the following will be displayed –

Next select "Populate" and specify the target volume for backups. Note: this should be the volume the MDMS data has been migrated to –
Browse to the folder the imported data is stored in –

Select "Advanced" and enable "Use per-VM backup files" –

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Choose “Next” –

New Backup Repository

Mount Server
Specify a server to mount backups to for file-level restores. vPower NFS service allows for running virtual machines directly from backup files, enabling advanced functionality such as Instant VM Recovery, SureBackup and On-Demand Sandbox.

Name
Mount server:
10.208.0.73 (Created by XIRTICA\administrator at 11/9/2010 4:08 PM.)

Type

Server

Repository

Mount server

Review

Apply

Select “Apply” to deploy any required Veeam software components and then “Finish” –

New Backup Repository

Review
Please review the settings, and click Apply to continue.

Name
Repository type:
Windows

Type
Mount host:
10.208.0.73

Server
Account:
virt\administrator

Repository
Backup folder:
C:\Backups
Write throughput:
Not limited
Max parallel tasks:
4

Mount Server

Apply

The following components will be processed on server 10.208.0.73:

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>already exists</td>
</tr>
<tr>
<td>vPower NFS</td>
<td>already exists</td>
</tr>
<tr>
<td>Mount Server</td>
<td>already exists</td>
</tr>
</tbody>
</table>

Import existing backups automatically

Import guest file system index

< Previous  Apply  Finish  Cancel
The IBM Cloud-based repository will then appear in the on-premises Veeam console –
In the test procedure employed for this documentation, the MDMS on-premises Veeam backup copy job was simply disabled once the MDMS device was disconnected and returned to IBM. In this way the job can simply be enabled and subsequently re-pointed to the new IBM Cloud repository, however, a new backup copy job can also be created from scratch (refer to KB1729 "Method B"). In our case, we simply select the previous job and “Edit” –

Since the VM objects will be the same, select “Target” –

![Backup Copy Job Configuration](image-url)
Switch the repository to the new IBM Cloud instance –

If all mapped correctly, the backup copy job should immediately begin processing incremental backup data –
Disaster Recovery to IBM Cloud

The following steps outline how to use Veeam-powered DR/BC to stage cold VM’s into vSphere on IBM Cloud for failover purposes using MDMS backup data to “seed” the Veeam replicas which reduce initial VM replication bandwidth requirements.

For this test we will leverage the IBM Cloud Veeam repository outlined in the prior section. A single ESXi host is also provisioned in IBM Cloud for use as a replication target to illustrate this use case. Note: the replica seeding operation only needs to leverage the VM backup data on the initial replication job iteration. All subsequent replication instances operate in a normal manner where VM deltas are transmitted from on-premises VM instances to the IBM Cloud VM replicas.

This section will focus strictly on leveraging the MDMS imported backup data to facilitate Veeam replication. For a full treatment of replication options and capabilities, refer to the Veeam online documentation here.

To begin, navigate to "Backup Infrastructure" -> "Managed Servers" -> "Add Server" to add the IBM Cloud-hosted vSphere or ESXi host to the on-premises Veeam configuration –

Add the vSphere or ESXi host credentials –
Select “Continue” if a certificate warning is presented and the server will be saved to the on-premises Veeam configuration –

If host creation is successful –
Once connectivity is established, navigate to “Home” → “Replication Job” → “VMware vSphere” to create a new replication job –

To enable replica seeding from the MDMS backup data, select “Low connection bandwidth (enable replica seeding)” –
Add VM(s) from the local (on-premises) virtual infrastructure that already exist in the IBM Cloud Veeam repository created from the MDMS backups. In our case, only a subset of the VMs are selected –

Next select the target IBM Cloud-hosted vSphere environment particulars (resource pool, folder, datastore) –
Veeam maintains a metadata repository for replication job status. This can be located in any valid Veeam repository; however, an on-premises repository is recommended –

Choose “Next” at the subsequent dialog –
Select "Get seed from..." and choose the IBM Cloud-hosted Veeam repository –

Optionally, choose any required application-level processing –
Define the replication job schedule –

And finally, select “Finish” to complete the replication job settings. Optionally, run immediately –

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If the seeding is successful, the initial replication run will appear as follows –

Once the replication job completes, the VM replicas can be verified in the appropriate vSphere management console e.g. –
Failover

The scope of this document is limited to the setup phase of the DR environment. Additional recommended resources are included in the reference section at the end of this document.

Veeam “Proxy Affinity”

A Veeam “proxy” or data mover in a given infrastructure can be employed for any eligible Veeam job. However, this can be undesirable in a distributed environment such as would exist between an on-premises Veeam installation and IBM Cloud. During the replication test, such a scenario presented itself.

Since the proxy on the on-premises Veeam server happened to be available when the replication job started, it was assigned to move the data resulting in an undesirable “hair pinning” data path which would defeat the purpose of the replica seed local to IBM Cloud. In this case, the on-premises data mover was reading the seed data from the IBM Cloud repository then shipping it back to the ESXi target in IBM Cloud. –

The solution is twofold: 1) explicitly assign the IBM Cloud Windows server a “proxy” or data mover role by simply adding it to the on-premises managed servers list and designating it as an available proxy; and 2) assign proxy affinity to the on-premises and new IBM Cloud Veeam proxies. This associates the respective Veeam repositories with their local proxies so that traffic flow is optimized e.g. –
IBM Cloud Low RTO VM Workload Migration

In addition to its use as a DR/BC mechanism, Veeam replication is routinely employed as a migration tool and can be used to migrate VM's from on-premises or other cloud/colocation/DR facilities into IBM Cloud. For VM workloads with low RTO (minutes) requirements, the replication procedure outlined in the preceding section can be used to stage VM's into IBM Cloud. Once successfully provisioned into IBM Cloud, a permanent failover operation can be performed from the source Veeam environment to bring the staged VM into full production generally requiring only a few minutes of VM downtime. For further reading, refer to the replication resource section of the references portion of this documentation.

IBM Cloud High RTO VM Workload Migration

High RTO (days/weeks) VM workload migrations is an additional MDMS+Veeam use case that is simple to implement. Since this particular case likely would not require any on-premises environment interaction, simply deploy a Veeam server (with adequate storage to accept the MDMS backup data) into IBM Cloud via the standard portal interface. Then accomplishing a restore into vSphere on IBM Cloud would only involve adding the rehydrated backup data as a Veeam repository and running restore operations to vSphere.
References

Veeam DR/Migration

Replication Failover/Failback [online]: https://helpcenter.veeam.com/docs/backup/vsphere/failover_failback.html?ver=95

Advanced DR Orchestration (VAO) [online]: https://helpcenter.veeam.com/docs/vao/userguide/welcome.html?ver=10

IBM Cloud Mass Data Migration (MDMS)

More information on MDMS: https://www.ibm.com/cloud/mass-data-migration

About Veeam Software

Veeam recognizes the new challenges companies across the globe face in enabling the Always-On Enterprise™, a business that must operate 24.7.365. To address this, Veeam has pioneered a new market of Availability for the Always-On Enterprise™ by helping organizations meet recovery time and point objectives (RTPO™) of less than 15 minutes for all applications and data, through a fundamentally new kind of solution that delivers high-speed recovery, data loss avoidance, verified recoverability, leveraged data and complete visibility.

Veeam Availability Suite™, which includes Veeam Backup & Replication™, leverages virtualization, storage and cloud technologies that enable the modern data center to help organizations save time, mitigate risks and dramatically reduce capital and operational costs, while always supporting the current and future business goals of Veeam customers.

Founded in 2006, Veeam currently has 43,000 ProPartners and more than 216,500 customers worldwide. Veeam's global headquarters are located in Baar, Switzerland, and the company has offices throughout the world. To learn more, visit http://www.veeam.com.