

# Veeam B&R Components

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# Outline

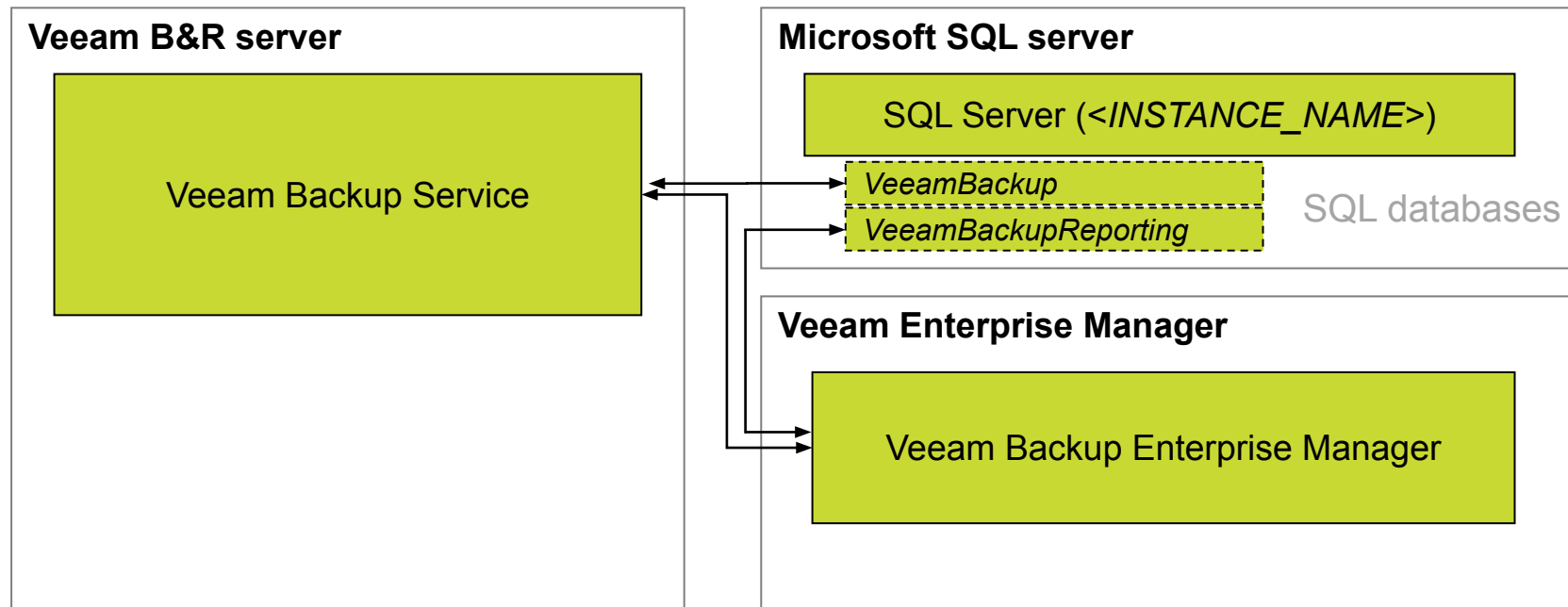
Veeam® Backup & Replication™ and Enterprise Manager

Windows services

Linux server interaction

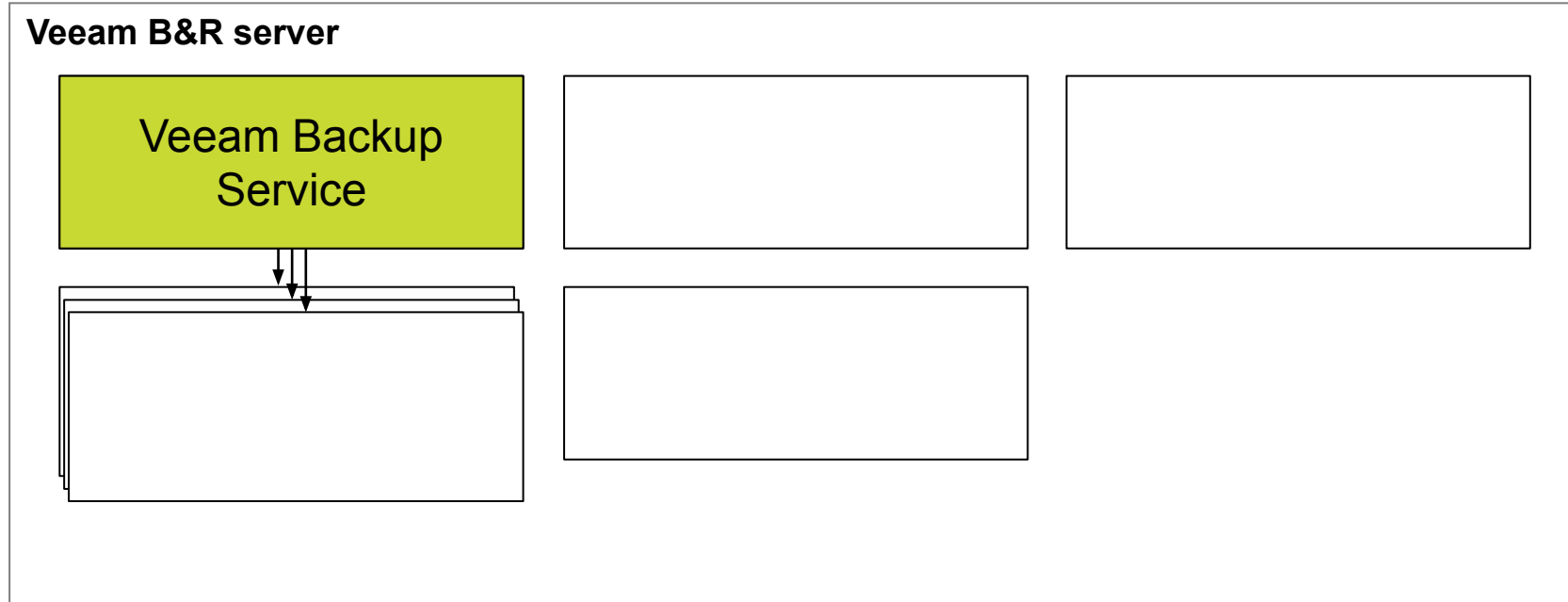
Veeam B&R guest interaction: Windows and Linux

# Veeam B&R and Enterprise Manager



 Service  Process  Driver

# Veeam Backup & Replication









 Service  Process  Driver

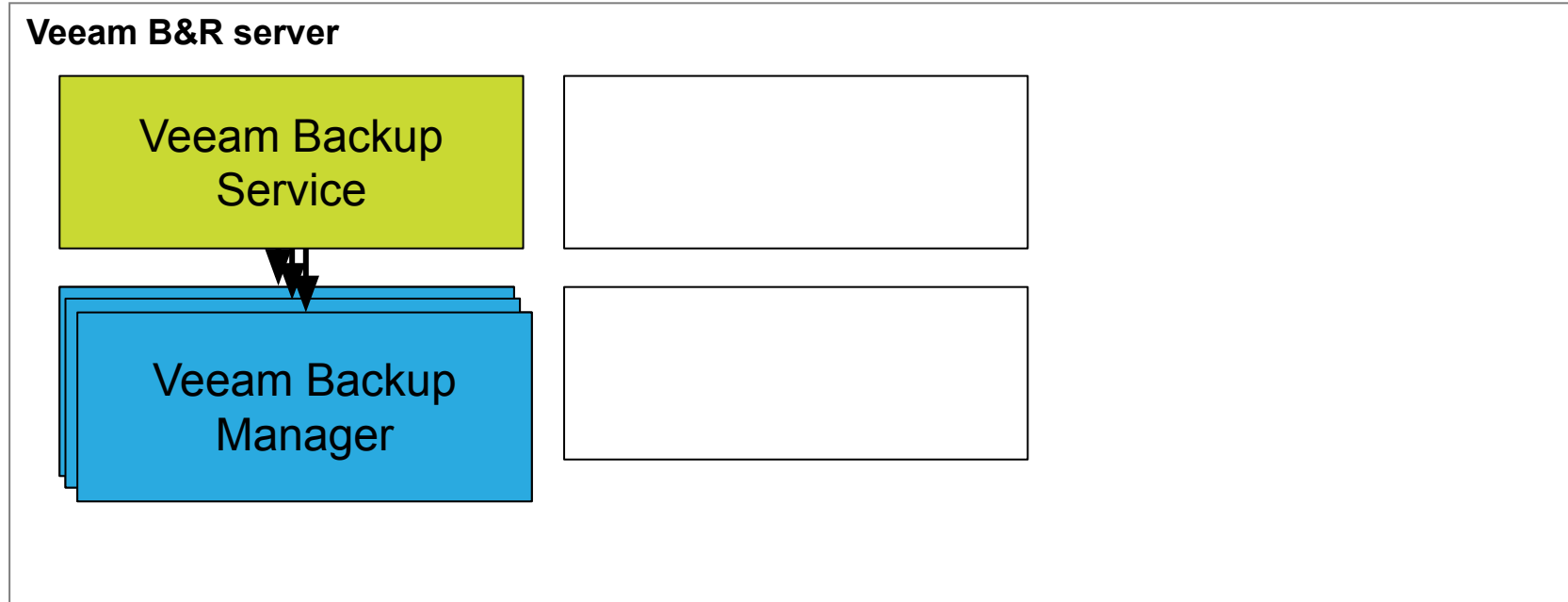
# Veeam Backup & Replication Service

Veeam.Backup.Service.exe

- Manages the database
- Initiates every job start
- Runs resource task scheduler (RTS):  
Tracking of “resource” usage (concurrent tasks on proxy, repository, concurrent CSV snapshots)
- Accepts incoming connections from Veeam Console, Enterprise Manager, Veeam Endpoint Backup™ and others

| Veeam Backup and Replication Service  |                                   | Veeam Backup Service             | Running |
|---|-----------------------------------|----------------------------------|---------|
|  | Veeam Backup Catalog Data Service | Veeam Backup Catalog Data Ser... | Running |
|  | VeeamCloudSvc                     | Veeam Cloud Connect Service      | Running |
|  | VeeamDeploymentService            | Veeam Installer Service          | Running |
|  | VeeamGateSvc                      | Veeam Cloud Gateway Service      | Running |
|  | VeeamNFSSvc                       | Veeam vPower NFS Service         | Running |
|  | VeeamTransportSvc                 | Veeam Data Mover Service         | Running |

# Veeam Backup & Replication



 Service  Process  Driver

# Veeam Backup Manager

Started by Veeam Backup Service  
and is able to access the database

Runs a job from start to finish and understands  
the actions it's supposed to take, such as:

- Connecting to vCenter over HTTPS or Hyper-V host over WMI
- Snapshot creation/removal
- Retention calculation and any other kind of job logic
- Direct communication with data movers (aka VeeamAgents).



# Veeam Backup Manager

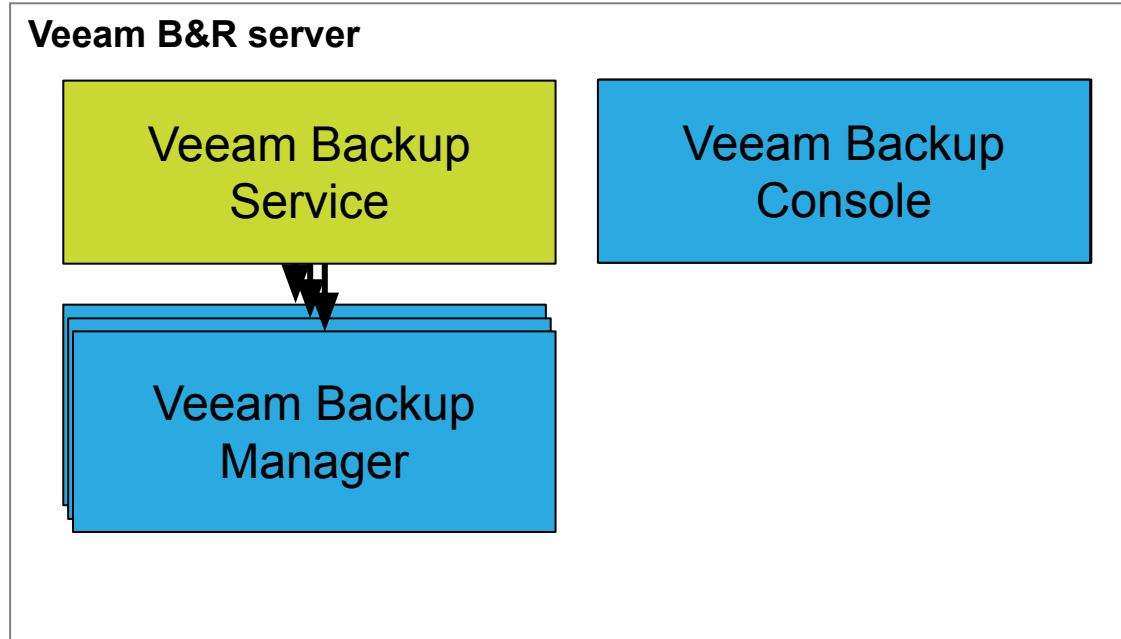
A **job** is almost any kind of *activity* that Veeam Backup & Replication can perform:

- Backup, replication, backup copy, etc.
- Any restore is a single-run job
- Any system jobs such as configuration backup, rescan, SAN rescan, tape infrastructure rescan





# Veeam Backup & Replication

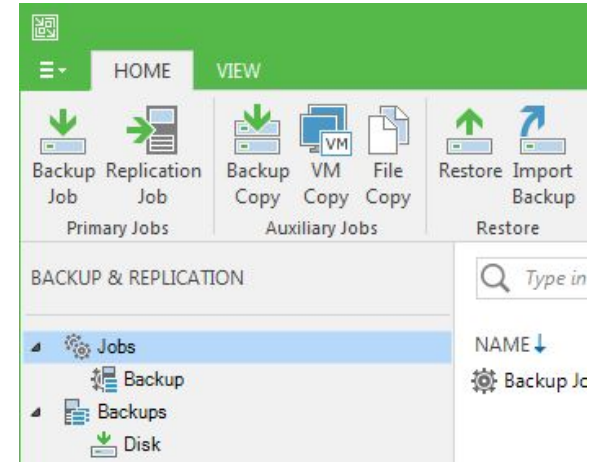


 Service  Process  Driver

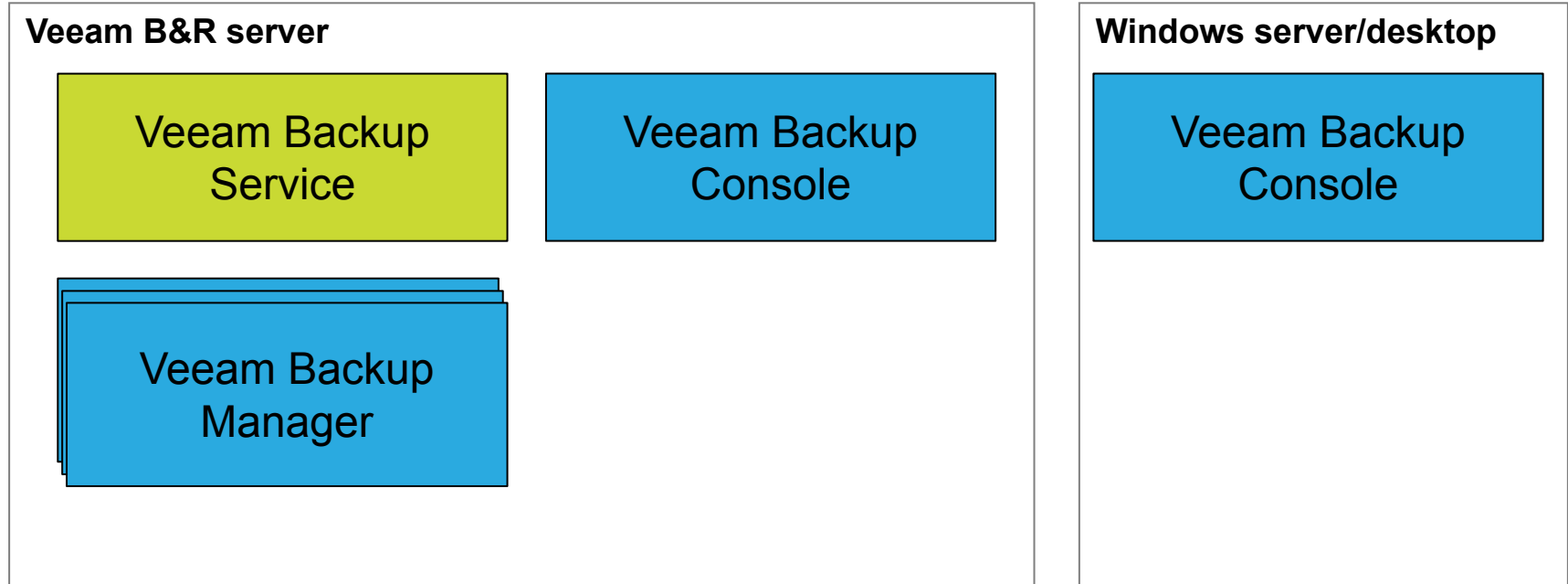
# Veeam Backup Console

Veeam.Backup.Shell.exe

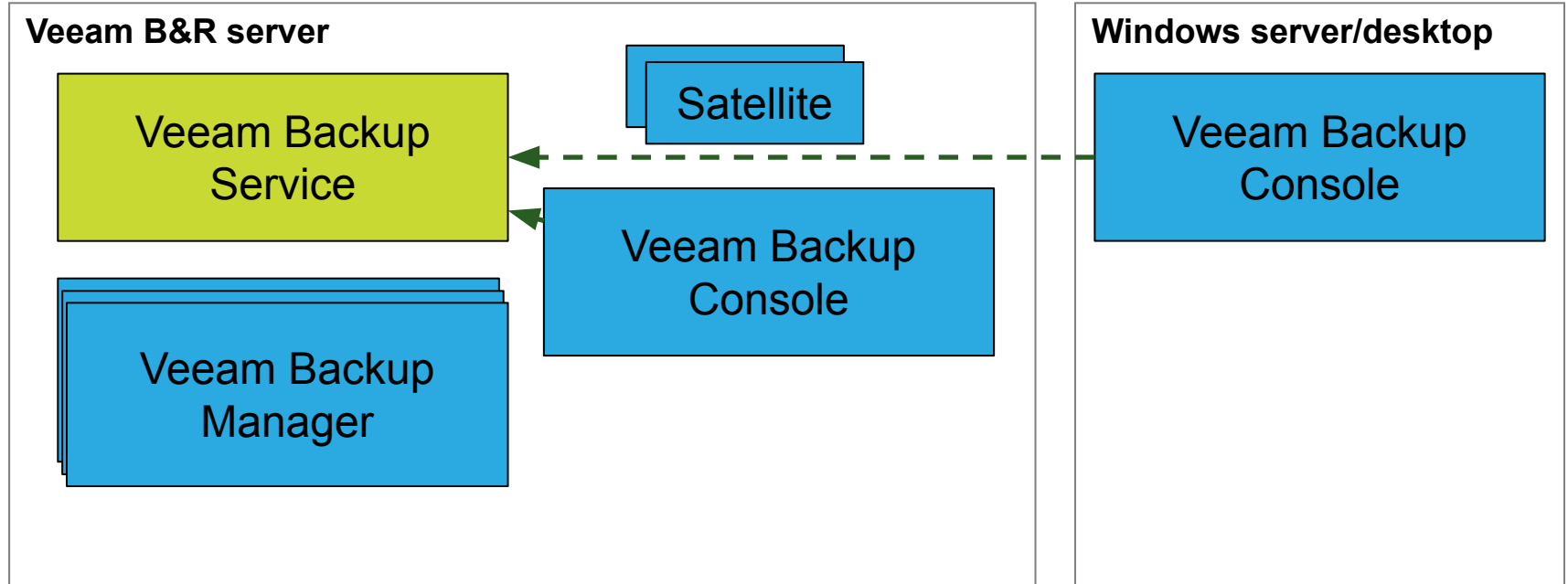
- Essentially a graphical user interface, started by end users
- Obtains data from the database to display jobs, backups and so on.
- Almost all user interaction and possible errors during interaction are logged.



# Veeam Backup & Replication



# Veeam Backup & Replication

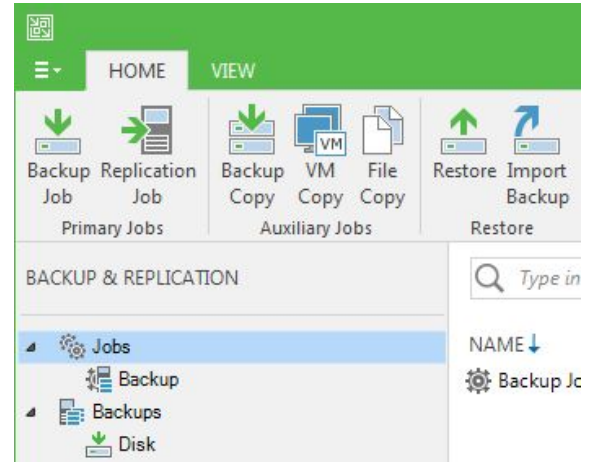


 Service  Process  Driver

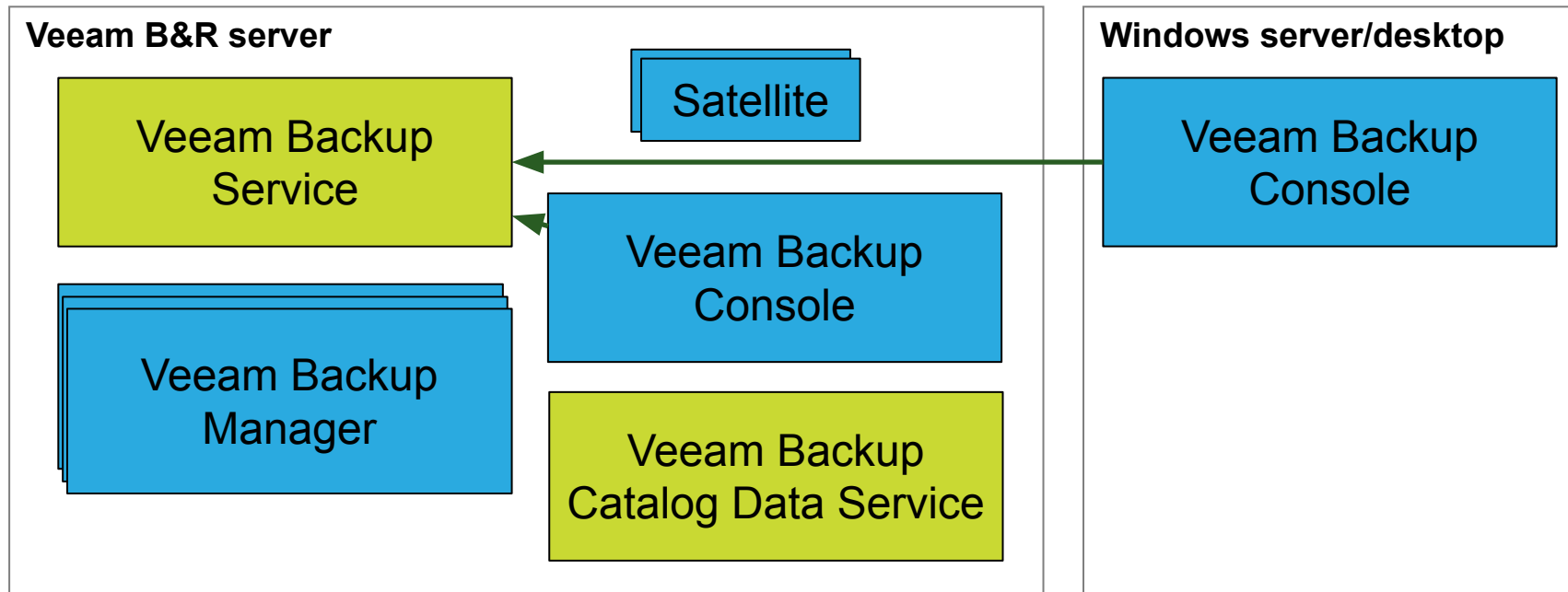
# Remote Console

## Control Veeam B&R from any Windows machine

- Veeam Console runs on your desktop and connects to a remote B&R
- Windows FLR is mounted locally, to the machine with Veeam Console
- Veeam Explorers also run locally
- Satellite process for each Console – used for offloading certain operations



# Veeam Backup & Replication

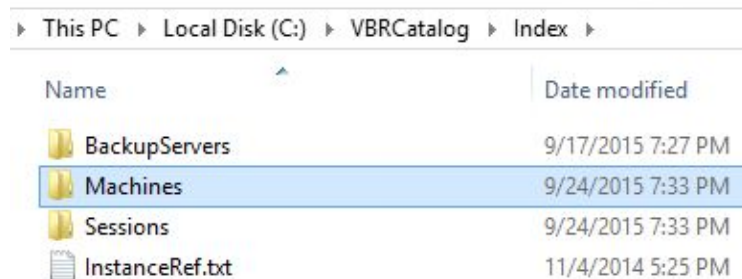


 Service  Process  Driver

# Veeam Backup Catalog Data Service

Veeam.Backup.CatalogDataService.exe

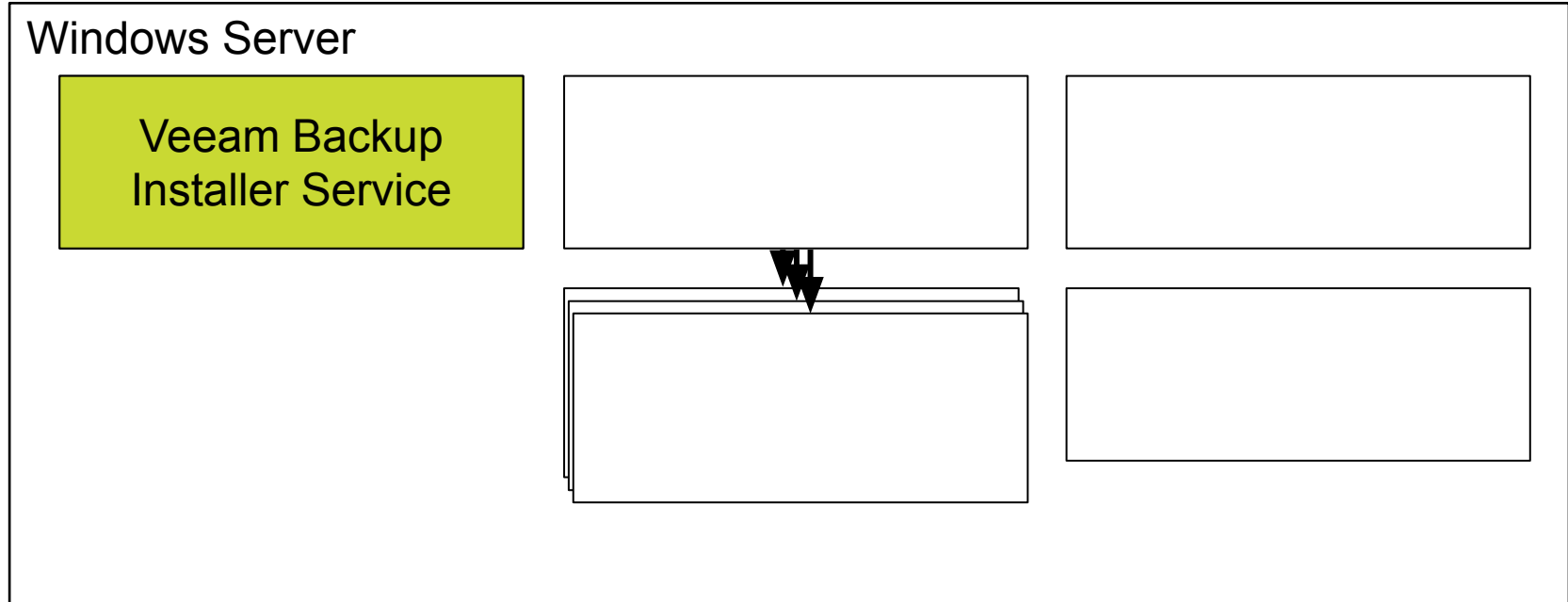
- Handles VM file system indexing data (the VBRCatalog folder)
- Handles catalog retention
- Only used when the indexing option is enabled in the backup jobs



The screenshot shows a Windows Explorer window with the address bar set to 'This PC > Local Disk (C:) > VBRCatalog > Index'. The main pane displays a list of files and folders. The 'Machines' folder is selected and highlighted in blue. The list includes folders for 'BackupServers', 'Machines', and 'Sessions', and a file named 'InstanceRef.txt'. The 'Date modified' column shows the last modification date and time for each item.

| Name            | Date modified     |
|-----------------|-------------------|
| BackupServers   | 9/17/2015 7:27 PM |
| Machines        | 9/24/2015 7:33 PM |
| Sessions        | 9/24/2015 7:33 PM |
| InstanceRef.txt | 11/4/2014 5:25 PM |

# Windows Server: Mandatory services

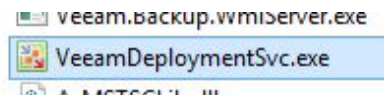


 Service  Process  Driver



# Veeam Installer Service (1/2)

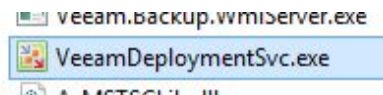
VeeamDeploymentSvc.exe:



- The first service installed on any Windows Server added to Veeam B&R
- Performs installation of other services
- On every “rescan,” gathers and reports back to Veeam:
  - OS version, number of CPU cores, attached storage, available volumes and amount of free space

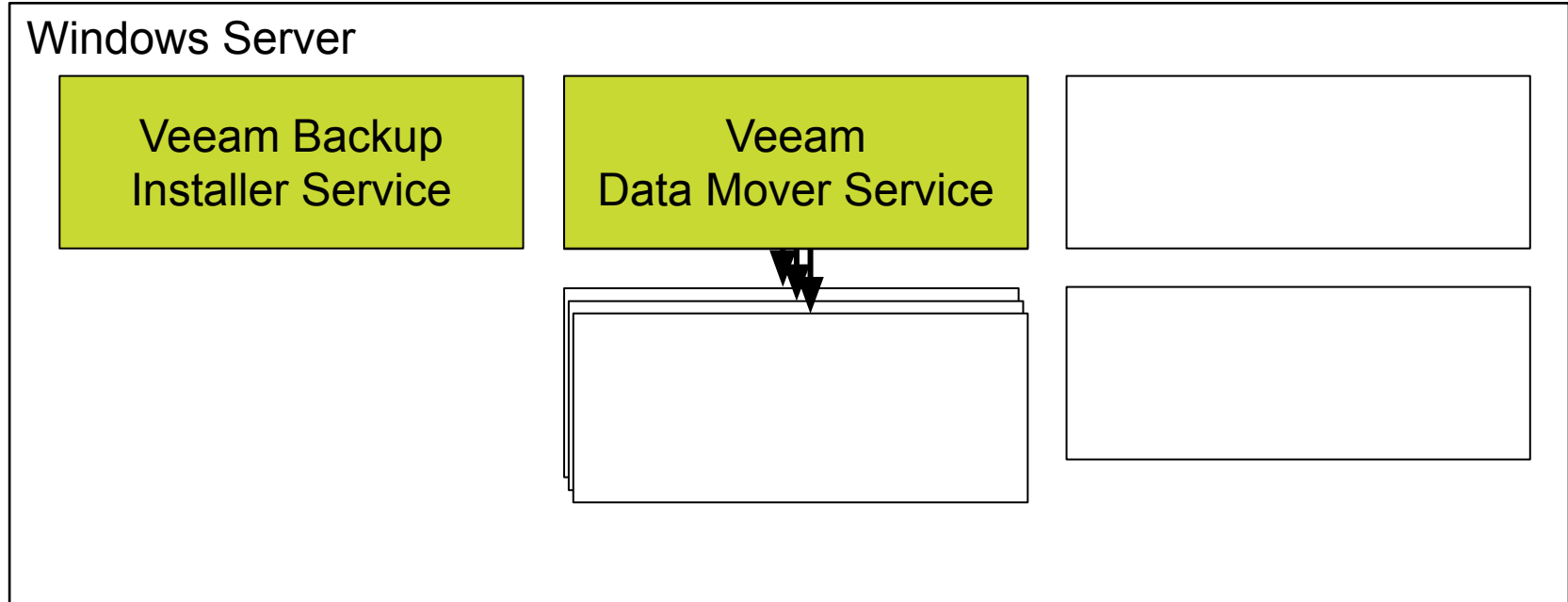
# Veeam Installer Service (2/2)

VeeamDeploymentSvc.exe:



- If the service isn't running, Windows server is considered "offline."
- Performs simple tasks such as:
  - directory enumeration
  - .vbm file read/write
  - file rename, remove

# Windows Server: Mandatory services



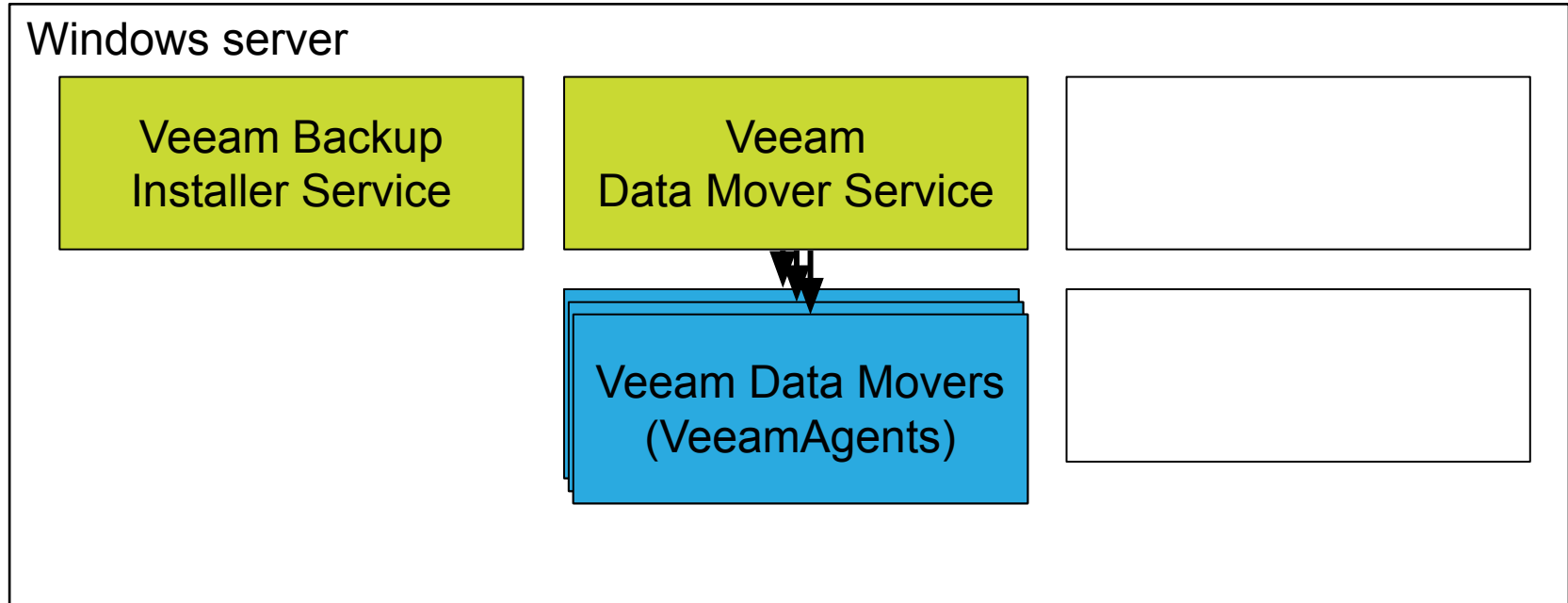
 Service  Process  Driver

# Veeam Data Mover Service

## VeeamTransportSvc.exe

- Starts data movers (VeeamAgents) by the requests from Veeam Backup Manager

# Windows Server: Mandatory services



 Service  Process  Driver

# Data Movers (1/2)

## VeeamAgent.exe

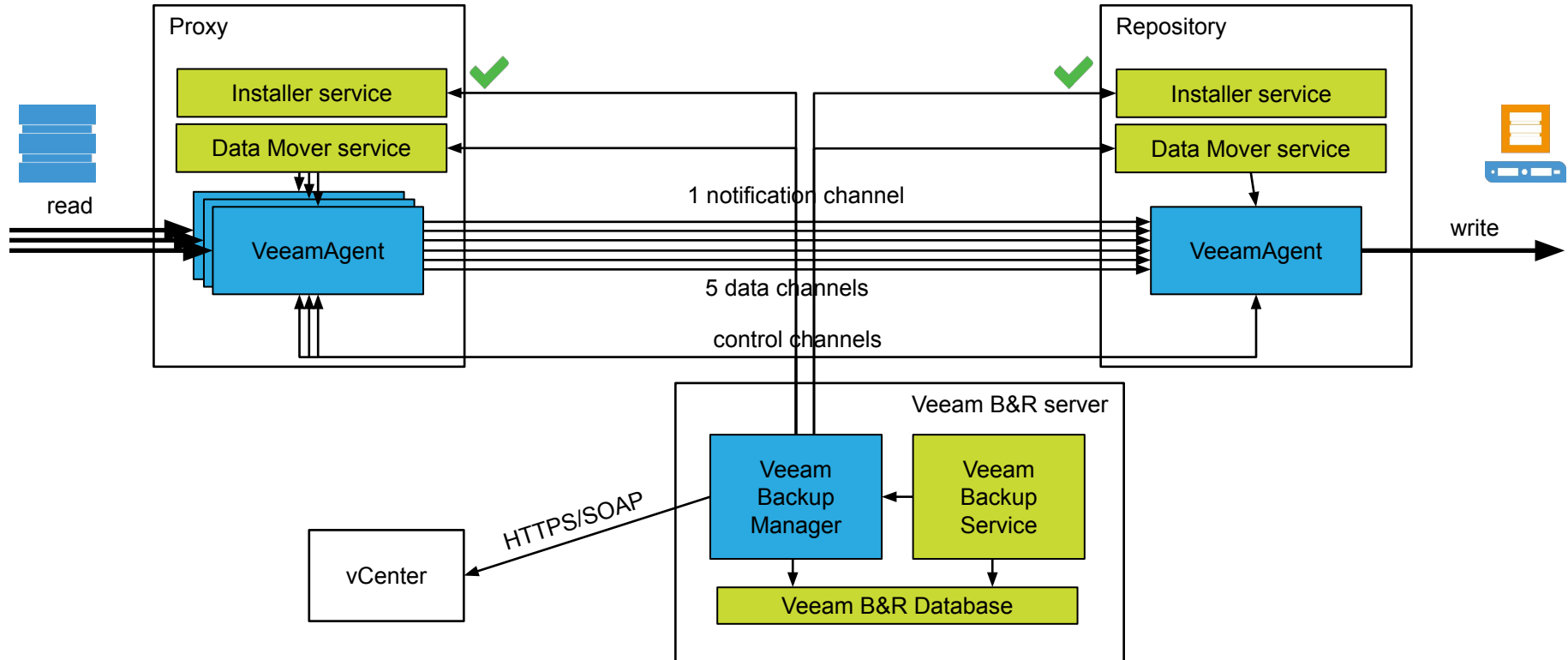
- Processes that do the “heavy lifting,” data transfer work associated with a proxy or repository
- For example, during a VMware backup job:
  - **Source** agents read .vmx, .vmxf, .nvram and .vmdk files
  - **Target** agents write backup files to the repository folder/share

# Data Movers (2/2)

## VeeamAgent.exe

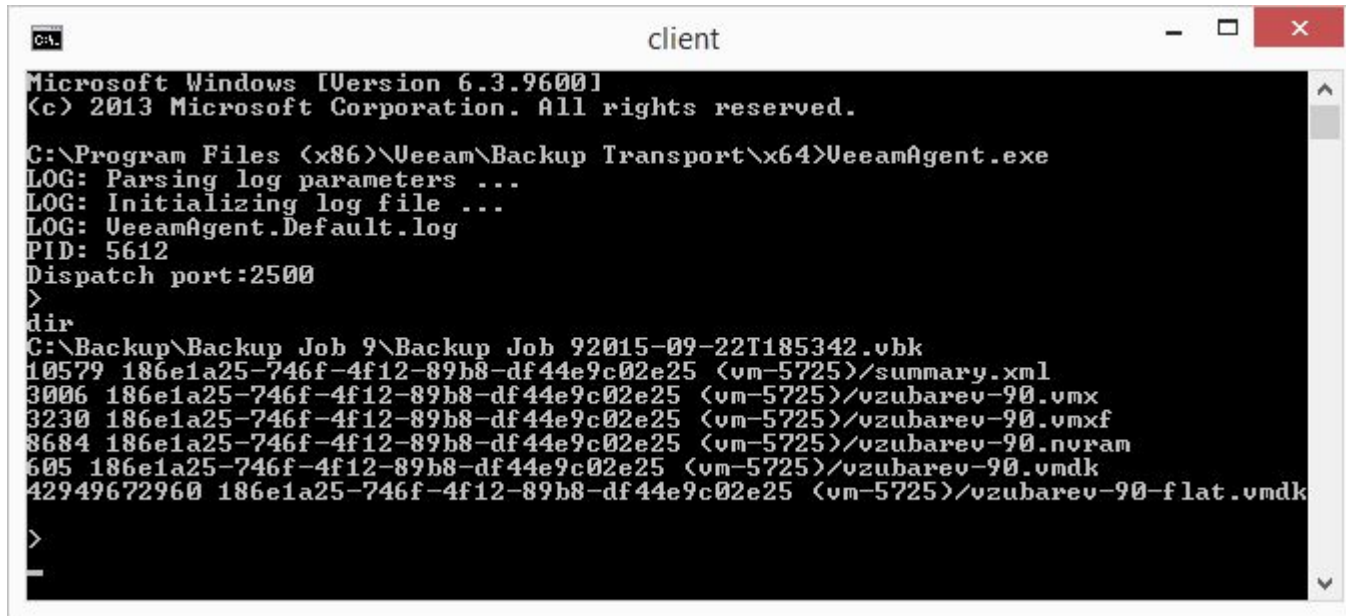
- VeeamAgents simply follow commands from the manager, they don't have a concept of a "job"
  - Manager knows which agent is performing which role
  - There are more than 200 commands for all the different scenarios
- 32 and 64-bit versions for both Windows and Linux

# VMware backup job workflow





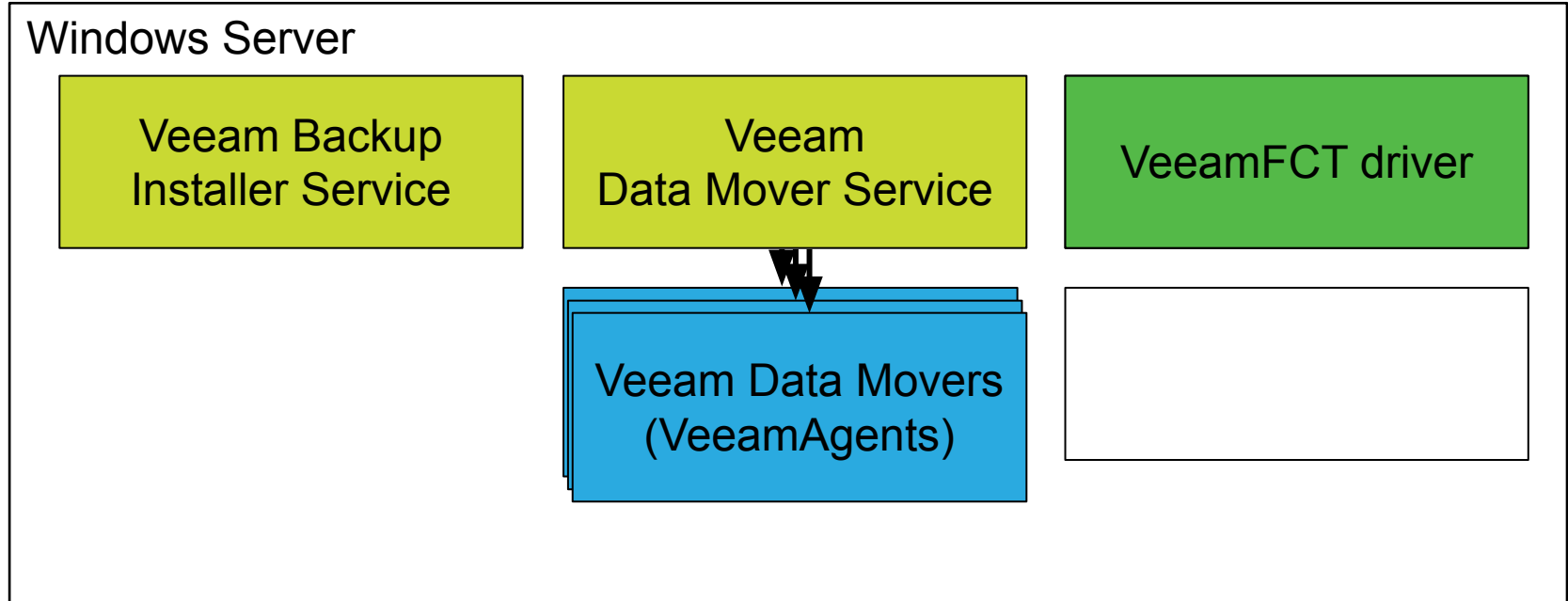
# VeeamAgent demonstration



```
client
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Program Files (x86)\Veeam\Backup Transport\x64\VeeamAgent.exe
LOG: Parsing log parameters ...
LOG: Initializing log file ...
LOG: VeeamAgent.Default.log
PID: 5612
Dispatch port:2500
>
dir
C:\Backup\Backup Job 9\Backup Job 92015-09-22T185342.vbk
10579 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/summary.xml
3006 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/vzubarev-90.vmx
3230 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/vzubarev-90.vmx
8684 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/vzubarev-90.nvram
605 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/vzubarev-90.vmdk
42949672960 186e1a25-746f-4f12-89b8-df44e9c02e25 <vm-5725>/vzubarev-90-flat.vmdk
>
```

# Windows Server: Mandatory services



 Service  Process  Driver

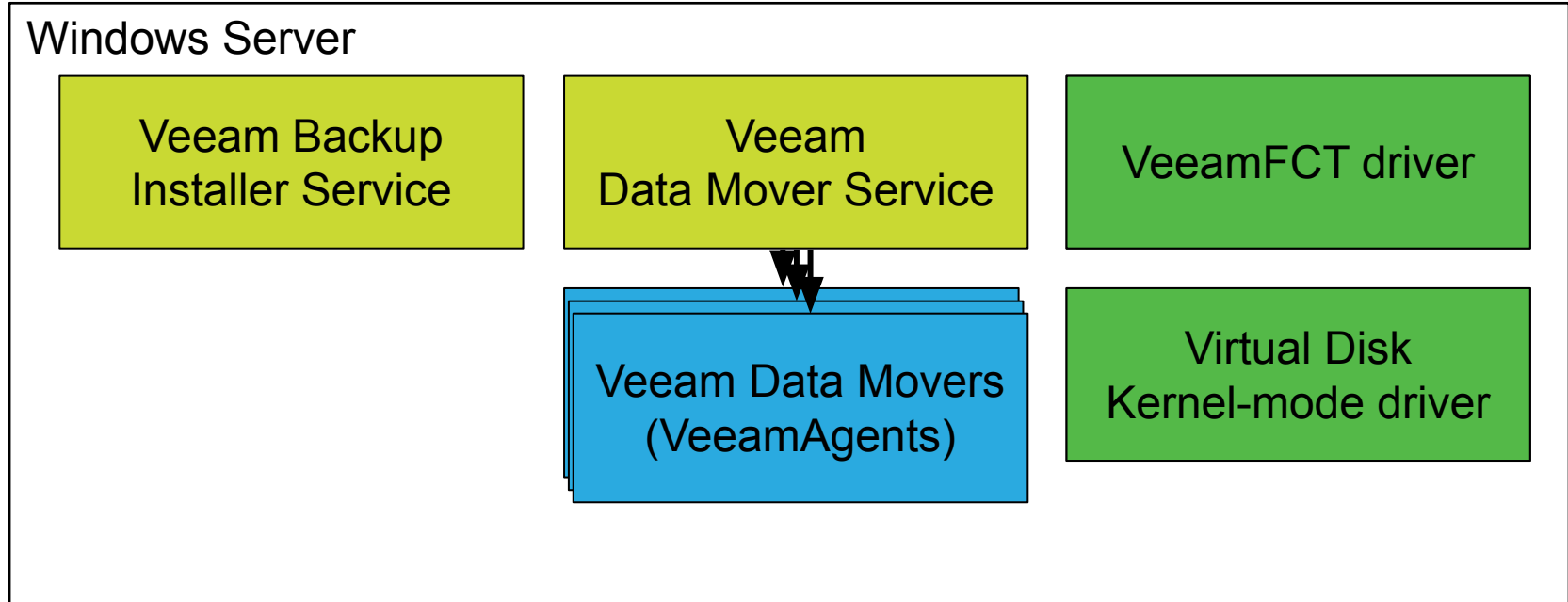
# Veeam FCT driver

## veeamfct.sys

- Restores Veeam backup contents, presenting files on the file system, without requiring any disk space
- Key component in many restore scenarios:
  - Instant VM Recovery, Windows FLR, Multi-OS FLR, SureBackup

| Driver Name | Driver Description                          | Driver Path   | Driver Type        | Required | Installation |
|-------------|---|---|--------------------|----------|--------------|
| vdrvroot    | Microsoft Virtual Drive Enumerator          | c:\windows\system32\drivers\vdrvroot.sys  | Kernel Driver      | Yes      | Boot         |
| veeamflr    | Veeam File Level Restore Mini-Filter Driver | \\?\c:\program files\common files\veeam\backup and replication\mount service\veeamfct.sys | File System Driver | No       | Manual       |
| verifierext | VerifierExt                                 | c:\windows\system32\drivers\verifierext.sys   | Kernel Driver      | No       | Manual       |

# Windows Server: Mandatory services



 Service  Process  Driver

# Virtual disk kernel-mode driver (1/2)

vdk.sys / vdk.exe

- A driver that is able to mount vSphere (.vmdk) and Hyper-V (.vhd(x)) disks to a Windows machine as if they were attached directly
- Driver is controlled via vdk.exe

```
Virtual Disk Driver for Windows version 4.0.0.3
Usage:
    VDK.EXE command [options...]

Commands:
INSTALL    Install the Virtual Disk Driver.
REMOVE    Uninstall the Virtual Disk Driver.
START     Start the Virtual Disk Driver.
STOP      Stop the Virtual Disk Driver.
DRIVER    Print Virtual Disk Driver status.
DISK      Set the initial number of virtual disk devices.
CREATE    Create a new virtual disk device.
DELETE    Delete a virtual disk device.
VIEW      Print disk image information.
DETAILS   Print disk image detailed information.
OPEN      Open a disk image as a virtual drive.
CLOSE     Close a disk image.
LINK      Assign a drive letter to a partition.
ULINK     Remove a drive letter from a partition.
IMAGE     Print opened image file information.
HELP      Print command help.
```

# Virtual disk kernel-mode driver (2/2)

vdk.sys / vdk.exe

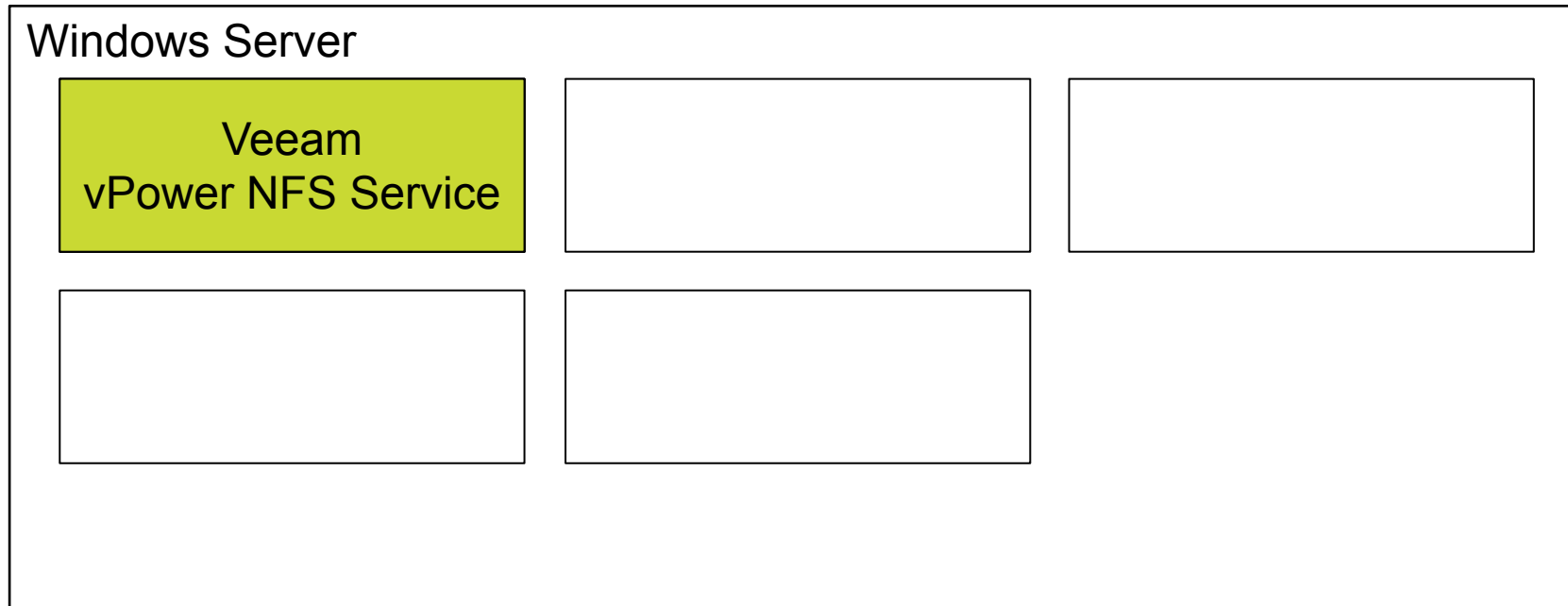
A key component in the following scenarios:

- Windows FLR, Veeam Explorers™
- Applying replica Re-IP rules during failover
- SureBackup Domain Controller recovery

```
Virtual Disk Driver for Windows version 4.0.0.3
Usage:
  UDK.EXE command [options...]

Commands:
  INSTALL      Install the Virtual Disk Driver.
  REMOVE      Uninstall the Virtual Disk Driver.
  START       Start the Virtual Disk Driver.
  STOP        Stop the Virtual Disk Driver.
  DRIVER      Print Virtual Disk Driver status.
  DISK        Set the initial number of virtual disk devices.
  CREATE      Create a new virtual disk device.
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  LINK        Assign a drive letter to a partition.
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```

# Windows Server: On-demand services

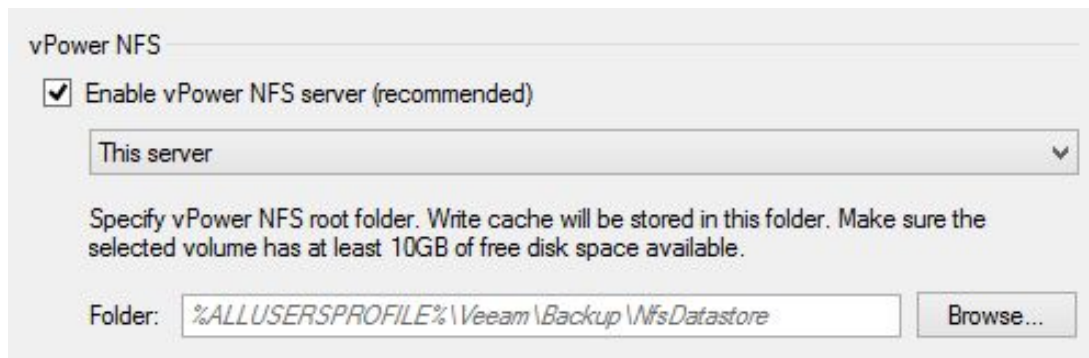


 Service  Process  Driver

# Veeam vPower NFS Service

VeeamNFSSvc.exe

- Acts as an NFSv3 server, mountable from ESXi hosts in particular
- Key component in Instant Recovery, Multi-OS FLR, SureBackup



The screenshot shows the 'vPower NFS' configuration window. It has a title bar 'vPower NFS'. Below the title bar, there is a checkbox labeled 'Enable vPower NFS server (recommended)' which is checked. Below this is a dropdown menu currently showing 'This server'. Under the dropdown, there is a text instruction: 'Specify vPower NFS root folder. Write cache will be stored in this folder. Make sure the selected volume has at least 10GB of free disk space available.' Below this instruction is a text field labeled 'Folder:' containing the path '%ALLUSERSPROFILE%\Veeam\Backup\NfsDatastore'. To the right of the text field is a 'Browse...' button.

vPower NFS

☒ Enable vPower NFS server (recommended)

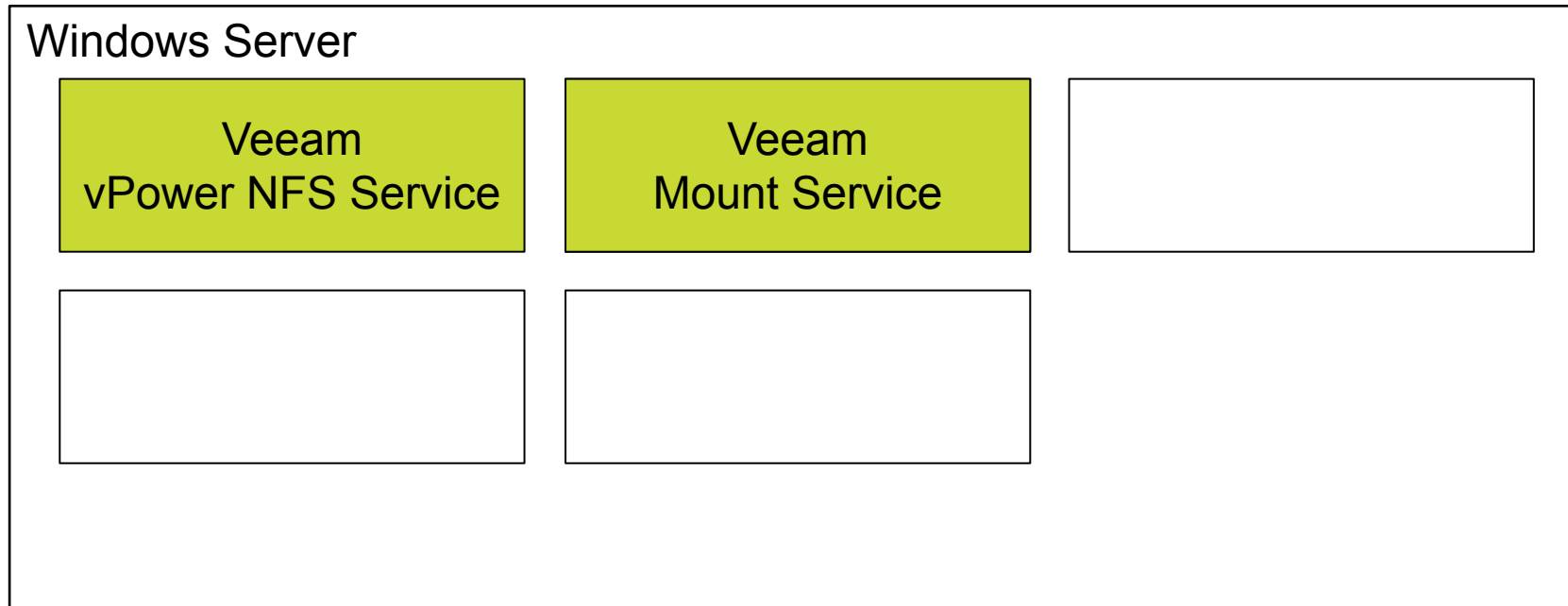
This server

Specify vPower NFS root folder. Write cache will be stored in this folder. Make sure the selected volume has at least 10GB of free disk space available.

Folder: %ALLUSERSPROFILE%\Veeam\Backup\NfsDatastore Browse...



# Windows Server: On-demand services

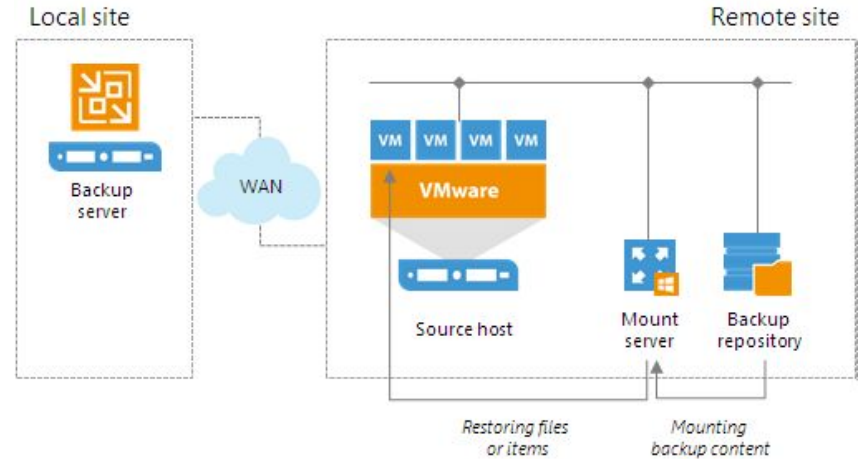


 Service  Process  Driver

# Veeam Mount Service/Server

Veeam.Backup.MountService.exe

- Used to contain File-Level Restore traffic on the remote site
- Defaults to Backup Repository or Backup Console



# Windows Server: On-demand services

## Windows Server

Veeam  
vPower NFS Service

Veeam  
Mount Service

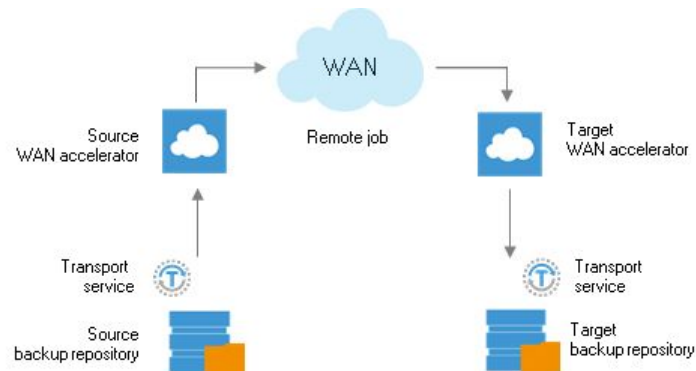
Veeam WAN  
Accelerator Service

 Service  Process  Driver

# Veeam WAN Accelerator Service (1/2)

VeeamWANSvc.exe

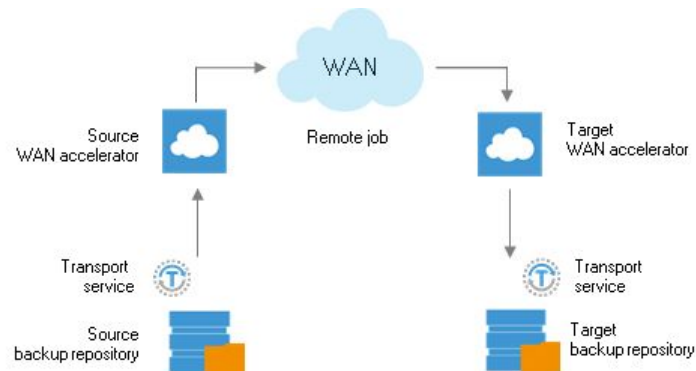
- Two instances are required, one on site, another off site
- Can be used for backup copy and replication jobs
- 64-bit process with minimal RAM requirement of 8 GB



# Veeam WAN Accelerator Service (2/2)

## VeeamWANSvc.exe

- Requires disk space for caching:  
100 GB+ recommended on target
- Performance may not improve if the network link is fast (e.g., 1 Gbit) and disks with cache are not fast enough



# Windows Server: On-demand services

## Windows Server

Veeam  
vPower NFS Service

Veeam  
Mount Service

Veeam WAN  
Accelerator Service

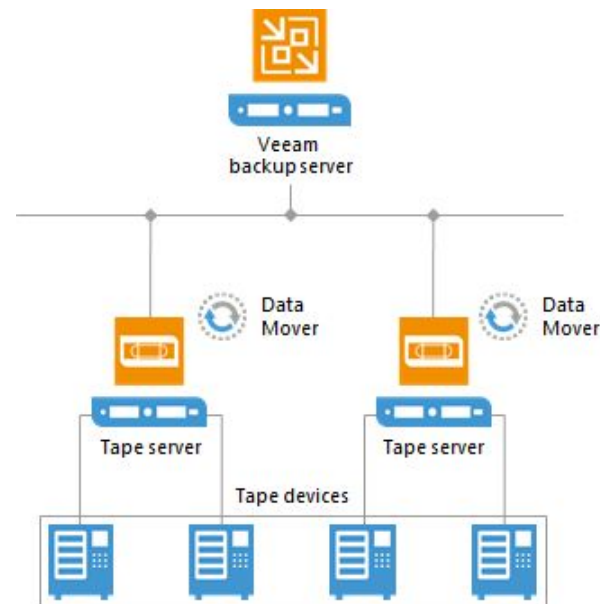
Veeam Remote Tape  
Access Service

 Service  Process  Driver

# Veeam Remote Tape Access Service

## VeeamTapeSvc.exe

- Gathers information about locally connected tape devices and sends it back to Veeam B&R
- Implemented to lift v7.0 limitation — previously only Veeam B&R could act as a tape server



# Windows Server: On-demand services

## Windows server

Veeam  
vPower NFS Service

Veeam  
Mount Service

Veeam WAN  
Accelerator Service

Veeam Remote Tape  
Access Service

Veeam  
Cloud Gateway  
Service

 Service  Process  Driver

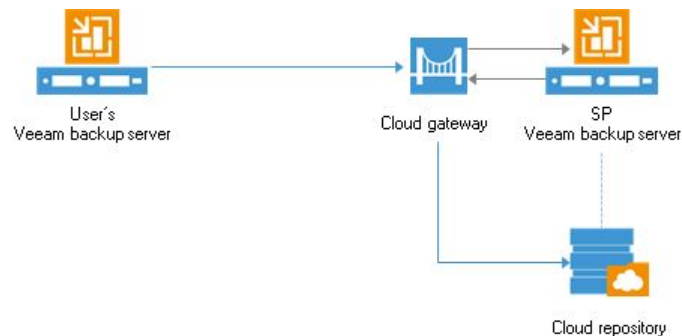


# Veeam Cloud Connect and gateway services

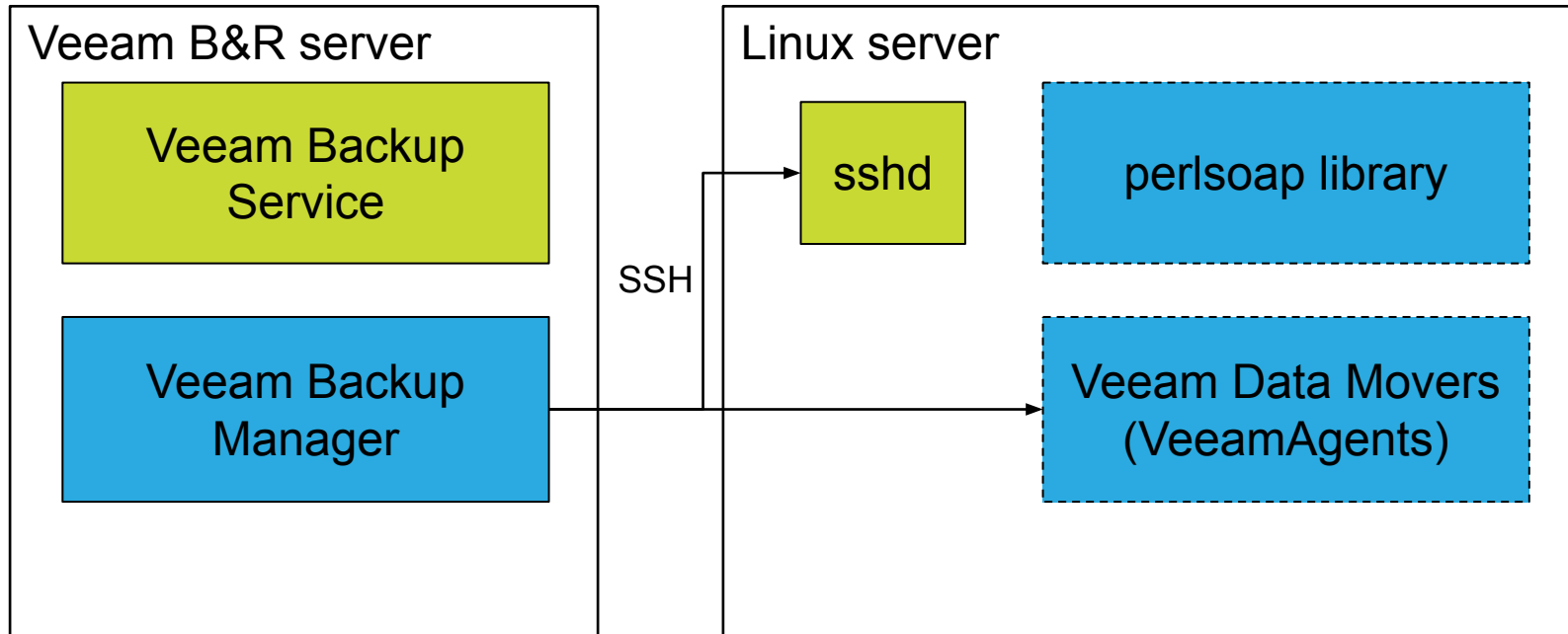
Veeam.Backup.CloudService.exe

VeeamGateSvc.exe

- Works in conjunction with the Cloud Connect service that is running on Veeam B&R on the cloud provider
- Accepts incoming connections from clients, directly or from behind NAT
- It is possible to deploy multiple gateways for increased Availability



# Linux server interaction



 Service  Process  Driver

# Linux server interaction

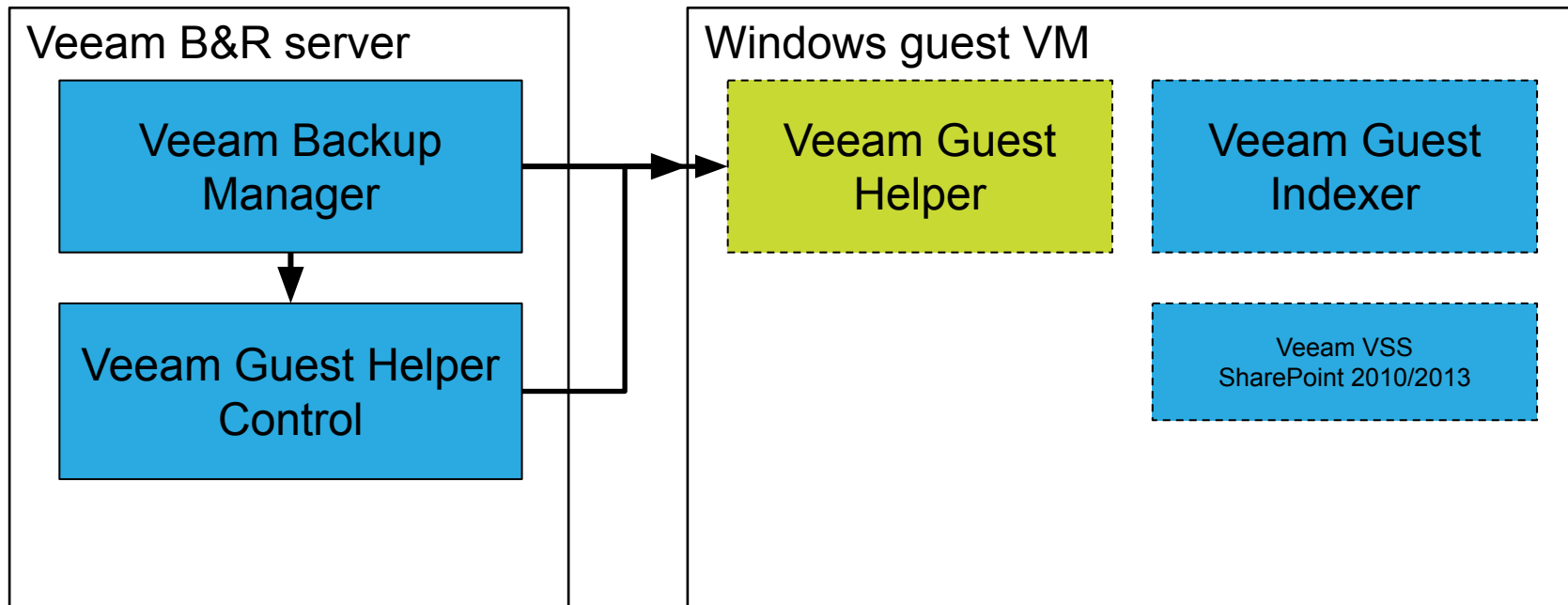
SSH connection required. Authentication via:

- Username, password. **root** account required or with elevation to root (sudoers file)
- Or using the **Identity/Pubkey** method

**perlsoap** library is uploaded and used for auxiliary tasks, such as renaming files and listing directories

- Requires Perl

# Guest VM interaction: Windows



 Service  Process  Driver

# Veeam Guest Helper (1/2)

VeeamGuestHelper.exe

Performs almost all in-guest interaction:

- Pre- and post-freeze scripts execution
- Creates in-guest shadow copy with all VSS writers enabled (only VMware).
- Collects application metadata collection for Active Directory, Exchange, MSSQL and SharePoint, Oracle services

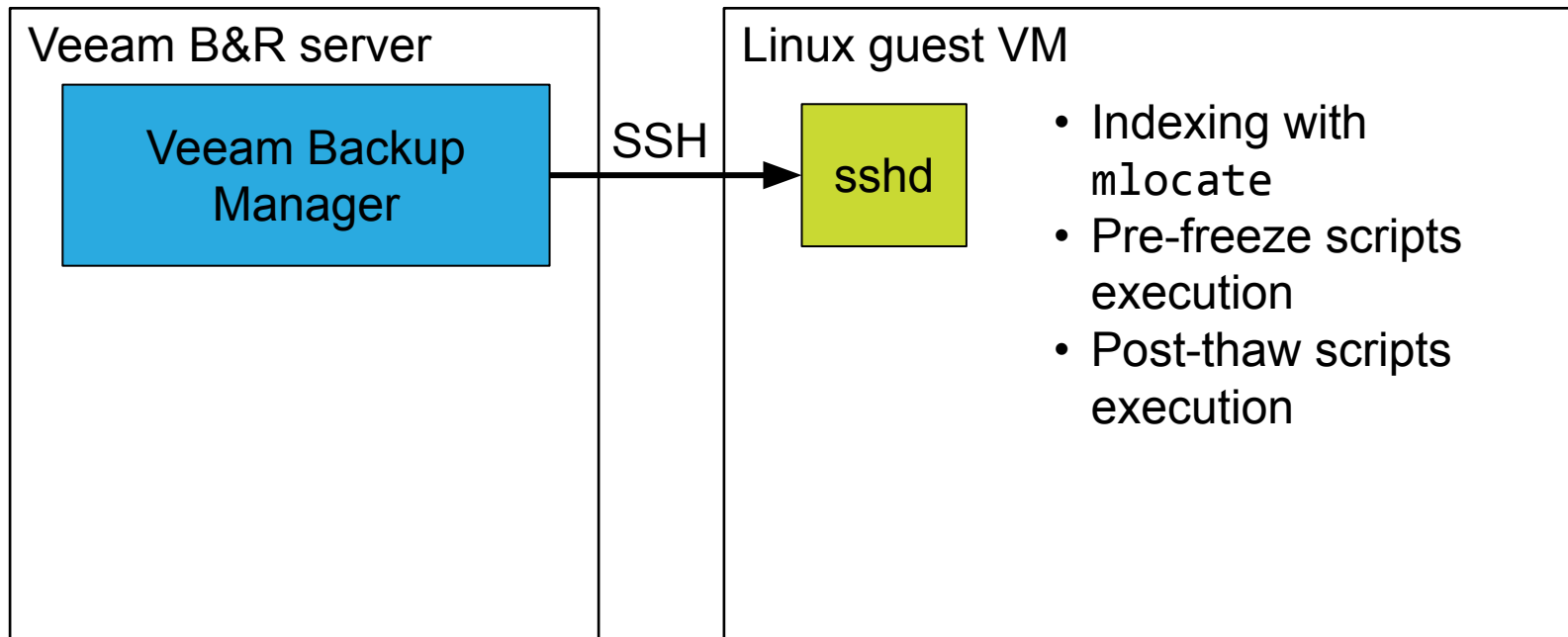
# Veeam Guest Helper (2/2)

## VeeamGuestHelper.exe

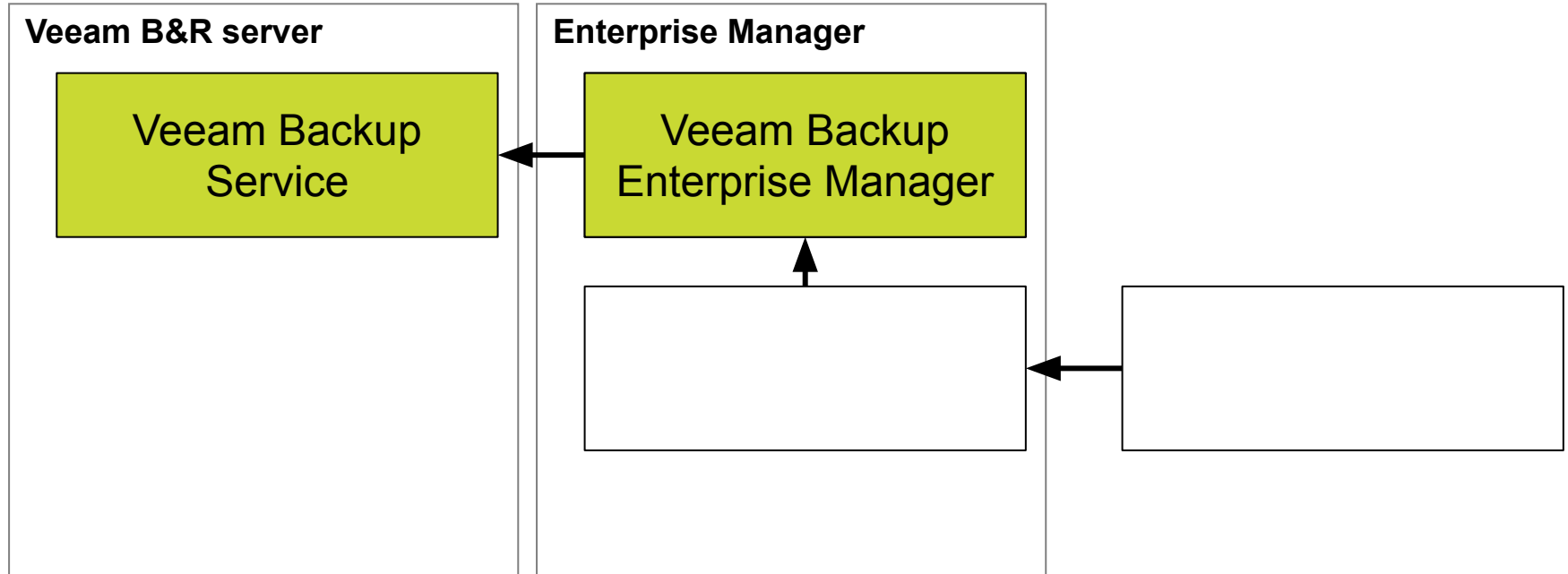
Performs almost all in-guest interaction:

- Truncates MSSQL and Exchange database transaction logs
- Starts **VeeamGuestIndexer** to index the file systems (if enabled in the job)
- If SharePoint is detected, starts **Veeam.VSS.SharePoint2010/13** to gather further information about the SharePoint infrastructure

# Guest VM interaction: Linux



# Enterprise Manager



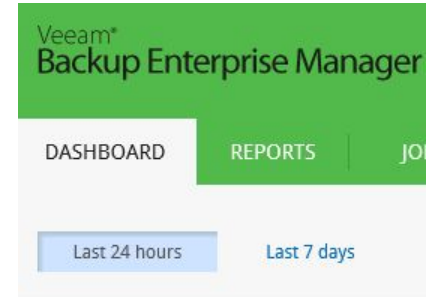
 Service  Process  Driver



# Enterprise Manager

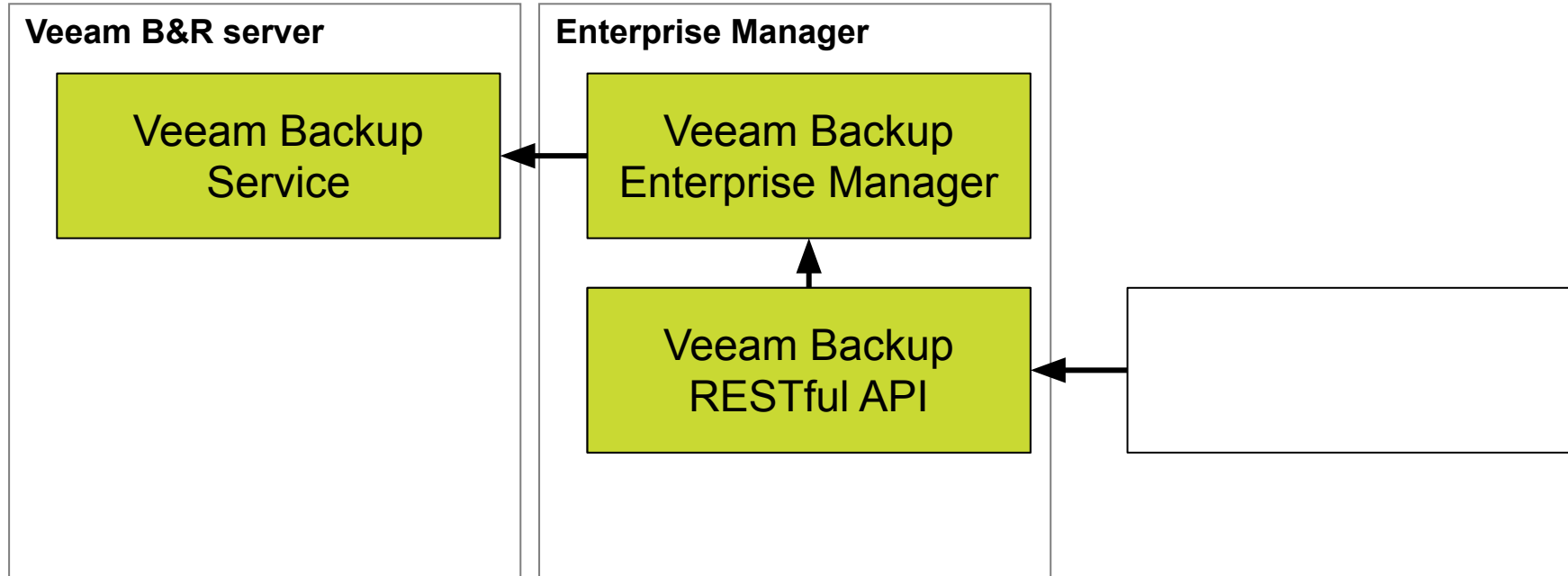
Veeam.Backup.EnterpriseService.exe

- A web application using IIS as its web server
- Periodically collects information from the connected Veeam B&R installations, such as:  
Jobs, restore points, sessions, etc.
- Aggregate information is stored in a separate database
- Accepts incoming connections from Veeam Backup RESTful API service



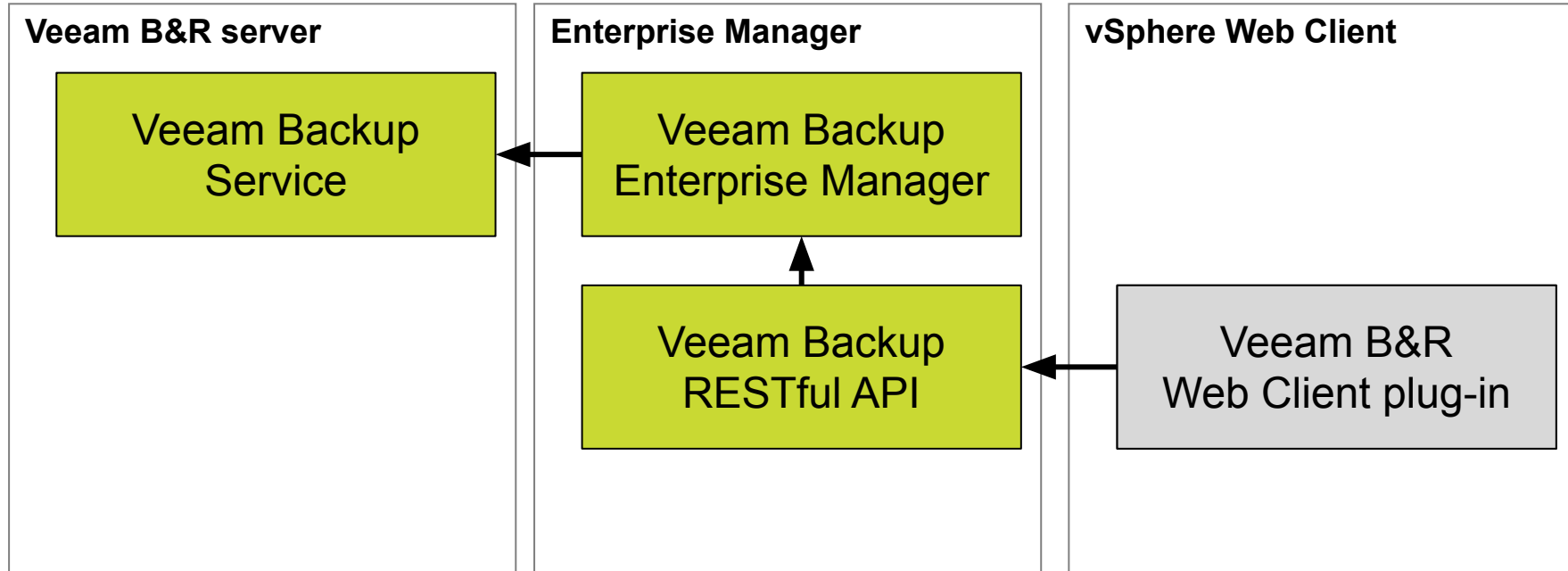
| SUMMARY         |     |
|-----------------|-----|
| Backup servers: | 2   |
| Jobs:           | 260 |
| VMs:            | 197 |
| Templates:      | 3   |

# Enterprise Manager



 Service  Process  Driver

# Enterprise Manager



 Service  Process  Driver  Plug-in

# New in v9.0: Mount server

**v8** limitation: Windows FLR mount always happens on Veeam Server

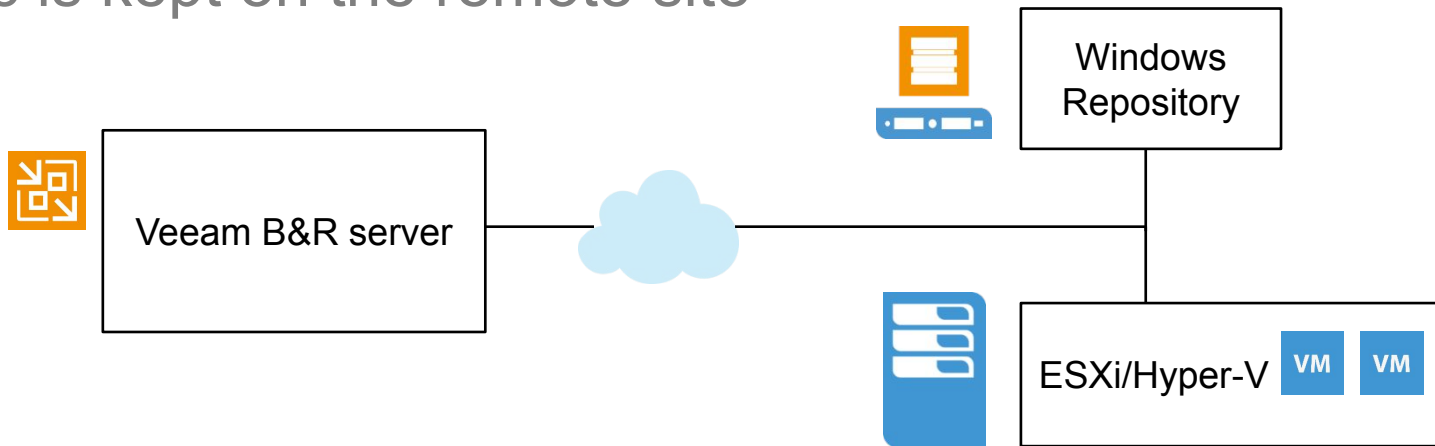
**v9:** Now when restoring on a remote site, all Windows FLR traffic is kept on the remote site

- New *Veeam Mount Service* (VeeamMountSvc)
- Windows repository is its own mount server
- vdk driver comes with Data Mover Service now

# New in v9.0: Mount server

**v8** limitation: Windows FLR mount always happens on Veeam Server

**v9:** Now when restoring on a remote site, all Windows FLR traffic is kept on the remote site



# Thank you

