

VEEAMON2018

Extremely fast processing  
to deliver the MAXIMUM performance

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**Step 1**

# Veeam settings

# Options: Network traffic rules

The screenshot displays the Veeam Backup and Replication interface. The main window shows a list of jobs, with 'Backup Job WIN-8L6...' selected. A dialog box titled 'Global Network Traffic Rules' is open, showing a table of rules. The first rule is highlighted in red:

Source IP range	Target IP range	Encryption	Throttling	Time period
192.168.0.1 - 192.168.0...	192.168.0.1 - 192.168.0...	Disabled	1 Mbps	Anytime

Below the table, there is a checkbox for 'Use multiple upload streams per job:' which is checked and set to 5. The description for this option reads: 'Improves job performance through better utilization of high-latency links. Disable this option if you are running a large amount of concurrent jobs, or for networking equipment compatibility purposes.' The dialog also includes 'OK' and 'Cancel' buttons.

In the background, the job details for 'Backup Job WIN-8L6...' are visible, showing a 'Success' status and a duration of 02:20. The interface also shows a sidebar with navigation options like 'HOME', 'INVENTORY', and 'FILES'.

# Options: I/O control

The screenshot displays the Veeam Backup and Replication interface. The main window shows a list of jobs, with 'Backup Job WIN-8L6...' selected. An 'I/O Control' dialog box is open, showing the following options:

- Enable parallel processing  
Makes backup, replication and restore jobs process multiple virtual disks and virtual machines in parallel, rather than sequentially.
- Enable storage latency control  
Define desired primary storage latency limits to ensure running jobs do not impact storage availability to production workloads.  
Stop assigning new tasks to datastore at: 20 ms  
Throttle I/O of existing tasks at: 30 ms  
Set custom thresholds on individual datastores [Configure...]

The dialog box also includes tabs for 'E-mail Settings', 'SNMP Settings', 'Notifications', 'History', and 'Security'. The 'Global Network' section is visible, showing 'Network traffic' and 'Source IP' (192.168.0.).

The background interface shows a table of jobs:

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1	Stopped	Success	<not scheduled>	TestRepo2	Created by WIN-RVED32EF8V8\Administrat
Test2	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
Test1	Nutanix policy	0	Options				Created by WIN-RVED32EF8V8\Administrat
sql	VMware Backup	1					Created by WIN-RVED32EF8V8\Administrat
Replication Job 1	VMware Replication	1					Created by WIN-RVED32EF8V8\Administrat
Backup Job WIN-8L6...	Windows Agent Backup						Veeam Agent for Windows backup job
Backup Job 4	VMware Backup						Created by WIN-RVED32EF8V8\Administrat
Backup Job 3	VMware Backup						Created by WIN-RVED32EF8V8\Administrat

The bottom status bar indicates '1 JOB SELECTED', 'CONNECTED TO: LOCALHOST', 'ENTERPRISE PLUS EDITION', and 'EVALUATION: 191 DAYS REMAINING'.



# Gateway server

The screenshot displays the Veeam Backup and Replication console. The main window shows a list of backup jobs and their configurations. An 'Edit Backup Repository' dialog box is open, allowing the user to configure a share on a gateway server.

**Table: Backup Jobs**

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
Test2	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat...
Test1	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat...
sql	VMware Backup						Created by WIN-RVED32EF8V8\Administrat...
Replication Job 1	VMware Replication						Created by WIN-RVED32EF8V8\Administrat...
hv_test	VMware Backup						Created by WIN-RVED32EF8V8\Administrat...
Backup Job WIN-8L6...	Windows Agent Back						Veeam Agent for Windows backup job
Backup Job 4	VMware Backup						Created by WIN-RVED32EF8V8\Administrat...

**Dialog: Edit Backup Repository**

**Share**  
Type in UNC path to share (mapped drives are not supported), specify share access credentials and how backup jobs should write data to this share.

Shared folder: \\win-rved32ef8v8\shara

This share requires access credentials:

Credentials: [Dropdown] Add...

Manage accounts

Gateway server:

Automatic selection

The following server:

WIN-RVED32EF8V8.support2.veeam.local (Backup server)

WIN-RVED32EF8V8.support2.veeam.local (Backup server)

HV2012R2N1 (Created by WIN-RVED32EF8V8\Administrator at 12/13/2017 9:23 AM.)

< Previous Next > Finish Cancel

# Job settings

VEEAM BACKUP AND REPLICATION

HOME VIEW JOB

Start Stop Retry Active Full Statistics Report Edit Clone Disable Delete

Job Control Details Manage Job

HOME

Type in an object name to search for

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1	Stopped	Success	<not scheduled>	TestRepo2	Created by WIN-RVED32EF8V8\Administrat...
Test2	Nutanix policy	0	Enabled	<not scheduled>	N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat...
Test1	Nutanix policy	0	Enabled	<not scheduled>	N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat...
sql	VMware Backup	1	Stopped	Failed	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat...
Replication Job 1	VMware Replication	1	Stopped	Success	<not scheduled>	sbpsupesx05.support2.veeam.local	Created by WIN-RVED32EF8V8\Administrat...
Backup Job WIN-8L6...	Windows Agent Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Veeam Agent for Windows backup job
Backup Job 4	VMware Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat...
Backup Job 3	VMware Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat...

SUMMARY

Duration: 01:00 Processing rate: N/A Bottleneck: Source

DATA

Processed: 1024.0 MB (100%) Read: 0.0 B Transferred: 32.0 B (0x)

STATUS

Success: 1 Warnings: 0 Errors: 0

THROUGHPUT (ALL TIME)

Speed: 0.0 KB/s

HOME INVENTORY BACKUP INFRASTRUCTURE STORAGE INFRASTRUCTURE TAPE INFRASTRUCTURE FILES

NAME STATUS ACTION DURATI...

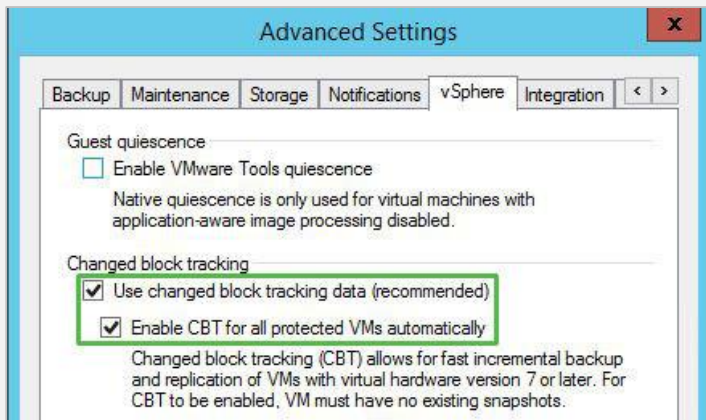
dummy Success

- Building VMs list 00:02
- VM size: 1024.0 MB
- Changed block tracking is enabled
- Processing dummy 00:44
- All VMs have been queued for processing 00:00
- Load: Source 99% > Proxy 0% > Network 0% > Target 0%
- Primary bottleneck: Source
- Job finished at 3/19/2018 1:14:41 PM

1 JOB SELECTED CONNECTED TO: LOCALHOST ENTERPRISE PLUS EDITION EVALUATION: 191 DAYS REMAINING

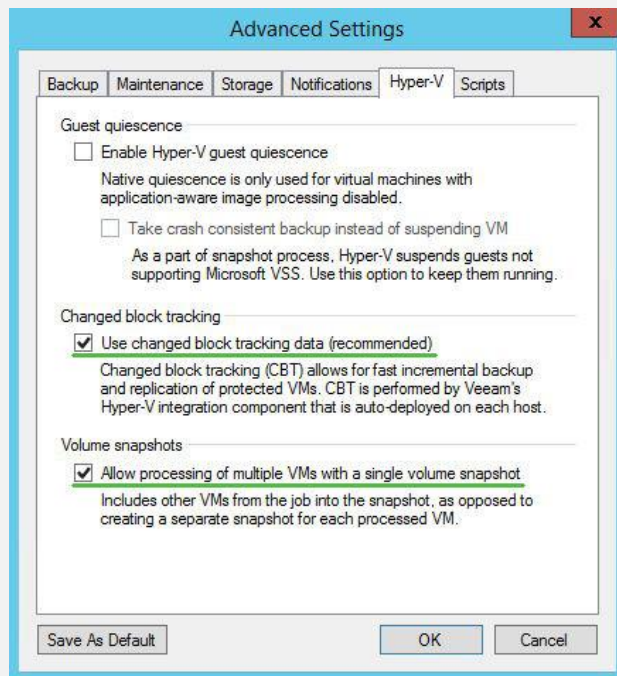
# Changed block tracking

## VMware specific:



How to reset VMware CBT:  
<http://www.veeam.com/kb1113>

## Microsoft Hyper-V specific:



# Changed block tracking

For physical environment:

**Veeam® Agent *for Microsoft Windows* —  
two mechanisms:**

1. Veeam native CBT driver
2. Parsing MFT

**Veeam Agent *for Linux* — Veeam proprietary  
kernel module**



**Step 2**

# Detecting bottleneck

# Job statistics window

VEEAM BACKUP AND REPLICATION

HOME VIEW

Backup Job, Replication Job, Backup Copy Job, Copy Job, Restore, Import Backup, Failover Plan

HOME

Type in an object name to search for

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1	Stopped	Success	<not scheduled>	TestRepo2	Created by WIN-RVED32EF8V8\Administrat
Test2	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
Test1	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
sql	VMware Backup	1	Stopped	Failed	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat
Replication Job 1	VMware Replication	1	Stopped	Success	<not scheduled>	spbsupesx05.support2.veeam.local	Created by WIN-RVED32EF8V8\Administrat
hv_test	VMware Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat
Backup Job WIN-8L6...	Windows Agent Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Veeam Agent for Windows backup job
Backup Job 4	VMware Backup	1	Stopped	Success	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat

HOME, INVENTORY, BACKUP INFRASTRUCTURE, STORAGE INFRASTRUCTURE, TAPE INFRASTRUCTURE, FILES

CONNECTED TO: LOCALHOST ENTERPRISE PLUS EDITION EVALUATION: 190 DAYS REMAINING

# Job statistics window

The screenshot shows a backup job window titled "Backup Job WIN-8L6EBNTBIDR". The job progress is 100% and it is running on 1 of 1 hosts. The summary section includes duration (02:20), processing rate (148 MB/s), and bottleneck (Source). The status section shows 1 success, 0 warnings, and 0 errors. A tooltip is displayed over the "Source" bottleneck, showing the percent busy for processing stages: Source (99%), Proxy (37%), Network (30%), and Target (43%).

Backup Job WIN-8L6EBNTBIDR

Job progress: 100% 1 of 1 hosts

**SUMMARY**

Duration: 02:20  
Processing rate: 148  
Bottleneck: Source

Transferred: 7.0 GB (1.6x)

**STATUS**

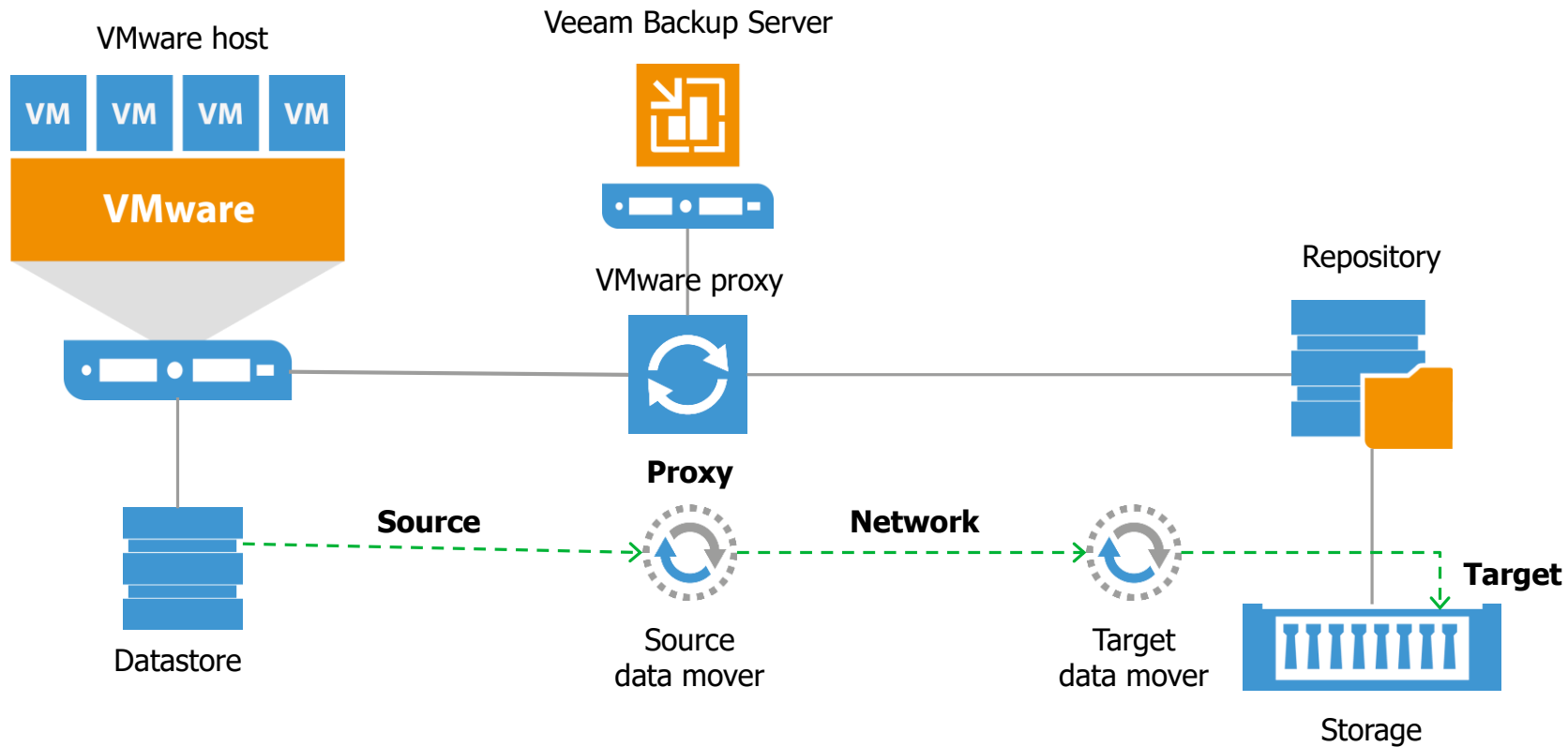
Success: 1 ✓  
Warnings: 0  
Errors: 0

Show Details OK

**Percent busy for processing stages**

Source	99%
Proxy	37%
Network	30%
Target	43%

# VMware backup infrastructure

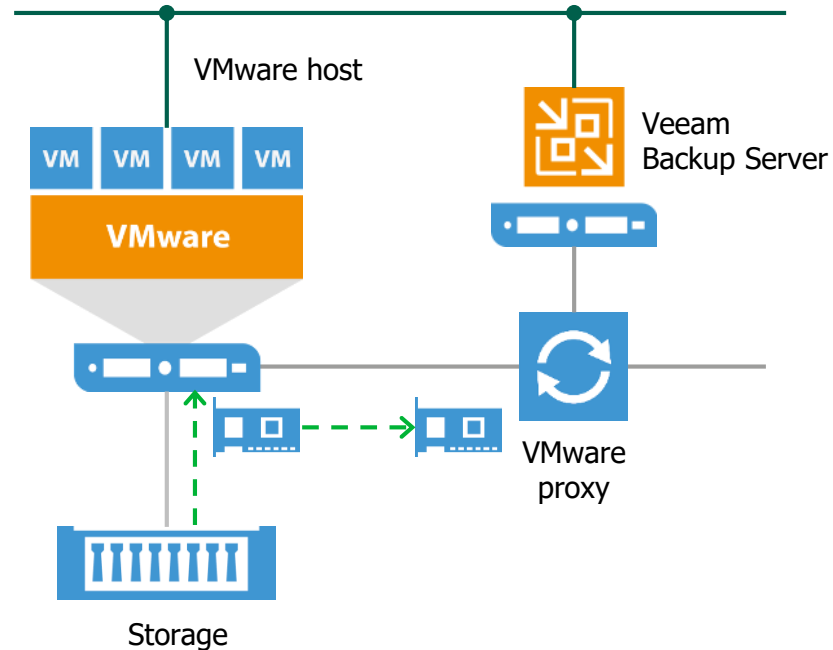


# Bottleneck source (VMware)

## NBD mode:

1. Storage read performance
2. Host load
3. Network connection between VMware host and proxy

## Network mode (NBD):

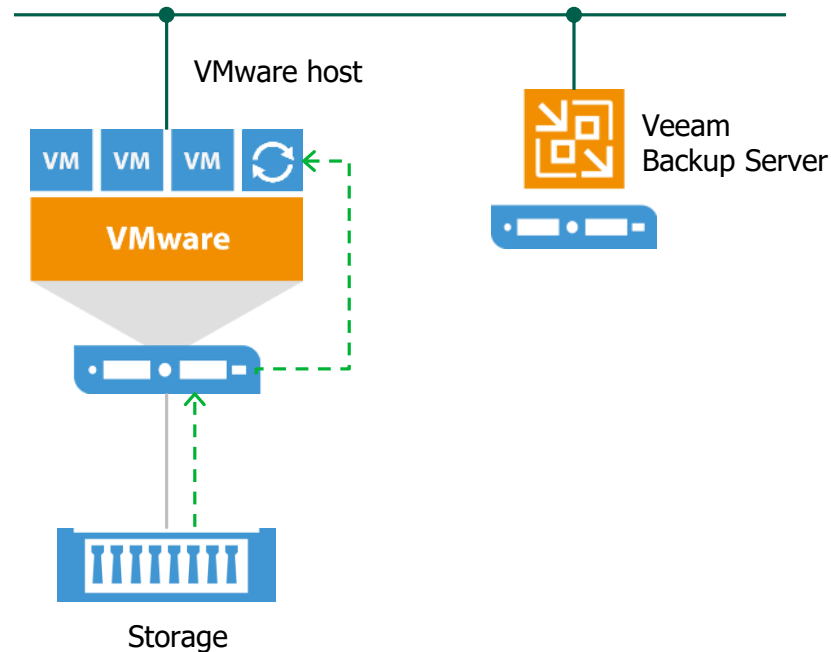


# Bottleneck source (VMware)

## Hot-Add mode:

1. Storage read performance
2. Host load

Hot-Add mode:

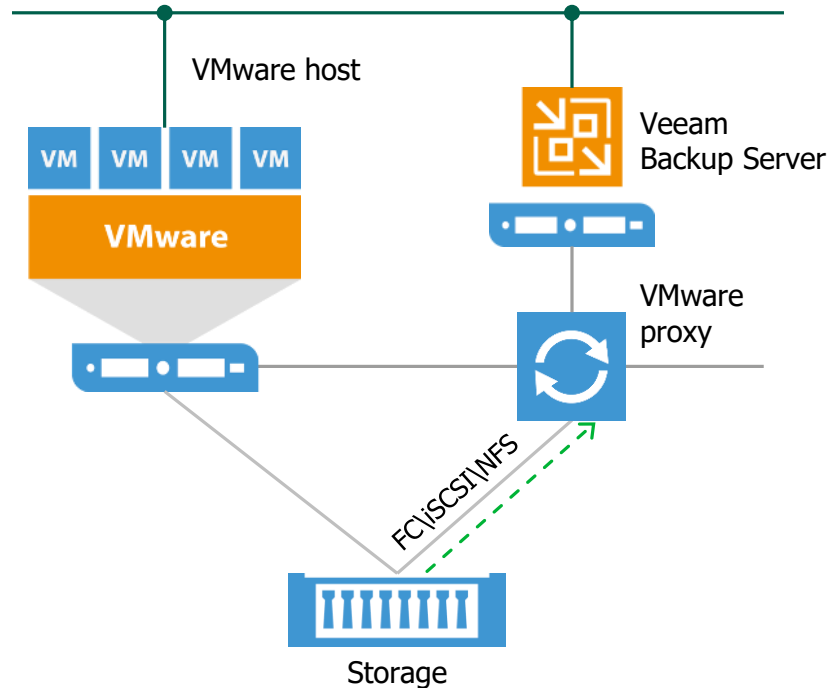


# Bottleneck source (VMware)

## Direct storage access:

1. Storage read performance
2. Connection between storage and proxy

## Direct storage access:



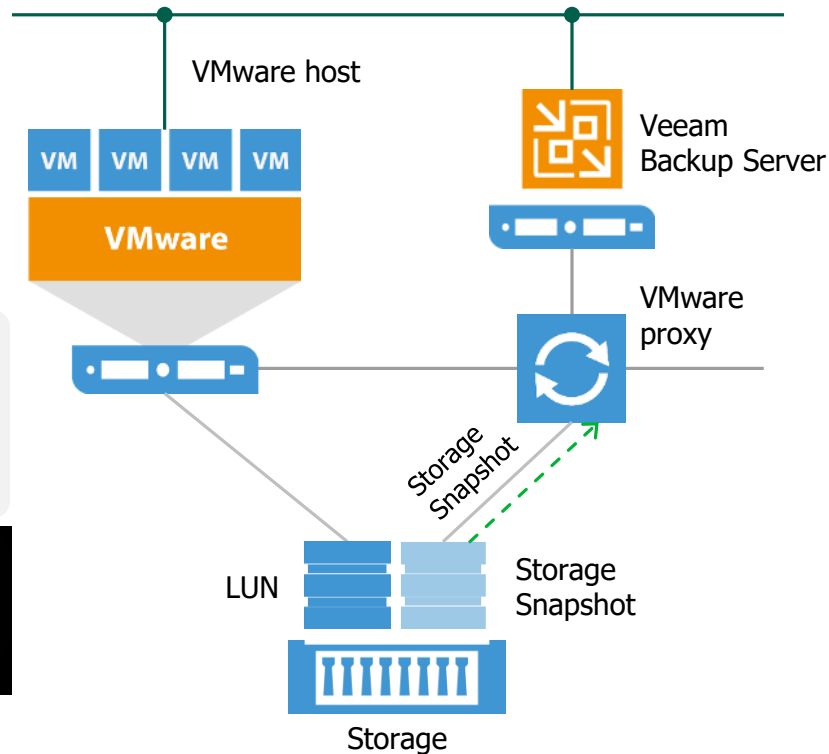
# Bottleneck source (VMware)

## Storage snapshot:






1. Storage snapshot read performance
2. Connection between storage and proxy



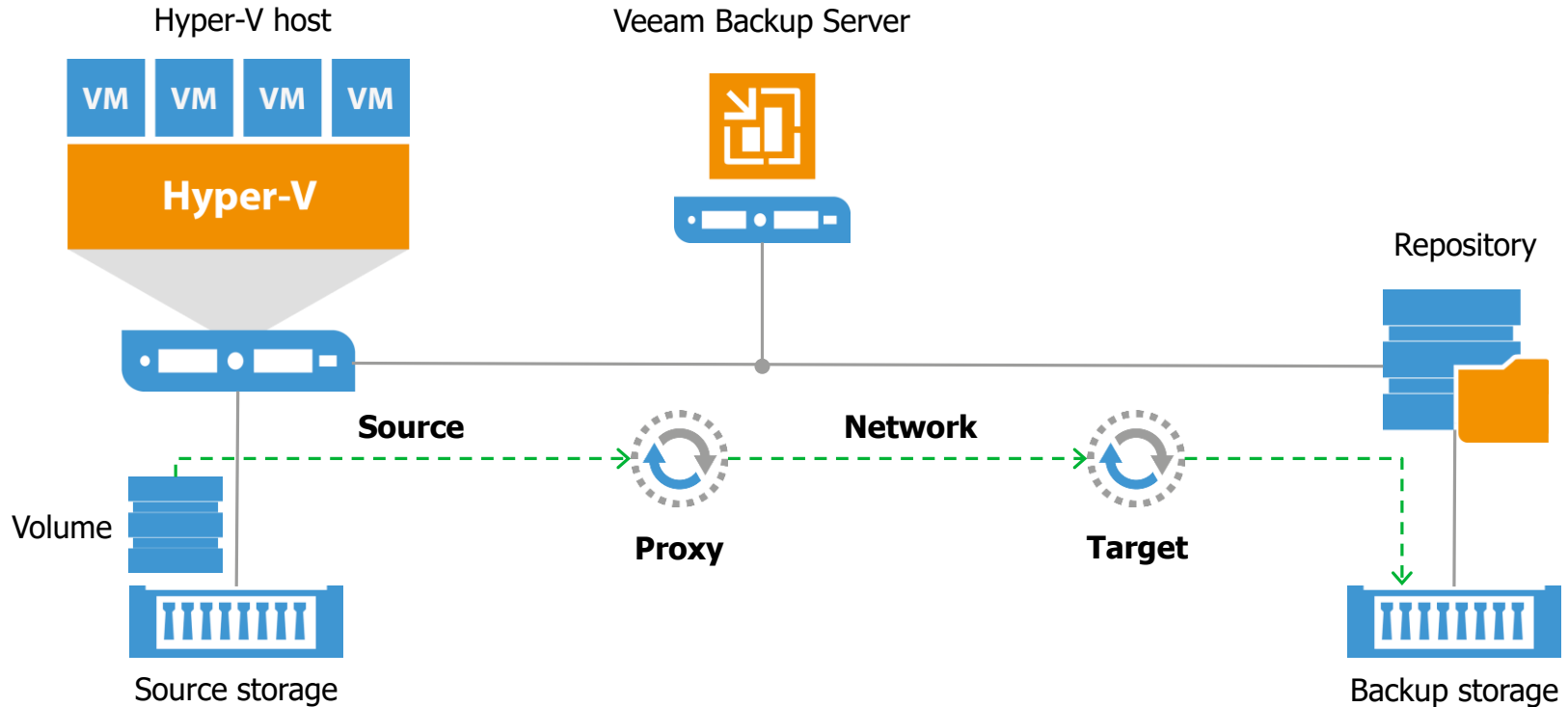
## Storage snapshot:



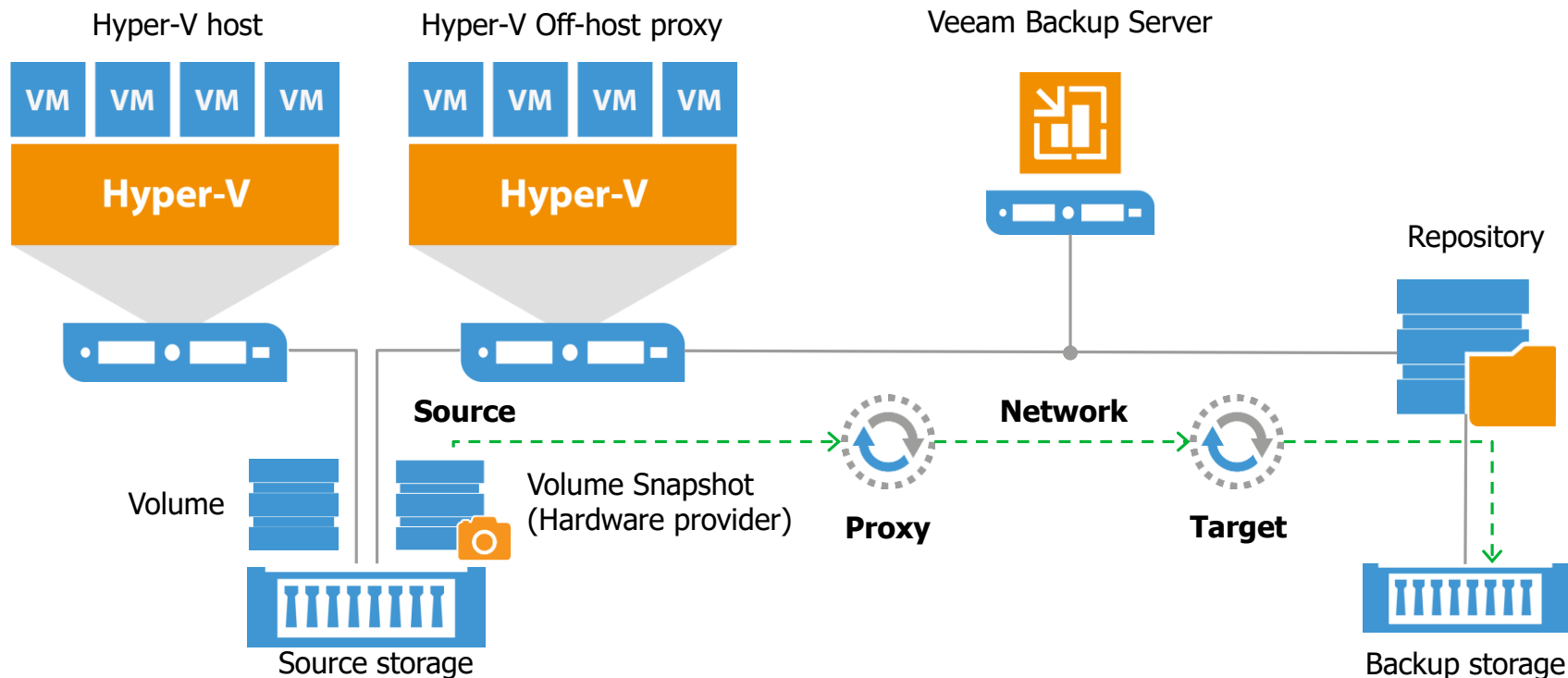
# Advanced data fetcher

Transport mode	Read method	ADF available
Storage snapshots	WinAPI	
Hot-Add	WinAPI	
Direct NFS	NFS	
Direct SAN	VDDK read	
Network (nbd)	VDDK read	

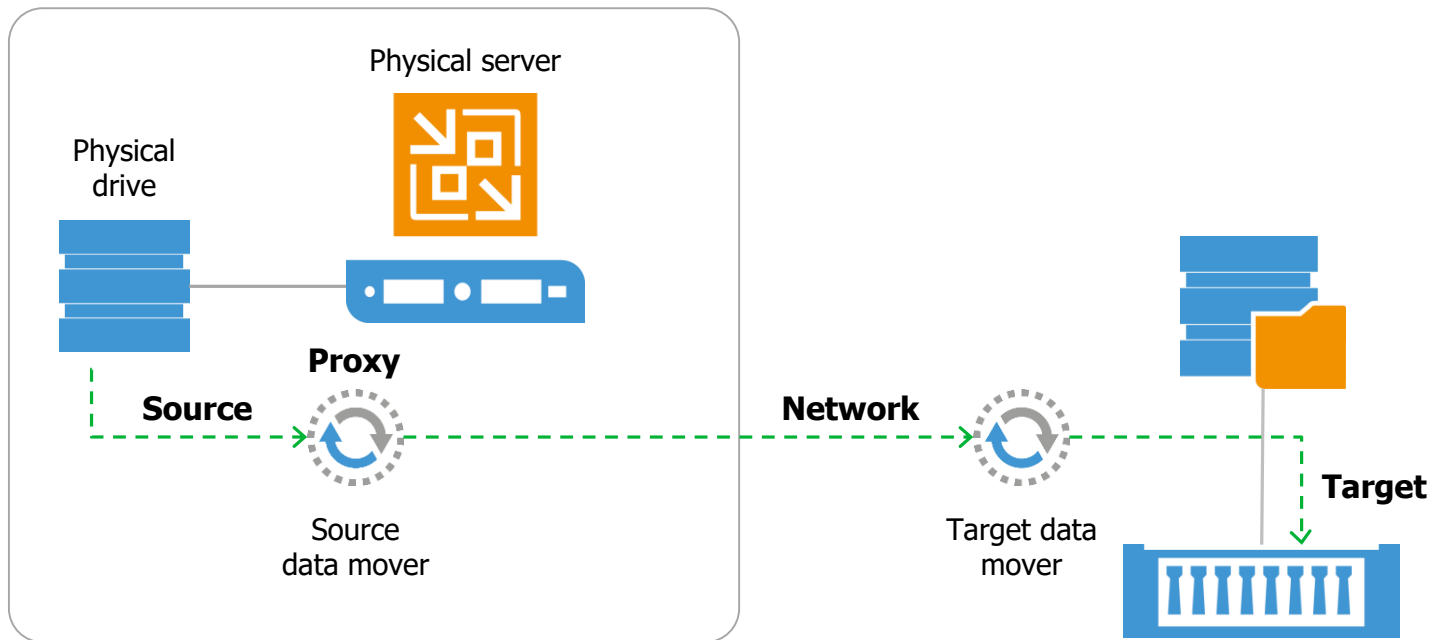
# Hyper-V 2016 performance scheme



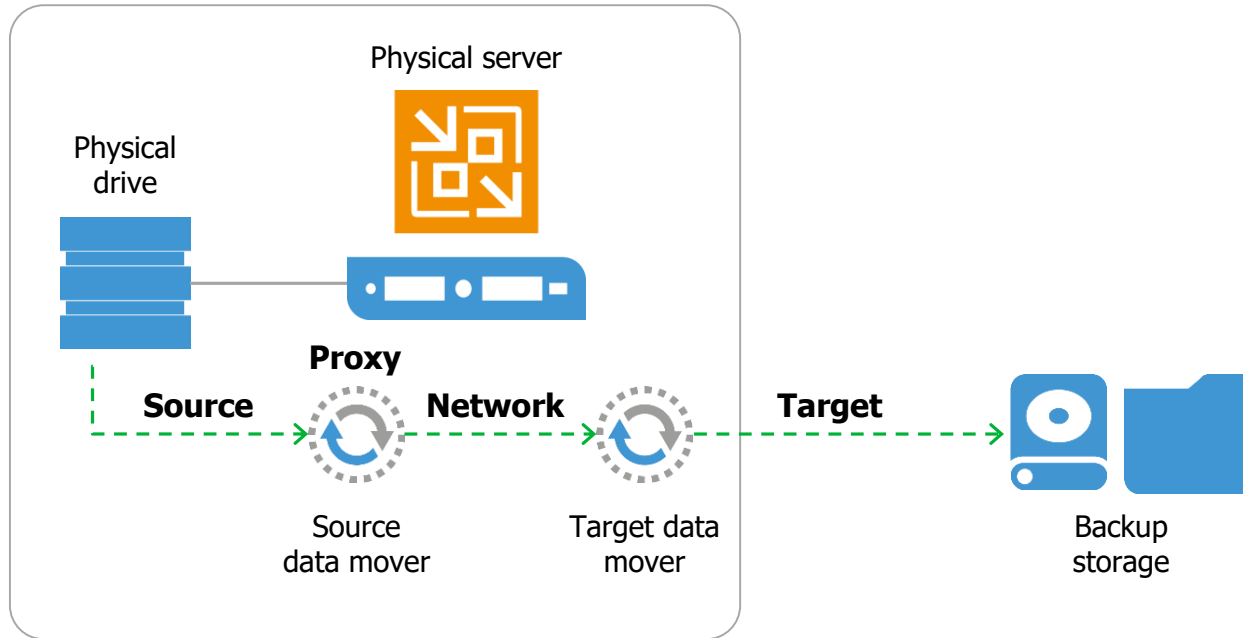
# Hyper-V off-host mode: Hardware provider



# Physical server to Veeam backup repository



# Physical server to USB disk or share



# Tweaking Veeam Agent backup performance

## Controlling process and IO priority in Veeam Agent *for Microsoft Windows*:

HKLM\SOFTWARE\Veeam\Veeam Endpoint Backup

**EndPointAgentPriority** (REG\_SZ)

Values: **Normal**, **Low**, **Background** (default)

## Controlling IO in Veeam Agent *for Linux*:

/etc/veeam/veeam.ini

**[backup]**

**ioRateLimit= 0.9 (default)**

Values range: 0.01-1.0, where 0.01 - very slow, 1.0 - no limit

# Read performance troubleshooting

## 1. Storage read performance:

- VMware vSphere client performance diagrams
- Storage vendor performance monitoring diagrams
- Windows performance monitor (perfmon)
- For Linux: sysstat
- ESXTOP: <https://kb.vmware.com/kb/1008205>

## 2. Connection between storage and proxy:

- Switch ports performance statistics
- iSCSI bandwidth

### ESXTOP metrics for virtual proxy:

- CMDS/s
- DAVG/cmd
- KAVG/cmd
- GAVG/cmd (DAVG/cmd + KAVG/cmd)



# Proxy settings: Concurrent tasks

The screenshot displays the Veeam Backup and Replication software interface. The top navigation bar includes 'HOME', 'VIEW', and 'JOB' tabs. Below this is a toolbar with icons for 'Start', 'Stop', 'Retry', 'Active Full', 'Statistics', 'Report', 'Edit', 'Clone', 'Disable', and 'Delete'. The main window is divided into several sections:

- HOME:** A sidebar on the left with a tree view showing 'Jobs', 'Backups', 'Replicas', and 'Ready'. The 'Jobs' section is expanded to show a list of jobs.
- Job List:** A table with columns: NAME, TYPE, OBJECTS, STATUS, LAST RES..., NEXT RUN, TARGET, and DESCRIPTION. The selected job is 'Backup Job 4' (VMware Backup).
- Job Details:** A summary section for the selected job, showing 'Duration: 11:01:50', 'Processing rate: 927 KB/s', and 'Bottleneck: Source'.
- Proxy Settings:** A dialog box titled 'Choose server:' is open, showing a dropdown menu with 'WIN-RVED32EF8V8.support2.veeam.local' selected. Below this, there are fields for 'Proxy description', 'Transport mode' (set to 'Network'), and 'Connected datastores' (set to 'Automatic detection (recommended)'). The 'Max concurrent tasks' field is set to '2'.
- Job Summary:** A section at the bottom of the dialog box showing a list of tasks with their status (all 'Success') and a 'Max concurrent tasks' field set to '2'.

At the bottom of the interface, there is a status bar with the following information: '1 JOB SELECTED', 'CONNECTED TO: LOCALHOST', 'ENTERPRISE PLUS EDITION', and 'EVALUATION: 191 DAYS REMAINING'.

# Bottleneck proxy: Compression

The screenshot displays the Veeam Backup and Replication software interface. The main window shows a list of jobs, with 'Backup Job 4' selected. The 'Advanced Settings' dialog box is open, showing the 'Compression level' dropdown menu set to 'Optimal (recommended)'. The 'Bottleneck proxy' section is visible, showing a 'Source' bottleneck. The 'Summary' section indicates a duration of 11:01:50, a processing rate of 927 KB/s, and a bottleneck of 'Source'. The 'Action' section shows a list of tasks completed successfully, including building VMs list, VM size, changed block tracking, processing pmak-sql1, and all VMs having been quiesced. The 'Job finished at 3/20/2018 1:37:57 AM'.

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1					Created by WIN-RVED32EF8V8\Administrat...
Test2	Nutanix policy	0					Created by WIN-RVED32EF8V8\Administrat...
Test1	Nutanix policy	0					Created by WIN-RVED32EF8V8\Administrat...
sql	VMware Backup	1					Created by WIN-RVED32EF8V8\Administrat...
Replication Job 1	VMware Replication	1					Created by WIN-RVED32EF8V8\Administrat...
Backup Job WIN-8L6...	Windows Agent Backup	1					Created by WIN-RVED32EF8V8\Administrat...
Backup Job 4	VMware Backup	1					Created by WIN-RVED32EF8V8\Administrat...
hv_test	VMware Backup	1					Created by WIN-RVED32EF8V8\Administrat...

SUMMARY		DATA	
Duration:	11:01:50	Processed:	4K
Processing rate:	927 KB/s	Read:	3K
Bottleneck:	Source	Transferred:	2K

NAME	STATUS	ACTION
pmak-sql16	Success	Building VMs list
		VM size: 40.0 GB
		Changed block tracking
		Processing pmak-sql1
		All VMs have been quiesced
		Load: Source 99% > P
		Primary bottleneck: Source
		Job finished at 3/20/2018 1:37:57 AM

Advanced Settings

Backup Maintenance Storage Notifications vSphere Integration Scripts

Data reduction

- Enable inline data deduplication (recommended)
- Exclude swap file blocks (recommended)
- Exclude deleted file blocks (recommended)

Compression level:

- Optimal (recommended)
- None
- Dedupe-friendly
- Optimal (recommended)
- High
- Extreme

Best performance at the cost of lower deduplication ratio and larger incremental backups. Recommended for direct-attached storage.

Encryption

Enable backup file encryption

Password:  Add...

Manage passwords

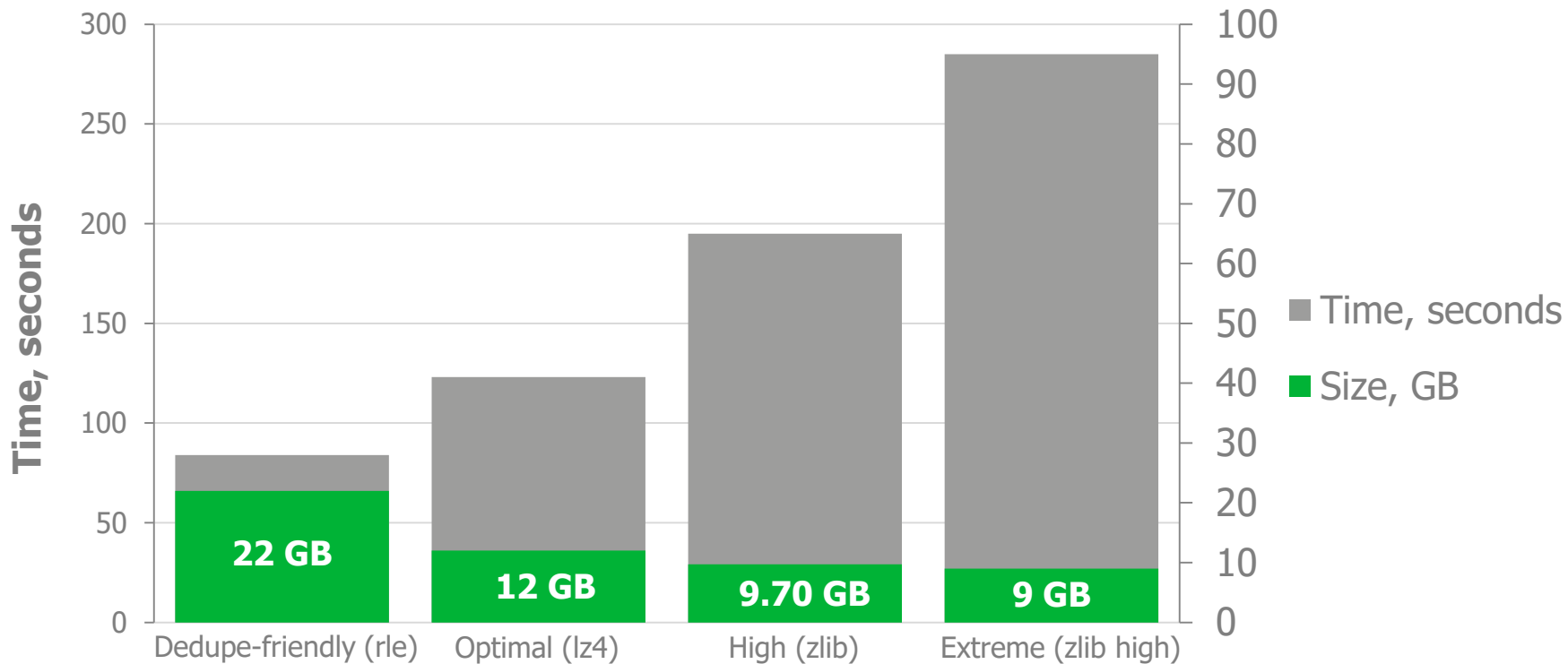
Save As Default OK Cancel

Speed: 2.1 MB/s

DURATI... 00:02 11:01:34 00:00

1 JOB SELECTED CONNECTED TO: LOCALHOST ENTERPRISE PLUS EDITION EVALUATION: 191 DAYS REMAINING

# Compression levels comparison



# Bottleneck network

VEEAM BACKUP AND REPLICATION

HOME VIEW

Backup Job Replication Job Backup Copy Job Restore Import Backup Failover Plan

Primary Jobs Auxiliary Jobs Restore

HOME

Jobs

- Backup
- Replication
- Backups
- Disk
- Disk (imported)
- Disk (encrypted)
- Cloud
- Replicas
- Ready
- Last 24 Hours

HOME INVENTORY BACKUP INFRASTRUCTURE STORAGE INFRASTRUCTURE TAPE INFRASTRUCTURE FILES

NAME TYPE OBJECTS STATUS LAST RES... NEXT RUN TARGET DESCRIPTION

NAME	TYPE	OBJECTS	STATUS	LAST RES...	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1	Stopped	Success	<not scheduled>	TestRepo2	Created by WIN-RVED32EF8V8\Administrat
Test2	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
Test1	Nutanix policy	0	Enabled		N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
sql	VMware Backup	1	Stopped	Failed	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat
Replication Job 1	VMware Replication	1	Stopped	Success	<not scheduled>	spbsex05.support2.veeam.local	Created by WIN-RVED32EF8V8\Administrat
hv_test	VMware Backup						Created by WIN-RVED32EF8V8\Administrat
Backup Job WIN-8L6...	Windows Agent						Veeam Agent for Windows backup job
Backup Job 4	VMware Backup						Created by WIN-RVED32EF8V8\Administrat

Global Network Traffic Rules

Network traffic rules:

Source IP range	Target IP range	Encryption	Throttling	Time period
192.168.0.1 - 192.168.0...	192.168.0.1 - 192.168.0...	Disabled	1 Mbps	Anytime

Use multiple upload streams per job: 5

Improves job performance through better utilization of high-latency links. Disable this option if you are running a large amount of concurrent jobs, or for networking equipment compatibility purposes.

OK Cancel

CONNECTED TO: LOCALHOST ENTERPRISE PLUS EDITION EVALUATION: 190 DAYS REMAINING

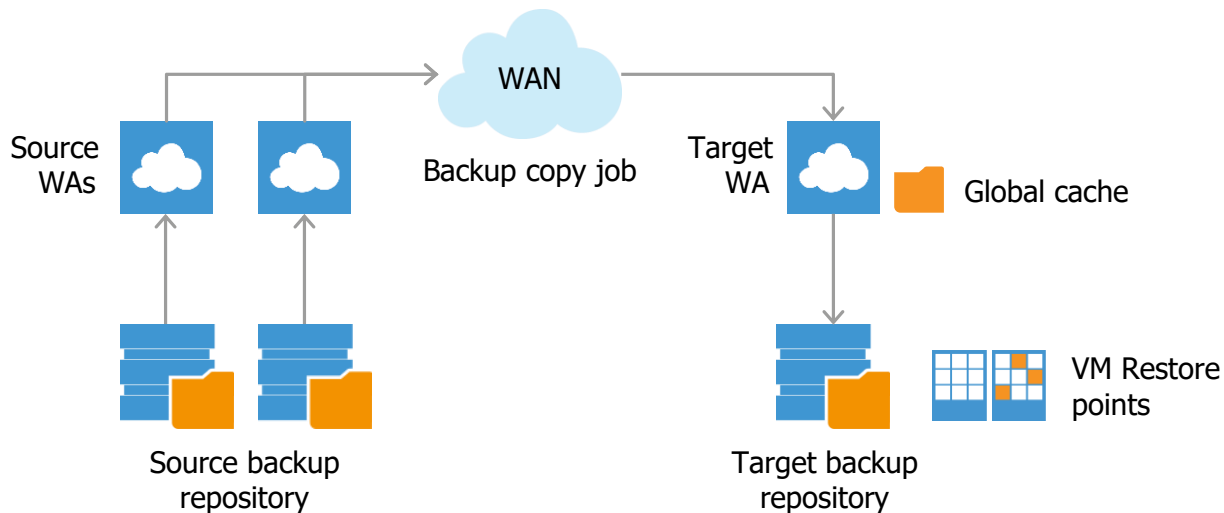
# Bottleneck network

The screenshot shows the Veeam Backup and Replication software interface. The main window displays a list of jobs with columns for NAME, TYPE, OBJECTS, STATUS, LAST RES., NEXT RUN, TARGET, and DESCRIPTION. A dialog box titled "Global Network Traffic Rules" is open, showing a "Preferred Networks" section with a table of network addresses and subnets. The dialog also includes a "Source IP" field and a "Use multiple connections to improve large amount of data transfer" checkbox.

NAME	TYPE	OBJECTS	STATUS	LAST RES.	NEXT RUN	TARGET	DESCRIPTION
wintolin3	VMware Backup	1	Stopped	Success	<not scheduled>	TestRepo2	Created by WIN-RVED32EF8V8\Administrat
Test2	Nutanix policy	0	Enabled	N/A	N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
Test1	Nutanix policy	0	Enabled	N/A	N/A	Default Backup Repository	Created by WIN-RVED32EF8V8\Administrat
sql	VMware Backup	1	Stopped	Failed	<not scheduled>	Backup Repository 6	Created by WIN-RVED32EF8V8\Administrat
Replication Job 1	VMware Replication	1	Stopped	Success	<not scheduled>	subsunex05.support2.veeam.local	Created by WIN-RVED32EF8V8\Administrat
hv_test	VMware Backup						Created by WIN-RVED32EF8V8\Administrat
Backup Job WIN-8L6...	Windows Agent						Veeam Agent for Windows backup job
Backup Job 4	VMware Backup						Created by WIN-RVED32EF8V8\Administrat

Network Address	Subnet Mask	CIDR Notation
172.171.12.0	255.255.255.0	172.171.12.0/24

# WAN acceleration

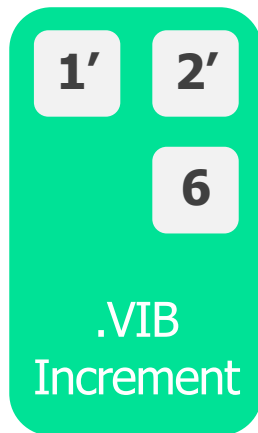
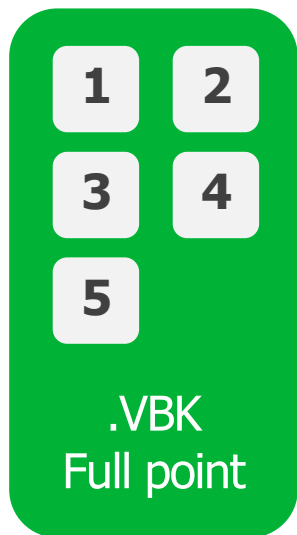


- VM restore points
- Global Cache

- Link latency — tweak upload streams number
- SSD disks for Global Cache are not necessary — async read

# Forward incremental mode, active full

One IO per block

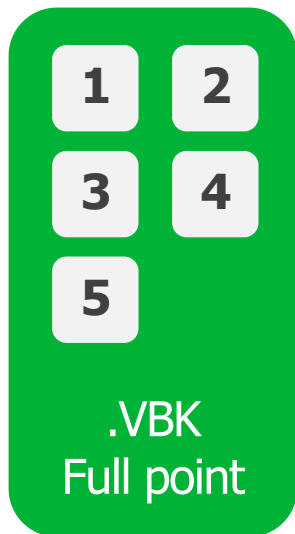
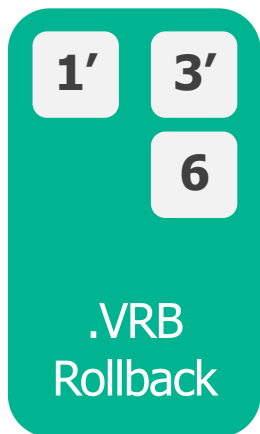


## Steps:

1. Write new block to storage

# Reverse incremental mode

## Three IOs per block

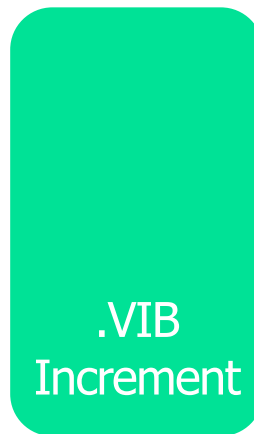
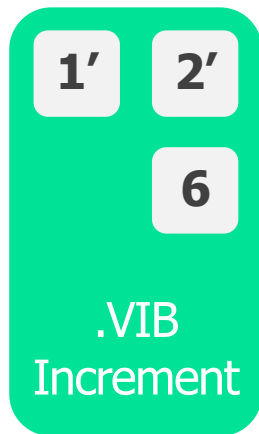
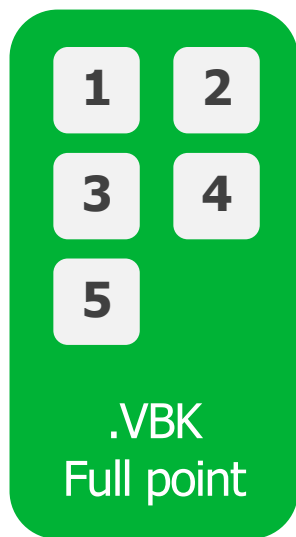


### Steps:

1. Read old block from VBK
2. Write old block to VRB
3. Write new block to VBK

# Forever forward incremental

## Two IOs per block

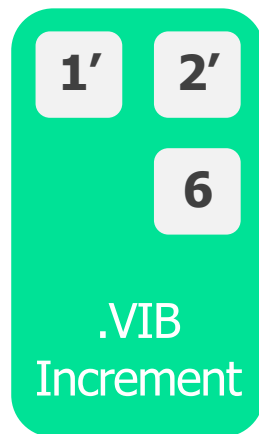
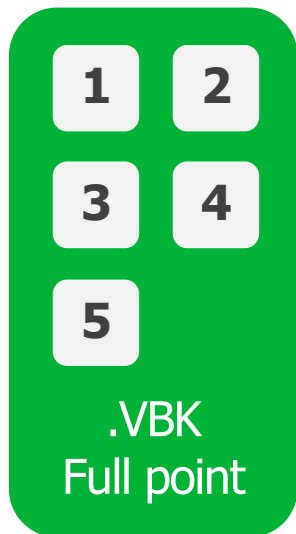


### Steps:

1. Read block from VIB
2. Write block to VBK

# Transform previous chain into rollbacks

Four IOs per block

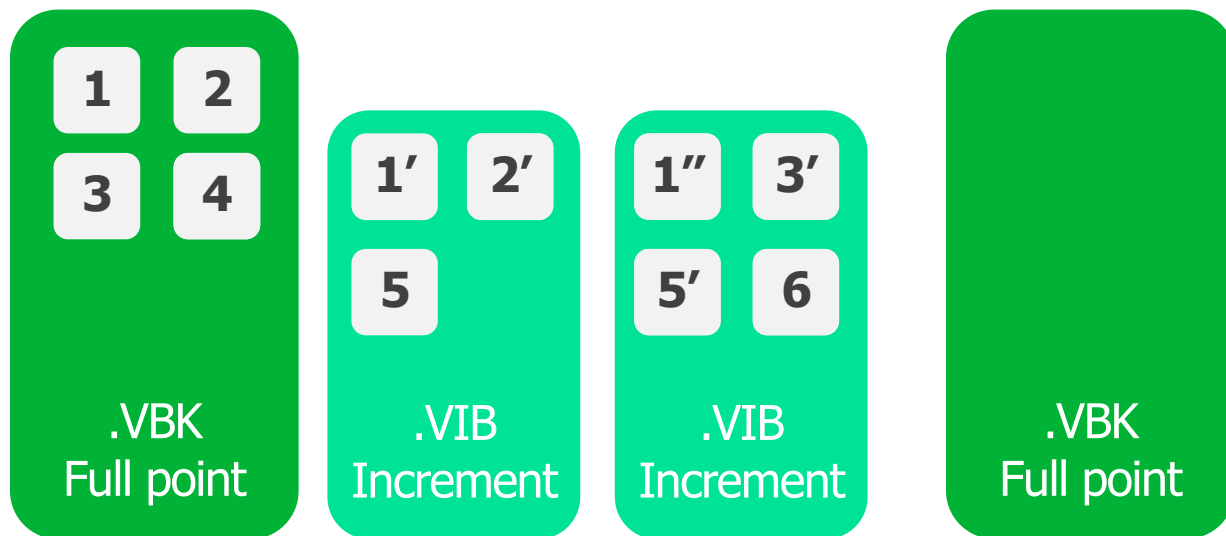


## Steps:

1. Read old block from VBK
2. Write old block to VRB
3. Read new block from VIB
4. Write new block to VBK

# Synthetic full

## Two IOs per block

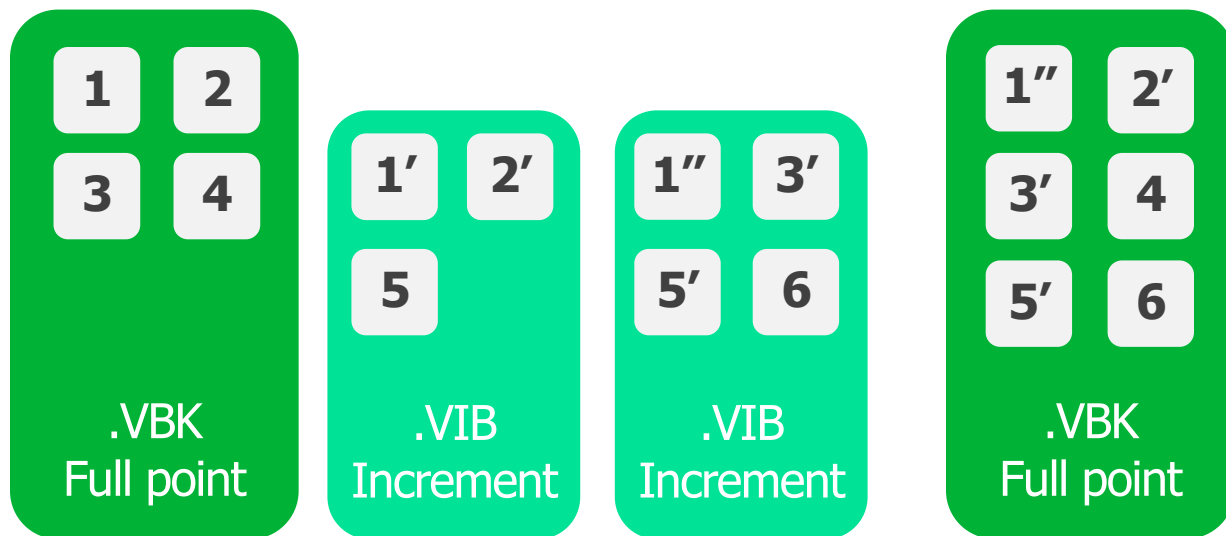


### Steps:

1. Read block from VIB
2. Write block to VBK

# ReFS: Synthetic full

## Zero IOs per block



### Steps:

1. ReFS command to map block

# Synthetic operations using fast merge

## Operations:

- Synthetic full
- Merge
- Reverse incremental
- GFS

## Advantages:

- Significant performance boost
- Synthetic full takes almost no space due to blocks re-usage

<https://forums.veeam.com/veeam-backup-replication-f2/refs-4k-horror-story-t40629-945.html>

Windows update KB4098787

# Backup file fragmentation

## Increased by:

- Many concurrent tasks (VMs) run in parallel to the same backup file
- Synthetic operations — merge, reversed incremental

## Decreased by:

- VBK per VM
- Compact full backup file job
- Schedule synthetic or active full

# Deduplication storages: Pros and cons

DELL EMC

data domain

EXAGRID™



Hewlett Packard  
Enterprise

## VEEAM BEST PRACTICES:

**For deduplication appliances:**

<http://www.vee.am/kb1745>

**For Microsoft deduplication:**

<http://www.vee.am/kb2023>



**Step 3**

**Benchmark test**

# IPerf

## Test scenarios:

- Network connectivity between servers
- iSCSI bandwidth

## Usage:

<https://goo.gl/qdcuxw>

[236]	0.0-1700.7	sec	1.00	GBytes	5.05	Mbits/sec
[196]	0.0-1704.9	sec	1.00	GBytes	5.04	Mbits/sec
[224]	0.0-1715.6	sec	1.00	GBytes	5.01	Mbits/sec
[248]	0.0-1753.1	sec	1.00	GBytes	4.90	Mbits/sec
[212]	0.0-1765.7	sec	1.00	GBytes	4.86	Mbits/sec
[SUM]	0.0-1765.7	sec	5.00	GBytes	24.3	Mbits/sec

C:\temp>\_

# VixDiskLib sample

## Transport modes to benchmark:

- VMware NBD
- VMware Direct SAN

## Tool options:

- **Readbench** (Source: Backup, replication)
- **Writebench** (Target: VM restore, replication)

## Usage:

<https://goo.gl/e3tL6y>

# Diskspd

## Use cases:

- Troubleshooting VAW source performance
- Troubleshooting Hyper-V source performance
- Troubleshooting storage-integration source performance
- Direct NFS mode
- Troubleshooting repository performance:
  - Slow backup (all chain modes and synthetic operations)
  - Slow restore, SureBackup<sup>®</sup>

## Usage:

<http://vee.am/kb2014>

# Diskspd

## Available benchmark targets with diskspd:

- Local drive on Windows machine: `C:\backup`
- CIFS\SMB share: `\\repository\backup`
- iSCSI\FC mounted disk or snapshot. Raw device access: `#X`
- NFS datastore: Should be mounted using **Client for NFS**

```
thread count:      1
proc count:       4
```

```
CPU | Usage | User | Kernel | Idle
-----|-----|-----|-----|-----
 0 | 37.37% | 15.89% | 21.48% | 62.63%
 1 | 26.71% | 16.15% | 10.57% | 73.29%
 2 | 33.11% | 20.16% | 12.95% | 66.89%
 3 | 14.70% |  9.31% |  5.39% | 85.30%
-----|-----|-----|-----|-----
avg. | 27.97% | 15.38% | 12.60% | 72.03%
```

```
Total IO
thread | bytes | I/Os | MB/s | I/O per s | file
-----|-----|-----|-----|-----|-----
 0 | 7545028608 | 115128 | 11.99 | 191.88 | #X <99GB>
-----|-----|-----|-----|-----|-----
total: 7545028608 | 115128 | 11.99 | 191.88
```

```
Read IO
thread | bytes | I/Os | MB/s | I/O per s | file
-----|-----|-----|-----|-----|-----
 0 | 7545028608 | 115128 | 11.99 | 191.88 | #X <99GB>
-----|-----|-----|-----|-----|-----
total: 7545028608 | 115128 | 11.99 | 191.88
```

```
Write IO
thread | bytes | I/Os | MB/s | I/O per s | file
-----|-----|-----|-----|-----|-----
 0 | 0 | 0 | 0.00 | 0.00 | #X <99GB>
-----|-----|-----|-----|-----|-----
total: 0 | 0 | 0.00 | 0.00
```

```
C:\TEMP\diskspd\Diskspd-v2.0.15\amd64fre>_
```

# Other tools for benchmarks

## Linux targets:

- FIO: <https://goo.gl/sxnVoJ>

## Data Domain:

- DDP connection checker manual:  
<https://support.emc.com/kb/334991>
- Download link: <ftp://nwc:nwc@ftp.emc.com>

## Hewlett Packard Enterprise StoreOnce:

- You can get it from Veeam support 😊

# Collecting advanced performance statistics

## Use cases:

- Slow read from storage snapshots
- Slow read in Hot-Add
- Slow synthetic operations
- Slow WAN accelerator processing
- **Benchmark test result differ from Veeam processing rate**

# Parsing performance statistics sample output

```
Parsing: "e:\AgentPerfLogs\Agent.3744.12122016T0656.txt":
```

```
Total events: 514824
```

```
Total file events: 417312
```

```
Total file init events: 776
```

```
Total cpu+mem events: 52062
```

```
Total agent session time:                23354.186492s
```

```
Time in "reader" threads:                 19508.786794s
```

```
Average CPU usage on the machine:         2.7%
```

```
Average MEM usage:                        83 MB (max 83 MB)
```

```
Time waiting on file read:                19221.583579s | 316852 ops
```

```
Time waiting on file write:               0.000000s | 0 ops
```

```
Time waiting on file seek:                0.800606s | 1109 ops
```

```
Time waiting on file flush:              0.000000s | 0 ops
```



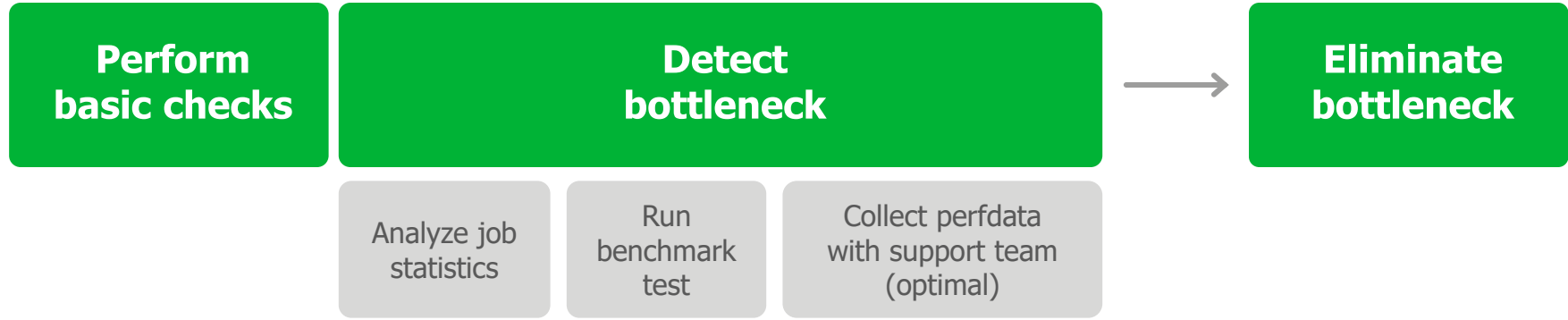
**Step 4**

The final step

# Maxing out performance

Bottleneck	Backup performance	Restore performance
Source	<ul style="list-style-type: none"><li>Choose the fastest read mode for your infrastructure</li></ul>	<ul style="list-style-type: none"><li>Decrease backup file fragmentation</li><li>Use faster repository</li></ul>
Proxy	<ul style="list-style-type: none"><li>Tweak concurrent tasks number</li><li>Play with compression</li><li>Add more proxies</li><li>Add more resources to a proxy</li></ul>	<ul style="list-style-type: none"><li>Increase backup block size</li><li>Playing with compression</li><li>Adding resources to a proxy</li></ul>
Network	<ul style="list-style-type: none"><li>Increase number of upload streams</li><li>Backup copy with WA</li><li>Preferred network for backup</li></ul>	<ul style="list-style-type: none"><li>Increase number of upload streams</li></ul>
Target	<ul style="list-style-type: none"><li>Incremental chain mode</li><li>VBK per VM</li></ul>	<ul style="list-style-type: none"><li>VMWare: Choose the fastest mode</li><li>HV or physical: Wait 😊</li></ul>

# Session summary







Thank you

VEEAMON2018

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