

Yellow cells are user inputs

Dropdown list

Switch between Hybrid and All-Flash

Click to check if a new version of the tool is available.  
*This feature doesn't work from some Dell offices*

**Disclaimer :** This spreadsheet is not a VMware official tool. Use it at your own risk

vSAN Version :

v6.6

Hybrid

Restore all inputs to their default value

Restore Default Settings

Check for Updates

*Timeout possible from Dell network*

<http://jo.my/vsancalc>

## Workload settings

Number of VMs :

100 VMs

#VMDKs per VM :

1 vDisk(s)

VMDKs Size :

50 GiB per vDisk

vCPU per VM :

2 vCPU(s)

vMemory per VM :

6.0 GiB vRAM

### VM Profile 1

### VM Profile 2 (disabled)

### VM Profile 3 (disabled)

0 VMs

1 vDisk(s)

50 GiB per vDisk

2 vCPU(s)

6.0 GiB vRAM

0 VMs

1 vDisk(s)

50 GiB per vDisk

2 vCPU(s)

6.0 GiB vRAM

## Availability settings

## Host calculation settings

## Storage calculation settings

FTT=1 / RAID-1 | HA Enabled

4 vCPU(s) per Core | 100% vRAM usage | 5% RAM slack | 25TB max per Host

Free space : 30% | Rebuild calc: Disabled | Cache ratio : 10%

[Edit](#)

[Use Default](#)

[Edit](#)

[Use Default](#)

[Edit](#)

[Use Default](#)

Summary of calculation settings

Edit calculation settings  
(details in next slides)

# Availability settings

## Availability settings

Primary FTT :

*\* 5 hosts minimum are required to m*

FTT=2 / RAID-1 | HA Enabled

FTT=2 (each VM has 2 additional copies)

FTT=0 (No redundancy)

FTT=1 (each VM has 1 additional copy)

FTT=2 (each VM has 2 additional copies)

FTT=3 (each VM has 3 additional copies)

Stretched Cluster (FTT=1 spread on 2 sites)

FTT=2 (each VM has 2 additional copies)

FTT=0 (No redundancy)

FTT=1 (each VM has 1 additional copy)

FTT=2 (each VM has 2 additional copies)

FTT=3 (each VM has 3 additional copies)

Stretched Cluster (FTT=1 spread on 2 sites)

FTT=1 RAID-5 (All-Flash only)

FTT=2 RAID-6 (All-Flash only)

FTT options depends on Hybrid/All-Flash selection

HA calculation (CPU & RAM) : TRUE

2 failure(s) per cluster(s) calculated

Choose if you want to calculate CPU et Memory resources for HA

HA calculation follows FTT selection  
HA calculation is **disabled with FTT=0** and **always enabled with Stretched clusters**

Erasure Coding options are displayed only when All-Flash is selected

[Close](#)

[Use Default](#)

# Availability settings – Stretched Cluster

## Availability settings

Primary FTT :	Stretched Cluster (FTT=1 spread on 2 sites)	HA calculation (CPU & RAM) : <div>TRUE</div> <div>Enforced on Stretched Clusters</div> <div>1-site failure capacity calculated</div>
Secondary FTT :	SFTT=1 (each VM has 2 copies per site)	
<i>* 6 hosts minimum are required to meet this policy.</i>		

## Virtual SAN Stretched Cluster - Minimum Bandwidth to Witness

Minimum Bandwidth between Witness and each Data Site	2 Mbps	<a href="#">See Tech Paper</a>
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SFTT option appears only if Stretched Cluster is selected **AND** vSAN version selected is v6.6 (minimum)

Calculates minimum bandwidth to witness.  
Does not consider stripping in storage policy  
(stripping option not available in this spreadsheet)

# Host calculation settings

Select server platform :  
2 or 4 sockets per Node

Select CPU consolidation ratio

Host calculation settings

4 vCPU(s) per Core | 100% vRAM usage | 5% RAM slack | 25TB max per Host

[Close](#) [Use Default](#)

COMPUTE	Server platform : Up to 2 sockets per host	Up to 4 vCPUs per Core
MEMORY	vMemory usage : 100%	Host Memory Headroom : 5%
MAX VMs/Host	Optimize density	
Formatted Storage Capacity Capping :	25.0 TB per Node (0 to disable)	

Set memory slack for vSphere Kernel overhead  
(vSAN memory will be added later)

Set vMemory usage vs provisioned capacity.  
Allows you to play with over-commitment.

Choose if you want to set a VM/Host consolidation ratio  
or if you want the spreadsheet to optimize density  
Max VMs per host density depends on vSAN version

Apply capacity capping per Node in calculation  
to prevent the spreadsheet from calculating  
nodes with excessive storage capacity

Optimize density

Limit max VMs/Host ratio

Optimize density

# Storage calculation settings – Hybrid

Storage capacity growth ratio expected

Free space (slack) to keep for maintenance tasks

## Storage calculation settings

Free space : 30% | Rebuild calc: Disabled | Cache ratio : 10% | Cache reservation : 5%

[Close](#)

[Use Default](#)

Capacity for Growth and Snapshots (%) :

0%

Free Space Reserve (%) :

30%

Rebuild Capacity Reserve :

0 (disabled)

Hybrid Cache vs vDisk usable capacity :

10%

Use Read Cache Reservation :

YES

Flash Read Cache Reservation (%) :

5%

of Total VMDKs capacity

Ad 0 (disabled)  
1 Host per Fault Domain  
2 Hosts per Fault Domain

Sets Hybrid Cache ratio.  
Default is 10%

This option shows up only if “Use  
Read Cache Reservation” is YES

Determine if you want to add free space for  
anticipated re-sync operations. Space added on  
top of slack space

Max rebuild calculation option is based on FTT  
selected previously

If enabled, this option can force calculation to add  
more hosts in cluster to satisfy resync  
requirements

# Storage calculation settings – All-Flash

Click here to switch to workload profile settings reported by Live Optics

## Storage calculation settings

Free space : 30% | Rebuild calc: 2 Hosts/FD | 70/30 R/W Rdm | 30k IOPS at 4KB | 1.5:1 Dedu

[Close](#)

[Use Default](#)

Capacity for Growth and Snapshots (%) : 0% Free Space Reserve (%) : 30% Rebuild Capacity Reserve : 2 Hosts per domain  
Adds capacity to rebuild data after failure

### All-Flash Workload :

Workload Profile

70/30 R/W Random

*Read Intensive, Standard Workloads*

Total Workload IOPS Average

30 000

@

4KB

Block Size

Dedupe & Compression :

Enabled

Dedupe & Compression Ratio :

1.5

:1 (33% savings)

[Use Live Optics XML](#)

Enable or disable Dedupe and Compression.  
Dedupe ratio must be set manually  
(use this option at your own risk)

Specify workload profile to calculate write buffer with relevant endurance  
These settings are used for **write buffer endurance calculation only**  
Performance-based calculation is not performed in this spreadsheet !

# Live Optics Import

Available with **All-Flash calculation only**

Runs an Explorer window to open a Live Optics output using XML format

## Storage calculation settings

Free space : 30% | Rebuild calc: 2 Hosts/FD | 45/55 Read/Write | 633 IOPS at 25KB | 1.5:1 D

[Close](#)

[Use Default](#)

Capacity for Growth and Snapshots (%) : 0% Free Space Reserve (%) : 30% Rebuild Capacity Reserve : 2 Hosts per Fault Domain

*Adds capacity to rebuild data after failure*

### All-Flash Workload :

Workload Profile : 45/55 Read/Write  
Workload IOPS Average : 633 @ 25KB Average Write IO Size  
Write Throughput Average : 10.79 MB/s  
Dedupe & Compression : Enabled  
Dedupe & Compression Ratio : 1.5 :1 (33% savings)

[Import Live Optics XML](#)

[Back to custom inputs](#)

Shows storage workload profile as reported by Live Optics

Close Live Optics and return to custom inputs

# Compare server configurations

Suitable hardware configuration to meet CPU, RAM and Storage capacity requirements

Hardware configuration defined by the user. Uses same chassis and devices as Minimum configuration

Calculates cluster using a Dell EMC Ready Node configuration published in the vSAN HCL

	Minimum Configuration	Custom Configuration	Ready Node :
<b>Compute</b>	<div>Recommends best CPU configuration</div> <div>1 x 20-Cores CPU</div>	<div>2 CPUs</div> <div>26-Cores CPU</div>	<div>14G AF-4-DELLEMC-R740 - 15.36TB</div> <div>2 x Intel Xeon Silver 4114 2.2G,10C/20T,9.6GT/s 2UPI,14</div>
<b>Memory</b>	<div>Includes vSAN Memory Overhead</div> <div>224 GB</div>	<div>512 GB</div>	<div>128 GB</div> <div>Increase RAM to improve consolidation</div> <div><a href="#">See this Ready Node in vSAN HCL</a></div>
<b>Storage</b>	<div>40 Drive Bays Chassis</div> <div>Cache Devices</div> <div>200GB SSD</div> <div>Capacity Devices</div> <div>1,92TB SSD</div>	<div>40 Drive Bays Chassis</div> <div>Large Cache : 153% of requirements</div> <div>2</div> <div>Host's Storage exceeds Capacity Limit (25TB)</div> <div>14</div>	<div>PowerEdge R740</div> <div>1 x 400GB SSD SAS WI MLC 12Gbps 2.5</div> <div>4 x 3.84TB SSD SAS RI MLC 12Gbps 2.5</div>



# Cluster summary view

Show calculation details

## Cluster Summary

[Show details](#)

#Hosts Required	7 Hosts	7 Hosts	8 Hosts
Total CPU Cores	84 Cores 108% of requirements	364 Cores 467% of requirements	160 Cores 213% of requirements
Total Memory	980 GB 101% of requirements	3584 GB 354% of requirements	1024 GB 109% of requirements
Flash Cache Capacity	2.8 TB 700% of requirements	5.6 TB 1400% of requirements	3.2 TB 800% of requirements
Storage Capacity	28 TB 105% of requirements	70 TB 169% of requirements	122.88 TB 208% of requirements

Total vDisks capacity in GiB (base 2) has been converted into TB (base 10) to match storage devices industry standard

# Cluster summary - Details

%achievements  
against  
requirements

Details showing  
resources  
allocation

CPU Overhead ratio depends  
on Space Efficiency features  
Base : 10%  
Erasure Coding : +2%  
Dedupe : +3%

## Cluster Summary

[Hide details](#)

#Hosts Required	7 Hosts	7 Hosts	8 Hosts
Clusters required :	1 Cluster	1 Cluster	1 Cluster
HA capacity calculated :	2 Hosts	2 Hosts	2 Hosts
<b>Total CPU Cores</b>	<b>84 Cores</b> 108% of requirements	<b>364 Cores</b> 467% of requirements	<b>160 Cores</b> 213% of requirements
Cores for VMs @ 4vCPUs/Core :	50 Cores 59.52% of total Cores	50 Cores 13.74% of total Cores	50 Cores 31.25% of total Cores
HA CPU capacity :	20 Cores 23.81% of total Cores	20 Cores 5.49% of total Cores	17 Cores 10.63% of total Cores
vSAN max overhead (13%) :	8 Cores 9.52% of total Cores	8 Cores 2.2% of total Cores	8 Cores 5% of total Cores
Extra CPU capacity :	6 Cores 7.14% of total Cores	286 Cores 78.57% of total Cores	85 Cores 53.13% of total Cores
<b>Total Memory</b>	<b>980 GB</b> 101% of requirements	<b>3584 GB</b> 354% of requirements	<b>1024 GB</b> 109% of requirements
vRAM usage @ 100% allocation :	600 GB 61.22% of total RAM	600 GB 16.74% of total RAM	600 GB 58.59% of total RAM
5% Memory added for slack :	32 GB 3.27% of total RAM	32 GB 0.89% of total RAM	32 GB 3.13% of total RAM
Total HA Memory capacity :	253 GB 25.82% of total RAM	253 GB 7.06% of total RAM	211 GB 20.61% of total RAM
Total VSAN Memory overhead :	82 GB 8.37% of total RAM	127 GB 3.54% of total RAM	93 GB 9.08% of total RAM
Extra Memory capacity :	13 GB 1.33% of total RAM	2572 GB 71.76% of total RAM	88 GB 8.59% of total RAM
<b>Flash Cache Capacity</b>	<b>2.8 TB</b> 700% of requirements	<b>5.6 TB</b> 1400% of requirements	<b>3.2 TB</b> 800% of requirements
Total Cache required :	0.4 TB 14.28% of Total Cache	0.4 TB 7.14% of Total Cache	0.4 TB 12.5% of Total Cache
Extra Cache capacity :	2.4 TB 85.72% of Total Cache	5.2 TB 92.86% of Total Cache	2.8 TB 87.5% of Total Cache
<b>Storage Capacity</b>	<b>28 TB</b> 105% of requirements	<b>70 TB</b> 169% of requirements	<b>122.88 TB</b> 208% of requirements
Formatting & Dedupe Metadata :	2.02 TB 7.2% of raw capacity	5.04 TB 7.2% of raw capacity	8.85 TB 7.2% of raw capacity
Free Space Reserve :	7.8 TB 30% Configured	19.49 TB 30% Configured	34.21 TB 30% Configured
Redundancy Overhead Factor :	3.00x FTT=2 / RAID-1	3.00x FTT=2 / RAID-1	3.00x FTT=2 / RAID-1
Capacity needed for vDisks :	3.58 TB 5.37 TB with 1.5:1 Dedupe	3.58 TB 5.37 TB with 1.5:1 Dedupe	3.58 TB 5.37 TB with 1.5:1 Dedupe
Capacity for Future Growth (0%) :	0 TB 0 TB with 1.5:1 Dedupe	0 TB 0 TB with 1.5:1 Dedupe	0 TB 0 TB with 1.5:1 Dedupe
Space required for Redundancy :	7.16 TB 10.74 TB with 1.5:1 Dedupe	7.16 TB 10.74 TB with 1.5:1 Dedupe	7.16 TB 10.74 TB with 1.5:1 Dedupe
Space required for Swap Files :	1.29 TB 0.64 TB with RAID-1	1.29 TB 0.64 TB with RAID-1	1.29 TB 0.64 TB with RAID-1
Rebuild capacity :	4.81 TB 2 Hosts	4.81 TB 2 Hosts	4.01 TB 2 Hosts
Extra Storage capacity :	1.35 TB 4.83% of Total Capacity	28.64 TB 40.91% of Total Capacity	63.79 TB 51.91% of Total Capacity

Understand  
how capacity  
is calculated

Total vDisks capacity in GiB (base 2) has been converted into TB (base 10) to match storage devices industry standard