

WORKLOADS

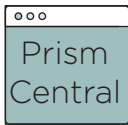
p2v - v2v - greenfield

- **COLLECT** workload data via RVTools, Live Optics or DPACKs
- **INSPECT** workload details down to the VM name
 - Old OS versions? Upgrades may require more RAM
 - Are there any VMs powered OFF? Why? Are they templates?
 - Are VMs thick or thin provisioned?

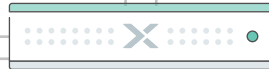
Don't forget about CVM and Prism Central Requirements!



vCPUs: 8
RAM: 32GB
SSD: 200GiB
Per Node



vCPUs: 4
RAM: 16GB
SSD: 500GiB
Per Instance



INFRASTRUCTURE

Try to find out early in the game, any infrastructure restrictions... things like available power, etc. can influence the final configuration.

Basic things to cover are:

- Rack space
- Power
- Cooling
- Network (speed, ports, etc)

2 RUs
RACK SPACE per
appliance/block
19" Rack Size

watch out for
telco racks

RECOMMENDED
208/240V

single phase
20A circuit
(NEMA L6-20)

110V available with
limited redundancy

10 GbE SFP+
10G BASE-T
1 GbE RJ45

Dual and Quad
port NICs available
Ensure at least one
connection per node

Workload + Growth Capacity + HA = Configuration

CPU

Understand Idle vs. Peak

4 vCPUs to 1 Core (4:1)

Typical virtual to physical
ratio for Server Virtualization

Also helpful is hypervisor
CPU Ready Time

RAM

Utilized Vs. allocated RAM is
different depending on hypervisor.

VMWare retrieves unused Memory,
AHV reserves the entire amount
assigned to a VM.

**Incorrect RAM configuration
accounts for 50% of CSAT issues.**

SSD (HOT TIER)

Sizing the SSD tier correctly is
critical to performance on a
Nutanix hybrid cluster. It is best
to **stay away from anything
lower than a 960GB SSD.**

In addition, workloads such as
SQL and Exchange should have
special attention paid to them
and the data IO needed.

HDD

When sizing for cold tier, don't
forget about snapshots and
retention policies.

Always consider storage efficiency features such as:

- Compression
- Deduplication
- Erasure Coding

SIZER.NUTANIX.COM

What is Sizer?

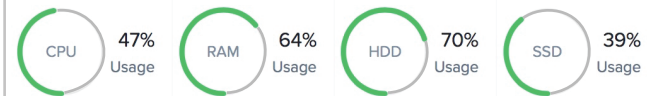
Sizer is a tool designed to apply Nutanix best practices against
workloads and propose an acceptable build on any of the platforms
supported. Due to the multiple factors dictating a build, be prepared
to make changes to the build sizer suggests.

Understand Customer's Required Capabilities

It may seem that the customer's priority is always price but
understanding the customer's priorities will determine what model is
selected; In some cases, a model like the 6155 can be used to
reduce the cost of the implementation while increasing the rack
space...some customers may be leasing colo space at a premium
and will pay extra for a solution that takes the least amount of space
possible.

Workload Types

VDI, SQL, Server Virtualization, etc... all these workloads behave
differently and sizer offers predefined values based on best
practices. for RAW capacity needs, it is still recommended that you
translate it into virtual machines using the "Server Virtualization"
workload and use it as a conversation starter.



Things to Consider!

N + 1 - Always make sure to edit the configuration and remove a
node to make sure that the remaining resources meet all the needs
of the workloads (CPU, Data and Storage).

Compression - Unless there is a lot of uncompressible data in the
workload (images, PDF, video...) then use 30% compression
savings for the workload when sizing. 85% of customers on Nutanix
see at least 30% compression savings. It is a safe number to use to
maximize the density, without under provisioning.

Erasure Coding - For configurations of 4 nodes and up and "Write
Cold" workloads, EC-X can provide up to 80% of storage efficiency.

Capacity Reservation - If you need capacity reservation, reserve
space for containers rather than for vDisks. Reserve capacity for a
container only if the SP has multiple containers...in other words,
know the container/datastore strategy for the customer.

NETWORKING

By default, the 10 GbE interfaces in the OVS bond or Virtual Switch operate in the recommended active-backup mode...depending on
customer requirements, a second Network Interface may or may not need to be added. Here is a list of things to consider:

- LACP configurations are known to work, but support might be limited or dependant on what the ToR switch can do
- for guest VM traffic on 10 GbE NICs, make sure that the guest VMs don't use the VLAN over which the CVM & hypervisor communicate
- If you want to use the 1 GbE interfaces for guest VM connectivity, follow the hypervisor manufacturer's switch port and networking guidelines

VDI

Things to consider:

User Profiles

- Task, Office, Knowledge or Power
- Number of desktops per pool/profile
- Requirements per desktop
 - vCPUs
 - vCPU MHz
 - Memory
- VM per Core ratios
- Concurrency (# of VMs turned on at the same time)

Pool/Profile Requirements

- Gold Image size
- Linked Clone or Persistent
- Apps
- Anti-virus Agent

User Experience

- Persistent - User logs in to same Desktop
- Non-persistent (Random)
- Broker
 - Citrix XenDesktop - Preferred
 - VMWare Horizon View, Microsoft RDS, Workspot, etc.

Storage Guidelines:

- Enabling compression for XenApp or XenDesktop is a general best practice; only enable the Elastic Deduplication Engine for full clones. Erasure coding is not a suitable data reduction technology for desktop virtualization.

Network Guidelines:

- Choose 10GbE or higher



MS SQL

you can size MS SQL Server by leveraging Xtract for DB or Nutanix Xplorer:

In Xtract for DB:

- Scan instances
- Generate a design
- Download the design

In Xplorer:

- Import the design
- Push the design to Sizer



CPU Guidelines:

- Choose an appropriate vCPU:pCore ratio in Sizer
 - Prod – 2:1
 - Dev/Test – 4:1 or 6:1
- Size the VM to fit within the NUMA boundary
- Use a 2.4Ghz or higher processor
- High clock speed + lower core count = reduce licensing cost

Memory Guidelines:

- No overcommit on RAM, even if the hypervisor supports it
- Use a balanced memory configuration
- Memory speed drops if all slots are full (Broadwell only)

Storage Guidelines:

- Lead with all flash
- Working set is typically 100% of the database size
- Only use compression for SQL Server workloads

SQL Server offers both compression and transparent data encryption. These features will significantly affect how much the data can be compressed on Nutanix.

Network Guidelines:

- Choose 10GbE or higher

BACKUP & DISASTER RECOVERY

- Validate the RTO and RPO
- Add snapshot details in sizer (see formula below)
- Validate customer network can support the throughput (not just bandwidth and latency) for the change rate
- If possible, use a dedicated backup network to avoid having backups travel via firewall or router; an extra VM NIC needed.

Sizing for Snapshots:

Local Snapshots - Account for the rate of change in the environment and how long you plan to keep your snapshots for. Understand that reduced snapshot frequency may increase the rate of change due to a greater chance of common blocks changing before next snapshot.

To find the space needed to meet RPO, use the following formula:

snapshot reserve = (frequency of snapshots * change rate per frequency) + (change rate per frequency * # of snapshots in a full curator scan * 0.2)

Example: (assumes change rate = 35GB of data every six hours and that we keep ten snapshots):

$$\begin{aligned} &= (10 * 35,980 \text{ MB}) + (35,980 \text{ MB} * 1 * 0.2) \\ &= 359,800 + (35,980 * 1 * 0.2) \\ &= 359,800 + 7,196 \\ &= 366,996 \text{ MB} \\ &= 367 \text{ GB} \end{aligned}$$

Remote Snapshots - Remote snapshots use the same process as above, but you must include the first full copy of the PD plus delta changes based on the set schedule.

GOTCHAS!

- Watch out for monster VMs
- Large, single vDisks can potentially consume all your hot tier
- Workloads that require heavy CPU utilization such as HPC require special attention as clockspeed and high core counts are a must
- Ask early about the existing network (VLANs and subnets) to ensure there is no conflict with the Nutanix internal 192.168.5.0/24 network

