

## Capacity Planning (Sizing) for Resiliency Platform Replication Appliances [VMware vSphere and Azure environment]

Veritas Resiliency Platform replication appliance participates in the replication data path and hence its sizing directly depends on the amount and the rate of data transfer it is expected to handle. Given that a single replication appliance caters to multiple VMs, the aggregate data transfer rate from those VMs needs to be factored in the sizing of the appliance. Alternately, if the size of the appliance is fixed, it will be able to support only as many VMs based on their aggregate data transfer. If you need to protect more VMs, you need to either add capacity (CPU and memory) to existing replication appliance(s) or deploy additional replication appliances in primary and recovery data centers.

Given that replication involves data transfer over network, overall network characteristics, including latency, bandwidth and quality (packet loss) of network components (LAN, WAN) play a crucial role in arriving at the aggregate data transfer and hence the number of VMs that can be supported in a given environment. For example, all other factors remaining constant; the number of supported VMs or aggregate data transfer from those VMs is directly proportional to the WAN bandwidth. As such a 5Gbps WAN link will be able to support 5 times as much combined data transfer rate as a 1Gbps WAN link.

Specific sizing attributes for a replication appliance are described below along with the factors that they depend on.

1. Number of virtual CPUs → Aggregate data transfer rate from protected VMs
2. Memory → Aggregate data transfer rate from protected VMs
3. Disk Size (used as staging area) → Number of VMs and average data transfer rate from each VM
4. Number of replication appliances → Aggregate data transfer rate from protected VMs, number of disks attached to each of the protected VMs and the number of disks that can be attached to a replication appliance VM. The last parameter is technology specific; for VMware, this number is 60 (sixty). That means 60 disks can be attached to a replication appliance when it acts as the replication target for protected VMs. Depending on the flavor of the VM selected in Azure, this number can vary from 2 to 64. For the sake of this document, the following two flavors are selected
  - a. Standard\_DS4\_v2 (8 vCPUs, 28GiB RAM and 32 data disks)
  - b. Standard\_DS5\_v2 (16 vCPUs, 56GiB RAM and 64 data disks)

Following assumptions are made while arriving at sizing recommendations

- Primary datacenter uses VMware hypervisor technology and recovery datacenter is in Azure.
- Both the datacenters have LAN which is at least twice as fast as the WAN.
- Oversubscription ratio for Virtual CPUs is 2:1.
- 80% of the WAN bandwidth is usable or in other words, there is minimal packet loss, if at all, over the WAN network.

- Performance of the staging area should match the storage performance of the replicated production workload. A staging area of at least 700GB is assumed for all the appliances.

Below is a tabular representation of various scenarios and the corresponding appliance sizing attributes. Customer requirements are captured in **green**, primary datacenter replication appliance(s) configuration is captured in **blue** and recovery datacenter appliance(s) configuration is captured in **orange**.

Customer Requirement			WAN bandwidth (Mbps)	Primary Datacenter (VMware)			Recovery Datacenter (Azure)			
Number of Protected VMs	Data transfer per VM (MB/s)	Disks per VM		Appliance virtual CPUs	Appliance Memory (GB)	Number of Appliances	VM Type	Appliance Virtual CPUs	Appliance Memory (GB)	Number of Appliances
28	2	2	250	8 *	16 *	1	Standard_DS4_v2	8	28	2
56	2	2	500	8	16	2	Standard_DS4_v2	8	28	4
100	2	2	900	8	16	4	Standard_DS4_v2	8	28	8
560	2	2	5000	8	16	20	Standard_DS4_v2	8	28	40
28	2	4	250	8	16	2	Standard_DS4_v2	8	28	4
500	2	4	4500	8	16	36	Standard_DS4_v2	8	28	72
28	4	2	500	13	25	1	Standard_DS4_v2	8	28	2
28	10	2	1250	29	55	1	Standard_DS5_v2	16	56	2
100	10	2	4200	29	55	4	Standard_DS5_v2	16	56	7

Table: Recommended appliance configuration for customer scenarios (\* Default VRP appliance configuration)