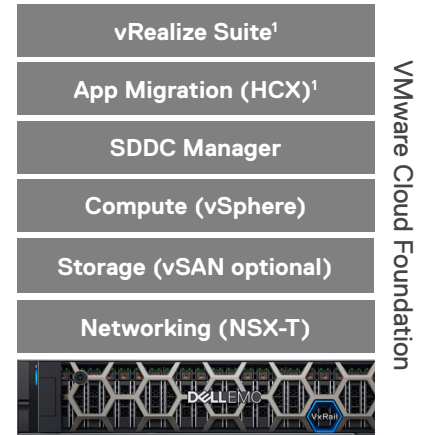# Dell APEX Hybrid Cloud

Securely extend your data center across cloud environments

Dell APEX Hybrid Cloud enables consistent, secure operations with automation and orchestration across private and public clouds for your VMware workloads with scalable compute, storage, and networking resources. With the integrated VMware Cloud Foundation, you decide where your workloads will work best, allowing you to seamlessly move workloads across multi-cloud environments. Easily scale on demand as your business needs grow, while having the ability to independently scale compute and storage with a compute-only option (no vSAN) for workloads with unique requirements.

APEX Hybrid Cloud offers predictable monthly pricing available through 1- or 3-year term subscriptions—where hardware, software, and services to support deployment, rack integration, and asset recovery are included. Subscribe to instances designed for your workloads through the Dell APEX Console and get your cloud infrastructure delivered and deployed in as few as 28 days[2]. Enjoy simplified operations and built-in lifecycle automation capabilities with infrastructure owned and deployed by Dell.

| vRealize Suite[1] |
| App Migration (HCX)[1] |
| SDDC Manager |
| Compute (vSphere) |
| Storage (vSAN optional) |
| Networking (NSX-T) |

VMware Cloud Foundation

Dell VxRail

Joint engineering between Dell and VMware leads to a seamless, curated, and optimized hyperconverged experience.

Let Dell help you manage your infrastructure

Management model	What Dell does
• Customer or partner managed; Dell owned • Monthly subscription with flexible terms • Single point of contact from order to decommission with a Customer Success Manager	• Proactive hardware monitoring • Troubleshooting/break-fix at customer site • Twice-a-year system maintenance • Monthly business reviews • Deploy and decommission

Management is simple with the Dell APEX Console

The Dell APEX Console is an online platform that reduces complexity in discovering, subscribing to, deploying, monitoring, optimizing, and growing IT services.

• Rapidly configure and deploy cloud resources

• Gain greater visibility over cloud costs

• Easily scale your subscriptions based on business demands

• Empower your key stakeholders, providing access based on role while retaining IT oversight
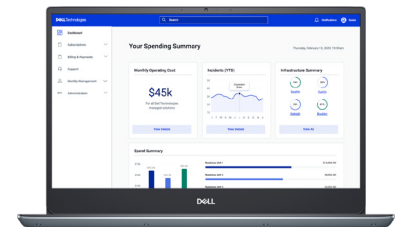
1. Included in VMware Cloud Foundation Enterprise only

2. Deployment time is measured between order acceptance and activation. The 28-day deployment applies to single rack deployments of select APEX Cloud services pre-configured solutions and does not include select vRealize components and some other features, including vRA and vRO, or customizations to the standard configuration. Deployment is subject to credit approval, acceptance of APEX terms by required parties, deployment survey, availability of resources at the deployment facility, and a completed configuration workbook before order placement. Product availability, international holidays, and other factors can impact deployment. US, United Kingdom, France, and Germany only. Contact your sales representative for details.

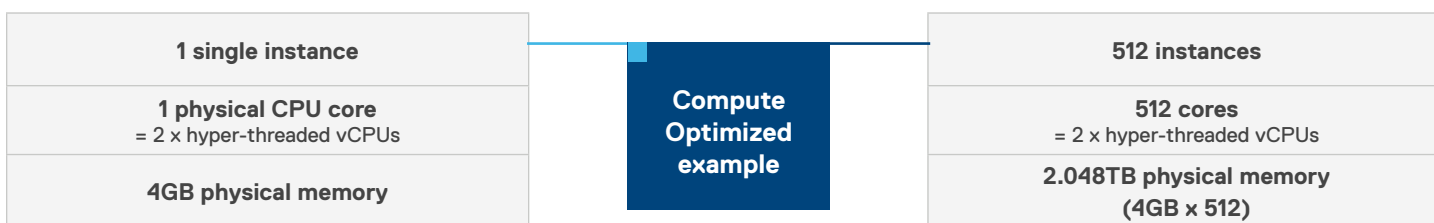## Instances designed for your VMware workloads

Instances are standardized combinations of compute and memory resources—defined by a fixed physical memory-to-core ratio—and powered by Dell VxRail. They are optimized for your virtualized and containerized workload requirements, ranging from small (4GB/Core) to extra-large (32GB/Core) memory-to-CPU core ratios. Instances are backed by VMware vSAN-based shared storage using Enterprise Class, high performance All Flash drives. All Flash storage includes high performance NVMe cache in two disk groups. You will have multiple storage capacity points to support your compute instances.

The physical cores are based on the latest 3rd Generation Intel® Xeon® Scalable Processors. Compute Optimized, General Purpose, Memory Optimized, Large Scale Optimized instances use Gold and Platinum Series processors while VDI Optimized and AI/ML Optimized instances use Gold series CPUs. Each CPU core has 2x hyper-threads (2x vCPU).

You can select the instance density of the subscription with three configuration options (16, 32, 64 instances per host) for Compute, General Purpose, Memory and Large-Scale Memory optimized instance types. This allows you to be more in control of the number of hosts provided in each instance quantity selection. For example, if you have an availability requirement for Failures to Tolerate (FTT)=2 with RAID6 (min of six hosts), you can choose the "16 instances per host" selection to ensure you get at least six hosts to meet your requirement without paying for unnecessary instances.

Instance example

Example: If you want each of your VM or container instances to use one physical core and 4GB of physical memory for your workloads, you should select the Compute Optimized instances category. In addition, you have full flexibility to over-commit your physical core and assign more than two vCPUs per physical core, thereby achieving a much higher number of VMs per instance.

1 single instance		512 instances
1 physical CPU core = 2 x hyper-threaded vCPUs	**Compute Optimized example**	**512 cores** = 2 x hyper-threaded vCPUs
4GB physical memory		**2.048TB physical memory** **(4GB x 512)**

Flexible vCPU/core ratios

Each CPU core has 2x hyper-threads (2x vCPU). Administrators have full flexibility to over-commit physical cores, thereby assigning more than 2x vCPUs per physical core. This achieves a much higher number of VMs per instance.
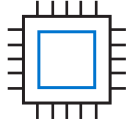
Instance types and details

Compute optimized

Delivers high performance for running compute intensive workloads

4_{GB} **memory/core**
(1 instance = 1 CPU core)

Application examples

- Mainstream web servers
- Batch processing applications
- Network applications
- Engineering applications

- High performance computing (HPC)
- Media encoding servers
- Online gaming servers

General purpose

Ideal for workloads using compute, memory, and storage resources in equal proportions

8_{GB} **memory/core**
(1 instance = 1 CPU core)
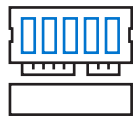
Application examples

- Low to medium traffic web server
- Database application servers
- Development and test servers

- Unstructured data and NoSQL databases
- Log and data processing

Memory optimized

Delivers fast performance for workloads that process large data sets in memory, using a high memory-to-core ratio

16_{GB} **memory/core**
(1 instance = 1 CPU core)
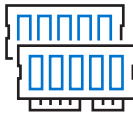
Application examples

- Relational databases (MySQL, MariaDB, PostgreSQL, etc.)
- Midsize in-memory databases (SAP/HANA)
- Data mining

- Web scale in-memory caches (Memcached)
- Smaller enterprise Java applications

Large-scale memory optimized

Delivers fast performance using an extra high memory-to-core ratio for workloads that process large data sets in memory

32_{GB} **memory/core**
(1 instance = 1 CPU core)

Application examples

- High performance relational databases (Oracle, Microsoft SQL, MySQL, etc.)
- Midsize in-memory databases (SAP/HANA)

- Data mining
- Web scale in-memory caches (Memcached)
- Enterprise Java applications

AI/ML optimized

Ideal for machine learning and compute-intensive applications using hardware accelerators in the NVIDIA Ampere family

8_{GB} **memory/core**
(1 instance = 1 CPU core)
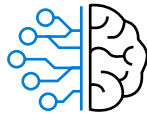
Application examples

- Artificial Intelligence (AI) and Machine Learning (ML) training and inferencing
- High performance computing and data analytics

Note: NVIDIA virtualization software sold separately

VDI optimized

Deliver high-density, graphics-rich Virtual Desktop Infrastructure (VDI) by leveraging GPUs from the NVIDIA Ampere family

32_{GB} **memory/core**
(1 instance = 1 CPU core)

Application examples

- Accelerated Virtual Desktop Infrastructure (VDI) for graphics-rich virtual PCs accessible from anywhere
- Computer aided design (CAD), large framebuffer per user for entry-level virtual workstations

Note: NVIDIA virtualization software sold separately

Instance Specifications

Instance type:	**Compute optimized**[3] (4GB memory/CPU core) **General purpose** (8GB memory/CPU core)		**Memory optimized instances** (16GB memory/CPU core) **Large-scale memory optimized** (32GB memory/CPU core)
Instances per host:	16	32	64
Processor[4]**:**	Intel Xeon Gold 6326	Intel Xeon Gold 6314U	Intel Xeon Gold 6338 Intel Xeon Platinum 8358[3]
Processor frequency (base/all core turbo):	2.9/3.3Ghz	2.3/2.9Ghz	2.0/2.6Ghz 2.6/3.3Ghz[3]
Disk groups and cache (per host):	2/2x1.6 MU Gen4 NVMe	2/2x1.6 MU Gen4 NVMe	2/2x1.6 MU Gen4 NVMe
Capacity storage (per host):	4TB RI SATA 23TB RI SATA 61TB RI SAS	4TB RI SATA 23TB RI SATA 61TB RI SAS	4TB RI SATA 23TB RI SATA 61TB RI SAS
Network interfaces (per host):	4 x 25GB	4 x 25GB	4 x 25GB
Min instance quantity (per rack)[5]**:**	32	64	128
Max instance quantity 1 phase power (per rack):	208	416	832
Max instance quantity 3 phase power (per rack):	384	768	1,536

Instance type:	**AI/ML optimized** (8GB memory/CPU core)	**VDI optimized** (32GB memory/CPU core)	**Dedicated management cluster** (Optional)
Instance per host:	64	64	32
Processor[4]**:**	Intel Xeon Gold 8358	Intel Xeon Gold 6338	Intel Xeon Gold 6314U
Processor frequency (base/all core turbo):	2.6/3.3Ghz	2.0/2.6Ghz	2.3/2.9Ghz
Disk groups and cache (per host):	2/2x1.6 MU Gen4 NVMe	2/2x1.6 MU Gen4 NVMe	2/2x1.6 MU Gen4 NVMe
Capacity storage (per host):	23TB RI SATA	23TB RI SATA	23TB RI SATA
Network interfaces (per host):	4 x 25GB	4 x 25GB	4 x 25GB
GPU[6]**:**	2 x NVIDIA A30	2 x NVIDIA A16	
Min instance quantity (per rack)[5]**:**	128	128	128
Max instance quantity 1 phase power (per rack):	448	448	128
Max instance quantity 3 phase power (per rack):	704	704	128

3. Only applies to Compute Optimized instances with 64 instances per host
4. Each CPU core has 2x hyper-threads (2x vCPU)
5. Min instance quantity reflects a 2-host cluster, requires a witness VM running outside the cluster and external vCenter
6. Dell has the ability to substitute equivalent hardware at our discretion

Dell APEX Hybrid Cloud

Powerful performance built for VMware workloads, with VMware

APEX Hybrid Cloud is designed with today's mission-critical workloads in mind and delivers multiple compute and storage options to cover a wide variety of instances. VxRail, powered by Dell PowerEdge server platforms and VxRail HCI System Software, delivers deep integration across the VMware ecosystem. This means you can rapidly deploy secure on-premises cloud infrastructure and take advantage of a full stack single-click lifecycle management experience. At the same time, this significantly simplifies operations and ensures clusters are in continuously validated states so that your cloud infrastructure is always up to date.

Adopting the next generation technology that includes the 3rd Generation Intel® Xeon® Scalable Processors, PCIe gen4 based NVMe cache, and higher bandwidth SAS controllers, APEX Hybrid Cloud delivers a powerful platform that is faster with lower latency to support increasing workload requirements and evolving business goals.

Flexibility to support different types of workloads and deployment architectures with a separate management cluster

The architecture of the VMware Cloud Foundation separates the management and workload functionalities. Depending on whether you need a separate management domain or not, the management and workload functionality may operate in a single domain (consolidated architecture), or separate domains (standard architecture). A dedicated management domain is a fixed configuration where the VCF management infrastructure will run separately from user workloads. This is known as the standard architecture model, where the management functionality operates in a dedicated management cluster. With the standard architecture model, management functionality runs on a dedicated management domain, and user workloads are deployed in separate virtual infrastructure (VI) workload domains. Each workload domain is managed by a separate vCenter Server instance which provides for scalability and allows for autonomous licensing and lifecycle management.

## Flexible options for data storage with independent scaling of resources

Compute-only vSphere clusters with no vSAN allow users to scale compute and storage independently based on your workload needs. This provides more flexibility to meet a wide range of workload requirements and freedom in how you choose to store data to best fit your business needs. The key use cases for the no vSAN option are:

Connect and utilize existing vSAN with HCI Mesh.
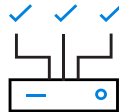
Connect with Dell storage arrays such as PowerFlex, PowerStore-T, PowerMax, or Unity XT.
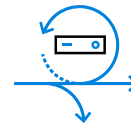
Refresh or transition infrastructure at your pace for different procurement cycles.

Go cloud native with the production-ready Kubernetes platform

APEX Hybrid Cloud enables you to automate the deployment of modern application infrastructure with VMware Tanzu. Accelerate development time of cloud-native applications with a consistent infrastructure operations model across your Kubernetes deployments. With support for both traditional and cloud-native applications on the same platform, you can now capitalize on the next evolution in enterprise applications.
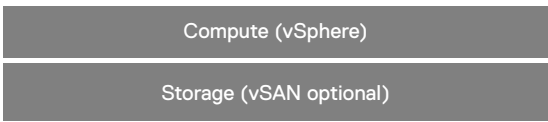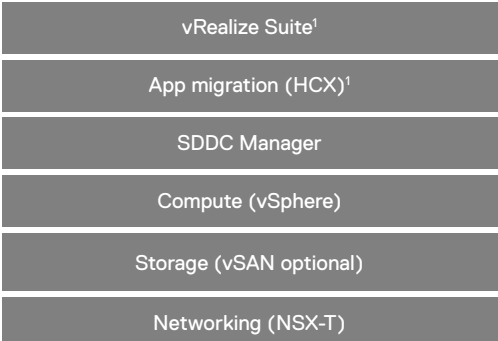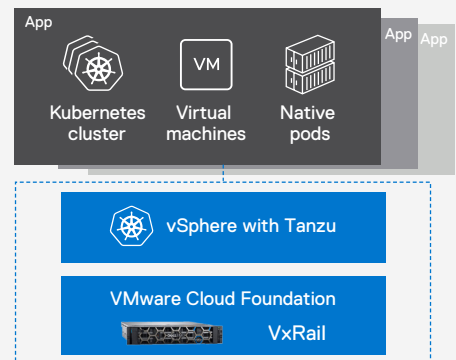
Rack infrastructure

Rack	42U (600mm wide x 1,200mm deep)
Network fabric	1 x management switch 2 x 25Gbps host network interfaces Redundant top of rack switches 4Tbps (full duplex) non-blocking switching capacity
Customer facing uplinks	1-4 x 10/25/40GB or 100GB per ToR (optical)
Power connections: AMER	4xNEMA L6-30 (200-240v) single phase 4xNEMA L21-30 (200-240V) three phase
Power connections: EMEA	4 x IEC 309 32a single phase 4 x IEC 309 16A three phase
Ambient operating temperature	10°C to 30°C 50°F to 86°F
Storage temperature range	-40°C to +65°C -40°F to +149°F
Operating relative humidity	10% to 80% (non-condensing)
Operating altitude with no deratings	3,048m (approx. 10,000 ft)
Weight (with common equipment)	Max weight - single phase: 1,402 pounds (636kg) Max weight - three phase: 1,950 pounds (885kg)

Dell APEX supports your entire cloud journey

Delivering cloud resources that are designed to support you wherever you are in your cloud journey in partnership with VMware, Dell APEX offers multiple options that enable you to choose the best cloud infrastructure that fits your organization's cloud strategy. This means you can start small and scale up in a phased approach that matches your application and business needs.

	Dell APEX Private Cloud	Dell APEX Hybrid Cloud
Management model	Customer managed; Dell owned	Customer managed; Dell owned
Dell provides	• Proactive hardware monitoring • Troubleshooting/break-fix at customer site • Twice-a-year system maintenance • Monthly business reviews	• Proactive hardware monitoring • Troubleshooting/break-fix at customer site • Twice-a-year system maintenance • Monthly business reviews
APEX Compute and HCI	Perfect for getting started with cloud or expanding your data center out to the edge Compute (vSphere) Storage (vSAN optional) **Dell VxRail**	Secure and consistent operations across private and public cloud environments vRealize Suite[1] App migration (HCX)[1] SDDC Manager Compute (vSphere) Storage (vSAN optional) Networking (NSX-T) *VMware Cloud Foundation* **Dell VxRail**

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