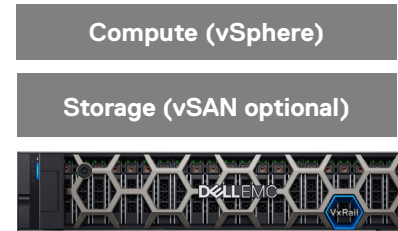


# Dell APEX Private Cloud

## Easily start your cloud journey or extend to the edge

Dell APEX Private Cloud delivers an on-premises cloud experience for VMware workloads in the data center and edge locations with scalable compute, storage, and networking resources. With a small footprint, APEX Private Cloud is ideal for getting started with a cloud model or expanding out to edge environments with limited space and resources. 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 Private 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<sup>1</sup>. Enjoy simplified operations and built-in lifecycle automation capabilities with infrastructure owned and deployed by Dell.



### Dell VxRail

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

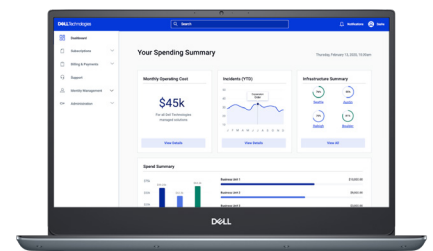
## Let Dell help you manage your infrastructure

Management model	What Dell does
<ul style="list-style-type: none"> <li>• Customer or partner managed; Dell owned</li> <li>• Monthly subscription with flexible terms</li> <li>• Single point of contact from order to decommission with a Customer Success Manager</li> </ul>	<ul style="list-style-type: none"> <li>• Proactive hardware monitoring</li> <li>• Troubleshooting/break-fix at customer site</li> <li>• Twice-a-year system maintenance</li> <li>• Monthly business reviews</li> <li>• Deploy and decommission</li> </ul>

## 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. 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 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 can be backed by VMware vSAN-based shared storage using Enterprise Class, high performance All Flash drives, or you can select no vSAN and use Dell external storage arrays or remotely access vSAN datastores through HCI mesh. 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).

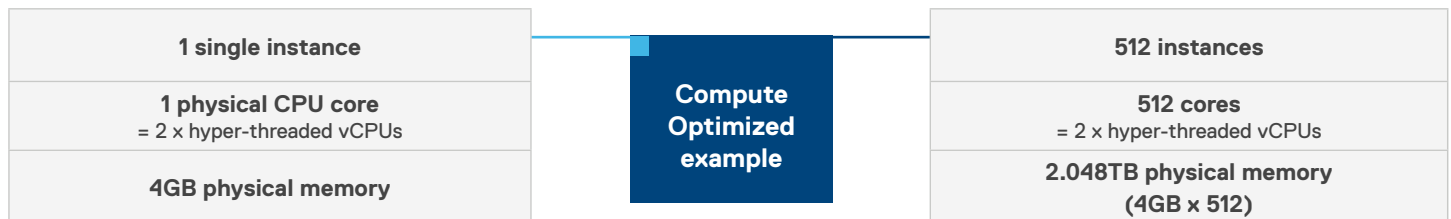
You can select the instance density of the subscription with three configuration options (16, 32, 64 instances per host) for Compute, General Purpose, Memory and Large-Scale Memory Optimized instance types. This allows you to be more in control of the number of hosts provided in each instance quantity 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.

## Start small and scale easily as you grow

APEX Private Cloud provides a smaller configuration, as low as 32 instances with the 2-node cluster solution, that meets the immediate need of edge environments with a small footprint, low-cost, easy-to-manage infrastructure option. Easily scale and expand as needed for workloads outside the traditional core data centers with co-termed expansions.

## 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.



## 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.

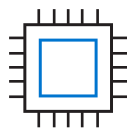
## Instance types and details

### Compute optimized

Delivers high performance for running compute intensive workloads

**4GB memory/core**

(1 instance = 1 CPU core)



#### Application examples

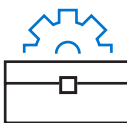
- Mainstream web servers
- Batch processing applications
- Network applications
- Engineering applications
- High performance computing (HPC)
- Media encoding servers
- Online gaming servers

### General purpose

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

**8GB memory/core**

(1 instance = 1 CPU core)



#### Application examples

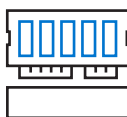
- Low to medium traffic web server
- Database application servers
- Development and test servers
- Unstructured data and NoSQL databases
- Log and data processing

### Memory optimized

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

**16GB memory/core**

(1 instance = 1 CPU core)



#### Application examples

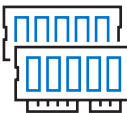
- Relational databases (MySQL, MariaDB, PostgreSQL, etc.)
- Midsize in-memory databases (SAP/HANA)
- Data mining
- Web scale in-memory caches (Memcached)
- Smaller enterprise Java applications

### Large-scale memory optimized

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

**32GB memory/core**

(1 instance = 1 CPU core)



#### Application examples

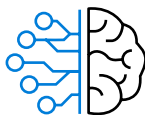
- High performance relational databases (Oracle, Microsoft SQL, MySQL, etc.)
- Midsize in-memory databases (SAP/HANA)
- Web scale in-memory caches (Memcached)
- Enterprise Java applications
- Data mining

### AI/ML optimized

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

**8GB memory/core**

(1 instance = 1 CPU core)



#### Application examples

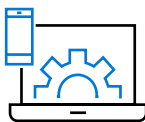
- Artificial Intelligence (AI) and Machine Learning (ML) training and inferencing
  - High performance computing and data analytics
- Note: NVIDIA virtualization software sold separately

### VDI optimized

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

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

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

2. Only applies to Compute Optimized instances with 64 instances per host

3. Each CPU core has 2x hyper-threads (2x vCPU)

4. Min instance quantity reflects a 2-host cluster, requires a witness VM running outside the cluster and external vCenter

5. Dell has the ability to substitute equivalent hardware at our discretion

## Powerful performance built for VMware workloads, with VMware

APEX Private 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 Private Cloud delivers a powerful platform that is faster with lower latency to support increasing workload requirements and evolving business goals.

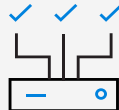


## Flexible options for data storage with independent scaling of resources

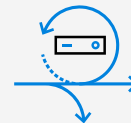
Compute-only vSphere clusters with no vSAN allow users to scale compute and storage independently based on your workload needs. This provides more flexibility to meet a wide range of workload requirements and freedom in how you choose to store data to best fit your business needs. The key use cases for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

## Flexible deployment option

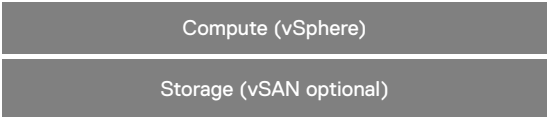
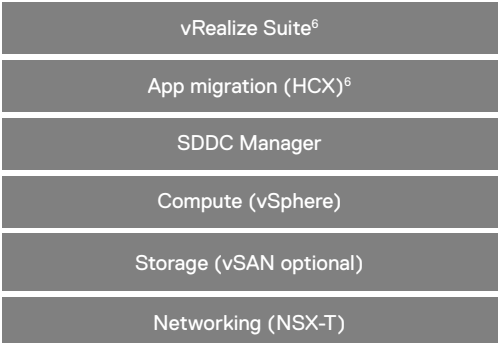
APEX Private Cloud offers further flexibility for you to utilize your own rack enclosure, top-of-rack switches, PDUs, etc. You can choose a Pre-Defined Integrated Rack from Dell or leverage existing rack space with on-site integration. A set of questions during the pre-sales phase will help you get started for this provide-your-own-rack option. The questions include confirming rack size, compliance with Dell's thermal requirements for VxRail, and sufficient PDU outlets to power your configuration.

## 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	<ul style="list-style-type: none"> <li>Proactive hardware monitoring</li> <li>Troubleshooting/break-fix at customer site</li> <li>Twice-a-year system maintenance</li> <li>Monthly business reviews</li> </ul>	<ul style="list-style-type: none"> <li>Proactive hardware monitoring</li> <li>Troubleshooting/break-fix at customer site</li> <li>Twice-a-year system maintenance</li> <li>Monthly business reviews</li> </ul>
APEX Compute and HCI	<p>Perfect for getting started with cloud or expanding your data center out to the edge</p> <div style="text-align: center;">  <p><b>Dell VxRail</b></p> </div>	<p>Secure and consistent operations across private and public cloud environments</p> <div style="text-align: center;">  <p><b>Dell VxRail</b></p> </div> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">VMware Cloud Foundation</p>

6. Included in VMware Cloud Foundation Enterprise only



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Dell APEX

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