

## Cloud Services for SAP

**Dimension Data can combine fit for purpose SAP HANA® certified enterprise public, private, and hybrid clouds together with skilled and certified SAP application services resources to provide an end-to-end SAP managed cloud service solution.**

We combine our SAP professional and support services with our Global Managed Cloud Platform to offer Cloud Services for SAP. Cloud Services for SAP provide scalable infrastructure, staffing, and a full stack of services that includes database management, BASIS support, and optional application management services, and implementation.

SAP production applications demand a secure, flexible, resilient, highly available infrastructure, supported with full disaster recovery and backed by service-level guarantees. Dimension Data's HANA production-certified Cloud Services for SAP meet these demands cost effectively.

Dimension Data offers multiple deployment options to serve both SAP, HANA, and non-HANA production systems, as well as development, quality assurance, and staging environments. With our mix of consumable public cloud and certified HANA environments, you can create the environment you need in a cost-effective deployment. Bare metal infrastructure can be integrated directly with a private or public cloud environment, for large HANA databases when required.

Dimension Data is SAP certified as an SAP cloud, hosting and HANA Operations provider and we have built our Cloud Services for SAP based on SAP's best practices and tailored data integration (TDI) methodology. By leveraging our SAP cloud model, we can offer you a solution that's right-sized for your SAP databases and applications.

There's no need to buy expensive appliances or large servers that sit largely idle and underutilised. Through an optimised mix of virtual and physical workloads combined with on-demand development and test environments you only have to get what you need.

You can also choose to have this SAP certified environment deployed as a private cloud at a location of your choice. This is a great option when you require a private cloud, need to deploy services in a specific city or country, or if your SAP environment is large enough to merit your own dedicated SAP cloud.

Using our certified SAP and HANA based services, you can bring your SAP licenses and applications to our cloud and rest assured that you'll continue to enjoy uninterrupted SAP support for your SAP applications.



**SAP® Certified**  
in Hosting Services

**SAP® Certified**  
in Cloud Services

**SAP® Certified**  
in SAP HANA® Operations Services

### Dimension Data SAP Services

Cloud Services for SAP can be delivered across Dimension Data’s portfolio of Managed Cloud offerings to form a multi-functional hybrid environment that addresses organisational requirements for a flexible, agile and scalable cloud infrastructure.

Our deployment options - which can easily be mixed and matched - include:

- **Cloud Services for SAP:** a managed SAP cloud service with partially or fully dedicated servers and storage that are optimised for running production SAP and HANA systems.
- **Public cloud:** a shared, multi-tenant compute, storage, and network infrastructure with separate, client-specific layer 2 networks and customisable firewalls; deployed from Dimension Data data centres across five continents.
- **Cloud Services for SAP – Private :** a managed SAP dedicated private cloud service on-premise or hosted in a Dimension Data data centre; optimised for running production SAP and HANA systems; and provides hypervisor, storage, compute and network physical isolation.
- **Private cloud:** dedicated private cloud service on-premise or hosted in a Dimension Data data centre; provides hypervisor, storage, compute and network physical isolation.
- **Managed Hosting:** physical and virtual infrastructure or appliances dedicated to each client hosted in a Dimension Data data centre that can be directly networked to Public Cloud.

Features and capabilities of each of these deployment models are highlighted in the table below:

Cloud Services for SAP meet all the requirements for a HANA production environment.

- supports virtual and physical servers  
- virtual up to 1 TB  
- physical up to 6 TB+
- provides 100% CPU reservation
- provides 100% memory reservation
- provides dedicated SAN storage for HANA production databases
- provides for storage LUN provisioning that meets HANA TDI specifications

	Managed Hosting	Private Cloud	Cloud Services for SAP - Private	Public Cloud	Cloud Services for SAP
<b>Use Cases</b>					
Production HANA	X		X		X
SAP	X	X	X	X	X
Quality assurance and development	X	X	X	X	X
Disaster recovery	X	X	X	X	X
Scalability	X	X	X	X	X
Self-provisioning		X		X	
Memory	Up to 6 TB	Up to 256 GB, larger memory requires physical servers	Up to 6 TB	Up to 256 GB	Up to 6 TB
<b>Deployment location</b>					
Dimension Data cloud data centre	X	X	X	X	X
On-premise		X	X		
<b>Pricing</b>					
Billing	Fixed	Fixed or consumption	Fixed or consumption	Consumption	Mixed

## Dimension Data cloud security

Dimension Data's cloud services are built leveraging our security, networking, and data centre expertise as a worldwide ICT managed service provider. Dimension Data processes are based on international standards and industry best practices and implemented consistently across the globe.

Our worldwide Security Operations Centres (SOCs) are staffed around the clock. They're equipped with a full complement of security technology to monitor and manage our cloud infrastructure and ensure that if there's a security incident, we can effectively and rapidly respond.

Within these secure confines, you can seamlessly extend your data centres to the Dimension Data cloud using your existing network and infrastructure topologies while

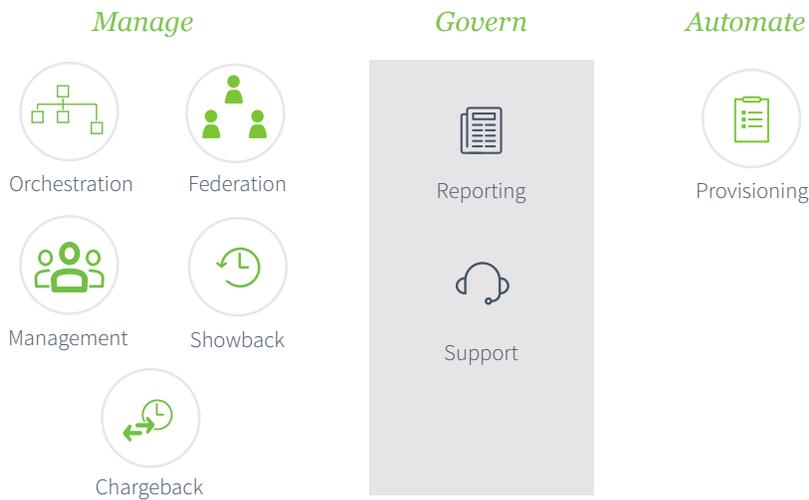
maintaining isolation and segregation across departments and groups within your organisation. With all of our Dimension Data cloud environments, you can create and deploy multiple network domains that are logically segregated. Each network domain includes firewall and load balancing capabilities and can be independently customised, based on specific needs.

Security Feature	Description	Benefit
VPN connectivity	Client-to-site VPN connectivity provides access to private IP addresses through a secure, encrypted tunnel.	This eliminates the need for direct access over public IP addresses and potential cybersecurity attacks.
Private IP addresses	Private IP addresses are routable with VLANs on the same network domain and across Dimension Data private cloud network connections.	Isolation and traffic control increases security. This feature allows each application to be isolated by separate firewall policies allowing you to control traffic.
Routable IPv6 addresses	IPv6 address space is routable between different data centres with traffic flowing across a secure site-to-site VPN tunnel with WAN acceleration.	Cloud servers in different Dimension Data data centres can communicate securely with one another.
Operating systems management for Cloud Services for SAP	Virtual images created using Dimension Data images are licensed with the vendor.	Security patches for these images are automatically deployed within the service.
Infrastructure network security	The Dimension Data cloud network is protected with edge-to-edge security, visibility, and carrier-class threat management and remediation.	Security monitoring and remediation are delivered around the clock.
Encryption at rest	Storage arrays are encrypted by default using AES encryption; keys are stored and managed separately from the disk.	This improves your security posture and ensures expedient remediation and maintenance in the event of a disk failure.
SIEM/RTM Service (Optional)	We can provide security event monitoring of the servers and environment.	Our Managed Security Services team performs event correlational and analysis to identify malicious security attacks.
Web Application Firewall-as-a-Service (Optional)	The service includes: firewall protection of web applications, distributed denial-of-service protection, web content optimisation, and web load balancing.	WAF protects web applications from internet based threats.
Anti-virus	Servers are scanned for viruses.	This helps ensure that no unwanted viruses take up residence on your servers.
Intrusion detection scanning	Host-based intrusion detection systems provide round-the-clock monitoring or our cloud environments.	This further secures the environment against malicious behaviour.
Vulnerability scanning	Checks for potential problem areas in the network and servers.	Together with IDS, this helps prevent problem areas from developing.

As a global managed services and cloud provider, we're able to provide you with a comprehensive approach to IT security. Dimension Data offers the people, processes, technology, and threat insight to support on-premise, cloud-based, and hybrid infrastructures.

### Dimension Data CloudControl™

All virtualised SAP and HANA configurations are managed by Dimension Data using our CloudControl™ portal. CloudControl™ supports the management, governance, and automation of each client's Dimension Data cloud environment. Dimension Data performs all cloud management activities for the Cloud Services for SAP environment via the CloudControl™ web user interface or an application programming interface (API).



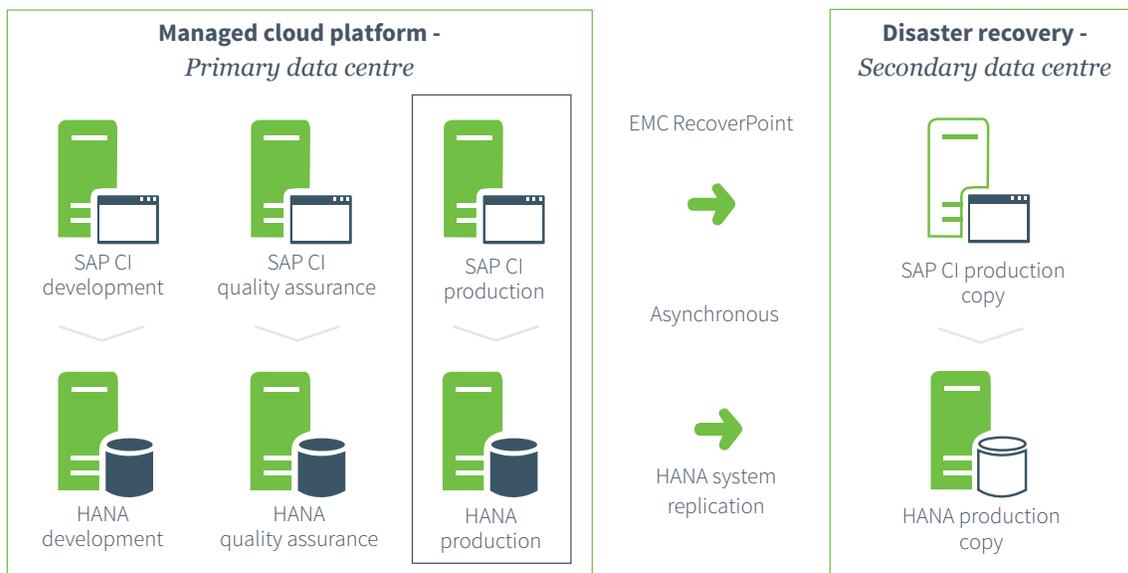
**Dimension Data CloudControl™ provides consistency across cloud delivery models.**

**Dimension Data CloudControl™**

### Disaster recovery

Disaster recovery is also an important part of an enterprise application deployment. With Cloud Services for SAP, you can add in-country disaster recovery to your key servers (production and/or non-production).

Using a mix of HANA and EMC replication tools, your site is copied to the second location and kept in synch to provide a minimum of a 30 minute recovery point objective (RPO) and 12 hour recovery time objective (RTO). The image below illustrates how the environments are duplicated and kept in synch.



### Dimension Data cloud network services

Our cloud network capabilities enable the deployment of network domains as well as layer 2 virtual local area networks (VLANs) across data centres in different geographies. With Dimension Data's cloud offerings, you can create and deploy multiple virtual data centres that are logically segregated with your own dedicated cloud network domain and layer 2 VLANs within that domain. Virtual data centres, each with its own network domain, can be used to segregate application sets, functional areas, or groups. You can build multi-tier network architectures to separate data tiers from front-end web tiers providing an additional layer of firewall rules to protect sensitive data.

#### With each virtual data centre and network domain, you can:

- choose a private IPv4 address space to be used for each VLAN
- deploy virtual servers onto your VLANs using operating system images, provided either by you or by Dimension Data
- assign tiered storage to virtual servers to meet application data performance levels
- allow VLANs with the same private IP address assignments to remain isolated from one another
- support both IPv4 and IPv6
- control the IPv4 and IPv6 traffic:
  - between different VLANs in the same network domain
  - between the public Internet and VLANs in the network domain
  - between any cloud network domain connect - connected IP space and the VLANs and public Internet connection of the network domain
- customise the firewall and load balancing
- determine public Internet connectivity and optional connectivity to non-public networks via Network Domain Connect

### Dimension Data cloud connectivity

Network Domain Connect provides the ability to interconnect any of the Dimension Data cloud environments - our public or private clouds - to your enterprise networks in a secure manner. Network Domain Connect options of Direct, Private, Interconnect, and Site-to-site (S2S) are each described in the table below.

Connectivity Options	Description
Direct	<ul style="list-style-type: none"> <li>• connect via a physical port (i.e. leased line, MPLS)</li> <li>• includes cross connect from one of our data centres to a third party WAN provider</li> <li>• 1 GB and 10 GB port options</li> </ul>
Private (available in select geographies)	<ul style="list-style-type: none"> <li>• connect using pre-existing connectivity at one of our data centres from managed MPLS vendors</li> <li>• 100 Mbps service</li> </ul>
S2S VPN	<ul style="list-style-type: none"> <li>• site-to-site virtual private network (VPN) connections via the Internet using Internet Protocol Security (IPSec) or IPSec Virtual Tunnel Interface (VTI) options</li> <li>• VTI routing via Border Gateway Protocol (BGP)</li> <li>• Advanced Encryption Standard (AES) 256 bit encryption</li> </ul>
Interconnect	<ul style="list-style-type: none"> <li>• direct, private connectivity between multiple client environments within our cloud data centre</li> </ul>

These cloud connectivity choices allow multiple disparate environments to communicate with one another outside both the public IP connectivity and the optimised VPN network that Dimension Data provides between different cloud data centre locations. These connectivity options allow you to extend your corporate networks seamlessly into the Dimension Data cloud environment.

**‘Network Domain Connect provides the ability to interconnect any of the Dimension Data cloud environments - our public or private clouds - to your enterprise networks in a secure manner.’**

### Cloud servers

With our SAP cloud services, you gain granular configuration control including the number of virtual CPUs, the amount of RAM and the amount of local storage allocated to the cloud server. Operating systems supported include: Red Hat Linux, SuSE Linux and Microsoft Windows.

### Tiered storage

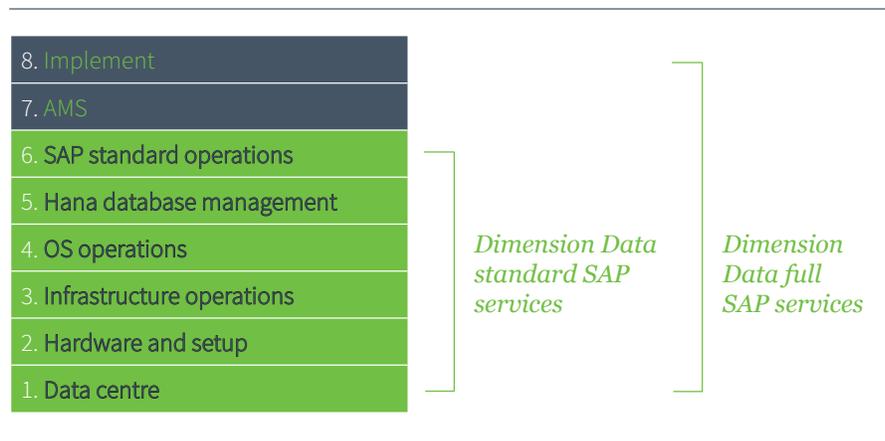
Cloud Services for SAP provide three storage tiers for SAP applications and non-production environments to improve performance and reduce the overall costs of data storage. Depending on the type of environment (development, test, quality assurance, etc.) or application requirements, you can choose the storage that best fits the particular application or workload. For HANA production, Cloud Services for SAP include a dedicated storage device for HANA production databases only. This ensures that you have the necessary IOPs and performance for your production environment and that this environment is meeting SAP’s stringent production HANA requirements.

Storage tier	Disk type	Usage examples
Tier 1 cloud storage (High performance)	600 GB 15k drives (RAID 5)	Cloud applications that use online active files, databases tables, Internet, and user files
Tier 2 cloud storage (Standard)	2TB 7200 RPM (RAID 5) Fast cache enabled	Cloud applications that use VM/VDI files, online archive videos, photos, backups and snapshots, and OS images
Tier 3 cloud storage (Economy)	3TB 7200 RPM (RAID 5) Nearline SAS, no fast cache	Cloud applications binary files, file storage
Tier 4 (HANA TDI production storage)	600 GB 10k drives (RAID 5)	Production HANA database files

### End-to-end management

We can provide full management support of your SAP and SAP HANA environments. We deliver SAP services from database management to full applications management support and also provide implementation services.

With this end-to-end service, you get a complete, fully managed solution. The cloud infrastructure for SAP, OS service support, database, BASIS, and SAP application management can all be provided under a single contract, from a single source.



Key feature	Benefit
<b>End-to-end management</b> of the application and infrastructure	We can support complex SAP environments from the infrastructure through the application layer.
<b>Security and compliance</b>	With intrusion detection system (IDS), vulnerability scanning, anti-virus, security incident and event management (SIEM), and Web Firewall-as-a-Service backed by a global Security Operations Centre, we can provide a safe and secure SAP environment.
SAP and Cisco certified	SAP cloud certifications, SAP HANA certifications, Cisco SAP certifications and compliance with SAP HEC provides assurances that enterprise SAP production applications can be hosted within our cloud environments with full support of SAP.
Security certifications	Globally recognised certifications support you in meeting your financial and audit requirements and ensure you that Dimension Data processes meet the standards demanded for enterprise production applications.
Cloud Private Network Connect	Flexible, private connectivity delivered between environments with lower bandwidth usage.
<b>Resiliency</b>	High availability and disaster avoidance options to provide for fault tolerance and recovery in the event of a disaster.
Anti-affinity	By allowing you to ensure VMs are separated from the host, we increase the resiliency of your cloud servers in the event of a catastrophic server failure.
Cloud backup	Integrated backup covering servers, files, and applications increases operational efficiency.
Disaster recovery in region or country	We offer regional disaster recovery solutions in multiple geographies to support data sovereignty requirements.
Multi NIC support	Multiple network connections can be maintained to a server supporting improved redundancy, disaster recovery, and potentially reducing operating costs.
<b>Fixed price or consumption-based pricing</b>	A mix of fixed-price and consumable purchase models together with virtualised configurations makes for a right-sized environment that maximises value.
Hybrid cloud environments	By offering private and public deployment models, we enable you to cost-effectively meet the needs of production, development, and quality assurance SAP environments.
6+ TB HANA database capacity and 1TB virtualised HANA capability	Supporting a HANA database of 6+ TB in size allows you to host most SAP production environments. Virtualising HANA up to the maximum permitted by SAP provides for high performance, cost effective systems.
Tiered storage	Cost can be optimised by assigning storage tiers by application type.
Multiple OS options	The service provides application specific OS flexibility provided at no incremental cost.
CloudControl	Dimension Data CloudControl™ offers a single point of automation and orchestration, reducing the effort and cost required in managing your SAP cloud.
Image import/export	VM image import and export reduces set-up time and simplifies the movement of workloads.
<b>Networking</b>	The ability to connect remotely via a variety of methods provides the same, secure connectivity you would get if the SAP servers were in your own facility.
Network domains	Network domains facilitate and simplify the creation and management of multiple virtual data centres each containing multiple VLANs and customised load balancing and firewalls.
IP6 support	Supporting both IP4 and IP6 provides a larger address space to be supported and enables more efficient routing, packet processing, and more simplified network configurations.
Client defined IP and IP portability	You can control your IP address space using your own business standards and rules. This simplifies network management.

*Our SAP credentials*

**SAP® Certified**  
in Hosting Services

**SAP® Certified**  
in Cloud Services

**SAP® Certified**  
in SAP HANA® Operations Services

- end-to-end SAP support with SAP-certified resources
- SAP-certified cloud data centres across five continents
- over 8,000 SAP professionals