



Service description & additional terms and conditions

Dynamic Services for Infrastructure with vCloud (DSI vCloud)

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1. Introduction

The Dynamic Services for Infrastructure with vCloud (DSI vCloud) is an Infrastructure-as-a-Service product offered by Telekom on the basis of the VMware vCloud technology. The services can be configured via a self-service portal or via programmable interfaces (API). DSI vCloud offers the following functions:

- a. Compute: provision of virtual data centers with varying computing power (PU/RAM).
- b. Storage: provision of volume storage for virtual servers.
- c. Network: virtual network services, such as virtual firewalls and load balancers, plus public and private IP addresses.
- d. Backup-as-a-Service: provision of a separate backup infrastructure to back up and restore virtual servers.
- e. Managed OS: operating systems run by Telekom on the basis of Windows Server, RHEL, and SuSE.

2. Services provided by Telekom

2.1 Place of performance

The DSI vCloud service will be provided from a twin-core data center of Telekom in Germany.

2.2 Provision of services

The services ordered by the customer will be set up in accordance with the agreed configuration. The vOrg and BaaS will each have an administration account set up for the customer and an initial password will be assigned. The access data for the vOrg and BaaS will be communicated to the customer in the ready-for-service e-mail, and the service will be provided from the date of this e-mail or, at the latest, when the customer begins to use the service.

On initial provision, the customer will also receive in an e-mail the access data and URL for the self-service portal (myWorkplace) unless the customer already has access to myWorkplace.

Changes to the configuration under the standard described below can be ordered via the Telekom Service Management.

2.3 Cloud options (hybrid, private)

There are two options available for the DSI vCloud service:

- a. DSI vCloud Hybrid: The self-service portals and APIs can be accessed via the Internet – it is not an obligatory requirement to order private network connections.
- b. DSI vCloud Private: The self-service portals and APIs can only be accessed via private network connections (customer intranet).

2.4 Virtual organizations (vOrg)

Every customer is given its own virtual organization (vOrg) in the vCloud environment, which enables client separation. The vOrg includes at least one virtual data center (vDC).

2.5 Virtual data centers (vDC)

The vDCs are resource pools that define the usable cloud capacity of performance units (PU), RAM, and storage for services within a specific vOrg. The PU is displayed in GHz in the portal. The customer can select on which side of the twin-core data center system a vDC is to be provided.

2.6 Reservation models for vDCs

Multiple vDCs with different reservation models can be provided within a vOrg. The following packages are currently available:

2.6.1 Summary of vDC sizes and reservation models

Package	RAM (res.)	PU (res.)	RAM burst* (max)	PU burst* (max)	Total GHz available	GHz per vCPU	vCPUs (max)	Total PU available	Total RAM available	VMs (max)**	VXLANs (max)
Committed VDC XS	38	10	12.7	10	5.4	0.27	20	20	50.67	30	10
Committed VDC S	96	24	32.0	24	13.0	0.27	48	48	128.0	50	20
Committed VDC M	192	46	64.0	46	24.9	0.27	92	92	256.0	100	30
Committed VDC L	384	92	128.0	92	49.7	0.27	184	184	512.0	200	60
Committed VDC XL	1,920	461	640.0	461	249	0.54	461	922	2,560.0	500	100
Committed VDC Individual	can be configured individually under the specified standard										
Dedicated starter package	1,380	600	n/a	n/a	min. 108.0	0.6	min. 180	400	920	300	75
Dedicated expansion package	460	200	n/a	n/a	min. 54.0	0.6	min. 90	200	460	150	25
Basic (usage-dependent)	n/a	n/a	n/a	n/a	n/a	0.6	n/a	n/a	n/a	n/a	50

* Indicates the maximum burst capacity in the Committed reservation model

*** Includes all VMs and templates created in the customer's own catalogs

The data storage is ordered separately from the computing powers.

As a paging file, the RAM assigned to a VM takes up the same storage space on the hard drive.

If a new virtual network and/or a new Edge Service Gateway are/is implemented, part of the assigned vDC capacity is consumed by this (e.g., 2 vCPU, 1 GB RAM, 320 MB storage).

2.6.2 Committed reservation model

Within the Committed reservation model (XS to XL standard packages), 75 percent of RAM resources and 50 percent of CPU resources are provided as reserved. 25 percent RAM and 50 percent CPU can be used cumulatively in burst mode and will be billed based on actual usage. Within the Committed reservation model (vDC Individual) the customer may once only define during the configuration the ratio of reserved resources and burst mode resources.

In the self-service portal, the burst area is mapped as a component of the vDC and will be used automatically when the workloads provisioned by the customer require more resources than are available in the reserved area. The customer will not receive any separate information on the use of the burst mode. The vCPU is limited in its computing power only by the existing resources in the vDC or by the physical hardware on which these are based (uncapped).

2.6.3 Dedicated reservation model

Within the Dedicated reservation model, 100 percent of the vDC resources are provided as reserved capacity. In this model, the PU and RAM provided to the customer are always located on dedicated servers provided exclusively to the customer.

2.6.4 Basic reservation model

Within the Basic reservation model all resources will be provided on a usage-dependent basis. In this model, the actual usage on the infrastructure is calculated and the chosen VM configuration (e.g., number of GB RAM) corresponds only to the usable maximum value for this VM. In contrast to the Committed model the computing power of a vCPU is limited to the fixed value of 0.6 GHz (capped).

2.7 Data storage (disk storage)

2.7.1 Online data storage

The customer can choose from three different online storage qualities:

- a. ENTRY storage
- b. NORMAL storage
- c. HIGH storage

The online data storage is situated in the same data center location as the compute resources used by the customer.

In case of the HIGH storage quality option, the data will also be synchronously mirrored to the other data center location. The secondary data storage cannot be accessed in self-service. Access to the secondary data storage will be switched by Telekom only in the DR case and for all customers at the same time.

All storage classes are connected via a highly redundant 10-Gbit multi-net and have a smart-flash-based cache service.

2.7.2 Backup Integrated Disk Storage (BIS)

All storage qualities are also additionally available as Backup Integrated Storage (BIS).

In addition to online data storage BIS includes a snapshot-based data backup to a secondary data storage in the respective other half of the twin-core data center system.

Telekom automatically generates a backup of the primary data storage in the secondary data storage on a daily basis. The data created by the backup on the secondary data storage does not reduce the available data storage in the vDC that has been ordered by the customer. The automated backup is usually carried out on the primary data storage at the data center location at midnight (12:00 a.m. +/- 15 minutes) local time. The snapshots are usually transferred to the backup storage within 12 hours. 35 snapshots (35 days) are stored as backup. The snapshot-based backups cannot be accessed in self-service. The customer has to order the recovery of its data. The time required to restore the data will depend on the size of the backup and the technical circumstances. Telekom aims to take into account the customer's requirements and reduce the restore time to a minimum.

2.8 Self-service portal

The self-service portal is a web application and only accessible via HTTPS. The self-service portal allows you to administer the virtual services via remote access. A manufacturer documentation is provided in the self-service portal.

The self-service portal supports the following languages: English, German, French, Chinese (simplified), Chinese (traditional), Japanese, Korean, Italian, and Spanish.

2.9 vCloud API

All functions that are available via the self-service portal and some other functions can be called up via a REST-based API. Documentation is provided in the self-service portal.

2.10 User and role management

Using his administration account, the customer can create additional users and authorizations based on pre-defined roles.

2.11 Virtual applications (vApps)

To make working with complex applications easier, multiple virtual machines (VMs) can be combined in groups. These are called vApps.

2.12 Console access to virtual machines

The customer can access the graphic user interface (GUI) of virtual machines directly from the self-service portal via console access. The customer has to install a plug-in depending on the operating system/browser locally installed. The plug-in is offered in the self-service portal. Local admin rights are required for the installation.

2.13 Virtual networks (VXLANs)

Using VXLAN, the customer can create networks that are logically separated according to its needs. An IP address can be assigned to the VMs started in a vApp network. In addition, these networks may be

- a. isolated in order to support repeating IPs, for example (isolated network), or
- b. connected directly with the higher-level organizational network (routed network), or
- c. connected via the Edge Service Gateway with defined access rights and NAT forwarding (NAT networks).

2.14 Virtual firewalls and load balancers

The customer will be provided with VMware-based firewall & load balancer functions (Edge Service Gateway). The Edge Service Gateway also allows you to apply routing, NAT, and port filtering settings. Any external network traffic (e.g., private network connections, secure Internet access, flexible Internet access) terminates on an Edge Service Gateway.

2.15 Disaster recovery capability

DSI vCloud allows you to implement DR plans because vDCs can be operated in different data centers of the twin-core data center system. To do so, the customer has to order two vDCs in different data centers (A/B), distribute the corresponding VMs for an application over both data centers, and configure them using the application-specific DR mechanisms.

The following specifics apply to data stored with the data storage quality HIGH:

- a. Access to the HIGH data storage will be switched from one half of the data center system to the other half if, and only if, Telekom has identified a case of DR.
- b. Telekom will then inform the customer of the occurrence of a case of DR.
- c. The customer must ensure that sufficient vDC resources are available in the half of the data center system that is not affected.
- d. Telekom aims to take into account the customer's requirements and keep the restore time to a minimum.

2.16 Catalogs and templates

Telekom will provide catalogs with pre-defined templates. A template is a read-only image and is used as the basis for creating VMs and vApps. The customer can also prepare its own, additional catalogs and upload its own templates or create new templates from the existing VMs/vApps.

Virtual machines that are created based on pre-defined templates having 'selfmanaged' in their name, have to be managed solely by the customer. The usage of pre-defined templates with 'managed' in their name leads to a Managed OS deployment.

2.17 Online snapshots of VMs/vApps

It is possible to use the VMware snapshot function to create an online copy of a VM or vApp. vApps can then be stored as a template in the customer's own catalog.

2.18 Backup-as-a-Service

Backup-as-a-Service (BaaS) allows the customer to create one-time or rule-based backups and restores via the BaaS self-service portal. Defined and non-changeable backup profiles are available for rule-based backup. These differ in terms of frequency and type of backup, and also in terms of the retention period for the data.

The backups are stored in a separate backend infrastructure in the same data center as the vDC (e.g., DC-A) and then mirrored to the other data center of the twin-core (e.g., DC-B) (redundant data storage). The required storage space is provided and billed for on the basis of usage.

2.19 Managed OS

DSIvCloud allows you to use operating systems that are managed by Telekom. This includes in particular the following services:

2.19.1 Automated installation:

The customer will be able to create managed OS VMs based on the templates available in the public catalog. Installation is largely automated.

2.19.2 Provision of operating system licenses:

It is a mandatory requirement to purchase operating system licenses from Telekom in order to use managed OS in Basic and Committed vDCs.

For the use of managed OS in Dedicated vDCs, the customer is free to decide, when ordering, whether to supply its own Windows Server licenses.

2.19.3 Backup of the operating system:

Managed OS are only provided on Backup Integrated Storage (BIS) and will be backed up on a regular basis as described above.

In the context of Managed OS, Backup-as-a-Service will only be available to some extent and may be configured by the customer only in coordination with Telekom.

Managed OS systems can be restored after consultation with Telekom Support without using BaaS.

2.19.4 Monitoring of operating systems:

Telekom will monitor the availability of the managed OS 24/7 with a central monitoring system.

2.19.5 Security/Vulnerability management / Patch management:

Telekom provides security updates on a regular basis. These updates can be accessed by the customer via the software distribution server. The customer will install these updates via self-service within three months and complete their activation by way of system restart.

In case the customer doesn't comply with the installation, Telekom reserves the right to actively install updates as part of an "emergency patch process" at the expense of the customer and to inform the customer of this measure.

2.19.6 Release management:

Telekom operates up-to-date versions of the operating systems Windows Server, RedHat Enterprise Linux, and SuSE Enterprise Linux, and makes these available in the public catalog. The images provided are updated on a regular basis.

Telekom will inform the customer of any operating system versions that are no longer supported and will remove these from the public catalog at the specified time.

The customer will replace or update within 3 (three) months any virtual machines installed on the basis of the operating system versions that are no longer supported.

If the customer fails to implement a necessary update, the VM concerned will be transferred to self-managed status. This status change will be communicated to the customer.

2.19.7 Root access:

All managed OS VMs are provided to the customer without administration rights. The customer may apply for temporary administrative access subject to a charge. Monitoring and all service levels will be suspended during the period in which the customer has administrative access; any faults that occur during this time will be deemed caused by the customer and any costs required for remedial work will have to be reimbursed by the customer.

After deactivation of the administration rights on the virtual machine Telekom will reactivate the monitoring and the service levels. Should faults arise after reactivation, the customer will have the burden of proof that these have not been caused by the changes it performed. Telekom reserves the right to restore the latest operable version during its remedial work. When temporary administration rights to a virtual machine are requested, these will be granted for a period of 14 days.

2.20 Performance adjustments in favor of the customer

Telekom reserves the right to make unilateral changes to expand the service and reduce charges in favor of the customer. The customer agrees to these adjustments. Telekom will notify the customer about any adjustments by sending the updated documents which are to replace the existing contract documents.

3. Optional services provided by Telekom

Telekom provides the following optional services, which need to be ordered separately, for an additional charge. If interested, the customer can contact Telekom:

3.1 Secure Internet access (inbound)

Services that are executed on virtual machines can be provided via secure Internet access (inbound Internet connections). A separate physical appliance (that is connected to the Internet) will be installed which offers a

standard firewall setup for all users. This system is placed upstream of the physical Telekom firewall and acts as a reverse proxy.

In addition, a new virtual Edge Service Gateway that processes the input of the reverse proxy is installed downstream of the Telekom firewall. It translates the external IP address of the customer workload into an internal private address (NAT) of the customer workload.

3.1.1 Supported protocols and ports

The secure Internet access supports only inbound data traffic (initiated from the Internet) based on the communication protocols HTTP and HTTPS using only the ports 80, 8080, 8081, 443, and 8443. Outbound data traffic (outbound data connections initiated by the VM) will be blocked at the firewall.

3.1.2 IP address pool

For each Internet access requested, an IP address is configured in the customer's address pool and made available for provisionings. Based on requirements, the customer can route several TCP ports from an external IP to various VMs and thus limit the number of external IPs and increase its flexibility. This can be done via the Edge Service Gateway that is part of the secure Internet access solution.

3.1.3 Bandwidth of the Internet access

Internet bandwidth of 1 Mbit/s is provided for each IP address ordered. However, Telekom does not limit this bandwidth to individual IP addresses but at the level of the individual vDCs. If 14 IP addresses are ordered for a single vDC, for example, the available bandwidth for this vDC is regulated to 14 Mbit/s.

3.2 Flexible Internet access (inbound and outbound)

With flexible Internet access, VMs can be activated for both inbound and outbound data traffic to the Internet. Unlike secure Internet access, flexible Internet access is routed directly to the customer's Edge Service Gateway without using an upstream reverse proxy solution.

The Edge Service Gateway on the perimeter of the vDC enables the customer to route IP traffic to various VMs and to implement various expanded network services. This comprises the independent management of the firewall approvals, the NAT configuration, the configuration of the load balancing for the external vDC network of multiple customer VMs, and additional functions.

The flexible Internet access can be booked as a volume-based or a bandwidth-based model.

3.2.1 Supported protocols and ports

The flexible Internet access supports the UDP, TCP, and ICMP protocols for inbound and outbound Internet connections. Outbound SMTP connections via ports 25, 465, and 587 are allowed by the central firewall only for the Telekom Secure Mailgateway and Business Mail Protect services, which are not part of the DSI vCloud service portfolio.

3.2.2 Security and network services

Telekom provides a virtual firewall (Edge Service Gateway) on which the Internet connection terminates. The configuration of the virtual firewall is carried out by the customer via self-service.

3.2.3 IP address pool

The number of IP addresses requested by the customer will be provided by Telekom at the customer's Edge Service Gateway.

3.2.4 Bandwidth of the Internet access

If the customer opts for the volume-based model, the available bandwidth per vDC will be limited to 500 Mbit/s. If the customer opts for the bandwidth-based model, Telekom is entitled to restrict the maximum available bandwidth to the value ordered by the customer.

3.2.5 Self-managed VPN

Within the Edge Service Gateway it is possible to configure Site-2-Site-VPNs in self-service using the flexible Internet access.

3.3 Private network connections (Managed Internet VPN/Managed MPLS/Ethernet Connect)

Depending on the selected data center, DSI vCloud supports the connection of the customer data center to the platform via a managed Internet VPN, MPLS or Ethernet Connect.

3.3.1 Managed firewalls

All private connections of customer networks must strictly be routed over a firewall to the DSIvCloud network infrastructure. Telekom offers firewall variants with variable throughputs and number of concurrent sessions here. The different options are offered in multiple performance grades (slices).

Perslice:

- Up to 30 MBit/s throughput
- Up to 2 MBit/s VPN throughput
- Up to 1,000 concurrent sessions

Per managed firewall:

- Max. 150 IP addresses
- Max. 200 FW rules
- Max. 20 VLANs
- Max. 20 VPNs (optional)
- Minimum purchase quantity: 1 slice
- Maximum purchase quantity: 250 slices

Telekom will operate the firewall systems on the hardware and software provided by Telekom (firewall systems and network components). Telekom will install the components of the firewall and carry out a function test. Two identical firewall systems (identical hardware and software) will be operated as a high availability solution.

3.3.2 Managed firewalls SMALL, MEDIUM, LARGE (Discontinued, not orderable anymore)

All private connections of customer networks must strictly be routed over a firewall to the DSIvCloud network infrastructure. Telekom offers three firewall variants here, which are small, medium, and large. To establish a VPN connection, Telekom offers the appropriate VPN function in addition to basic firewall operation.

Firewall Small: 10 Mbit/s reserved, up to 150 Mbit/s burst

Firewall Medium: 20 Mbit/s reserved, up to 300 Mbit/s burst, up to 3 VPNs included

Firewall Large: 200 Mbit/s reserved, up to 1,500 Mbit/s burst, up to 20 VPNs included

Telekom will operate the firewall systems on the hardware and software provided by Telekom (firewall systems and network components). Telekom will install the components of the firewall and carry out a function test. Two identical firewall systems (identical hardware and software) will be operated as a high availability solution.

3.3.3 Private network connections

Telekom provides an endpoint in the respective data center for realizing a private network connection via MPLS, Internet VPN as well as Ethernet Connect. The customer must provide a connection realized by Telekom to the data center. The prerequisite is the commissioning of a managed firewall and, for Ethernet Connect, the commissioning of a WAN Service Area Connect (WSA Connect). WSA Connect enables the network connection between the Ethernet Connect endpoint in the data center and the DSI vCloud Managed Firewall. The WSA Connect is connected to the Ethernet Connect endpoint in the respective data center and is no longer available in case of a complete failure of this availability zone.

3.4 Operating system licenses for self-managed VMs

The customer may use licenses for the operating systems Microsoft Windows Server, Redhat Enterprise Linux, and SuSE Enterprise Linux within its self-managed VMs from Telekom. The customer is strictly required to order the use of the Telekom licenses for each vDC. Hybrid operation within a vDC of the customer's own licenses and licenses provided by Telekom for an operating system type is not possible.

3.5 Consulting

Telekom will support the customer in the configuration and operation of the workloads within DSI vCloud and in the development of migration strategies to the DSI vCloud.

4. Licensing terms for operation systems

By using the subsequently specified software, the customer accepts the license conditions of the respective vendor. Through this a direct agreement between the customer and the respective vendor results.

a) Microsoft Windows Server

The customer shall be granted the time-limited, non-exclusive global right to use the software for its own purposes. Time-limited, non-exclusive, worldwide sublicensing to third parties is only permissible directly with end customers. If the customer provides Software-as-a-Service services (SaaS services) and thus considerably extends the scope of functions, a reseller may also be interposed. In this case, the reseller absolutely must deal with end customers. The right of sublicensing shall expire with the ending of this contract or the termination of the relevant services from this contract.

In the event of sublicensing, the customer is obligated to pass on these license conditions to its end customers. The customer shall also grant Microsoft a right to audit in order to check that sublicensing conforms to the contract. On request, the customer shall explicitly name possible resellers to Telekom and Microsoft.

To the extent permitted by applicable law, all warranties by Microsoft and any liability by Microsoft or its suppliers for any damages, whether direct, indirect, or consequential, arising from this software are declined.

The customer is expressly prohibited from:

- Removing, changing, and deleting copyrights, logos, or other trademarks that appear in or on the products.

- Reverse engineering, decompiling, or breaking down the products unless this is expressly permitted in accordance with applicable law.
- Directly contacting Microsoft for support reasons.
- Downloading, copying and using the software in local or different environments than DSI vCloud.
- Using the software in so-called high risk environments. Examples of high risk use include, but are not limited to: aircraft or other modes of human mass transportation, nuclear or chemical facilities or life support systems.

b) Redhat Enterprise Linux

http://www.redhat.com/licenses/cloud_cssa/Cloud_Software_Subscription_Agreement.pdf

c) SuSE Enterprise Linux

<https://www.suse.com/licensing/eula/>

5. The customer's duties to cooperate

The customer pledges oneself to perform all obligations to cooperate, which are necessary for a proper service provisioning, free of charge, in time and to the full extent. Obligations to cooperate are in particular stated below.

5.1 The customer's general duties to cooperate

- a. The customer shall name a central and qualified contact for customer support and ensure the contact's substitution. The customer shall ensure 24/7 availability of the contact. The nomination shall be kept up to date by the customer.
- b. The customer must protect the vDCs, the operating systems, and applications within its VMs against attacks by third parties and misuse, and keep them free from malware. The customer must also protect the virtual machines in the vDC against misuse and external attacks through the Edge Service Gateway firewall configuration for which it is responsible. The customer declares that it agrees to exchange information by e-mail and that it will always provide a current e-mail address. The customer is aware that essential information for the service provision, such as access data, information on modifications to the services, and the legal conditions is only sent by e-mail.
- c. The customer shall be responsible for checking whether the data transferred by it in connection with the use of the service is personal data and whether processing this personal data is permissible. To the extent that the customer wishes personal data to be processed, the customer shall sign an agreement on the processing of personal data based on the Telekom sample agreement, which will be provided by Telekom.
- d. The customer assures that it will not store any content on the contractual storage space and make available online, if the provision, publication, or use of such content violates applicable laws or third-party rights – this applies in particular to defamatory, hatred-inciting, or extreme right-wing content.
- e. The customer shall be responsible for checking, and ensuring, compliance, with any and all legal provisions, laws, regulations, and industry-specific provisions that are relevant and applicable in connection with the use of the service. This shall particularly also include compliance with confidentiality obligations, for example those resulting from a professional

activity. The customer shall confirm that data of relevance to confidentiality shall only be stored where there is an effective approval.

- f. Customer will inform his users about the regulations of this 'service specifications and additional terms and conditions', especially about the licensing terms for operating systems and the duties to cooperate, and will ensure adherence.

5.2 The customer's duties to cooperate in the initial provision

The customer shall provide Telekom with all information required to set up the optionally ordered private network connection and to configure vCloud:

- a. IPvPN/MPLS/EthernetConnect: The provision of an IP address area and a subnet mask from the customer network that are to be used to connect the DSI vCloud with the customer's IT landscape.
- b. Managed firewall: The definition of the firewall-related configuration parameters (agreed with Telekom) for the private network connection.
- c. Managed VPN: The provision of the VPN-related configuration parameters (agreed with Telekom) for managed VPNs.
- d. vCloud Private: Configuration of the routing and DNS resolution in the customer network via the private network connections to the IP addresses provided by Telekom.

5.3 The customer's duties to cooperate during the use of the service

- a. The customer shall be responsible for its own capacity management and shall expand or reduce its resource capacity at the level of the vDCs (Committed and Dedicated vDCs) through change requests via the Telekom sales channel, taking into account the relevant minimum lease periods.
- b. The customer must protect the vDCs, the operating systems, and applications within its VMs against attacks by third parties and misuse, and keep them free from malware. The customer will immediately install security relevant operating system patches via self-service.
- c. The customer shall change the passwords generated by Telekom and replace them with its own secure passwords. Passwords must not be passed on to third parties.
- d. The customer shall independently manage the user and administrator rights within its virtual organization (vOrg).
- e. The customer shall not delete or change any required system users, in particular the users created by Telekom (e.g., system users for BaaS).
- f. The customer must install the VMware tools or alternatively the Open-VM-Tools for the guest operating system support within its VMs. Installation is necessary to ensure service quality of VMs.
- g. Where necessary, the customer shall be available for coordination with Telekom in case of security and emergency changes.
- h. If it uses managed OS, the customer must ensure, when integrating Windows computers in its own active directory, that the "block inheritance," including at GPO level ("block GPO inheritance"), of the organizational unit (OU) is blocked for all managed OS VMs. The customer must also ensure that the local administrator ID is not overwritten or impaired by OU rules. The system management accounts must also in no way be overwritten by customer rules.
- i. Within managed OS VMs, the customer will install applications, except of Sharepoint, on separate data partitions unequal to "C:\" only.
- j. Customer will not grant access to the self-service portals or the operating system of virtual machines, if licensed by Telekom to third parties. Granting access to applications operated by the customer stays unaffected.

- k. Customer will use Telekom-Images (e.g. Managed, Self-Managed-Images) solely within DSI vCloud. Downloading and transferring to other environments is prohibited.

5.4 The customer's duties to cooperate upon termination of the agreement

The customer must independently back up all application data by way of a download before the agreement ends. Telekom shall deactivate the customer's access and delete the customer's application data in the data center with effect from the day when the agreement ends.

6. DSI vCloud service levels

6.1 Service transfer points

The responsibility of Telekom for the services specified ends at the service transfer point. The service transfer point is the entry point of the data center to the Internet, or the entry point to the private network connection of the customer in the data center.

6.2 Maintenance work

Telekom carries out maintenance work regularly. The platform is largely redundant, so that maintenance work regularly does not lead to outages. If maintenance work will lead to an outage, Telekom will inform the customer about this in advance. At this juncture Telekom aims to reduce impairments to a minimum. Maintenance work is not considered as downtime and is therefore not taken into account when calculating availability.

6.3 Calculation of Availability

Operating hours: The operating hours refer to the period in which the services are available.

Attended operation time: Attended operation time is the period during which technical operations support is provided and incidents that have an impact on system availability are processed.

Maintenance window: The customer and Telekom agree that the hardware and software infrastructure being used for the IT operation must be maintained in efficient and maintainable condition. The platform is predominantly configured redundantly so that maintenance work can be carried out during ongoing operations without service interruption. Should maintenance work result in downtime, Telekom will inform the customer thereof. Maintenance work will not be taken into account in the availability calculation.

Availability: The availability will be shown as a percentage (availability percentage) and is calculated as following:

$$\frac{(\text{Total service minutes}) - (\text{Total downtime minutes})}{\text{Total service minutes}}$$

The individual items have the following meanings:

Total service minutes = total number of minutes per year (calculation: 60 minutes x 24 hours x 365 days)

Total downtime minutes = number of minutes in the past 365 days during which a given DSI vCloud component was unavailable minus the excused events. If the contractual relationship (purchase of the service) has been in place for less than 365 days, only the downtime minutes which occurred since the contractual relationship began will be calculated.

Excused events:

- a. Downtime that was caused by maintenance work or changes.
- b. If the service of the customer represents a risk to or an impairment of services of third parties or Telekom's infrastructure (e.g., because of a DDoS attack) Telekom shall be entitled to deactivate the service concerned, without prior notification of the customer, until the risk or impairment has been remedied. Downtime caused by this action will not be taken into account in the availability calculation. Telekom will inform the customer.
- c. Incidents, downtimes, and problems that are attributable to the customer, its employees, or representatives.
- d. Failure of a complete availability zone (e.g., Data Center A). In this event, the SLA shall be suspended for the services within this availability zone.
- e. Additionally in the case of managed OS: non-availability of the platform and downtime during which the customer has local administration rights to the operating system, and downtime resulting from an emergency patch process.

The existence of one excused event is sufficient.

6.4 Service levels

6.4.1 Platform (virtual data center)

The platform comprises the following components: portal, API, vDC (PU, RAM, storage)

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability	99.98% per year (in storage classes NORMAL and HIGH) 98.98% per year (in storage class ENTRY)

6.4.2 Backup-as-a-Service (BaaS)

Components included: portal and backup infrastructure

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability	99.98% per year

6.4.3 Managed OS

Components included: fully provisioned operating system provided that the underlying platform is available.

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7

Availability	99.99% per year
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6.4.4 Flexible Internet access

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability at the WAN transfer point	99.95% per year

6.4.5 Secure Internet access

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability at the WAN transfer point	99.86% per year

6.4.6 Private network connections (Internet/MPLS)

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability at the WAN transfer point	99.98% per year

6.4.7 Firewall services for private network connections

Service parameter	Value
Operating hours	Monday – Sunday, 24/7
Attended operation time	Monday – Sunday, 24/7
Availability of the firewall	99.90% per year

6.4.8 WAN Service area Connect for Ethernet Connect (WSA Connect)

Service parameter	Value
Operating hours	Monday – Sunday, 24/7

Attended operation time	Monday – Sunday, 24/7
Availability of the WSA Connect	99.98% per year

6.5 Support in case of an incident

The support team will be available for all incidents 24/7 in German and English and can be contacted by phone on + 49 391 5976 2433 or by e-mail to cloud-products@telekom.de.

Telekom opens a ticket and classifies the incident described by the customer as critical or uncritical.

Critical events are incidents that have an impact on the agreed service level of the platform. Non-critical events are incidents that have no impact on the agreed service level of the platform.

Events are processed according to their criticality:

- a. Critical events: processed from Monday through Sunday, 24 hours a day
- b. Non-critical events: processed from Monday through Friday, 8:00 a.m. to 4:00 p.m. (CET, CEST)

7. DSI vCloud price list, minimum order quantities, minimum lease periods, and billing

7.1 Method of payment calculation

- a. For usage-based price elements (such as PU usage, RAM usage, VPN usage, license usage) the actual usage is measured in defined billing units at 5-minute intervals and billed to the customer as an averaged usage quantity per calendar month for each price element and vDC.
- b. In the case of the flexible Internet access volume the inbound and outbound Internet traffic per calendar month and vDC will be measured and billed to the customer.
- c. In the case of Backup-as-a-Service the actual quantity of stored data volumes will be measured on a daily basis and billed as an averaged usage quantity per calendar month.
- d. The usage of the managed OS will be measured per operating system instance (from the time of initial provision of a virtual machine to the time of deletion of a virtual machine) and billed as the monthly sum of all managed OS systems in a vDC. In the month of initial provision the monthly usage charge will be billed on a pro-rata basis for an individual virtual machine. In the following months the full monthly charge will be billed for an individual virtual machine, even if it is deleted during the month.
- e. Root access to a managed OS VM will be billed per request. Billing will take place as soon as the administrative rights have been assigned. Once the administrative access has been handed back and is then requested again, a further root access request will be charged.
- f. Billing will take place on a monthly basis in arrears (i.e., month of billing = month of service provision + 1) for one-time charges, monthly charges, and usage-based charges. Telekom has the right to change its billing for one-time charges and monthly charges to billing in advance (billing month = month of service provision). Telekom will inform the customer in advance of a planned change to billing.
- g. The price scales relate to the quantities within a vDC and are applied separately in relation to each price element. The highest scale reached within a vDC is always used for pricing.
- h. All price information exclusive of applicable VAT.

7.2 Minimum lease period

Services with a minimum lease period can be cancelled with a minimum notice period of 4 weeks to the end of the respective minimum lease period and when the relevant minimum lease period has been reached a minimum notice period of 4 weeks to the end of the month will apply. Reductions of services with a minimum lease period are possible with a minimum notice period of 4 weeks to the end of the respective minimum lease period and when the relevant minimum lease period has been reached a minimum notice period of 4 weeks to the end of the month will apply. The minimum lease period starts again with each reduction or increase.

7.3 Price list

COMMITTED vDC price elements	Scale	Charge	Billing unit, minimum order quantity, expansion steps, minimum lease period
VDC XS		€ 520.20	Monthly charge per vDC Minimum order quantity: 1 Minimum lease period: 3 months.
VDC S		€ 1,296.00	
VDC M		€ 2,486.40	

VDC L		€ 4,945.20	
VDC XL		€ 23,595.70	
VDC Individual Performance Unit (reserved)	0-49 PU	€ 14.40	Monthly charge per unit Minimum order quantity: 10, Expansion steps: 1 Minimum lease period: 3 months.
	50-249 PU	€ 14.10	
	>250 PU	€ 13.70	
Performance unit usage (burst)	0-49 PU	€18.90	Monthly charge per unit (usage-based billing)
	50-249 PU	€ 18.70	
	>250 PU	€ 18.40	
VDC Individual RAM (reserved)	0-99 GB	€ 9.90	Monthly charge per GB Minimum order quantity: 38, Expansion steps: 1 Minimum lease period: 3 months.
	100-499 GB	€ 9.50	
	>500 GB	€ 9.00	
RAM usage (burst)	0-99 GB	€ 12.50	Monthly charge per GB (usage-based billing)
	100-499 GB	€12.00	
	>500 GB	€ 11.50	
Disk storage ENTRY	0-5,999 GB	€ 0.056	Monthly charge per GB Minimum order quantity: 200 per storage class Expansion steps: 100 Minimum lease period: 3 months.
	6,000-49,999 GB	€ 0.055	
	>50,000 GB	€ 0.054	
Disk storage NORMAL	0-5,999 GB	€ 0.099	
	6,000-49,999 GB	€ 0.097	
	>50,000 GB	€ 0.095	
Disk storage HIGH	0-5,999 GB	€ 0.24	
	6,000-49,999 GB	€ 0.23	
	>50,000 GB	€ 0.22	
Backup Integrated Disk Storage ENTRY	0-5,999 GB	€ 0.142	
	6,000-49,999 GB	€ 0.141	
	>50,000 GB	€ 0.140	
Backup Integrated Disk Storage NORMAL	0-5,999 GB	€ 0.225	
	6,000-49,999 GB	€ 0.220	
	>50,000 GB	€ 0.215	
Backup Integrated Disk Storage HIGH	0-5,999 GB	€ 0.390	
	6,000-49,999 GB	€ 0.380	
	>50,000 GB	€ 0.360	
Secure Internet access		€ 89.00	Monthly charge per IP and 1 Mbit/s bandwidth Minimum order quantity: 1, Expansion steps: 1

			Minimum lease period: 3 months.
Flexible Internet access IP address		€ 9.90	Monthly charge per IP Minimum order quantity: 1, Expansion steps: 1 Minimum lease period: 3 months.
Flexible Internet access data volume	0-9,999 GB	€ 0.04	Charge per transmitted GB in a vDC (usage-based billing) For each vDC either the "data volume" <u>or</u> the "bandwidth" option can be ordered.
	10,000-249,999 GB	€ 0.03	
	>250,000 GB	€ 0.02	
Flexible Internet access bandwidth (max)	1-10 Mbit/s	€ 38.50	Monthly charge per Mbit/s in a vDC minimum order quantity: 1, Expansion steps: 1 (up to 49 Mbit/s), 10 (>50 Mbit/s) Minimum lease period: 3 months. For each vDC either the "data volume" <u>or</u> the "bandwidth" option can be ordered.
	11-49 Mbit/s	€ 23.00	
	50-190 Mbit/s	€ 11.00	
	>200 Mbit/s	€ 8.50	
Flexible Internet access VPN		€ 0.05	Hourly charge per VPN (usage-based billing)
Backup as a Service (BaaS)		€ 0.07	Monthly charge per GB (usage-based billing)
Managed OS		€ 69.00	Monthly charge per operating system (usage-based billing) May be terminated with effect from the end of the month
Root access		€ 79.90	One-time charge per root access (usage-based billing per request)
SLES licenses		€ 69.00	Monthly charge per VM (usage-based billing)
Redhat licenses		€ 38.00	Monthly charge per VM (usage-based billing)
Windows licenses		€ 1.85	Monthly charge per GB RAM (reserved) in the vDC Minimum order quantity: Quantity of RAM reserved in the vDC Minimum lease period: 3 months..
Windows license usage		€ 1.95	Monthly charge per GB RAM (burst) in the vDC (usage-based billing):
Creation of a vOrg (OnBoarding)		€ 178.20	One-time charge
DEDICATED vDC price elements	Scale	Charge	Billing unit, minimum order quantity, expansion steps, minimum lease period

Starter package		€ 20,640.00	Monthly charge Minimum order quantity: 1, Minimum lease period: 12 months.
Expansion package		€ 6,880.00	Monthly charge Minimum order quantity: 1, Maximum order quantity: 13 Minimum lease period: 12 months.
Disk storage ENTRY	0-5,999 GB	€ 0.056	Monthly charge per GB Minimum order quantity: 200 per storage class Expansion steps: 100 Minimum lease period: 3 months.
	6,000-49,999 GB	€ 0.055	
	>50,000 GB	€ 0.054	
Disk storage NORMAL	0-5,999 GB	€ 0.099	
	6,000-49,999 GB	€ 0.097	
	>50,000 GB	€ 0.095	
Disk storage HIGH	0-5,999 GB	€ 0.24	
	6,000-49,999 GB	€ 0.23	
	>50,000 GB	€ 0.22	
Backup Integrated Disk Storage ENTRY	0-5,999 GB	€ 0.142	
	6,000-49,999 GB	€ 0.141	
	>50,000 GB	€ 0.140	
Backup Integrated Disk Storage NORMAL	0-5,999 GB	€ 0.225	
	6,000-49,999 GB	€ 0.220	
	>50,000 GB	€ 0.215	
Backup Integrated Disk Storage HIGH	0-5,999 GB	€ 0.390	
	6,000-49,999 GB	€ 0.380	
	>50,000 GB	€ 0.360	
Secure Internet access		€ 89.00	Monthly charge per IP and 1 Mbit/s bandwidth Minimum order quantity: 1, Expansion steps: 1 Minimum lease period: 3 months.
Flexible Internet access IP address		€ 9.90	Monthly charge per IP Minimum order quantity: 1, Expansion steps: 1 Minimum lease period: 3 months.
Flexible Internet access data volume	0-9,999 GB	€ 0.04	Charge per transmitted GB in a vDC (usage-based billing). For each vDC either the "data volume" <u>or</u> the "bandwidth" option can be ordered.
	10,000-249,999 GB	€ 0.03	
	>250,000 GB	€ 0.02	
Flexible Internet access bandwidth (max)	1-10 Mbit/s	€ 38.50	Monthly charge per Mbit/s in a vDC Minimum order quantity: 1, Expansion steps:
	11-49 Mbit/s	€ 23.00	

	50-190 Mbit/s	€ 11.00	1 (up to 49 Mbit/s), 10 (>50 Mbit/s) Minimum lease period: 3 months. For each vDC either the "data volume" or the "bandwidth" option can be ordered.
	>200 Mbit/s	€ 8.50	
Flexible Internet access VPN		€ 0.05	Hourly charge per VPN (usage-based billing)
Backup as a Service (BaaS)		€ 0.055	Monthly charge per GB (usage-based billing)
Managed OS		€ 69.00	Monthly charge per operating system (usage-based billing) May be terminated with effect from the end of the month
Root access		€ 79.90	One-time charge per root access (usage-based billing per request)
SLES licenses		€ 69.00	Monthly charge per VM (usage-based billing)
Redhat licenses		€ 38.00	Monthly charge per VM (usage-based billing)
Windows licenses		€ 1.85	Monthly charge per GB RAM in the vDC Minimum order quantity: Quantity of RAM in the vDC Minimum lease period: 3 months.
Creation of a vOrg (OnBoarding)		€ 178.20	One-time charge per vOrg
Set-up of a Dedicated vDC (starter package)		€ 534.60	One-time charge per starter package
Expansion of a Dedicated vDC (expansion package)		€ 178.20	One-time charge per expansion package
Price elements BASIC vDC	Scale	Charge	Billing unit, minimum order quantity, expansion steps, minimum lease period
Performance unit usage	0-49 PU	€ 18.90	Monthly charge per unit (usage-based billing)
	50-249 PU	€ 18.70	
	>250 PU	€ 18.40	
RAM usage	0-99 GB	€ 12.50	Monthly charge per GB (usage-based billing)
	100-499 GB	€ 12.00	
	>500 GB	€ 11.50	
Disk storage ENTRY usage	0-5,999 GB	€ 0.061	Monthly charge per GB (usage-based billing)
	6,000-49,999 GB	€ 0.060	
	>50,000 GB	€ 0.059	

Disk storage NORMAL usage	0-5,999 GB	€ 0.118	
	6,000-49,999 GB	€ 0.116	
	>50,000 GB	€ 0.114	
Disk storage HIGH usage	0-5,999 GB	€ 0.275	
	6,000-49,999 GB	€ 0.265	
	>50,000 GB	€ 0.255	
Backup integrated disk storage ENTRY usage	0-5,999 GB	€ 0.160	
	6,000-49,999 GB	€ 0.155	
	>50,000 GB	€ 0.150	
Backup integrated disk storage NORMAL usage	0-5,999 GB	€ 0.260	
	6,000-49,999 GB	€ 0.255	
	>50,000 GB	€ 0.250	
Backup integrated disk storage HIGH usage	0-5,999 GB	€ 0.440	
	6,000-49,999 GB	€ 0.425	
	>50,000 GB	€ 0.410	
Secure Internet access		€ 89.00	Monthly charge per IP and 1 Mbit/s bandwidth Minimum order quantity: 1, Expansion steps: 1 Minimum lease period: 3 months.
Flexible Internet access IP address		€ 9.90	Monthly charge per IP Minimum order quantity: 1, Expansion steps: 1 Minimum lease period: 3 months.
Flexible Internet access data volume	0-9,999 GB	€ 0.04	Charge per transmitted GB in a vDC (usage-based billing). For each vDC either the "data volume" <u>or</u> the "bandwidth" option can be ordered.
	10,000-249,999 GB	€ 0.03	
	>250,000 GB	€ 0.02	
Flexible Internet access bandwidth (max)	1-10 Mbit/s	€ 38.50	Monthly charge per Mbit/s in a vDC minimum order quantity: 1, Expansion steps: 1 (up to 49 Mbit/s), 10 (>50 Mbit/s) Minimum lease period: 3 months. For each vDC either the "data volume" <u>or</u> the "bandwidth" option can be ordered.
	11-49 Mbit/s	€ 23.00	
	50-190 Mbit/s	€ 11.00	
	>200 Mbit/s	€ 8.50	
Flexible Internet access VPN		€ 0.05	Hourly charge per VPN (usage-based billing)
Backup as a Service (BaaS)		€ 0.055	Monthly charge per GB (usage-based billing)
Managed OS		€ 69.00	Monthly charge per operating system (usage-based billing) May be terminated with effect

			from the end of the month
Root access		€ 79.90	One-time charge per root access (usage-based billing per request)
SLES licenses		€ 69.00	Monthly charge per VM (usage-based billing)
Redhat licenses		€ 38.00	Monthly charge per VM (usage-based billing)
Windows license usage		€ 1.95	Monthly charge per GB RAM (usage-based billing)
Creation of a vOrg (OnBoarding)		€ 178.20	One-time charge
CONSULTING price elements	Scale	Charge	Billing unit, minimum order quantity, expansion steps, minimum lease period
Consulting (service)		€ 121.50	One-time charge (per hour)
NETWORK CONNECTION price elements	Scale	Charge	Billing unit, minimum order quantity, expansion steps, minimum lease period
Virtual firewall		€ 279.00	Monthly charge per firewall Minimum lease period: 3 months
Virtual firewall performance (slice)		€ 21.50	Monthly charge per slice Minimum lease period: 3 months
Creation of the firewall		€ 149.00	One-time charge
Additional VPN		€ 27.50	Monthly charge per VPN Minimum lease period: 3 months.
WAN Service Area (WSA) Connect		€ 359.00	Monthly charge per Connect Options: 100Mbit/s, 1 Gbit/s Minimum lease period: 3 months.
Internet bandwidth (max) (IPvPN)	1-10 Mbit/s	€ 38.50	Monthly charge per Mbit/s Minimum order quantity: 1, Expansion steps: 1 (up to 49 Mbit/s), 10 (>50 Mbit/s) Minimum lease period: 3 months.
	11-49 Mbit/s	€ 23.00	
	50-190 Mbit/s	€ 11.00	
	>200 Mbit/s	€ 8.50	
Service point of the network backbone in the data center (MPLS)	1-2 Mbit/s	€ 36.50	Monthly charge per Mbit/s Minimum order quantity: 1 Expansion steps: 1 Minimum lease period: 3 months
	3-9 Mbit/s	€ 30.00	
	10-35 Mbit/s	€ 22.50	
	36-150 Mbit/s	€ 11.00	

8. Consent in passing on customer names and address information

For DSIvCloud, the customer agrees to the forwarding of its data to the licensor VMware or to an intermediate service provider (license aggregator). For the purpose of license billing, Telekom will provide the service provider at its request with a summary containing information on the cumulated usage period of the VMware products used in the relationship between the licensor and Telekom. The details on the cumulated usage period are anonymized and do not make it possible to draw any conclusions about the respective customer.

Telekom will also provide the licensor (or the intermediate aggregator) at its request with information on so-called power users for the purposes of billing. A customer is deemed to be a power user if 700 billing points are achieved in a billing cycle (month) – this corresponds to an average monthly use of 100 GB vRAM, for example. Here, Telekom will transfer to VMware or its service provider involved (aggregator) information on the customer name, zip code, country, region, and the billing points achieved per VMware product used. This information is used to calculate the licensor's commission.

9. DSI vCloud glossary

Term	Description
AD	Active Directory
API	Application Programming Interface – typically used for automatic control of the vCloud and/or integration into higher-level orchestration
Appliances	VM appliances are templates for specialized virtual machines that make it possible to re-use images and typically contain professional software, e.g., for network functions such as FW.
BaaS	Backup as a Service
BYOL	Bring Your Own License
CPU/vCPU	(virtual) Central Processing Unit
DHCP	Dynamic Host Configuration Protocol (automated issue of IPs in a network)
DR	Disaster recovery (protection against the failure of a whole data center, e.g., in the event of a catastrophe)
DSI	Dynamic Services for Infrastructure (platform family for IaaS of Telekom)
FW	Firewall
GB	Gigabyte
IaaS	Infrastructure as a Service
IP	Internet Protocol
LB	Load balancer (hardware), Load balancing
CEST	Central European Summer Time
MPLS	Multiprotocol Label Switching (network connection)
NAT	Network Address Translation (in relation to firewalls)
Near/Best-shore	Use of operational units from abroad – typically within the EU and part of the Telekom International Group
OS	Operating system
OVF/OVA	Open virtualization (machine) format – open standard for the (image) format of the VM data files to allow for an exchange between heterogeneous hypervisors.
PU	Performance unit, 10,000 tpmC
RAM/vRAM	(virtual) Random Access Memory Main memory
SDM	Service Delivery Manager (customer adviser)
SLA	Service Level Agreement
TB	Terabyte
Templates	Models for virtual machines and vApps that allow the reuse of images for the provisioning of VMs/vApps and thus contribute to standardization and simplification.
tpmC	Assessment of the CPU speed using TPC-C-Benchmark – http://www.tpc.org
Twin Core	Redundant data center at a minimum distance of 10 km for DR scenarios
vApp	Virtual container in which one or several virtual machine(s) is/are grouped.
vApp network	A network that is specially in place for a particular virtual application
vDC	Virtual Data Center
VLAN	Virtual Local Area Network
VM	Virtual Machine
VMDK	Virtual Machine Disk (VMware vSphere hypervisor-specific)
vOrg	Virtual organization, client-enabled unit in a vCloud environment
VPN	Virtual Private Network (typically via IPsec and Site2Site scenario) – enables secure communication via insecure connection paths such as the Internet
vSYS/vDOM	A virtual firewall system that is hosted on a specific physical firewall appliance