MANAGED HOSTING

G-CLOUD 15 – SERVICE DEFINITION

Together we can

vodafone business

Contents

Introduction

1. Introduction

Vodafone Managed Hosting is a set of managed IT infrastructure services that enable our customers to focus on their core business activities, contracting their IT infrastructure to an experienced and trusted partner.

Managed Hosting includes the delivery, support and management of established IT and virtualisation technologies.

This Service definition outlines the Managed Hosting and Virtualisation services offered by Vodafone.
The document is organised in the following way:

- **Service Lifecycle** describes our delivery programme, in-life approaches and service overview
- **Service Components** describes each element used to build a solution, and what those elements include
- **Service Management** gives an overview of how we deliver managed IT to you as a service, utilising an ITIL-aligned framework
- **Charges, Billing and Contract Terms** outlines the commercial framework for our services
- **Standard Supported Technologies** gives a list of our standard vendors and technologies

At Vodafone, we have a number of accreditations recognised by industry bodies and suppliers. These include:

- ISO 9001 (Quality Management Systems)
- ISO 27001 (Information Security Management Systems)
- BS 25999 (Business Continuity Management Standard)
- PCI-DSS (Payment Card Industry Data Security Standard)
- Microsoft Gold Partner
- Cisco Gold Partner
- VMware Virtualised Partner

1.1. Glossary of Terms

This section describes commonly understood Vodafone- or industry-recognised acronyms and terms that are used within this Service definition.

Term	Description
APM	Application Performance Management
DNS	Domain Name Service
ITIL	Information Technology Infrastructure Library
LUN	Logical Unit Number
MSP	Managing Successful Programmes
NTP	Network Time Protocol
PRINCE2	Projects In Controlled Environments (a project-management methodology)
SAN	Storage Area Network
SLA	Service Level Agreement

Service Lifecycle

2. Service Lifecycle

Vodafone utilises ITIL-aligned design, delivery and operational processes, and using this methodology and our expertise can provide guidance and advice on your digital or IT strategy, help configure, support and manage a broad range of IT and network technologies, applications and services to help you focus or enable your key business drivers.

2.1 Professional Services

We can provide a number of professional services, including:

- **Requirement Consulting.** Our strategic and technology-focused consulting services help you make the most of our Hosting Services. Requirement Consulting consists of two parts: A Snapshot (light assessment) and an Impact Analysis (detailed assessment). We use discovery tools and capacity-management applications to investigate how you are currently using your infrastructure. Along with detailed analysis of the data collected and structured workshops, we can help you decide on the best approach for your business.
- **Application Consulting.** These are services for the design, architecture, implementation and management of both standard and bespoke applications.
- **Design Consulting.** This is consultancy for solutions comprising hosting and security products, both pre- and post-sale.
- **Facilities Consulting.** This is a service for the design and build of standard and bespoke infrastructure to support Vodafone Facility Services.
- **Infrastructure Consulting.** This is a service for the architecture, design, implementation and management of IT infrastructure to support the Vodafone infrastructure, operating system, storage, backup, and monitoring and reporting services.
- **Project Management.** This includes project and programme management for the delivery of customer solutions.
- **Security Consulting.** This is a range of professional services around security and forensics. We can offer security consulting for both commercial or public sector organisations.
- **Service Transition and Migration.** This service is provided in conjunction with project management to help migrate and transition existing services to Vodafone.

2.2 IT and Digital Transformation

Our approach to IT and digital transformation allows your business to achieve your goals in an agile and informed way. Working closely with you we will help drive business innovation and ensure service delivery is implemented to exacting standards using our tried and tested approach:

- **Requirements capture.** This enables Vodafone to fully understand your business and IT requirements and set the scope of the project. Requirements are documented and agreed to ensure that subsequent designs fully meet customer expectations. This can include the following professional services engagements:
    - **Snapshot** – Via a detailed online questionnaire and one-day workshop, Vodafone will discover how you can benefit from Vodafone Hosting Services. The resulting report will include the identification of cost savings.
    - **Impact Analysis** – This consists of two distinct consulting phases: data gathering using discovery technologies from workshops/interviews and detailed analysis.

- **Design.** Our consultants and design specialists will work with you to design a new platform and migration plans using the results from the Snapshot and/or Impact Analysis. There are two design stages within our engagement process:
    - **High Level Design (HLD)** - produced as part of our pre-sale's engagement. The HLD describes the solution that Vodafone will deliver and forms the basis of the commercial and contractual agreement between Vodafone and the customer.
    - **Detailed Level Designs (DLD)** - produced to document the level of detail required to allow the customer solution to be built. The DLD will be created once a customer order has been received.
- **Installation.** Once the design(s) have been agreed and a contract signed, we will build your new platform and infrastructure.
- **Migration.** Working to your timescales, we will manage the migration of your services and applications from your legacy infrastructure, and (if necessary) perform virtual to virtual (V2V) and physical to virtual (P2V) migrations.

2.3 Service Design

Our Product Development team ensures that our service catalogue and yours are kept up to date with the latest technologies needed by organisations today.

Our dedicated Design Specialist team, working alongside your Account team, will produce a detailed design and migration plans for your infrastructure (if required).

Using best practice availability and capacity-management methodologies, our Hosting Solution Managers will ensure that your solution will be available and scaled to meet the service levels needed by your business.

2.4 Service Transition

Our approach to Service Transition uses our tried and tested delivery methodology across all of customer projects and programmes. Using industry best practice in PRINCE2 and MSP to ensure the targets and outcomes we set with you are achieved to the standards that you expect.

Through in life management service we provide you with service request fulfilment, change management, and service asset and configuration management teams to ensure robust processes and rigorous discipline in the planning and implementation of change. All your solution information is maintained within the configuration management database which is specific to your IT infrastructure.

2.5 Service Operation

Our dedicated support teams, located in the UK, Germany, Romania and India, provide round-the-clock ITIL-based incident, problem and event management for your IT infrastructure and business applications. They work closely with your Application Management team or provider, owning incidents through to resolution.

Where appropriate, we offer solution or application availabilities of up to 99.99%. Each SLA is based on several factors, such as the level of resilience and disaster-recovery capability within the solution. For non-resilient solutions, we offer a per-device SLA of up to 97%.

Service Components

3. Service Components

Our Managed Hosting Service offerings are constructed from the service components listed below:

Managed Compute and Facilities	• Facility and Network Services • Hosted Internet Access • Server Management • Operating System Management
Managed Applications	• Database Management • Active Directory Management
Managed Local Area Network	• Switch Management • Router Management
Managed Security Services	• Firewall Management • Host Security
Managed Storage and Backup Services	• Primary Storage • Dedicated Storage • Cloud Storage • Cloud Storage Applications • Data Protect
High-Availability Solutions	• Site Resilience • Traffic Management
Procurement Services	• Hardware and Software Procurement – Rental • Hardware and Software Maintenance

3.1 Managed Compute and Facilities

Facility and Network Services

We will host your IT infrastructure in one of our secure data centre locations. In the UK, we can offer four data centre locations that are capable of housing secure government platforms with List X rooms available.

All our data centres are connected to our MSP (Multi-Service Platform) next-generation network with high-speed resilient links, and global Tier 1 Internet backbone, AS1273. These options allow you to access your applications and data over your WAN via our network services such as IP-VPN QoS, Ethernet Wireline and traditional bandwidth products.

For UK government (and dependent on the data centre location), PSN access is available, as are other government network connections.

Hosted Internet Access

For our Managed Services customers, we offer 100Mb/s (megabits per second) Internet access connection as part of the standard pricing at no additional charge. Bandwidths above 100Mb/s are also available, and these can be combined with our Anti-DDoS (Distributed Denial of Service) and secure gateway solutions to enhance the availability, performance and security of any Internet-facing solutions.

Shared DNS and NTP service

Vodafone operates DNS and NTP services which can be used by Customers who take out a Managed Hosting solution. These services are highly resilient and accurate and form part of the Data Centre backbone.

Server Management

Vodafone's server management includes, procurement, configuration & installation, capacity planning, configuration changes, maintenance updates and system testing of hardware and relevant software. We will continuously monitor the server availability and performance, resolving problems and faults proactively if and when they occur.

We can offer several different form factors and specifications to meet your requirements, including rack mount and blade.

Operating System Management

The Vodafone operating system management service provides the installation, configuration, management and support of operating systems on both physical compute platforms and virtual servers.

Vodafone will continuously monitor the OS availability 24x7 and provide fault monitoring against key OS metrics to assure availability.

Vodafone can offer several optional services that include:

- Operating system management
- Clustering management
- Web server application management
- Anti-virus management
- Host-based intrusion detection

All the operating system management options provide:

- Installation and configuration of the selected operating system(s) on your hosted servers, using current Vodafone specifications
- Support and maintenance of the operating system(s)
- Installation of security patches and service packs and other agreed changes as required

Patching

We will monitor operating system vendor updates and recommend appropriate patches and updates to you. Once you have notified us to agree to apply any such patch we will perform the agreed patching.

Clustering Management

We will help design, install and configure the clustering service on your solution, and provide testing of the service for both failover and failback to ensure resilience is working effectively. Our Clustering Services include:

- Installation and configuration of the clustering service
- Configuration of automated failure detection, failover and failback procedures
- Testing of the clustered servers for failover and failback
- Management of the clustered environment redundancy
- Monitoring of the operation of the clustered environment to establish that it is operating within agreed parameters
- Installation of security patches and service packs (or other changes as required)

Web Server Management

Where required, we will support the web server in addition to the operating system. Our support includes:

- Installation of the web server
- 24x7 support for the web server
- Upgrades and patching of the web server
- Support for either Apache or Microsoft IIS

Anti-Virus Management

As part of our operating system management service, we offer anti-virus protection. We will monitor any anti-virus vendor updates and will apply these patches on a regular basis.

If the anti-virus software detects what it believes to be a virus (or any other unexpected event), we will investigate it using our incident management and/or security incident response processes.

This service can be used in conjunction with our host-based security services and our security information management services.

3.2 Managed Applications

For your peace of mind, we can offer managed application services over and above your infrastructure as part of your solution. We will help you get up and running with an initial assessment and then will provide configuration or migration services and detailed testing before taking ownership of in life management and control.

Database Management

Our Database Management Service covers the configuration, management, monitoring and support of databases.

We will configure your database software to the agreed designs, including setting up any clustering and relevant transaction logs and service accounts. We will also integrate the database servers into our monitoring systems and configure these to the agreed thresholds.

We will provide incident management and both proactive and reactive expert support to ensure your databases are maintained.

We currently support the following databases:

- Microsoft SQL Server
- MySQL
- Oracle
- Cassandra
- MariaDB

Patching

We will monitor database vendor updates and recommend appropriate patches and updates to you. Once you have notified us to agree to apply any such patch we will perform the agreed patching of the relevant database server.

Managed Active Directory

Vodafone can also offer managed Microsoft Active Directory services which allows an enterprise to create a scalable, secure infrastructure for user and resource management. This service provides delivery and support services in both commercial and secure operating environments.

Vodafone offer a standard methodology for the deployment of the infrastructure roles which are required to support the service.

Supported features include:

- The management and installation of domain controllers (including read-only DC) and the associated DNS role
- Support for new Active Directory forest, domain tree and a child domain in an existing managed forest
- Web-based Active Directory object administration via ManageEngine ADManager Plus
- Standard installation of optional Active Directory components:
    - DHCP single or highly available instance
    - Active Directory CS Enterprise Root CA
    - AD CS Offline Standalone Root CA + Enterprise Subordinate
    - Read-only domain controller
- Customer-managed organisation unit (the domain, enterprise and schema administrator are retained by Vodafone)
- Active Directory trust relationships

- Fine-grained password policy
- Group-managed service accounts

Patching

We will monitor Microsoft Active Directory vendor updates and recommend appropriate patches and updates to you. Once you have notified us to agree to apply any such patch we will perform the agreed patching of the relevant Domain Controllers.

3.3 Managed Local Area Network

We can provide installation, monitoring and management services for Ethernet switching, IP routing and load-balancing equipment to be included within your solution infrastructure. These services include:

Switch Management

The Switch Management service offers:

- Installation of the Ethernet switching equipment
- Initial setup of VLANs (Virtual Local Area Networks)
- Initial setup of access control lists
- Implementation of agreed switch configuration
- Monitoring of the switch through the Vodafone monitoring infrastructure
- Software and hardware replacements and upgrades, if hardware is provided by us

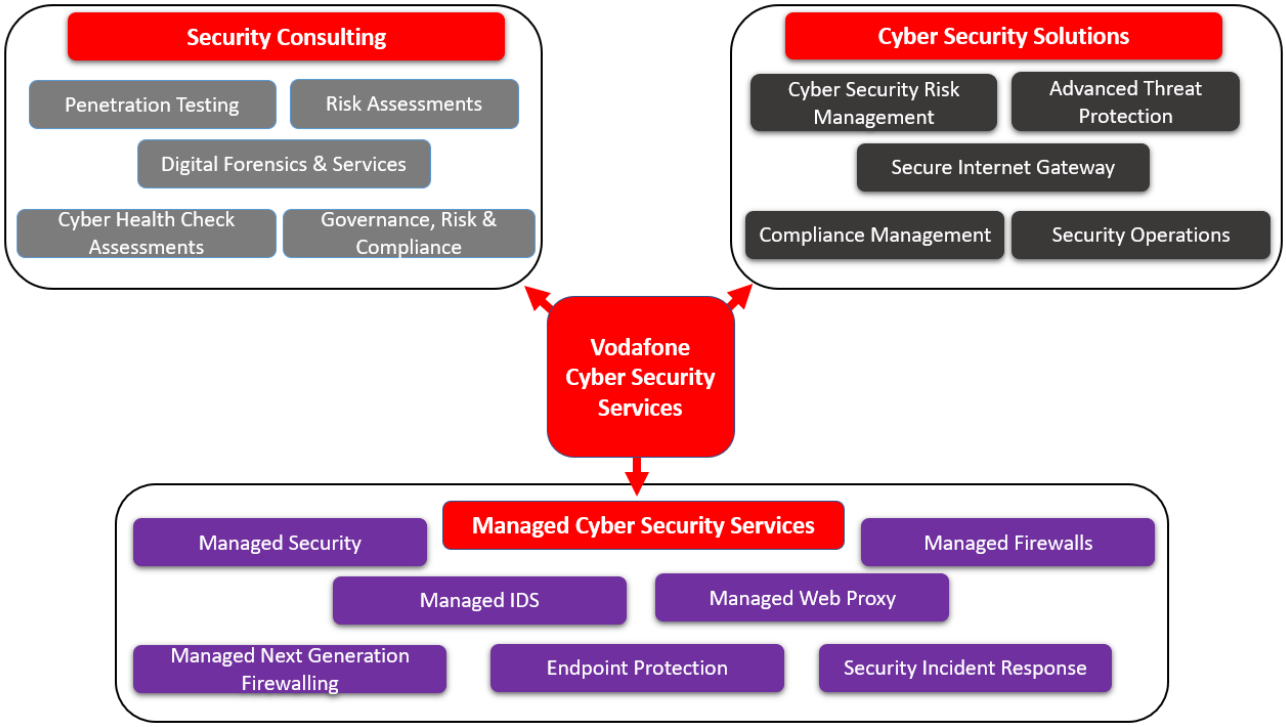
Router Management

The Router Management service offers:

- Installation of the routing equipment as part of your hosting solution infrastructure
- Configuration of IP routing protocols
- Configuration of access control lists
- Implementation of configuration changes
- Monitoring of the router and interfaces by the Vodafone Monitoring Infrastructure

3.4 Managed Security Services

Vodafone offers customers a wide and diverse range of Security services that can be included as part of your Managed Hosting Solution. These can be tailored to your environment and individual requirements to be able to meet your security demands.



Firewall Management

The Firewall Management service provides you with a firewall (either single or resilient pair) configured to your requirements to provide access control to your systems and networks. The service is designed for passive defence and security policy enforcement. It provides restrictions on the source and destination IP addresses and TCP/UDP service ports that can pass through the firewall.

We provide, configure and maintain hardware where required. We can provide and maintain standardised software installations with bespoke rules configured to meet your operational requirements.

We provide fail-over capabilities in the event of a failure of one unit or associated network connections within the firewall fail-over pair.

The Deep Packet Inspection option means the firewall can analyse the contents of the packet to assess the potential threat, thereby proactively detecting malicious traffic such as worms and Trojans.

We offer the multi-tenanted firewall in several package sizes that limit the number of virtual interfaces and maximum connections that can be processed. When you reach the limit of the specific package you have selected, you can move to a higher package (if available).

We support the use of firewalls for point-to-point VPN connections where compatibility has been confirmed. The following VPN connections are available to you and will be provided in accordance with the high-level design:

- IPSec authentication based on shared secret passwords
- IPSec encryption using 3DES and AES;
- Up to 10 defined remote hosts across the total number of VPN tunnels
- Up to five IPSec VPN tunnels

Host Security

As part of our richer security information management proposition we can also offer greater peace of mind.

This secures physical and virtual servers using flexible, policy-based monitoring and protection, and addresses compliance requirements across heterogeneous environments. Using non-signature-based Host Intrusion Prevention, it proactively protects against zero-day attacks and malicious insider threats. It also ensures host integrity and compliance using Host Intrusion Detection-based system monitoring, notification and auditing.

3.5 Managed Storage and Backup Services

Primary Storage

Our Primary Storage service offers high-performance file and block-based shared storage for customers within core Vodafone data centre locations.

Platform

The service platform is built on industry leading storage arrays, switches, and management software to deliver a high-performance storage service. Our service utilises All-Flash storage arrays to provide a range of tiers, each delivering different performance and price points.

Protection

The price you pay includes RAID (Redundant Array of Independent Disks) protection as standard. Plus, we follow these encryption standards:
- Primary Shared Storage UK has Data At Rest Encryption (D@RE)
- In addition, all locations support host level encryption

Block-based storage is presented in the core Vodafone data centre locations, based on Logical Unit Numbers (LUNs). If you don't place any files within your LUN, we will still charge you for your allocated amount of storage.

The service interface is via fibre channel optical connection. Two fibre connections are required per physical server/converged solution to protect against failure of either the SAN fabric or connection. Multi-path software is required to ensure continued operation in the event of a SAN fabric failure or planned works. We use industry-standard SAN masking and zoning measures to ensure that your data is secured from other customers'.

LUNs/volumes can be provisioned from the indicative performance and protection classes in the tables below:

UK Performance classes	Indicative performance
Tier 1	8.0 IOPS/Gb
Tier 2	2.0 IOPS/Gb
Tier 3	0.5 IOPS/Gb

Rest of World Performance Classes	Indicative performance
Platinum	2.0 IOPS/GB
Gold	1 IOP/GB
Silver	0.5 IOPS/GB
Bronze	0.1 IOPS/GB

Notes:
- Measured on the array at an aggregate level.
- IOPS = Input/Output Operations per Second.
- IOPS can be pooled across multiple LUNs where possible

Protection classes	Notes
Single site	Resilient within a single site
Dual site – real-time	Synchronous replication to a second Vodafone data centre to the same performance class
Dual site – near-real-time	Asynchronous replication to a second Vodafone data centre, where the second site is a performance class lower than the primary copy

Optional Services
For an additional charge, we can offer local mirrors, snapshots and clones on a per-LUN basis.

File-based storage commonly referred to as Network Attached Storage (NAS) is presented via Internet Protocol (IP) in the core Vodafone Data Centre locations. The Virtual Gateways are used to provide file access from the storage arrays.

The service interface is via IP. Multiple connections are required from an appropriately sized customer firewall into Vodafone Data Centre switches. Vodafone will configure a Virtual Routing & Forwarding (VRF) instance for your service and connect this to your associated Virtual Local Area Networks (VLANs).

For customers with managed AD, the service should be authenticated against your authentication domain operating in your environment.

Supported file protocols:

- Server Message Block (SMB)/Common Internet File System (CIFS)
- Network File System (NFS) – versions 3 & 4

Virtual servers / file shares can be provisioned from the following indicative performance and protection class in the tables below:

Performance classes	Indicative performance
Silver	0.5 IOPS/GB

Note: Measured on the array at an aggregate level. IOPS = Input/Output Operations per Second.

Protection classes	Notes
Single site	Resilient within a single site
Dual site – near time	Asynchronous replication to a second Vodafone data centre, where the second site is a performance class lower than the primary copy.

Optional services include file-system snapshots.

Pricing

Each combination of performance and protection class has its own monthly unit price in gigabytes (GB), displayed as a Monthly Recurring Charge (MRC) on your order form. The MRC is multiplied against the amount of storage we allocate to you to calculate your monthly price for the storage element of the service. The storage element of the service is charged by allocation, not by the actual amount of used storage. For example, if you order 500GB of Tier 2 single-site storage but only store 100GB of data, we will still charge you for 500GB at the end of each calendar month in arrears.

The minimum order size is 100GB for the initial storage requirement and a minimum of 50GB for additional capacity. Additional storage orders are subject to our approval.

SAN ports are available in pairs, billed in advance at a set monthly recurring charge.

Note: Due to technical confines and rounding, your provisioned capacity may be slightly higher than your requested capacity. The storage available to your host computers will be slightly lower than the provisioned capacity due to formatting.

Dedicated Storage

For customers unable to take advantage of multi-tenant platforms (such as some UK public-sector organisations), we can offer dedicated deployments of both our Primary Storage and Data Protect services. We will ensure that your platform and service are tailored to your needs.

You can also use our multi-tenant and dedicated storage services in isolation. For example, many of our customers use our Data Protect service alongside dedicated Primary Storage.

As part of this service, we can support a range of technologies:

- Industry leading storage arrays for scale-out file-based primary storage
- Industry leading storage arrays for both block- and file-based primary storage
- Industry leading disk-based duplication systems for effective backup and retention
- Industry leading SAN fabric switches
- Industry leading Replication and Recovery Management software, offering application-consistent continuously replicated data with point-in-time rollback

Cloud Storage

The Vodafone Cloud Storage service provides low-cost object storage that is designed to grow with your business. It includes a pay-as-you-go consumption model.

As part of the Vodafone Cloud Storage service, you can choose which networks your data is accessible from, including Internet addresses from a specific source. Connectivity options include:

- Internet
- Vodafone Wide Area Network (WAN), for which you need an existing WAN
- Direct Connection: local connectivity in selected Vodafone data centres

Via your Cloud Storage Admin GUI, you can provision 'buckets' that provide your users and applications with access to the storage service, allocating these buckets to your desired 'replication group' (Gold or Silver service

policy) and configuring your needed access API and WORM (write-once-read-many) property. You can add users, manage account permissions and view your usage.

The GUI is available for you to manage your service from any location on the Internet and/or via the secure connectivity methods that you order.

Protection

Cloud Storage uses a process called Erasure Coding which splits data into data and coding fragments. The fragments are placed into independent fault domains, residing on different disks and different nodes at a site. This overall process is referred to as "encoding" the object. When an object is requested by a client, the platform will "decode" the fragments back into the original object. This tolerates up to 3 disk drive failures and introduces self-healing.

Cloud storage also employs data at rest encryption (D@RE).

Policy/service tier

These policies, also known as service tiers define how your data will be stored and protected on the platform. We can help you select which option is most appropriate for your business, from the options in the table below:

Policy	SLA
Silver	Single site resilience with automatic self-healing, 99.9% data availability
Gold	Dual site resilience with automatic replication, 99.99% data availability

We recommend the use of our Gold service tier with Managed Cloud Storage Applications; this protects your data across multiple Vodafone data centres for the highest levels of availability.

'Compliance' feature and retention periods

'Compliance' is a feature that support government and industry standards for the storage of electronic records. It meets the storage requirements of the following standards, as certified by Cohasset Associates Inc:

- Securities and Exchange Commission (SEC) in regulation 17 C.F.R. § 240.17a-4(f)
- Commodity Futures Trading Commission (CFTC) in regulation 17 C.F.R. § 1.31(b)-(c)

If 'Compliance' feature is not activated (default scenario) then you can still configure 'bucket' or 'object' retention periods, but these settings can be overwritten by the admin. This does not achieve fully hard compliance but offers you the opportunity to terminate the service flexibly by removing the retention policies and dates, allowing you to delete the data from the system.

If 'Compliance' feature is selected (upon initial order or in-life service request) then the retention policy, you configure will be hard-coded. Note that while this feature is useful to achieve compliance, it is not possible to shorten or remove these retention dates (one can only increase a hard-coded retention period) and as such you will be billed for the data remaining on the system until it expires.

Pricing

Stored data is defined as Silver or Gold. Data is considered as stored on a 24-hour basis e.g. data stored on Cloud Storage at 15:15 is considered for that day and totalled. Monthly storage is calculated as each day's worth of data added, then divided by the number of days in a month, rounded down to the nearest gigabyte.

We will charge you monthly in arrears for stored data per gigabyte (GB) by policy.

Vodafone do not believe you should be charged to upload or access your data, so we have removed all hidden costs to simplify pricing. This includes storage overheads for protection and multiple copies. For example, if you upload a single 1GB file at the beginning of the month, you will be charged for 1 unit against the appropriate policy and tariff at the end of the month.

Apart from standard Internet connectivity, other connectivity options and set-up fees, professional services and Managed Cloud Storage Applications are priced separately.

Managed Cloud Storage Applications

Today, in UK we also offer a range of Managed Cloud Storage Application services that can help simplify data management and reduce your costs. Managed Cloud Storage Applications are fully integrated with Vodafone Cloud Storage and consist of:

- Managed Cloud Tiering Appliance
- Managed Cloud Storage Gateway

Our service

The Managed Cloud Storage Application service includes design, implementation, initial configuration, 24/7 support, availability monitoring and customer reports. We can provide additional professional services upon request, or where we deem your requirements fall outside the standard service offering.

We will manage the cloud storage and any other third-party management portals (if applicable) on your behalf as part of the managed service. This applies to the following scenarios y:

- For **New Managed Cloud Storage Applications customers**
- For **Existing Cloud Storage customers without Managed Cloud Storage Applications,** a new Cloud Storage service is required
- For **Existing Managed Cloud Storage Application customers,** can use their existing Cloud Storage account

Security

All Managed Cloud Storage Applications offer both encryption in transit via SSL and encryption of data at rest, to secure your data in Vodafone Cloud Storage. As part of the managed service, Vodafone will manage and back up encryption keys on your behalf.

Charges, billing and contract terms

Managed Cloud Storage Application services follow the standard Managed Hosting service model described in the Charges, billing and contract terms section of this Service definition.

Unmanaged service option

An unmanaged option is available on request if you don't require a managed service (or where Cloud Storage Applications are required in non-Vodafone data centres). Optional services include design, implementation and initial configuration. Unless otherwise stated, we provide no ongoing support or maintenance for this option.

Managed Cloud Tiering Appliance

The Managed Cloud Tiering Appliance (CTA) service provides an automated solution to effectively manage file storage growth. Inactive data is automatically compressed and moved to Vodafone Cloud Storage, helping to reclaim primary file storage capacity to offset further investments, whilst benefiting from the flexibility, lower cost and security of the enterprise Vodafone Cloud Storage service.

Our service in detail

We will configure policies on the CTA based on your requirements. These policies define which files are moved to Vodafone Cloud Storage. After the files are moved they are replaced with a small "stub" file in the local file system, with no obvious change to users and applications. Policies are typically configured to move files that have not been accessed for several months, and where the data is considered inactive.

Deployment options

All CTAs are deployed in a high-availability pair; this ensures that data can be read from Vodafone Cloud Storage if the primary device is unavailable.

Here are the available deployment options:

- Virtual appliances, for deployment on a Vodafone-managed VMware infrastructure
- Physical appliances, for all other scenarios

Service limitations

If the CTA is to be installed within an existing hosting solution, our team will assess compatibility.

Any changes (including policy configurations) are available as standard service requests.

The Managed Cloud Tiering Appliance service is only available in Vodafone data centres in UK and can be sold alongside selected Vodafone Dedicated Storage services. Managed service suitability is assessed on a per-opportunity basis for co-location customers.

Managed Cloud Storage Gateway

The Managed Cloud Storage Gateway (CSG) service provides the best combination of local performance with the elasticity and high availability of Vodafone Cloud Storage. The CSG provides a more cost-effective solution for the long-term online archival of your business data (when compared to traditional file storage).

Our solution in detail

The CSG appears as Networked Attached Storage (NAS)/file storage to your local hosting solution. This makes it compatible with many traditional applications that are not designed to write directly to object storage. The CSG provides an on-board cache for recently written data, whilst protecting all data in Vodafone Cloud Storage. The local cache automatically removes inactive data to ensure local capacity is available for new/active data. All data is compressed and encrypted before it is sent to Vodafone Cloud Storage, helping to protect your network and to secure your data. Active Directory integration is available as part of our service.

Deployment options

The following deployment options are available:

- Virtual appliances, for deployment on Vodafone-managed VM infrastructure
- Physical appliances, for all other scenarios (and recommended for large data sets)

Please note that there are several options for both the virtual and physical models, based on on-board cache sizes/capacity. We will recommend models based on your use cases and requirements.

Portal

A third-party portal is used as part of the solution; this will be managed on your behalf by Vodafone. The portal provides software licence validation, software updates and storage of the CSG configuration file (metadata) only. The CSG configuration file is stored in an encrypted format.

Please note that the data you write to the CSG is neither stored on nor available from this portal.

Disaster recovery

As part of our offering, all customers benefit from a free-of-charge virtual appliance licence. The virtual appliance can be used to recover your service from primary CSG failure. Once the virtual appliance is ready, your configuration file is downloaded from the portal and your service will resume shortly afterwards.

Service limitations

To benefit from the Disaster Recover feature, virtualisation capacity is required on your Vodafone hosting solution.

Any changes including the creation of new files shares are available as standard service requests.

The Managed Cloud Storage Gateway service is only available in Vodafone data centres in UK. Managed service suitability is assessed on a per-opportunity basis for Co-location customers.

Data Protect

The Data Protect service offers near-line (on-site) and off-site backup and restore of your data, covering file application and machine-level point-in-time copies if you are within a core Vodafone data centre. We offer both a commercial service for enterprises and a secure service for public-sector customers.

Platform

The platform offers compression and de-duplication of data to reduce costs It provides on-site storage with spinning disks, which provides increased backup and recovery performance when compared with traditional tape. However, we also offer off-site tape services for longer term retention, which can alternatively be achieved via our Cloud Storage service.

Our industry leading backup technology provides application-aware backup agents, shared/dedicated media, and master server software. Backup agents can provide client-side encryption for data at rest on the platform.

Backup policies

You can select backup policies for:

- Compressible data, benefiting from a lower-cost tariff because data is de-duplicated; or
- Uncompressible data, with a slightly higher-cost tariff because data is encrypted and cannot be de-duplicated

Here are the standard backup policies we offer for on-site retention:

Policy	Backup cycle	Retention
14 days	Weekly full, daily incremental	All copies
1 month	Weekly full, daily incremental	All weekly, 2 weeks for incremental
6 months	Weekly full, daily incremental	All monthly, 4 weeks of weekly, 2 weeks for incremental
1 year	Weekly full, daily incremental	All monthly, 4 weeks of weekly, 2 weeks for incremental
2 years	Weekly full, daily incremental	All monthly, 4 weeks of weekly, 2 weeks for incremental

Here are the off-site tape vaulting policies we offer:

Policy	Backup cycle	Retention
6 months	All monthly	Monthly rotation
1 year	All monthly	Monthly rotation
2 years	All monthly	Monthly rotation
5 years	All monthly	Monthly rotation

Pricing

Here is how we price the components of the service:

- Backup licensing is charged monthly for an allocated amount of protected data in GB, so a 100GB partition will be charged as 100GB of protected data per month against the unit rate
- Backup storage
    - On-site storage is charged monthly for an allocated amount of backup storage in GB based on policy, with different pricing structures for compressible and uncompressible data
    - Off-site storage is charged monthly for an allocated amount of backup tape storage in GB
- If you are a co-location customer, we will charge you a nominal monthly backup management fee per host

Note: To be able to order the off-site option, your data needs to be backed up on the on-site storage. In this case, you only pay for protected data (Backup licensing) once. A dedicated media server infrastructure (if applicable) will be charged under Managed Hosting, including a monthly charge for SAN ports. The pricing for the commercial and secure Data Protect services varies.

3.6 High-Availability Solutions

We design and deliver highly available solutions that eliminate single points of failure, thereby maximising the uptime of your business-critical applications to protect your operation.

We will work with you through the design phase to ensure that the proposed solution meets your availability requirements in terms of multiple servers, either clustered or load-balanced. If required, we will design your solution across multiple Data Centre locations to ensure site resilience in the event of a major disaster.

Site Resilience

Vodafone is a global Tier 1 provider of Internet connectivity via its AS1273 backbone. We carry hundreds of gigabits of traffic per second around the globe via a fast and resilient IP network. Each of the Vodafone Data Centres has resilient high-bandwidth breakout connectivity to our Internet backbone over Vodafone fibre.

For multi-site solutions, we recommend the use of Global Traffic Management (GTM) to enable stateful failover between Data Centre locations in the event of Data Centre or IT infrastructure failure, as well as to reduce the impact of planned works. We have over a decade of experience with F5 Networks BIG-IP product family, which offers the required technical features to enable GTM.

For databases and other high-bandwidth storage applications, we have a range of connectivity solutions that can provide private-line and Gigabit Ethernet services between Vodafone Data Centres.

Traffic Management

The Traffic Management service provides support for devices that manage the traffic load and content across several servers, sites and applications. We can offer:

- **Global Traffic Management (GTM).** For solutions split across multiple Data Centres, the GTM provides intelligent traffic management based on current Data Centre performance and disaster recovery and can route the customer's request to the Data Centre nearest to them.
- **Local Traffic Management (LTM).** LTM provides intelligent load balancing and traffic management over server clusters at a single Data Centre for application delivery.
- **Application Security Manager (ASM)** – Provides 'web application firewall' functionality, giving protection from layer 7 DoS/DDoS attacks, SQL injection, cross-site scripting and other application layer attacks.

3.7 Procurement Services

Procurement Services provide you with procurement, build and maintenance services for the hardware and software required for your solution. We offer equipment purchasing and rental options, as well as shipping to the required Vodafone Data Centre(s).

The Procurement Services include:

- Hardware and software procurement
- Hardware and software rental
- Hardware maintenance
- Software maintenance

Hardware and Software Procurement and Maintenance

Our Hardware and Software Procurement Service uses one of the following models:

- We purchase the hardware and software and resell it to you. In this model, you are responsible for procuring upgrades when hardware or software reaches end of life.
- We rent the hardware and software to you and ensure that the hardware or software is kept up to date to avoid end-of-life issues.
- We arrange for the hardware and software to be shipped to the relevant Vodafone Data Centre.


Service
Management

4. Service Management

Vodafone follows an ITIL-aligned methodology to provide our customers with a best-in-class IT service management experience.

4.1 Service Desk

We will provide a Service Desk as a single point of contact for our customers to raise and progress incidents and service requests. The Service Desk is available and operational 24x7. Specific contact details, escalation paths and detailed processes will be outlined within your customer handbook.

4.2 Hosting Service Manager

The optional hosting solution manager service from Vodafone will help maximise and optimise your solution performance to meet your business needs.

With this service you can expect regular ongoing analysis and assessment of your solutions capacity and performance, service continuity and technical enhancements through collaborative engagement.

The HSM service works closely with your business and provides detailed information about performance of your solution.

There will be comprehensive monthly reviews, analysis against trends and statistics seen on your solution.

The service comprises the following:

- Regular reviews of solution capacity and performance statistics to ensure the optimisation of performance across solutions
- Regular reviews of service continuity plans and performance to validate resiliency built into the solution
- Collaborative review of solution infrastructure making recommendations to improve the solution
- Resource levels will be determined based on solution size and complexity

4.3 Incident Management

All solutions within Vodafone are supported by our Incident Management service. We will carry out incident management when appropriate with the target to restore service operation to within any agreed service levels and minimise the adverse impact of the incident on the customer's business. Our Incident Management team and Service Desk are contactable and operate on a 24x7 basis.

We provide the following definitions for different severity levels of incident:

Severity Level	Description	Example(s)
1	Loss of service	Complete loss of service
2	Degradation of service	Service performance degraded below service level
3	Risk to service	Loss of resilience
4	Non-service-affecting	A failure that doesn't present a risk, or a non-fault

- All Hosting and Security solutions within Vodafone are supported by the Cloud and Hosting support team.
- Access requests into Vodafone Data Centres are made by contacting the Cloud and Hosting support team.

4.4 Patching

Vodafone can provide software patching for customers that have taken Operating System management, Anti-virus management or Database Management services. We will not automatically apply any patches, fixes and/or workarounds without your agreement except in the event of a significant risk to you, Vodafone or any of our customers. We will use reasonable endeavours to test and communicate the changes to you.

4.5 Event and Alert Management

We provide 24x7 incident, performance and monitoring services to ensure your solution is always available, and we give you access to statistics via the Customer Portal.

Our monitoring approach is based on a combination of agent-based and non-agent-based methodologies. These ensure that the performance of your devices and their accessibility are monitored, and that if a response falls outside the allowed thresholds, our Service Desk is automatically alerted.

Non-Agent-Based Monitoring

Non-agent-based monitoring is an infrastructure and system monitoring service provided over an IP network and without the need for any agents to be installed on the monitored device(s).

- The **Ping test** service offers monitoring via a periodic ping test of an IP address on the IP device(s) to check connectivity by Vodafone Monitoring Infrastructure
- The **TCP** service offers monitoring by periodic check with TCP of a single URL (Uniform Resource Locator)/IP address on the IP device(s) by Vodafone Monitoring Infrastructure

If the responses from ping and TCP tests fall outside the allowed thresholds, the Vodafone Service Desk is automatically notified.

Agent-Based Monitoring

We install an agent onto your servers to enable the monitoring of predefined parameters and thresholds to ensure the continuity of your service. The agent-based monitoring covers key elements of server infrastructure – CPU, file system, disk drives, memory, processes, key system logs, and so on. If a threshold is reached there is an automatic escalation through to the Vodafone Service Desk.

For both non-agent-based and agent-based alerts, the Vodafone Service Desk will identify the root cause of your hosting solution issue, contact you directly to notify you of the incident, and work to resolve the issue.

For some examples of metrics and values that can be monitored these can be provided on request.

4.6 Service Levels

We offer service levels to customers as part of our solutions, and these can vary in type and by service. Your specific service levels will be documented within your contract terms and may be dependent on your high-level designs.

Service Availability Service Levels

The Service Availability Service Levels are split across two categories and are dependent on your solution architecture and design as per the table below:

- Solution Availability; and
- Component Availability

Solution Availability Service Levels

Class of solution	Maximum availability	Example
Non-resilient	97%	Solution provided with one or more single points of failure, such as single server or single firewall.
Resilient	99.9%	Solution provided from a single location, but with no single points of failure, utilising load balancing, N+1 design, etc.
Distributed resiliency	99.99%	The same as resilient but also with automated failover to a second location comprising another N+1/resilient solution, with replication between sites.

Component Availability Service Levels

The following service levels below apply to each single component only if there is no solution availability set out in the high-level design.

Service Component	Service Level Type	Service Level	Notes
Hosted Internet Access	Availability	99.99 %	
Hosted Internet Access	Network Latency	milliseconds	Dependent on region
Hosted Internet Access	Packet Loss	%	Dependent on region
Shared Backup	Availability	99.9%	
Shared Backup – Backup Job Complete	Performance	98%	
Shared Storage	Availability	99.9% - 99.99%	
Managed Cloud Storage Gateway	Availability	97%–99.9%	Higher Service Level requires additional license

Hosted Internet Access Performance Service Targets

Vodafone will measure network latency and packet loss. The network latency and packet-loss targets set out in the table below apply to the Vodafone Network only.

Monthly average targets		
Region	**Parameters**	**Target**
Europe-North America	Network latency (ms)	90
	Packet loss (%)	0.2
North America	Network latency (ms)	55
	Packet loss (%)	0.2
UK-North America	Network latency (ms)	90
	Packet loss (%)	0.2
Europe	Network latency (ms)	35
	Packet loss (%)	0.2
Europe-UK	Network latency (ms)	20
	Packet loss (%)	0.2

Incident Management Service Level Targets

Our target restoration times are as follows:

Severity Level	Target Time to Restore
1	4 hours
2	8 hours
3	48 hours
4	N/A

Service Credits

Vodafone will offer service credits to customers against qualifying incidents against availability and performance service levels. The process and details of acceptance will be provided as part of your contract.

4.7 Change Management and Service Request Fulfilment

Vodafone will provide you with access to raise service requests for action and completion by us. These requests will be completed at our discretion. A service request may only have one requirement; it may not consist of multiple requirements for a single or multiple end users.

Change and service requests apply to soft changes, such as altering a rule on a firewall or applying a patch to the operating system of a server.

We classify change and service requests as follows:

- **Service Requests** are predefined changes stated within the service catalogue.
- **Routine Change Requests** cover all other types of request that are not service requests, emergency or complex.
- **Emergency Change Requests** are subject to review by Vodafone and acceptance will be at our sole discretion, these must be raised during normal business hours both via the completed form and via a telephone call to our service desk.

Process

- For **Service Requests**, please raise the request online on MyVCO portal, or email a completed Service Request Form to the Change Management team (servicechangerequest@vodafone.com).
- For **Routine Change Requests**, please raise the request online on the MyVCO portal, or email a completed Change Request Form to the Change Management team (change-request@vodafone.com).
- For **Emergency Change Requests,** complete the relevant form and email it to change-request@vodafone.com then follow this up with a call to our Hosting Change Management team on 0870 0600 808. Emergency Change Requests are only accepted during normal business hours (between the hours of 09:00 and 17:30 UK time, Monday to Friday).
- We will assess, plan, schedule, and implement the change subject to validation and approval. The Change Management team will communicate with you during this process.
- The Hosting Change Management team and your Service or Account Manager can provide all the forms stated above. Alternatively, they will be available via the customer portal.

Additional Information

- Not all activities are classified as a change. As a rough guide, reconfiguration of an existing infrastructure is a Change, whereas additional infrastructure (e.g. new servers) is an Implementation activity.
- A certain amount of configuration change is included as part of our Managed Service. However, work beyond this may be chargeable.


Charges, Billing
and Complaints

5. Charges, Billing and Complaints

5.1 Charges

Charges come in two forms: non-recurring setup and monthly-recurring charges. For most elements of a hosting solution, the monthly recurring charges are fixed. Storage and back-up charges may vary if your requirements change throughout the life of your solution(s).

Each device within the solution (e.g. a server or a firewall) will have a charge associated with it. This charge will cover everything relating to that device, which may include space, power, hardware, software, monitoring, change and incident management.

A number of configuration changes are included based on the quantity of devices we manage for you. Additional changes may incur charges based on an hourly rate.

Expansion and changes to the physical infrastructure (e.g. an additional web server) will be reflected in a change to the monthly fee, and (if re-sold) a one-off charge to cover the extra hardware and software. The setup charges will vary depending on whether the hardware and software is to be provided by you, resold to you up front, or rented to you by us. Where rentals apply, we will amortise the hardware and software upfront costs over the term of the contract.

A single consolidated bill is issued monthly which will detail device type, quantity and charge. This can be broken down further by Data Centre location or business unit. Vodafone can bill monthly, quarterly or annually.

If you use other Vodafone services in conjunction with your Managed Hosting service, these may be billed separately.

Contracts of one to five years are available. Please consult with your Vodafone sales contact or Account Manager.

5.2 Billing

Key contacts: Your Account Manager or Billing Account Manager.

If you do not have a dedicated Account Manager or Billing Account Manager, the Customer Service Billing Centre can be contacted at: **cbsc@vodafone.com**

5.3 Complaints

Vodafone takes great care in providing the highest level of support for our products and services. If you experience
any dissatisfaction with any of our products, services or support, a dedicated team is on hand to assist.

The Vodafone Complaints Team is available during normal working hours (09:00 to 17:00 Monday to Friday, excluding bank holidays), and will attempt to respond to issues raised by customers within one working day.

All commercially reasonable actions will be taken to resolve the complaint immediately. However, in the event of a resolution not being immediately possible, the Complaints Team will attempt to provide you with a status update via telephone or email, every 48 hours.

The Complaints Team can be contacted at: **complaintsteam@vodafone.com** or by ringing: **0800 048 1411.**

Appendix

6. Appendix

6.1 Standard Supported Platforms

The below table provides information on our current standard supported technologies:

Type	Vendor	Model
Blade frame	Cisco	UCS
Blade server	Cisco	M4/M5
Rackmount server	Lenovo	SR630
Fabric interconnect	Cisco	UCS Fabric
Switch	Cisco	Catalyst/Nexus
Firewall	Cisco	ASA
Firewall	Checkpoint	IP Series
Firewall Intrusion Detection	Cisco	Firepower
Traffic Management	F5	LTM/GTM
Primary Storage	Dell	Unity/VMAX
Cloud Storage	Dell	ECS/Atmos
Operating System	Microsoft	Windows Server
Operating System	RedHat	Enterprise Linux
Database Management	*Various*	Microsoft, Oracle, Cassandra, DB2
Virtualisation	VMware	vSphere
Application Firewall	F5	Big-IP
Data Protect	Veritas, Dell	NetBackup, Data Domain
Web Proxy	Symantec	Bluecoat Proxy SG
Security Information Management	Micro Focus	ArcSight
Anti-Virus	Symantec	End-Point Protection

Business Continuity Disaster Recovery

Vodafone's standard Business Continuity Disaster Recovery plan will depend on the solution and support model that the customer has chosen to purchase.

Any required Business Continuity Disaster Recovery plan will be discussed at point of order. Please contact frameworks_team@vodafone.com for more information.

Why Vodafone?

Vodafone Business is one of the world's largest telecommunications companies and provides a range of services including voice, messaging, data and fixed communications. Vodafone Business has mobile operations in 25 countries, partners with mobile networks in 42 more, and fixed broadband operations in 19 markets. As of 31 December 2018, Vodafone Ltd had approximately 700 million mobile customers and 21 million fixed broadband customers, including all of the customers in Vodafone's joint ventures and associates.

By connecting people, places and things, Vodafone Business helps businesses of all sizes to succeed in a digital world. Our expertise in connectivity, together with our leading IoT platform, multi-cloud solutions, digital services and global scale, delivers the results customers need to help them progress and thrive. We are trusted partner to businesses of all sectors and public services around the world, and work side by side with them to understand the unique challenges they face and the goals they want to achieve.For more information, please visit: www.vodafone.com/business

Next steps

If you want to discover more about Managed Hosting or other Vodafone cloud services, please contact frameworks_team@vodafone.com