



Service Description

VMware Horizon[®] Cloud Service[™] on IBM Cloud

Last Updated: 01 May 2019



© 2019 VMware, Inc. All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. This product is covered by one or more patents listed at <http://www.vmware.com/download/patents.html>.

VMware is a registered trademark or trademark of VMware, Inc. in the United States and/or other jurisdictions. All other marks and names mentioned in this Service Description may be trademarks of their respective companies.

As used in this Service Description, “VMware”, “we” or “us” means VMware, Inc., a Delaware corporation, if the billing address for your order is in the United States, and VMware International Limited, a company organized and existing under the laws of Ireland, if the billing address for your order is outside the United States. All terms used but not defined in this Service Description are defined in the Terms of Service or other documents comprising the Agreement between you and us regarding your use of the Service Offering.

VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

Contents

1. INTRODUCTION	4
1.1 SERVICE OFFERING SUBSCRIPTION OPTIONS.....	4
1.2 SERVICE PORTALS	10
1.3 ADDITIONAL INFORMATION.....	11
2. SERVICE OPERATIONS.....	11
2.1 IBM ACCOUNT	11
2.2 SUPPORT.....	12
2.3 SERVICE PROVISIONING	12
2.4 DISASTER AVOIDANCE AND DISASTER RECOVERY	13
2.5 MONITORING	13
2.6 INCIDENT AND PROBLEM MANAGEMENT.....	13
2.7 CHANGE MANAGEMENT	14
2.8 SECURITY	15
2.9 IMAGE TEMPLATES	16
2.10 TEMPLATE UPLOAD.....	16
3. BUSINESS OPERATIONS	16
3.1 ORDERING AND INVOICING.....	16
3.2 ADD-ON CAPACITY	17
3.3 RENEWAL.....	18
3.4 SUSPENSION AND RE-ENABLEMENT.....	18
3.5 TERMINATION.....	18
APPENDIX A – ORDERING.....	19
APPENDIX B - SUMMARY OF ITEMS INCLUDED AND AVAILABLE FOR PURCHASE SEPARATELY.....	27
ONBOARDING PACKAGES.....	28
APPENDIX C - HORIZON CLOUD GUEST OS COMPATIBILITY TABLE	30
APPENDIX D – MICROSOFT LICENSING RECOMMENDATIONS.....	31
APPENDIX E – SERVICE OFFERING FEEDBACK.....	32

1. Introduction

VMware Horizon® Cloud Service™ on IBM Cloud (the “Service Offering”) is a family of cloud services from VMware that enables the delivery of virtual desktops and applications to end users on any VMware Horizon Client compatible end user device, anywhere. The Service Offering brings VMware’s Horizon DaaS (desktop-as-a-service) platform to the IBM cloud environment, enabling customers to run any end-user compute application from a simple-to-use cloud service.

The Service Offering has the following features:

- VMware’s Horizon® DaaS platform running on bare metal hosts deployed in the IBM cloud
- Tenant onboarding and change management service
- Three distinct workload options: Horizon Cloud Desktops, Horizon Cloud Apps, and Horizon Cloud Graphical Workstations.
- Three different host types capable of running workloads with and without a virtual Graphics Processor Unit.
- Ten different VM (virtual machine) types, from an efficient “Value Desktop” to the high-performance “M60 Performance” workstation.
- Maintenance, patching, and upgrades of the platform and underlying software and infrastructure performed by VMware

1.1 Service Offering Subscription Options

An entitlement to the Service Offering consists of both: (i) a user subscription which can be purchased for named or concurrent user access, and (ii) a capacity entitlement which is sold by the host and allows the customer to provision one or more workloads available on the type of capacity provisioned on that host.

The Service Offering provides the following host types:

Host type	Standard Host	vGPU Desktop (M10)	vGPU Workstation (M60)
CPU	Intel Xeon E5-2690 v4 (28 Cores, 2.60 GHz) x 2	Intel Xeon E5-2690 v4 (28 Cores, 2.60 GHz) x 2	Intel Xeon E5-2690 v4 (28 Cores, 2.60 GHz) x 2
RAM (GB)	256	512	512
Usable HD Storage (GB)	6000	6000	6000
vGPU	N/A	NVIDIA Tesla M10 GPU Accelerator x 2	NVIDIA Tesla M60 GPU Accelerator x 2

The Service Offering allows customers to purchase capacity on a 1-, 12-, 24-, 36-, 48- or 60-month subscription. During the subscription term, customers can provision desktops and hosted apps VMs at any time up to the full capacity purchased. User subscription licenses are global across (that is, can be used for) all VMware Horizon® Cloud Service™ offerings, while capacity subscription licenses are specific to the Service Offering.

For customers that want a short-term low-cost proof of concept of the Service Offering, a “Starter Edition” bundle is available, which includes user licenses and capacity on a single Standard Host with month-to-month pricing (see details below).

Capacity Types

Different Service Offering hosts support different capacity types, which in turn determine which kind of VMs and how many VMs can be provisioned on those hosts. Hosts are bundled together in clusters (known as “pods”) of up to 32 hosts of the SAME capacity type. A tenant will have one or more pods. Each capacity type requires its own pod. Each pod can support up to 2,000 provisioned VMs. The Service Offering provides the following capacity types on these hosts:

Capacity Type	Standard Capacity	Hosted Application Capacity	M10 Professional	M10 Premium	M60 Professional	M60 Premium	M60 Performance
Host Type	Standard Host	Standard Host	vGPU Desktop (M10)	vGPU Desktop (M10)	vGPU Workstation (M60)	vGPU Workstation (M60)	vGPU Workstation (M60)
Usage Type	VDI	RDSH Apps and Published Desktops	VDI	VDI	VDI	VDI	VDI
Min Hosts Per Pod	2 (1 Usable)	2 (1 Usable)	1	1	1	1	1
Max Hosts Per Pod	32 (30 Usable)	32 (30 Usable)	32	32	32	32	32
High Availability / SLA in effect	Yes	Yes	No	No	No	No	No
Max VMs Per Host ¹	18 to 150 (150 SDCs)	7 (7 RDCs)	64 (64 M10s)	32 (64 M10s)	16 (16 M60s)	8 (16 M60s)	4 (16 M60s)
# of VM Models Supported	4	1	1	1	1	1	
VM Model Consumption Units	SDC (1 vCPU, 2GB vRAM, 30GB HD)	RDC (8 vCPU, 32GB vRAM, 240GB HD)	M10 (2 vCPU, 8GB vRAM, 120GB HD, 1GB vGPU)	M10	M60 (4 vCPU, 16GB vRAM, 120GB HD, 2GB vGPU)	M60	M60

High Availability is only available with the Standard Host which is why a minimum pod size is two hosts, and in a maximum pod size of 32 hosts, the actual usable capacity is 30 hosts. One high-availability host is required for every 15 (or up to 15) hosts in the pod. Because of the capacity reserved for High Availability, usable capacity will always be one fewer hosts than the Pod possesses. Each Standard Host pod must have one or two High Availability hosts, depending on the size of the pod.

Example: Company ABC wants to deploy a tenant for 700 value desktops, 30 RDSH servers, and 100 M10 Professional Desktops (1 Value Desktop consumes 1 SDC). For this tenant, the customer will need to purchase:

- Round Up $(700/150) + 1$ HA Host = 6 Standard Hosts
- Round Up $(30/7) + 1$ HA Host = 6 Standard Hosts
- Round Up $(100/64) = 2$ M10 Hosts
- Totalling to 12 Standard Hosts and 2 M10 Hosts.

¹ Maximum VMs per host is determined by desktop models selected and assumes a fully provisioned host with no platform, utility, imported, or image VMs present on the host. Actual usable capacity may vary due to specific tenant conditions. Note that Standard Capacity is the only capacity type with more than one model available for provisioning.

Once provisioned as a capacity type, making changes to hosts and capacities within a tenant will require contacting VMware. Any hosts being modified for use for a different capacity type must be cleared of all VMs prior to re-assignment. Capacity type can only be changed within what the host supports; for example, a Standard Host will only allow customers to shift usage from Hosted Apps Capacity to Standard Capacity, and vice versa. Capacities and types cannot be adjusted across tenants – that will require canceling capacity at one tenant and adding new capacity to the desired tenant and is subject to Horizon Cloud Service cancellation policies.

Similarly, pods of the same host or capacity type in the same tenant can be adjusted with respect to the host count of each pod. For example, a tenant with both an M10 Professional Pod and M10 Premium Pod could move hosts between those two pods as their use cases adjust. Those adjustments require contacting VMware.

All capacity types are deployed, by default, on dedicated computing servers with layer-2 network isolation for workload traffic isolation, dedicated storage volumes, and a dedicated desktop management instance. Each Service Offering instance is deployed with a public IP address for VPN-less remote access directly from the internet. Desktops and published applications can be accessed through VMware Horizon® View™ clients directly, VMware Identity Manager™, or through the Service Offering desktop portal by using the VMware Horizon View client and clientless HTML5 (Horizon Blast Protocol).

Standard Capacity Model Options on Standard Host

The **Standard Desktop Capacity** (“SDC”) unit contains one vCPU, 2GB vRAM, 30GB Hard Disk capacity, and 20 storage IOPS. Customers can provision desktop VM instances based on predefined models that consume one or more SDC units. For example, a customer that purchases a 1 Standard Host subscription on a 12-month term can provision between one and 150 Value Desktop VMs, or between one and 75 Professional Desktop VMs, or 37 Premium Desktop VMs, or a mixture of VMs of different model types at any time during that 12-month term (actual host capacity may vary due to other workloads required by the customer such as images, imported VMs, and customer managed utility server VMs). Customers can provision VMs with any predefined desktop model so long as the customer has sufficient capacity to satisfy the provisioning task.

Standard capacity desktops are available in four predefined SDC models:

- **Value Desktop** provides one vCPU, 2GB vRAM, 30GB HD, 20 IOPS.
- **Professional Desktop** provides two vCPU, 4GB vRAM, 60GB HD, 40 IOPS, and the benefits of Soft3D for the end user.
- **Premium Desktop** provides four vCPU, 8GB vRAM, 120GB HD, 80 IOPS, and the benefits of Soft3D for the end user.
- **Performance Desktop** provides eight vCPU, 16GB vRAM, 240GB HD, 160 IOPS, and the benefits of Soft3D for the end user.

All model specifications are fixed and cannot be adjusted.

Hosted Applications Capacity Service Model Options on Standard Host

Hosted Applications Capacity VMs are available in the following models:

- **Hosted Apps Server** provides eight vCPU, 32GB vRAM, 240GB HD, 160 IOPS, and the benefits of Terminal Services and Published Applications for the end user.

A Standard Host can run up to 7 Hosted Apps Server VMs. User density will vary by application payload and user requirements. When provisioning for Hosted Application Capacity, a customer must designate how much space to reserve for images.

All model specifications are fixed and cannot be adjusted.

Graphical Workstations Service Model Options

The Service Offering allows customers to purchase and provision virtual Graphics Processor Unit (vGPU) backed desktops and workstations.

The following desktop models are available for provisioning within each vGPU capacity type:

M10 Desktop workloads are available in two predefined models:

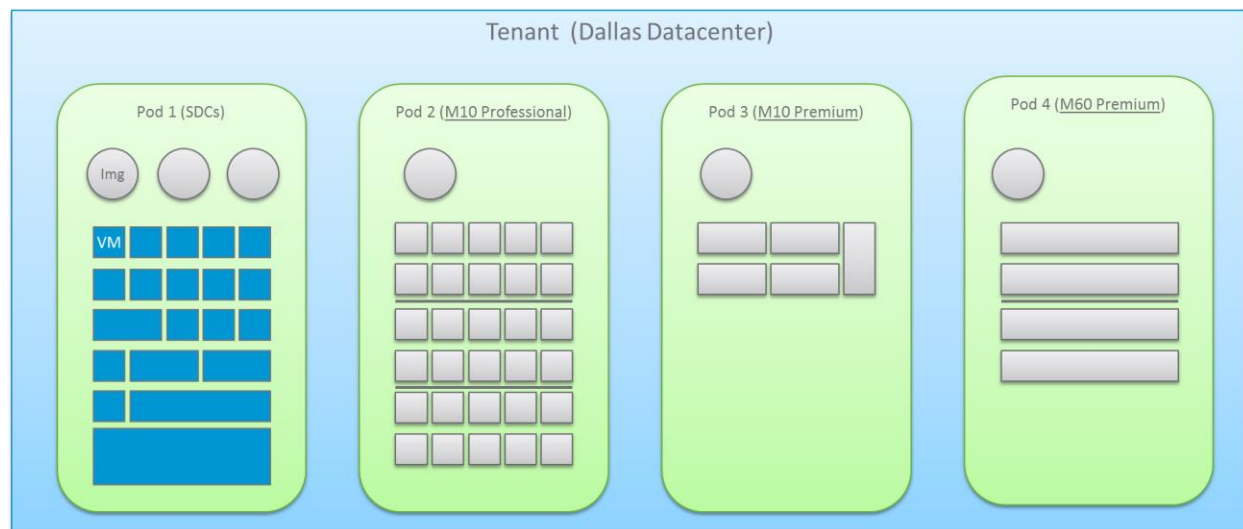
- **Professional Desktop** provides two vCPU, 8GB vRAM, 120GB HD, 1GB vGPU Memory
- **Premium Desktop** provides four vCPU, 16GB vRAM, 240GB HD, 2GB vGPU Memory

M60 Workstation workloads are available in three predefined models:

- **Professional** provides four vCPU, 16GB vRAM, 120GB HD, 2GB vGPU Memory
- **Premium** provides eight vCPU, 32GB vRAM, 240GB HD, 4GB vGPU Memory
- **Performance** provides sixteen vCPU, 64GB vRAM, 480GB HD, 8GB vGPU Memory

vGPU desktops and workstations are provisioned in full hosts only; each model's host capacity is set forth in the table on page 5, above. A pod (a logical container of capacity, images, and subnets) (see below for full definition) can contain one or more hosts. vGPU model capacities are not interchangeable within a host and cannot be mixed within a pod. Because you cannot easily modify the capacity allocated to a particular model type after it has been provisioned, it is important to size pods with vGPU models by planning how many hosts each pod should contain, based on the desired desktop models for that host. For example: if you are planning to deploy some number of standard desktops (i.e., not vGPU desktops), 192 Professional M10 desktops, 64 Premium M10 desktops, and 16 Premium M60 Workstations, you would allocate your tenant capacity as four pods, each with sufficient hosts for model capacity desired.

As an example, see the following graphic:



If you need to re-allocate your pod capacity for a different model configuration, you may do so by contacting VMware support. For further questions regarding planning for vGPU Desktops and Workstations, consult your VMware End User Computing (“EUC”) sales engineer.

All model specifications are fixed and cannot be adjusted.

IMPORTANT NOTES:

- vGPU desktops and workstations are exempt from the Service Level Agreement applicable to the Service Offering
- Use of vGPU VMs requires NVIDIA licenses. Customers are responsible for providing their own NVIDIA software licenses. See the following links more information regarding NVIDIA licensing and installation requirements:
 - <https://images.nvidia.com/content/grid/pdf/161207-GRID-Packaging-and-Licensing-Guide.pdf>
 - <https://docs.nvidia.com/grid/latest/grid-license-server-user-guide/index.html>

Starter Edition

Customers wanting to do a short-term proof of concept for the Service Offering can purchase the Starter Edition which comes with 50 concurrent user licenses and either 120 Standard Desktop Capacity units or 5 Hosted Application Capacity units on a Standard Host as determined at tenant provisioning time. Customers can connect to their corporate networks using VPN. The Starter Edition also has a specialized onboarding package.

To maintain a low cost, simple, and quick deployment, the Starter Edition comes with some limitations. The Starter Edition does not have a High Availability SLA, cannot incorporate additional add-ons, and cannot use direct connect functionality such as MPLS or Equinix Cloud Exchange. Customers deployed on the Starter Edition can convert to full production environments by purchasing the regular Service Offering SKUs (both user and capacity) and will not need to reconfigure their tenant environment. An upgrade to a production tenant instance with High Availability will require a maintenance window and coordination with VMware.

Image Templates

In order to provision workloads, customers must use image templates - whether provided by VMware or by the customer. Images must be configured and optimized according to VDI (virtual desktop infrastructure) best practices in order to properly function and perform in the Service Offering environment. Image templates typically consume host storage when powered off, but will also consume CPU capacity and memory on the host when powered on for editing and publication. During onboarding, customers will be required to set an image quota (number of images they will maintain) so that sufficient capacity on the host is reserved for provisioned workloads.

All utility servers must be sized to one of the predefined Service Offering desktop model hardware specifications, and will consume workload units based on the size selected except as noted in Appendix B.

Add-On Storage

Add-on storage is required to use advanced functions such as the Horizon Cloud user environment management feature (to store user settings and user profiles). Add-on storage can be allocated to Utility Server VMs as one additional disk mount. Utility Server E:/Drive maximum size is limited to 12000GB of raw storage; actual usable storage may vary due to many factors. If an individual hard disk is greater than 1000GB, storage can be purchased in increments that are greater than the largest hard disk. Those increments are 1000, 2000, 4000, 8000, and 12000GB.

Customers may choose to buy additional hard disk storage in 1000GB increments (referred to as 1TB in the actual SKUs); however, existing hard disks (such as utility server drives) cannot be expanded.

Microsoft Windows OS Licensing and support

For all virtual machine Microsoft OS licensing (Windows client or server OS), customers must use their own licenses purchased through their Microsoft licensing distributor. Customer are required to initiate all in-guest troubleshooting through their Microsoft Support process. See Appendices C and D for details on supported Guest OS and Microsoft licensing guidance.

End User Access Client Access

Use of the VMware Horizon® desktop and mobile clients to access the Service Offering is governed by separate license terms accepted at install time of those clients.

VMware Identity Manager™

The Service Offering includes the VMware Identity Manager™ feature. With Identity Manager, you can set up single sign-on (SSO) for Horizon Cloud apps and desktops, support security with multi-factor authentication (including VMware Workspace ONE® Verify, VMware's multi-factor authentication solution included in the Identity Manager feature that is powered by a third-party service provider), and control conditional access. If you use VMware Verify, then VMware, its affiliates, and its third-party service provider will have access to your personal information, including the name, phone number and email address of individual users. You are responsible for compliance with applicable laws. VMware, its affiliates and service providers will use the personal information collected through VMware Verify to provide the multi-factor authentication service. Information collected by VMware may be transferred, stored and processed by VMware in the United States or any other country in which VMware or its affiliates or service providers maintain facilities.

Use of Identity Manager within the Service Offering requires an Identity Manager connector, which can be installed and managed on a customer-owned server or on a utility server in the tenant (SDC cost is determined based on server sizes required).

The Identity Manager feature may only be used for SSO, identity federation, multi-factor authentication, and app catalog access for your Service Offering apps and desktops. If you want to use Identity Manager with other apps such as VMware Horizon® 7 apps and desktops, SaaS apps, or mobile apps, please consult your VMWare EUC sales engineer to purchase the appropriate subscription.

If you have previously purchased an Identity Manager on-premise license for general use, and the version of Identity Manager is compatible with the Service Offering, we will support use of that Identity Manager feature for your Horizon Cloud apps and desktops. Please consult with your VMware EUC sales engineer regarding your planned use of your existing on-premise Identity Manager entitlement with the Service Offering.

Horizon Cloud User Environment Manager

The Horizon Cloud user environment manager ("User Environment Manager" or "UEM") feature offers user profile personalization and dynamic policy configuration across Horizon Cloud's Windows environment. User Environment Manager must be installed as a separate Utility Server VM inside the Horizon Cloud tenant and will require a network file share to be established to save system and user settings.

The UEM feature requires a Utility Server and purchase of additional storage capacity in the amount of the customer's expected usage (typically between 125MB to 150MB per user).

Please consult with your VMWare EUC sales engineer regarding planning for use of User Environment Manager with the Service Offering.

Horizon Cloud Virtual Machine Types

The Service Offering supports the creation of VMs through use of Full Clone-based and Instant Clone-based provisioning. There are advantages and disadvantages to each type. A customer makes that choice when base images are created. Images can only be created for use as one type (not both). The type of VMs provisioned in a pool will depend on the image selected.

Instant Clone VMs provision very quickly (in minutes) but have the following image limitations:

- An Instant Clone image can only provision desktop instances to a single domain chosen at image publish time. If you have more than one domain, you will need an equivalent number of images even if they are identical in content.

- Only Windows 7 and Windows 10 client operating systems are supported.
- Maximum of two monitors with maximum display resolution of 2560 x 1600 pixels.
- Best used for Non-Persistent / Floating desktop use cases.
- If a customer intends to provide a “dedicated” desktop experience, an Instant Clone desktop is best used together with User Environment Manager.

Full Clone VMs provision at a much slower rate and are familiar to individuals with VDI background as the classic dedicated / persistent desktop experience. Full Clone VMs can also be used for Windows Server VDI desktops as well as Remote Desktop Session Host (“RDSH”) Hosted Application Servers.

Service Objects

The Service Offering includes the capability to access these objects:

- **Domain Binding** may be managed through the Service Offering Administration Console to set up active directory, administrator roles and permissions, and end user groups.
- **Image Template** may also be managed through the Service Offering Administration Console and are used as the base image from which VMs are cloned.
- **Desktop Pools** are the grouping object for VMs, RDSH-published desktops, and RDSH-published applications. Pools specify which Model, Image, VM type, and other policies to apply when creating VMs. Desktop VMs can only be created as part of a pool.
- **Virtual Machine (VM)** is the computer that is accessed by the end user.
- **RDSH Published Desktops (Sessions)** are the published desktops running on hosted RDSH servers that are accessed by the end user.
- **RDSH Published Applications (Apps)** are the published applications running on hosted RDSH servers that are accessed by the end user.
- **User Environment Manager** is a standalone application for managing user settings.
- **Pod** is a logical container which has capacity, images, and subnets available to that pod. Pools provisioned in the pod are limited in size by the pod’s capacity and limited in content to the images available in that pod. VMs are attached to subnets associated with a pod. By default, capacity, images and subnets are unique to a pod. Customers can request for pods to have image syncing, which can (depending on the specific use case) eliminate the need to copy images across pods. The type of capacity attached to a pod determines which desktop model types can be provisioned in that pod.
- **Cloud Monitoring** is used to capture and display guest VM performance and usage statistics

1.2 Service Portals

The Service Offering includes access to four self-service consoles:

- **My VMware Account Management Console (“My VMware™”)** provides access to subscription status, integrating navigation, incident management, viewing and management of all VMware product licenses and support under a single account.
- **VMware Horizon Cloud Administration Console (“Console”)** is the primary interface for consumption and management of the Service Offering, including domain binding, Image management, desktop provisioning, end user entitlement, and multi-factor authentication under the same sign-on.
- **VMware Horizon Cloud Desktop Portal** is the primary web interface for end users accessing the desktop and published apps. This interface provides browser-based access via HTML5. Users are not required to use the portal to access their desktop or app – they can do so with the VMware

Horizon® View™ clients supported on Windows, Mac, Linux, iOS, Android, and through various third-party thin and zero clients.

VMware will also provide organization administrator access to the Horizon Cloud application programming interface (API) for programmatic resource management. Documentation is provided upon request.

1.3 Additional Information

Technical Documentation and Training

Online help outlining Key Concepts with usage examples, a “Getting Started” guide, and “How To” guides for key objects are available through the Console.

Legal Terms

Use of the Service Offering is subject to the VMware Cloud Service Offerings Terms of Service located at <https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/downloads/eula/vmware-cloud-services-universal-tos.pdf>, or through the end user terms landing page, at <https://www.vmware.com/download/eula.html>

Note: As provided in Section 1.5 of the Terms of Service, any feature or functionality in the Service Offering offered on an evaluation basis is, unless we specify otherwise: (1) not intended for production use, (2) provided free of charge and without any support commitment from VMware, (3) provided “as is”, (4) excludes any service level commitment, and (5) provided without any indemnification, warranty, or condition of any kind. Some evaluation offerings may be available on an invitation-only basis. Some evaluation offerings may be very early technology preview or prototypes and may or may not be productized in the form offered for use as the evaluation offering, or at all. Contact your VMware EUC sales engineer or account executive to get further details on and availability of any evaluation offering. Different terms may apply to a VMware beta program.

If a particular service, feature, or functionality of the Service Offering is not expressly provided or specified in this Service Description or elsewhere in the Agreement, then it is not available, and VMware is under no obligation to provide such service, feature, or functionality.

2. Service Operations

The following outlines VMware’s roles and responsibilities in the delivery of the Service Offering. While specific roles and responsibilities have also been identified as being owned by you, any roles or responsibilities not contained in this Service Description are either not provided with the Service Offering or are assumed to be your responsibility.

VMware’s service level commitments are set forth in the Service Level Agreement document available at the following link:

<https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/support/vmware-horizon-cloud-hosted-sla.pdf>

2.1 IBM Account

You will not be able to access or use the Service Offering without having your own customer account with IBM (an “IBM account”), which you must establish directly with IBM. This means that if you do not already have an IBM account, you must establish one prior to being able to access and use the Service Offering. See <https://www.ibm.com/support/customer/csol/contractexplorer/cloud/csa/us-en/10> for the current form of the IBM Cloud Services Agreement. If you have questions on the IBM agreement, you must contact IBM.

2.2 Support

The Service Offering includes support for problems that you report as related to account and desktop/application availability, and selected additional services (such as add-on storage) to assist with adoption of the Service Offering. Support may be provided from both U.S. and non-U.S. locations, as appropriate to meet VMware's support obligations. Supported versions include the latest three production release versions. Customers on older tenant versions will not be eligible for support and are encouraged to keep up with the VMware change management requests.

Additional support information can be found at:

- SaaS Production Support Web Page: <https://www.vmware.com/support/services/saas-production.html>
- Cloud Service Support Policies: <https://www.vmware.com/support/policies/saas-support.html>

2.3 Service Provisioning

VMware will provide the following provisioning services:

- Implementation of service components (physical servers, physical storage, and physical network devices) needed to support contracted resource pools.
- Providing initial network resources including default public IP addresses.
- Providing initial capacity resources for Desktop Models (memory, processing, primary storage, and networking) and Hosted Apps Servers.
- Enabling a secure point to point network interconnect (a.k.a. backhaul) via VPN or other dedicated connection from the Horizon Cloud network (to your corporate network). Note that dedicated connectivity from your data center to VMware's port of access in VMware's data center is purchased separately from your carrier or telecommunications provider. Direct Connect from VMware's port of access to your tenant network (i.e., within the Service Offering) must be purchased separately from VMware and will have an additional monthly charge.
- Switching network interconnect from VPN to dedicated connection. Note that this conversion requires up to 14 days lead time after all connectivity elements are in place and the configuration has been validated by both VMware and the customer.
- Providing up to 10 VMware-approved 60GB (Professional Desktop) Images from the current Image catalog.
- Installing qualified Utility Server VMs in your VMware tenant cloud environment (see "Usage Restrictions" in Appendix A).
- Providing Utility Server for network share use with User Environment Manager (Note: purchase of add-on storage required).
- Providing access to self-service training videos.
- Providing up to two hours of Administration Console and Desktop Portal walkthrough.
- Validating tenant setup by provisioning a desktop with a VMware-provided image template.

You will be responsible for the following provisioning services:

- Providing corporate resource assistance for establishing site-to-site network connectivity.
- Completing Active Directory domain binding.
- Customizing Image Templates.
- Creating desktop, session, native and RDSH application pools and assigning to users.

- Windows Client OS licensing (if applicable, and if so, compliance with applicable license agreements).
- Installing and configuring custom or third-party applications and operating systems on Image Templates or deployed VMs.
- Configuring and supporting User Environment Manager.
- Configuring and supporting Utility Server VMs.
- Configuring and supporting an NTP server usable by the Horizon Cloud tenant if using quad zero network routing (0.0.0.0) where all network traffic is routed via your corporate network.

2.4 Disaster Avoidance and Disaster Recovery

VMware will provide the following services with respect to disaster avoidance and disaster recovery:

- Data protection, such as routine backups for the Horizon Cloud infrastructure, including management and user-management interfaces owned and operated by VMware.
- Data and infrastructure restoration for the Horizon Cloud infrastructure, including management and user-management interfaces owned and operated by VMware.
- NOTE: VMware does not provide backup or recovery for any customer-managed assets such as customer-provisioned VMs and Images.

You are responsible for the following services with respect to disaster avoidance and disaster recovery:

- Data protection, such as routine backups, for the data and content accessed or stored on Horizon Cloud VMs or storage devices, configuration settings, etc.
- Data, content, VM, and configuration restorations for assets accessed or stored on your Horizon Cloud account.

2.5 Monitoring

VMware will provide the following services with respect to monitoring:

- Monitoring the Service Offering infrastructure, infrastructure networks, top-layer management and user-management interfaces, and compute, storage and network hardware for availability, capacity, and performance. VMware will also provide customers with a service summary level view of desktop model quota utilization and desktop state.
- Horizon Cloud data center status can be viewed at: <http://status.horizon.vmware.com/>

You are responsible for the following services with respect to monitoring:

- Monitoring the assets deployed or managed within your Horizon Cloud tenant infrastructure, including, but not limited to inside the guest operating systems, applications, inside the guest storage utilization, dedicated network connectivity / VPN, or application vulnerabilities, etc.
- Monitoring the assets deployed within your own corporate infrastructure that are critical to Horizon Cloud tenant operations, including, but not limited to Domain Controller, Active Directory, DHCP, VPN, and user roles and permissions.

2.6 Incident and Problem Management

VMware will provide incident and problem management services (detection, severity classification, recording, escalation, and return to service) pertaining to:

- Infrastructure over which VMware has direct, administrative, and/or physical access and control, such as Horizon Cloud servers, storage and network devices.

- Service software over which VMware has provided the customer administrative access and control, such as the Console.
- VMware-provided operating system templates to the extent that:
 - Published templates cannot be accessed
 - Published templates cannot be used for provisioning without modification
 - Published templates cause errors at first run time
 - There are substantial hangs or excessive delays in the retrieval of a template
 - The configuration of a published template affects the virtual machine's interaction with the hypervisor
 - Time synchronization issues (NTP) exist

You are responsible for incident and problem management (e.g., detection, severity classification, recording, escalation, and return to service) pertaining to:

- Your account settings under our administrative management (domain, 2-factor authentication).
- User-deployed and configured assets such as VMs, User Environment Manager, custom-developed or third-party applications, custom or user-deployed operating systems, network configuration settings, and user accounts.
- Operating system administration including the operating system itself or any features or components contained within it even if the source is supplied from VMware. For any operating system issues, please contact your operating system support organization.
- VPN integration.
- Performance of user-deployed VMs, User Environment Manager, custom or third-party applications, your databases, operating systems imported or customized by you, or other assets deployed and administered by you that are unrelated to the Console, Horizon Cloud Desktop Portal, or the Service Offering.
- Anything else not under the direct control and administration of VMware.

2.7 Change Management

VMware will provide the following change management elements:

- Processes and procedures to maintain the health and availability of the Horizon Cloud Administration Console and Horizon Cloud service components. Please see the VMware Horizon Cloud Service Level Agreement for maintenance and downtime details.
- Processes and procedures to release new code versions, hot fixes, and service packs related to the Horizon Cloud Administration Console, and Horizon Cloud service components.
- Notifications of service upgrades required by a certain date and time and requests for scheduling of maintenance windows before that time. VMware will attempt three scheduling requests to coordinate an appropriate time for the maintenance. If no response was provided after 48 hours of the third attempt, VMware will automatically schedule that upgrade if you fail to respond to the scheduling request or if you and VMware cannot agree on an earlier date and time before specified date and time.

You are responsible for:

- Management of changes to your VMs, User Environment Manager, operating systems, custom or third-party applications, and administration of general network changes within your control.
- Administration of self-service features provided through the VMware Horizon Cloud console and

user portal, up to the highest permission levels granted to you, including but not limited to VM and domain functions, backup administration, and general account management, etc.

- Cooperating with VMware when scheduled or emergency maintenance is required.
- Scheduled maintenance is defined as pre-scheduled maintenance that has the potential to impact the availability of the customer's environment.
 - Maintenance Windows: Scheduled maintenance is generally performed between the hours of 12:00AM – 6:00AM local data center time. However, on rare occasions it may be necessary for VMware to perform maintenance outside of this window, and VMware reserves the right to do so.
 - Advance Notice: A minimum of 24 hours advance notice will be given for scheduled maintenance.
- Emergency maintenance is defined as potentially impactful maintenance activity that must be executed quickly due to an immediate, material threat to the security, performance, or availability of the Service Offering. Every attempt will be made to provide as much advance notice as possible, but notice depends on the severity and critical nature of the emergency maintenance.

2.8 Security

The end-to-end security of the Service Offering is shared between VMware and you. VMware will provide security for the aspects of the Service Offering over which it has sole physical, logical, and administrative level control. You are responsible for the aspects of the Service Offering over which you have administrative level access or control. The primary areas of responsibility between VMware and you are set forth below.

VMware will use commercially reasonable efforts to provide:

- **Physical Security:** VMware will protect the data centers housing the Service Offering from physical security breaches.
- **Information Security:** VMware will protect the information systems used to deliver the Service Offering for which it has sole administrative level control.
- **Network Security:** VMware will protect the networks containing its information systems up to the point where you have some control, permission, or access to modify your networks.
- **Security Monitoring:** VMware will monitor for security events involving the underlying infrastructure servers, storage, networks, and information systems used in the delivery of the Service Offering for which it has sole administrative level control. This responsibility stops at any point where you have some control, permission, or access to modify an aspect of the Service Offering.
- **Patching and Vulnerability Management:** VMware will maintain the systems it uses to deliver the Service Offering, including the application of patches VMware deems critical for the target systems. VMware will perform routine vulnerability scans to surface critical risk areas for the systems it uses to deliver the Service Offering. Critical vulnerabilities will be addressed in a timely manner.

You are responsible for:

- **Information Security:** Ensuring adequate protection of the information systems, data, content or applications that you deploy and/or access on the Service Offering. This includes, but is not limited to, any level of patching, security fixes, data encryption, access controls, roles and permissions granted to your internal, external, or third-party users, etc.
- **Network Security:** The security of the networks over which you have administrative level control. This includes, but is not limited to, maintaining effective firewall rules, exposing only communication ports that are necessary to conduct business, locking down promiscuous access, etc.

- **Security Monitoring:** Detection, classification, and remediation of all security events that are isolated with your Service Offering account, associated with VMs, operating systems, applications, data, or content, surfaced through vulnerability scanning tools, or required for a compliance or certification program in which you are required to participate, and which are not serviced under another VMware security program.
- **Compromised Desktops:** Any compromised desktops and resolving related issues. VMware reserves the right to suspend desktops or whole customer accounts if compromised desktops are detected to protect VMware's infrastructure and business operations.

2.9 Image Templates

VMware will provide a catalog of supported virtual desktop Image Templates that you may deploy into your Service Offering environment. The deployment and use of such templates will be subject to the Third Party Terms located at <http://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/support/vmware-horizon-cloud-hosted-third-party-terms.pdf>. VMware will provide these templates, test them for quality, check for viruses, and install security patches before making them available in the Administration Console. VMware will also maintain and update these cataloged templates from time to time. You are responsible for deploying and configuring the virtual desktop Image Templates that you choose to use, activating related licenses, and maintaining compliance with such license terms.

To comply with VMware's legal obligations to our third-party licensors, you will not be permitted to export, download, or remove certain templates or any installed forms of certain templates for installation or use outside of the Service Offering. For more details regarding the licensing of Desktop Image Templates, please see the Third-Party Terms

You may implement or import your own Image Templates so long as you have the legal right to deploy and use the software contained in such templates.

Templates that are provided by VMware but that are infrequently used, out-of-date, or no longer supported may be removed at any time.

2.10 Template Upload

The Service Offering will allow custom templates. All templates must use Open Virtual Machine Format (OVF). Customers can coordinate with VMware to upload any custom templates. Once transfer is completed, VMware will mount the received template into the customer account, and thereafter it will be usable as an Image Template. Customers may also use the self-service image upload function available, as a beta offering, as part of the Horizon Cloud Helpdesk Console.

3. Business Operations

This section summarizes processes for ordering, scaling, renewing, suspending, and terminating the Service Offering.

3.1 Ordering and Invoicing

Subscription Ordering

- Initial orders for the Service Offering include core named or concurrent user licensing, Host Capacity, Support, IP Address, and Internet Bandwidth components for a single Service Offering instance ("Service Identifier" or "SID") as described in further detail in Appendix A. The initial purchase establishes the default billing relationship that applies to all transactions for that SID for the duration of the contract; for example, if the initial order is placed through a VMware Authorized Reseller, then any subsequent payments related to that Service Identifier will be made through that Reseller. This billing relationship may be modified at time of subscription renewal.

- When you order the Service Offering, you will be required to fill out a detailed provisioning questionnaire provided to you by VMware (via email or link to the online account configuration portal). The information you provide is required to provision your order. It is your responsibility to complete and return the questionnaire within 10 business days of submitting your order. Your subscription term and Billing Period will begin on the earlier of (i) the date the service has been provisioned or (ii) 60 calendar days after the order date (irrespective of whether you complete the provisioning questionnaire). If you do not provide a completed questionnaire, we will provision the order on a commercially reasonable basis. In that case, your subscription term will terminate one year after the beginning of the term without further extension. VMware can elect to delay the start of the Billing Period at our discretion, and we will notify you via email if such action is taken.
- Additional capacity or services, such as additional Hard Disk Storage, may be purchased at the time of your initial order or through the My VMware portal at any time during the subscription term. Additional terms and fees may apply to such additional services. Those additional orders will terminate concurrently with the term of the initial order.
- Account changes to capacity can be made by ordering additional capacity or services any time before the end of the contracted term.
- Changes to the VMware Authorized Reseller associated with a SID may be made at the time of renewal by contacting VMware.
- Service capacity reductions must be coordinated with VMware at the time of subscription renewal and will require a new order for the reduced Service Offering capacity. However, if the capacity associated with your reduced Service Offering order is less than the capacity required to sustain your then-current workloads, VMware will continue to bill you for the excess capacity at the then current rates until you have released the excess capacity and VMware has reclaimed it. Reduction orders must be submitted to VMware a minimum of 30 calendar days prior to the date of subscription renewal. Reduction orders on subscription terms less than 12 months must be submitted to VMware a minimum of five calendar days prior to the date of subscription renewal.
- Order contents are not considered available for use until fulfillment is fully acknowledged by VMware.

Invoicing

- If you purchase the Service Offering directly from VMware, VMware will invoice you for all ordered services within thirty (30) business days after the beginning of each Billing Period. If you purchase the Service Offering through a VMware authorized reseller, the reseller will invoice you as mutually agreed between you and the reseller.
- Plan Charges, as defined in Appendix A, will be invoiced by VMware for the then-current Billing Period unless you choose a prepaid Service Offering SKU, in which case you will be billed for the ordered subscription term. If the Service Offering is not provided for the entire Billing Period, then the fees for such period will be prorated (a) from the day the Service Offering was first provided through the end of the Billing Period, or (b) from the beginning of the Billing Period through the last day in the Billing Period on which the Service Offering was provided, as appropriate.

3.2 Add-On Capacity

Add-on capacity (such as additional hosts and storage) may be purchased at any time to meet new or expanded requirements.

- Additional desktop capacity and storage may be added via the My VMware portal or by issuing a purchase order to VMware or to your authorized VMware reseller.
- The subscription term for add-on capacity or services will be set to terminate at the same time as the core subscription term for the SID.

3.3 Renewal

VMware reserves the right to not renew any SID at the end of its subscription term, in which case we will notify you 30 days prior to the end of the subscription term. Renewal options for each SID may be selected using the My VMware administrative portal.

Auto-Renewal (the default setting)

Except as set forth in this Section 3.3, each SID will automatically renew using the current configuration and the existing subscription term duration. The then-current SKUs and pricing, based on the applicable price list at the time of renewal, will be applied to the renewal term. You may opt out of auto-renewal by changing your renewal option setting for the SID within the My VMware Portal available at <https://my.vmware.com>. The deadline to change the renewal option is 30 days prior to the last day of the then-current SID subscription term.

Modify Subscription Service at End of Term

If you select the renewal method “Modify”, you will be contacted prior to the end of the SID subscription term to discuss your renewal options. Selecting “Modify” as the renewal method setting allows you to modify your Service Offering configuration and to make changes to your reseller relationship, if applicable, by both changing your setting for the SID within the My VMware Portal available at <https://my.vmware.com> and issuing a new purchase order. If you do not make any changes to your current SID profile and/or you do not issue a new purchase order for the new Service Offering to VMware or to your VMware authorized reseller (if applicable) by the deadline specified below, then your existing SID, as then currently configured, will automatically renew. If you purchase the Service Offering through a VMware authorized reseller, a manual renewal is the only time you may elect a change in your reseller relationship for that specific SID. The deadline to change the renewal option is 30 days prior to the last day of the current SID subscription term.

Terminate at End of Subscription Term

You may terminate your existing SID subscription by changing your setting for the SID within the My VMware Portal (available at <https://my.vmware.com>) to “Cancel”. When this option is set, your access to the Service Offering will expire at the end of the SID subscription term. The deadline to select the termination option is 30 days prior to the last day of the current SID subscription term.

3.4 Suspension and Re-Enablement

- During the time a SID is suspended by VMware for delinquent payment or any other reason as set forth in the Terms of Service, VMware will restrict access to all SIDs and block all traffic across their Public IP addresses. VMware will retain SIDs with configurations and data intact until the issue is resolved or the subscription expires or is terminated.
- SID re-enablement will be initiated immediately upon resolution of the account issues that led to suspension; access to the Service Offering and traffic across IP Addresses will be restored.

3.5 Termination

- Full termination of an SID due to contract expiration, termination, cancellation, or any other cause will result in permanent loss of access to the environments, discontinuation of account services, and a deletion of such environments, configurations and data pursuant to applicable VMware policies.
- Data from a terminated SID will not be retained by VMware beyond termination date of that SID.

Appendix A – Ordering

This Appendix A to the Service Description outlines the components that may be purchased by the customer in its initial or subsequent orders.

Definitions:

“Application Stacks” or “Application Bundles” are containerized applications that can be entitled to users accessing a VDI Session.

“Bandwidth” is the network connectivity from your Service Offering environment to the public Internet using VMware’s Internet service providers. Bandwidth is consumed when data is either transferred or received by your purchased class of service.

“Billing Date” is the date when VMware will periodically bill for the Service Offering. Billing Dates will occur monthly unless otherwise indicated.

“Billing Period” is the period for which the customer is being billed for use of the Service Offering. Billing Periods are monthly and are related to the provisioning of your SID, unless otherwise indicated.

“Dedicated Desktop” is a desktop that retains user entitlements to that desktop as well as any changes done to that desktop’s operating environment by the user from one session to another.

“Desktop Model” is a bundle of compute, memory, storage and bandwidth capacity that consists of a multiple of Standard Desktop Capacity and that can be instantiated as a desktop. For example, a desktop model may have twice as much resources as a Standard Desktop Capacity.

“Core Components” are Desktop Models that include a public IP Address and support, and storage for 10 Image Templates.

“Floating Desktop” is a desktop that does not retain any changes from one session to another.

“Graphical Workstation Desktop Capacity” is a fixed bundle of compute, memory, storage, vGPU memory and bandwidth capacity that can be instantiated as a desktop.

“High Availability” refers to the ability to restart a provisioned workload on a different server in the cluster, if its current server fails to function properly. This prevents users from being unable to access their workload in the event of a single server failure. Some data loss may occur during this transition from one server to another in the cluster.

“Image Templates” are master images that can be modified in the Administration Console and that are used to create virtual desktops.

“IOPS” (pronounced “eye-ops”) means Input/output operations per second, and is a performance measurement used to characterize computer storage devices like hard disk drives (HDD), solid state drives (SSD), and storage area networks (SAN).

“IP Addresses” are used to provide connectivity from the public Internet.

“LUN” in computer storage, is a logical unit number used to identify a logical unit, which is a device addressed by the SCSI protocol or Storage Area Network protocols which encapsulate SCSI, such as Fiber Channel or iSCSI

“NAT” is a method of remapping one IP address space into another by modifying network address information in Internet Protocol (IP) datagram packet headers while they are in transit across a traffic routing device.

“Plan Charges” are those Service Offering components that you have committed to purchase and are recurring during the subscription term without regard to use. These charges will be invoiced for the then-current Billing Period as described in Section 3.1 of this Service Description.

“Published Application” is an application running on a remote server but being accessed and used on a local user device as if it were running locally. What is happening is the application screen is being streamed

back to the user's local device, and the user's interactions are being streamed back to the remote application.

“Standard Desktop Capacity” is a fixed bundle of compute, memory, storage and bandwidth capacity that can be instantiated as a desktop.

“Storage” contains block level VM capacity surfaced to you through your purchased class of service. Storage is ordered in the increments defined below. Storage usage is intended for core operating system and applications only.

“Support” is the service delivered by VMware as set forth at <https://www.vmware.com/support/policies/saas-support.html>.

“Terminal Services” (known as Remote Desktop Services (RDS) in Windows Server 2012 and later) is a component of Microsoft Windows that allows a user to take control of a remote computer or virtual machine over a network connection.

“Third-Party Licenses” are those licenses for third-party software that are made available to you as optional services (either through the Service Catalog or otherwise).

Ordering Core and Add-On Components

A Horizon Cloud with Hosted Infrastructure subscription is comprised of two categories of SKUs: (i) a Core SKU and (ii) add-on SKUs. Each subscription account must contain one core SKU, with the remaining SKUs being add-ons.

For Horizon Cloud, the core SKU is a user licensing SKU, which can be either a named user or concurrent user subscription entitlement for a particular term (i.e., 1, 12, 24, or 36 months). The user entitlement governs how many **unique** users (named) or **concurrent** user sessions (concurrent) can access VDI and / or RDSH workloads on a single tenant account within the Service Offering. The user license SKU can be used either with this Service Offering or with the VMware Horizon™ Cloud Service® on Microsoft Azure® service offering. The quantity of licenses to be used with this Service Offering must be provided to VMware at deployment time or future add-on purchase time.

The two service classes of user licenses are:

1. **Horizon Cloud Apps:** provides the customer rights of use for RDS Published Apps, RDS Published Desktops, and User Environment Manager,
2. **Horizon Cloud:** Includes Horizon Cloud Apps and adds Full Clone and Instant Clone VDI Desktops.

Add-on SKUs can be purchased for additional user license quantities, upgrading from Horizon Cloud Apps to Horizon Cloud Apps and Desktops, as well as host capacity SKUs such as Standard, M10, M60, Storage, and network options (e.g., Direct Connect). Add-on SKUs purchased together with the core SKU will have the same subscription term as the related core licensing SKU; if purchased after the core SKU, they will expire concurrently with the core SKU.

As an example, a new customer order could be as follows:

- 1 Core Horizon Cloud Concurrent User Entitlement (50 users)
- 5 Add-on Horizon Cloud Concurrent User Entitlement (10 user) (that is, an additional 50 users)
- 4 Add-on Standard Capacity Host
- 3 Add-on 1TB Add-on Storage

Core and add-on components are ordered for specific subscription terms. Each component will be invoiced and payable monthly, or invoiced and payable as a lump sum if a prepaid Service Offering subscription is ordered. One core licensing SKU must be ordered for each set of SKUs under the same order (subscription duration, discount level, etc.).

For example, a customer that has three tenants of standard capacity -- West Coast Production, East Coast Production, and East Coast Staging -- will require at least one core licensing SKU and 6 standard host

SKUs, 2 hosts (or roughly 150 usable SDCs after HA) for each tenant. (Note that SKUs are defined at the region level, not at the data center level. A region may contain one or more data center locations.)

When purchased with Standard or Graphical Workstation Capacity, each tenant comes with the following standard options:

- IP Addresses: one public IP Address for access to the Administration Console and Desktop Portal/Broker
- Bandwidth: Each account is provided an aggregate bandwidth amount equal to the sum of desktop peak bandwidths as totaled from the standard desktop capacity quantities ordered². Average expected bandwidth is also listed for each model for customer remote site bandwidth planning purposes.
- Support: 24x7 Production Support

Standard Capacity Desktop Models

In order to provision desktop, the customer must decide which Desktop Model to use, which governs how much CPU, Memory, and Hard disk is allocated to such VMs, as well as potentially advanced option availability such as Soft3D. Each VM instantiated consumes one or more Standard Desktop Capacity (SDC) units as specified below.

Desktop Model	Value	Professional	Premium	Performance
vCPU	1	2	4	8
vRAM (GB)	2	4	8	16
vHDD (GB)	30	60	120	240
Average IOPs	20	40	80	160
Average Bandwidth (Kbps)	100	500	500	500
Peak Bandwidth (Kbps) per Core Size e.g. 50	1000	2,000	2,000	2,000
Soft3D Available	No	Yes	Yes	Yes
Workload Type	VDI	VDI	VDI	VDI
Windows 7,8 Client OS	Yes	Yes	Yes	Yes
Windows 10 Client OS	Yes ³	Yes	Yes	Yes

² Example: An account with 150 standard desktop capacity will have 150Mbps of total aggregate bandwidth available for all the account's desktops

³ Please note: Value desktops are not recommended to run Microsoft Windows 10 due to the amount of base memory

Desktop Model	Value	Professional	Premium	Performance
Windows Server OS	Yes	Yes	Yes	Yes
Standard Desktop Capacity	1	2	4	8

Due to service improvements and performance tuning, VMware reserves the right to modify the Hosted Apps Server specifications and quantities so long as the total capacity of Hosted Apps Servers purchased is of equal to or greater than the specification in this Service Description. Customers who provisioned an older specification of the RDSH server will be required to rebuild their pools to take advantage of the new specification, as mixed RDSH server specifications are not supported in a single tenant. Customers can still purchase the new specification SKUs and provision the old specification so long as equivalent resources (compute, memory, storage) were purchased for provisioning under the retired specification.

NOTES: Soft3D may only be used with compatible guest OS versions. vCPU performance is not restricted within each VM. vCPU is instead used as a factor in determining host density based on average consumption of 350Mhz per vCPU. Individual VMs are allowed to burst above 350 MHz per vCPU in order to ensure optimal aggregate performance. This could lead to potential resource contention and end user experience degradation on affected VMs. It is the customer's responsibility to ensure their VMs are properly sized to the appropriate desktop model to ensure sufficient resources are available to all VMs.

[CONTINUED ON NEXT PAGE]

consumed by the OS leaving very little additional memory available for applications without a severe performance degradation.

Hosted Application Capacity Models

The following is the specification for the Hosted Application Server:

Desktop Model	Hosted Application Server
vCPU	8
vRAM (GB)	32
vHDD (GB)	240
Average IOPs	320
Average Bandwidth (Kbps) per session	500
Peak Bandwidth (Kbps) per session	2,000
Soft3D Available	No
Workload Type	Published Desktops and/or Apps
Windows 7,8 Client OS	No
Windows 10 Client OS	No
Windows Server OS	Yes
Standard Desktop Capacity	8

[CONTINUED ON NEXT PAGE]

Graphical Workstation Capacity Desktop Models

In order to provision graphical workstation VMs, the customer must decide which model to use; that governs how much CPU, Memory, and Hard Disk capacity is allocated to those VMs. Each VM instantiated consumes one or more M10 Desktop Capacity units or M60 Workstation Capacity units as specified below.

Desktop Model	M10 Professional	M10 Premium	M60 Professional	M60 Premium	M60 Performance
vCPU	2	4	4	8	16
vRAM (GB)	4	8	16	32	64
vHDD (GB)	30	60	120	240	480
vGPU (GB)	1	2	2	4	8
Average IOPs	20	40	80	160	320
Average Bandwidth (Kbps)	500	500	500	500	500
Peak Bandwidth (Kbps) per Core Size e.g. 50	2,000	2,000	2,000	2,000	2,000
Workload Type	VDI	VDI	VDI	VDI	VDI
Windows Client OS	Yes	Yes	Yes	Yes	Yes
Windows Server OS	Yes	Yes	Yes	Yes	Yes
M10 Capacity	1	2	NA	NA	NA
M60 Capacity	NA	NA	1	2	4

Due to how vGPU is associated with VMs, customers must specify (at the time of tenant deployment) the workstation models they plan to use on which hosts. Once operational, changes to this configuration can be requested by submitting a support request to VMware and are addressed on a best effort basis.

See Appendix C for Guest VM compatibility details.

Add-on Storage

In order to use certain Service Offering capabilities such as User Environment Manager, customers will need to purchase add-on storage. Add-on storage can be purchased in 1 Terabyte increments and allocated in 1, 2, 4, 8, and 12 TB LUNs. -on storage performs at 1.5 IOPS per gigabyte.

Utility Servers

Service Offering utility VMs are intended for use with desktop and Terminal Services applications in direct support of the VDI and remote application service delivery functions. An exception is made for customers that wish to use a VM instance as a utility server (such as domain controller, active directory server, DHCP relay or file server). Anti-virus and OS lifecycle management tools (such as SCCM) are also allowed in limited quantities but not recommended due to their transactional nature and potential adverse impact on the performance of desktop VMs. To protect the integrity of the Service Offering, VMware reserves the right

to limit the resources available to the utility server, or to require the customer to upgrade the utility server specification (by consuming additional SDC units), or ultimately to remove the utility server from the tenant environment. Utility servers have the following administration limitations:

- They will be initially deployed by VMware by using an existing catalog image or customer-provided image
- All utility servers must fit within the specification of an existing desktop model specification.
- All utility servers must be compatible with the underlying ESX host version on which they will be deployed. Maintaining OS compatibility through ESX host upgrades is a customer responsibility.
- Utility Servers can only be deployed with a single Network Interface Card (NIC).
- Max E:/Drive size per Utility Server is 12TB
- E:/Drives can only be allocated in 1,2,4,8, and 12TB sizes
- The utility servers can only be accessed either internally from the customer environment or via the Helpdesk Portal
- The utility servers can only be administered by an authorized customer administrator accessing the VM directly via remoting protocol or via built in web application running on the server
- There is no ability to customize the utility servers' deployment configuration with regards to networking, availability, load management, infrastructure performance or business continuity
- Number of Utility Servers allowed:
 - Up to 200 SDC units: 3
 - Up to 1,000 SDC units: 6
 - Plus one additional Utility Server for every additional 1,000 SDC units purchased.
 - These numbers do not include utility servers specifically used with User Environment Manager.
- The following are not supported for Utility Servers:
 - Load balancing, NATs, or custom firewall rules: Utility servers are intended to run applications that support cloud desktop deployments. They are not designed to support server applications that require public internet access or advanced infrastructure configurations.

One VM in the tenant environment may be used as a utility server (with a Professional Desktop VM specification) without drawing from the SDC quota purchased. Any increases to the free utility server or additional utility servers will count towards the desktop quota purchased by subtracting the total CPU and memory resources consumed for utility service as expressed in terms of whole number of desktops from the total VMs purchased.

Except for approved utility server functions, any use of server-based applications or transactional applications is not supported and may interfere with performance and user experience. Utility servers may not intercept network communications between the provisioned VMs and platform components. Encrypted hard disks are not allowed within the Service Offering VM environment. Customers that need secure disk services should consider redirecting user data to their data center or should purchase a separate IaaS cloud instance and deploy an encrypted file server for user data.

[CONTINUED ON NEXT PAGE]

Utility Server recommendations for entry level enterprise accounts (up to 4 standard hosts: 400 SDCs & 200 Users):

Recommendation	Server Function	vCPU	GB RAM	GB HD
Basic	AD/DNS/DHCP #1	2	4	60
Basic	UEM/AAU/Fileshare #1	2	4	60(to 0.5TB with addon storage)
Basic	IDM Connector #1	4	8	50
HA	AD/DNS/DHCP #2	2	4	60
HA	UEM/AAU/Fileshare #2	2	4	60(to 0.5TB with addon storage)
HA	IDM Connector #2	4	8	50

UEM = User Environment Manager
AAU = Agent Auto Update

Fees and Charges

When you order directly from VMware, we will invoice you based upon the fees listed in VMware's then current applicable price list, or as otherwise provided in the order. When you order from a VMware authorized reseller, that reseller will invoice you based upon its price list or as otherwise agreed with you.

Orders that add services or capacity to an existing SID may be direct with VMware or a placed with your reseller depending on how the original SID order was placed. and the subscription term(s) for such additional services or capacity will be coterminous with the end of the SID subscription period. That is, if a reseller is already billing you for the SID, then your order for additional services or capacity will also be placed through that reseller, and the price that you agree to pay and other applicable terms will be as agreed with that reseller.

Usage Restrictions

Load Testing

Customer load testing (such as automated or manual login stress tests) is prohibited without prior approval from and coordination with VMware. Customers who wish to perform such tests must submit a support ticket and coordinate the planning of such tests with VMware to ensure minimal interference with performance and user experience.

SMTP Port 25

VMware will not allow port 25 egress out of the VMware-provided internet connection. TCP Port 25 (usually used for SMTP) is subject to egress filtering and not allowed for usage with no exceptions. A customer can use port 25 on VPN or Direct Connect.

Network Management

Customer will not have access to Horizon Cloud edge (router) appliance and any ability to configure or customize the firewall and network address translation rules set and managed by VMware.

Dedicated connectivity active/passive redundancy (via BGP only) is supported, but the customer will have to choose which link is active and which link is the backup, and also will be responsible for configuration to accomplish auto-failover of link in case of active link down.

Customers may request up to 10 desktop networks to be available in the tenant environment and up to 10 VPN connections to that tenant.

In-guest VPN usage is not allowed and will block VMs from being accessible by end users.

Appendix B - Summary of items included and available for purchase separately

Included in the Service Offering:

- Infrastructure for desktops, hosted apps servers and images (based on SKUs ordered)
- Up to ten 60GB VMware image templates per account
 - Choice from Microsoft Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2012 R2
- One-time walkthrough of administration console (two hours) at account setup
- Optional:
 - SKUs:
 - Additional storage in 1TB increment for use with utility servers, and User Environment Manager
 - Direct Connect for dedicated connectivity bridging
 - Services included:
 - One VM to serve as a utility server (such as: domain controller, DHCP relay, or file server)
 - Sized to Professional Desktop specification
 - Additional utility servers can be created but will consume desktop quota equal to the total amount of vCPU/Memory used by the utility servers.
 - One-time VPN and network configuration per Service Offering data center location setup

Available for purchase separately through *VMware Professional Services*; not included in the Service Offering core or add-on SKUs:

- Onboarding Packages (see next page for details)
- Project Management
- Use Case Assessment & Definition
- Desktop Engineering and Image Management
- Miscellaneous professional services requests

Additional services available for purchase from *third parties* that may be required to complete the setup of the Service Offering:

- Dedicated connectivity service from customer's data center to VMware's data center (up to four connections supported per location)
- Direct Connect setup inside the Service Offering data center to the customer's tenant instance

[CONTINUED ON NEXT PAGE]

Onboarding Packages

The Service Offering has the following onboarding packages that can be purchased for customers that prefer a guided onboarding experience.

Horizon Cloud Starter Edition	Onboarding Basic	Onboarding Plus
<ul style="list-style-type: none"> • Bundled with Starter Edition • 50 user licenses included • VPN Setup Included • Identity Manager • User Environment Manager • Production-level support • Add-ons not supported • Additional capacity not supported • 1 standard host with either 120 Standard Capacity Units or 5 Hosted Application Capacity Units • Environment auto-renews every 30 days unless canceled 	<ul style="list-style-type: none"> • Sold Separately • 0-249 desktops • IPSEC VPN 	<ul style="list-style-type: none"> • Sold Separately • 250 or more desktops • Advanced Networking (Direct Connect / ECX)

[CONTINUED ON NEXT PAGE]

Package Feature Comparison:

	Horizon Cloud Starter Edition	Horizon Cloud Onboarding Basic	Horizon Cloud Onboarding Plus
Training & Guidance			
Delivery Method	Remote	Remote	Remote
Platform Administration & How-To Training		Introductory	Guided
Deployment Services			
Pre-Onboarding Kickoff	✓	✓	✓
Standard IPSEC VPN Setup	✓	✓	✓
Active Directory Domain Bind	✓	✓	✓
Advanced Networking – Direct Connect			✓
VMware “Provided” Gold Pattern & Paring	Desktop or Server Image	1 Desktop and 1 Server	Up to 4 Images
Utility Server Creation for AD, DNS, DHCP, Storage	✓	✓	✓
Island Account Setup - if required	✓	✓	✓
Assisted End-to-End Platform Functionality Test	✓	✓	✓
How-To Walkthroughs		✓	✓
Optimization and Integration Services			
User Environment Manager (UEM) User Configuration & Application Profiles	Basic	Basic	Advanced
Customer Environment Assessment and Guidance			
VMware Workspace ONE configuration and guidance (IDM)	Single Authentication	Single Authentication	Multiple Authentication True SSO

* UEM Basic

- Assistance with default setup, UEM Share, UEM profile Share. Knowledge transfer of basic setup items including printer/drive mapping and the VMware Smart Polices feature of User Environment Manager

* UEM Advanced

- Additional UEM setup including knowledge transfer of application profiling (for a single basic application) and conditional policies

Appendix C - Horizon Cloud Guest OS Compatibility Table

The Service Offering supports the use of the following Windows operating systems on virtual machines hosted within the Service Offering.

Operating System	Patch / SP	32 / 64 bit	Additional Variants / Specs	VDI / RDSH	Instant Clone Capable
Win7	Base / SP1	Both	Professional / Enterprise	VDI	Yes
Win 8.1		64	Professional / Enterprise	VDI	
Windows 10	See knowledge base link below for latest version support	64	Professional / Enterprise	VDI	Yes
Win Server 2008 R2	SP1	64	Datacenter Edition	Both	
Win Server 2012 R2		64	Standard, Data Center	Both	
Win Server 2016		64	Standard, Datacenter	Both	

Supported languages are English and Japanese. Supported language packs are French, French Canadian, and German.

For supported build versions of Microsoft Windows 10, see: <https://kb.vmware.com/s/article/2149393>

Appendix D – Microsoft Licensing Recommendations

The following are recommendations only. Please verify licensing requirements and restrictions with your Microsoft Licensing distributor.

The Service Offering does not provide any guest OS licensing required for the full use of the Service Offering. All necessary Microsoft licenses for operating Horizon Cloud Desktops and Hosted Apps Servers are available from the customer's preferred Microsoft Licensing distributor.

Microsoft windows 7, 8.x, and 10 OS licensed guest VMs require Microsoft Virtual Desktop Access (VDA) subscription license or Microsoft Software Assurance for Windows.

Windows Server VMs used for either VDI desktops, RDSH servers or utility services must use Windows Server OS licenses. For VDI and RDSH workloads, customers are advised to bring one Windows Server Datacenter Edition for each host. In every standard (non vGPU) host cluster, there is one host reserved for High Availability, irrespective of how little the customer purchases. For customers planning to use only a few Windows Server VMs as utility services, please provide sufficient licensing (Standard or DC Edition) for a minimum of two hosts. Please consult with your VMware deployment services representative for complete details on the number of hosts and VMs that you are required to license from Microsoft.

Note: Since Horizon Cloud's underlying hardware and Microsoft's licensing policy may change over time, you must check with your VMware technical specialist for the latest recommendations.

Appendix E – Service Offering Feedback

We love hearing from our customers! If you would like to share your successes, difficulties, or other ideas on how we can improve the Service Offering, log into the Admin Console, click on the “Help” icon in the top right of the screen, and then click on “Give Feedback”.

