

Paperspace

Deployment Guide

Cloud VDI



Paperspace Whitepaper: Deployment Guide

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Overview

A full VDI implementation in the cloud

Paperspace provides a complete virtual desktop solution in the cloud without any of the headaches of on-premise VDI. It's easy to setup, simple to manage and drastically cuts IT costs. Paperspace enables employees to securely access their applications and files from any device, anywhere in the world.

User Management

Centralized control over your entire team

Paperspace offers two types of identity management: **Basic** (managed by Paperspace) and integration with **Active Directory**. A combination of both options is supported simultaneously. Integrating with Active Directory is not required during account setup and can be added anytime.

Basic

With Basic setup, identity management is provided by Paperspace using an email address based system. Its the quickest way to get started and requires minimal management.

Active Directory

Organizations that require Active Directory (AD) will need to connect to an Domain Controller (DC) on-premise, in your Paperspace network or in a third-party site. See the following section on Domain Controllers for more details.

To get started, domain credentials with machine join rights must be provided (using a secure web-based interface) so the necessary computer and user objects can be added to the domain. Paperspace employs LDAPS (LDAP over SSL/TLS) to securely communicate with your AD DC.

After the initial setup is complete, users can login to their machine using their domain credentials through the web or the native app.

Domain Controller

There are a few different scenarios to choose from for placing your Domain Controller (DC). A Paperspace Private Network is required in all scenarios.

Paperspace Hosted DC

- Within your Paperspace Private Network (new domain only)
- *No VPN required*

Existing Customer DC

- Within your corporate network
- *VPN required*

Existing Customer DC with Replica

- Primary DC within your corporate network with additional Replica DC hosted within your Paperspace Private Network for increased robustness and redundancy.
- *VPN required*

See the following section on Networking to understand how to connect to an on-premise or third-party DC.

Networking

Full cloud or hybrid cloud

Paperspace offers a few different scenarios which provide varying levels of logical isolation and connectivity.

Default Networking

In the Default Networking configuration, every machine resides within its own isolated network and cannot communicate with other machines, shared drives or other devices.

Note: Unless a public IP address is added, all machines on a Default Network are not directly addressable on the web.

Private Networking

Private Networking can be added which establishes a dedicated virtual private network, logically isolated from other networks in the Paperspace cloud. Launching machines into your Private Network will allow them to communicate with each other. This virtual network closely resembles a traditional home or office network.

Private Networking is required for AD integration. The AD DC must reside within your Private Network unless a VPN is configured.

Note: As in the Default Networking configuration, machines cannot be addressed directly from the internet unless a Public IP address is added.

VPN

Private Networking is a prerequisite for establishing a VPN tunnel between your Paperspace network and other networks. Once in place, a VPN Private Gateway can be attached to your Private Network. When the VPN has been provisioned and configured on the customer side, all machines and shared drives within your Paperspace network will be directly addressable on your corporate network and visa versa. Paperspace supports **IPsec** and **OpenVPN** for VPN protocols.

A VPN is required for integrating with an AD domain that resides outside of your Private Network.

Machines

Provisioning and managing desktops

Overview

Paperspace machines are fully persistent desktops. Machines come in different sizes and the billing options are hourly, monthly and annual for all types. The **Air**, **Standard**, **Advanced** and **Pro** are default configurations for the vCPU, RAM and vGPU allocation. The disk is separate and can be expanded independently.

Regions

We currently offer multiple datacenter regions:

- **US East (NY2)** East Coast US, near New York City
- **US West (CA1)** West Coast US, near San Francisco
- **EU (AMS1)** Central Europe, near Amsterdam

Operating System

Paperspace offers a set of stock operating system templates including most recent versions of Windows. See the Templates section below for information on creating your own custom images.

Windows is either licensed by Paperspace or by the customer (BYOL). See the Licensing under the Templates section for more details.

Adding, Removing & Customizing Machines

Machines can be provisioned in the Console by a team administrator. If a custom Template was created, it will be an option in the list of available templates when creating a machine. If AD is configured, an option for adding an AD username will be present in the form and the machine will be AD joined automatically after it is created. Machines can be modified or removed anytime.

Note: Increasing the disk size is permanent and is not reversible.

Application, Settings & Patch Management

Paperspace does not control any applications, settings or patches on the machine, with the exception of the Paperspace Agent which is responsible for establishing the remote connection. The customer is responsible for adding a custom anti-virus/firewall rules (if necessary), maintaining Windows Updates and configuring software, settings and security policies on the machine. Using AD or third-party tools is supported.

The default user on the machine is a local admin with full control over the machine. If using AD, the user inherits whatever policies are dictated by AD.

Drives

Network attached storage in the cloud

Drives can be provisioned by a team administrator in the Console and mounted on any machine within your private network. Shared Drives behave similar to a local office file server (commonly referred to as network attached storage or NAS) and are used to share files between machines.

Active Directory can be used to configure Shared Drive permissions and access.

Snapshots

Create backups on the fly

A Snapshot captures the state of a machine at a point in time which you can rollback to anytime. Snapshots can be created and destroyed on the machine page. Snapshots can be created while the machine is running.

Templates

Setup once, clone infinitely

Stock Templates

Paperspace offers stock templates which include only the operating system and Paperspace Agent. These can be used to configure a Custom Template:

Custom Templates

A custom template can be created from an existing VM. The custom template contains the entire disk image of the original VM. Once a template has been successfully created, it appears as a custom template in the Templates tab in the Console.

Custom Templates & Active Directory

Templates must not be AD joined. Templates are meant to include only the base operating system and programs/settings configured as needed. When a custom template is used to provision a new machine for an AD user, it will be automatically joined to your domain.

Operating System Licensing

Paperspace offers two licensing scenarios for Windows. Paperspace is permitted to license Server editions of Windows only. BYOL must be used for Desktop versions of Windows but can also be used for Server editions.

- **Paperspace Licensed:** Paperspace licenses Windows on behalf of the customer using our Service Provider License Agreement (SPLA) with Microsoft.
- **BYOL:** A customer can use their own license which is referred to as "Bring Your Own License" (BYOL). BYOL is available for enterprises with existing Microsoft Volume License agreements.

Receiver

HTML5, native application & features

Web Browser

Paperspace can be accessed directly in a web browser, on most modern devices. Chrome is recommended for optimal streaming performance. The web browser edition is ideal for Chromebooks and when accessing

Paperspace from a new device (since there's no install necessary). For everyday use, we recommend using our native app.

Native Application

The native app is supported on Mac, Windows and Linux clients. It offers improved fullscreen support, hotkey forwarding and faster streaming performance.

Features

There are several features available in the receiver. The following is a list and illustrates how they differ between the web browser edition and the native app.

- **Drag and Drop:** You can easily upload a file or folder to your Paperspace machine if you drag and drop it on a running machine. This feature works in both a web browser and native app.
- **Multi-monitor:** Paperspace currently supports up to two monitors. To add a second display, click "Add Display" in the native application. Experimental support in the web browser edition is also available.
- **Copy/Paste:** You can copy and paste text between your local device and your Paperspace machine on all platforms.
- **Hotkeys/Keyboard shortcuts:** Our native app has the ability to "forward" keyboard combinations to your remote machine. This is not possible in a web browser.
- **USB Redirection:** The native app includes the ability to "redirect" a USB port into the VM it is connected to. This can be used with any USB device.
- **Bitrate Adjustment:** Choose from a variety of bitrate options to adjust the desired responsiveness, bandwidth consumption, and image quality. An option for Auto adjustment, which will dynamically modulate the bitrate according to available bandwidth.
- **HiDPI:** For monitors with extremely high resolutions, content can become too small to read unless HiDPI scaling is enabled within the operating system (effectively increasing the size of all content). Toggling between these two modes is an available option in the on-screen menu and the scaling level is determined by the local device settings.

API

Automate your infrastructure

The Paperspace API allows you to manage resources within your Paperspace account programmatically, using simple HTTP requests. The endpoints are intuitive and powerful, allowing you to easily make calls to retrieve information or to execute actions.

Scripts

Paperspace can run a script automatically on the startup of a paperspace virtual machine. This feature is similar to `user_data` in other cloud provider frameworks. Scripts can be written in bash for Linux and Powershell for Windows.

Management

Users, machines, network, AD and consolidated billing

The Paperspace **Console** is a centralized location where team administrators can provision and manage machines, networks, Active Directory and drives. The interface also includes consolidated billing, security settings and account settings.

Users (non-admins) have access to a limited version of the Console with options to change their username and password as well as enable Two-Factor Authentication. They cannot order new machines or view billing information.

Getting Help

Support Channels, Help Center & Tutorials

The Paperspace support team can be reached by emailing **support@paperspace.com** or creating a support ticket. Our **Help Center** is a great resource for questions about billing, product updates, features, technical specifications, integrations and security. When logged in, the Help Center can be accessed by clicking Help Desk. There is a section called Tutorials with video walkthroughs of several core features.

A Solutions Engineer is available for enterprise accounts to help answer technical questions and assist with on-boarding.