LEOSTREAM™

Managing Remote Desktops and Hosted Applications in a Hybrid Cloud with Leostream

Introduction

As public cloud offerings mature, more and more organizations are ready to take advantage of their scalability, flexibility, and potential cost-savings for hosting desktops and applications — without scrapping legacy infrastructure. A hybrid cloud approach offers a best-of-both-worlds solution with unique advantages, such as bursting during times of high demand, mixing and matching clouds to create a multi-cloud environment, easy remote access, and more. However, a hybrid cloud is not without its own challenges. Creating a hybrid environment means managing resources across multiple platforms while still maintaining a seamless end-user experience, and that is no simple feat. In this whitepaper, we outline key strategies for embarking on a hybrid cloud initiative. We also introduce the Leostream™ Platform as a management layer for overseeing and handling user assignments and connections to resources.

We will cover:

- An overview of hybrid clouds
- Advantages to using a hybrid cloud for hosted resources
- How to architect a hybrid cloud hosted resource solution
- How Leostream can help

WHAT IS A HYBRID CLOUD?

To understand the hybrid cloud, first we need to understand the fundamental differences between a cloud and traditional on-premises infrastructure. When building a data center, it's a common practice to virtualize servers and desktops using a hypervisor and full-stack VDI solution, hosted on racks in the data center. Scaling this infrastructure requires purchasing hardware, building new virtual machines, and generally a fair amount of attention from IT staff. This traditional system has some short comings, and that's where the cloud can help.

The cloud facilitates flexibility. The available compute scales up and down as needed, typically based on user demand. Often times, compute is designed to be self-service so that users can request new resources at the time they need them. Just like in your traditional data center, the cloud is built of hardware and software, but the software is architected with this flexibility in mind. Hosting and public cloud providers have taken this model to heart, and have created reliable, large-scale environments that you can leverage for compute and storage, without investing in the infrastructure, yourself.

As the public cloud gained traction, cloud providers encouraged you to move everything in your datacenter up into the cloud. As it turns out, that was a tad overzealous, and the idea of starting entirely from scratch in the cloud is unrealistic for many organizations. In most cases, the best solution continues to be leveraging what already works well in your datacenter while finding ways for the public cloud to enhance IT initiatives.

That's the "hybrid" part of this equation. Let's use the comparison of a hybrid car which leverages two energy sources (gas and electricity). Similarly, a hybrid cloud leverages more than one type of hosting platform. When you build a hybrid environment, you continue to use your on-premises infrastructure, alongside resources hosted in the public cloud. The key to a good hybrid solution is that the mixed environment functions as a single unit — just like your hybrid car is a single vehicle, not two separate cars. When building a hybrid environment, you need to design the architecture, and implement the tools, that make it cohesive.

ADVANTAGES OF A HYBRID CLOUD

A hybrid cloud solution offers unique advantages over a completely on-prem or a completely cloud solution. Let's examine those advantages more closely.

"Best of both worlds" approach

If designed appropriately, a hybrid cloud leverages the best of both your on-premises infrastructure and the cloud. For example, your on-premises solutions may be better suited for storing files or running applications, but you should never limit your organization to only on-prem possibilities. Workloads that have an elastic capacity need, or that are expensive to scale in your datacenter are good candidates for moving to the cloud. So, it makes sense to use each platform for what it can do best.

Move to the cloud — slowly

By investing in a hybrid strategy, you can expand your cloud strategy slowly, over time. This way, your users experience little or no downtime or changes to their experience. This is important because no matter where you host your desktops and applications, user experience is the end-all, be-all measure of success.

Compute: here today, gone tomorrow

In the public cloud, additional compute is as simple as a quick spin up of a new instance. Today's public cloud providers offer a wide range of instance types – including high powered GPU-enabled instances for graphics-intense applications.

Remote access: anywhere, anytime

The easy remote access of the public cloud can help you improve the end-user experience by providing additional, more powerful compute when needed. This ensures users can work from anywhere — whether that's inside the four walls of the office, at home, or on the road.

Limit access to your datacenter

Finally, we see people leverage the public cloud to limit access to their data center. The cloud gives you a way to provide a buffer zone where temporary or contract workers can access resources. Providing a "browser in the cloud", can also make it harder for users to download viruses to their laptops.

USE CASES FOR THE PUBLIC CLOUD

The public cloud differs from on-prem legacy infrastructure in that it offers greater flexibility, scalability and potential cost savings with a pay-for-what-you-use model. Let's examine the use cases for remote desktops and hosted applications that can benefit from the public cloud.

Desktops for temporary/seasonal workers

The simplicity of "bursting" in the public cloud (i.e. rapidly spinning up new instance in times of high demand) make the public cloud an ideal choice for organizations that frequently take on temporary or seasonal workers.

Desktops and applications for remote workers

From a traveling salesforce to workforces that are entirely remote, the public cloud is an ideal choice for workers who need quick access to applications or product demos outside of the office. Public cloud hosted instances can be accessed either through a traditional display protocol launched from the user's laptop or thin client, or through an HTML5 viewer (such as the one provided in the Leostream Gateway) for access from a smartphone or tablet device.

Applications that are shared by many users

Using the public cloud, it's easy to create an instance (or instances) of an application that can be shared by many users. Sharing applications is perfect for enhancing collaboration while also minimizing cost.

Single-use applications and desktops

Sometimes all you need is quick access to a desktop that you want to disappear immediately after use. This is easy in the public cloud, and even easier using a connection management platform where desktops can be spun up and then immediately torn back down once the user's session is complete.

Steps to a hybrid cloud

Now that we have laid out some of the basics around why someone would want to move to a hybrid cloud solution, let's examine how hosting desktops and applications can be done. Here, we provide step-by-step instructions on how to build your ideal hybrid cloud.

STEP ONE: EVALUATE EXISTING INFRASTRUCTURE

The first step in your hybrid cloud journey is to evaluate what you already have in your datacenter. This gives insight into what is already working, and what can be moved to the cloud.

Some key components to keep in mind and the questions to ask yourself are:

Desktops and applications

Which of these are best to move to the cloud?

Networking and authentication servers

Consider your on-premises domain and active directory server. How do you plan to leverage those? Will you also want a multi-factor authentication system for your public-cloud resources (think Google Authenticator)? Will resources hosted in the public cloud need to be joined to your corporate domain?

Storage

For compute intensive applications, it's often better to co-locate the data with the applications to cut down on data transfers. Look at everything you have, where it is, and how it will be used. Use that information to determine what's best to move into the cloud or stay local.

STEP TWO: COMPARE CLOUD OFFERINGS

When it comes to selecting a cloud vendor, you have a lot of options to choose from. We've worked with customers using all of the major public cloud providers (Amazon Web Services, Microsoft Azure, and Google Cloud Platform), as well as private clouds, and even open source varieties like OpenStack. Different clouds have different strengths, so consider mixing and matching to suit the needs of each unique use case.

When you compare clouds look at:

- Regional datacenters and availability – Consider where your users are based and whether those locations are supported
- Pricing models – Drill into volume discounts, per-minute billing, termination fees, etc. to get a true idea on cost
- Egress fees – Where is your data flowing? What amount of data can you transfer in and out of the cloud vendor's servers without paying?
- Directory services – Do you want to leverage your in-house Active Directory? Do you have a corporate Identity Provider for MFA? Are they tied into Azure AD?
- Load balancing – What techniques are used by the vendor to distribute network traffic minimize downtime?
- GPU intensive instances – How robust are the instances? This is especially important if users require graphics heavy workloads
- Supported operating systems - Do you have macOS users? AWS is the go-to. Do you need Windows 10? Your best bet may be Azure.

STEP THREE: DEFINE CLOUD WORKFLOWS THAT MINIMIZE COSTS

We've talked about the *workloads* you might want to move to the cloud. Now let's talk about the *workflow*. A workflow determines what happens when the user logs in and what happens during the life cycle of the instances that run the workload.

Choose the right instance size

A productivity application (such as Word or Excel) and a graphics-intense application (such as AutoCAD or InDesign) require vastly different compute resources. Always make sure you use the smallest instance size possible for each workload to drive down costs.

Use the appropriate cloud

Remember that you are not limited to a single cloud! Investigate all of the "Big 3" public cloud offerings and, if necessary, mix and match to more accurately meet the needs of your environment. For example, research reserved instances in AWS, or other cost-savings mechanisms when you pay for resources up front. Or compare the Microsoft Azure and AWS GPU-enabled instances to determine which renders the greatest performance for your graphics-intense applications.

Terminate idle instances

Define workflows that keep the instances around and running for the smallest amount of time. If the resource is a user's persistent desktop, maybe you power it off when the user logs off. If the instance hosts a shared application, maybe you terminate the instance as soon as the user is done and spin up additional instances from an image with that application, but only when demand increases. Controlling the lifespan of the instance is key to

keeping compute costs in check. (These workflows can easily be created using Leostream to optimize resource usage).

Reduce VPN usage

As you build your infrastructure, we recommend reducing VPN connections as much as possible. There is a wide range in pricing, but the costs can add up quickly for a fast and reliable VPN connection. Browser-based gateways like the one included with Leostream provide a seamless VPN alternative for connecting end-users to resources.

Be mindful of data transfer charges

Most clouds don't charge for data transfer within the same Availability Zone, but if you are building a hybrid cloud that spans multiple regions, keep data transfer fees in mind and try to architect to minimize data transfer between regions or from the cloud to the internet

STEP FOUR: SELECT DISPLAY PROTOCOLS AND CLIENT DEVICES

The humble remote display protocol is the most frequently overlooked component of a virtualized or hosted resource environment. That's because in a traditional virtualization stack, the display protocol is built right in. When you build a hybrid cloud environment, you need to consider which protocol or protocols will be most appropriate for each use case.

Here is what to consider when selecting a protocol:

Performance

Ultimately, the only measure of your hybrid cloud environment the end user is truly concerned with is performance. At your disposal, you have two types of display protocols – commodity, such as RDP and VNC, and high-performance, such as Teradici PCoIP, HP ZCentral Remote Boost, and Mechdyne TGX.

Client devices

If your protocol requires a client, make sure it installs on your users' chosen devices!

Printing and USB redirection

Managing peripherals is often forgotten, but an important feature for ensuring continuity of your users' desktop experience.

Clientless solutions

If your users preferred devices won't support a display protocol client, such as tablets and smartphones, then consider an HTML5-based solution.

STEP FIVE: TIE IT ALL TOGETHER WITH A CONNECTION MANAGEMENT PLATFORM

Your connection management platform is the key ingredient for making all these pieces come together into one cohesive hybrid cloud solution.

At a minimum, ensure that your connection manager can:

- Work across all of the on-premises and cloud platforms you've chosen to use. If you need to log into different tools to manage your different environments, and if your users need to remember different URLs to access everything, your hybrid cloud is doomed to fail.
- Automate capacity and power state across all hosting platforms
- Control user access by connecting users to the correct resource, even adapting to changes in login location – such as inside your network vs. at a coffee shop
- Support all the display protocols you've decided to use, all while providing audit-level tracking, so you always know exactly who is using what, from where, and for how long
- Facilitate security initiatives around access control and supports your MFA and authentication providers

HOW LEOSTREAM CAN HELP

Now that we've defined the steps to build a hybrid cloud and what to look for in your cloud vendors, let's take a look at how Leostream can help make your transition to a hybrid cloud as straightforward as possible.

There are three components to the Leostream Suite:

- The Leostream Platform
- The Leostream Restful API
- Leostream Professional Services

Let's explore each individually to see how they work together to support a hybrid cloud environment.

THE LEOSTREAM PLATFORM

The Leostream Platform authenticates and manages connections to virtual and physical desktops/resources from a single-pane-of-glass interface. It supports hybrid and multi-cloud environments with just about any cloud-based or on-prem back end (such as VMware, vSphere, OpenStack, Nutanix AHV, Verge.io) along with all of your physical and racked workstations).

This powerful platform is essential for modeling intricate workflows that are designed to boost IT productivity and to support standards around securing the desktop environment. The administrative panel within Leostream can be customized to monitor and automate when instances are created, how users are connected, and when sessions are powered down and terminated.

In addition to giving oversight into who is logging into your network and resources at any given time, the Leostream Platform also integrates with a variety of MFA providers and active directory services to enhance authentication measures.

The Leostream Gateway

A key component of the Leostream software is a gateway that makes hybrid cloud possible and secure. The Leostream Gateway allows you to isolate instances in a virtual private cloud, and then connect users using either the clientless HTML5 solutions provided by the Leostream Gateway, or by tunneling the display protocol traffic through the Gateway.

The Leostream Gateway supports both commodity and high-performance display protocols so, no matter who your users are and what tasks they need to accomplish, you can get them connected to the resources they need with the performance they demand. Lastly, the Gateway can also proxy user login traffic, so you can isolate your environment off of the internet, as well, and still provide login access for local and remote users.

LEOSTREAM RESTFUL API

If your organization is looking to automate the hosted environment to improve IT efficiency and to create a consistent experience for users, we recommend using the Leostream API to conveniently automate user on-boarding, make bulk changes to desktop environments, and roll out configuration settings across the entire user base.

By harnessing the power of the API, Leostream customers and service providers are able to script Leostream environments efficiently and at scale to build highly adaptive solutions that enables nearly any use case for VDI, Desktops-as-a-Service, hosted physical resources, edge computing, hybrid cloud environments, etc.

LEOSTREAM PROFESSIONAL SERVICES

Our professional services team is here to help. With decades of experience in the virtual desktop and hosted application space, we are experts at ensuring that your hybrid cloud environment supports every aspect of your organization's unique IT needs. The Leostream Professional Services team is available to make recommendations on the various components of your environment and can assist in architecting your design.

SUMMARY

A hybrid cloud reaps all the benefits of the public cloud – flexibility, scalability, easy remote access, pay-for-what-you-use model, while keeping what's already working intact. That being said, building a hybrid cloud takes research, careful planning, and the right technology! Following the step-by-step instructions outlined in this guide and taking advantage of the tools offered by Leostream will help to ensure the success of your hybrid cloud deployment.

ABOUT LEOSTREAM

Leostream provides the critical remote desktop connection management technology required for organizations to build successful large-scale remote access solutions. The Leostream Platform embodies two decades of research and development in supporting customers with hosted desktop environments, including VDI, hybrid cloud, and high-performance display protocols. The Leostream Platform has proven to be one of the world's most robust desktop connection management platforms with a remote access feature that allows today's enterprises to choose the best-of-breed components to satisfy their complex security, cost, and flexibility needs.