cloudshare

The Economics of IT Training Labs

Cost-Benefit Comparison:

On-premise vs.
Commodity Cloud vs.
Specialized Cloud-based Solutions

Enterprises use virtual lab environments for a wide variety of training scenarios, including instructor-led training, self-paced training (e-learning) and technical certification programs. Whether the training is focused on end users, partners or internal employees, the virtual labs must support classes of varying sizes, in which each participant trains on a real-world environment, identical to the production system.

There are three main methods for running virtual training environments:

On-premise labs

Using on-prem infrastructure to replicate live environments. This has been the de-facto method for running virtual labs for many years.

Commodity cloud providers

Using public cloud providers such as AWS, MS Azure, Google Cloud Platform, and others to construct complex virtual lab environments, on top of the general cloud skeleton provided by these services.

Specialized virtual training providers

Cloud-based solutions purpose-built for running virtual training environments. These solutions come with specially designed functionality for creating, provisioning and sharing training environments, let organizations bring their applications to the cloud unchanged, as well as simplify integration with learning management systems.

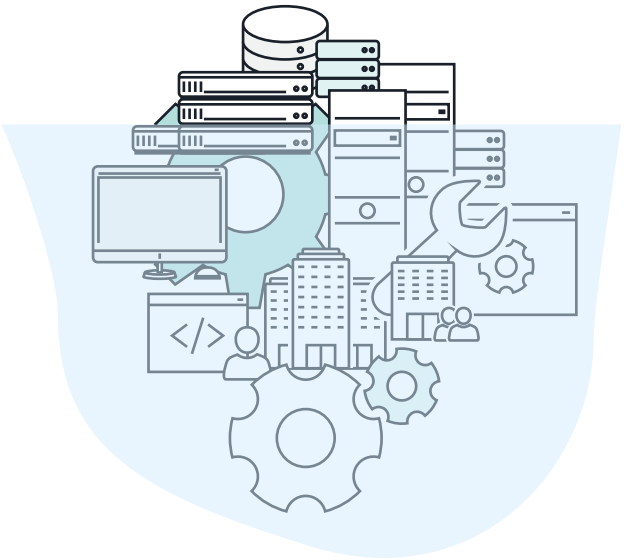
This paper examines the economic aspects of each of these three types of virtual training lab options.

On-Premise Training Cost Factors

CAPEX Is Just the Tip of the Iceberg

When your training environments reside in your on-premise data center, there are myriad cost factors to take into account. The CAPEX investment in hardware, massive as it may be, is only the tip of the cost iceberg. You also have to take into account operating costs, which include leasing of floor space, electricity, HVAC systems, and hardware depreciation and maintenance.

Once you have the infrastructure up and running, there are additional manpower costs for software maintenance — installation and licensing of operating systems, software patches, version upgrades, configurations, management, and anything else needed to make and keep the machines ready for use.



Setting up and Scaling up the Environment

Training environments are often complex and require IT professionals for configuration and setup. Complex training environments may take a few days to configure and set up, burdening IT personnel and distracting them from their core tasks.

Scalability is another key consideration when it comes to on-prem infrastructure. Training environments, sometimes comprised of hundreds of virtual machines, can consume resources beyond the capacity of the existing infrastructure. Unlike the public cloud, where infrastructure is virtually infinite, on-prem infrastructure can actually "run out" and require another round of capex investment for expansion. And, even if granted, the entire process takes time during which you may lose out on training opportunities.

At the other end of the spectrum, if infrastructure is planned for worst case (i.e., high resource consumption), it will be under-utilized most of the time since training environments only "live" for a few hours or days. This inefficient model of infrastructure planning and operation can greatly impact training costs.

Another factor to take into account is the need to provide training off-site — for example, at the customer's premises or at a conference. If you're running an on-premise training solution, that means shipping your hardware to the relevant site, installing it, and shipping it back when you're done. All of this results in substantial costs and effort.

Bottom Line: Can You Calculate the Cost of a Training Session?

The complexity of the cost factors for on-prem solutions makes it hard to arrive at an accurate cost model. Proportional breakdown of capex costs to reflect only the hardware that you used, including depreciation and recurring purchase cycles, along with multiple operating cost factors and hours of IT personnel, make for an unclear cost structure.

Even if such a model is quantified, it doesn't answer the real question at hand: What is the cost of a training session? After all, you should be able to calculate the costs of your training sessions, both to verify the pricing for your training courses and to charge back training costs to business units or partners. Equally important, you need to be able to correctly calculate the profitability of your training business.

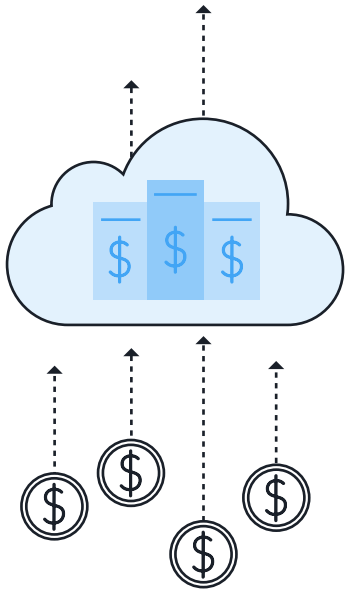
Cost factors	On-Premise Labs	CloudShare
Hardware Costs		No CAPEX costs. Pay according to usage.
Software Licenses		
Hardware and Software Maintenance		
Floor Space		
Electricity		
HVAC		
Depreciation		

Watch Out For

Scalability Issues	Not burstable, lack of immediate scalability	Unlimited scalability

Commodity Cloud Provider Cost Factors

Taking your virtual training labs to the cloud is already a step forward from an on-prem solution. It removes the headache and large financial outlay of purchasing and maintaining hardware, and provides virtually infinite scalability. However, it also presents new challenges as described below.



Complex Pricing Models

Migrating to the cloud eliminates many of the line item costs associated with on-prem solutions, since you don't need to specifically account for things like footprint, power usage, HVAC, hardware depreciation and more. On the other hand, commodity cloud providers employ highly complex pricing by which everything you consume in the cloud is metered and billed. This means that you pay for:

- Each CPU and GB of RAM you use each hour
- Every GB of storage used each month
- Every GB of data transferred to and from the cloud
- Charges for static IP addresses, load balancers, and software licensing costs which remain your responsibility even when migrating from on-prem to the cloud

Costs are also dependent on the pricing model you use and vary according to the specific hardware you select. Options include on-demand, discounted capacity commitment, or spare capacity pricing.

Beware of Cloud Sprawl

It is important to keep in mind that commodity cloud providers charge you for every instance-hour and stored-GB, regardless of whether you actually used them or not. Lack of awareness of the cloud economic model and lack of automated governance are the causes of a common phenomenon known as “cloud sprawl.” Cloud sprawl occurs when virtual instances are left active even though they aren’t being used anymore. Every minute that an instance is up is metered and billed, much like what happens when you leave the lights or A/C on after leaving home.

In cases where resources are used for short durations (e.g., training environments), and no proper governance is put in place to shut them off after use, cloud bills can grow by large factors. Imagine a training environment used for 4 hours, then forgotten until the next day. This will end up costing six times (24 hours vs. 4 hours) more than it should have. This becomes proportionally worse if training was held on a Friday and you only realize your mistake on Monday.

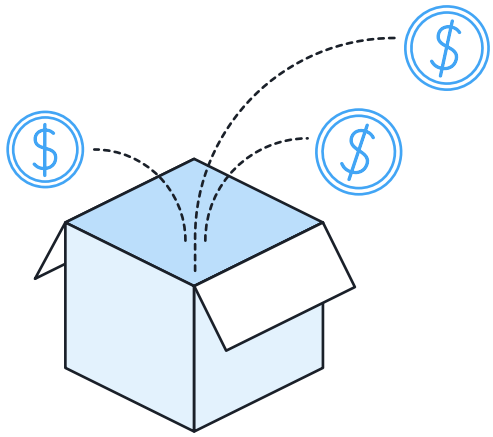
Configuring Training Environments Requires IT Support

Running your virtual labs in the cloud still doesn’t absolve you of the need to configure your training environments. Similar to on-prem solutions, you may still need IT assistance to help configure and import training environments in the cloud. For example, to provide each student in a class of 10 with their own training environment, someone would manually have to spin up 10 environments and assign one to each student. In addition, you would have to manually send out invitations to each student. The person-hours involved in these processes need to be calculated into your training costs.

Other training-related features you might want your IT team to build for you (and which have subsequent costs) include:

- Instructor console so trainers can see each student environment
- Chat functionality that allows students to communicate with the instructor and among themselves
- Over the shoulder and rollback functionalities to allow instructors to take control of a student console and/or revert it to its original state without affecting any of the other students.

Unforeseen Costs



Unforeseen costs may include special training-related features such as personalized invitations. Furthermore, if you want to increase the efficiency and effectiveness of training by integrating the virtual labs with your LMS system, you will find that the effort to integrate with a commodity cloud provider may require extensive point-to-point coding, which you would need to document manually and maintain over time.

Before investing the time and effort into a move to the cloud, be sure to verify that your commodity cloud provider has the network features to support an exact replica of your application or network environment. If not, this may require you to train on a modified version or require re-architecting your solution.

Cost factors	Commodity Cloud Provider	CloudShare
RAM & Disk Usage	$	$
Data Transfer Costs	$	included
Public IPs	$	included
Specialized Features for Instructors	$	included
Specialized Features for Students	$	included
Prebuilt Analytics Dashboards	$	included
Support Services	$	$

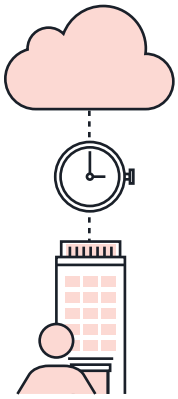
Watch Out For

Customizable Auto-suspend Policies to Prevent Cloud Sprawl	Not available	included
Complex Networking Support	Not available	included

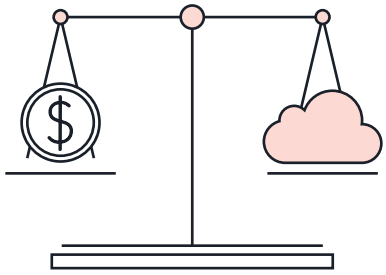
Specialized Virtual Training Provider Cost Factors

Similar to the large commodity cloud providers presented in the previous section, specialized virtual training providers are also public cloud service providers, offering organizations all the advantages of cloud:

Virtually unlimited scalability which is not possible in on-prem deployments.



Immediate availability of the amount of resources you need without having to plan expansions in advance.



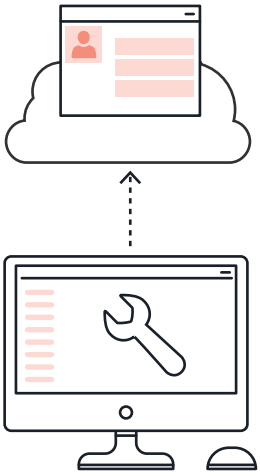
Pay only for what you use, eliminating need for large capital expenses.

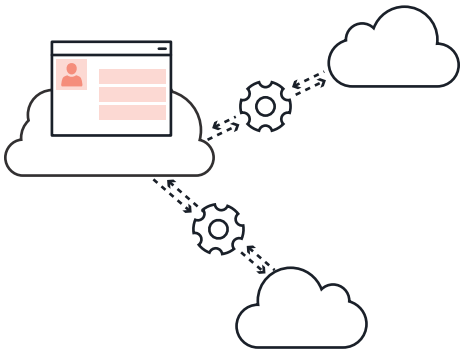
Rich Application Layer Designed for Virtual Training

Unlike commodity cloud provider solutions, specialized virtual training lab solutions offer much more than just the bare-bones infrastructure provisioned on the public cloud. They augment cloud infrastructure with a rich application layer specifically built for training activities. For example, they may offer an instructor console that lets trainers see a real-time view of each student's environment and be able to barge in and help as needed; they make it easy for instructors to set up a class and send out invitations; and make the student experience easier by offering a comprehensive student workspace with intuitive navigation and valuable features.

Easy Setup and Teardown of Training Environments

A major advantage of specialty virtual training providers is the simplicity of setting up and tearing down environments. These services often provide many prebuilt templates to choose from, with licensing included. They are also easy to modify. In addition, a worthy provider will support various hypervisors, such as VMWare and Oracle VirtualBox, and make it easy to import and create templates of your own virtual machines. These templates can then be pulled up and provisioned automatically, and even tweaked by trainers using a browser interface. This removes the burden from IT personnel, allowing them to focus on their core tasks.

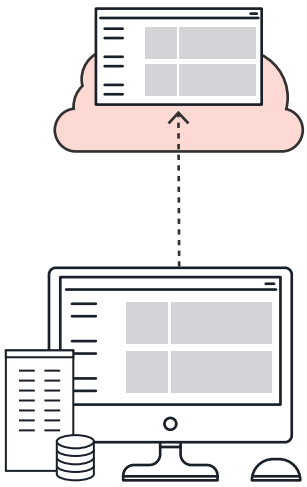




Specialized virtual training solutions are designed for integration with common LMS and other training tools that your organization is used to working with. These solutions use flexible REST APIs and offer prebuilt integrations with code-free integration tools, such as Zapier, to facilitate the integration effort.

Support for Complex Networking

In addition, while commodity cloud providers are built for cloud-native applications, specialized providers are geared toward enabling organizations to bring their on-premise applications and environments to the cloud, regardless of their complexity. For example, specialized providers typically support nested virtualization, which is not supported by the commodity cloud providers. This allows you to train users on an exact copy of your full application or environment without needing to remove features or modify your architecture.



Simple Pricing Schemes

Specialty virtual training lab providers aim to keep their pricing simple. They provide more features, but don't add line item charges for each individual component. Rather, they try to make their pricing as understandable and predictable as possible by relying on pricing of CPU-hours, GB-hours of RAM, GB of storage consumed, and number of training days. No separate and unexpected charges for IP addresses, data transfer, load balancing and other features, and no complex pricing models to choose from.

Caution is still advised, though, with respect to leaving your environment in an active state after training is over. Depending on the vendor, this could impact your costs. Some specialty virtual training providers offer an auto-suspend feature, which automatically shuts down idle environments, making sure you pay only for what you use and preventing bill-shock at the end of the month. This feature alone can save companies a bundle in avoidable charges.

Conclusion

Virtual training labs and remote training are becoming increasingly popular. Classic on-prem infrastructure can, to a certain extent, accommodate virtual training requirements. However, such a solution often comes with a complex economic model, high capital costs, limited scalability, and limited performance.

Lured by the promise of unlimited scalability and pay-as-you-go pricing, many organizations are migrating their on-prem virtual labs to commodity cloud providers, such as AWS and MS Azure. Organizations adopting this approach for their virtual training should be prepared to face an absense of dedicated training features and capabilities, and the threat of cloud sprawl.

Specialty virtual training lab solutions provide the best of both worlds. They provide all the benefits that cloud infrastructure has to offer, while augmenting them with a rich application and integration layer.

Many also let you migrate complex applications and network configurations to the cloud unchanged. This leads to the best operational efficiency and lowest TCO of all three options. Specialty virtual training solutions help companies grow training revenues and business faster and more effectively. By enabling your training team to operate more efficiently, these solutions save your organization both time and money.

About CloudShare

Since 2007, CloudShare has been the leading supplier of virtual IT environments in the cloud, providing its clients specialized solutions designed to meet a wide variety of business needs – including lab environments for virtual training, development and testing, and sales demos and POCs.

Offering unprecedented ease-of-use and efficiency, CloudShare's advanced suite of tools for building and managing environments turns cloud-based resources into true cloud solutions.

Trusted by worldwide industry leaders:

SOPHOS

ATLASSIAN

paloalto NETWORKS

hp

DELL

FORGEROCK

Get started today!

Request a Demo

www.cloudshare.com

sales@cloudshare.com