



# Managing Modern VILT Lab Environments with Skytap



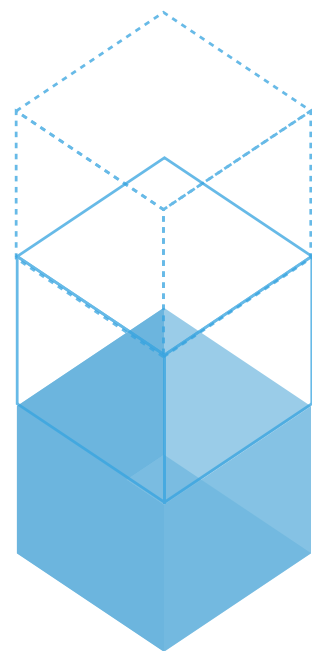
## Introduction

Organizations invest in technology, tools, and systems to gain a variety of business benefits including saving time and money, increasing sales, and improving communication and efficiency. Proper technical training is essential to maximize these benefits and stay competitive in the marketplace.

Both students and vendors benefit from technical training. Educated students are better prepared than their untrained peers to work with new technologies and to use and optimize the myriad functions provided by a solution. Vendors are more likely to gain repeat customers who both stick with their solution and spread the word to others.

Delivering effective training that serves both organizational goals as well as student learning objectives is a challenge that training managers face with limited resources and increased expectations. Providing hands-on lab experiences for students is particularly important, because learning by doing allows students to work with and experiment with systems in an isolated production-like sandbox environment.

However, managing and maintaining these student lab environments remains a challenge. This paper outlines how Skytap can help streamline the process of creating and managing cloud-based Virtual Instructor-led Training (VILT) labs.



# Virtual Instructor-Led Training

The content, lab exercises, and format for VILT is similar to traditional Instructor-led Training (ILT). However, VILT usually involves tailoring coursework for geographically dispersed students and instructors. Also, since the students and instructors are usually remote, VILT relies heavily on cloud computing and internet technologies, which results in training managers being required to deliver both the educational content as well as the platform through which the training is consumed. Instead of developing new content, training managers are forced to act as virtual systems integrators, pulling together multiple technologies and resources to create a high-quality and effective remote training solution. Hands-on labs—an important and expected component of any dynamic, self-serve training program—are particularly challenging, and can bog down trainers with technical issues.

## Hands-On Labs Technology

Several technology components integrate to make delivering VILT both possible and effective:

- » Virtualization
- » Cloud computing
- » Standardized and flexible APIs

When combined, these technologies allow training managers to design and deliver effective content in a manner easily consumed and understood by students.

### Virtualization

Virtualization makes it possible to provide students with their own isolated computing environments or “sandboxes.” This eliminates the need to manage physical hardware to provide a hands-on lab experience. It’s much simpler to reset a virtual machine to a predefined state than to physically image and re-configure computer hardware. Virtual labs make it possible to deliver a hands-on lab experience to students with nothing more than a laptop. However, for training managers with less technical experience, virtual labs can be time consuming to set up and often require IT support to create, configure, and manage.

### Cloud Computing

Cloud computing makes it possible to deliver pre-configured lab environments to students over the internet. Training managers can build and manage fully configured cloud-based labs and provide remote access to these environments to students for hands-on activities. The cloud simplifies managing complex virtual environments. These lab environments can be spun up when needed and then discarded once training has been delivered.

Using the cloud to deliver hands-on labs provides several benefits to students as well. Labs may be accessed from nearly anywhere, giving students maximum flexibility for when and where they consume training. Additionally, cloud-based lab

environments remain under the complete control of training managers and technical experts, ensuring a consistent and uniform student experience.

Online learning programs are necessarily made up of a mix of technologies and systems. These systems must be tightly integrated to enable automating common tasks such as student registration, lab provisioning, and class-related, lab-related communications. Successful integration and automation are often prerequisites to getting the full benefits from a blended learning solution.

### Keep it Simple

Cloud-based labs simplify the maintenance of class lab environments and allow students to use these labs from virtually anywhere. While each cloud vendor provides the essential platform for using virtual machines, they differ in how those virtual machines are managed.

Training departments may not always have access to deep technical expertise to help build and maintain lab environments. And even though a cloud vendor may offer the ideal toolset for a scalable and robust web application, they may lack simpler tools needed by training managers and coordinators. Therefore, it's important to work with a cloud vendor whose platform empowers non-experts to manage even some of the most technical aspects of virtual labs. A vendor should have tools that make it simple to create and update not just individual VMs, but complete environments made up of multiple VMs, networks, applications, and more.



## Skytap Virtual IT Labs

Skytap is an ideal platform for building, hosting, and delivering technical training labs to both students and instructors. It is a cloud service that makes managing the end-to-end lab environment delivery workflow a quick and simple task. Skytap offers flexibility and its global presence to provide an end-to-end student lab management solution. Within just

a few minutes it's possible to schedule the buildout, delivery, and teardown of even the most complex lab environments. Also, Skytap allows third parties, such as contractors or partners, to schedule and manage their own training labs, while the content and makeup of these labs remains under the direct control of the Skytap customer. Within just a few minutes it's possible to schedule the buildout, delivery, and teardown of even the most complex lab environments.

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## Templates

Skytap templates provide a foundation for successful lab environment management and delivery. Templates are “golden copies” of complete computing environments that include virtual machines, networks, and storage. A single Skytap template can be used to create any number of new, isolated, and unique environments, and, because of their isolation, these environments can run independently and concurrently. A template can be created by directly importing a virtualized environment, or by building a new environment within Skytap and then saving it as a template.

Skytap supports importing VMWare formats and can directly import VMDK, OVF, and OVA files. Both single virtual machine environments and environments with multiple virtual machines, networks, and disks may be imported as-is. This makes it very simple to create virtual environments using tools such as VMWare Workstation or vCenter and then import these environments into Skytap.

Once a template is in place, it's simple to create new and identical running environments providing student labs for on-demand, instructor-led, and virtual instructor-led training.

## Environments

Skytap environments are self-contained and isolated virtual data centers that include virtual machines, networks, and disks. During a training class, each student interacts with their own unique environment using a web browser.

## Courses & Events

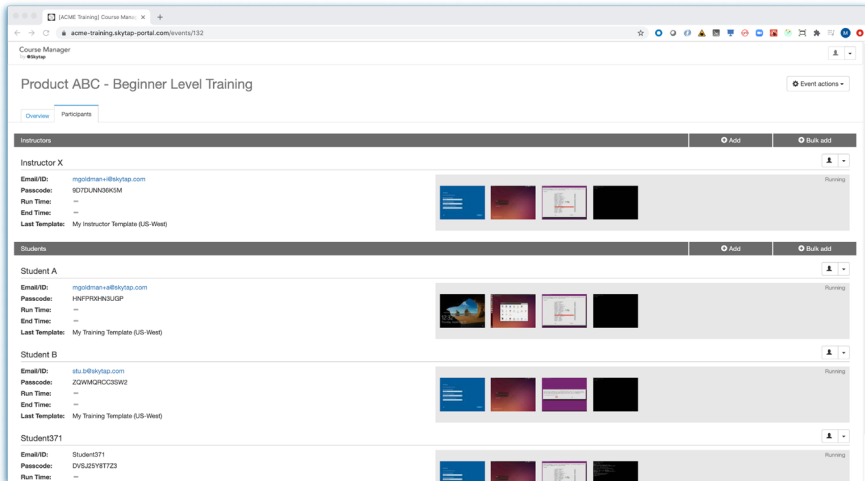
Courses are the foundation of scheduled training events. They contain information about Skytap templates from which student environments will be built. Additionally, courses may contain supplemental material, such as HTML content to be displayed to students during training, ISOs to be mounted into the lab VMs, and attachments such as PDF training manuals.

A course can support VILT events with geographically dispersed students. To maximize performance and ensure a quality student experience, Skytap can create student environments in a data center nearest the student's location.

It's simple to schedule a training event from a course. Once a course is selected, scheduling an event only requires:

- » Event start date and time
- » Event end date and time
- » Name and email address of each participant (optional), or number of labs to be provisioned
- » Skytap template from which each lab is to be provisioned

With this information, Skytap creates lab environments for each student, which will be running and ready to go at the beginning of the training event. In the event that additional students arrive at class, new lab environments can be created quickly. Likewise, student lab environments can be removed in case of a no-show or last-minute cancellation.



Skytap Instructor View

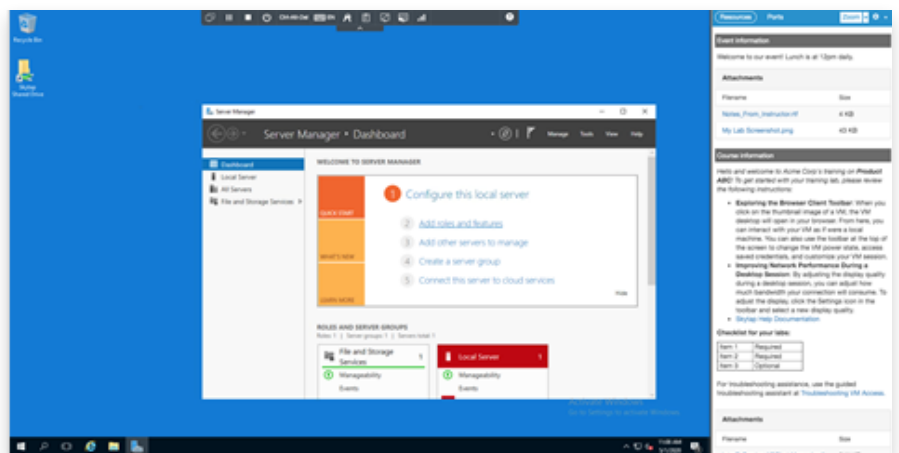
Training coordinators can skip the additional step of distributing web conference access details to students, by saving a link to the conference directly into the Event.

Skytap administrators are able to access a Thumbnail View of the student VMs. This view is refreshed periodically, and it is possible to click any thumbnail to directly access a VM.

Optionally, Skytap can manage distributing lab access information to students. For each student lab environment, a Learning Console is created and it is through this Learning Console that students access virtual machines in the lab. Providing a student's email address enables Skytap to email lab details, along with a link to the student's individual Learning Console, to the student.

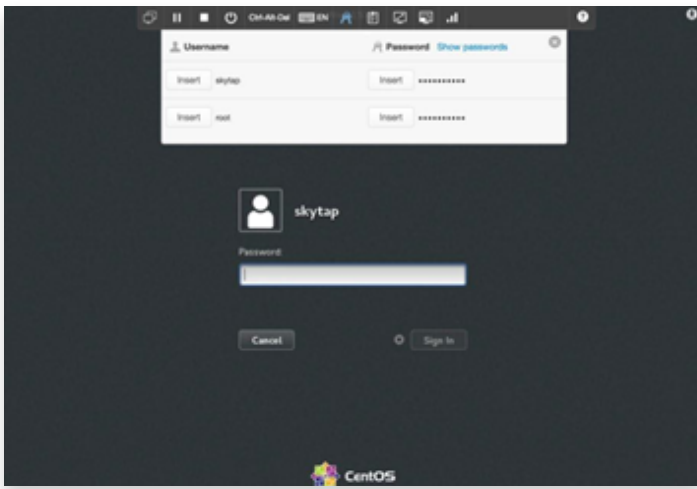
If email invites cannot be sent out, Skytap can create a unique passcode for each student, which can be easily distributed on the day of the event and provides access to the student's Learning Console directly from the Skytap home page.

It is possible to display custom HTML instructions, links to attachments such as a training guide, and published services access information within a Content Pane in the Learning Console. The Content Pane can be resized, minimized, or displayed on a separate screen using a link or a QR code.

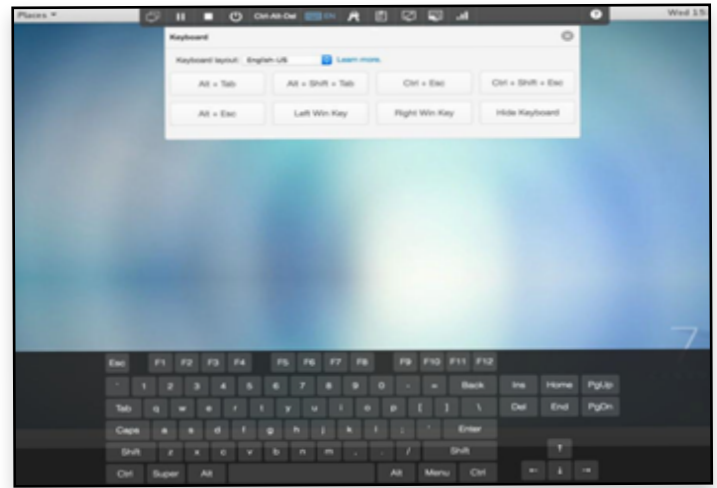


Student Learning Console

The instructor can send a broadcast message which is instantly displayed to all students within their Learning Consoles.



Student access with Credential Management



On-screen Keyboard and Shortcuts

## Guest Access View

An instructor may be granted access to the Guest Access View—that is, the page with a view of all student environments, and the ability to add, remove, or extend student lab access as necessary. When a student is having difficulty, the instructor can access a student’s VM(s)—while the student observes—to help resolve the issue.

Guest Access View gives valuable admin-like capabilities to instructors within the scope of their own event, and a set of convenient tools and features to manage the event without having to rely on Skytap administrators for assistance.

## Lab Environment Reprovision

In the event that a student falls behind in class or renders their lab environment unusable, the Reprovision feature allows the instructor to easily restore their labs. Depending on the situation, an instructor has the option to either reset the student’s environment to its original default state from the template or give them a copy of another event participant’s environment.

## Extend Lab Access

By default, Skytap will automatically shut down and clean up all student lab environments after the event ends. It is possible for an instructor to extend lab access for a student who requires additional time beyond the end time of the event. The lab environments for any such extended students will be preserved past the end of the event and remain available through their extended end time.

## Lab Environment Cleanup




After the end of the event, Skytap can manage tearing down and cleaning up student lab environments.

## Workflow: Skytap

Skytap dramatically simplifies and streamlines the workflow required to conduct VILT courses. Instead of taking hours (or even days when troubleshooting a difficult issue), setting up VILT with Skytap takes just 5-10 minutes, and frees up the subject matter expert (SME) for other work.

# Workflow Comparison

## Standard Setup vs. Skytap

Action	Standard Setup Work performed by:	Skytap Work performed by:
Build and maintain course templates	SME	SME
Registration Process	Training Manager	Training Manager
Schedule lab environments	Training Manager	Instructor / Training Manager
Provision lab environments	SME	 A Kyndryl Company
Distribute lab access information to instructors and students	SME	 A Kyndryl Company
Deliver training	Instructor	Instructor
Cleanup lab environments	SME	 A Kyndryl Company
Evaluate results	Instructor / Training Manager	Instructor / Training Manager
TOTAL TIME	1-2 hours (or more)	5-10 minutes



# Conclusion

The best technology platform for delivering training is the one that students don't notice. Careful planning, thoughtful design, and using the right technology can minimize technology-related disruptions and improve overall success.

When developing a VILT program, properly assembling a flexible technology platform is critical to providing a cohesive learning experience for students. In practice, this means tight integration between flexible technologies that can adapt to specific vendor and student requirements.

With limited IT resources, training departments must find, evaluate, and implement available technologies with little help. These technology choices affect whether training departments and programs achieve their operational, cost reduction, and content development goals. When choosing a cloud platform for hosting and managing hands-on labs, it's essential to choose a vendor whose management tools best fit the requirements for an ideal VILT learning solution.

Skytap reduces the time required by training managers, SMEs, and instructors to schedule, deliver, and cleanup VILT learning programs by 90%. Many tasks can be delegated to non-technical users, dramatically increasing the number of classes that can be scheduled and managed by a training department. Skytap allows you to easily track the cost of any class through detailed usage reports. You can significantly reduce administrative costs for your VILT program while providing clear and demonstrable ROI.



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## About Skytap

Skytap is a cloud service purpose-built to run specialized workloads in Microsoft Azure and IBM Cloud. As the best cloud service to support AIX, IBM i, and Linux on IBM Power together with x86, Skytap makes it easy to evolve traditional workloads by rapidly migrating them to the cloud. Enterprises around the world use Skytap for production workloads, disaster recovery, virtual training labs, and application development. Skytap's cloud environment simplifies management, reduces IT costs, speeds up application development, and allows organizations of all sizes to modernize at the pace of their business. Skytap is a Kyndryl company. To learn more or schedule a demo, visit [www.skytap.com](http://www.skytap.com).

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