



# **How to enhance** the student's digital work environment

A VMware Workspace ONE Proof of Concept

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# 1 Managing applications and user experience

A growing number of universities are struggling with the management of their student's applications and search for ways to deliver those applications to the devices. Thus, the user experience of students is suffering. Facing these challenges can be a problematic task for the IT helpdesk and IT administrators. Students are always on the move on campus, consuming data however it suits them and this way of working should be enabled, not discouraged due to a bad user experience. What can be done to improve the access to those applications and user experience?

In this document, we will present a case study which is based on a Proof of Concept how daily issues were reduced and the user experience was improved for the students of a Dutch University, by implementing VMware Workspace ONE with Horizon 7 and Identity Manager.

## 2 Proof of Concept history

The month before we started the Proof of Concept with the VMware Workspace ONE suite the university did a Proof of Concept with a similar product from Dell called vWorkspace which was tested in combination with App-V.

The same wishes and requirements were applied to both the vWorkspace POC and the Workspace ONE POC. The vWorkspace solution had some challenges regarding performance and application start times. A lot of requirements and wishes could be achieved, but the overall performance was a big issue. An important application (MatLab) took 20 minutes to start; not acceptable for a great user experience. Reconnecting to an application from Windows to a Mac was also not possible, users got a new session in that case.

## 3 Challenges and problems

### **The existing situation has the following challenges and problems:**

- Different versions of same application were locally installed and used on student devices
- Applications are not updated by the users
- Applications are not applicable for certain OS (Windows App on OSX)
- No standardization of devices
- 90% of devices are BYOD
- Students are unique users

## 4 Wishes and requirements

### The following aspects needed to be achieved for a successful Proof of Concept:

- Applications online available to any device via a portal
- Multiple Microsoft Office versions (2013/2016 32Bit)
- Microsoft Visio 2016 on OSX
- Firefox browser with specific java versions
- MatLab 2016b
- Decos JOIN (Client software to upload documents to a SharePoint site)
- Ability to resume applications at home when left open at work

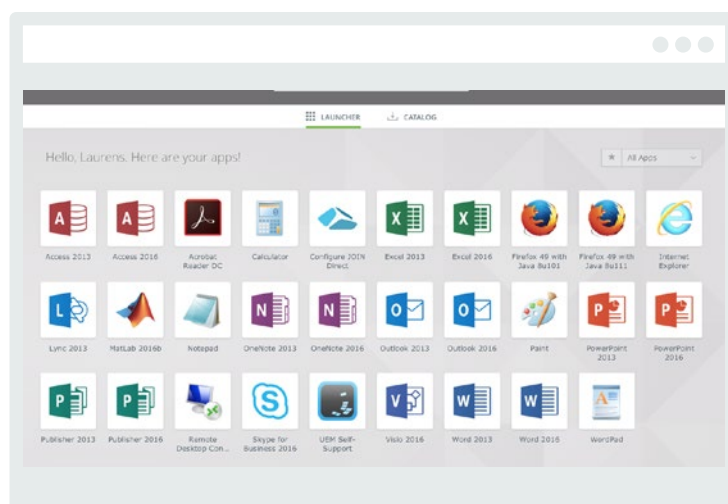
## 5 Proposed solution

To be able to meet these requirements, VMware Workspace ONE with Horizon 7 was selected to host the applications via RDSH servers and published the applications through a VMware Identity Manager portal.

For creating and presenting the software layer a combination of App Volumes and ThinApp was used.

Where application isolation is required, ThinApp is used in MSI format and placed in an AppStack. To manage the application data and user customizations of these applications VMware UEM was implemented.

On your right a preview of all implemented applications for this POC.

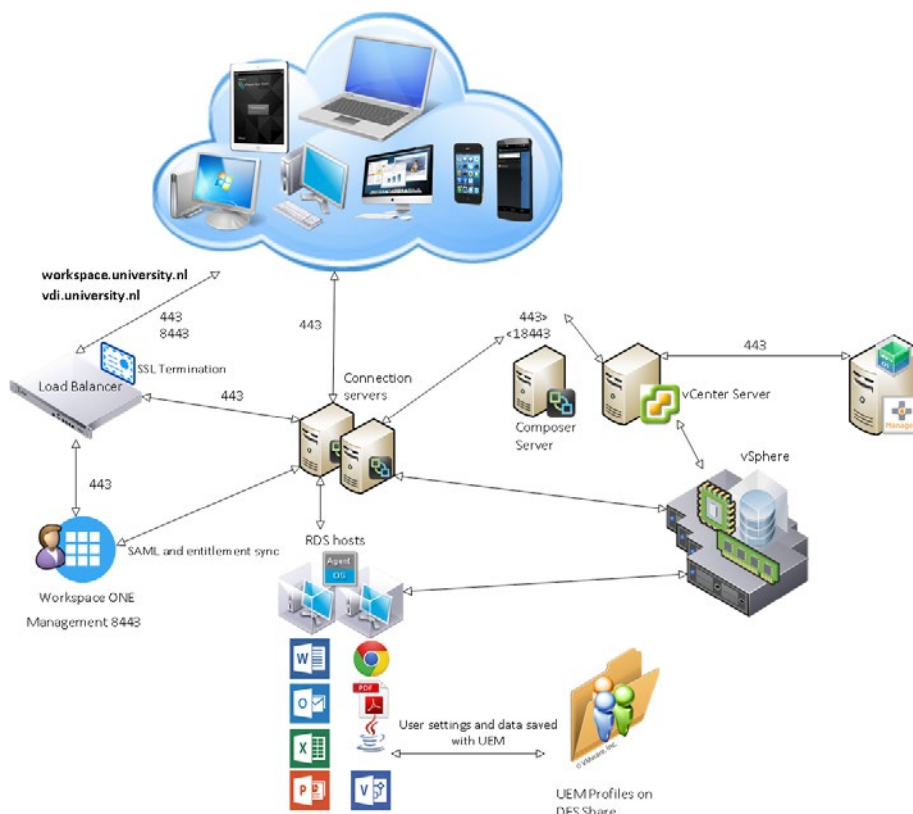


# 6 Deployed solution

**For this Proof of Concept, a basic configuration of Horizon 7 was deployed and limited to 50 concurrent users. This environment is consisting out of:**

- Two Connection servers
- One Composer server
- Two RDSH servers
- One Identity Manager Appliance
- One App Volumes Manager
- One UEM Manager
- Separate packaging VM to package ThinApp and AppStacks

The Connection servers and Identity manager were put behind a load balancer with certificate termination on the load balancer. Because the POC infrastructure was lacking a DMZ no Security Servers or Access Point were deployed to conserve ESXi host resource overhead. Instead we used load balancers to provide reverse proxy services to the Identity Manager and Connection servers. For this POC we had access to 4 HP ESXi hosts based on version 5.5U3 Update 3 with a Windows vCenter server on 5.5U3.



## 7 Used software versions and licenses

- VMware Horizon 7.02 Enterprise
- VMware Identity Manager 2.71
- VMware UEM 9.1
- VMware App Volumes 2.11
- VMware ThinApp 5.2.1 Enterprise

The RDSH servers are based on Windows Server 2012 R2 Datacenter and stripped down for optimal performance with the help of the VMware OS Optimization Tool version b1083 using default template for Windows Server 2012 R2.

A base template is built using best practices and used as source for an automated linked clone RDSH farm.

## 8 Applications

To virtualize the applications, App Volumes and ThinApp were used.

To keep the RDSH image as clean as possible we only natively installed Office 2016 and Visio 2016 into the RDSH image. Why? As of writing this, Office 2016 is not yet supported in an AppStack with App Volumes 2.11. This support will probably be added to App Volumes 2.12 soon.

### **Office 2013, Decos JOIN, Acrobat reader**

These applications are packaged in the same AppStack. All users will get this basic AppStack.

A UEM Profile for Office 2013 and Acrobat reader is available by default in UEM.

For Decos JOIN a new profile is captured with UEM Profiler and the specific Import/Export setting are:

#### **[IncludeRegistryTrees]**

#### **HKCU\Software\VB and VBA Program Settings**

Via the predefined settings of the Decos JOIN profile in UEM we added specific registry application settings that are preloaded with the application start.

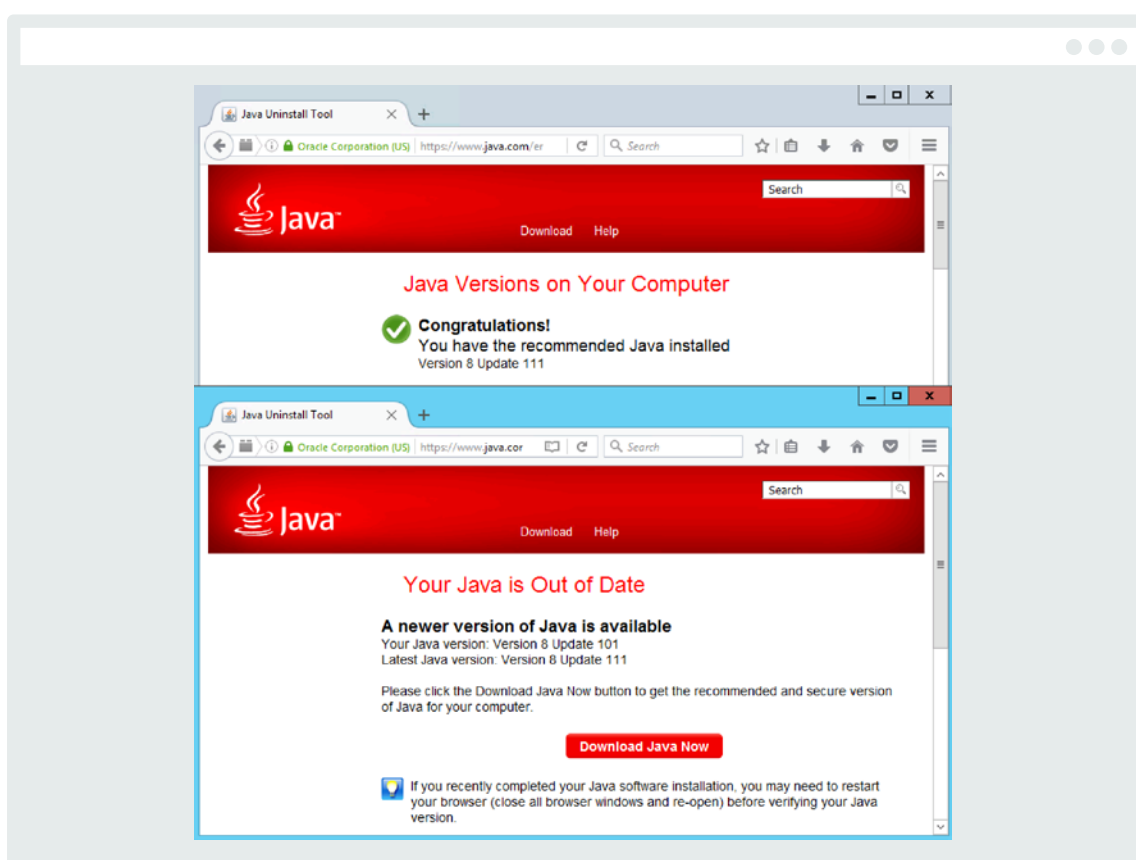


## Firefox 49 with Java 8 U101 and Firefox 49 with Java 8 U111

Firefox with Java was packaged with ThinApp version 5. Both application sets needed to be isolated from the host OS. This is a requirement to be able to run both packages side by side. The University has custom built Java applications and they need different java versions. These Java apps are still needed for daily operation. In the past few years, maintaining these Java apps was a big challenge and the Java app would break with accidental updates.

Both ThinApp versions are built with predefined URL's and packaged using the merge isolation option. Then the ThinApp MSI is installed into an AppStack for optimal performance. The ThinApp Sandbox is removed after the application is closed and the user is not allowed to make changes to Firefox. The changes are not saved with UEM.

More information on specific ThinApp ini file commands can be found here:  
[http://www.vmware.com/pdf/thinapp50\\_packageini.\\_reference.pdf](http://www.vmware.com/pdf/thinapp50_packageini._reference.pdf)



Both Java version running side by side

## MatLab 2016b



MatLab is widely used by students during their study at the University. This application has a big install base. A total of 7 Gigabytes of data is installed. Previous attempts to virtualize this application with App-V was not successful. Unpacking and starting this application with App-V took over 20 minutes. This was mainly due to the size of the application.

With App Volumes, MatLab was simply virtualized to an AppStack and starts up within 10 seconds, just like on a normal desktop or laptop.

A newly create UEM profile captures all MatLab settings and Exports/Imports them when MatLab is started or closed.

MatLab2016b	04/11/2016 09:45	icon	2 KB
MatLab2016b	04/11/2016 09:45	Configuration sett...	1 KB
MatLab2016b.ini.flag	04/11/2016 09:45	FLAG File	1 KB

The profile is made with UEM Profiler and the settings that are needed to be captured with UEM are:

**[IncludeRegistryTrees]**  
**HKCU\software\Mathwork**

**[IncludeFolderTrees]**  
**<AppData>\MathWorks**

The UEM settings are saved when the application closes instead of when the user logs off.

## 9 User Experience

In the first phase of testing 8 users were given access to the Workspace ONE environment. These users consisted of staff members from the Support and VMware Administrator departments; users supposed to support this new workplace. They picked up the new technologies very easily and within a week those users were adapted to this new way of working and packaging of applications.

In the second phase of the POC, 50 random users were given access to this new solution and asked to work with these applications instead of their local installed apps. Users were asked to make changes in application settings and verify if these settings would be saved by UEM and if these settings were restored with the next logon. UEM worked as expected and only a few programs needed additional UEM capturing rules which were applied by the support department.

Although the application start times were not the same as locally installed applications, the users did not find that much of a problem. Because of the ease of access via a portal, the user experience was improved in other ways.

The users of the second phase adapted quite fast and during a quick survey they rated the new workplace with a 92% satisfaction ratio.

The Identity manager portal was widely appraised for its ease of use and the ability to use fingerprints instead of passwords on IOS devices was a major improvement for the students. Not having to provide different passwords for every application logon saves the students a lot of time and frustrations with forgotten or expired passwords.

The ability to run their applications on any device and resume them when switching from device was a much-wanted feature. Students like to switch devices based on what is suited best for them at that moment. Users were seen switching from a laptop to a tablet, and vice versa, without compromising their user experience and have all their data centrally stored. An enabled student learns more!

## 10 Conclusion

With the proof of concept based on VMware Workspace ONE and its products we met all the customer's requirements and wishes. In this proof of concept, we were faced with some challenges. We only had access to a few hosts and those hosts were a few years old. This does impact the performance and user experience. The first logon to RDS takes a few more seconds (due to the user's policies) than expected, but after that initial logon it surprisingly works fast even on older hardware and on basic SAN storage with no flash caching.

For optimal user experience, you should always design and size a correct environment before going to a production phase. You need to collect those user requirements and use cases, otherwise your project will get a rocky start and that will impact the user experience.

That's why a proof of concept is a great tool to collect use cases. Users need to see it work.

The university was already thinking on applications for a possible production phase on how to use Horizon desktops for student exams.

The ability to spin up 150 desktops based on one template for an exam in MatLab was one of their use cases. The students bring their own devices, log on to the portal and start their exam desktop.

In the proof of concept, UEM was only used to save application settings on RDS but the university administrators have experienced the power of UEM and now can solve roaming profile issues they were facing for a long time. Their ability to control every aspect of a user profile independently makes UEM very powerful.

This proof of concept took 4 weeks to build and test. After that, support staff took over and tested a lot more options and features offered by the Workspace ONE suite, collecting those required use cases and requirements and getting experienced in the products.

Do you face similar challenges and want your own Proof of Concept? Contact us!



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