

# Making the VMware Digital Backpack for Higher Education a Reality – A CIO's Case Study

Merit Member Conference 2017

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# Making the VMware Digital Backpack for Higher Education a Reality – A CIO’s Case Study

- Why is a traditional two-year college the role-model for Higher Education institutions around the world?
  - “Old school” is not a term associated with application delivery at Schoolcraft College.
- Through the newly announced integration with Ellucian’s Banner and Colleague student information systems, VMware is enabling education institutions, like Schoolcraft College, to provide students with a personalized, anytime, anywhere, any app, any device digital learning environment that stays up-to-date as courses are added and dropped.
- Today’s presentation will highlight the key use cases, benefits, and architecture of this simple, but powerful solution that is a critical piece to meeting the expectations of today’s students and their “always on” lifestyle.

*Schoolcraft College Information Technology Vision*

# We Enable work!

Strategy:

**Position technology as an enabler and  
revenue generator, not a barrier**



*Schoolcraft College Information Technology Strategy*

We do not deploy  
successful technology,  
We deploy  
Successful Users!



# Where Might You Begin?

Modernize and mobilize learning environments

Improve The Campus Computing Experience

Enhance security and privacy

Improve efficiencies and reduce costs

## From 9/22/2014 Board Meeting Presentation:

# Definition of Primary Client's Expectations – Students

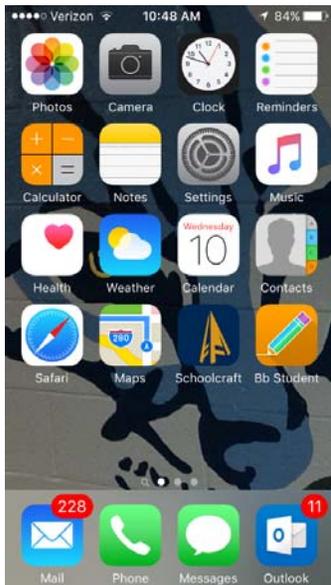


- Immersive Multimedia:

- Smartphones, Tablets, Texting, Facebook, Twitter, Snapchat, Instagram, Reddit, FaceTime, Video, PayPal, Socializing via Video Games, Campus Maps, Virtual Escort; etc.

- Instant Access from Anywhere:

- Registration from Smartphone, WIFI Blackboard access, Portal with "always relevant content", Class Notifications, Grades, Class Schedules, Campus Events, Parking Availability, etc.



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# From 9/22/2014 Board Meeting Presentation: Virtual Desktop – Bad Weather Access to Labs...

That's where the  
Story Begins...

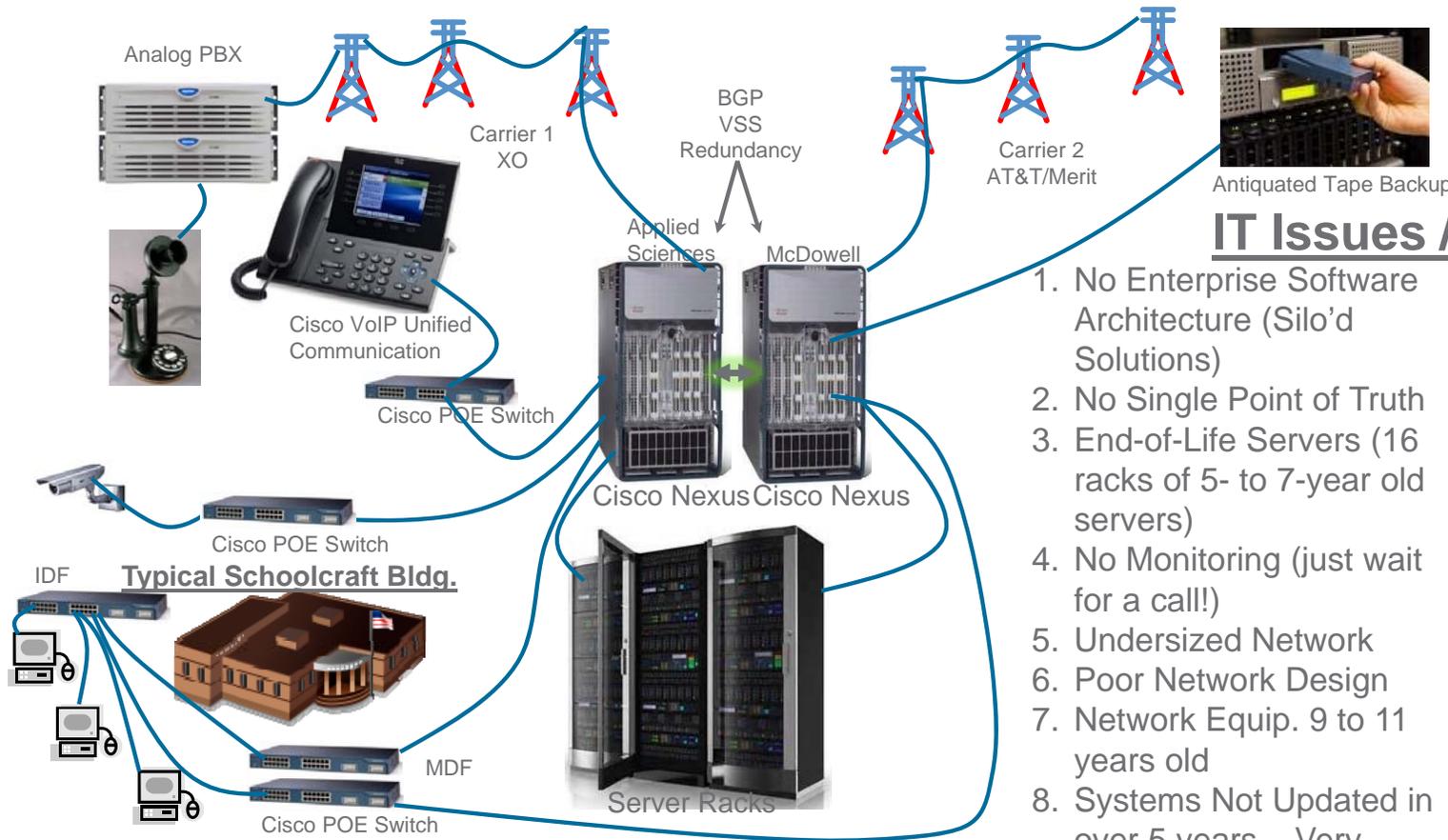
I had a few things  
to do first...



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**VMware®**  
**Digital Backpack™**

# From 9/22/2014: Remember where we came from...



## IT Issues / Initiatives

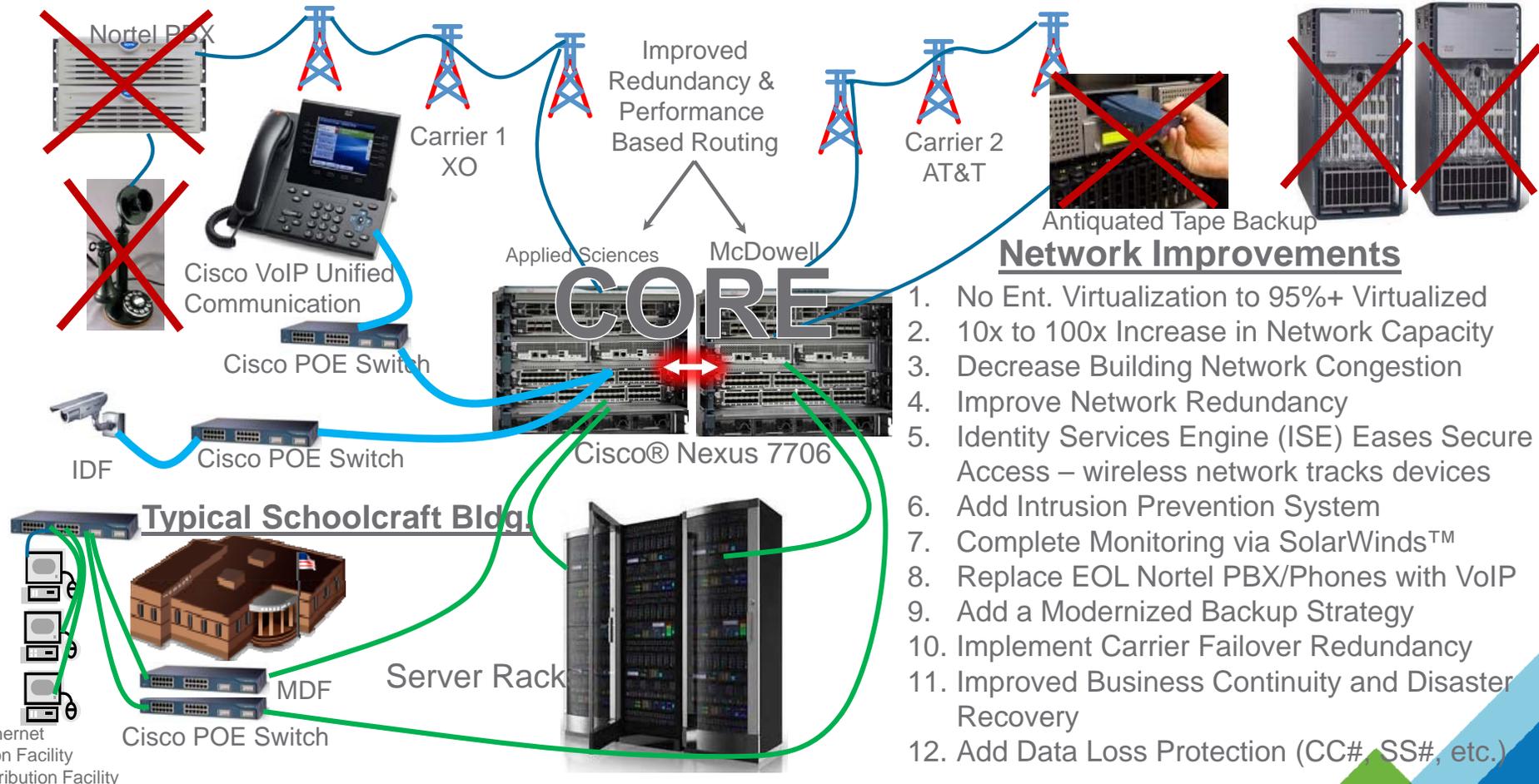
1. No Enterprise Software Architecture (Silo'd Solutions)
2. No Single Point of Truth
3. End-of-Life Servers (16 racks of 5- to 7-year old servers)
4. No Monitoring (just wait for a call!)
5. Undersized Network
6. Poor Network Design
7. Network Equip. 9 to 11 years old
8. Systems Not Updated in over 5 years – Very Vulnerable
9. Colleague HW Failing
10. Sys. with no spare parts
11. EOL Nortel PBX & Phones
12. Antiquated Back-up
13. Antiquated Security CCTV
14. No Carrier Redundancy
15. Old Back-up Strategy
16. No Data Loss Protect.
17. No Enterprise Virtualization
18. No Disaster Recovery Plan

# This is where Schoolcraft ended up!

# New Core Network New Distribution Network – 86 Closets

New Network Traffic

Increased Network Traffic



## Network Improvements

1. No Ent. Virtualization to 95%+ Virtualized
2. 10x to 100x Increase in Network Capacity
3. Decrease Building Network Congestion
4. Improve Network Redundancy
5. Identity Services Engine (ISE) Eases Secure Access – wireless network tracks devices
6. Add Intrusion Prevention System
7. Complete Monitoring via SolarWinds™
8. Replace EOL Nortel PBX/Phones with VoIP
9. Add a Modernized Backup Strategy
10. Implement Carrier Failover Redundancy
11. Improved Business Continuity and Disaster Recovery
12. Add Data Loss Protection (CC#, SS#, etc.)

POE = Power Over Ethernet  
MDF = Main Distribution Facility  
IDF = Intermediate Distribution Facility



**Then we prototyped remote access to Virtual Desktops**

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# Invitation Only: 15 Higher Ed Schools

## Only 3 customer presenters

### Schoolcraft College VSI & VDI IT Infrastructure Overhaul

- **2016 VMware® CIO Symposium for Higher Education**

- Patrick R. Turner, CIO, Schoolcraft College, Livonia, Michigan
- 3401 Hillview Avenue, Palo Alto
- Building A - Sequoia Room

**Attendees included: Stanford,  
Carnegie Mellon, UC Berkley...**

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**...Where I met Rory Clements of VMware**



Provision student workspaces and apps **in minutes and keep up to date**



Accommodate unmanaged devices on your network and **improve security**



Across devices – **Provide a consistent experience**



Extend learning environments to **any device anywhere**

## What If you could...



Fast , Flexible Deployment



Improved Security

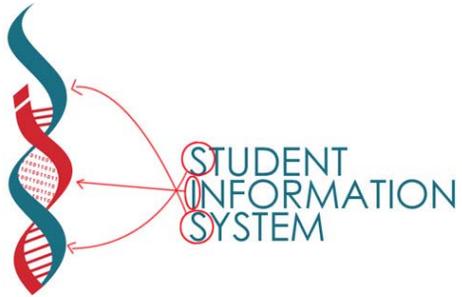


Standard Experience



Remote Learning Opportunities

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Typical Lab login today is User 1 - 24

We now need:

Student IDs – specific credentials

Course IDs – Changes hourly...

The Virtual Desktop must follow the student to wherever they are working and be available on their platform of choice

**Digital Backpack™  
Delivers!**

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# What Do Schools Really Need to Know?

## VDI Best Practices

- Do your homework
  - Consumption analysis was leveraged to characterize desktop requirements across campus infrastructure (similar to LakeShore™ or DPACK (Dell Performance Analysis Collection Kit) for server analysis).
    - How much horsepower do you need?
    - Properly size the infrastructure – Storage, Memory, CPU, Network capacity, plan for growth.
  - Do some testing to make sure you know what apps can be thin-app'd, App Volume'd, etc.  
(# of Images)
  - What is the roll out plan... IT first, Labs, Staff, Instructional Administrators, Faculty, Students...?
  - Don't over-promise – “CAD runs great on these GPUs, Lets try a couple CGT Labs.”

# What Do Schools Really Need to Know?

## VDI Best Practices

- Find an internal champion – someone who can share the vision; turn detractors into advocates. Make them successful! The personal touch!
  - Many ways to do it wrong – few to do it right – ultimately, can the users get their jobs done better...
  - Close interaction with end user is essential.
    - VDI gets blamed for everything, like, “It’s the Network!”
- Start with a lab – Dual Boot old hardware virtual and physical to wring out issues with no interrupt.
  - Work with Faculty on Expectations – stay connected.

# What Do Schools Really Need to Know?

## VDI Best Practices

- Do it right – Flash – GPU – Cores – Auto Resource Management – make solutions not excuses.
  - Be very mindful of latency between SAN and CPUs – monitor at capacity usage.
  - Be mindful of campus network latency between data center and desktops.
  - GPU (NVIDIA Tesla M60 GPU or NVIDIA Grid K2 GPU) – remember VDI likes all Flash arrays!
  - Be careful with thin provisioning – i.e., double-dipping VMware and SAN – avoid weirdness.
  - Desktop warming strategy – classroom turnover, boot storms vs image explosion (N+1 Strategy).
    - SAN auto-tiering can be your enemy – pinning VDI provisioning to flash vs auto-tiering.
    - Resource Management (DRS vs other ways – need dynamic resource mgmt., not once per day).

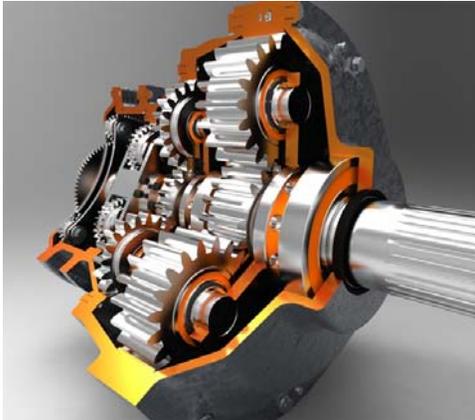
# What Do Schools Really Need to Know?

## VDI Best Practices

- Do it right...
  - End user acceptance can hinge on USB Drive, DVD Player, Doc Camera, or Capture SW for Microscope.
  - IOPS for VDI – different than VSI – separate the infrastructures.
  - Look closely at vSAN and hyper-converged architecture, performance.
- Pick a good implementation vendor who has done many and has partnership mentality.
- Training is a must.

# Applications Requiring Special / High Performance Computing

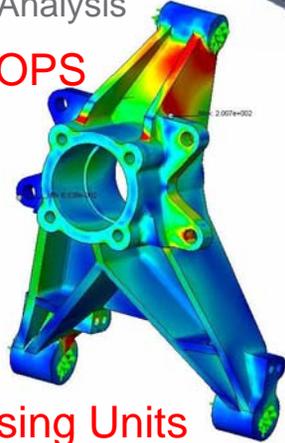
## The Challenges of Virtual Desktop Computing in Higher Ed



Computer Aided Design

Finite Element Analysis

IOPS



Document Camera



DVD Player



Projector



Computer Graphics Technology



Mechatronics



Electron Microscope

## GPUs – Graphics Processing Units



Emergency Room Operations

Nursing



Special Interfaces, Drivers, etc.



Welding and Manufacturing

Machine Interfaces



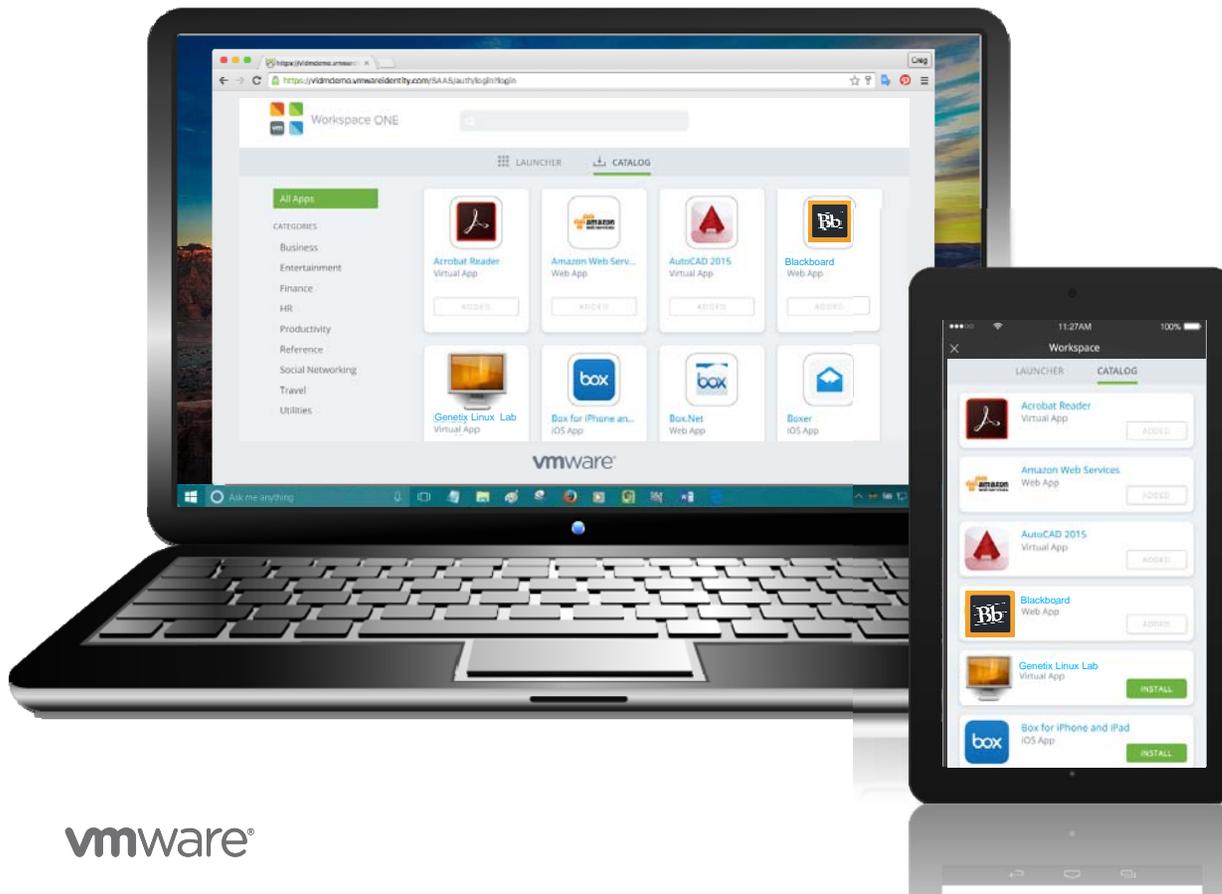
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# Explosion of Platforms when heavy lifting is in the Data Center



# The Answer: VMware's Digital Backpack



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Internal web apps

(Registrar, HR)



SaaS apps

(O365, LMS, Google)



Native public mobile apps

(email client, file shares)



Internally developed mobile apps

(Campus app, line of business apps)



Modern Windows apps



Legacy Windows apps (Line of business, administrative)



Virtualized apps & desktops (Computer Labs, 3D Graphics, other)

# Enabling the VMware Secure Digital Backpack

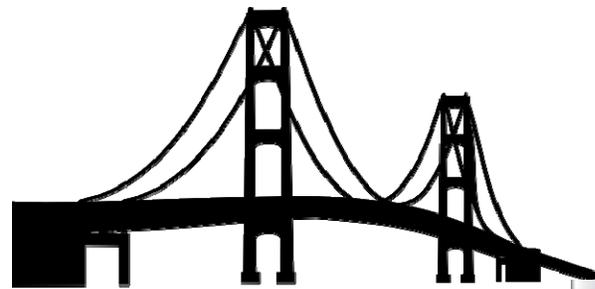


Banner® by Ellucian

Student Credentials & Course IDs



Colleague® by Ellucian



VMware Ellucian Connector

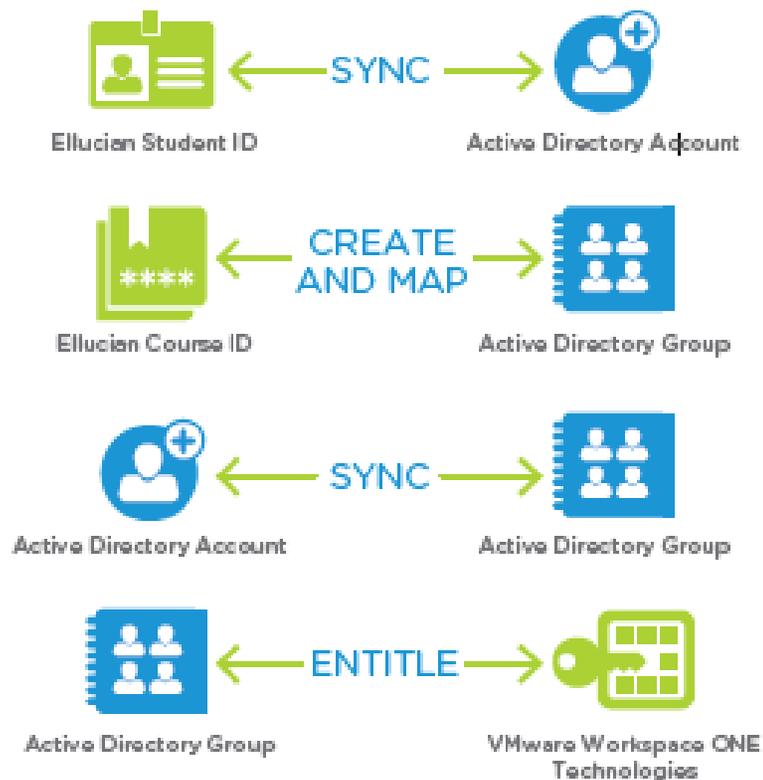


VMware Digital Workspace



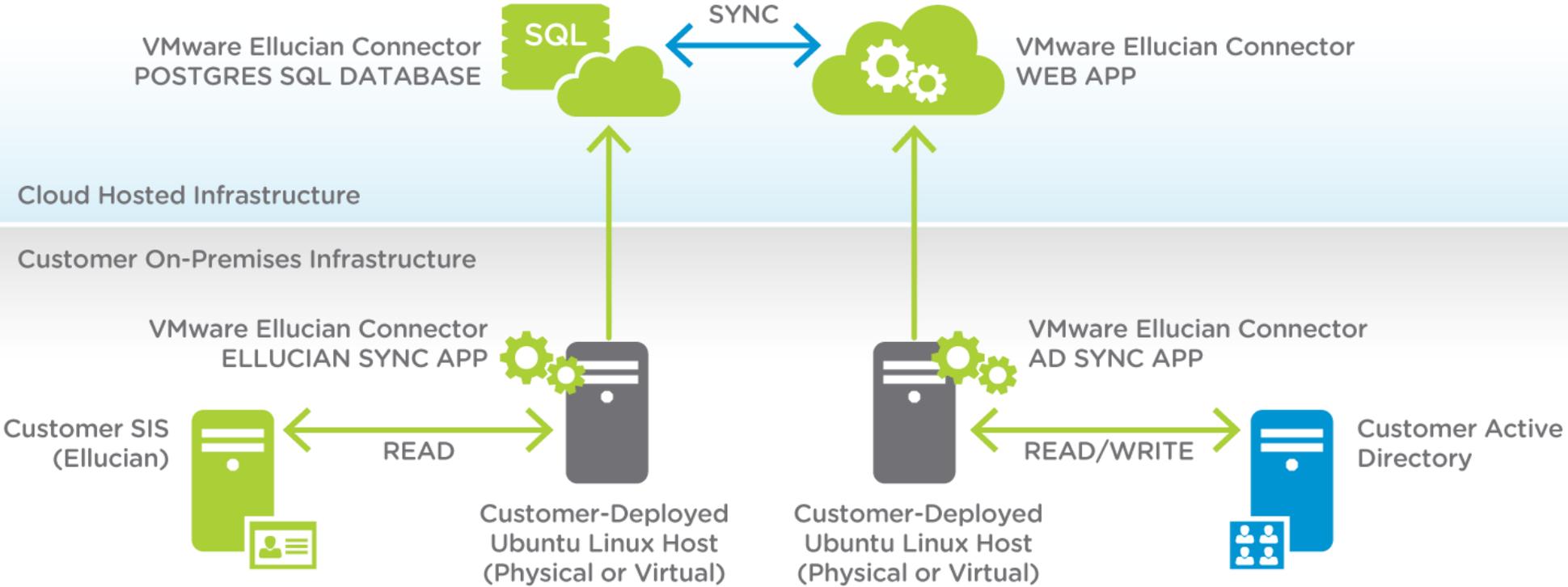
# VMware Ellucian Connector - How it works

## HIGH-LEVEL OVERVIEW

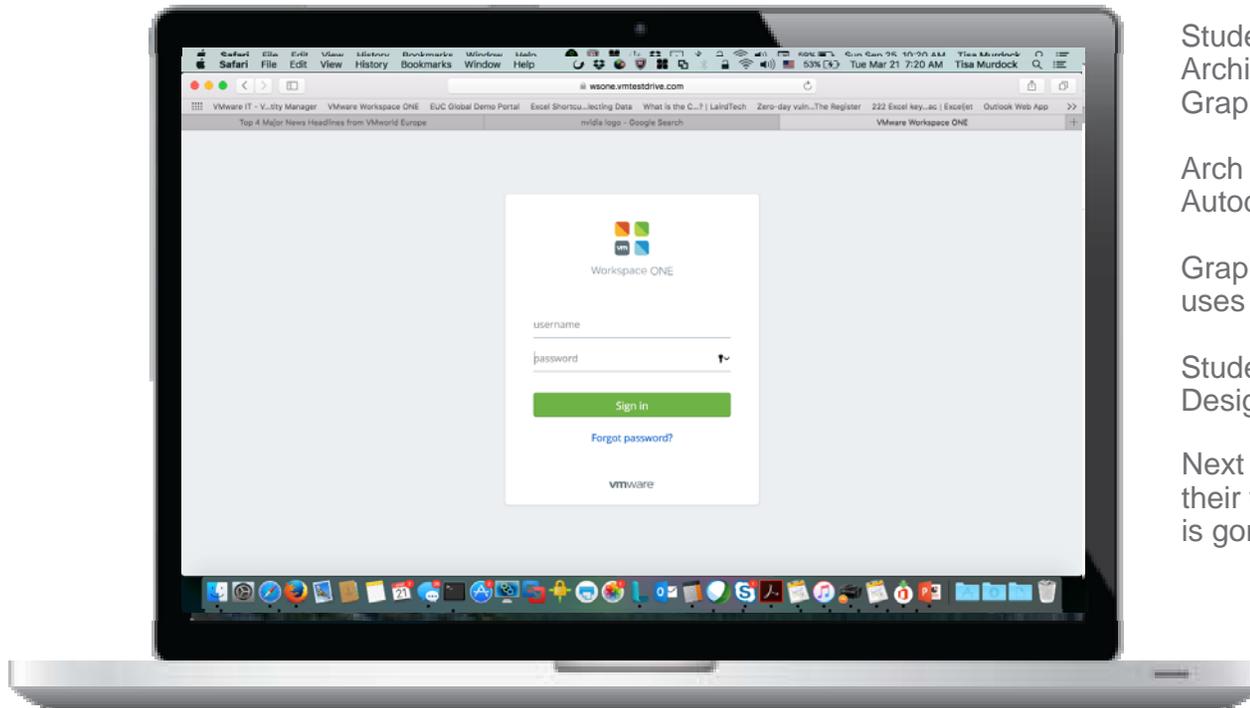


- Developed using ETHOS API's.
- The Connector takes the student ID in the Ellucian SIS and synchronizes it with a corresponding AD account (or creates one, if it doesn't exist).
- Takes the course ID in the Ellucian database and creates an AD group based on that course.
- Maps students IDs to the AD groups (courses) they are taking and keeps that data in sync as students add and drop classes.
- Entitle resources based on AD groups (offered courses).
- VMware Secure Digital Backpack stays up-to-date.

# THE SOLUTION



# VMware Secure Digital Backpack - Fully Customizable



Student is taking both Architecture 101 and Graphic Design 201

Arch 101 uses Autodesk AutoCAD

Graphic Design 201 uses Photoshop

Student drops Graphic Design 201

Next time they log into their workspace the app is gone

# Video of Prototype

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## VMware Ellucian Connector

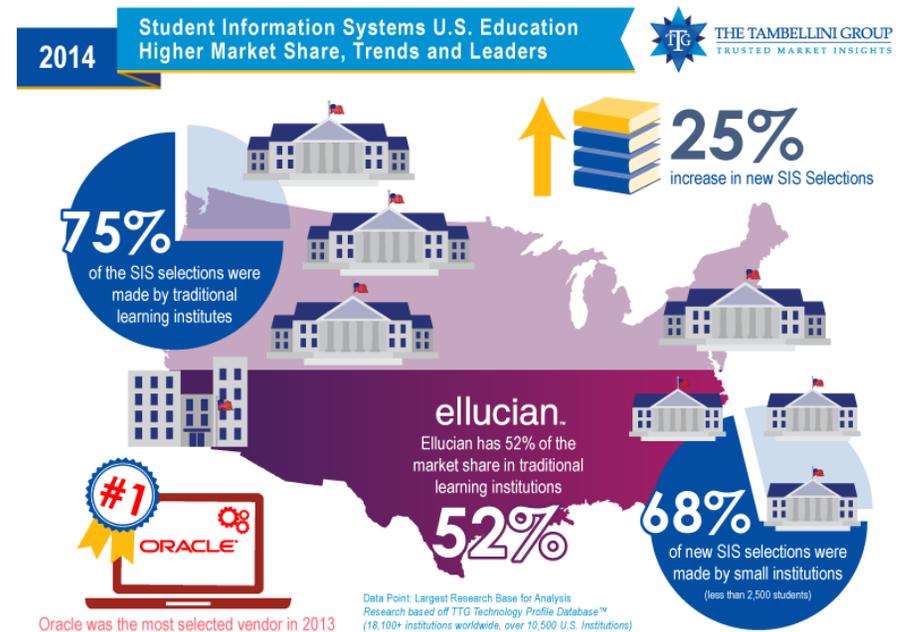
Rory Clements - Solution Engineering  
VMware End-User Computing

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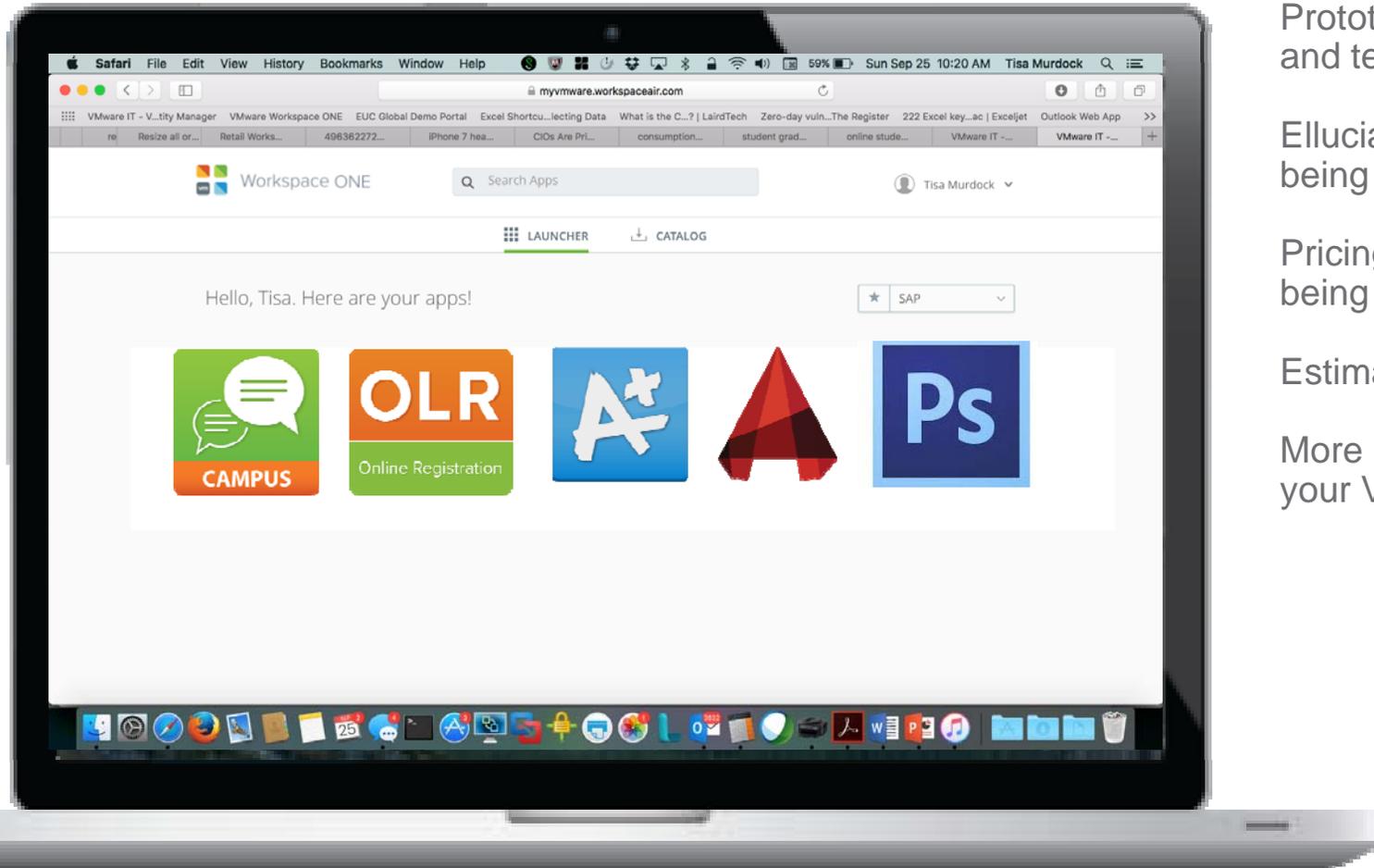
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# Why Integrate with the Ellucian SIS?

- Ellucian is the market leader for SIS in Higher Ed.
- Ellucian is used by more than three-fifths of the nation's public and private, non-profit colleges and universities.
- Global presence.
- Prototype syncs the Ellucian SIS database with Active Directory.



# VMware Ellucian Connector Status



Prototype is complete and tested.

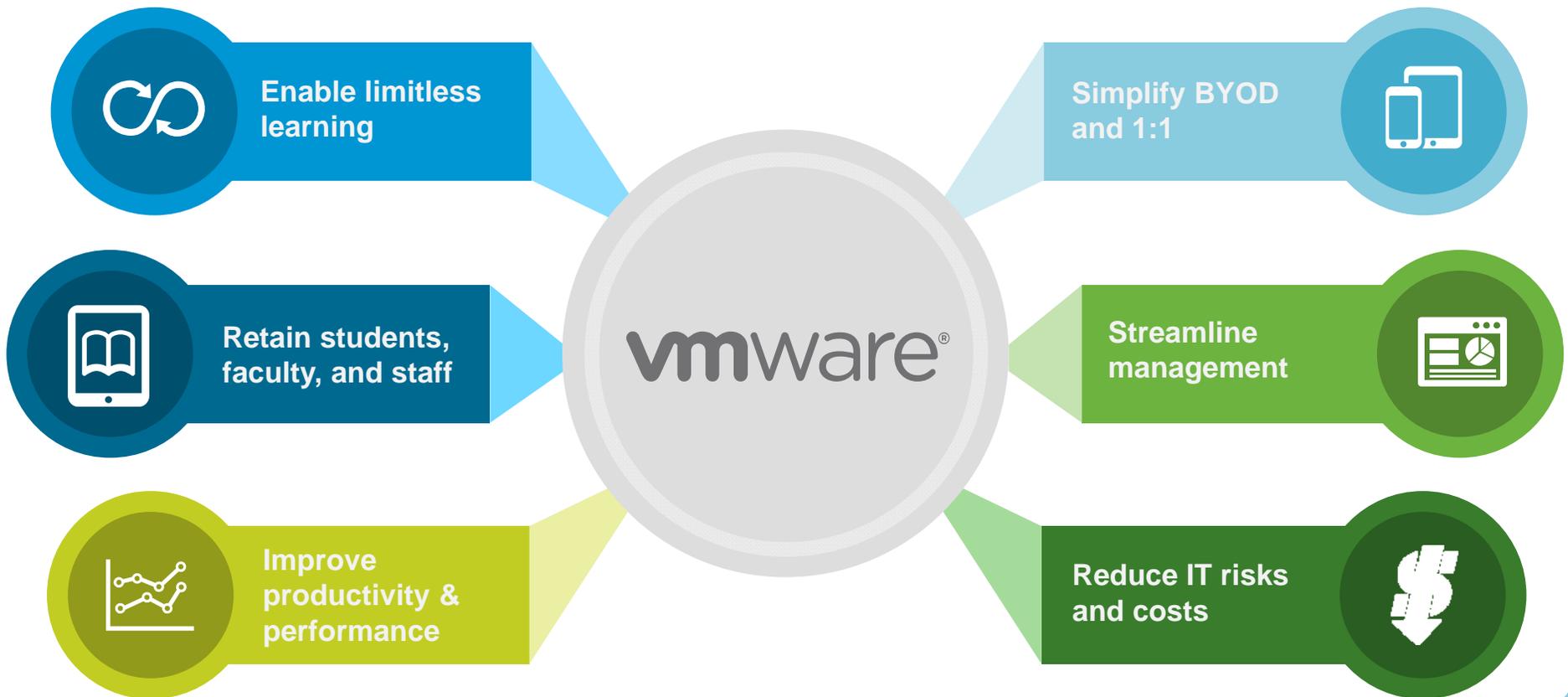
Ellucian Connector is being developed.

Pricing and Bundling are being worked on.

Estimate H1 2017 GA .

More Info? Reach out to your VMware team.

# Transform Digital Learning And Work Environments in HE



# THE END

Partnering for success



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