Any App on Any Device
Higher Education Digital Backpacks And The New VMware Connector For Ellucian

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Schoolcraft College Information Technology Vision

We Enable work!

Strategy:

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

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

From 9/22/2014 Board Meeting Presentation:

Definition of Primary Client's Expectations – Students

- Immersive Multimedia:
  - Smartphones, Tablets, Texting, Facebook, Twitter, Instagram, Reddit, FaceTime, Video, PayPal, Virtual Escort, Campus Maps, Schedules; 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.
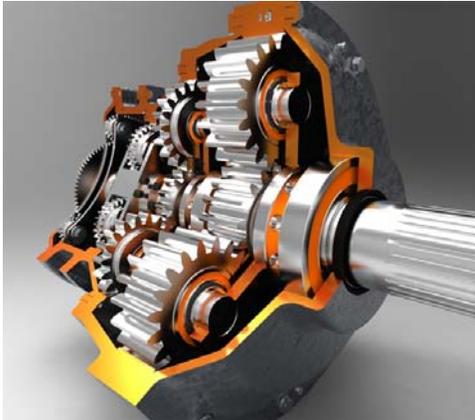
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4
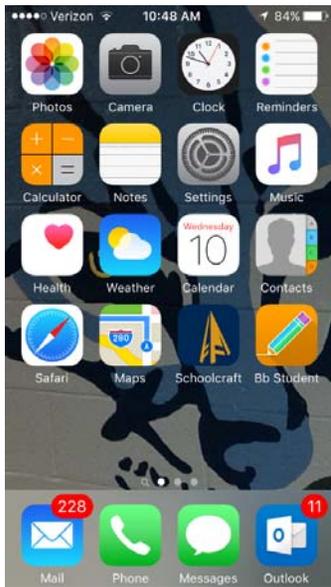
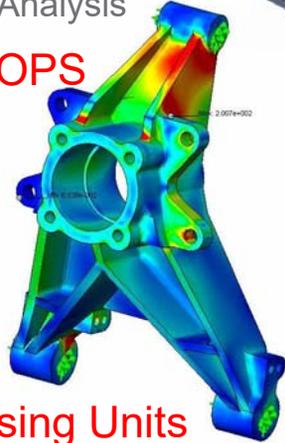# Applications Requiring Special / High Performance Computing

The Challenges of Virtual Desktop Computing in Higher Ed

Document Camera

DVD Player

Projector

Finite Element Analysis

IOPS

Computer Aided Design

GPUs – Graphics Processing Units

Computer Graphics Technology

Mechatronics

Electron Microscope

Special Interfaces, Drivers, etc.

Machine Interfaces

Emergency Room Operations

Nursing

Welding and Manufacturing

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Explosion of Platforms when heavy lifting is in the Data Center

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

Any App,
On Any Device,
From
ANYWHERE!!!

…From Home

Schoolcraft College

9:41
Monday, November 17

VMware®
Digital Backpack™

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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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Digital Backpack Overview

What is it?
➤ Automation of application entitlement to students based on course enrollment

How'd it start?
➤ Schoolcraft College developed a solution to map courses to AD groups, but needed help from Ellucian and VMware to enable the API's on each end to automate the data flow and seamlessly translate student course enrollment to application access

What's Needed?
➤ **VMware**
- ❖ VMware Enterprise System Connector (aka WS1 connector) – Windows server
- ❖ Ellucian Connector – Linux server
- ❖ Optional – Postgres DB, UAG & TrueSSO
- ❖ Horizon – Necessary if they want to publish desktops/legacy apps

➤ **Ellucian**
- ❖ Ethos – Ellucian's new unified data platform layer that delivers data in a consistent format for added functionality within Ellucian's products and easier integration with third party solutions

STUDENT INFORMATION SYSTEM
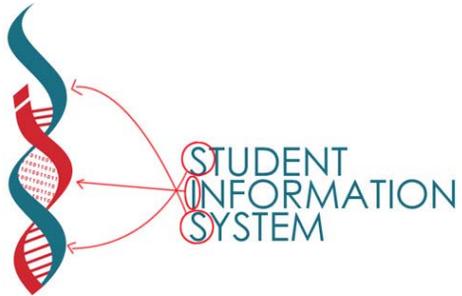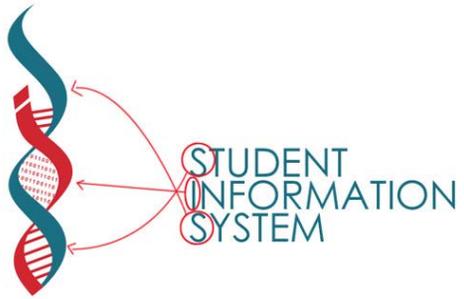
Typical Lab login today is User 1 - 24
We now need:
Student IDs – specific credentials
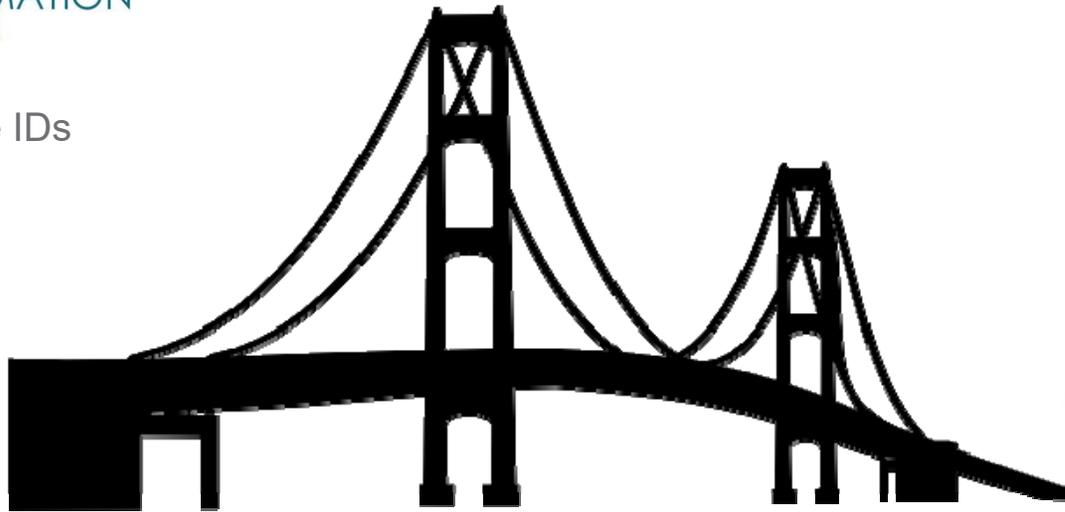Course IDs – Changes hourly…
The Virtual Desktop must
   follow the student to
   wherever they are working
   and be available on their
   platform of choice

Digital Backpack™
Delivers!

Student & Course IDs

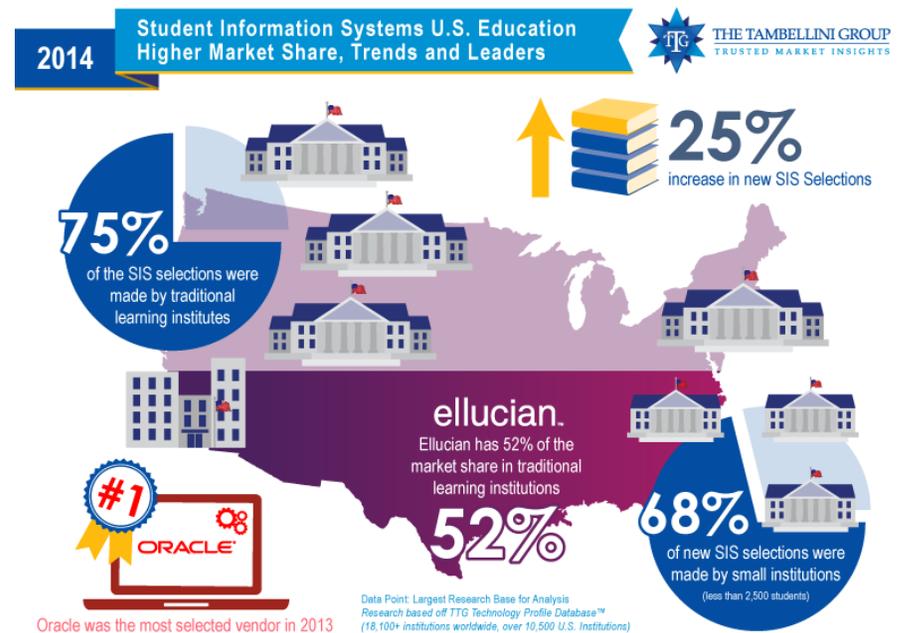**VMware Ellucian Connector**

A Student Digital Backpack
on any device

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

The Solution Design

How It Works

Ellucian student ID is synchronized with an AD account (or creates one, if it doesn't exist).

Ellucian Student ID ← SYNC → Active Directory Account

Ellucian course ID is synchronized and creates an AD group

Ellucian Course ID ← CREATE AND MAP → Active Directory Group

The Connector maps student accounts with class groups in AD

Active Directory Account ← SYNC → Active Directory Group

IT administrators entitle resources once based on those AD groups.

Active Directory Group ← ENTITLE → VMware Workspace ONE Technologies
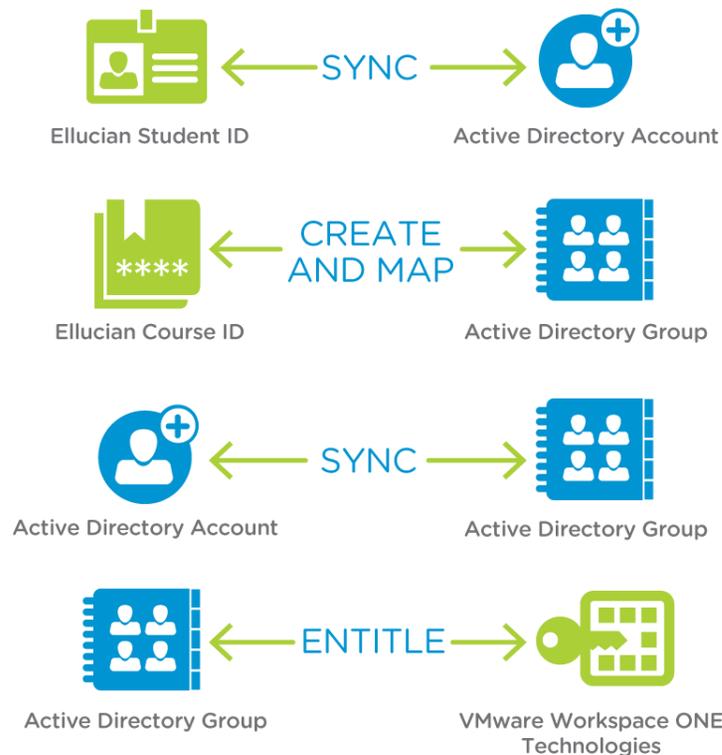
Course Connection to AD Group

The Answer: VMware's Digital Backpack
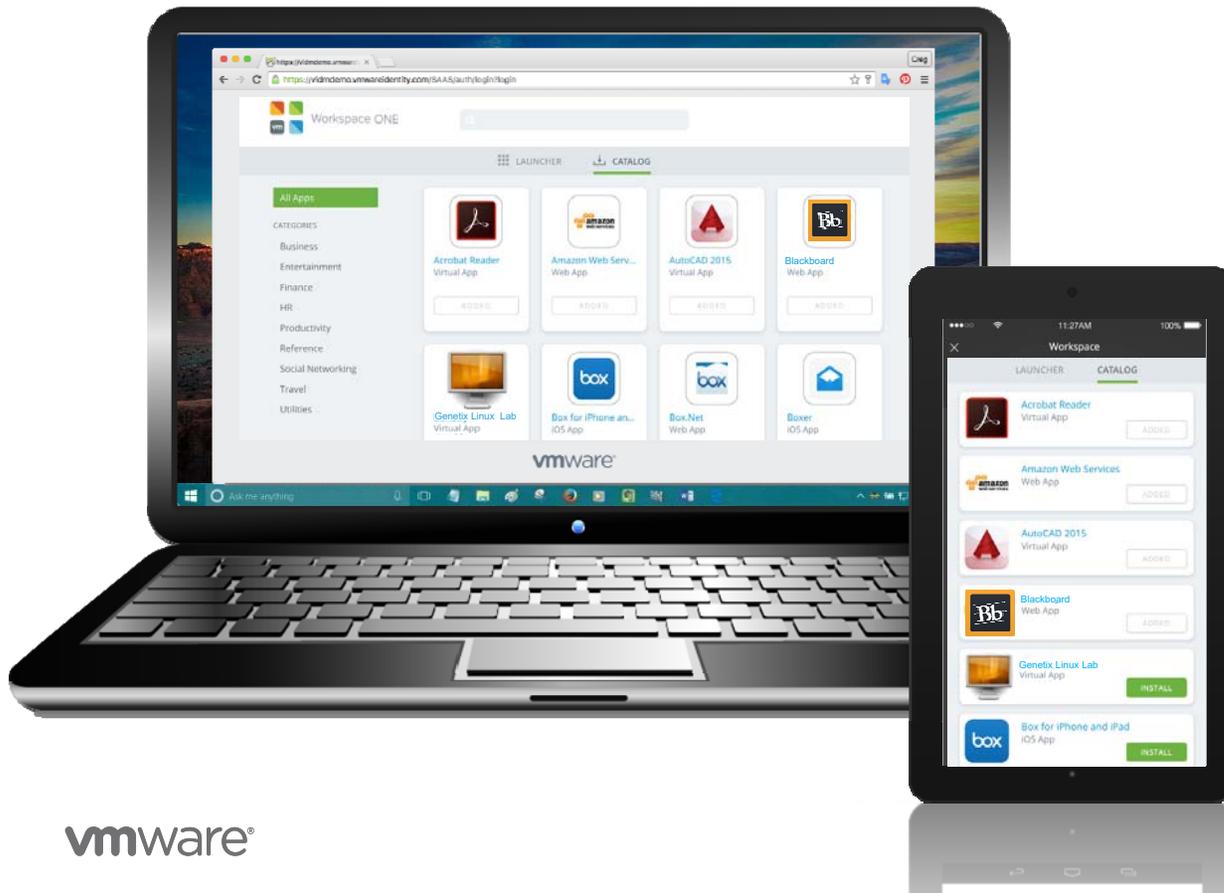
Internal web apps (Registrar, HR)

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)

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15

Beta Deployment - Overview

Ellucian Ethos Platform (Hosted)

Internet

Internal Network

Protocol: HTTPS, Port: 443
IP: 52.0.163.27; 50.16.144.60; 52.0.3.106

Read Data – courses, sections, students info, registrations

VMware Ellucian Connector

PostgreSQL (NOT provided by Vmware)

Linux machine

Protocol: LDAP / LDAPS
Port: 389, 636

**Read / Write:
Groups: Create, Update, Delete**

AD

Workspace ONE Service (Hosted – AWS US Data Centers)

- Authenticate users with AD and other on-prem auth systems.
- Sync user, group, apps, and entitlements.

Protocol: HTTPS, Port: 443
Outbound connection only

VMware Enterprise Systems Connector

Windows 2012R2 machine

Protocol: LDAP / LDAPS
Port: 389, 636

**Read / Write:
Users: Read, Update (password)
Groups: Read only**

Protocol: HTTPS
Port: 443

Read desktops, apps, and entitlements

Protocol: LDAP / LDAPS
Port: 389, 636

**Read:
Users: Read only
Groups: Read only**

Horizon
View Connector Server

Student (access Desktops from inside the network for PoC)

Horizon Apps & Desktop

Horizon Client

For Horizon Client
Blast Extreme
Ports: TCP/UDP 443, 8443 (if no UAG)
HTTPS: TCP 443
PCoIP: TCP/UDP 4172
CDR/MMR: TCP 9427
USB-R: TCP 32111

For Browser
Blast Extreme
HTTPS HTML: TCP/UDP 443

Access Desktops and Apps from inside the network

**Workspace ONE Service
(Hosted – AWS US
Data Centers)**

Internet

VMware Unified Access Gateway (UAG)
Linux Appliance, 20 GB disk space
All Traffic is Tunneled

DMZ

Internal Network
For Horizon Client
Blast Extreme: TCP & UDP 22443
HTTPS: TCP 443
PCoIP: TCP/UDP 4172
CDR/MMR: TCP 9427
USB: TCP 32111

Access Desktops and Apps from inside the network

Horizon Client

**Horizon
View Connector Server**

**VMware
Enterprise Systems
Connector**

Horizon Desktops
and RDS Hosts

| VM | VM | VM | VM |
| VM | VM | VM | VM |

VMware vSphere

AD

For Browser
Blast Extreme
HTTPS HTML: TCP/UDP 22443

- User logs in to Workspace portal
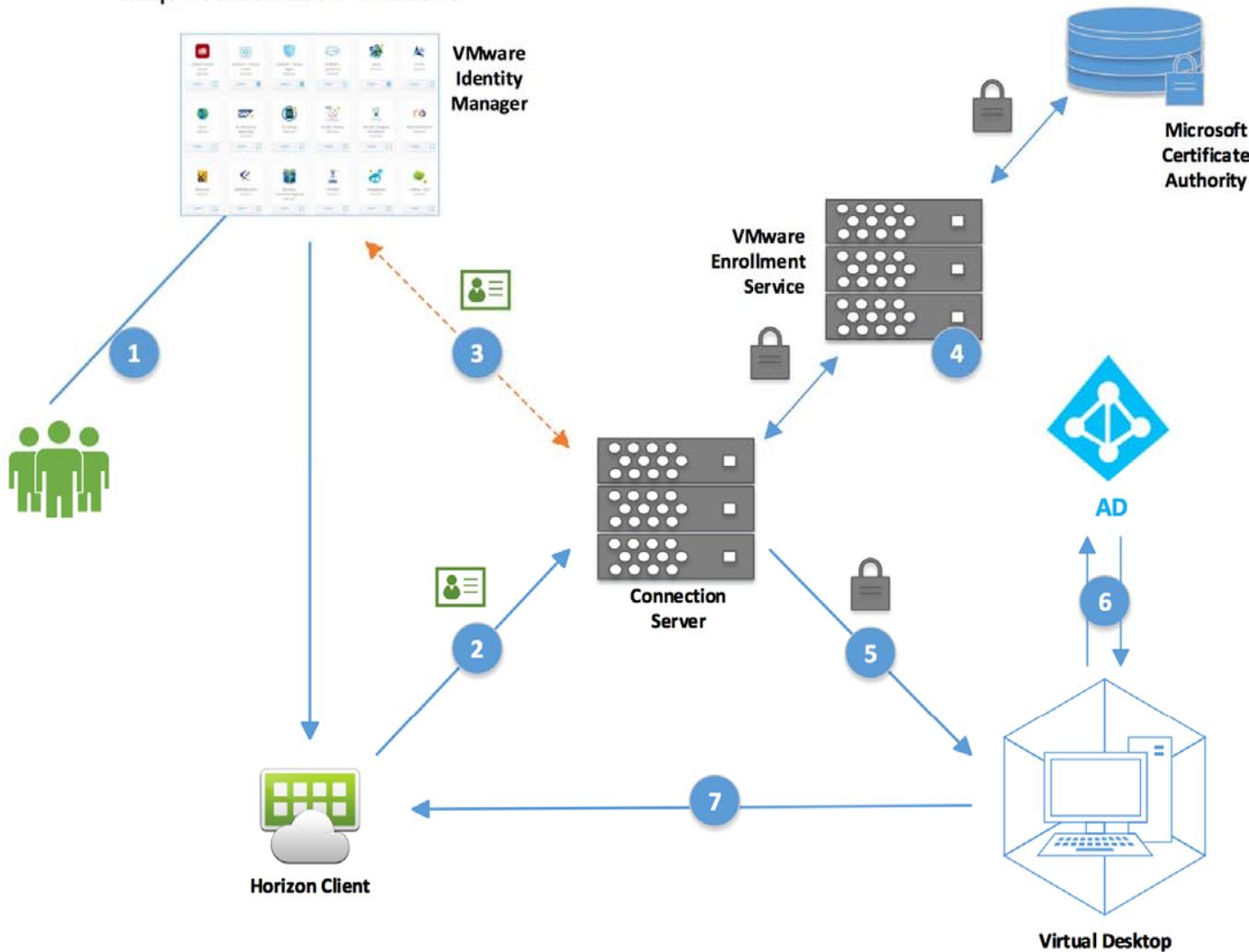
- Workspace retrieves Horizon entitlements from on premise Connector

- Workspace Connector syncs entitlements via SAML connection to Horizon Connection Server

- When user launches a Horizon resource via Workspace, the connection request is sent to the Horizon Client or Browser and follows normal Horizon connection sequence

Horizon Apps & Desktop: True SSO

Requires Horizon 7 or above

VMware Identity Manager

Microsoft Certificate Authority

VMware Enrollment Service

AD

Connection Server

Horizon Client

Virtual Desktop

True SSO is required when authenticating to vIDM with UPN (user@domain.edu)

1. User authenticates to vIDM.

2. Horizon Desktop or Application requested.

3. SAML assertion sent to Horizon Connection Server.

4. TrueSSO Enrollment service request SSL Certificate "ticket".

5. SSL "ticket" acts like a SmartCard and passes authentication to the Desktop or RDS Aplication.

6. SSL "ticket" validated by AD.

7. End user is logged in via Single-Sign-On as "username".

VMware Ellucian Connector Status
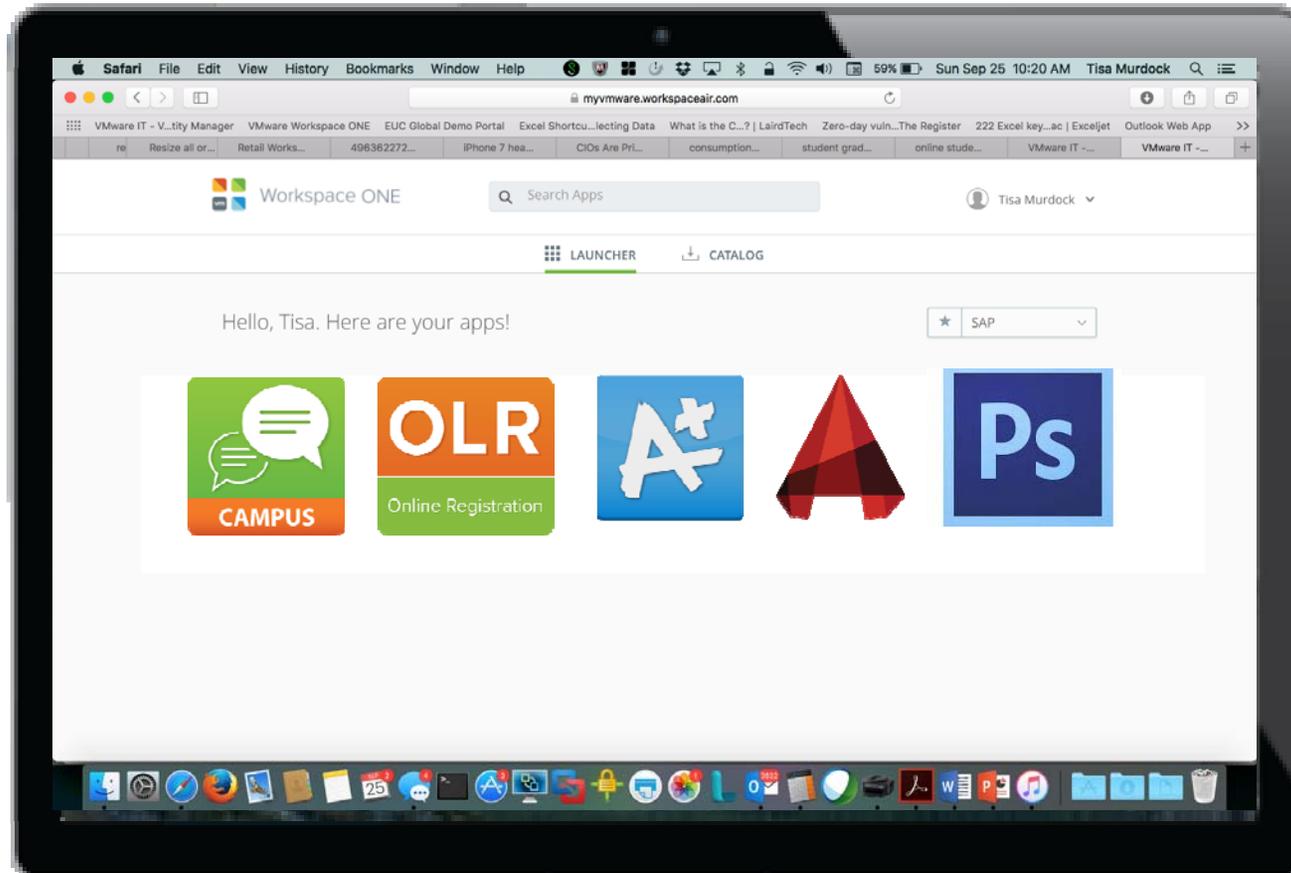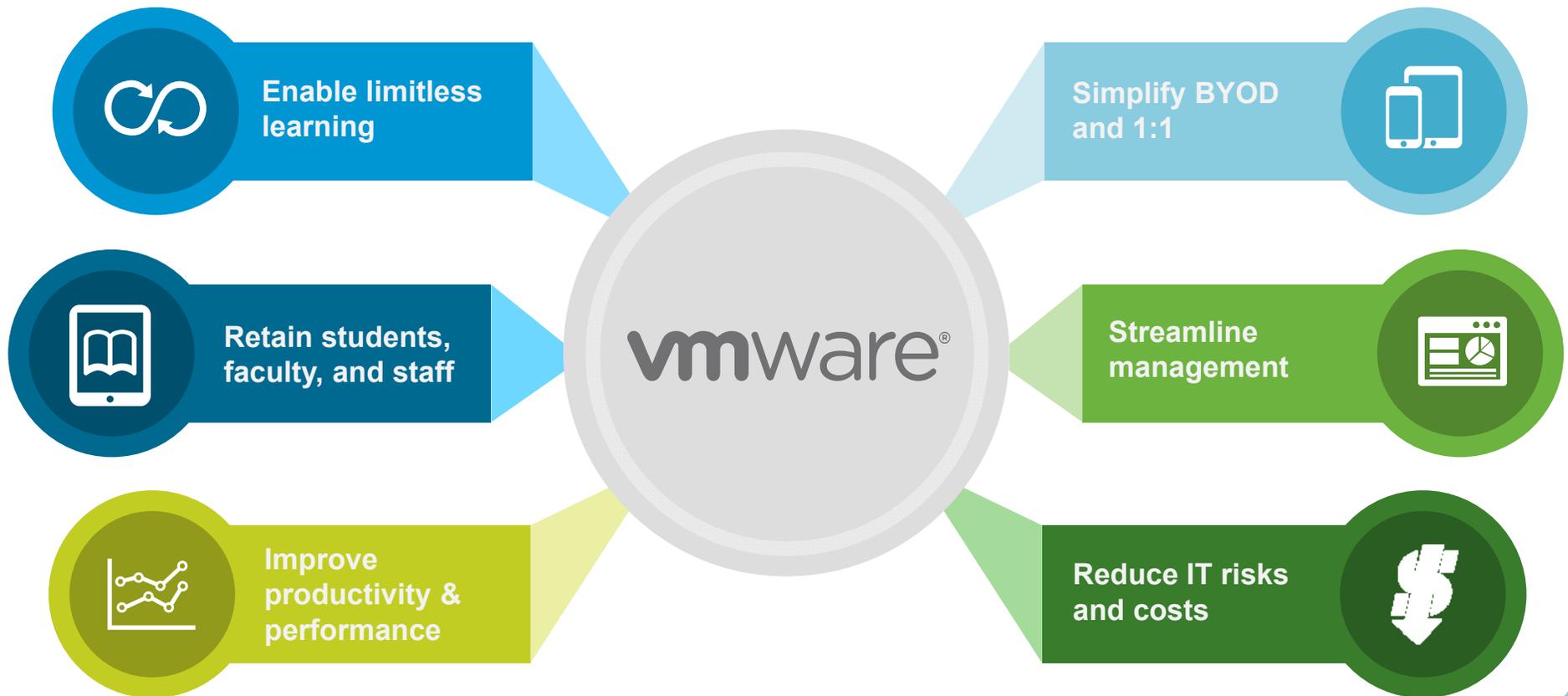

Prototype is complete and tested

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

Enable limitless learning

Simplify BYOD and 1:1

Retain students, faculty, and staff

Streamline management

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Improve productivity & performance

Reduce IT risks and costs

THE END
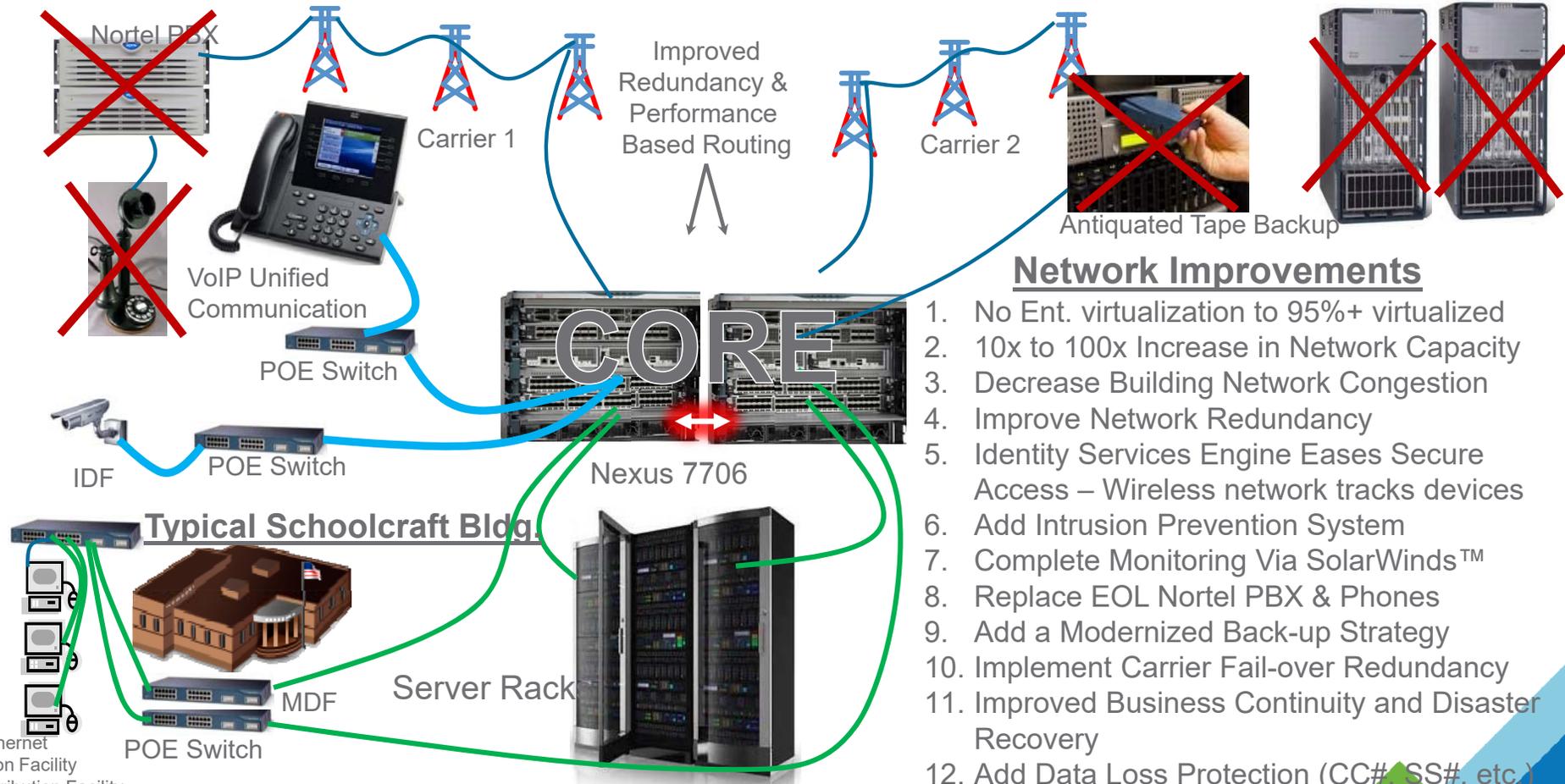
Partnering for success

Appendix

This is where Schoolcraft Ended up!

New Core Network
New Distribution Network – 86 Closets

New Network Traffic

Increased Network Traffic

Nortel PBX

Carrier 1

Improved Redundancy & Performance Based Routing

Carrier 2

Antiquated Tape Backup

VoIP Unified Communication

POE Switch

IDF

POE Switch

CORE

Nexus 7706

Typical Schoolcraft Bldg.

Server Rack

MDF

POE Switch

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

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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 Eases Secure Access – Wireless network tracks devices
6. Add Intrusion Prevention System
7. Complete Monitoring Via SolarWinds™
8. Replace EOL Nortel PBX & Phones
9. Add a Modernized Back-up Strategy
10. Implement Carrier Fail-over Redundancy
11. Improved Business Continuity and Disaster Recovery
12. Add Data Loss Protection (CC#, SS#, etc.)

Network Improvements

23

Where Might You Begin?

Modernize and mobilize learning environments

Improve The Campus Computing Experience

Enhance security and privacy

Improve efficiencies and reduce costs

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24

Higher Education Pain Points

Student Experience

- Inability to deliver consistent student experience across devices and locations
- Need to enable anytime, anywhere learning
- Remote access to lab software and class resources – 3D apps

Security and Compliance

- Ensuring personally identifiable information is protected and secure
- Challenged to keep network and data secure without implementing solutions that degrade end-user experiences

Mobility and BYOD

- Unable to meet increasing student, faculty, and staff demands for access to learning resources from their own devices
- Inability to deliver resources in a device-agnostic, personalized way

New & Adaptive Learning Environments

- Challenged to collect real-time data (e.g., class rosters, majors) to adapt curriculum, learning environments, and teaching methods to student and faculty needs
- Difficulty supporting new blended learning environments, flipped classroom models and makerspaces

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