Creating a Virtual Lab for Data Science

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- Continuing Education, Outreach and E-Learning (CEOEL)
- Partnership with 26 UW System Campuses
  - Program development & management
  - Financial & enrollment management
  - Instructional design
  - Recruitment
  - Student services
  - Marketing & research
  - Media services
  - IT support
Flexible Option Programs

• Competency-based education degree & certificates
• Fully online and self-paced

• Degree programs
  ▪ Associate of Arts and Science
  ▪ BS Nursing, RN to BSN completion
  ▪ BS Biomedical Sciences Diagnostic Imaging
  ▪ BS Information Science and Technology

• Certificate programs
  ▪ Business and Technical Communications
  ▪ Global Skills
  ▪ Sales
Online Collaborative Degree Programs

- BS, MS or certificates in Sustainable Management
- BS in Health Information Management & Technology
- BS in Health & Wellness Management
- BPS in Organizational Leadership & Communication
- **MS in Data Science**
- BSN Linc: Nursing (National)
- BSN@Home: Nursing (WI Residents Only)
Agenda

- Masters Degree of Data Science (MSDS)
- Project Management for MSDS Implementation
- Building the Virtual Lab
- Lessons Learned
- Questions
Masters Degree in Data Science (MSDS)

- Accepting enrollments beginning FALL 2015
- 100% online program
- 12 courses
- 3-credits each, with a Capstone
- Real-world datasets, tools, analytical methods
- Response to “Big Data”
Masters Degree in Data Science (MSDS)

Six Partner Campuses

- UW-Eau Claire
- UW-Green Bay
- UW-La Crosse
- UW-Oshkosh
- UW-Stevens Point
- UW-Superior
Online Program Implementation for MSDS

- Student & Faculty experience across multiple campuses
- Requirements gathering for environment, software
- Project management and coordination
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Requirements Gathering

• DS 700 – Foundations of Data Science, UWGB
• DS 705 – Statistical Methods, UWLX
• DS 710 – Programming for Data Science, UWEC
• DS 715 – Data Warehousing, UWSP
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Challenges

- Server-based applications
- Timeline
- Staffing
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Project Management & Coordination

- MSDS Faculty
  - UW Eau Claire
  - UW Green Bay
  - UW La Crosse
  - UW Stevens Point

- Instructional Designers & Media Team

- Information Technology

- MSDS Project Team

- MSDS Program Manager, Student Services Coordinator

- Academic Directors (On Campus)
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Project Communications

- Project team meetings (bi-weekly)
- IT Stand-up meetings (daily)
- Implementation summary (weekly)
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Implementation Strategies

• Technical Requirements Gathering
  
  o Windows 7/8
  
  o The student will need access to 6 – 8 specific software titles for the program
  
  o Student will need access to SQL Server
  
  o The ability to provide student technical support
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Implementation Strategies

- Cloud Solution
- Hybrid Solution
- Decentralized – Non Hosted Solution
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Centralized Cloud – Hosted Solution

DRAFT
Centralized Cloud-Hosted Solution
Horizon Air by VMWare
Desktop as a Service (DaaS)

STUDENTS
Access to virtual desktop through web browser or client installed locally on computer

FACULTY

CEOEL IT
- Account Provision/De- Provision
- Manage VDI (Refresh/Recovery)
- Licensing

Virtual Student Desktop 1
Virtual Student Desktop 2
Virtual Student Desktop 3
Virtual Student Desktop N.
Virtual Faculty Desktop 1
Virtual Faculty Desktop 2
Virtual Faculty Desktop 3
Virtual Faculty Desktop N.
Database
Storage
Hybrid Hosted Solution

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Decentralized Non - Hosted Solution

DRAFT
Decentralized Non-Hosted Solution

Central IT has proposed to host SQL server and separate database instances for each student.

- More individualized Technical Support
- Multiple OS, PC vs Mac
- Storage
- Servers
- Licensing
Centralized Cloud Hosted Approach using VMware

• Utilize a technology solution we are familiar with
• Centralize both server and desktop environment
• Work with a Technology Partner to assist in the implementation and meet aggressive timelines
• Improve technical support experience

Enhance Student Experience by

• Provide standardized desktop experience for students
• Provide fast and reliable environment
• Easily accessible
• Can be accessed from most any client device
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VMware Cloud Offerings

- VMware vcloud Air – Infrastructure as a service (IaaS)

vCloud Air: Three Compute Service Offerings

<table>
<thead>
<tr>
<th>Service</th>
<th>Compute</th>
<th>Storage</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated Cloud</td>
<td>120GB vRAM, 30GHz vCPU</td>
<td>6 TB</td>
<td>50 Mbps allocated, 1 Gbps burstable, 3 Public IPs</td>
</tr>
<tr>
<td>Virtual Private Cloud</td>
<td>20GB vRAM, 10GHz vCPU</td>
<td>2 TB</td>
<td>10 Mbps allocated, 50 Mbps burstable, 2 Public IPs</td>
</tr>
</tbody>
</table>
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VMware Cloud Offerings

VMware Horizon Air - Offers Desktop as a Service (DaaS) or Applications as a Service (AaaS)

- **Standard**
  - Designed for the knowledge worker
  - 1 vCPU
  - 2 GB RAM
  - 30 GB HD

- **Advanced**
  - Designed for the power user
  - 2 vCPU
  - 4 GB RAM
  - 60 GB HD
  - Soft 3D

- **Enterprise**
  - Designed for the power user+
  - 4 vCPU
  - 8 GB RAM
  - 120 GB
  - Soft 3D

Windows desktops and apps as a cloud service
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Implementation Considerations

- Horizon Air – purchased in packs of 50
- Right Size Desktop (standard, advance, enterprise)
- vcloud air - Right sizing the resources for your environment
- Network Infrastructure – extended or isolated
- Support Model – day to day operations and tiered support
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Other Implementation Considerations

• Credentials for students
  o Provisioning/de-provisioning
  o Password resets
  o Permissions

• Desktop Management
  o Re-imaging
  o Software installation and standardization
  o Security, patches and updates
  o Licensing

• Connections to Horizon Air
  o Determine URL for the hosted environment
  o Browser or Horizon Client
  o Protocol(s) PCoIP, RDP, HTML, RDSH

• Horizon Air Administration
  o Master Template – Configuration
  o Desktop Static verses Dynamic
  o Number of Pools (group of desktops)
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Costs Breakdown

**Horizon Air**
- Advanced Desktop
- 50 pack $47.50 per desktop

**vcloud Air**
- Virtual Private Cloud $8,992 /year

Vendor Implementation – Varies

Vendor Support – Varies
Cloud Makes the Complex Easy

Management, Devices, Apps, OS
- Desktop management
- Access devices (end-point)
- Applications
- Image creation, deployment and maintenance
- Operating system licenses

Provided by:
End Customer OR Solution Provider

Software
- DaaS platform software
- Server/data store
- DaaS platform SW patching & administration
- Support and maintenance

Hardware
- Servers
- Storage (RAID protected)
- Networking infrastructure
- Hardware Administration
- Support and maintenance

Facilities
- Data center
- Racks
- Power and cooling
- Security

Support
- 7 x 24 x 365 L2+ support for desktop admin
- DaaS platform — certified support personnel
- Integrated incident, service request and escalation management system
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Lessons Learned

• Implementation partners
• Program development framework
• Project communications
• Agile project management
• Current Enrollment = 38 students
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Demo

OUR SERVERS ARE USING TOO MUCH ELECTRICITY. WE NEED TO VIRTUALIZE.

I DID MY PART BY READING ABOUT VIRTUALIZATION IN A TRADE JOURNAL. NOW YOU DO THE SOFTWARE PART.

WHY IS YOUR PART TAKING SO LONG?
Creating a Virtual Lab for Data Science

Questions?

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