What is Server Virtualization?
Key Properties of Virtualization

Partitioning
- Run multiple operating systems on One physical machine
- Divide system resources between Virtual Servers

Encapsulation
- Entire state of the Virtual Server can be saved to files
- Move and copy virtual servers as Easily as moving and copying files
Key Properties of Virtualization

Hardware Independence

Provision or migrate any virtual Server to a different physical Server
The Results of Virtualization = Savings!

Financial Energy

Human Energy

Earth’s Energy
Capital costs Reduced by 50% - 60% *

Delayed Data Center Expansion

Operational costs reduced by 25%

* VMWorld 2009
Average of 33% reduction
In routine admin time *

E.g. provision a server in minutes

* VMWorld 2009
Up to 80% reduction in data Center Energy costs *

* VMWorld 2009
Virtualization as a Service (VaaS)

• VaaS provides a virtual datacenter for departments

• Virtual servers are available for purchase by campus departments

• Departments have full access and control over virtual servers

• VaaS manages the hardware layer down through the datacenter. Departments continue to manage from the Operating System up through the application.
Power and Cooling Costs Without VaaS

Estimated Costs* for 400 Physical Servers in server rooms or closets:

Power: $106,696

Servers * hrs/yr * UM utility rate

Cooling: $213,393

Annual power cost * PUE (3) - 1

*Assumptions: Servers are Dell 2950’s (.350kW), PUE of 3 for unit server rooms and closets.
Power and Cooling Costs with VaaS

Estimated Costs for 400 Virtual Servers:

Power: $10,903

(Servers + SAN) * hrs/yr * UM utility rate

Cooling: $10,903

Annual power cost * PUE (2) - 1
Annual Carbon Savings with Virtualization

400 Virtual Servers:
125,320 kW/yr = 90 Metric Tons CO₂

400 Physical Servers:
1,226,400 kW/yr = 881 Metric Tons CO₂

Carbon Savings through Virtualization:
1,101,080 kW/yr = 791 Metric Tons CO₂

http://www.epa.gov/RDEE/energy-resources/calculator.html
VaaS Benefits and Features

• It's Green! Save on Power, Space, and Cooling
• Enterprise solutions at a low cost
• Scalability and Flexibility
• Fast Procurement
• No physical server installation/upgrades/maintenance
• No hardware vendor support contracts to maintain
• Save money on staffing
• Technology refresh at no additional cost
• Hardware Fault Tolerance
• Increased Security
• Disaster recovery
• Offsite Encrypted Tape Backups

http://vaas.umich.edu
Virtual Desktops Coming Soon!

Look for a new Virtual Desktop service offering from ITS in early 2010!
Questions?

http://vaas.umich.edu