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Using Virtual Machines to Prototype Mapping Applications

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Using Virtual Machines to Prototype Mapping Applications

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GIS Day - 2008
Virtual Machines

• What is this technology?
• Why would I use it?
• What does it look like?
• How would I use it?
• How do I get it?
Virtual Machines Benefits

In general, VMware virtual machines possess four key characteristics that benefit the user:

• **Compatibility**: Virtual machines are compatible with all standard x86 computers

• **Isolation**: Virtual machines are isolated from each other as if physically separated

• **Encapsulation**: Virtual machines encapsulate a complete computing environment

• **Hardware independence**: Virtual machines run independently of underlying hardware
We create our own virtual computer that runs in a physical computer
The virtual computer is stacked on a physical cluster and EACH has its own operating system.
The physical cluster is running virtual computers with LINUX, Windows Server, Windows XP, Mac OS, etc.
Four reasons to use virtual computer environment.

- Resource Balancing
- Disaster Recovery
- Easy Deployment
- Consolidation
VMWare Workstation:

Pros:
• Rapid prototyping
• Easy to involve student programmers
• Bridged to internet for real testing

Cons:
• Slower
• Limited file access (image size includes harddrive allocation)
  better for streaming data than for massive arrays of files.

VM Server (Offsite Cluster)
• Rapid installation
• Better resource utilization
• Back-up and Recovery
• Freedom from Hardware limitations
• Cheaper than hardware (for School of Agriculture units)
• Computational speed is slower
VMware is the recognized leader in virtualization technology solutions proven to increase the utilization of existing hardware and reduce capital and operational costs throughout the organization.
VMware Workstation allows multiple standard operating systems and their applications to run with high performance in secure and transportable virtual machines. Each virtual machine is equivalent to a PC with a unique network address and full complement of hardware choices.

Click this button to create a new virtual machine. You then can install and run a variety of standard operating systems in the virtual machine.

Click this button to create a new team. You then can add several virtual machines and connect them with private team LAN segments.

Click this button to browse for virtual machines or teams and to select one to display in this panel. You then can interact with the guest operating system within this display as you would a standard PC.
Welcome to the New Virtual Machine Wizard

This wizard will guide you through the steps of creating a new virtual machine.
Basic server

State:
Guest OS:
Configuration file:
Version:
Snapshot:

Commands
- Start this virtual machine
- Edit virtual machine
- Clone this virtual machine

Notes
Type here to enter notes

New Virtual Machine Wizard

Select a Guest Operating System
Which operating system will be installed on this virtual machine?

Guest operating system
- Microsoft Windows
- Linux
- Novell NetWare
- Sun Solaris
- Other

Version
Windows 2000 Professional

< Back | Next > | Cancel
New Virtual Machine Wizard

Network Type

What type of network do you want to add?

Network connection

- Use bridged networking
  Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.

- Use network address translation (NAT)
  Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.

- Use host-only networking
  Connect the guest operating system to a private virtual network on the host computer.

- Do not use a network connection
Specify Disk Capacity
How large do you want this disk to be?

Disk capacity
This virtual disk can never be larger than the maximum capacity that you set here.

Disk size (GB): 80

Allocate all disk space now.
By allocating the full capacity of the virtual disk, you enhance performance of your virtual machine. However, the disk will take longer to create and there must be enough space on the host's physical disk.

If you do not allocate disk space now, your virtual disk files will start small, then become larger as you add applications, files, and data to your virtual machine.

Split disk into 2 GB files
Virtual Machine Settings

Memory
Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine:
1160 MB

- Guest OS recommended minimum: 64MB
- Recommended memory: 256MB
- Maximum recommended memory: 1740MB
(Memory swapping may occur beyond this size)
Welcome to Windows

Press Ctrl-Alt-Delete to begin.

Requiring this key combination at startup helps keep your computer secure. For more information, click Help.
Virtual server running on a desktop - a
MS4W - MapServer 4 Windows - version 2.2.1

Introduction

Welcome to MS4W v2.2.1, the MapServer package for Windows. This package is intended to simplify your life if you are:

- a novice MapServer user with little knowledge (or time) to compile MapServer from scratch.
- interested in one of the MS4W addon packages and looking to avoid configuration issues.
- any MapServer user who needs a quick and dirty installation on Windows.

In any of these cases, and probably more, MS4W can help you. However, a few notes about this package:

- This is not a true installer, it will not modify any file or registry setting outside of the MS4W directory.
- Since it is not a true installer, it will not install to any location. It ***MUST*** be installed at the root of one of the drives on your system.
- The MS4W addon packages must be extracted at the same root as the base installer, and files must be overwritten.

Features

MS4W contains default installations of Apache, PHP, MapServ, MapScript (CSharp, Java, PHP, Python) and some sample applications. It is structured in a way as to facilitate upgrading individual components without messing up the rest of the install. The base installer package comes pre-configured with the following software:

- Apache 2.2.3
- PHP 5.2.0
- MapServer 4.0.1
To directly manage a single host, enter the IP address or host name. To manage multiple hosts, enter the IP address or name of a VirtualCenter Server.

- **IP address / Name:** 128.210.115.79
- **Username:** one@purdue\teller
- **Password:** ********
What is a Virtual Machine?

A virtual machine is a software computer that, like a physical computer, runs an operating system and applications. An operating system installed on a virtual machine is called a guest operating system.

Because every virtual machine is an isolated computing environment, you can use virtual machines as desktop or workstation environments, as testing environments, or to consolidate server applications.

In VirtualCenter Server, virtual machines run on hosts or clusters. The same host can run many virtual machines.

Basic Tasks

- Power off the virtual machine
- Suspend the virtual machine
- Edit virtual machine settings

Explore Further

- Learn more about virtual machines
- Learn how to install an operating system
Welcome to Windows

Press Ctrl-Alt-Delete to begin.

Requiring this key combination at startup helps keep your computer secure. For more information, click Help.