

VMware Workstation

vCenter Server (\$) (license manager)	Server	ESX (\$) (vMotion, DRS, HA, Storage vMotion)		
	hardware	ESXi (freeware) (ESXi freeware is managed by the Virtual Infrastructure (or vSphere) Client) ESXi (\$) (vMotion, DRS, HA, Storage vMotion)		Guest OS Guest OS Guest OS...
Workstation hardware	Windows or Linux OS	User session	VMware Server (freeware)	Guest OS
			VMware Workstation (\$)	Guest OS
			VMware Player (freeware)	Guest OS...
			vSphere Client for managing ESX(i) hosts (freeware)	

VMware-Desktop software & End-User Computing

- **VMware ThinApp** (formerly known as Thinstall), an application virtualization solution designed to accelerate application deployment and simplify application migration.
- **VMware ACE** (Assured Computing Environment)
- **VMware Express** (for accessing Windows applications from a Linux desktop)
- **VMware Fusion** (for Mac Desktops), a solution for Apple users to seamlessly run Windows and Windows applications on an Intel processor-powered Apple OS X Macintosh computer.
- **VMware Player**, is a free software used to run multiple operating systems at the same time on your PC.
- **VMware View** (formerly VMware VDM), an enterprise desktop virtualization platform designed to optimize application and desktop management and enable flexibility for end-users.
- **VMware Workstation**, a solution that enables multiple operating systems to run at the same time on a single endpoint device.
- **VMware Zimbra**, an enterprise-class, calendar and collaboration platform based on the popular Zimbra open source project.
- **SlideRocket**, is an online presentation platform that lets users create, manage, share and measure presentations.

VMware

■ ***VMware Workstation***

- Softverski paket za virtuelizaciju
- vrši emulaciju više različitih x64 i x86 sistema na jednom računaru
- omogućava korisnicima kreiranje više virtuelnih računara i njihovu simultanu upotrebu sa matičnim operativnim sistemom
- Svaka instanca virtuelne mašine može pokrenuti sopstveni operativni sistem (gostujući), poput Windows-a, Linux-a, BSD-a i sl.
- Ukratko, VMware Workstation omogućava jednoj fizičkoj mašini da simultano pokrene više operativnih sistema.

■ ***VMware Fusion***

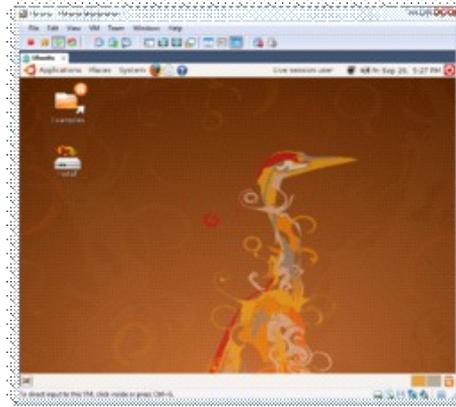
- Ima istu funkcionalnost kao prethodni alat,
- ali namenjen je Intel i Mac sistemima.

VMware-Desktop software

- **VMware Workstation** (first product launched by VMware in 1999). This software suite allows users to run multiple instances of x86 or x86-64-compatible operating systems on a single physical PC
- **VMware Fusion** provides similar functionality for users of the Intel Mac platform, along with full compatibility with virtual machines created by other VMware products
- **VMware Player** is for users without a license to use VMware Workstation or VMware Fusion. VMware offers this software as a freeware product for personal use. While initially not able to create virtual machines, this limitation was removed in version 3.0.1

VMware Workstation

VMware Workstation



VMware Workstation running [Ubuntu](#) under Windows

<u>Developer(s)</u>	VMware, Inc.
Initial release	1999 ^[1]
<u>Stable release</u>	8.0.4 ^[2] / June 13, 2012; 9 days ago
<u>Preview release</u>	VMware Workstation Technology Preview / March 12, 2012; 3 months ago
Development status	Active
<u>Operating system</u>	Microsoft Windows Linux
<u>Platform</u>	x86 (discontinued in 8.0 onwards), x86-64
<u>Available in</u>	English
<u>Type</u>	Virtual machine
<u>License</u>	Commercial , Proprietary
Website	http://www.vmware.com/products/ws/

VMware Workstation

Major Version	Release Date	Significant Changes
1.0	1999	first release
3.0	01 November 2001	?
3.1	09 April 2002	?
4.0	23 March 2003	?
4.5	05 April 2004	?
5.0	11 April 2005	?
5.5	12 September 2005	?
6.0	09 May 2007	?
6.5	23 September 2008	?
7.0	26 October 2009	?
8.0	14 September 2011	?
VMware Workstation Technology Preview 2012	March 2012	add support for windows 8

VMware Workstation

- VMware Workstation is a virtual machine software suite for x86 and x86-64 computers from VMware, a division of EMC Corporation, which allows users to set up multiple x86 and x86-64 virtual machines (VMs) and use one or more of these virtual machines simultaneously with the hosting operating system.
- Each virtual machine instance can execute its own guest operating system, including:
 - ◆ Windows
 - ◆ Linux
 - ◆ BSD variants, and others
- In simple terms, VMware Workstation allows one physical machine to run multiple operating systems simultaneously, whereas other VMware products help manage or migrate VMware virtual machines across multiple physical host machines.
- Workstation is sold and developed by VMware; VMware Player is a similar program with fewer features supplied free of charge.

VMware Workstation

- VMware Workstation **supports bridging to existing:**
 - ❖ host network adapters
 - ❖ CD-ROM devices
 - ❖ hard disk drives
 - ❖ USB devices (including USB Isochronous devices such as webcams, microphones etc.)

- provides the ability to **simulate some hardware**
- For example,
 - ❖ **it can mount an ISO file as a CD-ROM**
 - ❖ **.vmdk files as hard disks,**

- can configure its network adapter driver to use network address translation (NAT) through the host machine rather than bridging through it (which would require an IP address for each guest machine on the host network)

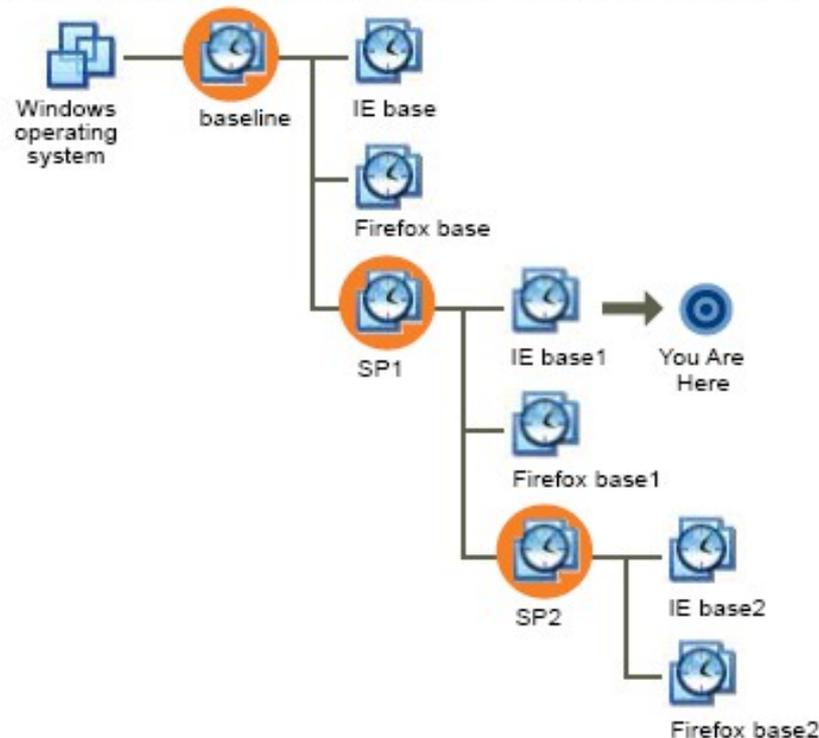
VMware Workstation

- Multiple **successive snapshots** of an operating system running under VMware Workstation can be taken, and the virtual machine can be restarted in the state it was in when any snapshot was saved.
- VMware Workstation includes the ability to **designate multiple virtual machines as a team** which administrators can then power on and off, suspend, and resume as a single object, making it particularly useful for testing client-server environments.

VMware-Take a Snapshot of a Virtual Machine

- **When you take a snapshot**, you preserve the state of a virtual machine at a specific moment in time and the virtual machine continues to run. Taking a snapshot **enables you to return to the same state repeatedly**. You can take a snapshot while a virtual machine is powered on, powered off, or suspended.

Figure 2-1. Snapshots as Restoration Points in a Process Tree



Understanding Virtual Networking Components

- The virtual networking components in Workstation include virtual switches, virtual network adapters, the virtual DHCP server, and the NAT device.
- **Virtual Switches**
- Like a physical switch, a virtual switch connects networking components together. Virtual switches, which are also referred to as virtual networks, are named **VMnet0**, VMnet1, VMnet2, and so on. A few virtual switches are mapped to specific networks by default.
- **Virtual Network Adapters**
- When you use the New Virtual Machine wizard to create a new virtual machine, the wizard creates a virtual network adapter for the virtual machine. The virtual network adapter appears in the guest operating system as an AMD PCNET PCI adapter or Intel Pro/1000 MT Server Adapter. In Windows Vista and Windows 7 guest operating systems, it is an Intel Pro/1000 MT Server Adapter. Workstation 6.0 and later virtual machines can have up to 10 virtual network adapters. Workstation 4 or 5.x virtual machines are limited to three virtual network adapters.

Understanding Virtual Networking Components

■ **Virtual DHCP Server**

- The virtual Dynamic Host Configuration Protocol (DHCP) server provides IP addresses to virtual machines in configurations that are not bridged to an external network. For example, the virtual DHCP server assigns IP addresses to virtual machines in host-only and NAT configurations.

■ **NAT Device**

- In a NAT configuration, the NAT device passes network data between one or more virtual machines and the external network, identifies incoming data packets intended for each virtual machine, and sends them to the correct destination

Understanding Virtual Networking Components

- You can configure
 - ◆ **bridged networking**
 - ◆ **NAT**
 - ◆ **host-only networking** for virtual machines
- You can also use the virtual networking components to create sophisticated custom virtual networks.
- **Bridged Networking**
- Bridged networking **connects a virtual machine to a network by using the network adapter on the host system.**
- If the host system is on a network, bridged networking is often the easiest way to give the virtual machine access to that network.
- When you install Workstation on a Windows or Linux host system, a **bridged network (VMnet0)** is set up for you.

Understanding Virtual Networking Components

■ NAT Networking

- With NAT, a virtual machine does not have its own IP address on the external network. Instead, a separate private network is set up on the host system. In the default configuration, a virtual machine gets an address on this private network from the virtual DHCP server. The virtual machine and the host system share a single network identity that is not visible on the external network

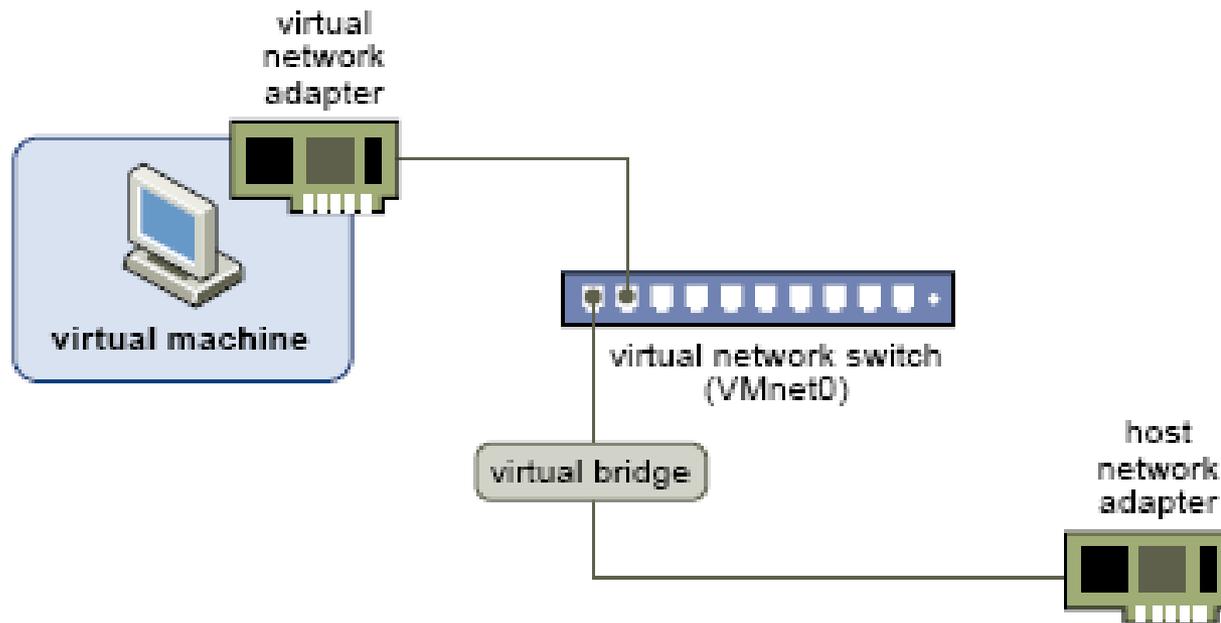
■ Host-Only Networking

- Host-only networking creates a network that is completely contained within the host computer. Host-only networking provides a network connection between the virtual machine and the host system by using a virtual network adapter that is visible on the host operating system.
- When you install Workstation on a Windows or Linux host system, a host-only network (**VMnet1**) is set up for you.

Bridged networking

- Bridged networking configures the virtual machine as a **unique identity on the network, separate from and unrelated to the host system**. The virtual machine is a **full participant in the network**. It has access to other machines on the network, and other machines on the network can contact it as if it were a physical computer on the network.

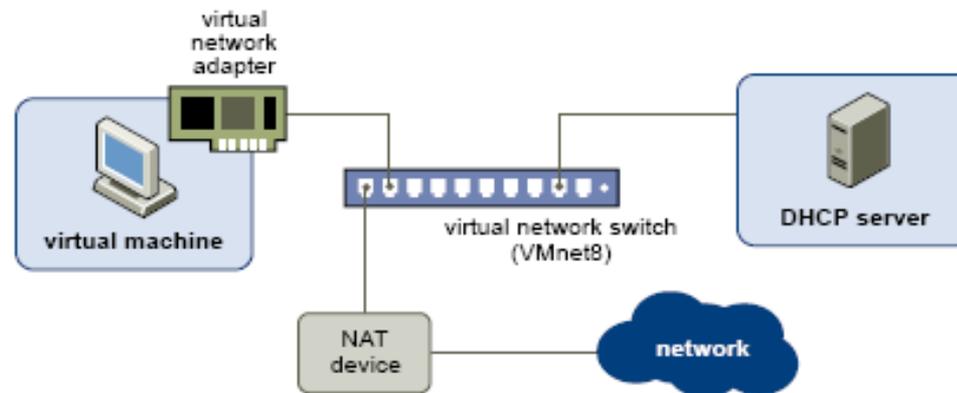
Figure 5-1. Bridged Networking Configuration



NAT networking

- With NAT, a virtual machine does not have its own IP address on the external network. Instead, a separate private network is set up on the host system. **In the default configuration, virtual machines get an address on this private network from the virtual DHCP server.**
- The virtual machine and the host system share a single network identity that is not visible on the external network. NAT works by translating the IP addresses of virtual machines in the private network to the IP address of the host system. When a virtual machine sends a request to access a network resource, it appears to the network resource as if the request is coming from the host system.

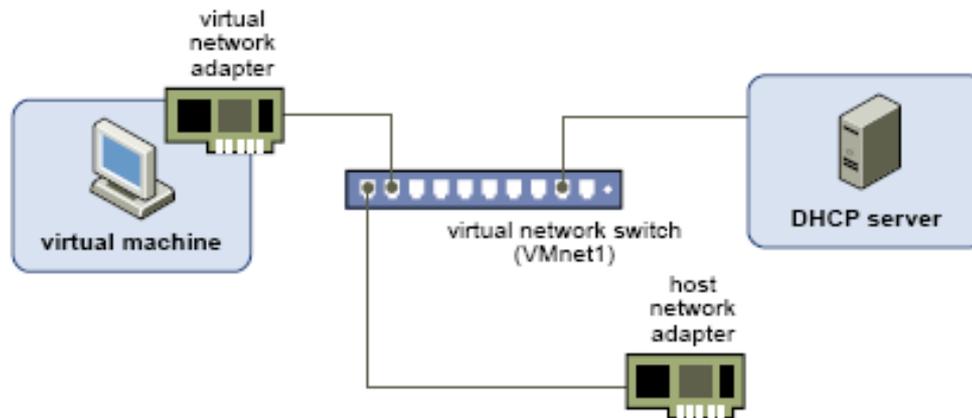
Figure 5-2. NAT Configuration



Configuring Host-Only Networking

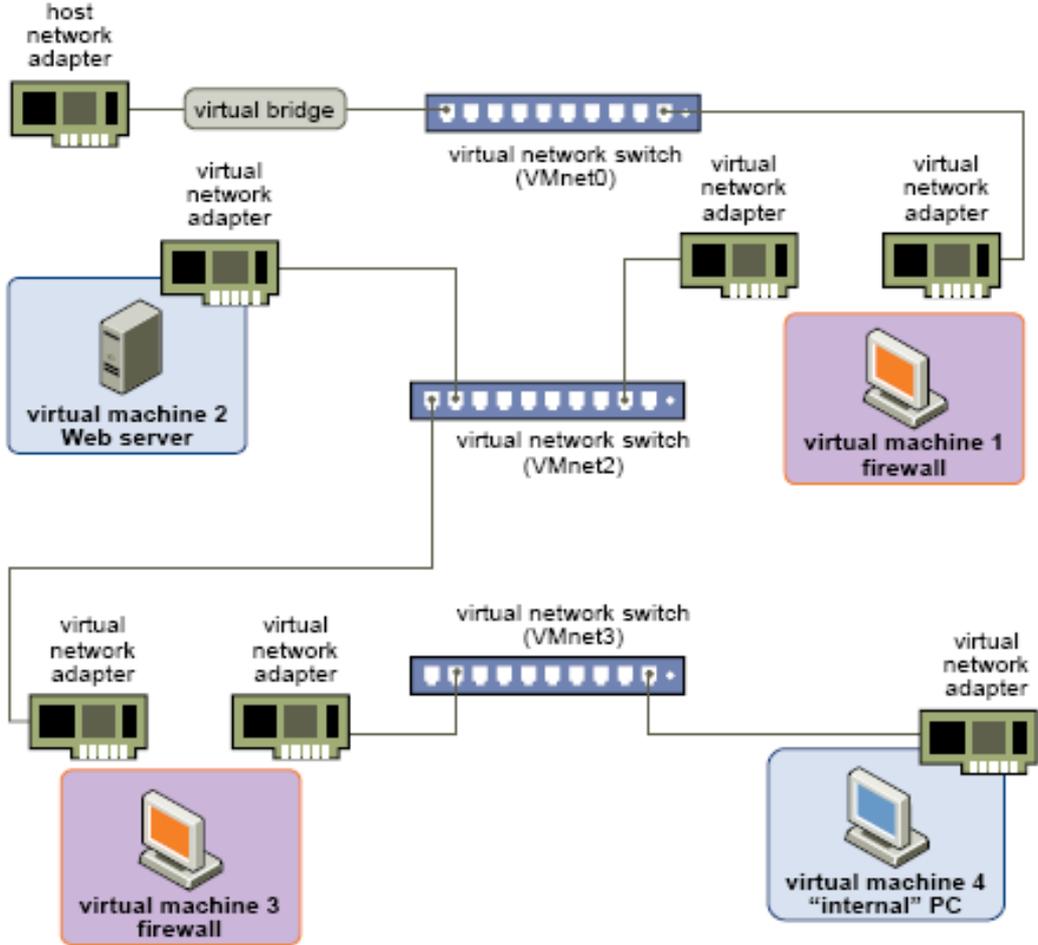
- When you install Workstation on a Windows or Linux host system, a host-only network (VMnet1) is set up for you. **Host-only networking is useful if you need to set up an isolated virtual network. In a host-only network, the virtual machine and the host virtual network adapter are connected to a private Ethernet network. The network is completely contained within the host system.**
- The network connection between the virtual machine and the host system is provided by a virtual network adapter that is visible on the host operating system. The virtual DHCP server provides IP addresses on the host-only network.

Figure 5-3. Host-Only Networking Configuration



Firewall

Figure 5-4. Custom Configuration with Two Firewalls



VMware

■ Hardware support:

- ❖ Workstation 8 is the first version that **requires a x86-64-compatible CPU**
- ❖ VMware virtual machines do not directly support FireWire
- ❖ VMware Workstation version 5.5 provided only experimental support for 3D hardware acceleration, via Microsoft's Direct3D 8 API. A video has appeared on YouTube that demonstrates several 3D-accelerated games running under VMware Fusion and Mac OS X. The release notes for Fusion beta 2 include a list of 3D-accelerated computer games that can run within Windows XP-based virtual machines. In version 6.5, Direct3D 9.0 API support (only up to Shader Model 2.0) is provided on Windows 2000 and Windows XP guests (although not Windows 9x) and on any host OS. Version 7 has support for Shader Model 3.0 and OpenGL 2.1 graphics. It can run[dead link] Crysis at 14-18 frame/s at low settings. Windows Display Driver Model support (version 1.0) was introduced in version 7.0, allowing Windows Aero to run in virtualized Windows Vista and later Windows guests, but OpenGL is regressed to 1.4.
- ❖ 64-bit guest operating systems require a 64-bit processor and a BIOS compatible with x86 virtualization. Intel processors require Intel VT hardware virtualization technology as Intel 64-bit processors without hardware virtualization technology do not have segmentation support in long mode. Only AMD64 processors of revision D or later can run 64-bit guests

VMware Tools

- **VMware Tools** is a package with drivers and other software that can be installed in guest operating systems to increase their performance.
- It has several components, including the following:
 - ❖ Drivers for the emulated hardware:
 - ✓ VESA-compliant graphics for the guest machine to access high screen resolutions
 - ✓ Network drivers for the vmxnet2 and vmxnet3 NIC
 - ✓ Ensoniq AudioPCI audio
 - ✓ Mouse integration
 - ❖ Drag-and-drop file support
 - ❖ Clipboard sharing between host and guest
 - ❖ Time synchronization capabilities (guest syncs with host machine's clock)
 - ❖ Support for Unity, a feature that allows seamless integration of applications with the host desktop

VMware WorkStation 6.5 & 7

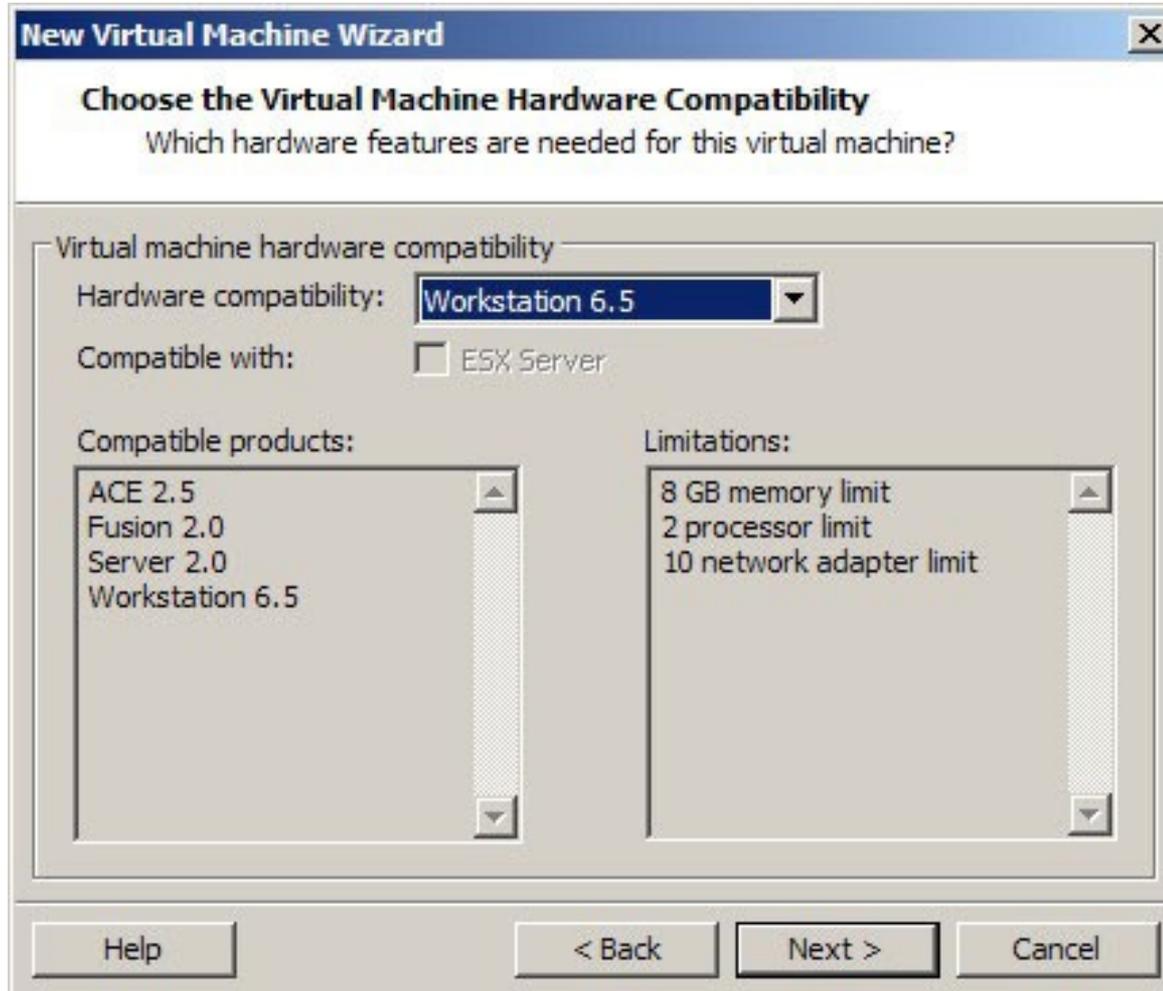
- Biće reči o dve verzije VMware Workstation-a (**verzija 6.5 i verzija 7**),
- **najveća razlika** između ove dve verzije je ta da **verzije 6.5 ima ograničenje upotrebe procesora**, tačnije podržava samo dva jezgra po virtuelnoj mašini, što znači da ako, na primer, imate procesor sa četiri jezgra, verzija 6.5 će koristiti samo dva, dok će ostala dva jezgra, praktično, ostati neiskorišćenja.
- U verziji 7 je ovaj nedostatak je otklonjen

7.1. VMware WorkStation

- **VMware Workstation se lako instalira**, poput svih Windows desktop aplikacija, s tim što VMware Workstation nije besplatan.
- Proces kreiranja nove virtuelne mašine je takođe jednostavan.
- **Po startovanju aplikacije, dobija se startni ekran sa tri izbora:**
 - ❖ *New Virtual Machine*
 - ❖ *New Team*
 - ❖ *Open Existing VM or Team*
- koja pruža izbor kreiranja jedne virtuelne mašine, više virtuelnih mašina u mreži (LAN tim) ili otvaranje postojeće virtuelne mašina ili tima.
- Po odabiru jedne od opcija, na verziji 6.5 se vide limiti softvera (8 GB RAM memorije, 2 procesora (jezgra), 10 mrežnih adaptera).

7.1. VMware WorkStation

■ Slika 7.1. VMware Workstation 6.5

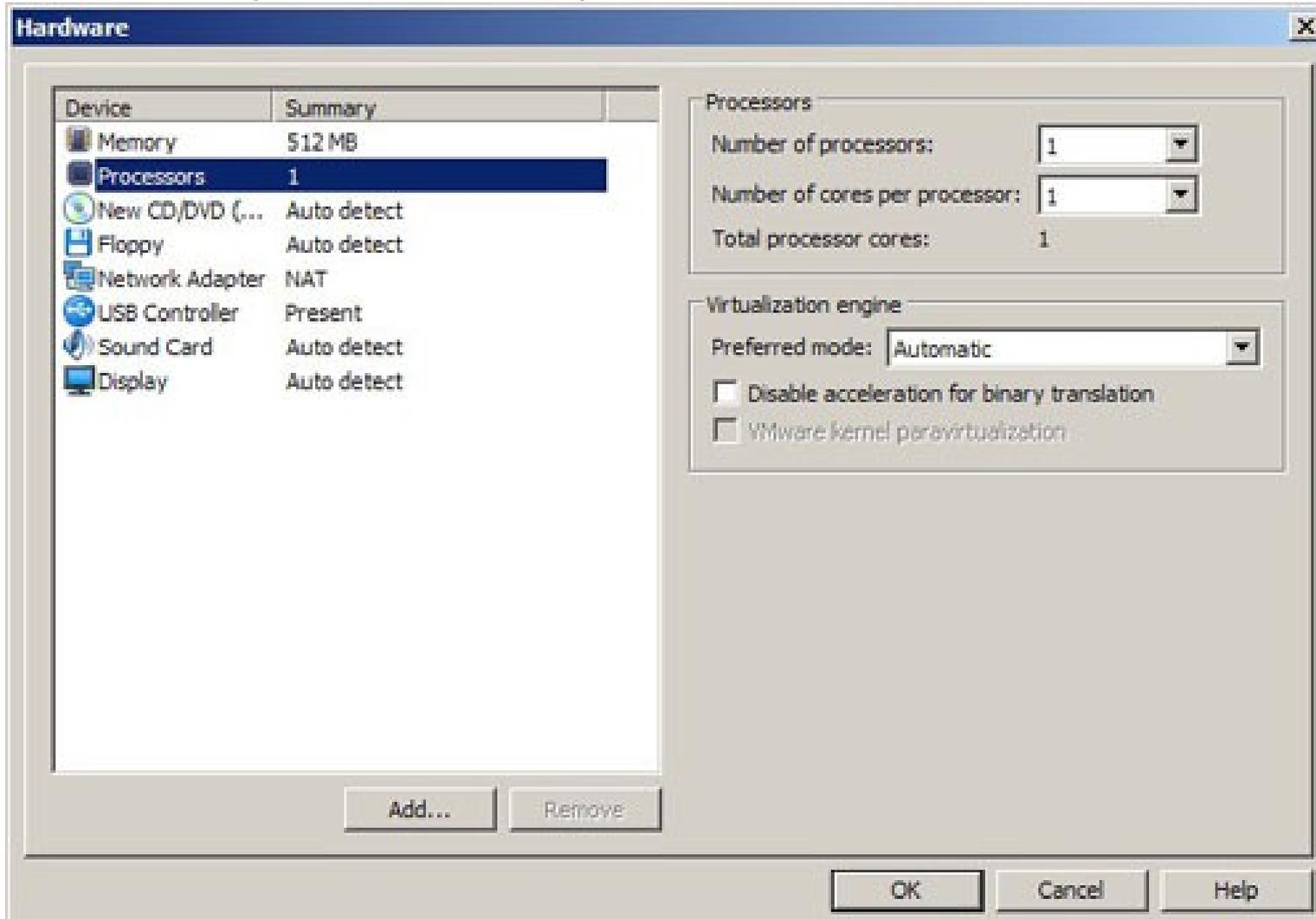


7.1. VMware WorkStation

- Zatim se pristupa
- izboru medija za instalaciju (CD/DVD ROM matičnog računara, image disk)
- sledi redom izbor:
 - ❖ operativnog sistema
 - ❖ zatim broja procesora (jezgara)
 - ❖ memorije
 - ❖ vrste mrežne kartice i načina njenog ponašanja
 - ❖ izbor hard disk kontrolera
 - ❖ kreiranje diska, imamo ponuđene tri opcije:
 - ✓ *Create New Virtual Disk*
 - ✓ *Use Existing Disk*
 - ✓ *Use Physical Disk*
 - ❖ pa odabir vrste (IDE ili SCSI) i veličine virtuelnog diska
- Kod verzije 7, kreiranje virtuelne mašine je konciznije tj. odabir komponenti se nalazi na jednom ekranu.

7.1. VMware WorkStation

- *Odabir komponenti na verziji 7*



7.1. VMware WorkStation

- Posle svega ovoga, instalacija OS se normalno nastavlja
- Nakon instalacije,
 - ❖ VMware Workstation automatski pristupa instalaciji *VMware Tools*-a,
 - ❖ paketa drajvera i ostalog softvera,
 - ❖ koji ima za cilj poboljšanje performansi gostujućeg operativnog sistema

VMware VMware WorkStation

- **VMware Tools softverski paket** ima nekoliko komponenti, kao što su :
 - ❖ Drajveri (*Drivers*) za emulirani hardver
 - ✓ VESA drajveri za grafičke karte (radi pristupa većim rezolucijama),
 - ✓ Drajveri za Intel PRO 10/1000 mrežnu kartu,
 - ✓ Drajveri za zvučnu kartu,
 - ✓ Drajveri integracija miša,
 - ❖ "Drag and drop" podrška,
 - ❖ Deljenje clipboard-a između gostujuće i matične mašine,
 - ❖ Sinhronizacija vremena (gostujuće virtuelne mašine sinhronizuju vreme po vremenu matične mašine).