Session Overview

Topics
- Product Introduction
- Recent Releases
- Example: Java One 2009
- Demo of Desktop usage
- VirtualBox SDK/API
- VBoxManage Features
- Upcoming Features
Sun VirtualBox is a collection of powerful virtual machine tools, targeting desktop computers, enterprise servers and embedded systems. With VirtualBox, you can virtualize 32-bit and 64-bit operating systems on machines with Intel and AMD processors, either by using hardware virtualization features provided by these processors or even entirely in software, at your option.
VirtualBox Basics

With VirtualBox, you can run unmodified operating systems – including all of the software that is installed on them – directly on top of your existing operating system, in a special environment called a “virtual machine”. Your physical computer is then usually called the “host”, while the virtual machine is often called a “guest”.

VirtualBox Basics

VirtualBox allows the guest code to run unmodified, directly on the host computer, and the guest operating system “thinks” it’s running on a real machine. In the background, however, VirtualBox intercepts certain operations that the guest performs to make sure that the guest does not interfere with other programs on the host.
VirtualBox Uses

The techniques and features that VirtualBox provides are useful for several scenarios:

- Operating system support
- Infrastructure consolidation.

- Infrastructure consolidation.
**Terminology**

Host Operating System
- Physical Computer

Guest Operating System
- Virtual Computer

Virtual Machine
- Virtual environment

Guest Additions
- Software to improve user environment
Hardware Virtualization

VT-X and AMD-V

Nested Paging and Extended Page Tables (EPT)
Recent Past Major Release

Virtual Box 2.2.0 (2009-04-08)
- Virtual Appliances
- 32GB Guest
- Network: host-only
- SCSI Disks
Recent Major Release
Version 3.0.0 (2009-06-30)

- Guest SMP with up to 32 virtual CPUs (VT-x and AMD-V only)

- Windows guests: ability to use Direct3D 8/9 applications / games (experimental)

- Support for OpenGL 2.0 for Windows, Linux and Solaris guests
Recent Release

Version 3.0.2 (2009-07-10)
- Bug fixes
- Install on Pardus Linux
- NT4 Guest Service supports Time Synch and Guest Properties
Java One 2009 Usage

7,000 attendees.
150 Thin clients
3 OS choices: Ubuntu, Vista, OpenSolaris
21,000 desktops
2 System Administrators
Java One 2009 Usage

Server environment:
- One rack of hardware
- Four servers to handle Virtual Box (Fire 4450, 64 GB RAM, 4x4core).
- Three for VDI Core (HA setup)
  - Three storage arrays (7000's-8 core, 44 TB).
Java One 2009 Usage
Sun VDI 3 -- Sun commercial software
- Originally relied on VMWare, now VirtualBox savvy.
- Enterprise desktop PC costly to manage.
- Virtual desktop--use from anywhere.
- RDP connections to VirtualBox sessions.
- Runs in the data center.
- mySQL for configuration mgmt (running hosts, etc.).
- LDAP for user authentication.
- Released March 2009
Live Demo

Full Screen
Seamless Mode
OpenGL
DirectX 8 and 9
SMP
32-bit/64-bit Guests/Create Virtual Machine Configuration Snapshots
Save/Start Session States
RDP Connect
Virtual Appliances

Preinstalled downloads
- http://virtualboximages.com
- http://ovfappliances.com
VirtualBox API

Management
- VirtualBox GUI
- VBoxManage
- Webservice

VirtualBox Main API
- OS X
- Linux
- Solaris
- Windows
- Live Migration
- Resource Monitor
- VirtualBox RDP Server

VirtualBox hypervisor
- Windows, Linux, OS X, Solaris, FreeBSD
- Portability Layer
- cross platform abstraction layer

Kernel mode
- Virtual Devices
  - binary compatible interface
  - 3rd Party plug-in
VirtualBox SDK

Free download from virtualbox.org

Language bindings: python, java, PERL, C (MSCOM and XPCOM)
VBoxManage

Does everything that the GUI does
And a whole lot more!

Command line tool
- should be in your default path
**VboxManage**

Usage: VboxManage list [-l | --long] <option>

* vms lists all virtual machines currently registered with VirtualBox. By default this displays a compact list with each VM's name and UUID; if you also specify --long or -l, this will be a detailed list as with the showvminfo command (see below).

* runningvms lists all currently running virtual machines by their unique identifiers (UUIDs) in the same format as with vms.

* hdds, dvds and floppies all give you information about virtual disk images currently registered in VirtualBox, including all their settings, the unique identifiers (UUIDs) associated with them by VirtualBox and all files associated with them.

* ostypes lists all guest operating systems presently known to VirtualBox, along with the identifiers used to refer to them with the modifyvm command.

* hostdvds, hostfloppies and hostifs, respectively, list DVD, floppy and host networking interfaces on the host, along with the name used to access them from within VirtualBox.

* hostusb supplies information about USB devices attached to the host, notably information useful for constructing USB filters and whether they are currently in use by the host.

* usbfilters lists all global USB filters registered with VirtualBox -- that is, filters for devices which are accessible to all virtual machines -- and displays the filter parameters.

* systemproperties displays some global VirtualBox settings, such as minimum and maximum guest RAM and virtual hard disk size, folder settings and the current authentication library in use.

* hddbackends lists all known hdd backends of VirtualBox. Beside the name of the backend itself, descriptions about the capabilities, configuration and other useful informations are displayed.
VBoxManage

VBoxManage showvminfo <uuid>|<name> [--details] [--statistics] [--machinereadable]

VBoxManage registervm <filename>

VBoxManage unregistervm <uuid>|<name> [--delete]

VBoxManage createvm --name <name> [--ostype <ostype>] [--register] [--basefolder <path> | --settingsfile <path>] [--uuid <uuid>]
VBoxManage modifyvm <uuid|name>
[--name <name>] [--ostype <ostype>] [--memory <memorysize in MB>]
[--vram <vramsize in MB>] [--acpi on|off] [--ioapic on|off] [--pae on|off] [--hwvirtex on|off]
[--nestedpaging on|off] [--vtvpid on|off] [--cpus <number>] [--monitorcount <number>]
[--accelerate3d <on|off>] [--bioslogofadein on|off] [--bioslogofadeout on|off]
[--bioslogodisplaytime <msec>] [--bioslogomagepath <imagepath>]
[--biosbootmenu disabled|menuonly] [--biosystemtimeoffset <msec>]
[--biospxedebug on|off] [--boot<1-4> none|floppy|dv|disk|net] [--hd<a|b|d> none]<uuid>|<filename>]
[--sataideemulation<1-4> <1-30>] [--scsi on|off] [--scsiport<1-16> none]<uuid>|<filename>]
[--scsitype LsiLogic|BusLogic] [--dvd none]<uuid>|<filename>|host:<drive>] [--dvdpasssthrough on|off]
[--floppy disabled|empty|<uuid>|<filename>|host:<drive>] --nic<1-N> none>null|nat|bridged|intnet|hostonly
[--nictrace<1-N> on|off] [--nictracefile<1-N> <filename>] [--nicspeed<1-N> <kbps>]
[--bridgeadapter<1-N> none]<devicename>]
[--hostonlyadapter<1-N> none]<devicename>]
[--intnet<1-N> <network|name>]
[--natnet<1-N> <network>default] [--macaddress<1-N> auto]<mac>]
[--uart<1-N> off]<I/O base> <IRQ>] [--uartmode<1-N> disconnected| server <pipe>]
client <pipe> file <file> <devicename>]
[--gueststatisticsinterval <seconds>]
[--audio none|null|dsound|solaudio|oss|alsa|pulse|coreaudio]
[--audiocontroller ac97|sb16]
[--clipboard disabled|hosttoguest|guesttohost|bidirectional]
[--vrdrp on|off] [--vrdrdpport default] [--vrdrdpaddress <host>]
[--vrdpauthtype null|external|guest] [--vrdpmulticon on|off]
[--vrdpreusecon on|off] [--usb on|off] [--usbehci on|off]
[--snapshotfolder default]
**VBoxManage**

VBoxManage import        <ovf> [--dry-run|-n] [more options]
(run with -n to have options displayed for a particular OVF)

VBoxManage export        <machines> --output|-o <ovf>
    [--legacy09]
    [--vsys <number of virtual system>]
        [--product <product name>]
        [--producturl <product url>]
        [--vendor <vendor name>]
        [--vendorurl <vendor url>]
        [--version <version info>]
        [--eula <license text>]
        [--eulafilename <filename>]

VBoxManage startvm       <uuid>|<name>
    [--type gui|sdl|vrdp|headless]
VBoxManage

VBoxManage controlvm <uuid>|<name>
  pause|resume|reset|poweroff|savestate|
  acpipowerbutton|acpisleepbutton|
  keyboardputscancode <hex> [<hex> ...]
  injectnmi|
  setlinkstate<1-N> on|off |
  usbattach <uuid>|<address> |
  usbdetach <uuid>|<address> |
  dvdattach none|<uuid>|<filename>|host:<drive> |
  floppyattach none|<uuid>|<filename>|host:<drive> |
  vrdp on|off |
  setvideomodehint <xres> <yres> <bpp> [display]]
  setcredentials <username> <password> <domain|
    [--allowlocallogon <yes|no>]

VBoxManage discardstate <uuid>|<name>

VBoxManage adoptstate <uuid>|<name> <state_file>
VBoxManage

VBoxManage snapshot <uuid>|<name>
take <name> [--description <desc>] |
discard <uuid>|<name> |
discardcurrent --state|--all |
edit <uuid>|<name>|--current
    [--name <name>]
    [--description <desc>] |
showvminfo <uuid>|<name>

VBoxManage openmedium disk|dvd|floppy <filename>
    [--type normal|immutable|writethrough] (disk only)

VBoxManage closemedium disk|dvd|floppy <uuid>|<filename>

VBoxManage showhdinfo <uuid>|<filename>
VBoxManage

VBoxManage createhd --filename <filename>
  --size <megabytes>
  [--format VDI|VMDK|VHD] (default: VDI)
  [--variant Standard,Fixed,Split2G,Stream,ESX]
  [--type normal|writethrough] (default: normal)
  [--comment <comment>]
  [--remember]

VBoxManage modifyhd <uuid>|<filename>
  [--type normal|writethrough|immutable]
  [--autoreset on|off]
  [--compact]

VBoxManage clonehd <uuid>|<filename> <outputfile>
  [--format VDI|VMDK|VHD|RAW|other>]
  [--variant Standard,Fixed,Split2G,Stream,ESX]
  [--type normal|writethrough|immutable]
  [--remember] [--existing]
VBoxManage

VBoxManage convertfromraw  <filename> <outputfile>
  [--format VDI|VMDK|VHD]
  [--variant Standard,Fixed,Split2G,Stream,ESX]
VBoxManage convertfromraw  stdin <outputfile> <bytes>
  [--format VDI|VMDK|VHD]
  [--variant Standard,Fixed,Split2G,Stream,ESX]

VBoxManage addiscsidisk  --server <name>|<ip>
  --target <target>
  [--port <port>]
  [--lun <lun>]
  [--encodedlun <lun>]
  [--username <username>]
  [--password <password>]
  [--type normal|writethrough|immutable]
  [--comment <comment>]
  [--intnet]
VBoxManage

VBoxManage getextradata  global|<uuid>|<name>  
<key>|enumerate

VBoxManage setextradata  global|<uuid>|<name>  
<key>  
[<value>] (no value deletes key)

VBoxManage setproperty  hdfolder default|<folder> |  
machinefolder default|<folder> |  
vrdpauthlibrary default|<library> |  
webservauthlibrary default|null<library> |  
loghistorycount <value>
VBoxManage

VBoxManage usbfilter  add <index,0-N>
    --target <uuid>|<name>|global
    --name <string>
    --action ignore|hold (global filters only)
    [--active yes|no] (yes)
    [--vendorid <XXXX>] (null)
    [--productid <XXXX>] (null)
    [--revision <ⅠⅠFF>] (null)
    [--manufacturer <string>] (null)
    [--product <string>] (null)
    [--remote yes|no] (null, VM filters only)
    [--serialnumber <string>] (null)
    [--maskedinterfaces <XXXXXXXX>]
VBoxManage usbfilter  modify <index,0-N>
  --target <uuid>|<name>|global
  [--name <string>]
  [--action ignore|hold] (global filters only)
  [--active yes|no]
  [--vendorid <XXXX>|"""]
  [--productid <XXXX>|"""]
  [--revision <IIFF>|"""]
  [--manufacturer <string>|"""]
  [--product <string>|"""]
  [--remote yes|no] (null, VM filters only)
  [--serialnumber <string>|"""]
  [--maskedinterfaces <XXXXXXXX>]
VBoxManage

VBoxManage sharedfolder  add <vmname>|<uuid>
   --name <name> --hostpath <hostpath>
   [--transient] [--readonly]

VBoxManage sharedfolder  remove <vmname>|<uuid>
   --name <name> [--transient]

VBoxManage vmstatistics  <vmname>|<uuid>  [--reset]
   [--pattern <pattern>]  [--descriptions]

VBoxManage guestproperty  get <vmname>|<uuid>
   <property>  [--verbose]

VBoxManage guestproperty  set <vmname>|<uuid>
   <property>  <value>  [--flags <flags>]

VBoxManage guestproperty  enumerate <vmname>|<uuid>
   [--patterns <patterns>]

VBoxManage guestproperty  wait <vmname>|<uuid> <patterns>
   [--timeout <timeout>]

VBoxManage metrics  list [*|host|<vmname>  [<metric_list>]]
   (comma-separated)
VBoxManage

VBoxManage metrics setup
  [--period <seconds>]
  [--samples <count>]
  [--list]
  [*|host|<vmname> [<metric_list>]]

VBoxManage metrics query [*|host|<vmname> [<metric_list>]]

VBoxManage metrics collect
  [--period <seconds>]
  [--samples <count>]
  [--list]
  [--detach]
  [*|host|<vmname> [<metric_list>]]
VBoxManage

VBoxManage hostonlyif   ipconfig <name>
    [--dhcp |
    --ip<ipv4> [--netmask<ipv4> (def: 255.255.255.0)] |
    --ipv6<ipv6> [--netmasklengthv6<length> (def: 64)])

VBoxManage dhcpserver   add|modify --netname <network_name> |
    --iface <hostonly_if_name>
    [--ip <ip_address>
    --netmask <network_mask>
    --lowerip <lower_ip>
    --upperip <upper_ip>]
    [--enable | --disable]

VBoxManage dhcpserver   remove --netname <network_name> |
    --iface <hostonly_if_name>
Upcoming Features

Announced at Java One in June 2009:

- Mac OS X Guest (on Mac OS X Hosts)
- Live Migration

Listed On Wikipedia
Memory ballooning
More portable snapshots
Next-generation seamless windowing with better desktop integration
Paravirtualization using Virtual Machine Interface (VMI) and Windows
"Enlightenments" paravirtualization
Thank You

Any questions?