

Index

SYMBOLS AND NUMERICS

1-Gbit network, 86–88
2.4 kernel Linux, 42, 456
2D video card, 32
3DNow!, 290
/3GB boot parameter, 78
24-bit color modes, 43
32-bit operating systems, 77–78
64-bit operating systems, 77–78
100-Mbit network, 86, 87
802.3 (Ethernet) standard, 31
802.5 (Token Ring) standard, 31

A

abstraction

hardware, 6
 virtual machines, 4

AcceptButton, **426**

access

to administrative website, 558
 to BIOS, 32
 COM. See COM API access
 from PowerShell, 408
 restricting, 165–168
 to virtual machine, 165–168

access control list (ACL), 166, 489

access restriction, 165–168

access right descriptors, 389

accessed-denied error, 72, 555

accountant, virtual machine, 387–389

ACL (access control list), 166, 489

ACPI (Advanced Configuration and Power Interface), 250

activation, grace period for, 58

Active Directory

Domains and Trusts, 73
 environment, 20
 server backup, 191

active mode (FTP), 151

ActiveX control, VMRC, 19, 424

Adaptec SCSI controller, 89

AddVDROMDrive, **370**

Additional Commands (Sysprep)

discussed, 122
 with Windows 2000 server, 61

ADDLOCAL, 17

Administration Agent (ADS), 221

Administrative website. See Virtual Server

Administrative website

administrator password (Sysprep)

discussed, 55
 encryption of, 60
 with Windows 2000 server, 60–61, 64
 with Windows Vista, 68

administrators group, local, 70

ADS. See Automated Deployment Services

Advanced Configuration and Power Interface (ACPI), 250

Advanced Programmable Interrupt Controller (APIC), 250

Allocated MB, 107

Allocated Pages, 108

AllSigned **setting, 405**

AMD

hardware virtualization, 78

NUMA, 95

Opteron 246 processors, 86

anonymous authentication, 482–483

answer file (Sysprep 2.0)

defined, 54

discussed, 61–63

viewing, 56–58

with Windows 2000 server, 61

with Windows NT, 64

antispymware software, 147–148

antivirus software, 147–148

apartments, threading, 301

APIC (Advanced Programmable Interrupt Controller), 250

application debugging

automated remote debugging, 547–548

discussed, 545–546

manual remote debugging, 546

approval, automatic, 120–121

Approve for Detection, 120, 123

Approve for Installation, 120, 123

ASP.NET

advantages of, 477

authentication with, 482–483

ChangeState.aspx, 522–536

COM API access with, 325–331

CreateNewVM.aspx, 504–522

Default.aspx, 485–504

discussed, 477–479

identity in, 482–483

IIS and, 483–485

impersonation in, 483

solutions with, 541

thread identity in, 482–483

user account in, 478

VMRC.aspx, 536–541

ASPX pages, 485

ASR backup. See Automated System Recovery backup

assumeeyes, 142

AttachedDriveTypes, **356**

AttachHostDrive, **370**

AttachImage, **370**

AttachToVirtualNetwork, **377**

Audit options, 58

AUOptions, 133

authentication

anonymous, 482–483

with ASP.NET, 482–483

Basic Authentication, 184, 185

choosing type of, 183–185

configuring, 184–185

discussed, 183–185

IIS and, 482–483

NTLM, 20, 183–185

options for, 346

types of, 183

user, 182

VMRC, 182

AutoInstallMinorUpdates, 133

automated backup, 193

Automated Deployment Services (ADS)

Administration Agent, 221

booting to, 233

Deployment Agent, 233, 234

discussed, 215

setup for, 217–219

static IP address for, 218

in VSMT, 234–235

automated remote debugging, 547–548

automated setup, 54

Automated System Recovery (ASR) backup

with NTBackup, Advanced mode, 239

with NTBackup, Wizard mode, 238–239

restoring, to virtual machine, 239–241

for Windows Server 2003, 238–245

for Windows Server XP, 238–245

automated updating

discussed, 116–117

with WSUS, 117–136

with YUM, 137–144

automated virtual machine library, 51–52

automatic approval (WSUS), 120–121

automatic detection, 265

automatic grouping, 112

automatic restart (WSUS), 128–129

automatic start

problems with, 556

virtual machine COM object, 363–364

automatic update. See automated backup

automatic updates, 126

automation, 401–404

AvailableSystemCapacity, **348**

B**Background Intelligent Transfer Service (BITS), 117, 118****backing up**

- Active Directory server, 191
- automated, 193
- with Backup Wizard, 195–199
- base virtual machines, 144
- with command-line interface, 201–203
- detailed log for, 198
- discussed, 187, 212
- to DVD drives, 239
- files, 189–193, 240
- full system, 241–243
- graphical interface for, 194
- guest operating system, 191
- incremental, 190
- inside virtual machine, 193–208
- locating file for, 240
- log for, 198
- machine file-based, 193–194
- for manual migration, 241–243, 244–245
- problems with, 193–194
- in Red Hat Enterprise Linux 4, 205–208
- from remove backup server, 208–209
- for resiliency, 8
- scheduling, 199–201
- software for, 238–245
- strategies for, 211
- for Sysprep, 144
- with VHDMount, 187–188
- of virtual machine files, 189–193
- of Virtual Server, 210–211
- VMC and, 189
- with VSS, 203, 209–210
- with Windows 2000, 203, 241–243
- with Windows NT 4.0, 203–204
- with Windows Server 2003, 194–203, 241–243
- with Windows Vista, 204–205
- with Windows XP, 194–203, 205, 241–243

backup log, summary, 198**Backup Reports dialog box, 197****backup software, 238–245****Backup tab, 196****Backup Type tab, 198****Backup Wizard, 195–199****bandwidth, 82****base virtual machine**

- backup for, 144
- cloning, 398–401
- languages for, 122
- Linux, 70–72
- passwords for, 55
- Sysprep for, 53
- updating of, 144

Basic Authentication, 184, 185**BIOS**

- NUMA and, 96
- with virtual network, 32

BITS (Background Intelligent Transfer Service), 117, 118**“block level” clone, 25****boot failures, 230–231****boot loader, 46****boot parameter, /3GB, 78****boot partitions, multiple, 217****boot policy, 231****Branding (OEM), 61****“broken” virtual machines, 9****“brute force” attack, 184****buttons, naming issues with, 426****C****cache memory, 95****CancelButton_Click, 426, 507, 524, 537****candidate selection, 98–99****casual virtual machine library, 49–50****CD/DVD drive**

- imaging, 246
- physical, 29
- as storage, 22–29

centralized virtual machine library, 50–51**chaining (WSUS), 118****change permissions, 165****ChangeState.aspx, 485, 522–536****ChangeStateButton_Click, 490****checking process, 227****checkpointing, 113****cleanup, 264–266****client virtual machine**

- emulated SCSI and, 281–282
- in WSUS, 123–131

client-side targeting, 127

`clock=pit` option, **42, 46**

cloning

- base virtual machine, 398–401
- “block level,” 25
- SCVMM and, 112
- support for, 112
- of virtual machine, 112

cluster group, 280, 293–295

cluster network, private, 275

cluster node

- pinging, 275
- preparation for, 272–274
- preparing, 272–275
- SCSI setup for, 275–282
- on virtual machine, 294

cluster resource script, 294–295

cluster service, 278–280

cluster user account, 275–276

ClusterDC, 271

clustered Virtual Server, 291–292

clustering. See also Virtual Server clustering

- configuration of, 285–286
- dynamically expanding virtual hard disk, 277
- with emulated SCSI, 269–282
- with iSCSI, 5, 282–286, 285–286
- public network, 270
- Share SCSI bus, 276
- support for, 5
- of virtual machine, 5, 269–286

`CoInitializeSecurity`, **302–303, 314, 458**

color

- 24-bit mode, 43
- in Linux, 43, 46

COM (Component Object Model) API

- constants used in, 341
- defined, 299
- discussed, 299, 333
- impersonation in, 300
- security with, 300–301
- summary request, 409
- tabbing through, 408
- threading apartments in, 301
- VM task objects, 338

COM API access

- from ASP.NET, 325–331
- C# code, sample, 310–315, 329–331
- from managed code, 305–323
- from Microsoft Windows PowerShell, 323–325
- from native code, 302–305
- remotely, 331–333

requirements for, 300–301

from VBScript, 301–302

Visual Basic .NET code, sample, 307–310, 319–323, 326–328

COM objects. See also virtual machine COM object; Virtual Server COM object

discussed, 299–300

.NET framework for, 305–307

for removable storage, 344

for virtual networks, 373–375

COM ports, 32

command, YUM, 143

command line-based installation, 17

command-line interface

backing up with, 201–203

of PowerShell, 408

compacting

dynamically expanding virtual hard disk, 24–25, 557

imaging for, 25

compatibility issues, 223

complexity, 335

Component Object Model API. See under COM API

compressed tar archives, 208

computer groups (WSUS), 119

computer name, static, 55. See also static IP address

computer name (Sysprep)

discussed, 55

with Windows 2000 server, 60, 63

`ConfigID`, **356**

configuration values, 395–396

`Connect` routine, **488, 507, 524**

connected virtual network adapter, 30

connections

kernel debugging of, 550–552

problems with, 556

consistency, 193

consolidation, 7

constants

in COM API, 341

in PowerShell, 416

constrained delegation, 73

context switch

discussed, 79

Host-to-VMM, 108

`Continue` option, **412**

control permission, 165

conversion

of dynamically expanding virtual hard disk, 26

VSMT for, 234

CORE 1.5 (WMI), 216CoSetProxyBlanket, **314–315, 323, 406, 444****CPU allocation, 82****CPU load, 82, 86****crashes**

- solutions for, 555
- virtual machine, 4
- VSMT and, 230–231

CreateButton_Click, **491**CreateFloppyDiskImage, **344****CreateNewVM.aspx, 485, 504–522**CreateVirtualMachine, **342**CreateVirtualNetwork, **373**CreateVMButton_Click, **508****critical devices, 249****critical updates, 120****cscript, 337****Cumulative Guest Run Time, 108****custom installation, 16****Customize the Software (Sysprep), 60****D****DACL (discretionary access control list), 165****DAG archive, 140****daily schedule setting, 199****DCOM (Distributed COM), 182–183****debugging**

- application, 545–548
- automated remote debugging, 547–548
- discussed, 545
- firewalls and, 546
- kernel, 548–552
- manual remote debugging, 546
- remote debugging, 546–548
- symbols for, 551
- virtual machine, 545

DEC 21140 network adapter, 29**Decline update, 123****default settings, 98****Default.aspx, 485–504****definition updates, 121****defragmentation, 93****delegation, constrained, 73**DeleteButton_Click, **490–491****demonstrations, 9–10****Deployment Agent (DA), 233, 234****Description of service, 154**DetachFromVirtualNetwork, **377****detailed backup log, 198****Details tab, 123****Detection, Approve for, 120, 123****DetectionFrequency, 133****DetectionFrequencyEnabled, 133****Device Manager, 292****DHCP server**

- configuration, 219–220, 272
- for domain joining, 56, 61
- IP addresses for, 272
- network, 375–377
- for physical to virtual migration, 219–220
- virtual, 30, 375–377

Diagram option (MOM), 111**differencing virtual hard disk**

- creating, 343
- discussed, 26–28, 89
- full copies vs., 52
- for new virtual machines, 144
- for virtual machine library, 52

differential tar archives, 207DiscardSavedState, **358–359**DiscardUndoDisks, **359****Disconnect idle connections setting, 181****discretionary access control list (DACL), 165****disk write failure, 24****display object, 381–382****display settings, 54****display size changes, 438–440****Distributed COM (DCOM), 182–183****DNS server, 375****Documentation and Developer Resources, 16****Domain (Sysprep)**

- discussed, 55–56
- with Windows 2000 server, 61

Domain Administrator password, 271**domain controller**

- setup, with emulated SCSI, 271–272
- static IP address for, 271–272

domain joining

- DHCP for, 56, 61
- of virtual machine, 69

“Don’t reset grace period for activation” option, 58**DOS-based networking, 247****driver**

- F6 floppy driver, 37
- HAL, 231
- IDE. See IDE drivers

driver (continued)

SCSI. See SCSI drivers
storage. See storage drivers
VMM, 108
in Windows 2000, 265
in Windows NT 4.0, 265
WSUS, 121

“dry runs,” 8

dual processing computer, 83–86

DVD drives. See also CD/DVD drive

backing up to, 239
floppies vs., 344
on IDE controller, 370
location changing, 370
scripting, 370–372
as storage, 22–29

dynamic MAC address, 29–30, 377

dynamically expanding virtual hard disk

in clustering, 277
compacting, 24–25, 557
conversion of, 26
creating, 343
discussed, 24, 39, 89
errors in, 24
fixed-size virtual hard disk and, 23, 26
maximum size of, 26
problems with, 557
space in, 24
undo disks and, 92

E

EFS (Encrypting File System), 169

802.5 (Token Ring) standard, 31

802.3 (Ethernet) standard, 31

ElevateNonAdmins, 132

emulated device(s)

discussed, 21, 30
for networking, 29–31
for storage, 22–29
in Virtual Server 2005, 21–30

emulated SCSI

application setup, 280–281
client virtual machines and, 281–282
cluster node preparation for, 272–274
cluster node setup for, 275–282
cluster service and, 278–280

clustering with, 269–282
discussed, 269
domain controller setup with, 271–272
shared disk configuration for, 276–278
testing with, 281–282
Virtual Server setup with, 269–271

Enabled configuration, 127

Encrypting File System (EFS), 169

encryption

SSL and, 174
of Sysprep administrator password, 60

end user, 335

end user license agreement (EULA), 38

error(s)

access-denied error, 72, 555
with added virtual machine, 556–557
configuration value, 557
in dynamically expanding virtual hard disk, 24
from failure. See failure
in migration, 233
moving disks, 294
page-cannot-be-displayed error, 556
on SPNs, 557
unknown/unexpected, 337
unregistered SPNs, 557

error handling

in MOM, 110
in PowerShell, 410, 412
in VBScript, 336–337

Ethernet (802.3) standard, 31

EthernetAddress, 377

EULA (end user license agreement), 38

event

classes of, 104
display of, 104
ID for, 107
scripting, 392–395

event handlers, .NET, 443

event log

display of, 104
monitoring with, 106–107

Exceptions, VMM, 108

Exchange server, 6, 53

Exchange Server (Microsoft), 53

Exclude Files option, 198–199

exclude option, 142

execute permissions, 166

ExecuteCommand, 386

execution, pipeline, 411–412

expand.exe, 248

express installation files, 122
external firewall, 148
external firewalls, 182–183
External Port number, 154

F

F6 floppy driver, 37
Factory and Audit options, 58
failure. See also error
 boot failures, 230–231
 at deployment, 233
 disk write failure, 24
 error messages lacking at, 233
 of migration, 234–235
 resiliency to, 8
 system, 8
 of virtual hard disk, 38
 of Virtual Machine Additions, 558

FAT partitions, 217
feature packs (WSUS), 121
file(s)
 backing up, 189–193
 for backing up, 240
 VHD, 22
 VMC, 18
 VSV, 189
 VUD, 189
 in web-based interface, 36
 for WSUS, 122
 XML, 229

file permissions, 165–167
file transfer protocol (FTP), 151
filter(s)
 configuring, 160
 inbound, 157, 160
 for network traffic, 160–161
 outbound, 157, 160
 FindVirtualNetwork, **373**

firewall(s)
 configuration of, 15–16
 debugging and, 546
 external, 148, 182–183
 on host operating system, 546
 inside virtual machine, 148
 network connections through, 149
 for network security, 148–149

for TCP connections, 183
 visual studio and, 546

fixed-size virtual hard disk
 creating, 343
 discussed, 23, 39, 89
 dynamically expanding virtual hard disk and, 23, 26
 undo disks disabled on, 92

flexibility, 4, 335
floppy drives
 disk images, 29
 DVD drives vs, 344
 F6, 37
 scripting, 372–373

formal virtual machine library, 50
forwarding
 with Internet Connection Sharing, 153–154
 port, 153–154, 158
 with RRAS, 158

fragmentation, 93
FTP (file transfer protocol), 151
full copies, 52
full format
 quick format vs., 38
 reformatting and, 39

full permission, 165
full system backup
 for manual migration, 241–243
 with Windows Server 2003, 241–243
 with Windows XP, 241–243

full system recovery, 193
fully automated setup, 54
functions, PowerShell, 413–414

G

gateway address, 375
Gatherhw.exe, 219
 GetConfigurationValues, **395**
 GetDVDFiles, **344**
 GetFloppyDiskFiles, **344**
 GetHardDisk, **343**
 GetHardDiskFiles, **344**
 GetVirtualMachineFiles, **342**

global function, PowerShell, 413
 GoButton_Click, **524**

grace period, 58
graphical interface, 194

Group Policy (WSUS), 119, 123–124

grouping, 112

GRUB boot loader, 46

guest CPU load, 82, 86

Guest External Interrupts, 108

guest operating system

backing up, 191

defined, 11

discussed, 35, 47

for kernel debugging, 549–550

Red Hat Enterprise Linux 4, 41–46

Windows Server 2003, 36–41

GuestOS **object, 385–387**

H

HAL. See hardware abstraction layer

hard disk

physical, 246

SAT A, 91

virtual. See virtual hard disk

hardware

abstraction of, 6

emulated. See emulated device(s)

identification strings, 360

non-plug and play, 59

performance of, 78–81

for Virtual Server 2005, 12

virtualization, 78

virtualization of, 78–81

hardware abstraction layer (HAL)

ACPI, 250

APIC, 250

configuration of, 249

defined, 225

discussed, 250–251

drivers, 231

loading, 263

migration and, 254–256

MP, 250–251

Non-ACPI, 250

PIC, 250

types of, 250–251

unsupported type, 231

UP, 250–251

in VSMT, 225

wrong installation of, 225

havm.vbs, 561–566

HBA (Hot Bus Adapter) cards, 282

health information, in MOM 2005, 110–111

History properties, 373

host CPU load, 82, 86

“host key”

defined, 37

for log in, 39

host name, Linux, 71

host operating system

defined, 11

firewall on, 546

kernel debugging connection for, 552

HostInfo **object, 373, 391–392**

Host-to-VMM context switch, 108

Host-to-VMM context switches, 108

Hot Bus Adapter (HBA) cards, 282

hotfix files, 229

HttpContext, **482, 483**

HVM mode, 108

HVM-VP, 108

hyper-threaded processors, 88

I

IDE controller

DVD drives on, 370

PCI, 252

SCSI controller vs., 89

storage, 22

IDE disk

configuration changes, 36

Linux on, 41

performance, 90

Virtual Machine Additions and, 92

IDE drivers

loading, 251–254, 262

in Windows 2000, 253

in Windows NT, 254

in Windows Server 2003, 251–252

in Windows XP, 251–252

identification, COM object for, 360–362

Identification String (OEM Duplicator String)

discussed, 122

hardware, 360

with Windows 2000 server, 61

identity, in ASP.NET, 482–483

- IIS. See Internet Information Server**
- IIS configuration. See Internet Information Server configuration**
- IIS Lockdown tool, 172**
- image encryption, 235**
- image file configuration (CD/DVD), 29**
- imaging**
 - blank, 29
 - CD/DVD drive, 246
 - for compacting disks, 25
 - ISO, 116
 - for manual physical to virtual migration, 245–256
 - migration and, 249–256
 - over network, 247
 - of physical into virtual, 245–256
 - prepared, 237
 - unprepared, 237
 - VHDMount and, 247
 - virtual floppy disk, 29
 - of Windows systems, 247–248
 - in Windows Vista, 264
- impersonation**
 - in ASPNET, 483
 - in COM, 300
 - discussed, 72, 163
- inbound filters, 157, 160**
- incremental backups, 190**
- incremental tar archives, 207–208**
- Inquire option, 412**
- Install Printers, 122**
- “Install Updates and Shut Down,” 124–125**
- Installation, Approve for, 120, 123**
- installation (Microsoft Virtual Server 2005)**
 - advanced options for, 16–17
 - command line-based, 17
 - custom, 16
 - discussed, 14
 - firewall configuration, 15–16
 - MSI-based, 16–17
 - options for, 16–17
 - speed of, 80
 - website configuration, 15
- Integrated Windows Authentication, 183**
- Integrated Windows Automatic, 183**
- Intel, hardware virtualization by, 78**
- Intel 21140 network adapter, 29, 39, 81**
- Intelide.sys, 235**
- intelligent placement technology, 113**
- interactivity, 335**
- internal firewall, 148**
- internal networking, 88**
- Internal Port number, 154**
- Internet Connection Sharing**
 - discussed, 151–153
 - for network security, 151–154
 - port forwarding with, 153–154
- Internet Explorer (Microsoft)**
 - running, as administrator, 18
 - Trusted Sites, 231
- Internet Information Server (IIS)**
 - ASPNET and, 483–485
 - authentication and, 482–483
 - default website of, removing, 173–174
 - Lockdown tool, 172
 - remote, 12
 - security with, 169–174
 - self-signed SSL certificates from, 179–180
 - SSL and, 174, 176
 - for web-based interface, 12
 - website configuration with, 15
 - Windows XP with, 173
- Internet Information Server (IIS) configuration**
 - securing, for Virtual Server, 171–174
 - on separate computers, 169–171
 - on Windows Codenamed Longhorn Server, 14
 - on Windows Server 2003, 13
 - on Windows Vista, 13–14
 - on Windows XP, 13
- Internet Information Server (IIS) Lockdown tool, 172**
- Internet sharing, with NAT router, 151**
- Intranet, updating via, 126–127**
- IP address. See also static IP address**
 - connectivity, 275
 - for DHCP server, 272
 - with NAT, 158
 - static, 218
 - with VSMT, 231
- IsComplete, 339, 340, 443**
- iSCSI**
 - cluster configuration with, 285–286
 - clustering with, 5, 282–286
 - defined, 282
 - discussed, 282–283
 - HBA cards, 282
 - preparation for, 283–284
 - shared data drive configuration for, 284–285
 - software-based target of, 284
 - targets, 282

IsEthernetAddressDynamic **property, 377**

ISO imaging, 116

isolation, 4

ISORecorder, 116

K

Kerberos, 20, 181, 184, 185

kernel

discussed, 249

loading, 263

migration preparation of, 254–256

uniprocessor, 249

kernel debugging

connections, 550–552

discussed, 548–549

guest operating system for, 549–550

host operating system connection for, 552

named pipes and, 550–551

virtual machine connection for, 551–552

virtual serial port and, 550–551

kernel (ring 0) mode, 79

kernel mode code, 79, 80

kernel-level development, 548

keyboard object, 383–384

keystroke repetition, 559

Kudzu, 264

colors and, 43, 46

discussed, 70–72

failure of, 558

keystrokes repeated in, 559

PIT in, 42

problems with, 559

SIDs and, 70

Virtual Machine Addition installation, 558

“zero out” free space on, 25

Linux Yellow dog Updater, Modified (YUM), 137–144

automated updating with, 137–144

commands for, 143

configuring, 141–143

creating, 137–141

discussed, 137

offline, 141

using, 143

loadVMRC, 537

Local Administrator

adding users to groups, 70

password, 271

“local computer” option, 107

log in

“host key” for, 39

with Windows NT, 66

log message IDs, 459

log out, of user, 70

logical unit number (LUN), 288–289

LPT port, 32

LPT1 port, 380

LUN (logical unit number), 288–289

L

learning applications, 9

legacy applications, 8

LeoStream, 103

license agreement, end user, 38

Licensing Mode

discussed, 55

with Windows 2000 server, 60

LiLO boot loader, 46

line breaks, 443

linked virtual hard disk, 26, 343

Linux base virtual machines. See also Red Hat

Enterprise Linux 4

2.4 kernel, 42, 456

background of, 46

M

MAC address

configuration, 29–30

dynamic, 29–30, 377

finding, 221

management of, 29

migration and, 225

of network card, 221

static, 377

machine file-based backup, 193–194

managed applications

creating, 457–476

discussed, 423

Virtual Server Administrative website and, 470–476

VMRC client for, 423–457, 468–470

managed code, 305–323**manual physical to virtual migration**

- with backup software, 238–245
- clean up after, 264–266
- with complete PC backup, 244–245
- discussed, 237–238, 266
- with full system backup, 241–243
- imaging, 245–256
- for Red Hat Enterprise Linux 4, 256, 264
- success rate of, 238
- with system image, unprepared, 256–264
- for Windows 2000, 241–243, 256–261, 265
- for Windows NT server, 253–254, 261–263, 265
- for Windows Server 2003, 238–243, 251–252, 256–261, 264
- for Windows Vista, 244–245, 264
- for Windows XP server, 238–245, 251–253, 256–261, 264

manual remote debugging, 546**manual updating, 116****mapping, to serial port, 548****maximum capacity, 97****MB, Allocated, 107****memory**

- amount of, 94–95
- for cache, 94–95
- configuration settings for, 18
- non-uniform, 95–96
- PerfMon for, 95
- performance and, 5, 94–97
- utilization of, 94
- for virtual machine, 94

MergeUndoDisks, 360**methods, PowerShell, 408–411****Microsoft**

- licensing by, 187
- products of. *See specific types, e.g.:* Windows Server 2003
- support policy of, 11

Microsoft Exchange server, 6, 53**Microsoft installer package (MSI), 16–17****Microsoft installer package-based (MSI-based) installation, 16–17****Microsoft Internet Explorer**

- running, as administrator, 18
- Trusted Sites, 231

Microsoft (MS) Loopback Adapter

- discussed, 149
- for network security, 150–151

Microsoft Operations Manager (MOM) 2005

- Diagram option in, 111
- discussed, 108

error handling in, 110

health information in, 110–111

for monitoring, 108–111

Operator Console, 111

performance monitoring with, 111

reporting capabilities of, 111

rules of, 111

tasks in, 109

virtualization reports with, 111

Microsoft SMS, 16**Microsoft SQL Server, 53****Microsoft SQL Server Desktop Edition, 217****Microsoft Virtual Hard Disk, 10****Microsoft Virtual Server 2005**

backing up, 210–211

clustering of, 269–286

configuring host environment of, 12–14

creating virtual machines in, 17–19

discussed, 11–23

emulated devices in, 21–30

hardware requirements for, 12

host environment configuration with, 12–14

installing, 14–17, 290–291

PowerShell and, 408

previous versions of, 5

on separate computers, 169–171

setup, with emulated SCSI, 269–271

Virtual Machine Additions in, 33

virtual machines and, 17–20

virtual networks in, 31–33

Microsoft Virtual Server Programmers Guide, 341**Microsoft Windows PowerShell. *See* PowerShell****Microsoft Windows SQL Server 2000 Desktop Engine (WMSDE), 118****Microsoft Windows Update Catalog, 116****migration**

errors in, 233

failure of, 234–235

of HAL, 254–256

imaging and, 249–256

of kernel, 254–256

MAC address and, 225

manual. *See* manual physical to virtual migration

physical to virtual. *See* physical to virtual migration

SCVMM and, 112

of storage drivers, 251–252, 251–254

support for, 112

of virtual machine, 112

Windows NT 4.0, 232

of Windows Server 2003, 251–252

migration (continued)

- Windows systems, 249, 251
- of Windows XP, 251–252
- Mini-Setup, 59**
- minor updates, WSUS for, 129–130**
- mixed capacity, 98**
- MMX, 193**
- modify permissions, 165**
- MOM 2005. See Microsoft Operations Manager 2005**
- MOM Operator Console, 111**
- monitoring (managing)**
 - with MOM 2005, 108–111
 - with PerfMon, 107–108
 - with SCVMM, 112–113
 - SCVMM for, 112–113
 - with web interface, 103–106
 - with Windows event log, 106–107
- monthly schedule setting, 199**
- mount points, NTFS, 289**
- mouse, scripting, 384–385**
- Move computers task, 119**
- MP (multiprocessor), 250–251**
- MSDE, 118**
- MSI (Microsoft installer package), 16–17**
- MSI-based (Microsoft installer package-based) installation, 16–17**
- Msvmcs.sys, 235**
- MTA model. See multithreaded apartment model**
- multiple boot partitions, 217**
- multiprocessor (MP), 250–251**
- multithreaded apartment (MTA) model**
 - defined, 301
 - handling, 322–323

N

named pipe

- for COM port, 32
 - kernel debugging and, 550–551
 - virtual serial port to, 550–551
- NAT. See Network Address Translation router**
- native code, COM API access from, 302–305**
- .NET framework**
- for COM objects, 305–307
 - event handlers, 443
 - for WSUS, 118
- NetBIOS, 275**

Netbootdisk.com, 247

NetDom, 69, 70

network adapter

- DEC 21140, 29
- Intel 21140, 29, 39, 81
- isolating, 164
- object, 377
- on physical computer, 30
- scripting, 377–379
- security with, 164
- virtual, 19

Network Address Translation (NAT) router

- Internet sharing with, 151
- ports in, 153–154
- RRAS for, 156–157
- security with, 152

network card

- enabling, 232
- MAC address of, 221

network connection

- configuration, 30
- routing, 149–161
- security with, 149–161
- through firewall, 149

network DHCP server, 375–377

network notes, virtual, 30

network performance, 556

network security

- discussed, 148
- with firewalls, 148–149
- with Internet Connection Sharing, 151–154
- with MS Loopback Adapter, 150–151
- by routing network connections, 149–161
- with RRAS, 155–161

Network Service, 106, 170

Network Settings (Sysprep), 61

network storage, 72–73

network traffic, 160–161

network-based scripting, 70

network-based tape drives, 194

networking

- custom options for, 39
- DOS-based, 247
- emulated devices for, 29–31
- internal, 88
- MAC address configuration, 29–30
- network connection configuration, 30
- performance and, 81–88
- performance of, 5
- virtual networks and, 30–31

Networking Components, 55

NewSID, 53
 “no media” configuration, 28
NoAutoRebootWithLoggedOnUsers, 133
NoAutoUpdate, 134
Non-ACPI (Non-Advanced Configuration and Power Interface), 250
Non-Advanced Configuration and Power Interface (Non-ACPI), 250
 non-plug and play hardware, 59
Non-Uniform Memory Architecture (NUMA), 94–96
 “NoSIDGen,” 59
Not Configured, 125, 128, 129
NSR, 238
NTBackup
 Advanced mode, 239
 modes of, 194
 NSR creation with, 238
 options for, 196–197
 at startup, 196
 VSS and, 209
 in Windows Vista, 205
 Wizard mode, 238–239
NTFS mount points, 289
Ntkrnlpa.exe, 255
NTLM authentication, 20, 183–185
NUMA (Non-Uniform Memory Architecture), 94–96
NUMA ratio, 95, 96

O

OEM Branding, 61
OEM Duplicator String. *See* **Identification String**
On Error Resume Next, 336–337
OnSwitchedDisplay event handler, 442
operating system. *See also specific types*,
 e.g.: **Windows XP**
 32-bit, 77–78
 64-bit, 77–78
 guest, 11, 191
 host, 11
Operator Console (MOM), 111
OptionExplicit, 336
options setting, 119–120
OSI layer 3, 29, 31, 148
outbound filters, 157, 160

P

P2V migration. *See* **Physical to virtual migration**
P2Vdrivers.xml, 230
packet filtering, static, 157, 160
page file (Windows), 94
page-cannot-be-displayed error, 556
Page_Load, 490, 507, 524
Pages, Allocated, 108
parallel port, 380–381
ParallelPorts collection, 380
 “parent” disk, 26
parser, script, 106
passive mode (FTP), 151
password
 administrator, 55, 60–61, 64
 for base virtual machine, 55
 changing, 70
 for Domain Administrator, 271
 for Local Administrator, 271
 user account, 70
pause command, 443
PCI IDE controller, 252
Pciidex.sys, 235
PerfMon (Performance Monitor)
 for memory, 95
 monitoring with, 107–108
performance
 in 32-bit operating systems, 77–78
 in 64-bit operating systems, 77–78
 at 100%, 82
 candidate selection for, 98–99
 defragmentation, 93
 discussed, 77, 93
 fragmentation for, 93
 of hardware, 78–81
 hardware virtualization, 78–81
 IDE disk, 90
 of internal networking, 88
 memory and, 5, 94–97
 network, 556
 networking, 5, 81–88
 resource allocations for, 97–98
 slow, 556
 storage, 88–93
 testing, 6
 Virtual Machine Additions for, 33
 virtualization and, 5–6

Performance Monitor (PerfMon)

- for memory, 95
- monitoring with, 107–108

permission

- change, 165
- control, 165
- execute, 166
- file system, 165
- full, 165
- modify, 165
- read, 166
- remove, 165
- special, 165
- for VHD files, 166
- view, 165
- for VNC, 166–167

physical CD/DVD drive, 29

physical clusters

- preparation for, 288–290
- Virtual Server installation on, 290–291

physical computer serial port, 32

physical hard disk

- mounted, 246
- virtual hard disk vs., 38

physical to virtual (P2V) migration. See also manual

physical to virtual migration

- checking process for, 227
- compatibility issues with, 223
- deployment, 227
- DHCP configuration for, 219–220
- discussed, 215, 236
- process of, 222–227
- script file generation for, 223–226
- SCVMM and, 113, 235
- server setup for, 217–219
- source computer and, 216–217, 222, 226–227
- source server information for, 222–223
- System Center Virtual Machine Manager and, 235
- tools for, 113
- Virtual Server configuration for, 221–222
- with VSMT, 215–216, 227–235

physical Virtual Server clustering, 288–291

PIC (Programmable Interrupt Controller), 250

pinging, cluster node, 275

pipeline execution, 411–412

PIT (Programmable Interval Timer), 42

PlateSpin, 103

“PnP,” 59

- `populateListBoxes`, 488

port(s)

- for administrative website, 15
- in NAT router, 153–154
- parallel, 380–381
- scripting, 380–381
- serial, 548
- for website, 15

port 21, 153, 154

port 80, 15, 182

port 135, 15

port 443, 182

port 1024, 15, 182, 183

port 5900, 36

Port 5900 (TCP), 182

port forwarding

- with Internet Connection Sharing, 153–154
- with RRAS, 158

portability, 193

PortsInternetAvailable, 183

post-deployment commands, 69–70

power

- management settings, 201
- processing, 82

PowerShell

- accessing Virtual Server from, 408
- advantages of, 405
- COM API access from, 323–325
- command line of, 408
- constants in, 416
- discussed, 405
- environment for, 405–407
- error handling in, 410, 412
- functions of, 413–414
- global function in, 413
- integration of, 113
- methods of, 408–411
- objects of, 408–411
- pipeline execution in, 411–412
- pipelining execution in, 411–412
- profile of, 407
- properties of, 408–411
- script configuration on, 406–407
- script parameters of, 413–414
- in SCVMM, 113
- set up for, 405–407
- Set-ExecutionPolicy on, 406
- variable declaration in, 412
- VBScript vs., 405
- Virtual Server and, 408

“Pre-activated” option, 58
“preferred” node, 96
prepared system image, 237
 PressAndReleaseKey, **383**
 PressKey, **383**
print servers, 4
printers, install, 122
private network
 cluster, 275
 IP addresses on, 158
problems, 555–559
processing power, 82
product key, 54
product type specifications, 121–122
ProductID (Sysprep), 63
Programmable Interrupt Controller (PIC), 250
Programmable Interval Timer (PIT), 42
grammatical shutdown, 193
provisioning
 SVCMM and, 113
 virtualization for, 4
proxy option, 143
proxy server, 122
public network
 clustering, 270
 VMRC on, 174
PXE, 226

Q

quick format, **38**

R

R2 SP1, Virtual Server. See Virtual Server R2 SP1
RAID storage, 88
Raise Domain Functional Level, 73
rbfg.exe, 226
read permissions, 166
read-only properties
 of virtual machine, 356–357
 Virtual Server COM object, 348–349

“Reanalyzing cluster,” 279
rebooting, 70
 RebootRelaunchTimeout, **134**
 RebootRelaunchTimeoutEnabled, **134**
 RebootWarning, **134**
 RebootWarningTimeout, **134**
recovery, full system, 193
Red Hat Enterprise Linux 4
 backing up in, 205–208
 configuring, after installation, 46
 guest operating system of, 41–46
 host name in, 71
 on IDE disk, 41
 installing, 41–46
 manual migration for, 256, 264
 SCSI and, 41
 on SCSI disk, 41
 speed of, 80
 tar archives in, 206–208
 Virtual Machine Additions for, 44–46, 558
refresh rate, of administrative website, 104
REG files (Sysprep), 65–66
Regional Settings, 56
 RegisterVirtualMachine, **342**
 RegisterVirtualNetwork, **373**
Registry
 editing, 131, 247–248
 offline editing, 247–248
 Windows, 247–248
 WSUS with, 131–135
relative weight, 97
relative weight-based capacity, 98
 ReleaseKey, **383**
reliability, 191
remote access, to COM API, 331–333
Remote Boot Floppy (Windows), 231
Remote Control, 106
remote debugging
 automated, 547–548
 manual, 546
Remote Desktop, 490
remote IIS, 12
Remote Procedure Calls, 15
 RemoteSigned setting, **405**
removable storage. See also specific types, e.g.:
 CD/DVD drive
 COM objects for, 344
 for Virtual Server COM object, 344–346
remove permissions, 165

RemoveDVDROMDrive, **370**
reports (MOM 2005), 111
repository metadata file, 140
re-prompt delays, 130–131
RescheduleWaitTime, 134
RescheduleWaitTimeEnabled, 134
Reseal option, 58, 59
reservation based capacity, 98
reserved capacity, 97
resiliency, 8
resource(s)
 allocating, 97–98
 moving, 294
 multiple, 294
Resource Kit (Windows NT 4.0), 70
resource script, cluster, 294–295
Response.Redirect, **491**
restart
 automatic, 128–129
 delays, 130
Restore and Manage Media, 196
Restore tab, 198
Restricted setting, **405**
resume **command, 443**
retries option, 142
Revisions to Updates, 120
ring 0 (kernel) mode, 79
ring 3 (run user mode) code, 79
router
 NAT. See Network Address Translation router
 RRAS as, 158–160
 for traffic, 149
Routing and Remote Access Services (RRAS)
 discussed, 155
 for filtering network traffic, 160–161
 for NAT routing, 156–157
 for network security, 155–161
 port forwarding with, 158
 as standard router, 158–160
RPM, 138–140
RRAS. See Routing and Remote Access Services
rsync, 140, 141
Run as Administrator, **18**
Run Once, 122
run user mode (ring 3 code) code, 79

S

S3 Trio 32/64 video adapter, 32
SAN (storage area network), 288–289
SAT A hard disk, 91
saved state, 192, 193
 discard, 358
 discussed, 192, 193
 problems with, 556
 at shutdown, 556
scalability, 6
Schedule Jobs tab, 196–197
Schedule Task setting, 199
scheduled system scans, 148
ScheduledInstallDay, 126, 135
ScheduledInstallTime, 126, 135
schedules
 backing up, 199–201
 daily schedule setting, 199
 multiple, 199
 options for, 199
 timing of, 199
 WSUS, 121
script file generation, 223–226
script parser, 106
scripting. See also VBScript
 cluster resource script, 294–295
 complexity, 335
 cscript, 337
 DVD drives, 370–372
 end user, 335
 events, 392–395
 flexibility, 335
 floppy drives, 372–373
 GuestOS object, 385–387
 interactivity, 335
 keyboard objects, 383–384
 launching, 106
 network adapters, 377–379
 network-based, 70
 PowerShell, 406–407, 413–414
 SCSI controller, 364–365
 virtual hard disk, 365–370
 virtual machine COM object, 362–363
 for Virtual Server clustering, 291
 Virtual Server COM object, 350–352
 wscript, 337

SCSI adapter

install confirmation for, 274
 shared, 277
 VSMT and, 232–233

SCSI controller

from Adaptec, 89
 IDE controllers vs., 89
 scripting, 364–365
 storage, 22
 virtual, 22
 VM-SCSI, 89

SCSI disk

configuration for, 36
 emulated. *See* emulated SCSI
 Linux and, 41
 Linux on, 41

SCSI drivers

disk attachment for, 252
 loading, 252, 254, 262–263
 in Windows NT, 254
 in Windows Server 2003, 252

SCSIControllers collection, 364**SCVMM. *See* System Center Virtual Machine Manager****SDK, VSS, 209****search paths, 349****second virtual hard disk, 247****Secure Sockets Layer. *See* under SSL****security. *See* also network security**

with access restriction, 165–168
 with antivirus/antispyware software, 147–148
 with authentication, 183–185
 with COM API, 300–301
 discussed, 72, 147, 163–164
 with EFS, 169
 with external firewalls, 182–183
 with IIS, 169–174
 with NAT routers, 152
 with network adapters, 164
 with RRAS over NAT, 157
 with SSL, 20, 174–180
 with VMRC, 181–182

security identifiers (SIDs)

discussed, 53
 in Linux, 70
 regeneration of, 59

security object, 389–391**security updates (WSUS), 121****SecurityAnonymous (COM), 300****SecurityDelegation (COM), 300****SecurityIdentification (COM), 300****SecurityImpersonation (COM), 300, 306, 314****self-service provisioning tool, 113****self-signed SSL certificates**

discussed, 179
 for IIS, 179–180
 for VMRC, 180–181

SelfSSL, 179**serial port**

mapping to, 548
 physical, 32
 scripting, 379–380
 virtual, 550–551

server consolidation, 7**service packs (WSUS), 121****SetBusLocation, 370****SetConfigurationValues, 395****SetDimensions, 381****Set-ExecutionPolicy, 406****SetParameter, 387****SetSchedulingParameters, 387****Setting Change category, 106****Setup Manager, 54****Setup.exe, 14****Share SCSI bus, 276****shared data drive, 284–285****shared disk, emulated SCSI and, 276–278****shared SCSI adapter, 277****shutdown**

discussed, 59
 programmatical, 193
 saved state at, 556
 of virtual machine, 192
 in Windows Server 2003, 59

SIDs. *See* Security identifiers**SilentlyContinue, 412****single processing computer, 83–86****single threaded apartment (STA) model, 301****single user interface (SCVMM), 112****64-bit operating systems, 77–78****slicing, time, 78****SMS (Microsoft), 16****snapshot, VSS, 209****software, antivirus/antispyware, 147–148****software development, 8****solutions, 555–559**

source computer

- capturing, 226–227
- migration and, 216–217, 222, 226–227
- migration requirements for, 216–217
- preparing, for migration, 222

source server information, 222–223

special permissions, 165

SPNs, errors on, 557

SQL Server (Microsoft), 53, 118, 217

SQL Server Desktop Edition (Microsoft), 217

SSE2, 193

SSL (Secure Sockets Layer)

- configuring, 174–180
- encryption and, 174
- IIS and, 174
- security with, 20, 174–180
- on Virtual Server Administrative web site, 174–176
- on VMRC, 174, 177–179

SSL certificates

- assigning, 175, 177
- existing, 176–179
- requesting, 174–175, 177
- requiring, for IIS, 176
- self-signed, 179–181
- workaround for, 178–179

STA (single threaded apartment) model, 301

StarWind software, 284

state

- discard, 358
- restoration to, 193
- saved, 192, 193, 358
- saving, 192

Static Ethernet (MAC), 29

static IP address. See also IP address

- for ADS, 218
- discussed, 55
- for domain controller, 271–272
- MS Loopback Adapter and, 151

static MAC address, 377

static packet filtering, 157, 160

Status tab, 123

Stop option, 412

storage

- CD/DVD drives, 22–29
- emulated devices for, 22–29
- floppy drives, 29
- fragmentation of, 93
- network, 72–73
- performance and, 88–93

performance of, 5

RAID, 88

removable, 344

SCSI controller, 22

virtual hard disk, 72–73

of virtual hard disk, 72–73

virtual hard disks, 22–28

storage area network (SAN), 288–289

storage drivers

- migration of, 251–254
- of Windows 2000, 252–253
- of Windows NT 4.0, 253–254
- of Windows Server 2003, 251–252
- of Windows XP, 251–252

subnet, 156

summary backup log, 198

summary request, COM API, 409

Support Drivers, 348

support policy (Microsoft), 11

symbols, for debugging, 551

synchronization (WSUS), 121–122

Sysprep

- answer file of, 56–58, 61–63
- backup, 144
- for base virtual machine, 53
- discussed, 53
- drawbacks of, 65–66
- running, 58–59, 63, 66
- user interface for, 59
- with Windows 2000 server, 60–63
- for Windows base virtual machines, 53–69
- with Windows NT, 64–66
- with Windows Server 2003, 53–59
- with Windows Vista, 66–69
- with Windows XP, 53–59

System Center Virtual Machine Manager (SCVMM)

- migration and, 112
- for monitoring, 112–113
- physical to virtual migration and, 113, 235
- PowerShell in, 113

system failures, 8

system file loading, 248–249

system imaging

- prepared, 237
- unprepared, 237
- in Windows Vista, 264

system scans, scheduled, 148

System State option, 195

T

tape archives. See **tar archives**

tape drives, network-based, 194

tar archives (tape archives), 206–208

- compressed, 208
- creating, 206–207
- differential, 207
- incremental, 207–208
- restoring, 206–207

TargetGroup, 132

TargetGroupEnabled, 132

TCP

- defining, 154
- firewall for, 183

TCP Port 5900, 182

TCP/IP, 31, 275

Telephony, 56

template virtual machine, 479–482

TESTCLUSTER node, 280

testing

- advantages for, 545
- with emulated SCSI, 281–282
- performance, 6

text file (COM), 32

third-party firewalls, 15

32-bit operating systems, 77–78

thread identity (ASP.NET), 482–483

threading apartments, 301

“three machine problem,” 72

/3GB boot parameter, 78

throttle option, 143

time slicing, 78

Time Stamp Counter (TSC), 42

time zone settings, 54

timeout option, 143

TimeZone (Sysprep), 67

Titanium processors, 11

Token Ring (802.5) standard, 31

tolerant option, 142

tools

- for physical to virtual migration, 113
- WSUS, 121

traffic routing, 149

training applications, 9

troubleshooting VSMT, 227–234

Trusted Sites (Internet Explorer), 231

try...catch statement, 491

TSC (Time Stamp Counter), 42

24-bit color modes, 43

2D video card, 32

2.4 kernel-based Linux, 42, 456

TypeAsciiText, 383

TypeKeySequence, 383

U

UDP, 154

undo disks

- discussed, 28, 89
- dynamically expanding disks and, 92
- fixed-size virtual hard disks and, 92

uniprocessor (UP), 250–251

uniprocessor kernel, 249

unprepared system image, 237

unregistered SPNs, 557

Unrestricted setting, 405

UP (uniprocessor), 250–251

Update Catalog (Microsoft Windows), 116

update CD, 116

update detection frequency (WSUS), 129

update rollups (WSUS), 121

Update Tasks panel, 123

updating

- automated. See automated updating of base virtual machines, 144
- declining, 123
- of definitions, 121
- discussed, 115
- with Intranet, 126–127
- lack of, 115–116
- manual, 116
- minor, 129–130
- nonexistent, 115–116
- WSUS, 120, 121, 129–130

UpTime, 348

URLScan tool, 172–173

UseInternetPorts, 183

user account

- in ASPNET, 478
- cluster, 275–276
- password for, 70

user authentication, VMRC, 182

user interface (Sysprep 2.0), 59

UseWU Server, 135

V

variable declaration, in PowerShell, 412

VBScript

- best practices for, 336–337
- COM API access from, 301–302
- discussed, 335
- error handling in, 336–337
- On Error Resume Next, 336–337
- execution environments of, 337
- OptionExplicit, 336
- PowerShell vs., 405
- running, 337
- Virtual Server COM object and, 341–352
- VM task objects, 338–341
- in Windows, 337

VHD files

- discussed, 189
- EFS on, 169
- functions for, 416
- permissions for, 166
- virtual hard disk as, 22

VHDMount

- backing up with, 187–188
- discussed, 148
- imaging, 247

video

- performance of, 5
- virtual network for, 32
- VMRC for, 32

video adapter, S3 Trio 32/64, 32

video card, 2D, 32

VideoMode, **381**

view permissions, 165

ViewButton_Click, **490**

virtual DHCP server, 30

Virtual Disk Operation, 107

Virtual Disk Service, 188

virtual floppy disk images, 29

virtual hard disk

- calls for, 343
- configuration settings for, 18–19
- creating, 343
- differencing, 26–28
- discussed, 22–28
- dynamically expanding, 23–26
- failure of, 38
- fixed-size, 23
- linked, 26
- network storage of, 72–73

- physical hard disk vs., 38
- scripting, 365–370
- second, 247
- size of, 190
- storing, 72–73
- undo disks, 28
- as VHD files, 22
- Virtual Server COM object for, 343–344

Virtual Hard Disk (Microsoft), 10

virtual hard disk COM object, 300

virtual machine. See also base virtual machine

- abstraction, 4
- additional, 556–557
- advantages of, 545
- ASR backups for, 239–241
- automatic grouping of, 112
- automation, 401–404
- backing up inside, 193–208
- “broken,” 9
- checkpointing, 113
- cloning of, 112
- on cluster nodes, 294
- on clustered Virtual Server, 291–292
- clustering and, 5, 269–286, 291–292
- columnar display of, 104
- content determination for, 52–53
- crashes, 4
- creating, 17–19, 396–398
- debugging, 545
- display list, 104
- domain joining to, 69
- file backups, 189–193
- firewall inside, 148
- first, 17–20
- kernel debugging and, 551–552
- memory for, 94
- on Microsoft Virtual Server 2005, 17–20
- migration of, 112
- read-only properties, 356–357
- renaming, 70
- restricting access to, 165–168
- shutdown of, 192
- size of, 190
- starting, 19–20
- starting, in Virtual Server, 19–20
- template, 479–482
- Virtual Server and, 17–20
- Virtual Server COM object, 341–342
- viruses in, 152
- VMRC access to, 35

virtual machine accountant, 387–389**Virtual Machine Additions**

- on 2.4 kernel-based Linux, 456
- IDE virtual hard disks and, 92
- installation of, 40
- installer for, 41
- for mouse, 384
- for performance, 33
- for Red Hat Enterprise Linux 4, 44–46, 558
- VSMT and, 234–235
- in Windows 2000, 33
- in Windows Codenamed Longhorn Server, 33
- in Windows NT, 33
- in Windows Server 2003, 33, 40–41
- in Windows Vista, 33
- in Windows XP, 33

virtual machine category, 107**virtual machine COM object**

- adding devices, 353–355
- automatic start, 363–364
- defined, 300
- DiscardSavedState, 358–359
- DiscardUndoDisks, 359–360
- discussed, 352
- for identification, 360–362
- property configuration, 355–357
- removing devices, 353–355
- scripting, 362–363
- state management with, 352–353

virtual machine configuration (VMC)

- backing up and, 189
- undo disk files in, 28

virtual machine file backup

- discussed, 189–190
- problems with, 190–191
- saved state for, 191–193
- shut down for, 191–193

virtual machine library

- advantages of, 50
- automated, 51–52
- casual, 49–50
- centralized, 50–51
- content determination for, 52–53
- defined, 49
- differencing disks for, 52
- disadvantages of, 50
- discussed, 49
- formal, 50
- full copies of, 52

- managed, 112
- types of, 49–52

virtual machine name, 18**Virtual Machine Remote Control Client (VMRC)**

- access, to virtual machine, 35
- ActiveX control, 19, 424
- administrative display, 425
- display size changes, 438–440
- in installation, 16
- for interaction, 35
- locking down, 440–443
- for managed applications, 423–457, 468–470
- on public network, 174
- securing, 181–182
- security with, 181–182
- self-signed SSL certificates for, 379–380
- SSL on, 174, 177–179
- at startup, 19
- state handling, 443–457
- user authentication, 182
- for video, 32
- Virtual Server COM object and, 346–348
- web interface and, 35

virtual network

- BIOS access with, 32
- clustering and, 292–293
- COM objects for, 373–375
- COM ports in, 32
- discussed, 30
- LPT ports in, 32
- name of, 30
- for networking emulated devices, 30–31
- operation of, 31–33
- for video, 32
- in Virtual Server, 31–33
- Virtual Server COM object, 342–343

virtual network adapter, 19, 30**virtual network COM object, 300****Virtual Network Computer (VNC)**

- discussed, 189
- file permissions for, 166–167
- TCP Port 5900, 182

virtual network notes, 30**virtual SCSI controller, 22****virtual serial port, 550–551****Virtual Server Administrative website**

- access to, 558
- accessed-denied error, 555
- configuration of, 15

Virtual Server Administrative website (continued)

- on desktop operating systems, 15
- discussed, 15, 231, 470–476
- IIS, 173–174
- with IIS, 15
- page-cannot-be-displayed error, 556
- ports for, 15
- problems with, 557, 558
- refresh rate of, 104
- removing, 173–174
- SSL on, 174–176
- of VSMT, 231
- Windows Server 2003 and, 173, 179
- on Windows XP, 179
- for WSUS, 119

Virtual Server category, 107

Virtual Server clustering

- advantages of, 287
- cluster group for, 293–295
- disadvantages of, 287
- havm.vbs, 561–566
- layered, 288
- physical, 288–291
- preparation for, 288–290
- script for, 291
- virtual machines and, 288, 291–292
- virtual network configuration, 292–293

Virtual Server COM object

- accessing, 305
- discussed, 341
- path management with, 349–350
- read-only properties, 348–349
- removable storage for, 344–346
- scripting and, 350–352
- VBScript and, 341–352
- for virtual hard disks, 343–344
- for virtual machine manipulation, 341–342
- for virtual network manipulation, 342–343
- VMRC configuration and, 346–348

Virtual Server Host Clustering Step-By-Step Guide, 291

Virtual Server Migration Toolkit (VSMT)

- administrative website of, 231
- ADS Deployment Agent in, 234–235
- advanced options for, 234–235
- boot failures and, 230–231
- boot policy for, 231
- for conversion, 234
- crashes and, 230–231

- Hardware Abstraction Layer drivers in, 231
- image encryption and, 235
- IP address issues with, 231
- long migration and, 233
- network card enabling for, 232
- physical to virtual migration with, 215–216, 227–235
- problems with, 233–234
- SCSI adapter enabling, 232–233
- server setup for, 217–219
- software incompatibilities with, 228–230
- support for, 216
- troubleshooting, 227–234
- Virtual Machine Additions and, 234–235
- for Vmware conversion, 234

Virtual Server R2 SP1

- discussed, 5, 19, 41, 77
- for scanning, 148
- Virtual Server Host Clustering Step-By-Step Guide, 291
- VSS in, 209

Virtual Server Scripts, 105–106

Virtual Server Service, 16

Virtual Server Web Application, 16

virtualization

- for availability, 5
- benefits of, 3–5
- for consolidation, 7
- for demonstrating solutions, 9–10
- for demonstrations, 9–10
- in development and testing, 7–8
- drawbacks of, 5–6
- for flexibility, 4
- hardware, 78–81
- hardware abstraction and, 6
- for learning applications, 9
- with legacy applications, 8
- performance and, 5–6
- physical world vs., 4
- for provisioning, 4
- for resiliency to system failures, 8
- scalability of, 6
- for server consolidation, 7
- for system isolation, 4
- for training applications, 9
- uses of, 7–10
- for utilization increases, 3
- in web-based interface, 10

virtualization reports (MOM 2005), 111

- virus, in virtual machine, 152**
- Visual Studio 2005, 305–306, 325, 484, 545–546**
- VM task objects, 338–341**
- VMC (virtual machine configuration)**
 - file, 18, 166, 189
 - folder, 166
 - undo disk files in, 28
- VMList, 430**
- VMM driver, 108**
- VMM Exceptions, 108**
- vmm.sys, 78**
- VMRC. See Virtual Machine Remote Control Client**
- VMRC ActiveX control, 19, 424**
- VMRC.aspx, 485, 536–541**
- VMRCAuthenticator, 346**
- Vmscript, 228**
- VmScript.exe, 223**
- VM-SCSI controller, 89**
- Vmsrvc.sys, 235**
- Vmware conversion, 234**
- VNC. See Virtual Network Computer**
- Volume Shadow Copy Services (VSS)**
 - backing up with, 203, 209–210
 - NTBackup and, 209
 - SDK, 209
 - snapshot, 209
 - in Virtual Server R2 SP1, 209
 - Writer, 107
- vsftpd, 137, 138**
- VSMT. See Virtual Server Migration Toolkit**
- Vsmt_ide.inf, 235**
- Vsmt_scsi.inf, 235**
- VSS. See Volume Shadow Copy Services**
- VSS SDK, 209**
- VSS snapshot, 209**
- VSS Writer, 107**
- VSV file, 189**
- VUD files, 189**
 - for monitoring, 103–106
 - problems with, 35
 - Virtual Server Scripts in, 105–106
 - virtualization in, 10
 - VMRC and, 35
- weekly schedule setting, 199**
- welcome dialog box, 14**
- Welcome tab, 196**
- Windows 2000**
 - backing up in, 203
 - cleanup requirements of, 265
 - drivers in, 265
 - full system backup with, 241–243
 - IDE drivers in, 253
 - manual migration for, 241–243, 256–261, 265
 - storage drivers of, 252–253
 - Sysprep 2.0 with, 60–63
 - Virtual Machine Additions in, 33
- Windows AIK (Windows Automated Installation Kit), 67**
- Windows Automated Installation Kit (Windows AIK), 67**
- Windows base virtual machines**
 - discussed, 53
 - post-deployment commands for, 69–70
 - Sysprep 2.0 for, 53–69
- Windows Codenamed Longhorn Server**
 - IIS configuration on, 14
 - Virtual Machine Additions in, 33
 - Virtual Server on, 11
- Windows Complete PC Backup, 204–205**
- Windows event log. See event log**
- Windows firewall, 15**
- Windows Management Instrumentation (WMI)**
 - CORE 1.5, 216
 - interface, 183
- Windows Memory Diagnostic Tool, 555**
- Windows NT 4.0**
 - automatic detection in, 265
 - backing up in, 203–204
 - drivers in, 265
 - IDE drivers in, 254
 - log in with, 66
 - manual migration for, 253–254, 261–263, 265
 - migrating, 232
 - multiple network adapters, 558
 - problems with, 558
 - SCSI drivers in, 254
 - storage drivers of, 253–254
 - Sysprep 2.0 with, 63–66
 - Virtual Machine Additions in, 33

W

- WaitForCompletion, 339, 443**
- web-based interface. See also Virtual Server Administrative website**
 - disadvantages of, 104
 - files in, 36
 - IIS for, 12

Windows NT 4.0 Resource Kit, 70

Windows Performance Monitor (PerfMon)

- for memory, 95
- monitoring with, 107–108

Windows PowerShell. See PowerShell

Windows Remote Boot Floppy, 231

Windows Server 2003

- ASM backup for, 238–245
- backing up in, 194–203
- full system backup with, 241–243
- guest operating system of, 36–41
- IDE drivers in, 251–252
- IIS configuration on, 13
- installing, 36–41
- manual migration for, 238–243, 251–252, 256–261, 264
- migration of, 251–252
- Mini-Setup on, 59
- plug and play hardware in, 59
- SCSI drivers in, 252
- shutdown in, 59
- SID regeneration in, 59
- storage drivers of, 251–252
- Sysprep 2.0 with, 53–59
- Virtual Machine Additions in, 33, 40–41
- “virtual server” in, 280
- Virtual Server on, 8, 11
- websites and, 173, 179
- WSUS on, 117

Windows Server Update Service (WSUS)

- administration of, 119
- automated updating with, 117–136
- automatic approval options of, 120–121
- automatic restart option of, 128–129
- chaining, 118
- classifications, 120–122
- client virtual machine configuration in, 123–131
- client-side targeting in, 127
- computer groups in, 119
- configuring, 119
- discussed, 117, 136
- drivers, 121
- files for, 122
- “Install Updates and Shut Down” option of, 124–125
- installing, 118–119
- Internet connection, without, 135–136
- with Intranet, 126–127
- languages for, 122

- for minor updates, 129–130
- options setting in, 119–120
- preparation for installation of, 117–118
- product type specifications, 121–122
- with proxy server, 122
- with registry, 131–135
- re-prompt delays with, 130–131
- rescheduling, 127–128
- restart delays with, 130
- scheduling, 121
- synchronization options, 121–122
- update detection frequency in, 129
- with update source, 122
- updates for, 120
- using, 122–123
- website for, 119
- Windows Update and, 131

Windows SQL Server 2000 Desktop Engine (WMSDE), 118

Windows System Image Manager, 66–69

Windows systems

- imaging of, 247–248
- migrating, 249, 251
- system files in, 248–249
- VBscripts in, 337

Windows Task Manager, 94

Windows Update

- timing of, 129
- WSUS and, 131

Windows Update Catalog (Microsoft), 116

Windows Vista

- backing up in, 204–205
- cache memory, 95
- IIS configuration on, 13–14
- manual migration for, 244–245, 264
- NTBackup in, 205
- system imaging in, 264
- Virtual Machine Additions in, 33
- Virtual Server on, 11

Windows XP

- ASR backup for, 238–245
- backing up in, 194–203, 205
- full system backup with, 241–243
- IDE drivers in, 251–252
- with IIS 5.1, 173
- IIS configuration on, 13
- manual migration for, 238–245, 251–253, 256–261, 264
- migration of, 251–252

Mini-Setup on, 59
plug and play hardware in, 59
shutdown in, 59
SID regeneration in, 59
storage drivers of, 251–252
Sysprep 2.0 with, 53–59
Virtual Machine Additions in, 33
Virtual Server on, 11
websites on, 179

WINS server, 375**WMI (Windows Management Instrumentation)**

CORE 1.5, 216
interface, 183

WMSDE (Microsoft Windows SQL Server 2000 Desktop Engine), 118**Workgroup (Sysprep)**

discussed, 55
with Windows 2000 server, 61

Writer, VSS, 107**wscript, 337****WSUS. See Windows Server Update Service****WUServer, 132****WUStatusServer, 132****X****xcopy, 203–204****XML files, 229****Y****Yellow dog Updater, Modified (YUM).**

See Linux Yellow dog Updater, Modified

