Index

Note to the Reader: Throughout this index boldfaced page numbers indicate primary discussions of a topic. Italicized page numbers indicate illustrations.

A

A (host) records
  addressing space, 60
  format, 88, 585
  IPv6 addresses, 425
  stub zones, 76, 574
A Recursive Query To Other DNS Servers option, 105, 602
AAAA records
  format, 88, 585
  IP addresses, 60
  IPv6 addresses, 425
AAS (application assignment scripts), 330, 790
Access-Based Enumeration (ABE) description, 212
  DFS, 540
access control entries (ACEs)
  delegating, 254
  description, 369, 369, 712, 712
access control for networks, 667–668
access control lists (ACLs), 369, 369, 712, 712
Access-Denied Assistance remediation, 887–889, 888–889
access rules and policies in DAC, 881–884, 882–883
Account Lockout Duration option, 373, 720
Account Lockout Threshold option, 373, 720
Account Operators group, 363, 706
Account tab for user templates, 274
  accounts
    AD RMS, 1092
  audit policies for, 545
  computer, 283–284, 359, 703
  managed service and virtual, 708–709
Accounts: Rename Administrator Account option, 373, 720
acknowledge messages in DORA process, 117
Action screen for BranchCache, 864–865, 864
Activate instance %s command in ntdsutil, 743
Activate Scope page, 134, 135
activating
  DHCPv6 scopes, 944–945, 944–945
  IPv4 scopes, 134, 135, 149–151
  superscopes, 940
Active Directory, 166
  account integration, 377
AD CS. See Active Directory Certificate Services (AD CS)
AD Delegation, 314, 771
AD DS, 4, 8, 700, 741, 915
AD FS. See Active Directory Federation Services (AD FS)
AD LDS, 8, 178, 741, 915
AD RMS. See Active Directory Rights Management Services (AD RMS)
  administrative tools, 192–193
  application data partitions, 195–200, 197, 200
  authorizing DHCP for, 126–128, 127–128
  backups. See backups
  command prompt commands, 290–291
  domains. See domains
  Event Viewer, 190–192
Active Directory (continued)

- exam essentials, 203, 747, 1038–1040
- file system verification, 166–171, 167, 170–171

forests. See forests

GPOs linked to, 309, 764

installing, 179–190, 181–189

network connectivity, 171–174

objects. See objects in Active Directory OUs. See organizational units (OUs)

recycle bin, 741–742, 914–915

replication. See replicas and replication

review questions, 204–206, 748–750, 1041–1043

security. See security

sites. See sites

subnets

creating, 991–993, 992

description, 987–988, 987

summary, 203, 746, 1037–1038

testing, 193–195, 194

trees

creating, 1017–1023, 1018–1023

joining to forests, 1023–1024

planning, 1013

single, 1014–1015, 1015

WSUS clients, 498

Active Directory Administrative Center

DAC, 878, 878, 880, 880, 882, 885

description, 193

working with, 289–290, 289

Active Directory Certificate Services (AD CS), 7–8

CAs. See certificate authorities (CAs)
certificates. See certificates

configuring, 1059–1061, 1059–1060
cryptography, 1049–1051, 1050
description, 4, 700

installing, 1055–1058, 1056

new features, 1047–1048

roles, 1048–1049

Active Directory Claims Provider Trusts Wizard, 1084, 1086

Active Directory Delegation (AD Delegation), 314, 771

Active Directory-detached failover clusters, 852

Active Directory Domain Services (AD DS), 8

description, 4, 700

recycle bin, 741, 915

Active Directory Domains and Trusts tool
description, 193

name suffix routing, 1034

single-master operations, 728, 1028–1029

trust management, 1032

UPN suffixes, 1033

Active Directory Federation Services (AD FS), 1070

attribute stores, 1073

certificates, 1082, 1082

claims. See claims in AD FS

compound authentication, 1088–1089

configuring, 1078–1082, 1079–1080

description, 8

dedicated endpoints, 1072–1073

exam essentials, 1105

federated identity management, 177

installing, 1076–1078, 1077

new features, 1074–1076

relying parties, 1072, 1083

review questions, 1106–1108

services, 1074

summary, 1104–1105

upgrading, 1078

Active Directory Installation Wizard

DNS servers, 180

domain controllers, 1024–1025

promotion process, 1017

trees, 1017

Active Directory Integrated DNS, 74–75, 74,

201–202, 202, 572–573, 572

Active Directory Lightweight Directory Services (AD LDS)
description, 8

forests, 178

recycle bin, 741, 915
Active Directory Migration Tool (ADMT)
- functions, 274–275
- OUs, 253

Active Directory Module for PowerShell, 193

Active Directory Object Type page, 264

Active Directory Rights Management Services (AD RMS), 9
- backups, 1100–1101
- connection points, 1097
- considerations, 1091–1093
- description, 4–5, 700
- encryption, 372, 719
- exam essentials, 1105
- installing, 1094–1097, 1094–1096
- overview, 1091
- requirements, 1093
- review questions, 1106–1108
- summary, 1104–1105
- templates, 1098–1099, 1104
- trusts, 1101–1104

Active Directory Service Interfaces (ADSI), 196

Active Directory Service Interfaces Editor (ADSI Edit), 723, 723, 745, 917–918

Active Directory Sites and Services tool
- connection objects, 999–1000, 999
- description, 193
- global catalog servers, 1004, 1035
- intersite replication, 996
- replication topology, 1009
- sites
  - configuring, 993
  - creating, 988–990, 989–990
  - links, 998
  - moving objects between, 1000–1001, 1000
  - subnets, 991–992
  - UGMC, 1036

Active Directory Users and Computers tool
- applications, 334, 795, 804
- audit logs, 873
- audit policies, 546
- computer accounts, 283
- delegating control, 370–371, 717–718, 770
- description, 193, 194
- dial-in access, 680
- file sharing, 211
- filtering, 280–281, 281
- foreign security principals, 367, 367, 710, 710
- GPOs, 312–313, 769
- groups, 280, 361, 704
- objects
  - creating, 270–273, 271
  - finding, 287–288
  - moving, 282
  - properties, 277
  - sections, 268
- OUs, 253, 255, 257, 263, 714–716, 715
- passwords, 725
- permissions, 368, 711
- queries, 287
- RSoP, 345, 805
- shared folders, 287, 549
- single-master operations, 728, 1028–1029
- user templates, 717

ActiveX controls in Performance Monitor, 501

activity retries in Windows PowerShell, 236

AD CS. See Active Directory Certificate Services (AD CS)

AD CS Configuration Wizard, 1059, 1060

AD Delegation (Active Directory Delegation), 314, 771

AD DS (Active Directory Domain Services), 8
- description, 4, 700
- recycle bin, 741, 915

AD FS. See Active Directory Federation Services (AD FS)

ad hoc mode in wireless access, 663–664
AD LDS (Active Directory Lightweight Directory Services)

description, 8
forests, 178
recycle bin, 741, 915
AD RMS. See Active Directory Rights Management Services (AD RMS)
Add-AdfsFarmNode cmdlet, 1081
Add-AdfsProxy cmdlet, 1081
Add-BCDataCacheExtension cmdlet, 867
Add Counters dialog box, 503–504, 503
Add Exclusion dialog box, 144, 145
Add Exclusions page
  DHCPv6 scopes, 944
  IP scopes, 138, 138, 152
  multicast scopes, 942
Add Exclusions And Delay page, 130, 131, 135
Add Features screen
  DNS, 92, 591
  failover clusters, 835
  RDC, 543
  Remote Access role, 634
  SNMP, 522
Add Group Or User dialog box, 313, 314, 770, 770
Add IP Address dialog box, 968, 969
Add Issuance Authorization Claim Rule Wizard, 1088
Add New Quota Entry dialog box, 225
Add Node Wizard, 840
Add Printer page, 227
Add Printer Wizard, 226, 285, 285
Add Roles And Features Wizard
  AD CS, 1056, 1056
  AD FS, 1076
  AD RMS, 1094, 1094
  Backup utility, 736, 737, 910, 910–911
  BitLocker, 536, 536–537
  BranchCache, 865, 866
  DFS, 540
  DHCP, 122, 123
  failover clusters, 835–837, 835
  FSRM, 531
  Hyper-V, 448, 448–449
  IPAM, 964, 964
  iSNS, 47, 47, 893, 893
  MPIO, 42, 42
  NFS data store, 859
  NLB nodes, 825, 825
  Remote Access role, 633, 633
  roles, 7, 8
  SNMP, 522
  trees, 1018–1020, 1019
  Windows Server Migration Tools, 11
  WSUS servers, 489–490, 489–490
Add Roles Wizard for Hyper-V, 447, 447
Add Servers dialog box, 966, 966
Add ShadowStorage command in vssadmin.exe, 217, 924
Add Storage Wizard, 861, 861
Add To Superscope option, 940
Add Upgrade Package dialog box, 336, 797
Add-WdsDriverPackage cmdlet, 481
Add-WindowsFeature cmdlet, 189
Additional Options screen for trees, 1022
additive permissions, 222
address pools in DHCP, 121
Address Resolution Protocol (ARP), 390
address space in IPv6 addresses, 423
addresses. See IP addresses
adjunct policies, 673
administration
  Active Directory tools, 192–193
  delegating control of, 253–254
  WDS, 479
administrative templates, 299–300, 754–755
Administrative Tools window, 185–186
Administrator accounts, 365, 707
administrator password, 24
Administrators group, 363–364, 706
ADMT (Active Directory Migration Tool)
  functions, 274–275
  OUs, 253
ADMX Central Store, 300, 756
adprep command
description, 180
forests, 1023
recycle bin, 741, 915
user attributes, 179
ADSI (Active Directory Service Interfaces), 197
ADSI Edit (Active Directory Service Interfaces Editor), 723, 723, 745, 917–918
Adsiedit.msc tool, 745, 918
Advanced Attributes dialog box, 732, 732, 906, 906
Advanced Audit Policy settings, 377, 548, 874
Advanced Boot Options screen, 925, 925
Advanced Deployment dialog box, 339, 339, 799, 800
Advanced Encryption Standard (AES), 663
Advanced Policies tab for resources, 849–850, 850
Advanced Security Settings dialog box, 649
Advanced Sharing dialog box, 551
Advanced Sharing page, 224
Advanced tab
DHCP scope, 149
DNS recursion, 959, 960
IPv4 server properties, 141, 142
IPv6 server properties, 143, 144
netmask ordering, 85
printers, 230–231, 231
queries, 288, 288
advertising in Microsoft Windows Installer, 328–329, 789
AES (Advanced Encryption Standard), 663
AGDLP acronym, 280
aging in DNS, 103–104, 600–601
alerts in Graph tab, 509–510
alias records, 89, 586
all-1s broadcasts, 396
All Servers Task Details screen, 1021
All Servers Task Details And Notifications screen, 491, 491
allocate-on-write transactional model, 168
Allow Administrator Interaction When The Private Key Is Accessed By The CA option, 1051
allow filtering in DHCP, 950, 950
Allow Macros right, 1099
Allow The Connection option, 864
Allow These Protocols option, 649
Allow Users To Continue To Use The Software, But Prevent New Installations option, 341, 803
Allow Zone Transfers option, 98, 595
Allowed EAP Types attribute, 672
Allowed RODC Password Replication group, 366, 710
Always Callback To option, 669
Always Dynamically Update DNS A And PTR Records option, 154, 613
Always Install With Elevated Privileges option, 804
Analytical logs, 956–957
ANI information, 667
anonymous authentication, 1063
AnonymousAddress value, 429
anycast addresses
DHCP scope, 137
IPv6 addresses, 428–429
Appearance tab in Performance Monitor, 508–509, 509
application assignment scripts (AAS), 330
application data partitions
creating, 196–198, 197
ntdsutil for, 197–200, 200
overview, 195–196
replicas, 198
Application layer in TCP/IP model, 390, 391
Application Server, 9
applications
  assigning, 331, 334–335, 791–792, 794–796
  AD FS, 1076, 1088–1089 domain controllers, 1006 key-based renewal, 1063 multiple domains, 1031, 1033 networks, 664–666, 689–690 pass-through, 652 RADIUS, 688 remote access profiles, 681–682, 681 verifying, 1008 VPN clients, 649 Windows, 689 Workplace Join feature, 1090 Authentication Methods pane, 681–682, 681 Authentication Type attribute, 672 Authoritative restore command in ntdsutil, 743 authoritative restores, 740, 913–914 authorization
availability
  high. See high availability
Resilient File System, 168
Storage Spaces, 36
AVMA (Automatic Virtual Machine Activation), 442–443
AXFR (full zone transfers), 78, 575

B
Background Intelligent Transfer Services (BITS) technology, 485–486
background zone loading in DNS, 81, 579
backup intervals in database files, 157
Backup Once Wizard, 738–739, 738–739, 911, 911–912
Backup Operators group, 364, 706
Backup Or Restore Wizard, 1069
backup vaults in Windows Azure, 920–921
backups
Active Directory, 903–904
bare-metal, 734–735, 907–908
database compaction, 744, 917
Group Policy objects, 735–736, 909
offline maintenance, 742–744, 915–917
replication, 744–745, 917
restoring, 735, 739–741, 908–909, 913–915
scheduling, 735, 908
setting up, 736–739, 737–739, 909–912, 910–912
system state data, 733–734, 906–907
types, 732–733, 905–906, 906
AD RMS, 1100–1101
ADSI Edit, 745, 917–918
certificate authorities, 1068–1069
GPOs, 782–783
wbadmin command, 745–746, 918
Windows Azure, 919–921
bandwidth
  networks, 980–981
UGMC, 1035
Bandwidth Allocation Control Protocol (BACP), 631
Bandwidth Allocation Protocol (BAP), 631, 683
bare-metal operating systems, 858
bare-metal restores (BMRs), 734–735, 907–908
basic disks, configuring, 32–34, 33
Basic Encryption (MPPE 40-Bit) option, 683–684
Basic Resource Health Check Interval option, 850
BCD (Boot Configuration Data), 52, 909
bcdedit utility, 52, 909
Berkeley Internet Name Domain (BIND), 562
BGP (Border Gateway Protocol) routing protocol, 633
bidirectional trusts, 1030
BIND (Berkeley Internet Name Domain), 562
BIOS for virtual machines, 464
BitLocker Drive Encryption
description, 5
  features, 533–536
  working with, 532–533
BITS (Background Intelligent Transfer Services) technology, 485–486
Block Policy Inheritance option, 304, 758–759
blocks of IP addresses, 968–969, 969
BMRs (bare-metal restores), 734–735, 907–908
Boot Configuration Data (BCD), 52, 909
boot environment in Windows Deployment Services, 479
boot files, backing up, 733, 907
boot.ini file, 52
Bootcfg.exe utility, 909
booting
  advanced options, 925, 925
  boot logging, 926–928, 927
  menu modes, 928–929
  Safe Mode, 925–926
  from VHD, 52
  Windows Recovery Environment, 928
Border Gateway Protocol (BGP) routing protocol, 633
BranchCache technology
  description, 5
  distributed cache mode, 862–865, 863–864
  enhanced features, 868
  hosted mode, 865–866, 866
  PowerShell for, 866–867
  storage, 862
bridgehead servers
  creating, 1001–1002
  working with, 985, 985
bring your own device (BYOD) applications, 652, 1089
broadcast addresses, 396, 425
browsing for connectivity tests, 174
Built-In container, 268
built-in domain local groups, 363–365, 363, 365, 705–707, 706, 708
business continuity. See disaster recovery (DR)
business needs, multiple domains for, 1011
BYOD (bring your own device) applications, 652, 1089
cache locking in DNS, 83, 580–581, 956
caches
  BranchCache, 868
  DNS, 70, 567–568
  UGMC, 361, 704, 1006
caching-only servers, 94–95, 94, 591–592, 592
Callback Control Protocol (CBCP)
  PPP, 623
  remote access, 666–667
Callback Options settings, 669
Called Station Id attribute, 672
Caller ID, 667
Calling Station Id attribute, 672
canonical name (CNAME) records, 89, 586
CAs. See certificate authorities (CAs)
categories for applications, 340, 341, 801–802, 801
CAU (Cluster-Aware Updating), 851
CBCP (Callback Control Protocol)
  PPP, 623
  remote access, 666–667
CCP (Compression Control Protocol), 623, 631
CDPs (CRL distribution points), 1055
Central Policy tab, 885, 885
CEP (Certificate Enrollment Policy Web Server), 1049
Cert Publishers group, 366, 709
certificate authorities (CAs)
  description, 1048
  enterprise, 1051–1052
  functions, 320, 776
  hierarchy, 1049–1051
  names, 1061–1062
  policy auditing, 1061
  private keys, 1051
  server backups, 1068–1069
  site names, 1068–1069
  subordinate, 1051–1052
Certificate Enrollment Policy Web Server (CEP), 1049
Certificate Enrollment Web Services (CES), 1049
Certificate field, 1083
Certificate Publishers, 320, 776
Certificate Request dialog box, 1060
Certificate Revocation dialog box, 1067
certificate revocation lists (CRLs), 1049, 1054–1055
Certificate Service DCOM Access group, 364, 707
Certificate Template Management Console, 1065, 1066
certificates
AD CS, 1059
AD FS, 1082, 1082
CAs. See certificate authorities (CAs)
CSP/KSP ordering, 1064
key archive and recovery, 1069–1070
key-based renewal, 1063
online responders, 1055
relying-party trusts, 1083
renewal enforcement, 1063–1064
revocation, 1054–1055, 1067
templates
compatibility, 1064–1065
creating, 1065, 1066
description, 777
overview, 1064
validation, 1054–1055
validity periods, 1054
CertificateThumbprint option, 1081
CES (Certificate Enrollment Web Services), 1049
chained installation for Windows Update, 485
Challenge Handshake Authentication Protocol (CHAP), 44, 623
Change service account command in ntdsutil, 743
child domains, 1014, 1014
Choose A Local Or Network Printer page, 285
Choose A Printer Port page, 227, 285
Choose A Server Authentication Certificate For SSL Encryption screen, 1097
Choose Classifications screen, 495
Choose Disk Format screen, 458
Choose Disk Type page, 458
Choose Upstream Server screen, 494
CIDR (Classless Inter-Domain Routing), 395, 419–420
Cipher command, 538–539
circular logging in Performance Monitor, 510
claims-aware agents, 1074
claims in AD FS
authorization, 1084, 1085
descriptions, 1073
model, 1075–1076
overview, 1070–1071
providers, 1071
rules
description, 1073
pass-through, 1084–1087, 1085–1087
transform, 1083–1084
Class A networks, subnetting, 417–418, 420
Class B networks, subnetting, 415–416, 420
Class C networks, subnetting, 410–415, 419–420
Class D addresses, 941
Class D networks, 151
classes
DHCP clients, 147–149
IP addresses, 395–398
resource records, 86, 584
Classification tab, 884, 884
classifications
DAC, 884, 884
FSRM, 530, 869
Classless Inter-Domain Routing (CIDR), 395, 419–420
Clear-BCCache cmdlet, 867
Clear-History cmdlet, 237
Client Friendly Name attribute, 672
Client IP Address attribute, 672
Client Vendor attribute, 672
clients

- Active Directory testing from, 193–195, 194
- connectivity tests, 172
- DHCP scope, 147
- DNS, 65, 563
- DNSSEC, 84, 582
- forcing GPO updates, 765–766
- PPP, 623
- preparation in WDS, 29, 483–484
- RADIUS, 677
- VPNs, 644–650, 645–646, 648, 650–651
- WSUS, 496–499

cloning
- databases, 542
- domain controllers, 1006–1007
- CLR (common language runtime), 235
- Cluster-Aware Updating (CAU), 851
- Cluster Shared Volumes (CSV), 850
- clustered applications, 830

clusters
- AD RMS, 1092, 1100
- failover. See failover clustering
- NLB nodes, 826–829, 826–828
- cmdlets, 235, 240
- CNAME (canonical name) records, 89, 586
- collections in IPAM, 972
- Color Management tab, 232
- COM+ class registration database, backing up, 734, 907
- com domain, 62, 560
- Comment field for printers, 228
- common language runtime (CLR), 235
- Common Name screen, 724
- communities in SNMP, 522

compacting
- databases, 158, 744, 917
- virtual hard disks, 460
- compatibility in certificate templates, 1064–1065
- Compatibility tab, 1064
- Completing The New Scope Wizard page, 138, 139
- compound authentication, 1088–1089
- Compression Control Protocol (CCP), 623, 631
- compression in NTFS file system, 218, 218
- computer accounts
  - resetting, 283–284
  - security, 359, 703
- computer certificates in GPOs, 319–321, 321, 776–778, 778
- Computer Management
  - dial-in access, 680
  - differencing hard disks, 457–458
  - disk configuration, 171
  - dynamic disks, 33
  - initializing files, 32
  - network adapters, 172
  - shadow copies, 216, 922, 922
  - SNMP, 522
  - volume sets, 34
- computer names, 77, 575
- Computer Network Options settings, 318, 775
- Computer Selection page, 345, 345, 806, 806
- computers and computer objects
  - description, 269
  - Group Policy, 300, 754
  - offline domain joins, 275
  - properties, 278
  - WSUS servers, 492
- Computers container, 268
- conditional forwarding in DNS, 102, 599
- conditions in DAC, 877
- configSDDL command in WinRM, 235
- configurable settings command in ntdsutil, 743
- configuration database in AD RMS, 1100
- Configure A Service Or Application Wizard, 842, 844
Connect To Server dialog box, 1100
Connect To Upstream Server screen, 494
connection command in ntdsutil.exe, 199
Create Shadow command in vssadmin.exe, 217, 924
Create Virtual Switches screen, 448
Credit cards screen, 1059
CRL distribution points (CDPs), 1055
CRLs (certificate revocation lists), 1049, 1054–1055

Configure AD RMS Cluster Key Storage screen, 1096
Configure Authentication Methods page, 675, 686
Configure Automatic Updates Properties dialog box, 498
Configure Constraints page, 675, 686
Configure Device - WAN Miniport (PPTP) dialog box, 636, 636
Configure DHCP Options page, 131, 132, 135
Configure Disk page, 458
Configure Failover Wizard, 946, 947–948
Configure Identity Federation Support screen, 1097
Configure Networking page, 462
Configure Rule screen, 1089
Configure Server Discovery page, 967, 967
Configure Settings page network access policies, 676
VPN access policies, 686
configuring Windows Server, 208
disk quotas, 224–225
file servers. See file servers
print services, 226–233, 227–232
remote management, 233–240, 241
review questions, 244–246
summary, 241–242
Confirm Installation Selections page, 41
Conflict Detection Attempts option, 141
Connect To Server dialog box, 1100
Connect To Upstream Server screen, 494
connection command in ntdsutil.exe, 199
Connection Manager, 686–687
Connection Settings dialog box, 723
connections
AD RMS, 1097
creating, 999–1000, 999
network security, 666–667
remote access, 686–687
virtual machines, 465–466, 466
connectivity
client tests, 194
networks, 171–174
consistency
multiple domains, 1011
performance monitoring, 500–501
contact objects, 269
Content Location Selection screen, 490
Context-Sensitive Buttons Provide Quick Access to Key Features option, 466
Control Access permission, 368, 712
Convert action for virtual hard disks, 460
Convert To Dynamic Disk dialog box, 34
CONVERT utility, 170
converting
basic disks to dynamic, 33–34, 33, 460
FAT partitions to NTFS, 170
copy backups, 733, 906
copy on write model, 168
Copy-WdsInstallImage cmdlet, 481
copying GPOs, 783
costs, network, 981
Counter logs in Performance Monitor, 510
counters in Performance Monitor, 503
CPU requirements in Hyper-V, 447
Create A New Failover Relationship page, 947
Create A New Private Key option, 1060
Create Child permission, 368, 712
Create Claim Type dialog box, 878, 878
create command
ntdsutil, 199
WinRM, 234
Create Or Join An AD RMS Cluster screen, 1095
Create Shadow command in vssadmin.exe, 217, 924
Create Virtual Switches screen, 448
Credentials screen, 1059
CRL distribution points (CDPs), 1055
CRLs (certificate revocation lists), 1049, 1054–1055
cross-forest trusts, 1030–1031

cryptographic mode in AD RMS, 1092, 1096

Cryptographic Mode screen, 1096

Cryptographic Operators group, 364, 707

Cryptographic Service Provider/Key Service Provider (CSP/KSP) ordering, 1064

cryptographic service providers (CSPs), 1049–1050

cryptography in AD CS, 1049–1051, 1050.

See also encryption

CSV (Cluster Shared Volumes), 850

csvde.exe utility, 274, 290

custom views in Event Viewer, 518–519, 518

Customize Message For Access Denied Errors dialog box, 888, 888

D

DAC. See Dynamic Access Control (DAC)
daily backups, 733, 906
dashboard, cluster, 853

Data Collector Sets in Performance Monitor, 502
data integrity in Resilient File System, 168

Data Protection Manager (DPM) application, 919–921
data store, backing up, 733, 907

Data tab in Performance Monitor, 507, 508
database mounting tool, 744, 916
databases

AD RMS, 1100–1101

compacting, 158, 744, 917

DFS, 542–543

DHCP, 156–158

DNS zones, 72–73, 570–571

IPAM, 972

Day And Time Restrictions attribute, 672

dcdiag command, 290

DCM (Desired Configuration Manager), 823

DDNS (Dynamic DNS) standard, 65–66, 67, 563–565, 564
database population, 67, 68, 565–566, 565

DHCP integration with, 153–155, 155, 612–614
deactivating

DHCP scopes, 149–151

superscopes, 940

Debug Logging tab, 106, 107, 602, 603

Debug logs, 956–957

Debugging Mode option, 928

decentralized administration, multiple domains for, 1012

decimal points (.) in IP addresses, 59, 557

Default Domain policy, 722–723

Default Package Location setting, 339, 799

Default Routing class, 149

Default Stores screen, 449
defaults


gateways, 132, 133


subnet masks, 403
defragmentation of databases, 744, 917
defunct schema classes and attributes, 177
delay in DHCP scope, 130, 131

Delegated Domain Name page, 101, 598
delegation of control

administrative, 253–254

DNS, 959

DNS zones, 100–101, 597–598

GPOs, 313–314, 314, 770–771, 770

IPAM, 971, 972

OUs, 263–267, 264–266

Storage Spaces, 36

users and groups, 370–371, 717–719

zones, 571–572

Delegation of Control Wizard, 263–266, 264–266, 370, 717–718

Delete Child permission, 368, 712
delete command

ntdsutil, 199

WinRM, 234
Delete Shadows command in vssadmin.exe, 217, 924
Delete ShadowStorage command in vssadmin.exe, 217, 924
Delete Tree permission, 369, 712
deleting
    objects, 278, 282–283
    OUs, 260–261, 260–261
    superscopes, 150, 940
    virtual machines, 465, 465
deletions, backups for, 903–904
Demand-Dial Routing Connections
    (Inbound And Outbound) option, 637
demoting domain controllers, 1024–1025
Denied RODC Password Replication group, 366, 710
deny filtering in DHCP, 950, 950
Deny-WdsClient cmdlet, 481
dependencies
    in AD FS, 1075
    in failover clustering, 847–848, 848
dependency viewers, 846–847, 847
Deploy Software dialog box, 335, 795
Deployment Configuration screen, 183
Deployment tab for software, 338–339, 339, 799–800, 799
deprecated features, 12–15
deprovisioning objects, 278

descriptions for organizational units, 252
Desired Configuration Manager (DCM), 823
desktop virtualization, 441
details tab
    RSoP, 347, 348, 808, 809
    Task Manager, 513, 513
device claim types in DAC, 875–879, 876–879
Device Registration Service (DRS), 1090
device unique identifiers (DUIDs), 943
devolution in DNS, 84, 582
DFS. See Distributed File System (DFS)
DFS Replication (DFSR), 986
Dfsrdiag.exe tool, 986
DHCP. See Dynamic Host Configuration Protocol (DHCP)
DHCP Management Console
    DHCP failover, 946
    DHCPv6 scopes, 944–945
    DNS registration, 952
    filtering, 950
    multicast scopes, 941
    name protection, 950
    superscopes, 940
dhcp.mdb database, 157
dhcp.tmp file, 157
DHCP User Classes dialog box, 148
dial-in access, restricting, 680
Dial-In tab, 668, 669
Dial-Up Networking (DUN) infrastructure, 621–623
    overview, 621
    Point-to-Point Protocol, 623–624
Dialing Options settings, 647
differencing virtual hard disks, 457
differential backups, 733, 906
digital certificates. See certificates
DirectAccess technology, 653
    infrastructure, 655–656
    operation, 655
    prerequisites, 654
    vs. virtual private networks, 653
directed broadcasts, 396
Direction Of Trust page, 1032
directory services database, 1100
Directory Services Restore Mode (DSRM), 735, 908
Directory Services Restore Mode option, 928
Disable Automatic Restart On System Failure option, 928
Disable-BC cmdlet, 867
Disable-BCDowngrading cmdlet, 867
Disable Driver Signature Enforcement option, 929
Disable Dynamic Updates For DNS PTR Records option, 952
Disable-WdsBootImage cmdlet, 481
Disable-WdsDriverPackage cmdlet, 482
Disable-WdsInstallImage cmdlet, 482
Disabled option in Group Policy, 299, 754
disabling objects, 278
disaster recovery (DR), 730, 821, 902 backups. See backups boot options, 925–929, 925, 927 domain controllers for, 1024 exam essentials, 933 review questions, 934–936 shadow copies, 921–924, 922–924 site-level fault tolerance, 929–931, 931 Startup Repair tool, 932 summary, 933 system protection, 902–903
disaster recovery plans (DRPs), 1024
Discard A And PTR Records When Lease Is Deleted option, 154–155, 613, 950 Disconnect-WdsMulticastClient cmdlet, 482
discover step in DORA process, 116
Discovery tab, 891, 891–892
Discovery Domain Sets tab, 48, 49
Discovery Domains tab, 48, 894, 894
Discretionary Access Control List (DACL) option, 784
disk drives
configuring, 32–34, 33
encrypting
BitLocker, 532–537, 536–537
Encrypting File System, 537–539
Hyper-V, 447
initializing, 31–32
virtual machines, 464. See also virtual hard disks (VHDs)

Disk Management program
disk conversions, 33–34
Hyper-V, 458, 458
initializing disk drives, 32
mount points, 40
NTFS partitions, 171

shadow copies, 216, 922
VDS, 51
volume sets, 34–35, 39, 40
disk mirroring, 36–37
disk quotas, 168–169, 224–225
disk striping with parity, 37
DiskPart command, 51, 51
DiskRAID command, 51
Disks To Convert dialog box, 34
Dism.exe utility, 30
Display Name field, 1083
Display Progress While Connecting option, 647
distributed cache mode in BranchCache, 862–865, 863–864
Distributed File System (DFS), 539
advantages, 539–540
databases
cloning, 542
recovering, 542–543
optimizing, 543
replication, 540–542, 986
types, 540–541, 541
distribution groups
description, 279
security, 359–360, 703
Djoin command, 291
DNS. See Domain Name System (DNS)
DNS Manager
DNSSEC, 954–955, 955
GlobalName zones, 961
recursion, 959
DNS Notify, 78, 79, 576, 577
DNS screen, 185
DNSCmd utility, 113–114, 610
DNSKEY records, 953–954
DNSLint utility, 111–112, 608–609
DNSSEC (Domain Name System Security Extensions), 83–84, 581–582, 953–955, 954–955
DnsUpdateProxy group, 85, 582–583
Do Not Enroll Certificates Automatically option, 1062
Do Not Log Any Events option, 640
Do Not Use A Migration Table option, 784
Domain Admins group, 366, 709
Domain Computers group, 366, 709
Domain Controller: Allow Server Operators To Schedule Tasks option, 373, 720
Domain Controller Options screen, 1022
Domain Controllers group, 268, 366, 709
Domain Guests group, 366, 709
domain local groups
description, 279
security, 361, 704
domain controllers
   adding, 1024
   authentication, 1006
cloning, 1006–1007
demoting, 1024–1025
   placing, 1003, 1025–1026
   RODCs, 20
   DNS, 82, 580
   local groups, 366, 710
   replication, 1002–1003
Domain Controllers group, 268, 366, 709
Domain Name And DNS Servers page, 132, 133, 136
Domain Name System (DNS), 58–59
   Active Directory integration, 74–75, 74, 201–202, 202, 572–573, 572
   advantages, 80–86, 578–583
   aging and scavenging, 103–104, 600–601
   cache locking, 83, 580–581, 956
caching-only servers, 93–94, 93, 591–592, 592
delegated administration, 959
description, 5
devolution, 84, 582
dynamic
database population, 67, 68, 565–566, 565
   overview, 65–66, 67, 563–565, 564
exam essentials, 159–160, 614–615, 973
   forwarding, 101–102, 599
installing, 91–93, 92–93, 588–591, 589–590
introduction, 556–557
IP addresses, 59–64, 60, 63, 557–562, 558, 561
load balancing with round robin, 93, 591
logging, 956–959, 957–958
monitoring, 104–107, 105–107, 601–603, 601–603
netmask ordering, 960–961
non-dynamic, 65–66, 563–565
queries, 68–70, 69, 566–568, 566
record types, 86–91, 583–588
recursion, 959, 960
registration, 952–953, 952
resource records, 102–103, 599–600
review questions, 161–163, 616–618, 974–976
security. See security servers, clients, and resolvers, 64–65, 192, 562–563
socket pools, 82, 580, 955
summary, 158, 614, 973
TCP/IP for, 556–557
troubleshooting
   DNSCmd, 113–114, 610
   DNSLint, 111–112, 608–609
   ipconfig, 112–113, 609
   log files, 114–115, 611
   non-Microsoft DNS servers, 115–116, 115, 611–612, 611
   nslookup, 108–111, 604–607
   overview, 107–108, 603–604
   root zones, 115, 611
zones, 64, 71–72, 569
   Active Directory, 74–75, 74, 572–573, 572
delegating, 100–101, 571–572, 597–598
DNS Notify, 78, 79, 576, 577
dynamic updates, 98–100, 99–100, 595–597, 596–597
GlobalName, 77, 575, 961
Domain Name System (DNS) (continued)
primary, 72–73, 569–570
properties, 95–98, 96–97, 592–595, 593–594
secondary, 73–74, 571
signing, 953–954
statistics, 84–85, 962
stub, 75–77, 76, 573–575, 574
transfers and replication, 77–80, 80, 575–578, 577
Domain Name System Security Extensions (DNSSEC), 83–84, 581–582, 953–955, 954–955
Domain Naming Masters, 724, 1027
Domain Profile tab in Windows Firewall, 377, 378
domain users and groups, 360, 702
Domain Users group, 366, 709
domains
controllers. See domain controllers
functional levels, 174–176
GPOs, 303, 758
joining, 194–195
multiple. See multiple domains
names, 64, 560–561
namespaces, 61–62, 559
operations masters, 726–727, 1027–1028
promotion process, 1017
renaming, 177
structure, 178
trees. See trees in Active Directory
DORA process, 116–117
dotted decimal notation, 59, 557
down-level servers, configuring, 238–239
DPM (Data Protection Manager)
application, 919–921
drivers
printers, 231
provisioning in WDS, 479
DRPs (disaster recovery plans), 1024
DRS (Device Registration Service), 1090
DS behavior command in ntdsutil, 743
Dsacls command, 291
Dsadd command, 291
Dsadmin command
description, 291
recovery process, 744, 916
Dsdbutil command, 291
Dsget command, 291
DsGetSiteName API, 1068
Dsmgmt command, 291
Dsmod command, 291
Dsmove command, 291
Dsquery command, 291
DsQuerySitesByCost API, 1068
DSRM (Directory Services Restore Mode), 735, 908
Dsrmm command, 291
dual stack in IPv6 addresses, 431, 431
DUIDs (device unique identifiers), 943
DUN (Dial-Up Networking)
infrastucture, 621–623
overview, 621
Point-to-Point Protocol, 623–624
duplicate content in BranchCache, 868
DVD drives in virtual machines, 464
Dynamic Access Control (DAC), 875
Access-Denied Assistance remediation, 887–889, 888–889
access rules and policies, 881–884, 882–883
enabling, 876–877, 876–877
file classification, 884–885, 884–885
policy changes and staging, 885–887, 886–887
resource properties and lists, 879–881, 880–881
user and device claim types, 875–879, 876–879
uses, 371–372, 719
Dynamic Bandwidth Control Using BAP Or BACP option, 631
dynamic disks, configuring, 32–34, 33
database population, 67, 68, 565–566, 565
DHCP integration with, 153–155, 155, 612–614
Dynamic Host Configuration Protocol (DHCP), 66, 564
advantages, 118
allow and deny filtering, 950
authorizing, 126–128, 127–128
description, 5
DHCP snap-in, 125–126, 126
disadvantages, 118–119
DNS registration, 952–953, 952
DORA process, 116–117
enforcement in network access, 690
exam essentials, 159–160, 973
failover, 946–949, 947–949
high availability, 946–950, 947–950
hot standby, 156
installing, 122–125, 123–125
leases
duration, 131, 131, 138
options, 119–120
releases, 118
renewals, 117–118
load sharing, 156
name protection, 950–951, 951
overview, 116
relay agent, 122
review questions, 161–163, 974–976
scope
activating and deactivating, 149
database files, 156–158
details, 120–122
DHCPv6, 943–945, 944–945
dynamic DNS with, 153–155, 155, 612–614
exclusions. See exclusions in DHCP
IPv6 addresses, 136–138, 136–139
multicast, 151–152, 153, 940–943, 942–943
multiple servers, 155–156
properties, 138, 140
reservations, 145–146, 145
server properties, 140–143, 141–143
split scopes, 949
superscopes, 149–151, 939–940
summary, 158, 973
dynamic least queue depth, 41
Dynamic Memory feature in Hyper-V, 443
dynamic quorum management, 834
Dynamic Updates field, 96, 593
dynamic updates in DNS zones, 98–100, 99–100, 595–597, 596–597
dynamic volumes in NTFS file system, 169
dynamic witness in failover clustering, 852
dynamically expanding virtual hard disks, 456
Dynamically Update DNS A And PTR
Records For DHCP Clients That Do Not Request Updates option, 154, 613
Dynamically Update DNS A And PTR
Records Only If Requested By The DHCP Clients option, 154–155, 613, 950

E
E-mail Notifications option, 492
EAP (Extensible Authentication Protocol)
networks, 665
VPNs, 626
EAP-RADIUS authentication, 665
EAP-Transport Level Security
(EAP-TLS), 665
EAP types in networks, 665
Easy Print Driver, 233
Edit Claim Rules For Claimapp window, 1088–1089
Edit Disk tool, 459
Edit right, 1099
Edit Rights right, 1099
Edit Virtual Hard Disk Wizard, 459–460, 459
edu domain, 62, 560
Effective Permissions tab, 771
EFI (Extensible Firmware Interface), 31
EFS (Encrypting File System)
features, 537–539
NTFS file system, 218–219, 219
802.1X standard, 666, 690
Elevation-of-privileges attacks, 1030
Enable-AdfsDeviceRegistration cmdlet, 1090
Enable-BCDistributed cmdlet, 867
Enable-BCHostedClient cmdlet, 867
Enable-BCHostedServer cmdlet, 867
Enable-BCLocal cmdlet, 867
Enable Bidirectional Support option, 230
Enable Broadcast Name Resolution option, 632
Enable Certificate Templates dialog box, 1066–1067
Enable Default Route Advertisement option, 633
Enable DNS Dynamic Updates According To The Settings Below option, 154, 613, 950
Enable IPv4 Forwarding option, 632
Enable IPv6 Forwarding option, 632
Enable Low-Resolution Video option, 928
Enable-WdsBootImage cmdlet, 482
Enable-WdsDriverPackage cmdlet, 482
Enable-WdsInstallImage cmdlet, 482
Enabled option in Group Policy, 299, 754
Encapsulation
PPP, 624
VPNs, 627–628, 627
Encrypt Contents To Secure Data option, 219
Encrypting File System (EFS) features, 537–539
NTFS file system, 218–219, 219
Encryption, 532
AD CS, 1049–1051, 1050
BitLocker Drive Encryption, 532–537, 536–537
BranchCache, 868
NTFS file system, 168–169
Remote access profiles, 683–684, 683
VPN clients, 649
VPN tunnels, 625
Wireless access, 663
Encryption pane, 683–684, 683
End IP Address field, 140, 144
End IPv6 Address field, 137
Endpoints in AD FS, 1072–1073
Enforce Password History option, 372, 720
Enforced option in GPOs, 304, 759
Enhanced Session Mode in Hyper-V, 442
Enroll Certificates Automatically option, 1062
Enterprise Administrators group, 1093
Enterprise Admins group, 366, 709
Enterprise certificate authorities, 1051–1052, 1052
Enumerate command in WinRM, 234
Error messages in nslookup, 110–111, 605–606
Event Logging tab, 105, 105, 601, 601
Event logs
DNS, 105, 105, 601, 601
Replication, 1008
RRAS, 641–642
Event Properties dialog box, 516–517, 517
Event Viewer
for Active Directory installation, 190–192
Audit events, 546, 873
DNS logs, 957, 958
Working with, 515–519, 516–519
Evicting cluster nodes, 840
Exclusions in DHCP
Adding, 130, 131, 138, 138
DHCPv6 scopes, 944
Multicast scopes, 152, 942
Overview, 120–121
Ranges, 144–145, 145–146
Expand action for virtual hard disks, 460
Expiration dates of certificate authorities, 1054
Expires After field in DNS zones, 97, 594
Export-AdfsDeploymentSQLScript cmdlet, 1081
Export-BCSecretKey cmdlet, 867
Export-DfsrClone cmdlet, 542
Export right, 1099
Export Trusted Publishing Domain dialog box, 1103
Export-WdsBootImage cmdlet, 482
Export-WdsInstallImage cmdlet – file servers

Export-WdsInstallImage cmdlet, 482
exporting
  NPS policies, 678–679
tagged publishing domains, 1103
  Windows Firewall policies for, 383–384
expression-based audit policies, 377, 548, 874–875
Extended User Interface 64-bit (EUI-64) format, 429
Extensible Authentication Protocol (EAP) networks, 665
VPNs, 626
Extensible Firmware Interface (EFI), 31
extensions, mapping, 340, 800–801
external forwarding in DNS, 101–102, 599
external networks in Hyper-V, 454
external trusts, 1030
Extract right, 1099

F
failback in MPIO, 41
failover clustering, 830
  clusters
    application settings, 844–848, 845–848
    creating, 839–840, 840
    nodes, 840
    validating configuration, 834–839, 835–838
description, 5, 9
DHCP, 946–949, 947–949
features, 850–853
quorums, 833–834, 833
requirements, 831–833
resource properties, 847–850, 848–849
roles, 840–844, 841–843
failover in MPIO, 41
FAST (Flexible Authentication Secure Tunneling), 1088
FAT (File Allocation Table), 218
FAT partitions, 170
fault tolerance. See high availability
FDE (Full Disk Encryption), 534
Features On Demand, 30–31, 895–896
Features screen
  DHCP, 122
  IPAM, 964
federated identity management, 177
federated trusts, 1101
Federation Metadata endpoint, 1072
Federation Service Proxy, 1074
FederationServiceName option, 1081
FederationServiceTrustCredentials option, 1081
Fibre Channel feature
  Hyper-V, 442
  vs. iSCSI, 890
  overview, 49–50
File Access Settings or Exit Virtual Machine Connection option, 466
File Allocation Table (FAT), 218
File and Storage Services, 9
File Server Resource Manager (FSRM), 868–870
  Access-Denied Assistance, 889, 889
description, 5
  features, 530–531
  installing, 531–532, 869
file servers, 552–554
  Access-Based Enumeration, 212
  Active Directory object availability, 210–212, 210–211, 548–551
  audit policies, 543–548
  DFS, 539–543, 541
encryption
  BitLocker, 532–537, 536–537
  Encrypting File System, 537–539
exam essentials, 551
FSRM, 530–532
offline files, 212–215, 213–215
overview, 208–209
permissions, 218–224, 218–223
review questions, 552–554
sharing folders, 209
summary, 551
VSS, 215–217
File Sharing dialog box, 287, 549
file systems
  DFS. See Distributed File System (DFS)
  encryption, 168–169
  NTFS, 168–171, 170–171, 218–224,
      218–223
  verifying, 166–171, 167, 170–171
filename extensions, mapping, 340,
      800–801
files
  classification in DAC, 884–885,
      884–885
  conflicts in Microsoft Windows Installer,
      328, 789
  screening in FSRM, 869
files command in ntdsutil, 743
Filter Options dialog box, 280, 281
filtering
  AD objects, 280–282, 281
  DHCP, 950, 950
GPOs
  inheritance, 315, 315–316, 771–772, 772
  security groups, 311–313, 311,
      768–769, 768
Find Users, Contacts, And Groups dialog
box, 287–288, 288
fine-grained password policies, 722–725, 723
firewalls
  verifying configuration, 1008
  Windows. See Windows Firewall
fixed size virtual hard disks, 457
flat addressing, 394
flexibility in multiple domains, 1012
Flexible Authentication Secure Tunneling
      (FAST), 1088
flexible host isolation, 690
floppy disks for virtual machines, 464
folders
  offline
      configuring, 212–215, 213–215,
      549–551
      vs. folder redirection, 323, 780
  redirecting, 322–323, 323, 778–780, 779
  shared, 286–287, 549
  sharing, 209
footprint in Server Core version, 19
Force Policy Inheritance option, 304, 759
forcing GPO updates, 764–766
foreign security principals, 268, 367, 710
forests
  authentication, 1031
  domain functional levels, 176–178
  joining trees to, 1023–1024
  operations masters, 726, 1026–1027
  planning, 1013
  working with, 1015–1017, 1016
Format-table cmdlet, 237
Format Volume page, 35
Forward right, 1099
forwarding in DNS, 101–102, 599
ForwardProxy option, 1081
FQDNs. See fully qualified domain names
      (FQDNs)
Framed Protocol attribute, 672
FsConfigWizard.exe file, 1079
FSMO roles
  assigning, 727–728, 1028–1029
  managing, 725–726, 1026
  seizing, 728–729
FSRM. See File Server Resource Manager
      (FSRM)
full backups, 733, 906
Full control right, 1099
Full Disk Encryption (FDE), 534
Full Volume Encryption (FVE), 534
full zone transfers (AXFR), 78, 575
fully qualified domain names (FQDNs)
  AD RMS, 1092
  certificate authorities, 1061
  description, 1012
  host contacts, 63, 560
FVE (Full Volume Encryption), 534
G
  gateways, default, 132–133, 133
GC (global catalog)
  replication enhancements, 177
  trees and forests, 1013, 1016–1017
GC (global catalog) servers
managing, 1034–1035
placing, 1004
General tab
certificate templates, 1065
DNS zones, 95–96, 592–593
IPv4 server, 141, 141
IPv6 server, 143, 143
iSNS, 48, 894
multicast scopes, 152, 153, 942, 942
OUs, 261, 262
Performance Monitor, 506–507, 506
printers, 228, 228
user templates, 273–274
VPN clients, 645–646

Global Name zones, 77, 575, 961
gov domain, 62, 560
GPMC. See Group Policy Management Console (GPMC)
GPPs (Group Policy preferences), 300, 755
gpresult.exe utility, 349–350, 809–810
GPTs (GUID Partition Tables), 31–32
GPUpdate.exe command, 765–766
GPUs (graphical processing units) in Hyper-V, 452
Graph tab
logs and alerts, 509–510
Performance Monitor, 507–508, 508
Graph view in Performance Monitor, 504, 504
graphical deployment for AD FS, 1079–1080, 1080
graphical processing units (GPUs) in Hyper-V, 452
Graphical User Interface (GUI)
installation with, 17, 22–24, 23–24
MBSA, 520–521
GRE (Generic Routing Encapsulation)
headers, 628
Group Membership Evaluation command in ntdsutil, 743
group objects, 269
Global catalog (GC)
replication enhancements, 177
trees and forests, 1013, 1016–1017
Global catalog (GC) servers
managing, 1034–1035
placing, 1004
Global groups
description, 280
predefined, 365–367, 709–710
security, 361, 704
Global object access auditing, 376–377, 547, 874
Global unicast addresses, 428
Global Update Manager (GUM)
failover clustering, 852
settings, 931
GlobalName zones, 77, 575, 961
geoclustering, 839
Get-ADDomain cmdlet, 729
Get-ADForest cmdlet, 729
Get-BCClientConfiguration cmdlet, 867
Get-BCContentServerConfiguration cmdlet, 867
Get-BCDataCache cmdlet, 867
Get-BCStatus cmdlet, 867
get command in WinRM, 234
Get-Date cmdlet, 237
Get-DnsServerStatistics cmdlet, 84
Get-event cmdlet, 237
Get-Fsrm cmdlets, 531, 869–870
Get Help And Support option, 485
Get-Help cmdlet, 237
Get-NetIPAddress cmdlet, 237, 239
Get-NetIPConfiguration cmdlet, 239
Get-NetIPInterface cmdlet, 239
Get-WdsBootImage cmdlet, 482
Get-WdsClient cmdlet, 482
Get-WdsDriverPackage cmdlet, 482
Get-WdsInstallImage cmdlet, 482
Get-WdsInstallImageGroup cmdlet, 482
Get-WdsMulticastClient cmdlet, 482
Get-WindowsFeature cmdlet
AD CS, 1058
AD FS, 1078
description, 237
Group Policy and Group Policy Objects (GPOs), 298
automatic updates, 337, 798
backing up, 782–783
certificates, 319–321, 321, 776–778, 778, 1062
delegating control of, 313–314, 770–771, 770
description, 9
default groups. See also Group Policy and Group Policy Objects (GPOs)
description, 9
deleting groups, 299–301, 301, 754–756, 755
delays, 333–334, 794
debunking, 327–328
deployments. See software deployment
devices. See also hardware
DDE, 175
disabling, 378
DNS server, 852
domain controllers, 898
domains.
DRAC, 876
Dynamic Access Control (DAC), 876
Dynamic Directory (DD), 862
eXen, 904
eXen hypervisor, 904
eXen virtual machines, 904
exam essentials, 351–352, 812–813
exporting, 783
external policies, 316–317, 317
forced updates, 764–766
ftcp, 120
functionality, 122
GPOs, 305–306, 309, 736, 760, 764–765
Group Policy Creator Owners group, 366, 709
Group Policy Management Console (GPMC)
backups, 736, 909
BranchCache, 863–864
certificates, 321, 711, 1062
DAC, 876
GPOs, 305–306, 309, 736, 760, 764–765
item-level targeting, 782
migration tables, 784
offline folders, 213–214, 550
publishing applications, 334, 795
restoring GPOs, 783, 909
security policies, 722
software policies, 333, 794
software updates, 336, 796
GPOs, 305–306, 309, 736, 760, 764–765
item-level targeting, 782
migration tables, 784
Group Policy Management Editor
BranchCache, 863–864
DAC, 876, 876
GPOs, 307, 721–722, 721, 762
Group Policy Management Tool, 888
Group Policy preferences (GPPs), 300, 755
groups. See also Group Policy and Group Policy Objects (GPOs)
AD RMS, 1093
creating, 280
delegating control of, 370–371, 717–719
properties, 279–280
purpose, 279
security
built-in domain local groups, 363–365, 363, 365, 705–707, 706, 708
creating, 714–716, 715
foreign security principals, 367, 367, 710, 710
predefined global groups, 365–367, 709–710
scope, 360–361, 362, 703–704, 705
types, 359–360, 702–703
summary, 350–351, 811
troubleshooting, 344–350, 345–348
Update policy, 333–334, 794
Windows Firewall, 383
WMI, 310–311, 767
WSUS clients, 496, 498
WMI, 310–311, 767
WSUS clients, 496, 498
AD RMS, 1093
creating, 280
delegating control of, 370–371, 717–719
properties, 279–280
purpose, 279
security
built-in domain local groups, 363–365, 363, 365, 705–707, 706, 708
creating, 714–716, 715
foreign security principals, 367, 367, 710, 710
predefined global groups, 365–367, 709–710
scope, 360–361, 362, 703–704, 705
types, 359–360, 702–703
Guest accounts, 365, 707
Guests group, 364, 707
GUI (Graphical User Interface)
installation with, 17, 22–24, 23–24
MBSA, 520–521
GUID Partition Tables (GPTs), 31–32
GUM (Global Update Manager)
failover clustering, 852
settings, 931

H

hardware
Hyper-V, 446–447, 447
virtual machines, 463–464
hardware failures, backups for, 903
hash algorithms, 1050
HBAs (host bus adapters), 44, 890–891
HCAP (Host Credential Authorization Protocol) User Groups attribute, 673
headers in IPv6 addresses, 423–424
Help And Support dialog box, 926
Help command in ntdsutil, 743
helpmsg command in WinRM, 235
hierarchies
certificate authorities, 1049–1051
IP addresses, 393–394
multiple domains, 1011
OUs, 252
high availability, 821
Active Directory, 982
Active Directory Integrated zones, 75, 573
components, 821–822
DHCP, 946–950, 947–950
domain controllers, 1024
exam essentials, 854
failover clustering. See failover clustering foundation, 822–823
local databases, 73, 570
NLB, 824–830, 825–829
patches, 823–824
review questions, 855–856
summary, 853–854
Histogram view in Performance Monitor, 505, 505
historical information, backups for, 730, 904
history in performance monitoring, 501
Hold Mismatched Documents option, 231
home folders in file servers, 209
host (A) records
addressing space, 60
format, 88, 585
IPv6 addresses, 425
stub zones, 76, 574
host addresses in IP addresses, 395
host bus adapters (HBAs), 44, 890–891
Host Credential Authorization Protocol (HCAP) User Groups attribute, 673
host records, 88, 585
hosted mode in BranchCache, 862, 865–866, 866
hostnames, resolving. See Domain Name System (DNS)
HOSTS files, 60, 557–559, 558
hot standby in DHCP, 156
HTTP.SYS feature, 1074–1075
Hyper-V Recovery Broker, 853
Hyper-V role, 9, 440
architecture, 445–446, 445
description, 5–6, 700
exam essentials, 469–470
fault tolerance, 930–931, 930
features, 441–443
Hyper-V Manager, 450–451, 451
installing, 447–450, 448–449
Integration Components, 468
operating system support, 443–445
requirements, 446–447, 447
review questions, 471–472
Server Manager, 450, 450
settings, 452
summary, 469
virtual hard disks, 455–461, 458–459
virtual machines, 461–468, 463, 465–467
virtual switches, 453–456, 454–455
virtualization overview, 440–441
hypervisors, 445
IaaS, 189–190
IANA (Internet Assigned Numbers Authority), 391
ICANN (Internet Corporation for Assigned Names and Numbers), 63, 560–561
IDE controllers in virtual machines, 464
Identifiers field in relying-party trusts, 1083
identity command in WinRM, 234
Idle Time Before Hanging Up menu, 647
IDNs (Internationalized Domain Names), 1048
If All The Restart Attempts Fail, Begin Restarting Again After The Specified Period option, 849
If Resource Fails, Attempt Restart On Current Node option, 849
If Resource Fails, Do Not Restart option, 849
If Restart Is Unsuccessful, Fail Over All Resources In This Service Or Application option, 849
IGMP multicast clusters, 828
image types in WDS, 479
Immediately Uninstall The Software From Users And Computers option, 341, 802
Import-BCCachePackage cmdlet, 867
Import-BCSecretKey cmdlet, 867
Import-DfsrClone cmdlet, 542
Import-Module cmdlet, 189, 237
Import-WdsBootImage cmdlet, 482
Import-WdsDriverPackage cmdlet, 482
Import-WdsInstallImage cmdlet, 482
initializing disks, 31–32
Inspect Disk tool, 459
Install-ADDSForest cmdlet, 189
Install-AdfsFarm cmdlet, 1081
Install-AdfsStand-alone cmdlet, 1081
Install The Printer Driver page, 227, 285
Install Windows dialog box, 932
Install-WindowsFeature cmdlet
AD CS, 1058
features, 30
FSRM, 531, 869
Server Core, 21
Windows Server Migration Tools, 11
installation of Windows Server
exam essentials, 53
Features On Demand, 30–31
with GUI, 22–24
planning, 7
migrating roles and features, 10–11
NIC Teaming, 22
reduced roles and features, 12–15
server roles, 7–10, 8
type, 17–21
versions, 16–17
review questions, 54–56
Server Core, 24–26
storage. See storage
Installation Options page, 462
Installation Progress screen, 182, 182
Installation Results page, 41
Installation User Interface Options settings, 339, 800
installing

Active Directory, 179–190, 181–189
AD CS, 1055–1058, 1056
AD FS, 1076–1078
AD RMS, 1094–1097, 1094–1096
Backup utility, 736–739, 737–739, 910–912, 910–912
DHCP, 122–125, 123–125
DNS, 91–93, 92–93, 588–591, 589–590
FSRM, 531–532, 869
Hyper-V, 447–450, 448–449
IPAM, 964–966, 965–966
NLB nodes, 825–829, 825–829
patches, 823–824
Remote Access role, 633–634, 633
WDS, 481–483

Windows Server. See installation of Windows Server

Installing Printer page, 227, 285
Installing Windows screen, 25
instances in Performance Monitor, 503
int domain, 62, 560
Integrated Services Digital Network (ISDN), 622
Integrated Windows authentication, 1076
Integration Components in Hyper-V, 468
integration in IPv6 addresses, 430–433, 431, 433
Interactive Logon: Do Not Display Last User Name option, 373, 722
internal networks in Hyper-V, 454
Internationalized Domain Names (IDNs), 1048
Internet connectivity tests, 172
overview, 980
Internet Assigned Numbers Authority (IANA), 391
Internet Corporation for Assigned Names and Numbers (ICANN), 63, 560–561
Internet layer in TCP/IP model, 390–391
Internet Protocol (IP), 390, 980. See also IP addresses
IP Protocol Security (IPsec), 424
encryption in failover clustering, 852–853

enforcement in network access, 690
policies in Windows Firewall, 384
tunneling, 629
Internet service providers (ISPs) subnets, 417
wide area networks, 980
Internet Small Computer System Interface (iSCSI), 43–44
configuring, 44–46, 45–46
target and initiator, 890–892, 891–892
Internet Storage Name Service (iSNS), 46–49, 47–49, 892–895, 893–895
intersite replication, 995–996, 996
Intra-Site Automatic Tunnel Addressing Protocol (ISATAP), 432
intratisite replication, 995
inverse queries in DNS, 70, 567
Invoke-command cmdlet, 237
invoke command in WinRM, 234
Invoke-GPUpdate cmdlet, 765
IP (Internet Protocol), 390, 980. See also IP addresses
IP Address Management (IPAM), 6
collections, 972
databases, 972
delegating control of, 971, 972
description, 701
exam essentials, 973
installing, 964–966, 965–966
IP address space utilization, 970, 971
IP blocks and ranges, 968–969, 969
migrating to, 971
review questions, 974–976
server discovery, 967, 967
summary, 973
IP Address Range page, 130, 130, 135, 152, 942
IP addresses, 393
form, 59–64, 60, 63, 557–562, 558, 561
hierarchical, 393–394
IPAM, 968–969, 969
IPv4. See IPv4 addresses
IPv6. See IPv6 addresses
network classes, 395–398
space utilization, 970
IP addresses (continued)
structure, 394–395
subnets. See subnets
IP-based connections in remote access services, 631–634, 631–633
IP Control Protocol (IPCP), 623–624
IP datagrams in virtual private networks, 628
IP Settings pane, 682, 683
IPAM. See IP Address Management (IPAM)
	ipconfig utility
	connectivity tests, 172, 173
IPv6 addresses, 427, 428, 432–433, 433
lease options, 119–120
options, 112–113, 609
IPsec Defaults option, 384
IPsec Exemptions option, 384
IPsec Setting tab, 379, 380
IPsec Tunnel Authorization option, 384
IPv4 addresses
	DHCP integration with dynamic DNS, 153–155, 155, 612–614
IPv6 address interoperability, 424–425
scope
	DHCP, 129–136, 129–135
multicast, 151–152, 153
options, 146–149, 148
superscopes, 149–151
server properties, 141–142, 141–142
IPv4 tab, 631–632, 631
IPv6 addresses, 422
assigning, 427, 427–428
concepts, 423–425
DHCP scope, 136–138, 136–139
DNS, 81–82, 579–580
dual stack, 431, 431
format, 425–426, 426
history and need, 422
information commands, 433
integration/migration, 430–433, 431–433
server properties, 143, 143
subnets, 433–434
tunneling, 431–433, 433
types, 428–430
IPv6 tab, 632–633, 632
iscsicli command, 893
ISDN (Integrated Services Digital Network), 622
item-level targeting in GPOs, 781–782
Items To Back Up screen, 1069
iterative queries, 68, 566
IXFR (incremental zone transfers), 78, 575

J
J50.chk file, 157
J50.log file, 157
JET (Joint Engine Technology) databases, 157
Join Microsoft Update Improvement Program screen, 494
joining
domains, 194–195
trees to forests, 1023–1024
Joint Engine Technology (JET) databases, 157
jp domain, 62, 560

K
KCC (Knowledge Consistency Checker), 198, 988, 997
Kerberos authentication
AD FS, 1076, 1088
description, 6, 701
networks, 666
Key Distribution Center Service accounts, 365, 707
key masters in DNSSEC, 954
Key Recovery Agent template, 1069–1070
Key Signing Key (KSK) key, 954
key storage providers (KSPs), 1049
keyboard in Hyper-V, 453
keys
AD CS, 1051
archive and recovery, 1069–1070
certificate renewal, 1063–1064
length, 1050
Knowledge Consistency Checker (KCC), 198, 988, 997
krbtgt accounts, 365, 707
KSK (Key Signing Key) key, 954
KSPs (key storage providers), 1049

L
L2TP (Layer 2 Tunneling Protocol), 626
L2TP/IPsec tunneling, 629
LANs (local area networks)
  connectivity tests, 172
  overview, 980
large-scale clusters, 850–851
Last Known Good Configuration option, 928
Launch NPS option, 670, 671
Layer 2 Tunneling Protocol (L2TP), 626
LBFO (load balancing and failover)
  overview, 21
  virtual machines, 466–467, 467
LCP (Link Control Protocol), 623, 631
LDAP (Lightweight Directory Access Protocol)
  configuring, 197
  description, 8
  limitations of organizational units, 252
  linear logging in Performance Monitor, 510
Link Control Protocol (LCP), 623, 631
Link Control Protocol (LCP) Extensions option, 631
Link layer in TCP/IP model, 390, 391
link-local addresses, 428–429
Linked Group Policy Objects tab, 310, 766
linked value replication, 177, 984
links
  creating, 987, 987
  GPOs, 309, 764
  replication, 997–999, 997
list command in ntdsutil, 199
List Contents permission, 369, 712
List In The Directory option, 229
List Object permission, 369, 712
List Providers command in vssadmin.exe, 217, 924
List Shadows command in vssadmin.exe, 217, 924
List ShadowStorage command in vssadmin.exe, 217, 924
List Volumes command in vssadmin.exe, 217, 924
List Writers command in vssadmin.exe, 217, 924
live migration, 453, 830
load balancing. See also Network Load Balancing (NLB)
  with round robin, 94, 591
  secondary zones, 73, 571
load balancing and failover (LBFO)
  overview, 21
  virtual machines, 466–467, 467
load sharing in DHCP, 156
local area networks (LANs)
  connectivity tests, 172
  overview, 980
Local Computer Policy tool, 305, 760
local databases in DNS zones, 72–73, 570–571
Local File Logging dialog box, 642
local group objects, 303, 757
Local Log File Properties dialog box, 641
Local Security Policy tool, 375, 545, 872
local users and groups, 360, 702
Locate Network File System page, 861, 861
Location field for printers, 228
Location Groups attribute, 673
Lockout Duration screen, 724
Lockout Threshold screen, 724
Log All Events option, 640
Log Errors And Warnings option, 640
Log Errors Only option, 640
Log File tab, 641–642, 641
Log Properties page, 957, 958
logging database in AD RMS, 1100
Logging tab for RRAS, 640
Logman tool, 691
logon events, auditing, 375, 544–545, 872
Logon/Logoff Scripts settings, 316, 773
logs
  audit events, 873
  boot, 926–928, 927
  DNS
    configuring, 956–959, 957–958
    creating, 114–115, 611
    event, 105, 105, 601, 601
  Event Viewer, 192, 518, 518
  Graph tab, 509–510
  replication, 1008
  RRAS, 639–643, 641–642
Loopback Policy for GPOs, 318, 773
loopback test addresses, 396

M
MADCAP (Multicast Address Dynamic Client Allocation Protocol), 151, 941
mail exchanger (MX) records, 90, 587
maintenance in Server Core version, 19
Managed By tab, 262, 262
Managed Service Accounts (MSAs) container, 268
description, 6, 701
working with, 708–709
management
  auditing, 375, 872
  FSRM, 530
  multiple domains, 1011
  PowerShell, 236
mandatory software updates, 336, 797
mapping filename extensions, 340, 800–801
masks in subnets, 402–405, 403–404
Master Boot Records (MBRs), 31–32
Maximum Password Age screen, 724
Maximum Strength Encryption option, 649
maximum transmission units (MTUs), 623–624
MBRs (Master Boot Records), 31–32
MBSA (Microsoft Baseline Security Analyzer), 519–521
mbsacli.exe utility, 521
mbsasetup.msi file, 519
mean time between failures (MTBF), 730, 822, 903
mean time to recovery (MTTR), 822
Members Of tab for user templates, 273–274
memory
  Hyper-V, 447
  virtual machines, 462, 464
Merge action for virtual hard disks, 460
Merge mode Loopback Policy, 318, 774
Message security mode in AD FS, 1073
metadata cleanup command in ntdsutil, 743
Microsoft Baseline Security Analyzer (MBSA), 519–521
Microsoft CHAPv2 (MS-CHAPv2) authentication, 665
Microsoft-developed accounting for networks, 688
Microsoft Device Specific Module (Microsoft DSM), 41
Microsoft Federation Gateway, 1101
Microsoft Management Console (MMC)
  Active Directory, 193
  Active Directory Administrative Center, 193
  Group Policy, 299, 305
  GUI version, 17
  Hyper-V Manager, 450
  OUs, 255
  Performance Monitor, 502
  Windows Firewall with Advanced Security, 379
Microsoft Point-to-Point Encryption (MPPE) algorithm, 628
Microsoft Transformation (MST) files, 329, 790
Microsoft Update Improvement Program option, 492
Microsoft Windows Installer (MSI)
  application installation issues, 327, 787–788
  benefits, 327–329, 788–790
  description, 326–327, 787
  file types, 329–330, 330, 790, 791
  packages, 327, 329, 787, 790
  settings, 342–343, 343, 803–804, 803
migration
  DFS, 539
  Hyper-V, 453
  IPAM, 971
  IPv6 addresses, 430–433, 431, 433
  objects, 274–275
  print servers, 232–233
  roles and features, 10–11
Migration Table Editor (MTE), 784
migration tables in GPOs, 784
.migttable extensions, 784
mil domain, 62, 560
Minimal Server Interface, 1047
Minimum (Default) TTL field, 97, 594
Minimum Password Age screen, 724
Minimum Password Length option, 372, 720
Minimum Password Length screen, 722–723, 722
MinShell version, 17
mirrored volumes, 34
Mixed security mode in AD FS, 1073
MMC. See Microsoft Management Console (MMC)
  mobility in IPv6 addresses, 424
  modems, 622
  monitoring
    DNS, 104–107, 105–107, 601–603, 601–603
    NAP, 691
    replication, 744–745, 917, 1007
    RRAS, 639
    Windows Firewall, 384
  Monitoring tab, 105, 106, 602, 602
  mount points, 40–41
  mounted drives in NTFS file system, 169
  mouse release key in Hyper-V, 453
  Move-ADDirectoryServerOperationMaster Role cmdlet, 729
  Move Server dialog box, 1000–1001, 1000
  moving
    database files, 158
    objects, 282–283, 1000–1001, 1000
    OUs, 260–261, 260–261
  MPIO (Multipath I/O), 41–43, 42–43
  MPIO Properties dialog box, 41, 41
  MPPE (Microsoft Point-to-Point Encryption) algorithm, 628
  MS-CHAPv2 (Microsoft CHAPv2) authentication, 665
  MS RAS Vendor attribute, 673
  MSAs (Managed Service Accounts) container, 268
  description, 6, 701
  working with, 708–709
  MSI. See Microsoft Windows Installer (MSI)
  MSIMaging-PSPs container, 269
  MSMQ Queue Alias object, 269
  MST (Microsoft Transformation) files, 329, 790
  MTBF (mean time between failures), 730, 822, 903
MTE (Migration Table Editor), 784
MTTR (mean time to recovery), 822
MTUs (maximum transmission units), 623–624
Multi-valued Distinguished Name dialog box, 725
Multicast Address Dynamic Client Allocation Protocol (MADCAP), 151, 941
multicast addresses, 429
multicast clusters, 828
Multicast Scope Name page, 152, 942
Multicast Scope Properties dialog box, 152, 153, 942–943
multicast scopes, 151
building, 152, 941–942
creating, 940–941
MADCAP, 941
properties, 152, 153, 942–943, 942–943
multicasting in WDS, 479
multifactor authentication, 1088–1089
multihomed routers, 402
Multilink And Bandwidth Allocation Protocol (BAP) pane, 682–683
Multilink Connections option, 630
multilink extensions in PPP, 624
multimaster replication, 984
Multipath I/O (MPIO), 41–43, 42–43
multiple domains, 1010
benefits, 1010–1012
drawbacks, 1012–1013
Global Catalog servers, 1034–1035
Name Suffix Routing, 1034
operations masters
domains, 726–727, 1027–1028
forests, 726, 1026–1027
role seizing, 728–729
single-master operations, 725–728, 1026, 1028–1029
trusts, 1029–1033, 1029, 1031
UGMC, 1035–1036
UPN suffixes, 1033
multiple PKIs, 1053, 1053
multiserver management, 236, 970
multisite clusters, 839
MX (mail exchanger) records, 90, 587

N

N-Port Identification Virtualization (NPIV), 50
name protection in DHCP, 950–951, 951
name server (NS) records
format, 87–88, 584–585
stub zones, 76, 574
Name Servers page, 97, 97, 101, 594–595, 594, 598
Name Suffix Routing, 1034
Name The Server Licensor Certificate screen, 1097
names
certificate authorities, 1061–1062, 1061
domains, 64, 177, 560–561
objects, 282–283
OUs, 252
namespaces in DFS, 540
NAP (Network Access Protection)
monitoring, 691
networks, 688–689
tasks, 141, 142
NAS (network attached storage), 50
NAS Identifier attribute, 673
NAS IP Address attribute, 673
NAS Port Type attribute, 673
NAT (Network Address Translation), 422, 643–644
nbtstat command, 146
NDDNS (non-dynamic DNS), 65–66, 564–565
NDES (Network Device Enrollment Service), 1049
NDP (Neighbor Discovery Protocol), 429
negative cache TTL, 70, 568
neighbor discovery, 425, 429
Neighbor Discovery Protocol (NDP), 429
net domain, 62, 560
netmask ordering in DNS, 85, 582, 960–961
netsh command
IPv6 addresses, 433
Windows Firewall, 241
Network Access layer in TCP/IP model, 390, 391
Network Access Permission settings, 668
network access policies, 670
  attributes, 670–673, 671–672
  creating, 673–676, 673–675
Network Access Protection (NAP)
  monitoring, 691
  networks, 688–689
  tasks, 141, 142
network adapters
  connectivity tests, 172
  virtual machines, 464
Network Address Translation (NAT), 422, 643–644
network attached storage (NAS), 50
network classes in IP addresses, 395–398
network configuration for GPOs, 318–319
  319, 775–776, 775
Network Device Enrollment Service (NDES), 1049
Network File System (NFS) data store, 858–862, 859–861
network folders, publishing, 549
Network Isolation in Hyper-V, 443
network layer protection in networks, 689
Network Load Balancing (NLB)
  description, 9
  Hyper-V, 441
  nodes, installing, 825–829, 825–829
  purpose, 824
  upgrading, 830
Network Monitor, 511
Network Monitor Agent, 511
Network Policy and Access Services server role, 9
Network Policy Server (NPS)
  certificates, 666
  configuring, 677
  exporting, 678–679
  importing, 679–680
  network access policies, 674
  policies, 678–680
  RADIUS clients, 677
  RADIUS proxy servers, 676–677
  remote access, 640, 640, 684
  templates, 678
  VPN access, 686
network printers, 226
network services
  DHCP. See Dynamic Host Configuration Protocol (DHCP)
  DNS. See Domain Name System (DNS)
  exam essentials, 159–160
  review questions, 161–163
  summary, 158
  WDS, 27, 479
network traffic
  Active Directory Integrated DNS, 75, 573
  local databases, 73, 570
  subnets for, 398
Network Unlock feature, 534
Networking tab for VPN clients, 650, 650
networks and networking, 662
  bandwidth, 980–981
  connectivity, 171–174, 1007–1008
  costs, 981
  description, 6, 9
  exam essentials, 692
  remote access, 664–668
  review questions, 693–695
  security, 687–691, 687
  summary, 691
  types, 980
  user access. See user access
  VPNs. See virtual private networks (VPNs)
  wireless access, 662–664
New Class dialog box, 148
New Delegation Wizard, 101, 598
New-event cmdlet, 237
new features, 4–6
New-Fsrm cmdlets, 531–532, 870
New GPO dialog box, 307, 762–763
New Inbound Rule Wizard
  BranchCache, 863, 863–864
  Windows Firewall, 381
New Mirrored Volume Wizard, 38, 38–39
New Multicast Scope Wizard, 152, 941
New-NetIPAddress cmdlet, 239
New Network Policy Wizard
network access policies, 671, 674
VPN access policies, 686
New Object - Group dialog box, 361
New Object - Shared Folder dialog box, 211, 211, 287, 549
New Object - Site dialog box, 989
New Object - Site Link dialog box, 998
New Object - Site Link Bridge dialog box, 999
New Object - Subnet dialog box, 991, 992
New Outbound Rule Wizard
BranchCache, 864–865
Windows Firewall, 381
New Packages settings, 339, 799
New Reservation dialog box, 145, 145
New Scope Wizard
DHCPv6 scopes, 944–945, 944
IPv4 addresses, 129–135, 129–135
IPv6 addresses, 136–138, 136–139
New Spanned Volume Wizard, 35
New Superscope Wizard, 150, 940
New Trust Wizard, 1032
New Virtual Hard Disk Wizard, 457, 461
New Virtual Switch page, 455
New-WdsClient cmdlet, 482
New-WdsInstallImageGroup cmdlet, 483
New Zone Wizard, 596, 596, 961
next-generation (CNG) providers, 1050
Next Secure (NSEC/NSEC3) records, 953
NFS Advanced Sharing page, 859, 860
NFS (Network File System) data store, 858–862, 859–861
NFS Share Permissions page, 859, 859
NIC Teaming
overview, 21
virtual machines, 466–467, 467
NLB. See Network Load Balancing (NLB)
No Callback option, 669
No Encryption option, 684
No Encryption Allowed option, 649
No Override option, 304, 759
nodes
cluster, 840
NLB, 825–829, 825–829
non-domain-joined computers
automatic certificate renewal, 1048
key-based certificate renewal, 1063
non-domain servers in PowerShell, 236
non-dynamic DNS (NDDNS), 65–66, 564–565
non-Microsoft DNS servers, troubleshooting, 115–116, 115, 611–612, 611
nonauthoritative restores, 741, 914
nonmandatory software updates, 336, 797
Nonsecure setting in DDNS, 66, 565
normal backups, 733, 906
Not Configured option, 299, 754
NPIV (N-Port Identification Virtualization), 50
NPS. See Network Policy Server (NPS)
NS (name server) records
format, 87–88, 584–585
stub zones, 76, 574
NSEC/NSEC3 (Next Secure) records, 953
nslookup command, 108–111, 604–607
NT Directory Services (NTDS), 988
ntbtlog.txt file, 927, 927
NTDS Settings Properties dialog box, 1004, 1004, 1035
NTDS Site Settings Properties dialog box, 996, 996, 1036
ntdsutil utility
Active Directory, 291
application data partitions, 197–200, 200
offline maintenance, 742–743, 915–917
NTFS file system
overview, 168–169
partitions, 170–171, 170–171
permissions, 218–224, 218–223
NTLMv2 (Windows NT LAN Manager), 666
NUMA spanning, 453

O

objects in Active Directory. See also Group Policy and Group Policy Objects (GPOs)
audit policies for, 545
auditing, 375, 872
availability, 210–212, 210–211, 284, 548–551
computer accounts, 283–284
creating, 270–272, 271
domain policies, 292–293
filtering, 280–282, 281
groups, 279–280
importing, 274
managing, 289–290, 289
migrating, 274–275
moving, renaming, and deleting, 282–283
offline domain joins, 275
organization, 268–269
properties, 275–278, 277
publishing
printers, 284–286, 285–286
shared folders, 286–287
querying, 287–289, 288
review questions, 294–296
summary, 292
types, 269–270
user principal names, 272
user templates, 272–274
Observation Window screen, 724
OCSP (Online Responder), 1049, 1055
octets in IP addresses, 59, 393, 425
offer step in DORA process, 116–117
offline domain joins for objects, 275
offline folders
vs. folder redirection, 323, 780
offline maintenance, 742–744, 915–917
Offline Settings dialog box, 351
offline stand-alone certificate authorities, 1052–1053
on-demand installations, 328–329, 789
one-way trusts, 1030
Online Certificate Status Protocol (OCSP), 1055
Online Responder (OCSP), 1049, 1055
operating modes in wireless access, 663
operating system support
Hyper-V, 441, 443–445
WDS, 479
operations masters
domains, 726–727, 1027–1028
forests, 726, 1026–1027
Operations Masters dialog box, 728, 1028
Optional Encryption option, 649
Options tab for VPN clients, 646–647, 648
organizational units (OUs)
benefits, 250
creating, 255–259, 256–257, 259
deleing control of, 253–254, 263–267, 264–266
GPOs, 303, 758
group policies, 255
inheritance, 252–254
moving, deleting, and renaming, 260–261
overview, 248–249
properties, 261–262, 262
purpose, 249–250, 249
resource grouping, 250–252, 251
troubleshooting, 267
Out-file cmdlet, 237
outbound rules in Windows Firewall, 381–383
OverwriteConfiguration option, 1081
packages
assigning, 331
overview, 329
properties, 330, 330
removing, 341, 342
restriction policies, 333
PAP (Password Authentication Protocol), 664–665
parent-child relationships in OUs, 254
parent domains, 1014, 1014
partial attribute set (PAS), 1034
Partition And Configure The Disk screen, 29, 478–479
partitions
  application data
    creating, 196–198, 197
    ntdsutil for, 197–200, 200
    overview, 195–196
    replicas, 198
NTFS file system, 170–171, 170–171
PAS (partial attribute set), 1034
pass-through authentication, 652
pass-through claim rules, 1084–1087, 1085–1087
Pass Through or Filter an Incoming Claim template, 1084
Password Authentication Protocol (PAP), 664–665
Password Complexity screen, 724
Password History Length screen, 724
Password Replication Policy (PRP), 1003
Password Reversible Encryption Status For Users Accounts screen, 724
Password Settings objects (PSOs), 723
Password Settings Precedence screen, 724
passwords
  Active Directory, 188
  AD FS, 1076
  AD RMS, 1092, 1096, 1100
  BitLocker, 534
  fine-grained policies, 722–725, 723
  key-based renewal, 1063
  objects, 271
  RODCs, 1003
  VPN clients, 648–649
PAT (Port Address Translation), 422
patch files (MSP)
  description, 329, 790
  for high availability, 823–824
Paths screen
  Active Directory, 185
  trees, 1022
Pause option for virtual machines, 463
payload files in Features on Demand, 896
PDC Emulator Masters, 726–727, 1027
Pending Timeout option, 849
per-user access in VPNs, 684
Performance Monitor
  monitoring decisions, 502–505, 503–505
  properties, 505–509, 506–509
  uses, 501–502
  views, 504–505, 504–505
performance monitoring
  Event Viewer, 515–519, 516–519
  exam essentials, 524
  guidelines, 499–501
  MBSA, 519–521
  Network Monitor, 511
  Performance Monitor, 501–510, 503–509
  review questions, 525–527
  SNMP, 521–523, 523
  summary, 523–524
  Task Manager, 511–514, 512–515
  performance objects, 503
  performance of domain controllers, 1024
  Performance tab in Task Manager, 512
permissions
  DAC, 879, 886–887, 886–887
  NTFS file system, 218–224, 218–223
  OUs, 264–265
  printers, 232
  security, 367–369, 367–368, 711–712, 711
  shared, 220–224, 221–223
Permissions dialog box, 224
Permissions page, 265
Personalization option in WSUS servers, 493
Personalize Windows Update option, 485
physical GPUs in Hyper-V, 452
Pick Updates To Install option, 485
ping command, 173, 433
PINs in BitLocker, 534
PKI (public key infrastructure) certificates, 4
  AD CS, 700
  components, 320, 776–777
  hierarchy, 1051–1053, 1052
PKI-savvy applications, 320, 776–777
Plain Old Telephone Service (POTS), 622
planning mode in RSoP, 347, 348, 809
Point-to-Point Protocol (PPP)
  connecting with, 623–624
  encapsulation, 627–628, 627
  options, 630–631, 630
Point-to-Point Tunneling Protocol (PPTP), 626, 628–629
pointer (PTR) records
  inverse queries, 70, 567
  overview, 89, 586–587
policies
  AD RMS, 1101–1104
  auditing. See audit policies and auditing
  DAC, 881–884, 882–883
  DAS, 885–887, 886–887
  network access, 670–676, 671–675
  NPS, 678–680
  resources, 848, 848
pools
  printer, 230, 233
  socket, 82, 580, 955
Port Address Translation (PAT), 422
Port Status dialog box, 643, 643
ports
  printers, 229–230, 230
  RRAS, 643, 643
  TCP/IP, 391–393
  VPNs, 636–637, 636
Possible Owners option, 850
POTS (Plain Old Telephone Service), 622
PowerShell
  Active Directory, 193
  AD CS, 1057–1058
  AD FS, 1081–1082
  BranchCache, 866–867
  DFS replication, 541–542
  DNS, 85–86
  failover clustering, 850
  FSRM, 869–870
  GPOs, 324, 780–781
  remote management, 235–238
  WDS installation, 481–483
PPP (Point-to-Point Protocol)
  connecting with, 623–624
  encapsulation, 627–628, 627
  options, 630–631, 630
PPP frames in VPNs, 628
PPP tab, 630–631, 630
PPTP (Point-to-Point Tunneling Protocol), 626, 628–629
Preboot Execution Environment (PXE)
  network devices, 28, 481
precreate command in ntdsutil utility, 199
predefined global groups, 365–367, 709–710
predefined options in DHCP scope, 146
Predefined Rules screen, 864–865
prefixes in IPv6 addresses, 426, 429–430
Prerequisites Check screen
  Active Directory, 185
trees, 1022, 1023
presentation virtualization, 440
Prevent Failback option, 845
Prevent Removable Media Source For Any Install option, 343, 804
Primary Server field, 96, 594
primary zones, 72–73, 569–570
PrimaryComputerName option, 1082
PrimaryComputerPort option, 1082
principal objects in AD FS, 1075–1076
Print and Document Services role, 9–10
Print Operators group, 364, 707
Print right, 1099
print servers, 226
print services, 226
  failover clustering, 842–843, 842–843
  migrating print servers, 232–233
  printers
    configuring, 228–232, 228–232
    creating and publishing, 226–228, 227
    Easy Print Driver, 233
    pooling, 230, 233
Print Spooled Documents First option, 231
Printbrm.exe tool, 233
Printer Migration Wizard, 233
Printer objects, 269
printer pools, 230, 233
Printer Sharing page, 285
private keys in AD CS, 1051, 1060
private networks
failover clustering, 832
virtual. See virtual private networks (VPNs)
Private Profile tab, 378, 378
privileges
audit policies, 545
auditing use of, 375, 872
Microsoft Windows Installer, 328, 788–789
Processes tab in Task Manager, 512, 512
processors in virtual machines, 464
Products And Classifications option, 492
Profile field in relying-party trusts, 1083
Profile tab for user templates, 273–274
profiles, user, 668–670, 669
programs, removing, 325, 341, 342, 787, 802–803, 802
Prohibit Rollback option, 343, 804
Promote This Server To A Domain Controller link, 183
promotion process for domains, 1017
Prompt For Name And Password, Certificate, Etc. option, 647
Prompt For Phone Number option, 647
Protect Container From Accidental Deletion option, 257
provisioning
BitLocker, 533
drivers, 479
IPAM, 964–966, 965–966
thin, 895–896
PRP (Password Replication Policy), 1003
PSOs (Password Settings objects), 723
PTR (pointer) records
inverse queries, 70, 567
overview, 89, 586–587
public key infrastructure (PKI) certificates, 4
AD CS, 700
components, 320, 776–777
hierarchy, 1051–1053, 1052
public networks, failover clustering in, 832
Public Profile tab in Windows Firewall, 379, 379
publishing
Active Directory objects, 210
applications, 331, 334–335, 651–652, 792, 794–796
certificate templates, 1066–1067
shared folders, 286–287, 549
PXE (Preboot Execution Environment) network devices, 28, 481
quads in IP addresses, 393
Quality of Service (QoS) for storage, 467–468
queries
DNS, 65, 68–70, 69, 563, 566–568, 566
objects, 287–289, 288
zone statistics, 962
Query Reverts command in vssadmin.exe utility, 924
quick migration feature in Hyper-V, 441
quickconfig command in WinRM, 235
quorums, cluster, 833–834, 833
quotas
disk, 168–169, 224–225
FSRM, 530, 869
NTFS file system, 218
RADIUS. See Remote Authentication Dial-In User Service (RADIUS)
RAID (Redundant Array of Independent Disks), 36–39, 38–39
RAID-5 volumes, 34
ranges of IP addresses, 968–969, 969
RDC (Remote Differential Compression) feature, 543
read-only domain controllers (RODCs), 20 DNS, 82, 580
local groups, 366, 710
replication, 1002–1003
Read permission, 369, 712
realm trusts, 1030
“Reason For Access” reporting, 377, 547–548, 874
Receive-job cmdlet, 237
Reconnect action for virtual hard disks, 460
record types
alias, 89, 586
creating, 102–103, 599–600
DNS, 86, 583
host, 88, 585
mail exchanger, 90, 587
name server, 87–88, 584–585
pointer, 89, 586–587
service, 90–91, 587–588
start of authority, 86–87, 583–584
record weighting in DNS, 85, 582
recovering databases in DFS, 542–543
recovery point objectives (RPOs), 821–822
recovery time objectives (RTOs), 821–822
recursive queries in DNS, 68, 566–567, 959, 960
recycle bin
forests, 178
limitations, 282
working with, 741–742, 914–915
Redial Attempts field, 647
Redial If Line Is Dropped option, 647
Redialing Options settings, 647
redirecting folders, 322–323, 323, 778–780, 779
Redundant Array of Independent Disks (RAID), 36–39, 38–39
Refresh Interval field, 96, 594
ReFS (Resilient File System), 167–168
registry
backing up, 734, 907
WSUS clients, 496–497
Relative ID (RID) Masters, 726, 1027
relay agents in DHCP, 122
/release switch in ipconfig, 119
reliability in domain controllers, 1024
relying parties in AD FS
certificate decryption, 1082
claims rules, 1087
description, 1072
trusts, 1083
Remote Access class, 149
Remote Access Connections (Inbound Only) option, 637
Remote Access role, 633–634, 633
Remote Authentication Dial-In User Service (RADIUS), 639
clients for NPS, 677
network accounting, 688
network authentication, 688
proxy servers, NPS as, 676–677
Remote Desktop Services, 6, 10
Remote Differential Compression (RDC) feature, 543
remote management, 233–234
down-level servers, 238–239
PowerShell, 235–238
Windows Firewall, 240, 241
WinRM, 234–235
Remote Procedure Call (RPC) protocol, 995
Remote Server Administration Tools (RSAT), 324, 781
remote storage in NTFS file system, 169
RemoteFX in Hyper-V, 442
removable storage device auditing, 377, 548, 875
remove command in ntdsutil utility, 199
Remove-FsrmClassificationRule cmdlet, 532, 870
Remove-FsrmFileScreen cmdlet, 532, 870
Remove-FsrmQuota cmdlet, 532, 870
Remove-job cmdlet, 237
Remove-WdsBootImage cmdlet, 483
Remove-WdsClient cmdlet, 483
Remove-WdsDriverPackage cmdlet, 483
Remove-WdsInstallImage cmdlet, 483
Remove-WdsInstallImageGroup cmdlet, 483
removing
database files, 157
programs, 325, 341, 342, 787,
802–803, 802
replicas, 198
renaming
domains, 177
objects, 282–283
OUs, 260–261, 260–261
Render Print Jobs On Client Computers option, 229
/renew switch in ipconfig, 119
Repadmin utility
commands, 1009
description, 291
purpose, 745, 917
repairing corrupted applications in
Microsoft Windows Installer, 328, 789
Replace mode Loopback Policy, 318, 775
replicas and replication
Active Directory
application data partitions, 198
bridgehead servers, 1001–1002,
1001–1002
changing environments, 1005
configuring, 994
connection objects, 999–1000, 999
DFS, 540–542, 986
intersite, 995–996, 996
intrasite, 995
monitoring, 744–745, 917, 1007
moving objects between sites,
1000–1001, 1000
overview, 981–982
RODCs, 1002–1003
server topology, 1003–1004
site links, 997–999, 997
sites, 983–984
troubleshooting, 1007–1009
UGMC, 1006
DFS, 540–542
DNS zones, 77–80, 80, 575–578, 577
Hyper-V, 453
Replication indicator in DNS zones, 95, 593
Replicator group, 364, 707
Reply right, 1099
Reply All right, 1099
Report view in Performance Monitor, 505, 506
Reporting Rollup option, 492
reports
cluster configuration, 838–839, 838
FSRM, 531, 869
Reports page in WSUS servers, 495
request messages, 117
Require BAP For Dynamic Multilink Requests option, 683
Require Encryption option, 649
reservations, IP address, 120–121,
145–146, 145
Reset Account Lockout Counter After option, 373, 720
reset check boxes in Hyper-V, 453
Reset option for virtual machines, 463
Resilient File System (ReFS), 167–168
Resize ShadowStorage command in vssadmin.exe, 217, 924
resolvers in DNS, 65, 563–564
resolving hostnames. See Domain Name System (DNS)
resource grouping in OUs, 250–252, 251
resource metering in Hyper-V, 441
resource properties and lists
DAC, 879–881, 880–881
failover clustering, 847–850, 848–849
Resource Record Signature (RRSIG) records, 953
Responsible Person field, 96, 594
Restart The Destination Server
Automatically If Required option, 536
Restartable Active Directory Services, 742, 915
restoresubtree command, 740, 914
restoring
Active Directory, 739–741, 913–915
bare-metal, 734–735, 907–908
Group Policy objects, 735–736, 783, 909
system state data, 735, 908–909
Restricted Groups settings, 302, 757
restriction policies for software, 333, 793–794
Resultant Set of Policy (RSoP), 344–345, 804–805
logging mode, 345–347, 345–347, 805–808, 806–809
planning mode, 347, 348, 809
Results dialog box, 1061
Resume option for virtual machines, 463
Retry Interval field, 96, 594
Revert Shadow command in vssadmin.exe, 217, 924
Review And Install Updates option, 485
Review Options screen
   Active Directory, 185
trees, 1022
revoking certificates, 1054–1055, 1067
RID (Relative ID) Masters, 726, 1027
rights in AD RMS, 1099
robustness of Microsoft Windows Installer, 328, 788
RODCs (read-only domain controllers), 20
   DNS, 82, 580
   local groups, 366, 710
   replication, 1002–1003
roles and features
   failover clustering, 840–844, 841–843
   migrating, 10–11
   reduced, 12–15
   seizing, 728–729
Roles screen, 964
root certificate authorities, 1051
root domains, 1014, 1014, 1016
Root Hints tab, 93, 93, 592, 593
root servers, 64, 561–562
root zones, troubleshooting, 115, 611
round robin
   load balancing with, 93, 591
   MPIO, 41
   round robin with subset paths, 41
route command, 433
route print command, 433
Router (Default Gateway) page, 132, 133, 136
routers
   configuring, 132, 133
   description, 981
   verifying configuration, 1008
Routing and Remote Access Services (RRAS), 620
   Dial-Up Networking, 621–624
   DirectAccess technology, 653–656
   exam essentials, 656
   IP-based connections, 631–634, 631–633
   logging, 639–643, 641–642
   managing, 638–639
   monitoring, 639
   NAT, 643–644
   ports, 643, 643
   PPP options, 630–631, 630
   RADIUS, 639
   review questions, 657–660
   summary, 656
   VPNs. See virtual private networks (VPNs)
   Web Application Proxy, 651–652
RPC (Remote Procedure Call) protocol, 995
RPC over IP protocol, 996
RPOs (recovery point objectives), 821–822
RRAS. See Routing and Remote Access Services (RRAS)
RSAT (Remote Server Administration Tools), 324, 781
RTOs (recovery time objectives), 821–822
Rule Type screen, 863–865, 863
Run This Resource In A Separate Resource Monitor option, 850

S

Safe Mode, 925–926
Safe Mode With Command Prompt option, 928
Safe Mode With Networking option, 928
SAML Artifact Resolution endpoint, 1072
SAML authentication for AD FS, 1076
SAML Token (Asymmetric) endpoint, 1072
Save option for virtual machines, 463
Save A Certificate Request To File On The Target Machine option, 1060
Save right, 1099
scalability
  multiple domains, 1010
  Resilient File System, 168
scale-out file servers, 851
scavenging in DNS, 103–104, 600–601
Schannel, 6, 666, 701
scheduling
  backups, 735, 908
  replication, 996, 996, 998
  shadow copies, 216, 922–923
Schema Admins group, 366, 709–710
Schema Masters, 726, 1026–1027
schemas for forests, 1016
scope in DHCP. See Dynamic Host Configuration Protocol (DHCP)
Scope Lease page
  DHCPv6 scopes, 944
  IPv6, 138, 139
Scope Name page
  DHCPv6 scopes, 944
  IPv4, 130
  IPv6, 136, 136
Scope Options dialog box, 147, 148
Scope Prefix page
  DHCPv6 scopes, 944, 944
  IPv6, 137
script policies for GPOs, 316–318, 317, 773–774, 773–774
scripting
  Hyper-V, 442
  WDS, 479
SCSI controllers, 464
secondary zones, 73–74, 571
Secure setting in DDNS, 66, 565
Secure Only setting in DDNS, 66, 565
Secure Sockets Tunneling Protocol (SSTS), 629
security
  accounts, 708–709
  ACLs and ACEs, 369, 369, 712, 712
  Active Directory features, 700–701
  Active Directory Integrated DNS, 75, 573
  audit policies, 6, 373–377
  DAC, 371–372, 719
  delegating control, 370–371, 717–719
  DFS, 540
  DNS, 83, 581
    cache locking, 956
    DNSSEC, 953–955, 954–955
    logging, 956–959, 957–958
    socket pools, 955
  Event Viewer, 192
  exam essentials, 385
  fine-grained password policies, 722–725, 723
GPOs
  filters, 311–313, 311, 768–769, 768
  groups, 359, 702–703
    built-in domain local groups, 363–365, 363, 365, 705–707, 706, 708
    foreign security principals, 367, 367, 710, 710
    predefined global groups, 365–367, 709–710
    scope, 360–361, 362, 703–704, 705
    types, 360, 703
local databases, 73, 571
networks, 664–668, 687–691, 687
new features, 10
NTFS file system, 169, 219–220, 220
overview, 358, 699–700
permissions, 367–369, 367–368, 711–712, 711
principles, 358–359, 701–702
review questions, 386–387
Server Core version, 19
summary, 385
User Account Control, 370
user templates, 716–717
users and groups, 714–716, 715
Windows Firewall, 377–384, 378–382
security account management command in
ntdsutil, 743
security groups, 279
security identifiers (SIDs)
deleted objects, 741, 914
description, 358
external trusts, 1030
objects, 278, 282
security modes in AD FS, 1072–1073
Security Policy Settings dialog box, 721
Security Support Provider Interface (SSPI), 6
security support providers (SSPs), 6
Security tab
DAC, 885
DNS, 202
networks, 687–688, 687
printers, 232, 232
VPN clients, 647–649, 648
security templates for Group Policy, 300, 756
seizing roles, 728–729
Select A Password screen, 1069
Select Backup Configuration screen, 738, 912
select command in ntdsutil utility, 199
Select Condition dialog box, 671, 673, 675, 675, 686
Select Configuration Database screen, 1095
Select Destination screen, 1019
Select Destination Server screen
Active Directory, 181
AD CS, 1056
AD FS, 1077
Backup utility, 736, 910
failover clusters, 835
Hyper-V, 448
Select Disks page, 35, 38, 39
Select Features screen
Active Directory, 182
AD CS, 1057
AD FS, 1077
Backup utility, 736, 910
BitLocker, 536
BranchCache, 866
DFS, 540
failover clusters, 835
Hyper-V, 448
iSNS, 47, 893
MPIO, 42, 42
SNMP, 522
WSUS servers, 489
Select GPO dialog box, 309, 764
Select Installation Type screen
Active Directory, 181
AD CS, 1056
AD FS, 1077, 1077
Backup utility, 736, 910
failover clusters, 835
Hyper-V, 448
Select Provisioning Method screen, 965
Select Role screen, 842
Select Role Services screen
AD CS, 1057
AD RMS, 1095
Remote Access role, 634
WSUS servers, 489
Select Rule Template screen, 1088
Select Scopes page, 150, 940
Select Server Roles screen
Active Directory, 181, 181
AD CS, 1056–1057, 1056
AD FS, 1077
Backup utility, 736, 910
BitLocker, 536
BranchCache, 865
DFS, 540
failover clusters, 835
Hyper-V, 448, 448
Remote Access role, 633, 633
SNMP, 522
trees, 1019, 1019
Select Storage page, 843
Select Storage Type page, 861
Select The Operating System That You Want
To Install screen, 22, 23, 25
Select User page
disk quotas, 225
shared folders, 223–224
Select Website screen, 1096
Selection type page
  DNS, 92, 589
Remote Access role, 633
selective authentication, 1031, 1033
self-healing NTFS, 169
Send Claims Using a Custom Rule template, 1084
Send Group Membership as Claim template, 1084
Send LDAP Attributes as Claims template, 1084
Serial Number field in DNS zones, 96, 594
server backups for certificate authorities, 1068–1069
server-class hardware, 823
Server Cleanup Wizard option, 492
Server Core version
  Active Directory installation on, 186–187
  AD CS, 1047
  Hyper-V installation in, 449–450
installing, 24–26
overview, 17–19
server discovery in IPAM, 967, 967
Server Manager
  Access-Denied Assistance, 888
  AD CS, 1059–1060
  AD FS, 1076–1079, 1077, 1079
  AD RMS, 1094–1095
Backup utility, 736, 910
BitLocker, 536
BranchCache, 865
DAC, 876, 882
DFS, 540
DHCP, 122–124, 124
DNS, 92, 92, 589, 589
failover clusters, 835
Hyper-V, 448, 450, 450
IPAM, 965, 966, 967–970, 969–970
iSNS, 893
NFS data store, 859
NPS policies, 678–679
Remote Access role, 633
SNMP, 522
trees, 1018–1021, 1018, 1020–1021
WSUS servers, 491, 491
Server Operators group, 364, 707
Server Properties dialog box
  DHCP-DNS integration, 155, 613
name protection, 951
server virtualization, 440
servers, 476
caching-only, 93–94, 93, 591–592, 592
DHCP
  multiple, 155–156
  properties, 140–143, 141–143
  scope, 146–147
DNS, 64–65, 563
down-level, 238–239
overview, 7–10, 8
PPTP, 623
print, 232–233
WDS. See Windows Deployment Services (WDS)
WSUS. See Windows Server Update Services (WSUS)
service connection points (SCPs), 1097
service level agreements (SLAs), 821–822
service principal names (SPNs), 6
service profiles for VPNs, 687
service (SRV) records, 90–91, 587–588
service requests for sites, 983
service set identifiers (SSIDs), 664
Service Type attribute, 673
ServiceAccountCredential option, 1081
Services tab in Task Manager, 513, 514
Set-AD cmdlet, 1076
Set-ADUser cmdlet, 1088
Set-BCAuthentication cmdlet, 867
Set-BCCache cmdlet, 867
Set-BCSecretKey cmdlet, 867
Set By Caller option, 669
set commands
  nslookup, 109, 605
  ntdsutil, 200
  WinRM, 234
Set-Date cmdlet, 237
Set-DNSClientServerAddress cmdlet, 240
Set DSRM Password command in ntdsutil, 743
Set-FsrmFileScreen cmdlet, 532, 870
Set-FsrmQuota cmdlet, 532, 870
Set-NetIPAddress cmdlet, 237
Set-NetIPv4Protocol cmdlet, 237
Set Sync Schedule screen, 495
Set-WdsBootImage cmdlet, 483
Set-WdsClient cmdlet, 483
Set-WdsInstallImage cmdlet, 483
Set-WdsInstallImageGroup cmdlet, 483
/setclassid switch in ipconfig, 119
Settings tab
  folder redirection, 323, 780
  remote access profiles, 682–684, 683–684
  RRAS logs, 640–642
Setup Type screen, 1059–1060
shadow copies
  configuring, 922–923, 922–923
  overview, 215–217, 921–922
Shadow Copies dialog box, 216
Share This Printer option, 229
Shared Folder objects, 269–270
shared folders, 286–287, 549
shared permissions, 220–224, 221–223
Shared Virtual Hard Disk feature in Hyper-V, 442
shared virtual hard disks in failover clustering, 851
sharing folders, 209
Sharing tab
  printers, 227–229, 228–229, 286
  VPN clients, 650, 651
shortcuts
  IPv6 addresses, 426
  trusts, 1031
Shut Down option, 463
ShutDown: Allow System To Be Shut Down Without Having To Log On option, 373, 721
SHV (system health validator), 690
SIDs. See security identifiers (SIDs)
Signing Options page, 954–955
Simple Mail Transfer Protocol (SMTP), 996
Simple Network Management Protocol (SNMP), 521–523, 523
simple volumes, 34
single-master operations
  assigning, 727–728, 1028–1029
  managing, 725–726, 1026
single sign-on (SSO), 652, 1071
site link bridges, 997–999, 997
site links
  creating, 987, 987
  replication, 997–999, 997
sites
  certificate authorities, 1067–1068
  certificates, 1047–1048
  concepts, 982–983, 983
  configuring, 993
  creating, 988–990, 989–990
  description, 987–988, 987
  fault tolerance, 929–931, 930
  GPO levels, 303, 758
  moving objects between, 1000–1001
  planning, 984–985, 985
  replication, 983–984
  service requests, 983
6to4 mechanism in IPv6 addresses, 425, 432
size of shadow copies, 216, 922
slash notation in IPv6 addresses, 426
slow link detection, 333–334, 794
smart cards, 6
Smart Paging files, 464–465
SMTP (Simple Mail Transfer Protocol), 996
snapshots
  Hyper-V, 441
  virtual machines, 464
sneakernet, 298
SNMP (Simple Network Management Protocol), 521–523, 523
SOA (start of authority) records
  structure, 86–87, 583–584
stub zones, 76, 574
socket pools in DNS, 82, 580, 955
Software Compression option, 631
software deployment, 324–325, 785
AppLocker, 333, 794
group policy slow link detection, 333–334, 794
MSI. See Microsoft Windows Installer (MSI)
preparing for, 332–333, 792–793
process, 330–331, 334–335, 791–792, 794–796
publishing, 324–325, 781
restriction policies, 333, 793–794
software management life cycle, 325–326, 785–786
updates, 335–337, 796–797
verifying installation, 336–337, 797–798
software management life cycle, 325–326, 785–786
software providers for VDS, 50
software restriction policies, 302, 757
Software Settings options, 300, 754–755
solid-state drives (SSDs), 896
Source tab in Performance Monitor, 507, 507
spanned volumes, 34
Specify Access Permission page, 673, 675, 686
Specify Backup Time window, 735, 908
Specify Cluster Address screen, 1096
Specify Conditions page, 675, 686
Specify Intranet Microsoft Update Service Location properties, 498
Specify Name And Location page, 458, 461
Specify Proxy Server screen, 494
Specify Service Account screen, 1096
Specify The Order In Which Windows Installer Searches option, 343, 804
Specify The Partner Server To Use For Failover page, 947
split scopes, 949
SQL Server Management Studio, 1100
SQLConnectionString option, 1081
SSO (single sign-on), 652, 1071
SSPI (Security Support Provider Interface), 6
SSPs (security support providers), 6
SSTS (Secure Sockets Tunneling Protocol), 629
stale records, scavenging, 104, 601
stand-alone certificate authorities, 1052
Start IP Address field, 140, 144
Start IPv6 Address field, 137
Start-job cmdlet, 237
start of authority (SOA) records
structure, 86–87, 583–584
stub zones, 76, 574
Start Of Authority (SOA) tab, 96–97, 96, 593–594, 593
Start option for virtual machines, 462
Start Windows Normally option, 929
Starter Group Policy objects, 301, 757
Startup Properties dialog box, 317, 317
Startup/Shutdown Scripts settings, 316, 317, 773, 773
stateless autoconfiguration, 423
static IP addresses, 190
statistics for zones, 962
Status indicator in DNS zones, 95, 592
Stop-job cmdlet, 237
storage, 30, 858
audit policies and auditing, 870–875
BranchCache technology, 862–868, 863–864, 866
configuring basic and dynamic disks, 32–34, 33
DAC. See Dynamic Access Control (DAC)
exam essentials, 897
Features on Demand, 895–896
Fibre Channel, 49–50
FSRM, 868–870
initializing disks, 31–32
iSCSI, 43–46, 45–46, 890–892, 891–892
iSNS, 46–49, 47–49, 892–895, 893–895
mount points, 40–41
MPIO, 41–43
NAS, 50
NFS data store, 858–862, 859–861
RAID, 36–39, 38–39
review questions, 898–900
shadow copies, 216, 922
Storage Spaces, 35–36
summary, 897
thin provisioning and trim, 895–896
tiered storage, 896
VDS, 50–51, 51
volume management, 34–35
storage pools, 35
Storage Quality of Service (QoS) for virtual
machines, 467–468
Storage Spaces
failover clustering, 851
overview, 35–36
Store Migration feature, 453
stretched clusters, 839
striped volumes, 34
Strong Encryption (MPPE 56-Bit) option, 684
Strongest Encryption (MPPE 128-Bit)
option, 684
stub zones, 75–77, 76, 573–575, 574
subdomains, 63, 561
subnets
Active Directory
creating, 991–993, 992
description, 987–988, 987
applying
Class A, 417–418, 420
Class B, 415–416, 420
Class C, 410–415, 419–420
easy method, 406–410, 407
benefits, 399
calculating number of, 405, 406, 421
CIDR notation, 419–420
implementing, 400–402, 401–402
IPv6 addresses, 433–434
masks, 402–405, 403–404
overview, 398–400
requirements, 400
sites, 984
supernets, 421
subordinate certificate authorities,
1051–1052, 1052
subscriptions in Event Viewer, 519, 519
suffixes for user principal names, 272, 1033
Summary Of Selections page, 346, 346,
807, 807
Superscope Name page, 150, 940
superscopes
creating and configuring, 939–940
DHCP, 120
IPv4 addresses, 149–151
symmetric multiprocessor support, 441
synchronization, verifying, 1008
synchronization logs in WSUS servers, 495
Synchronization Schedule option, 492
Synchronize All Offline Files Before Logging
Off option, 213–214, 550
Synchronize All Offline Files When Logging
On option, 213–214, 550
Synchronize Offline Files Before Suspend
option, 213–214, 550
sysprep.exe utility, 1006
system, Event Viewer for, 192
system backups, 733, 906
System folder for objects, 281, 281
system health validator (SHV), 690
System Monitor for replication, 1007
System Recovery Options dialog box, 932
System Stability Index, 502
system state data, backing up, 733–734,
906–907
Sysvol directory, backing up, 734, 907

T

Task Manager, 511–514, 512–515
task scheduling in PowerShell, 236
Tasks To Delegate page, 263
TCP (Transmission Control Protocol), 390
TCP/IP. See Transmission Control Protocol/
Internet Protocol (TCP/IP)
Telemetry service, 10
templates
AD RMS, 1098–1099, 1104
administrative, 299–300, 754–755
templates (continued)
certificates
compatibility, 1064–1065
creating, 1065, 1066
description, 777
overview, 1064
Group Policy, 299–300, 754–755
NPS, 678
objects, 272–274
quotas, 225
transform claims rules, 1083–1084
users, 272–274, 716–717
Templates Administrators group, 1093
Temporal Key Integrity Protocol (TKIP), 663
Teredo mechanism, 425, 432
Test-ComputerSecureChannel cmdlet, 284
test environments for performance monitoring, 500
TGS-REP (ticket-granting service replies), 1088
TGS-REQ (ticket-granting service requests), 1088
TGSs (ticket-granting services), 1088
TGTs (ticket-granting tickets), 1088
thin provisioning, 895–896
third parties
application data partitions, 196
backups, 731–732, 905–906
CAs, 1049
EAP, 665
third-tier CA hierarchy model, 1053
Thorough Resource Health Check Interval option, 850
ticket-granting service replies (TGS-REP), 1088
ticket-granting service requests (TGS-REQ), 1088
ticket-granting services (TGSs), 1088
ticket-granting tickets (TGTs), 1088
Tie Breaker For 50% Node Split option, 852
tiered storage, 36, 896
Time Between Redial Attempts menu, 647
Time Of Day Constraints dialog box, 671, 675, 675
time to live (TTL)
choosing, 70–71, 568–569
DNS, 70, 567–568
multicast scopes, 152
TKIP (Temporal Key Integrity Protocol), 663
TLDs (top-level domains), 62, 559–561, 560
TLS (Transport Layer Security)
AD FS, 1076
description, 6
TLS/SSL (Schannel)
description, 6, 701
networks, 666
security, 699
top-level domains (TLDs), 62, 559–561, 560
TPDs (trusted publishing domains), 1101, 1103–1104
Trace-command cmdlet, 237
tracert command
connectivity tests, 173
IPv6 addresses, 433
tracert6 command, 433
traffic reduction
Active Directory Integrated DNS, 75, 573
local databases, 73, 570
multiple domains for, 1010
subnets for, 398
transfer statistics for zones, 962
transfers in DNS zones, 77–80, 80, 575–578, 577
Transform an Incoming Claim template, 1084
transform claims rules, 1083–1084
transformation rules, 1084–1087, 1085–1087
transitive trusts, 1030
Transitivity Of Trust page, 1032
Transmission Control Protocol (TCP), 390
Transmission Control Protocol/Internet Protocol (TCP/IP), 58–59, 390
connectivity tests, 172
for DNS, 556–557
exam essentials, 435
IP addresses. See IP addresses model, 390–393, 391–392
port numbers, 391–393
review questions, 436–438
summary, 435
Transport layer in TCP/IP model, 390–391
Transport Layer Security (TLS)
  AD FS, 1076
description, 6
Transport security mode in AD FS, 1073
transports in bridgehead servers, 1002
trees in Active Directory
creating, 1017–1023, 1018–1023
forests. See forests
joining to forests, 1023–1024
planning, 1013
single, 1014–1015, 1015
trim feature, 895–896
troubleshooting
  DNS. See Domain Name System (DNS)
  GPOs, 344–350, 345–348, 804–810,
  806–808
  OUs, 267
  replication, 1007–1009
  VPNs, 637–638
Trust Anchor key, 954
trust anchors in DNS, 83–84, 581–582, 954
Trust Name page, 1032
Trust Password page, 1033
Trust Type page, 1032
Trustbridge. See Active Directory Federation
  Services (AD FS)
  Trusted Publishing Domain File dialog
  box, 1104
trusted publishing domains (TPDs), 1101,
  1103–1104
  Trusted User Domain File dialog box, 1102
trusted user domains (TUDs), 1101–1103
  AD FS, 1083
  AD RMS, 1101–1104
  forests, 177
  managing, 1029–1033, 1029, 1031
TTL (time to live)
  choosing, 70–71, 568–569
  DNS, 70, 567–568
  multicast scopes, 152
TTL For This Record field, 97, 594
TUDs (trusted user domains), 1101–1103
Tunnel Type attribute, 673
tunneling
  IPv6 addresses, 431–433, 433
  L2TP/IPsec, 629
  PPTP, 628–629
  SSTP, 629
  Turn Off option, 462
two-tier CA hierarchy model, 1053
two-way trusts, 1030
Type A Printer Name page, 227, 285
Type indicator in DNS zones, 95, 592–593

U

UAC (User Account Control), 370
UEFI (Unified Extensible Firmware
  Interface) support, 460–461
UGMC (Universal Group Membership
  Caching)
  description, 361, 704
  managing, 1035–1036
  overview, 1006
  uk domain, 62, 560
unidirectional replication, 1002
Unified Extensible Firmware Interface
  (UEFI) support, 460–461
Uninstall Applications When They Fall Out
  Of The Scope of Management option,
  339–340, 800
Uninstall-WindowsFeature cmdlet, 30, 237
unique local addresses, 429
unique name suffixes, 1034
Universal Group Membership Caching
  (UGMC)
  description, 361, 704
  managing, 1035–1036
  overview, 1006
universal groups
description, 280
security, 361, 704
virtual accounts, 708–709
Virtual Disk Service (VDS), 50–51, 51
Virtual Fibre Channel, 442
virtual hard disks (VHDs)
booting from, 52
creating, 457–459, 458
failover clustering, 851
generation 1 vs. generation 2, 460–461
Hyper-V, 452
managing, 459–460, 460
types, 456–457
Virtual Machine Migration screen, 449
Virtual Machine Monitoring feature, 853
virtual machines and devices
architecture, 446
connections, 465–466, 466
creating, 461–463, 463
deleting, 465, 465
Hyper-V, 452
NIC Teaming, 466–467, 467
settings, 463–465, 465
Storage Quality of Service, 467–468
switches, 453–456, 454–455
VHDs. See virtual hard disks (VHDs)
Windows Azure, 190
Virtual Switch Manager, 453–454, 454
virtualization. See Hyper-V role
Volume Shadow Copy Service (VSS), 215–217, 919, 921–923, 922
volumes
disk quota setting by, 224
managing, 34–35
VOM ports, 464
VPN enforcement in network access, 690
VPNs. See virtual private networks (VPNs)
VSS (Volume Shadow Copy Service), 215–217, 919, 921–923, 922
vssadmin.exe utility, 217, 923–924
W
WANs (wide area networks)
connectivity tests, 172
multiple domains, 1010–1011
overview, 980
warnings in Event Viewer, 516
wbadmin command, 745–746, 918
WCF (Windows Communication Foundation) components, 1082
WDS. See Windows Deployment Services (WDS)
WDSUTIL utility, 27–28, 480–481
Web Application Proxy, 651–652
web enrollment role in AD CS, 1048
Web Proxy Service for AD FS, 1075
Web Server (IIS) role, 10
Web Server Role (IIS) page, 634
weighted paths in MPIO, 41
WEP (Wired Equivalent Privacy), 663
Which Type Of Installation Do You Want? screen, 23, 23, 25
Wi-Fi Protected Access (WPA), 663
Wi-Fi Protected Access 2 (WPA2), 664
WID (Windows Internal Database), 972
wide area networks (WANs)
connectivity tests, 172
multiple domains, 1010–1011
overview, 980
WIM images, 30–31
Windows authentication, 688–689
Windows Azure
Active Directory deployment in, 189–190
backups, 919–921
Windows Azure Management Portal, 920
Windows Communication Foundation (WCF) components, 1082
Windows Deployment Services (WDS)
client preparation, 29, 483–484
description, 6, 10, 701
functionality, 478
installing, 481–483
network services, 27, 479
preparing for, 478
requirements, 478
server components, 27–29, 480–481
server preparation, 26–27
server requirements, 27
working with, 26, 477–478
Windows Deployment Services
Configuration Wizard, 27
Windows Firewall
configuring, 240, 241
GPOs, 383
import/export policies, 383–384
inbound and outbound rules, 381–383, 381–382
IPsec policies, 384
monitoring, 384
options, 377–381, 378–380
Windows Firewall with Advanced Security snap-in, 379
Windows Groups attribute, 673
Windows Identity Foundation (WIF), 1075
Windows installer. See Microsoft Windows
Installer (MSI)
Windows Integrated authentication, 1063
Windows Internal Database (WID), 972
Windows Internet Name Service (WINS)
name resolution, 65, 563
settings, 133–134, 134
Windows Live ID, 1101
Windows Management Instrumentation (WMI), 310–311, 765, 767
Windows PowerShell. See PowerShell
Windows Recovery Environment (Windows RE), 928
Windows Remote Management (WinRM) utility, 234–235, 542
Windows Script Host (WSH), 316, 773
Windows Server 2012 R2 Datacenter version, 16
Windows Server 2012 R2 Essentials version, 16
Windows Server 2012 R2 Foundation version, 16
Windows Server 2012 R2 Standard version, 16
Windows Server Backup feature, 10
Windows Server Migration Tools, 11
Windows Server Update Services (WSUS), 487
advantages, 487–488
clients, 496–499
description, 10
server configuration, 483–485, 492–496
server installation, 489–491, 489–491
server requirements, 488
Windows Settings options, 300, 755
Windows token-based agents, 1074
Windows Update service, 325, 484–485, 786
WINS (Windows Internet Name Service)
name resolution, 65, 563
settings, 133–134, 134
WINS page, 97, 595
WINS Servers page, 133–134, 134, 136
Wired Equivalent Privacy (WEP), 663
wireless access, 662–664
witnesses
configuration, 834
dynamic, 852
WMI (Windows Management Instrumentation), 310–311, 765, 767
workflows, 235
Workplace Join feature, 1089–1091
World Wide Names (WWNs), 49–50
WPA (Wi-Fi Protected Access), 49–50
WPA-Enterprise mode, 663
WPA-Personal mode, 663
WPA2 (Wi-Fi Protected Access 2), 664
WPA2-Enterprise mode, 664
WPA2-Personal mode, 664
Write permission, 369, 712
WS-Federation Passive/SAML Web SSO endpoint, 1072
WS-Trust 1.3 endpoint, 1072
WS-Trust 2005 endpoint, 1072
WS-Trust WSDL endpoint, 1072
WSH (Windows Script Host), 316, 773
WSUS. See Windows Server Update Services (WSUS)
WSUS Server Configuration Wizard, 493–494
WWNs (World Wide Names), 49–50

X
X.509 certificates, 1076

Z
zone signing, 83, 581, 953–954
Zone Signing Key (ZSK) key, 954
Zone Signing Wizard, 954, 954
Zone Type screen, 99, 596, 961
zones. See Domain Name System (DNS)