

## Preface

---

When we look into the series of developments that have occurred in the field of computers in the past three decades, we find that the most important milestone achieved, after the invention of PC, is the development of NC (Networking in Computers). In present times, be it 'Internet' or 'Intranet', they are the result of 'Networking'. In earlier times, Ethernet Cards and ordinary cables were used for Networking; on the path of technological development, it has reached upto the level of 'Wireless Networking'. If you wish to make your career in Computer Hardware field, you must have good knowledge of Computer Networking. You can know in details, Ethernet Networking from this book as also the Wireless Networking (Wi-Fi).

In this book, sharing of files and printer has been described for all versions of Windows. SOHO Networking is also given in details. You can learn Small Office and Home Networking. All aspects of Dial-up Networking are described in detail. You can understand TCP/IP Networking for XP / Vista / 7 versions of Windows.

In the revised edition of this book, latest networking features and components relating to the new latest versions of Windows, *i.e.*, WINDOWS VISTA and WINDOWS 7, have been described. These additional features (peer to peer networking, wireless networking, IEEE 802.11 and EAP Host Architecture) would be of immense use for users of these new operating systems. Users would also know from this book about those components which have been removed and/or changed for enhanced and improved connectivity in the new versions of Windows operating system. We trust that this book will prove to be very useful for all levels of students.

-Author

# Contents

---

<b>1. Networking Fundamentals .....</b>	<b>1-7</b>
Area Networks .....	1
LAN Basics .....	2
WAN Basics .....	2
LANs and WANs at Home .....	2
MAN, SAN, PAN, DAN, and CAN .....	3
Network topology .....	3
Client-server Networking .....	5
Thin clients vs. Fat Clients .....	5
n-Tier Architecture .....	6
Peer-to-peer Networking .....	6
Advantages of peer-to-peer networks .....	7
<b>2. Ethernet Networking .....</b>	<b>8-55</b>
Ethernet .....	9
Fast Ethernet .....	9
Token Ring .....	10
Media .....	10
Topologies .....	11
Collisions .....	11
Ethernet Products .....	12
Transceivers .....	12
Network Interface Cards .....	12
Hubs/Repeaters .....	13
Bridges .....	13
Ethernet Switches .....	14
Routers .....	15
When Ethernets Become Too Slow .....	16
Device Servers .....	17
Print Servers .....	18
Multiport Device Servers .....	18
Access Servers .....	19
Device Servers .....	19
Terminal and Print Servers -- Traditional Applications .....	20

Serial-to-Ethernet Service .....	20
Device Server Technology .....	21
Lantronix Device Servers .....	22
Device Servers - Making the Applications Work .....	24
Data Acquisition .....	24
Factory Floor Automation .....	25
Security Systems .....	26
Scanning Devices .....	26
Medical Devices .....	27
More Applications .....	27
Fast Ethernet .....	28
Rules of the Road .....	29
Maintaining a Quality Network .....	30
Fast Ethernet Migration .....	30
Network Switching .....	31
What is a Switch? .....	31
Network Congestion .....	32
The Factors Affecting Network Efficiency .....	33
Measuring Network Efficiency .....	33
Routers .....	33
Switch Benefits .....	33
Switch Costs .....	34
General Benefits of Switching .....	34
Switching in Your Network .....	34
Replacing a Central Hub with a Switch .....	35
Adding Switches to a Backbone Switched Network .....	35
Designing for Maximum Benefit .....	35
Good Candidates for Performance Boosts from Switching .....	36
Advanced Switching Technology Issues .....	36
Managed or Unmanaged .....	36
Store-and-Forward vs. Cut-Through .....	37
Blocking vs. Non-Blocking Switches .....	37
Switch Buffer Limitations .....	37
Layer 3 Switching .....	38
Making the Transition to Gigabit Ethernet .....	38
The Switch .....	38
Cabling .....	40
Network Cards .....	40
Twisted Pair Ethernet (10baseT/UTP) .....	41
Ethernet and Dialup-adapter: Sharing Internet Connection .....	44
Sharing one modem on a Network for Internet access ? .....	47
Non Microsoft Internet Connection Sharing .....	47
Using the Internet Connection on the Client systems .....	53
<b>3. Basics of MS Windows 7 Networking .....</b>	<b>56-66</b>
DNS Lookup .....	56

Ethernet & ARP .....	57
IP Addressing and Subnetting .....	57
Default Gateway .....	57
NAT and Private IP Addressing .....	58
Firewalls .....	59
LAN vs WAN .....	59
Routers .....	59
Switches .....	59
OSI Model encapsulation .....	59
10 New Features of Windows 7 Networking .....	60
Super Fast Wake up and Boot, Smart Network Power, and Wake on LAN for Wireless .....	63
<b>4. Networking in MS Windows 7 .....</b>	<b>67-124</b>
Set up a network .....	68
What you need to set up a home network? .....	69
Wireless networks .....	70
Ethernet .....	70
HomePNA .....	71
Powerline .....	71
Cable modem .....	72
Selecting a wireless router .....	72
Set up a wireless router .....	73
Connect computers to the network .....	75
Set up a broadband (DSL or cable) connection .....	75
What is a homegroup? .....	76
File sharing essentials .....	83
Share files with someone .....	86
Advanced sharing .....	89
Share files using the Public folders .....	90
View and connect to available wireless networks .....	92
Choosing a network location .....	92
Connecting Windows 7 to an iSCSI SAN .....	96
Understanding Network Administration and Configuration .....	101
Windows 7 Network and Sharing Center .....	102
Windows 7 Homegroup? .....	103
Fix a network problem .....	105
Windows 7 Simple TCP/IP Services .....	106
Adding Bluetooth Devices in Windows 7 .....	109
Remote Server Administration Tools for Windows 7 and Windows Servers .....	113
Understanding Virtual Networking in Microsoft Hyper-V .....	118
Wireless Network Security in Windows 7 .....	121
<b>5. Using Internet in MS Windows 7 .....</b>	<b>125-141</b>
<b>6. Networking in Windows XP .....</b>	<b>142-198</b>
Adding the OEM Network Adapter Driver to the RIS Image .....	143
Configuring the IP Address .....	144
Configuring the Default Gateway, DNS, and Host Name .....	144
Adding Static Clients to the Hosts File .....	146
How to add a computer description .....	147
How to change a computer name and join a domain or a workgroup .....	147

Network ID Wizard .....	148
Setup procedures .....	151
Configuration and usage issues .....	152
Enable TCP/IP Forwarding in Windows .....	152
Preventing the Overloading Effect .....	155
Configuring Windows NT 4.0 Emulation .....	155
Consider the following scenario: .....	156
To Enable ICS on a PPPoE Broadband Network Connection .....	158
Configuration and Usage Issues .....	159
Troubleshoot VPN connections .....	164
To enable or prevent the receiving of files: .....	167
On the host computer .....	167
How to configure an additional DNS server IP address .....	173
How to modify the resolution behavior for unqualified DNS names .....	174
How to modify DNS dynamic update behavior .....	174
How to Remove a Network Place .....	178
Set up your computer for wireless networking .....	179
Install the wireless adapter .....	179
Connect to the network .....	179
Configure Windows XP for IrDA Dial-Up Networking .....	198
Establish an Infrared Connection .....	198
Connect to the Internet .....	198
Disconnect from Your Mobile Device .....	198
<b>7. Files and Printer Sharing in Windows .....</b>	<b>199-253</b>
File Sharing in Windows XP .....	200
Components of File and Printer Sharing .....	204
Enabling File and Printer Sharing .....	207
Sharing a Folder .....	208
Connecting to a Shared Folder .....	208
Sharing a Printer .....	212
Managing Shared Folders .....	216
Windows 2000 .....	216
File Sharing in Windows 2000 .....	216
Connecting to a Windows 2000 Shared Folder .....	218
Components of File and Printer Sharing .....	219
Windows 98 and Windows Me .....	229
File Sharing in Windows 98 and Windows Me .....	229
Windows NT 4.0 .....	244
File Sharing in Windows NT 4.0 .....	244
<b>8. File Sharing and Permission in MS Windows .....</b>	<b>254-262</b>
Turning on and turning off Simple File Sharing .....	254
Managing levels of access to shares and to files .....	255
Troubleshooting file sharing in Windows XP .....	259
Internet Connection Firewall can prevent browsing and file share .....	260

<b>9. Microsoft Windows server 2003 .....</b>	<b>263-304</b>
Windows Home Server .....	268
How to configure MS Distributed Transaction Coordinator? .....	271
Setting up Perl/CGI to work with Windows Server 2003 .....	273
Setting up PHP to work on Windows Server 2003 .....	276
Setting Host Headers in IIS 6.0 .....	280
Creating a New User on Windows Server 2003 .....	282
Windows Server 2003 Security Boundaries .....	285
Disabling the Shut Down Tracker .....	299
Disabling Automatic Updates on Windows Server 2003 .....	300
Finding your new hard drive .....	300
Enabling Remote Desktop .....	302
<b>10. Wireless Networking .....</b>	<b>305-323</b>
Wireless networking .....	305
Range of a wireless network .....	308
Wireless network and LAN .....	311
Setting Up an 802.11b Home Wireless Network .....	315
Configuring Wireless Devices .....	318
802.11b vs. Bluetooth .....	320
<b>11. Networking in Linux .....</b>	<b>324-356</b>
Networking with TCP/IP .....	324
TCP/IP hardware requirements, Configuring TCP/IP on your system .....	325
Setting your host name, SLIP configuration .....	332
Dial-up networking and PPP .....	336
Using Internet servers with dynamic IP numbers, PPP connection files .....	342
Make sure you are logged in as root .....	344
The ppp-on script .....	347
Using MSCHAP .....	352
<b>12. Networking in Windows Vista .....</b>	<b>357-388</b>
Network technologies .....	357
Setup a Network .....	362
Network locations .....	377
How Windows Firewall affects network locations .....	378
Making your network more secure .....	379
Wireless network security recommendations .....	384
What are the different wireless network security methods? .....	386
Enable 802.1X authentication .....	386
<b>13. File and Printer Sharing in Windows Vista .....</b>	<b>389-406</b>
<b>14. Microsoft Windows server 2008 .....</b>	<b>407-414</b>
<b>15. Laptop Computers: Introduction and Networking .....</b>	<b>415-424</b>
<b>16. Home Network Security .....</b>	<b>425-440</b>
<b>17. Wi-Fi Network Security Fundamentals .....</b>	<b>441-458</b>
<b>18. Wireless (Wi-Fi) Network Security .....</b>	<b>459-488</b>