Understanding the Network: A practical Guide to Internetworking
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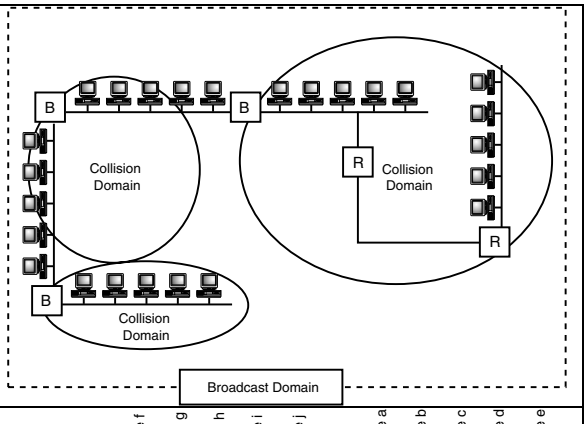
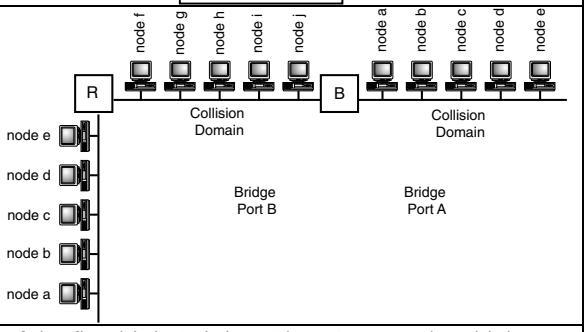
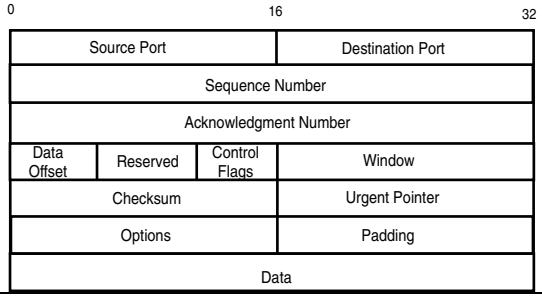
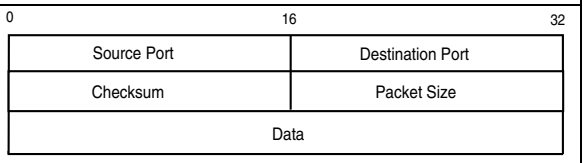
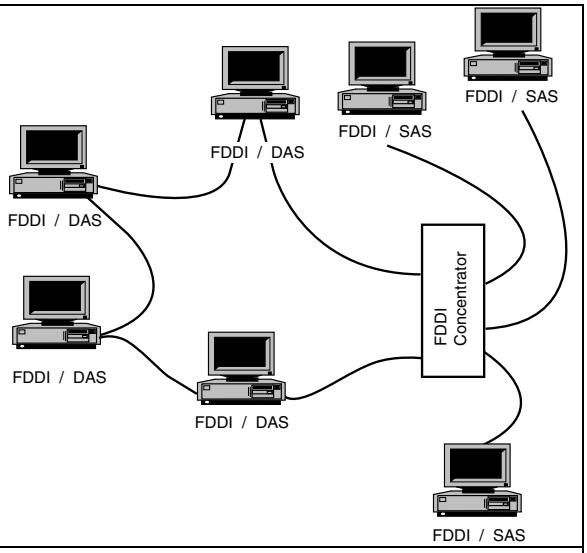
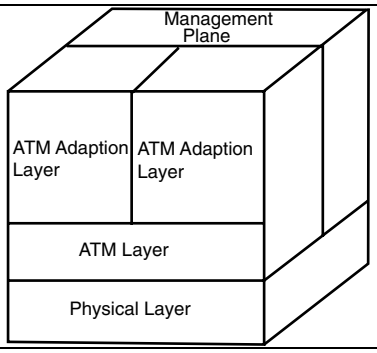
Misprint	Correction
Page 1 What were once spreadsheet stations and personal printing presses have now become powerful communication tools that utilize text, graphics, video, and sound-to-relay information.	What were once spreadsheet stations and personal printing presses have now become powerful communication tools that utilize text, graphics, and sound-to-relay information.
Page 5 Interface issues are minimized by using high quality shielded and unshielded cable casings. Although the shielding minimizes the effects of outside noise, it also reduces the signal strength of the twisted pairs, which use their crosstalk to help amplify the carrier signal. For this reason, not all signaling methods can operate on shielded twisted pair.	Using high quality shielded and unshielded cable casings minimizes electrical interference issues. In most environments unshielded cable is more than adequate for most data transmission. However, in environments where high levels of electrical noise and interference exist, in places such as manufacturing facilities, the use of shielded cable is highly recommended. Keep in mind though that not all data transmission protocols can operate over shielded or unshielded cable. So always refer to the transmission protocol specification for the proper cable type prior to installing your data cable infrastructure.
Page 6 • cycle—the shift in the electromagnetic wave from it's peak positive amplitude to its peak negative amplitude. The completion of a single cycle is known as a period.	A wave that shifts from its peak positive to its peak negative amplitude has only gone through a _ cycle; a cycle is completed when the wave returns to its initial value.
Page 11 The transport protocol, known as Ethernet, uses a 48-bit address called the Media Access Control (MAC) address for this purpose.	For example, the OSI-RM data-link protocol, Ethernet, uses a 48-bit address known as the Media Access Control (MAC) address for this purpose.
Page 13 This period lasts as long as it takes to reach the ends of the network.	This period lasts as long as it takes to reach the ends of the segment.
Page 15 IEEE 802.x Ethernet and Apple's LocalTalk are CSMA/CD-based transmission protocols.	IEEE 802.x Ethernet is a CSMA/CD-based transmission protocol.

Page 19	
Page 20	
Page 44 If the first bit is 0, it is a Class A network, which can support up to 16 million hosts.	If the first bit is 0, it is a Class A network, which can support over 16 million hosts.
Page 49 **Decimal Mask in Bits** 255.220.0.0	**Decimal Mask in Bits** 255.240.0.0
Page 55 – Table 2.9 – Class A Entry **Number of Hosts per Net**: 16,000,000	**Number of Hosts per Net**: 16,777,214
Page 56 Class C: 192.160.0.0 to 192.168.255.0 255.255.255.0 or /24	Class C: 192.168.0.0 to 192.168.255.0 255.255.255.0 or /24 (missing address space) Dynamic Assignment: 169.254.0.0 to 169.254.255.0 255.255.255.0 or /24 (missing text) The dynamic assignment address space is allocated for dynamic IP addressing systems, such as DHCP. It is not typically used for addressing private IP networks.
Page 76	
Page 76 The TCP header is 40 bytes in size, which is rather	The TCP header is quite large for a network packet header. The TCP header is constructed using 4 or 5,

large for a network packet header.	4-octet (32-bit) segments, containing 10 fixed length and 1 variable length fields. The fixed length segments are 160 bits in length for an average header size of 20 octets (20 Bytes). The variable length field, when utilized, extends the header to 192 bits (24 octets) in length. When combined with the IP header, the over 40 bytes of delivery and control information are sent along with ever TCP packet transmitted.
Page 76 • Source Port—This is the TCP port the process is coming from. • Destination Port—This is the TCP port the process is sending data to. • Sequence Number—This is the sequence number for data contained in the packet. • Acknowledgment Number—This field contains the sequence number the sender expects to receive from the destination. • Data Offset—This field indicates how large the TCP header is. • Control flags indicate the status of the TCP connection: SYN sets up TCP connections. ACK indicates if the information in the Acknowledgement filed is relevant. RST resets TCP connections. PSH tells the destination that the DATA should be delivered to the ULP upon delivery. FIN ends the TCP connections. • Window—This field is used to provide flow control information. The value is the amount of data the sender can accept.	• Source Port (16-bits)—This is the TCP port the process is coming from. • Destination Port (16-bits)—This is the TCP port the process is sending data to. • Sequence Number (32-bits)—This is the sequence number for the outbound segment data contained in the packet. • Acknowledgment Number (32-bits)—This is the sequence number of the next segment of data the sender expects to receive from the destination. • Data Offset (4-bits)—This field indicates how large the TCP header is, expressed in 32-bit segments. • Reserved (6-bits)—This field is unused; it is reserved for future modifications to the protocol. • Control flags (6-bits) indicate the status and contents of the data: URG indicates that the data continued in the packet is urgent. SYN indicates the initiation of a TCP session. ACK indicates the acknowledgement filed is relevant. RST resets the TCP session. PSH indicates that the data should be delivered to the ULP upon receipt. FIN indicates the sender byte stream has been completed. • Window (16-bits)—This field indicates how much buffer space is available for inbound data delivery. • Checksum (16-bits)—The checksum is used to validate the integrity of the data. The checksum is calculated by appending a 12-byte pseudo header containing the key data elements needed to deliver the data to the data segment and generated a 16-bit checksum. Upon arrival, the receiver performs the same calculation and compares the results. If they match, the data is assumed to be valid. • Urgent Pointer (16-bits)—This field is used to indicate that the packet's data is of a "control" nature that may affect the operation of the application. • Options (variable length)—This "optional"

	field is used to send miscellaneous packet handling or connection information. Its most common use is to specify the Maximum Segment Size (MSS) the TCP application will accept. The MSS is typically grounded to the Maximum Transmission Unit (MTU) of the data-link protocol. The idea here is to ensure that the communicating hosts transmit data segments of a size they can handle efficiently. Hosts that do not communicate over a common data-link path can discover the smallest MTU in the transmission path through IP MUT discovery or use the minimum MTU 576-bytes, which results in a MSS of 536-bytes. • Padding (variable length)—Not including the *options* field, the TCP header is 160-Bits in length. For efficiency, the header is constructed of 32-bit segments. When no options are used the header falls on a 32-bit boundary. To accommodate for the variable size of the options field, padding bits are sometimes added to "round-out" the TCP header.
Page 77	
Page 82	(missing RFCs) RFC 813 Window and Acknowledgement Strategy in TCP RFC 896 Congestion Control IP/TCP Internetworks RFC 1063 IP MTU Discovery Options
Page 137 Ethernet's media access mechanism Carrier Sense Multiple Access Collision (CSMA/CD), was based on work done by Dr. Norman Abramson at the University of Hawaii on the radio transmission WAN known as the ALOHA system.	Ethernet's media access mechanism Carrier Sense Multiple Access Collision Detection (CSMA/CD), was based on work done by Dr. Norman Abramson at the University of Hawaii on the radio transmission WAN known as the ALOHA system.

Page 184	
Page 191 PSTN was originally developed from every other, but that the continuity of each separate transmission be distinguishable from every other, but the continuity of each separate transmission be maintained.	PSTN was originally developed from every other, but that the continuity of each separate transmission be indistinguishable from every other, but the continuity of each separate transmission be maintained.
Page 236	
Page 262	(Note to follow section "Spanning Tree Algorithm") The 802.1d specification defines a five-state machine for port operation. Under normal operation ports on the bridge will be in Forwarding or Blocking mode. 1. Forwarding, port is active, learning MAC addresses and forwarding frames. This is the normal operational mode for an active bridge or switch port. 2. Listening, port is active, sending and receiving BPDUs in order to learn the topology of the network. The absence of BPDU or changes in the segment topology will cause the bridge to shift from a Forwarding/Blocking state to a Listening state while the bridge topology reconverges. 3. Learning, port is active, in the process of moving to a forwarding state. The learning state is a 15-second transitional period from listening to forwarding. During this state the bridge port is collecting MAC information on its adjacent

	devices and entering them in the bridge's SAT. 4. Blocking, port is listening for BPDUs but not learning addresses or forwarding frames. This is the normal operational mode for a "stand-by" bridge link in a redundant path bridge topology. 5. Disabled/Down, port either down or STP has been disabled.
Page 351 An `!` indicates that a 64-bit UDP packet has been successfully transferred, and `0` indicates a missed packet.	An `!` indicates that a 64-Byte UDP packet has been successfully transferred, and `0` indicates a missed packet.
Page 362 **OS Daemon Logfile Root Location** Linux /usr/sbin/syslogd-n /var/log	**OS Daemon Logfile Root Location** Linux /usr/sbin/syslogd-r /var/log
Page 368 **CiscoSecure 1.0 (TACACS+)**	**CiscoSecure 1.0 (TACACS)**
Page 385 But what if the link between F and A is a 10Mbps link and the link between A and C is an OC3 (155Mbps)?	But what if the link between F and A is a 10Mbps link and the link between A and C is an OC3?
Page 413 Although it is not generally a good idea to start adjusting cost metrics, there might be a need because OSPF's cost metric is only valid up to 1Gbps.	Although it is not generally a good idea to start adjusting cost metrics, there might be a need because OSPF's cost metric is only valid up to 100Gbps.

Page 537
missing line
	`<show ip bgp neighbor>`
	`<show ip bgp neighbor [ip address] ad>`
	`<show ip bgp peer-group>`

Page 538 missing Note preceding the section "Inter-Autonomous BGP"	As a network reachability protocol, a BGP peer will only announce networks that are contained in its routing table. The route table entries are generally constructed by a dynamic routing protocol, howe3ver static route entries may also be used. In fact, in large internetworks it's common to "announce" BGP routing information from a standalone Computer or Router running BGP using static generated routing table. To announce static routes via BGP on a Cisco router, the static entries must either point to a reachable adjacent IP gateway, Physical or <null> router interface.
Page 547 missing bulleted text – to follow `<show ip bgp neighbors.>`	`<show ip bgp neighbor [ip address] ad>`—This command lists all of the networks being announced to a BGP peer.

This errata sheet is intended to provide updated technical information.
Spelling and grammar misprints are updated during the reprint process,
but are not listed on this errata sheet.