Router Tests V.5

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Testing the Devices

juggling more of them bits

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BMWG

Benchmarking Methodology Working Group

- part of IETF
  Internet Engineering Task Force
- sanctioned by IAB
  Internet Activities Board

- defined terms (RFC 1242)
  throughput, latency, etc

- working on defining specific tests
  methodology and reporting format
  draft on hsdndev.harvard.edu in pub/bmwg

- Mailing list
  bmwg-request@harvard.edu

Life on a real world network:

pathological conditions:

peak load
- arp storms
- broadcast storms
- graphics
- backbone
- star network design
- Novell servers & clients

bursts of packets
- NFS traffic
- routing updates
- Novell Burst mode

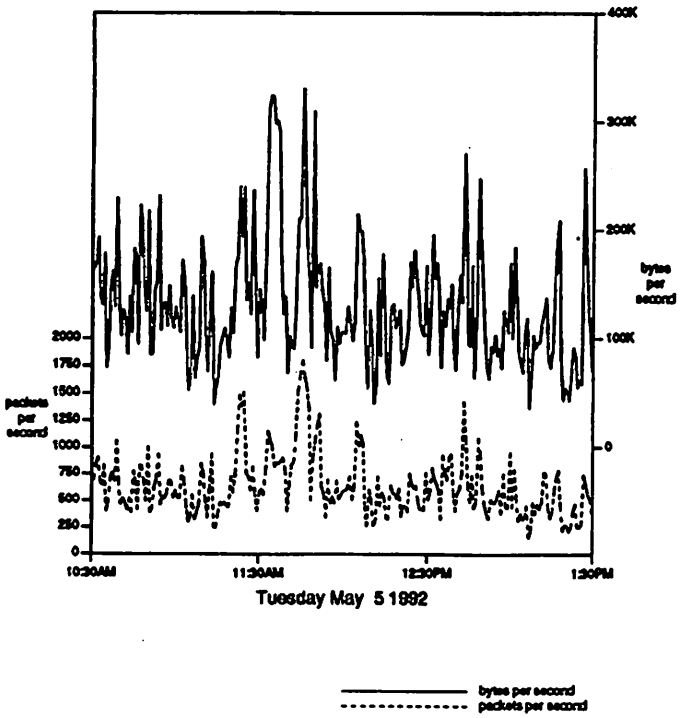
Life on a real world network:

"normal" conditions

- NFS servers
- named
- NNTP
- FTP
- terminal servers
- Novell servers and clients

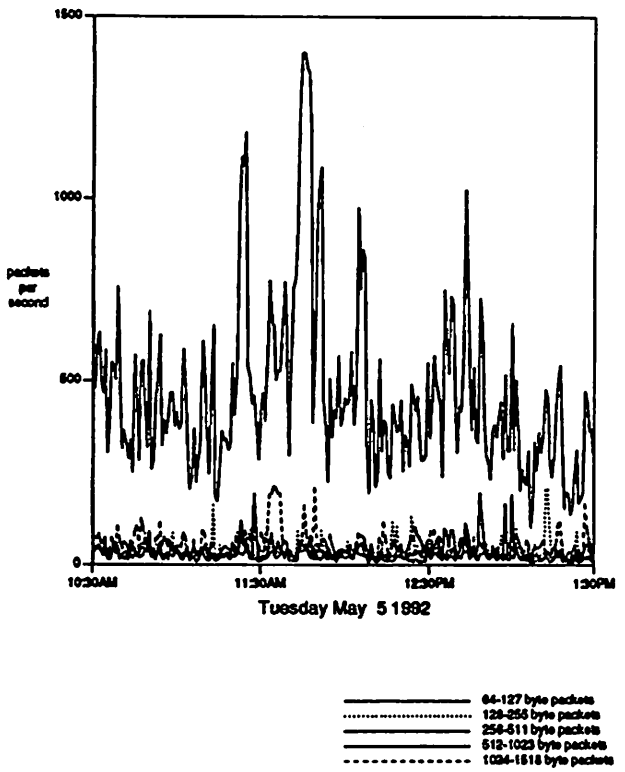
Life on a real world network:

load on a Harvard backbone



Life on a real world network:

packet size distribution on a Harvard backbone



Other things to consider:

don't choose between router & bridge on performance alone
don't choose specific product on performance alone

- political/economic
  pre-decided by "powers that be"
- cost
  how deep a pocket do you have?
- vendor support
  how many $
  over Internet?
- network management
  standard (SNMP, CMOT) or proprietary
- documentation
  fit for human consumption?

More things to consider:

- user interface
  how expensive a guru is needed?
- reachability
  can it be managed over the network?
  how easy is it to overload the router so that the processor does not respond to commands on the serial line?
- generational migration
  how costly, how often
- rebooting requirements
  when do you have to reboot the box?
  how long does it take?
- security
  what access controls on router?
  what sorts of filtering can be done on traffic? (src,dest,protocol)
  can have performance & function impact
- network design
  pools linked with WAN lines
  236 Ethernets into a box

Still more things to consider:

- purchasing volume
  - hard to switch vendors if have local spares
- standards tracking
  - are they part of it?
  - do they keep up?
- protocols supported
  - do you need chaosnet?
- interfaces supported
  - need T3?, ARCnet?
- physical config
  - hot-swap, redundancy
- feature nits
  - protocol prioritization

Testing, how to simulate real world

- can't do a very good job of
  - simulating the "real world"
- who's world to simulate
  - Fred uses SNA, Bill uses Novell
- easy to check simple things
  - throughput
  - idle state traffic
  - effects of filtering functions
  - accuracy of counters
  - reaction to error packets
  - effect of different protocols on throughput
  - delay through router
    - problem on token networks
  - reboot time

Testing, pathological conditions

- not too hard to simulate the pathological conditions
  - high offered load
  - back to back packets
  - bidirectional traffic
  - mixed protocols
- much harder to test for table space related limits
  - routing table size
  - arp cache size
  - filtering list space

Tests - background

- packet size
  - from RFC 1242:

> The number of octets in the frame from the first octet following the preamble to the end of the FCS, if present, or to the last octet of the data if there is no FCS.

- sizes used
  - AppleTalk - 52, 64, 512
  - ip - 52, 64, 512, 1024, 1518, 2048, 3690
  - ipx - 52, 64, 512, 1024, 1518, 2048, 3690
  - SRB - 48, 52, 64, 512, 1024, 1518, 2048, 3690
- larger sizes force fragmentation if forwarded over Ethernet
- FDDI packet size determined by:
  - sending a packet from Ethernet through a router to FDDI
  - capturing the packet with the Tekelec
- resulted in Ethernet size +9 bytes

Test equipment - FDDI tests

Tekelec ChameLAN 100-S
- FDDI network analyzer
- runs UNIX

- special routine to send stream of frames
  `trigger FC daddr frame util N`
  - `FC` - Frame Control byte
  - `daddr` - dest MAC address
  - `frame` - file name for frame to send
  - `util` - % utilization requested
  - `N` - number of frames to send

- 2 FDDI channels
  - > 140,000 fps
  - > 99 Mbits/sec

- shell procedure loops through frame sizes and loads

- note:
  - sends >1 frame/token
    - problem for many devices with small frames
    - to be able to select in future

Test equipment - FDDI tests, contd.

Alantec PowerBits
- Ethernet tester/checker

- 12 Ethernet ports
  - > 87,000 fps
  - > 59 Mbits/sec

- script driven
- Harvard scripts
- test scripts from last fall

Test equipment - token ring tests

Wandell & Golterman DA-30
- Ethernet/token ring network analyzer

- 2 Ethernet and 2 token ring channels
  - > 7,500 fps
  - > 15.7 Mbits/sec

- Bridge & Router test utility
  - packet loss rate
  - throughput
  - latency

- setable max data rate

Test equipment - token ring tests, contd.

Proteon special software
- two Proteon token ring cards in PC

- 1 way or 2 way stream
  - > 16,500 fps
  - > 15.7 Mbits/sec

- script driven

- Harvard scripts

Hewlett Packard Network Advisor
- LAN analyzer
- Ethernet & token ring

FDDI tests

FDDI to FDDI
- target information
  - device packet rate limits
  - device bit rate limits
- protocols used
  - TCP/IP, bridgeable packet
- frame sizes used
  - 64, 512, 1024, 1518, 2048, 3960
- test equipment used
  - Tekelec ChameLAN 100-S
  - Ascom Timeplex TIME/LAN 100

FDDI to FDDI via Ethernet
- target information
  - device overload behaviour
  - IP fragmentation effect
    - for bridges & routers
- protocols used
  - TCP/IP, bridgeable packet
- frame sizes used
  - 64, 512, 1024, 1518, 2048, 3960
- test equipment used
  - Tekelec ChameLAN 100-s
  - Ascom Timeplex TIME/LAN 100

FDDI tests, contd.

Ethernet to Ethernet through FDDI
- target information
  - device backplane limits
- protocols used
  - TCP/IP, bridgable packet
- frame sizes used
  - 64, 128, 256, 512, 768, 1024, 1280, 1518
- test equipment used
  - Alantec PowerBits

Token ring tests

token ring to token ring
- target information
  - device packet rate limits
  - device bit rate limits
- protocols used
  - TCP/IP, source route
- frame sizes used
  - 48, 64, 256, 512, 1024, 1518, 2048, 3960
- test equipment used
  - Proteon hardware and software

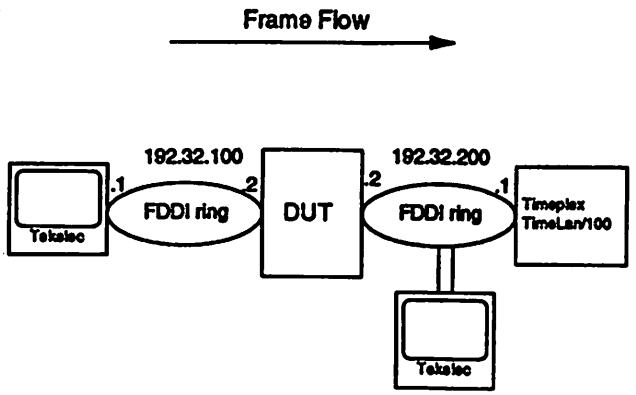
token ring to token ring via Ethernet
- target information
  - device overload behaviour
  - IP fragmentation effect
- protocols used
  - TCP/IP, source route
- frame sizes used
  - 48, 64, 256, 512, 1024, 1518, 2048, 3960
- test equipment used
  - Proteon hardware and software

Token ring tests

token ring to token ring via WAN
- target information
  - ability to maintain flow over WAN
- protocols used
  - TCP/IP, source route, AppleTalk, IPX
- frame sizes used
  - 52, 64, 256, 512, 1024, 1518, 2048, 3960
- WAN link speeds
  - 56 Kb/sec
  - T1 (1.536 Mb/sec)
- test equipment used
  - Wandell & Goltermann DA-30
    - with Bridge & Router test suite
  - Digital Link DL551VX CSU/DSU

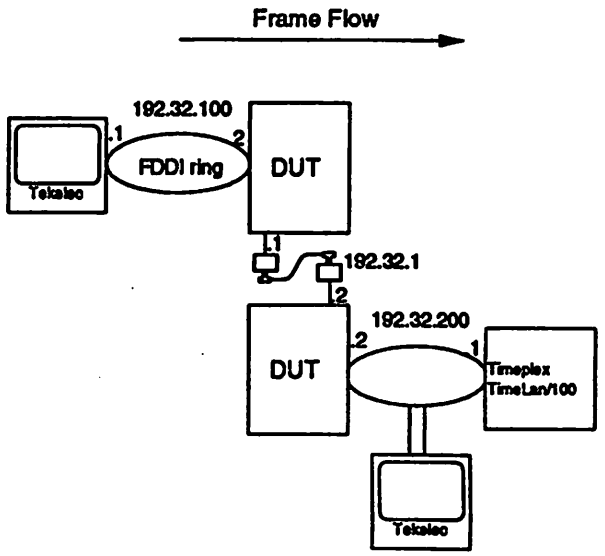
Test set up - f2f

FDDI to FDDI



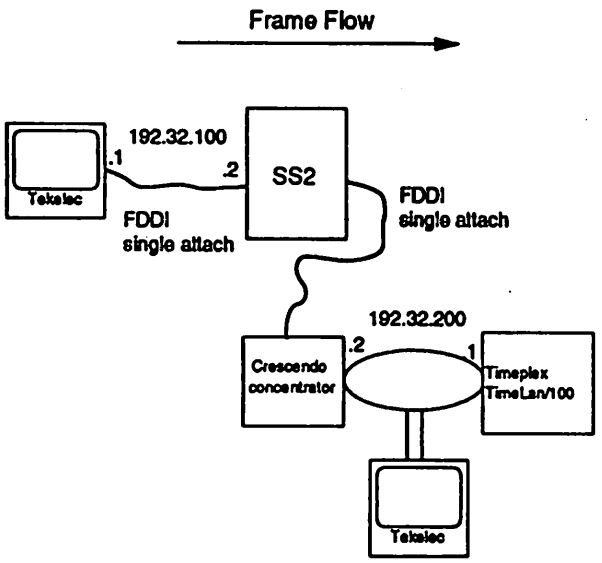
Test set up - f2fve

FDDI to FDDI through Ethernet



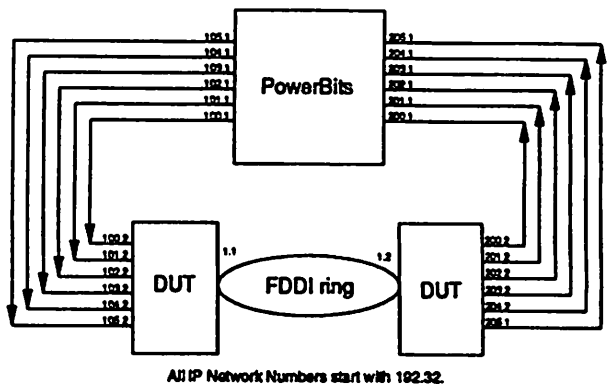
Test set up - f2fvsun

FDDI to FDDI through SUN SS2



Test set up - e2evf

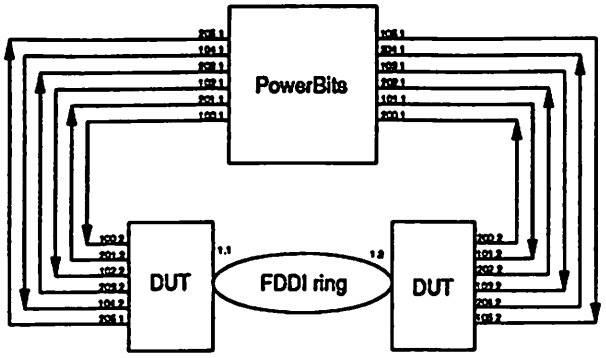
Ethernet to Ethernet through FDDI
single direction



Test set up - e2evf_2way

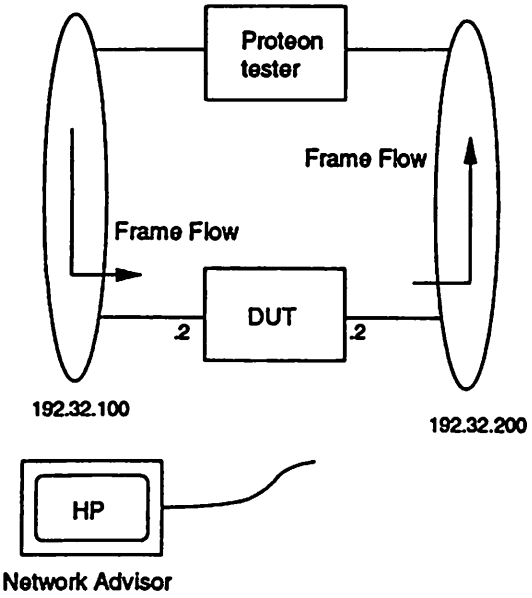
Ethernet to Ethernet through FDDI

dual direction



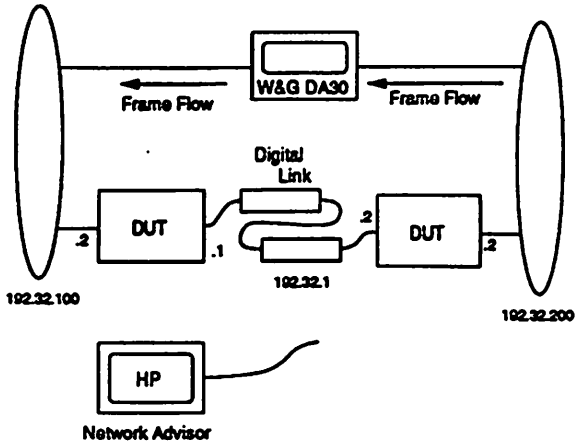
Test set up - t2t

Token Ring to Token Ring



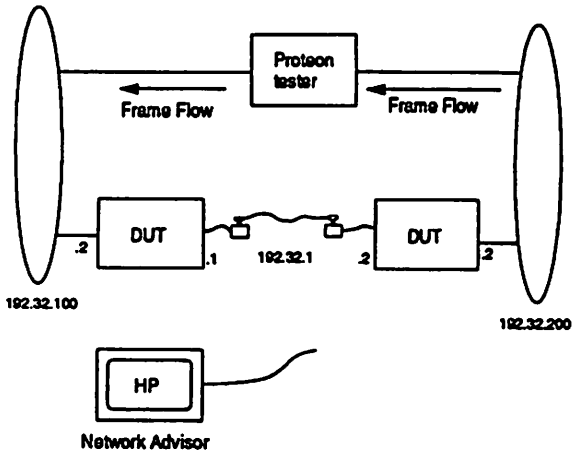
Test set up - t2t.t1, t2t.56

Token Ring to Token Ring through WAN



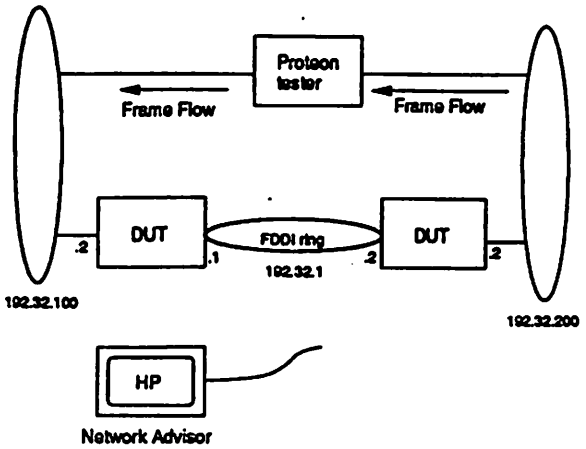
Test set up - t2tve

Token Ring to Token Ring through Ethernet



Test set up - t2tvf

Token Ring to Token Ring through FDDI



Tests - background

protocols used in FDDI tests

- FDDI to FDDI
- FDDI to FDDI via Ethernet
  - bridge test packet - SNAP 010000 0810
  - IP - UDP Echo Request
- Ethernet to Ethernet via FDDI
  - bridge test packet - protocol 9000x
  - IP - UDP Echo Request

Tests - background

protocols used in token ring tests

- token ring to token ring
- token ring to token ring via Ethernet
- token ring to token ring via FDDI
  - IP - UDP Echo Request
  - source route - SNAP 0101000331
- token ring to token ring via WAN
  - IP - UDP Echo Request
  - source route - SNAP 0101000331
  - AppleTalk II - AppleTalk Echo Request
  - IPX - Echo Request

Frame addressing

- simple addressing
  - from one address on one adjacent LAN
  - to one address on another adjacent LAN
- i.e., no routing
- tests with 2 routers used static routes between boxes
- Ethernet multi stream frame sequence
  - strings of N frames
    - each addressed to separate LAN
- BMWG draft suggests multiple addresses on
  - non-adjacent LANs with "real" routing
  - in "next version"

Tests - max frame rates

maximum frame rates used in tests

frame size	56KB	T1	Ethernet	FDDI	token ring
48	150	3,903	-	-	16,883
64	110	2,603	14,880	140,630	14,756
256	27	779	4,528	-	6,100
512	14	381	2,349	23,211	3,433
1024	6	190	1,197	11,883	1,826
1518	4	130	812	8,081	1,258
2048	3	99	-	5,984	943
3096	-	49	-	3,131	496

Tests - packet loss rate

- definition from RFC 1242

> Percentage of frames that should have been forwarded by a network device under steady state (constant) load that were not forwarded due to lack of resources.

Ethernet to Ethernet through FDDI and token ring
to token ring tests
- for each frame size in a list
  divide potential load into ranges
    for each load value
      send N frames at specific load
      record # frames received
- tester source and destination of packet stream

FDDI to FDDI tests currently different
- send frames at specific rate
  record rate of passed traffic
- tester source of packet stream
- Timeplex used as destination
  used BASHER software to control and
  send bridge learning frames

- reworked test using a Tekelec "ADN"

FDDI tester repeatability

- ChameLAN FDDI IP test repeated 3 times

	min value	max value	%var
64 byte offered rate	140,630	140,780	0.1%
3960 byte offered rate	3,132	3,135	0.1%

- PowerBits 4 channel Ethernet IP test repeated 10 times

	min value	max value	%var
64 byte offered rate	59,520	59,520	0.0%
1518 byte offered rate	3,248	3,248	0.0%

- PowerBits 6 channel Ethernet IP test repeated 9 times

	min value	max value	%var
64 byte offered rate	87,698	89,280	1.8%
1518 byte offered rate	4,872	4,872	0.0%

Token ring tester repeatability

- Proteon token ring tester, 21 trials

	min value	max value	%var
64 byte offered rate	14,243	15,251	7.1%
3960 byte offered rate	494	496	0.4%

- W&G token ring tester - T1, 14 trials

	min value	max value	%var
64 byte offered rate	3,122	3,125	0.1%
3960 byte offered rate	49	49	0.0%

- W&G token ring tester - 56Kb, 5 trials

	min value	max value	%var
64 byte offered rate	110	110	0.0%
2048 byte offered rate	3	3	0.0%

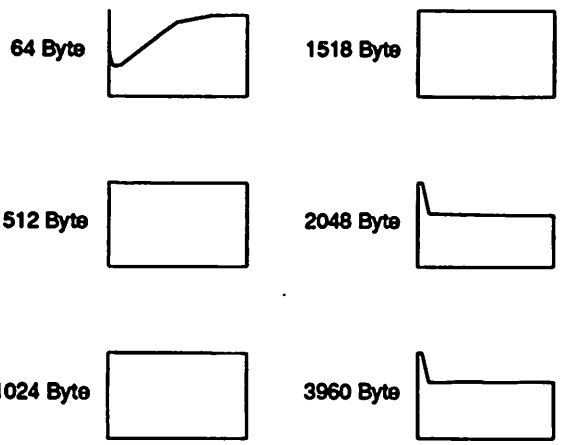
Reporting the results

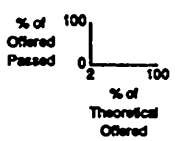
- whole lot of data
- packet loss rate
  graph of % of theoretical in vs % of theoretical out
  "nibbled sugar cube" better but...

Sample graph

Bits "R" Us BitMover III

TCP/IP
FDDI to FDDI via Ethernet





Testing Date 3/13/92, Software version 1.2.3.4
Test Equipment Tekelec ChameLAN 100-Harvard NTDL Software

Promo - Harvard Network Device Test Lab

- permanent test lab
- available to vendors for private testing
  development cycle
- available to vendors for certified testing
  Harvard certifies that the test was run
  (not pass-fail, or approval)
- available to others to test products
  media
  potential customers
  "how do the boxes work in 'my' net"
  custom protocol mix etc
- cheaper to non-profit organizations

Harvard Network Device Test Lab ftp archive

ftp archive on hsdndev.harvard.edu in pub/ndtl
- Harvard scripts for PowerBits
- Harvard scripts for Proteon software
- Harvard software for Tekelec
- packet formats
- graphing routines
- PostScript for this presentation
- text of published reports
- text of "for hire" reports

- "tree" of test results
- new data added to vendor entries
- comments in data files

- Proteon token ring test program

Device configurations

FDDI to FDDI

port	IP address
FDDI 0	192.32.100.2
FDDI 1	192.32.200.2

FDDI to FDDI through Ethernet

- first router

port	IP address
FDDI 0	192.32.100.2
Ethernet 0	192.32.1.1

- second router

port	IP address
FDDI 0	192.32.200.2
Ethernet 0	192.32.1.2

Device configurations, contd.

Ethernet to Ethernet through FDDI

- first router

port	IP address
Ethernet 0	192.32.100.2
Ethernet 1	192.32.101.2
Ethernet 2	192.32.102.2
Ethernet 3	192.32.103.2
Ethernet 4	192.32.104.2
Ethernet 5	192.32.105.2
FDDI 0	192.32.1.1

- second router

port	IP address
Ethernet 0	192.32.200.2
Ethernet 1	192.32.201.2
Ethernet 2	192.32.202.2
Ethernet 3	192.32.203.2
Ethernet 4	192.32.204.2
Ethernet 5	192.32.205.2
FDDI 0	192.32.1.2

Device configurations, contd.

Ethernet to Ethernet through FDDI, 2 way

- first router

port	IP address
Ethernet 0	192.32.100.2
Ethernet 1	192.32.201.2
Ethernet 2	192.32.102.2
Ethernet 3	192.32.203.2
Ethernet 4	192.32.104.2
Ethernet 5	192.32.205.2
FDDI 0	192.32.1.1

- second router

port	IP address
Ethernet 0	192.32.200.2
Ethernet 1	192.32.101.2
Ethernet 2	192.32.202.2
Ethernet 3	192.32.103.2
Ethernet 4	192.32.204.2
Ethernet 5	192.32.105.2
FDDI 0	192.32.1.2

Device configurations, contd

token ring to token ring

port	IP address	ring #
token 0	192.32.100.2	1
token 1	192.32.200.2	2

token ring to token ring via Ethernet

- first router

port	IP address
token 0	192.32.100.2
ether 0	192.32.1.1

- second router

port	IP address
token 0	192.32.200.2
ether 0	192.32.1.2

Device configurations, contd

token ring to token ring via FDDI

- first router

port	IP address
token 0	192.32.100.2
fddi 0	192.32.1.1

- second router

port	IP address
token 0	192.32.200.2
fddi 0	192.32.1.2

token ring to token ring via WAN

- first router

port	IP address	ring number	AppleTalk network range	IPX network #
token 0	192.32.100.2	1	5-5	50000
*WAN 0	192.32.1.1	3	1-1	40000

- second router

port	IP address	ring number	AppleTalk network range	IPX network #
token 0	192.32.200.2	2	107-107	D0001
*WAN 0	192.32.1.2	3	1-1	40000

IP test packet for PowerBits

- IP - UDP Echo Request
  from 192.32.100.1 to 192.32.200.1

```
                    DATAGRAM HEADER

AA 00 04 00 02 04       # dest MAC address (router)
AA 00 04 00 01 04       # src MAC address
08                      # type high byte
00                      # type low byte

                      IP HEADER

45                      # IP version - 4,
                          # header length (4
                          # byte units) - 5
00                      # service field
00 2E                   # total length
00 00                   # ID
40 00                   # flags (3 bits)-4 (do not
                          # fragment),
                          # fragment offset-0
0A                      # TTL
11                      # protocol - 17 (UDP)
C4 8D                   # header checksum
C0 20 64 01             # src IP address
C0 20 C8 01             # dest IP address

                      UDP HEADER

C0 20                   # source port
00 07                   # destination port
                          # 07 = Echo
00 1A                   # UDP message length
00 00                   # UDP checksum

                       UDP DATA

00 01 02 03 04 05 06 07 # some data
08 09 0A 0B 0C 0D 0E 0F
```


IP ARP Request packet for PowerBits

- ARP Request from dest to router

```
                    ARP REQUEST PACKET

FF FF FF FF FF FF
AA 00 04 00 03 04       # from port 6 mac address
08                      # type hi byte
06                      # type low byte
00 01                   # hardware type = ethernet
08 00                   # protocol type = IP
06                      # hw addr length
04                      # proto addr length
00 01                   # opcode = request
36 6 22                 # from port 6 mac address
C0 20 C8 01             # and port 6s IP
FF FF FF FF FF FF       # router's MAC
C0 20 CD 02             # router's IP
```


Bridge test packet for PowerBits

- Bridge test packet
  UB data - on Ethernet (not 802.3)
  from AA-00-04-00-01-04 to AA-00-04-00-03-04

```
                    DATAGRAM HEADER

AA 00 04 00 03 04       # dest address
AA 00 04 00 01 04       # src address
90                      # type high byte
00                      # type low byte

2C 00                   # length (little endian)
00 00                   # command

                    NON-RANDOM DATA

00 01 02 03 04 05 06 07
```

IP test packet for ChameLAN

- IP - UDP Echo Request
  from 192.32.100.1 to 192.32.200.1

```
                        DATAGRAM HEADER
AA                        # DSAP
AA                        # SSAP
03                        # control
0000000800                # SNAP

                          IP HEADER
45                        # IP version - 4,
                              # header length (4
                              # byte units) - 5
00                        # service field
0026                      # total length
0000                      # ID
0000                      # flags (3 bits)
                              # fragment offset-0
FF                        # TTL
00                        # protocol
0F94                      # header checksum
C0206401                  # src IP address
C020C801                  # dest IP address

                          UDP HEADER
C0 20                      # source port
00 07                      # destination port
                              # 07 = Echo
00 12                      # UDP message length
00 00                      # UDP checksum

                           UDP DATA

00 01 02 03 04 05 06 07   # some data
12 34 56 78 90 12 34 56
78 90. 12 34 56
```


Bridge test packet for ChameLAN

- bridge
  sent to MAC address of Timeplex

```
                        DATAGRAM HEADER
AA                        # DSAP
AA                        # SSAP
03                        # control
0100000810                # SNAP

                         OPAQUE DATA
450000260000000FF000F94C020
6401C020C801C020000700120000
000102030412345678901234567 8
90123456
```


IP test packet for Proteon tester

- IP - UDP Echo Request
  from 192.32.100.1 to 192.32.200.1

```
                        DATAGRAM HEADER
00                        # Access Control
40                        # Frame Control
000000000000              # Dest MAC Address
000011223340              # Src MAC Address
AA                        # DSAP
AA                        # SSAP
03                        # cntrl
0000000800                # SNAP

                          IP HEADER
45                        # vers, hlen
00                        # service type
03E6                      # total length
0000                      # ID
0000                      # flags, frag offset
FF                        # TTL
00                        # protocol
0ED4                      # header checksum
C0206401                  # src IP address
C020C801                  # dest IP address

                          UDP HEADER
C020                      # src port
0007                      # dest port
0012                      # msg lenth
0000                      # udp checksum

                           UDP DATA
0001020304                # udp data
```


AppleTalk test packet for Proteon tester

- AppleTalk DDP Echo Request
  from 5.65 to 107.3

```
                        DATAGRAM HEADER
10                        # Access Control
40                        # Frame Control
000000000000              # Dest MAC Address
000011223340              # Src MAC Address
AA                        # DSAP
AA                        # SSAP
03                        # Control
0800078098                # SNAP

                        APPLETALK HEADER
0016                      # 2 bits 0
                          # 4 bits hop count
                          # 10 bits length
0000                      # checksum 0=none
006B                      # Dest Network
0005                      # Src Network
03                        # Dest Node ID
41                        # Src Node ID
04                        # Dest Socket #
60                        # Src Socket #
04                        # DDP type, 04=ARP

                          ECHO HEADER
01                        # Echo Command, 1=echo request
0001020304050607          # Echo Data
```

IPX test packet for Proteon tester

- IPX - IPX Echo Request
  from 000011223340 to 000011223344

```
                        DATAGRAM HEADER
10                        # Access Control
40                        # Frame Control
000000000000              # Dest MAC Address
000011223340              # Src MAC Address
E0                        # DSAP
E0                        # SSAP
03                        # Control

                          IPX HEADER
FFFF                      # Checksum, FFFF=none
0016                      # Datagram Length
01                        # Transport Control
02                        # Packet Type, 2=Echo
000D0001                  # Dest Network #
000011223344              # Dest Node
0002                      # Dest Socket, 2=Echo
00050000                  # Src Network #
000011223340              # Src Node
4002                      # Src Socket
0001                      # Command, 1=Echo Request

                           ECHO DATA
000102030405              Echo Data
```


Source route test packet for Proteon tester

- source route
  opaque data from ring 1 to ring 2 via bridge 1

```
                        DATAGRAM HEADER
00                        # Access Control
40                        # Frame Control
000011223344              # Dest MAC Address
800011223340              # Src MAC Address
060000110020              # RIF
E0                        # DSAP
E0                        # SSAP
03                        # Control
0101000331                # SNAP

                             DATA
00010203040506
```

Router Test Results V.5

Scott Bradner

Harvard University

Test Results: Routers and Bridges

Whole lotta bits in that little pipe

Thanks

all test hardware and software provided
by cooperating vendors

- Alantec
  Power Bits hardware & software
- Crescendo Communications Inc.
  FDDI concentrator
- Cisco Systems
  AGS+ routers as mules
- Digital Link
  DL551VX extended T1 converter + CSU
- Hewlett Packard
  Network Advisor Ethernet/token ring network analyzer

Thanks, contd.

- Proteon
  token ring test boards and software
- Tekelec
  ChameLAN 100-S dual port FDDI analyzer
- Ascom Timeplex
  Time/LAN 100 routers with BLASTER software
- Wandel & Goltermann
  DA-30 Multi-port Dual Protocol Analyzer
  Bridge/Router test suite
- BMWG
  test design

Vendor selection

- announcement sent on comp.protocols.tcp-ip
- mentioned when sales people called
- some vendors missed
- not done
  latency
  effects of filters
  effects of broadcast and error packets
  multiple protocol
- not done enough
  two way traffic

Perspective

- 1 GB router on a 9.6KB link not all that useful

- theoretical frame rates for link speeds
  64 octet frames
  "ideal" serial links, i.e., no MAC address
  (rounded up)

link speed	fps
2.4KB	5
9.6KB	19
56KB	110
64KB	125
.5T1	1508 (*2)
T1	3016 (*2)
Ethernet	14,880
T3	>85,000 (*2)
FDDI	156,000

Software version

- β software permitted

- bugs found & fixed
  results from fixed version used

- pledge required

The versions of software and firmware used in these tests do not have to be currently available to normal customers at the time of testing but must be the version that will be shipped to customers within 3 months of Interop Spring 1992. Or, if the vendor uses a calander-based release schedule (every 6 months, for example), then at the next regularly scheduled release after the 3 month window. It is assumed that in the normal course of development features may be added or removed and that the version shipped may not be exactly the version used during the testing. Assurance is hearby given that the versions used are properly identified and that they are not subsets of the normal functionality that the vendor ships. (i.e., the testing was not done on a special version created to be used during this sort of testing.)

Results - notes

- the following numbers are a way to represent the results of this round of tests

- the maximum packet rate and maximum bit rate do not represent specific frame sizes

- the maximum packet rate is taken from the place in the grid of data results for a particular device that held the maximum packet rate, this could be for 48, 52, or 64 byte packets and at various offered loads

- the same is true for the maximum bit rate

- use the graphs to get the full picture of the device performance over the range of packet sizes and offered loads

Results - t2t

16 Mb token ring to 16 Mb token ring

device	protocol	max pps	max bps
tester	IP	14,703	15.7Mb
	SRB	16,851	15.7Mb
Ascom Timeplex	IP	3,721	15.7Mb
	IPX	3,746	15.7Mb
	SRB	3,395	15.7Mb
Cisco AGS+	IP	2,128	6.5Mb
	IPX	2,384	6.5Mb
	SRB	11,581	7.8Mb
Develcon 220M-SA	SRB	3,157	8.5Mb
Fibronics FR 9500	SRB	1,613	5.6Mb
Netronix TokenMaster	SRB	2,703	14.2Mb
Proteon CNX500	IP	14,828	15.7Mb
	IPX	4,710	6.0Mb
	SRB	15,129	15.7Mb
Synoptics 3522	SRB	7,836	15.7Mb

Results - t2tv56

16 Mb token ring to 16 Mb token ring via 56Kb WAN

device	protocol	max pps	max bps
tester	AppleTalk	139	56Kb
	IP	150	56Kb
	IPX	139	56Kb
	SRB	150	56Kb
Cisco AGS+	AppleTalk	139	56Kb
	IP	150	56Kb
	IPX	139	56Kb
Develcon 220LM3	SRB	126	56Kb
HP 27286A	AppleTalk	150	56Kb
	IP	150	56Kb
	IPX	110	56Kb
	SRB	111	56Kb
Proteon CNX500	IP	139	56Kb
3Com NetBuilder I	SRB	137	56Kb

Results - t2tv1

16 Mb token ring to 16 Mb token ring via T1 WAN

device	protocol	max pps	max bps
tester	all	3903	1.53Mb
Ascom Timeplex	IP	1,128	1.53Mb
	SRB	1,115	1.53Mb
Cisco AGS+	AppleTalk	1,983	1.53Mb
	IP	2,552	1.53Mb
	IPX	2,723	1.53Mb
HP 27286A	AppleTalk	3,822	1.52Mb
	IP	3,903	1.53Mb
	IPX	2,980	1.53Mb
	SRB	1,932	1.53Mb
Proteon CNX500	IP	3,903	1.53Mb
	IPX	3,903	1.45Mb
	SRB	2,962	1.52Mb
3 Com NetBuilder I	IP	1,571	1.53Mb
	SRB	3,248	1.53Mb

Results - f2f

100 Mb FDDI to 100 Mb FDDI

device	protocol	max pps	max bps
tester	all	140,781	99.4Mb
Ascom Timeplex	Bridge	9,932	48.7Mb
	IP	13,274	48.4Mb
Cisco AGS+	IP	30,534	94.6Mb
Coral CX1600	Bridge	140,781	99.4Mb
	IP	24,520	81.2Mb
Proteon CNX500	IP	27,274	50.0Mb
3Com NetBuilder II	Bridge	50,356	92.2Mb
	IP	48,904	92.2Mb

Results - f2fvs

100 Mb FDDI to 100 Mb FDDI using SUN SS2

device	protocol	max pps	max bps
tester	all	140,780	99.4Mb
Crescendo Comm.	IP	8,438	30.0Mb
Network Perp.	IP	5,794	40.0Mb
SUN	IP	5,055	57.1Mb

Results - f2fve

100 Mb FDDI to 100 Mb FDDI via Ethernet

device	protocol	max pps	max bps
tester	all	14,880	9.9Mb
Ascom Timeplex	IP	13,151	9.9Mb
Cisco AGS+	IP	14,027	9.9Mb
Coral CX1600	Bridge	12,698	9.8Mb
	IP	13,863	9.8Mb
Fibronics FX8210B	IP	4,643	9.9Mb
Penril 2500	Bridge	13,671	9.8Mb
Proteon CNX500	IP	12,041	9.9Mb
SUN SS2	IP	5,780	9.9Mb
Sigma ECS/1	Bridge	14,880	9.9Mb
Synernetics	Bridge	14,880	9.9Mb
3Com NetBuilder II	IP	14,863	9.9Mb

Results - e2evf

4 Ethernets to 4 Ethernets via FDDI, one way

device	protocol	max pps	max bps
tester	all	59,520	39.4Mb
Ascom Timeplex	IP	16,785	38.9Mb
Cisco AGS+	Bridge	22,320	39.3Mb
	IP	46,663	39.2MB
Fibronics 8610	Bridge	7,618	38.9Mb
Penril 2500	Bridge	42,409	39.4Mb
Proteon CNX500	IP	17,856	39.2Mb
Sigma ECS/1	Bridge	59,433	39.4Mb
	IP	53,564	39.4Mb
Synernetics	Bridge	58,925	39.4Mb
3Com NetBuilder II	IP	41,664	39.4Mb

Results - e2evf

4 Ethernets to 4 Ethernets via FDDI, two way

device	protocol	max pps	max bps
tester	all	59,520	39.4Mb
Cisco AGS+	Bridge	19,523	39.4Mb
	IP	53,032	39.4Mb
Penril 2500	Bridge	44,027	39.4Mb
Proteon CNX500	IP	20,237	39.2Mb
Sigma ECS/1	Bridge	59,266	39.4Mb
	IP	59,270	39.4Mb
Synernetics	Bridge	59,147	39.4Mb

Results - e2evf

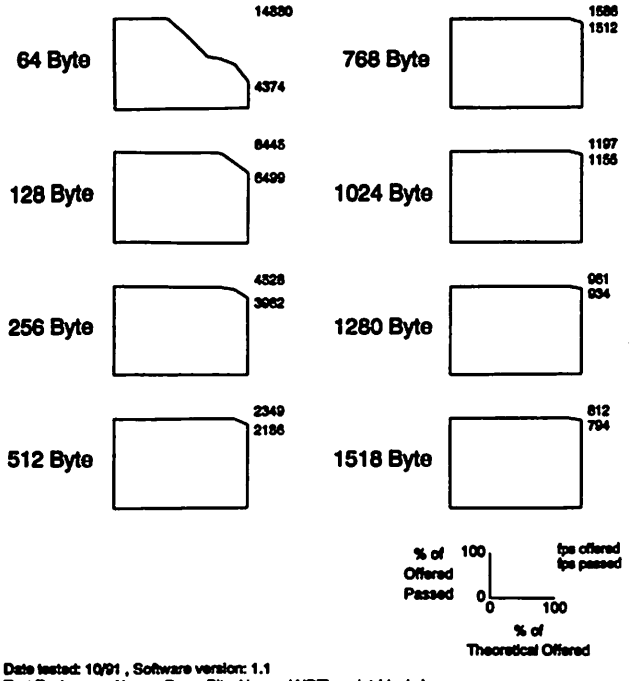
6 Ethernets to 6 Ethernets via FDDI

device	protocol	max pps	max bps
tester	all	89,280	59.2Mb
1 way			
Cisco AGS+	Bridge	21,963	58.6Mb
	IP	47,356	58.6Mb
Synernetics	Bridge	84,816	59.2Mb
3Com NetBuilder II	IP	40,176	59.2Mb
2 way			
Cisco AGS+	Bridge	30,712	58.9Mb
	IP	52,496	58.9Mb
3Com NetBuilder II	IP	48,747	59.2Mb

3Com NetBuilder I

TCP/IP

1 eth to 1 eth

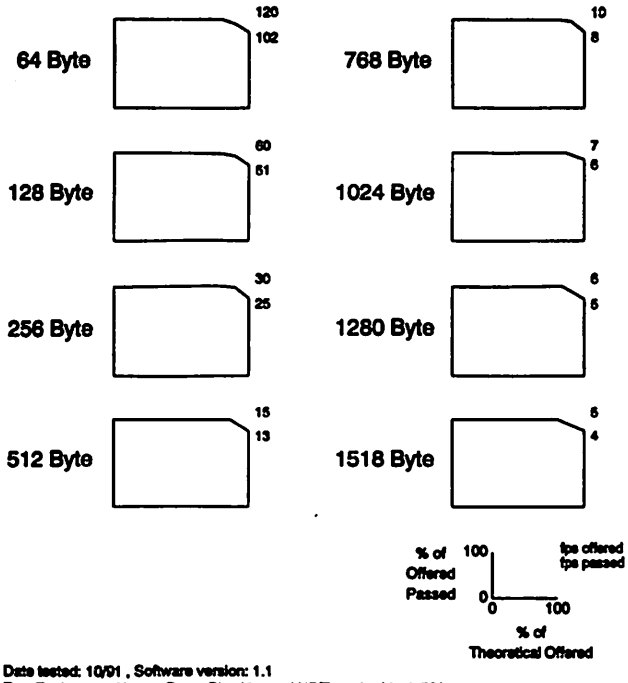


Date tested: 10/91 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

3Com NetBuilder I

TCP/IP

1 eth to 1 eth via 56Kb WAN

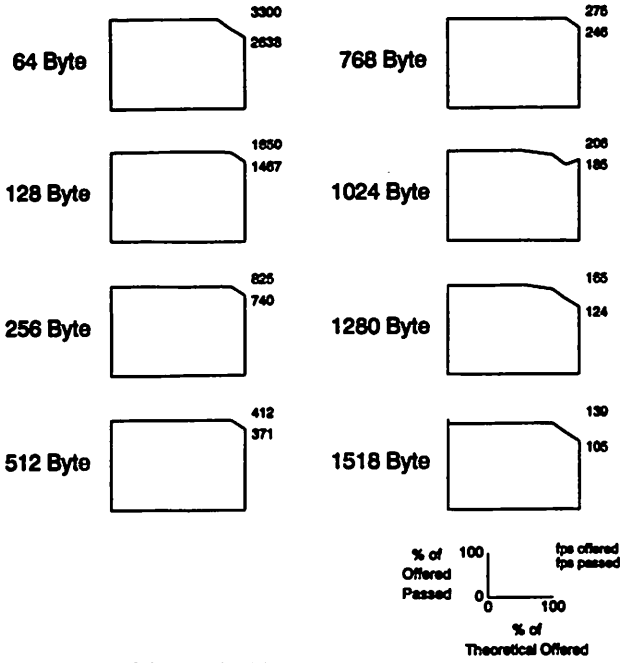


Date tested: 10/91 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_tp56)

3Com NetBuilder I

TCP/IP

1 eth to 1 eth via T1 WAN

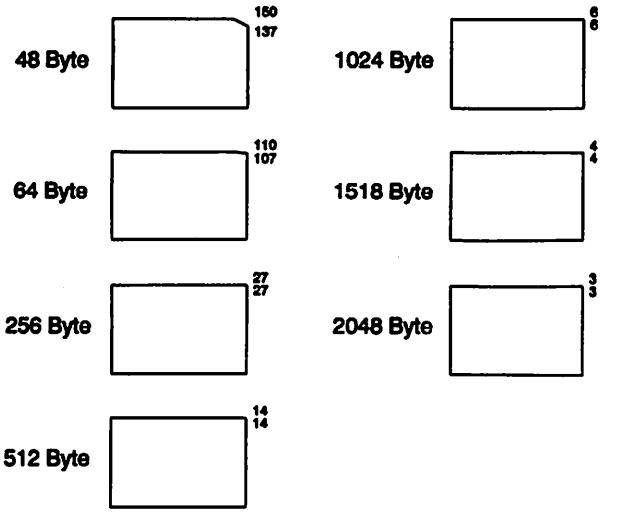


Date tested: 10/91 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_lpt1)

3Com NETBuilder TR

SourceRouting

16MB token ring to 16MB token ring via 56KB WAN

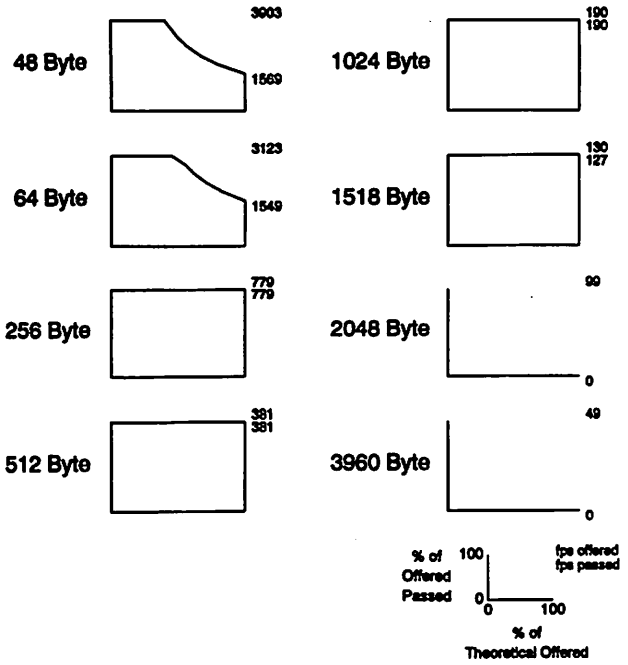


Date tested: 4/29/92, Software version: SW/NB-TR 4.5.1
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

3Com NETBuilder TR

TCP/IP

16MB token ring to 16MB token ring via t1 WAN

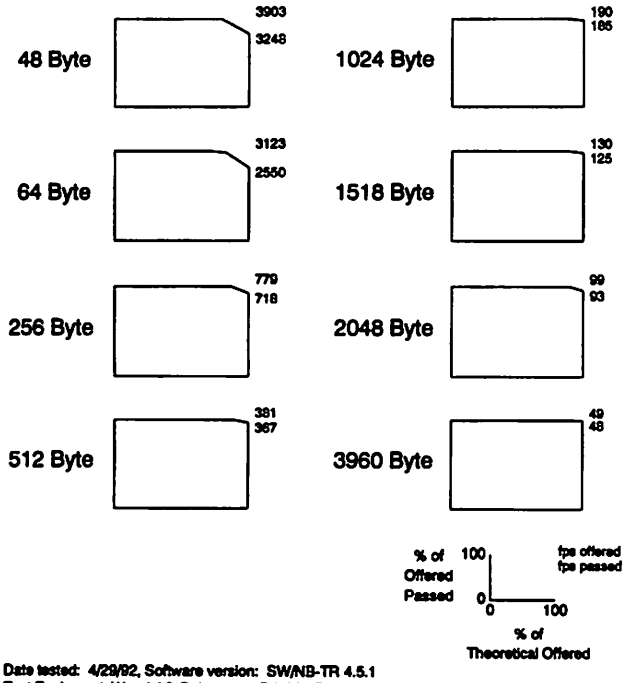


Date tested: 4/29/92, Software version: SW/NB-TR 4.5.1
Test Equipment: Wandel & Gottermann DA-30 - Router Benchmark-Token Ring

3Com NETBuilder TR

SourceRouting

16MB token ring to 16MB token ring via t1 WAN

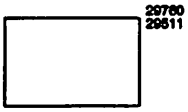


Date tested: 4/29/92, Software version: SW/NB-TR 4.5.1
Test Equipment: Wandel & Gottermann DA-30 - Router Benchmark-Token Ring

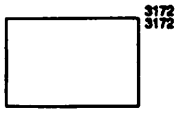
3Com NetBuilder II

2 eth to 2 eth via fddi

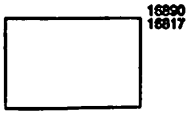
64 Byte



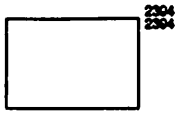
768 Byte



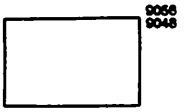
128 Byte



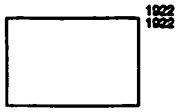
1024 Byte



256 Byte

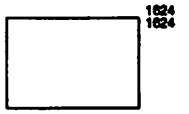


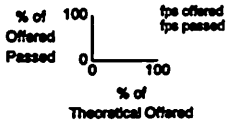
1280 Byte



512 Byte

1518 Byte



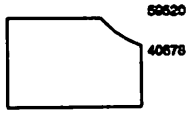


Date tested: 4/24/92 , Software version: 5.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip2s)

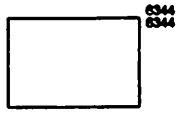
3Com NetBuilder II

4 eth to 4 eth via fddi

64 Byte

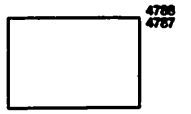


768 Byte



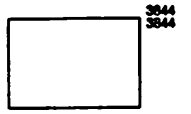
128 Byte

1024 Byte

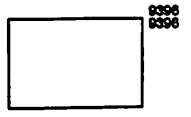


256 Byte

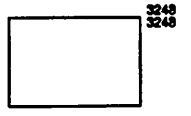
1280 Byte

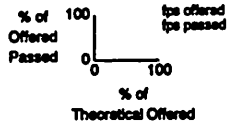


512 Byte



1518 Byte

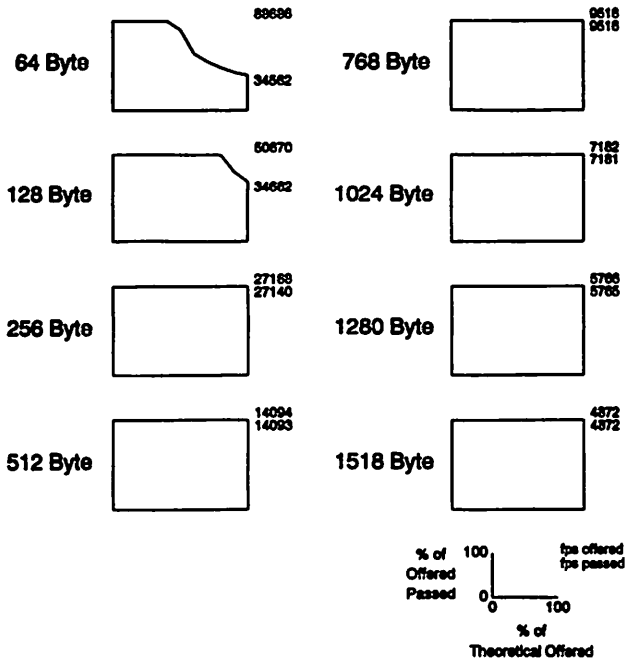




Date tested: 4/24/92 , Software version: 5.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

3Com NetBuilder II

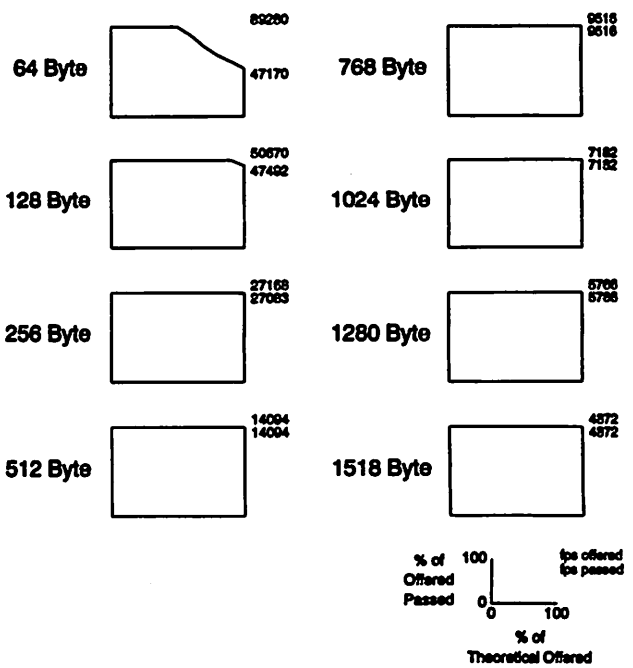
6 eth to 6 eth via fddi



Date tested: 4/24/92 , Software version: 5.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

3Com NetBuilder II

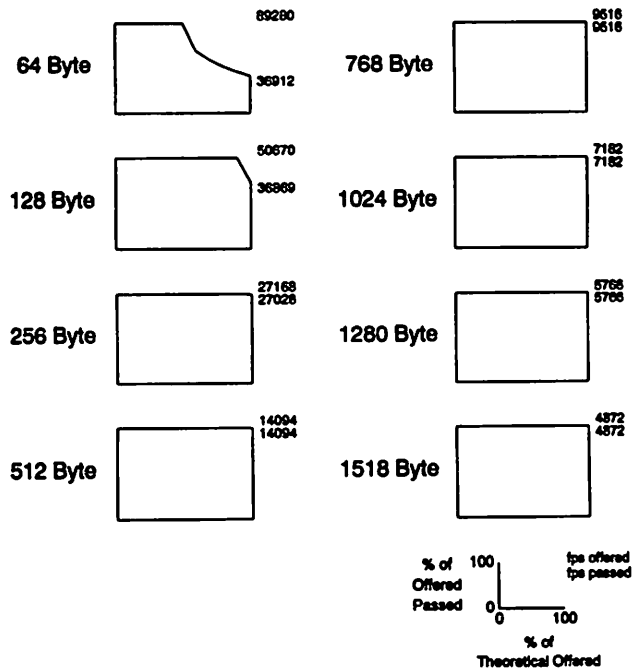
6 eth to 6 eth via fddi, 2 way



Date tested: 5/15/92 , Software version: 50088
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s.1)

3Com NetBuilder II

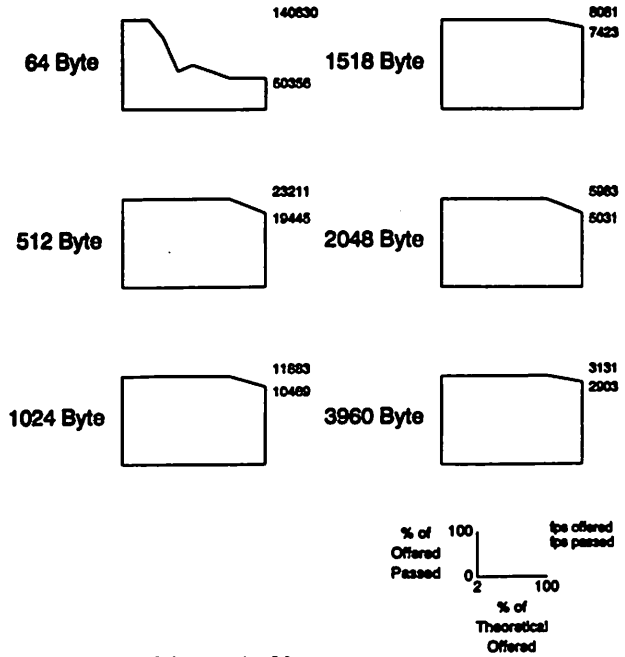
6 eth to 6 eth via fddi



Date tested: 5/15/92 , Software version: 50088
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s.1)

3Com NetBuilder II

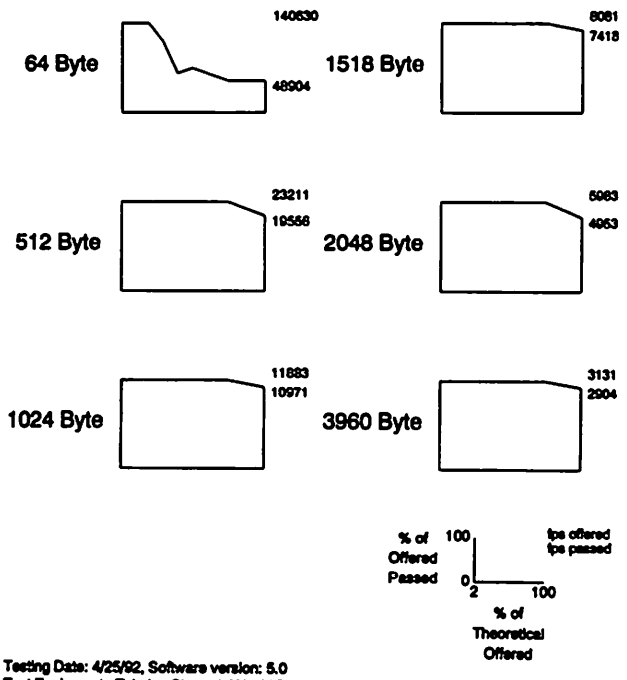
Bridge
FDDI to FDDI



Testing Date: 4/25/92, Software version: 5.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

3Com NetBuilder II

TCP/IP
FDDI to FDDI

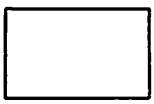


Testing Date: 4/25/92, Software version: 5.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

3Com NetBuilder II

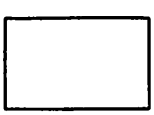
TCP/IP
FDDI to FDDI via Ethernet

64 Byte

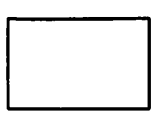


1518 Byte

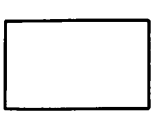
512 Byte



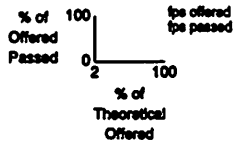
2048 Byte



1024 Byte



3960 Byte



Testing Date: 4/25/92, Software version: 5.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

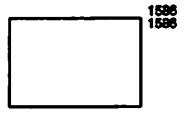
Alantec PowerHUB

Bridge

1 eth to 1 eth, between cards

64 Byte

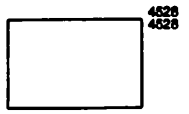
768 Byte



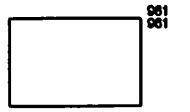
128 Byte

1024 Byte

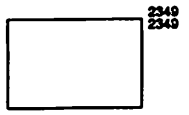
256 Byte



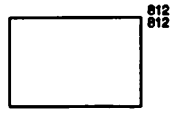
1280 Byte

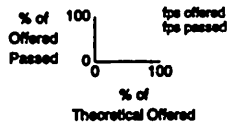


512 Byte



1518 Byte





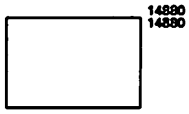
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Alantec PowerHUB

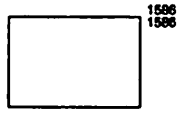
TCP/IP

1 eth to 1 eth, between cards

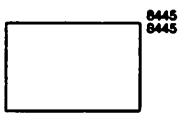
64 Byte



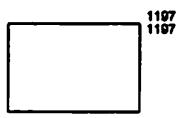
768 Byte



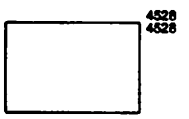
128 Byte



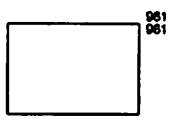
1024 Byte



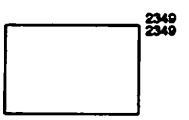
256 Byte



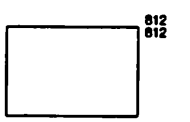
1280 Byte

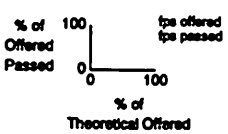


512 Byte



1518 Byte





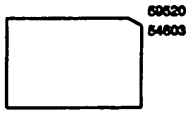
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Alantec PowerHUB

Bridge

4 eth to 4 eth

64 Byte

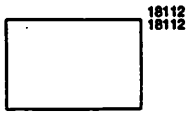


768 Byte

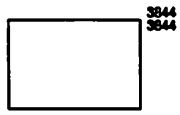
128 Byte

1024 Byte

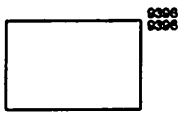
256 Byte



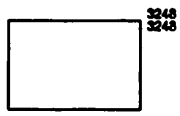
1280 Byte

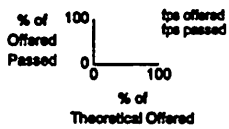


512 Byte



1518 Byte





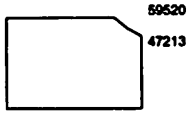
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Alantec PowerHUB

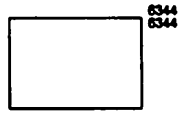
TCP/IP

4 eth to 4 eth

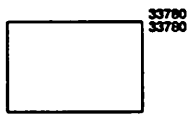
64 Byte



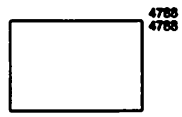
768 Byte



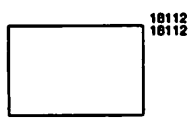
128 Byte



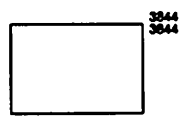
1024 Byte



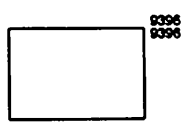
256 Byte



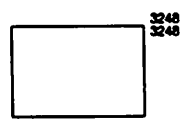
1280 Byte

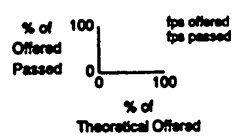


512 Byte



1518 Byte



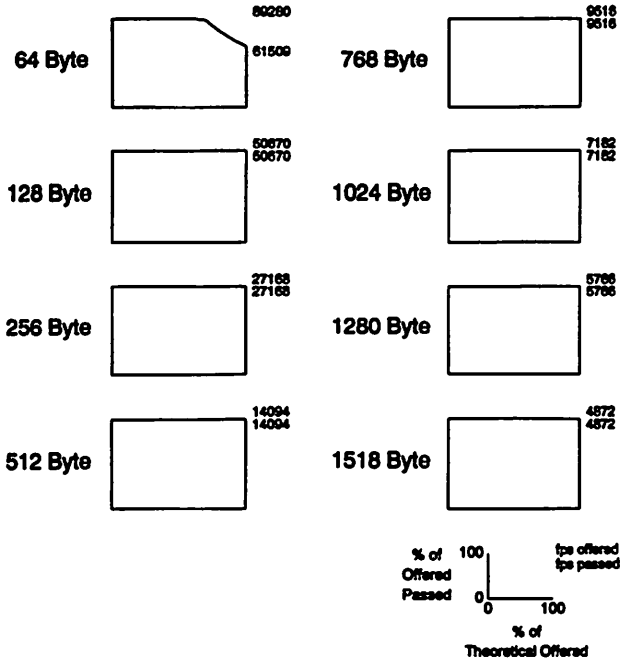


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Alantec PowerHUB

Bridge

6 eth to 6 eth

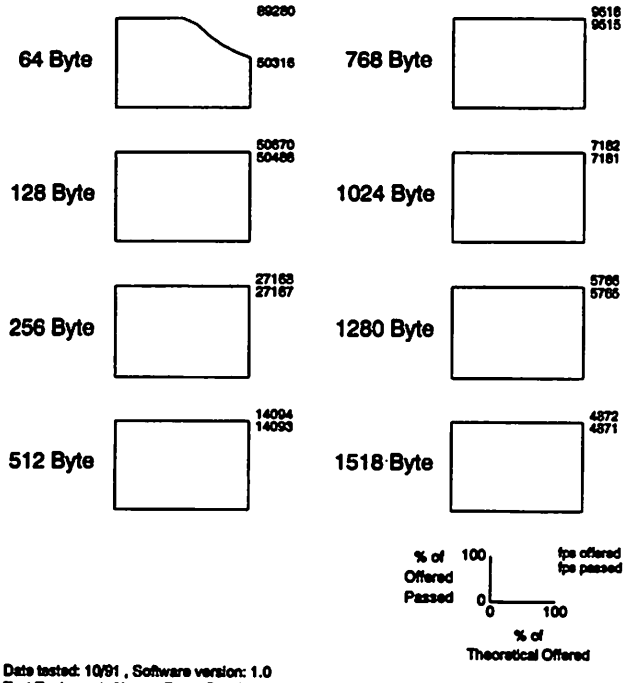


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

Alantec PowerHUB

TCP/IP

6 eth to 6 eth



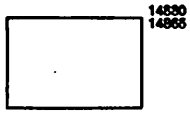
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

Artel Galactica

Bridge

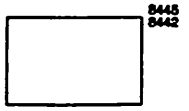
1 eth to 1 eth, between interface cards

64 Byte



768 Byte

128 Byte

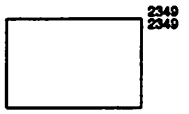


1024 Byte

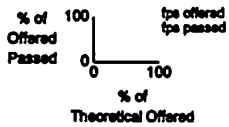
256 Byte

1280 Byte

512 Byte



1518 Byte



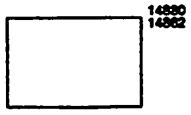
Date tested: 6/18/92 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Artel Galactica

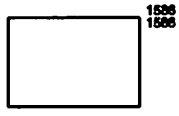
Bridge

1 eth to 1 eth, within an interface card

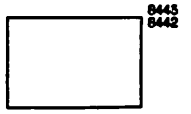
64 Byte



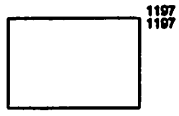
768 Byte



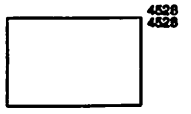
128 Byte



1024 Byte

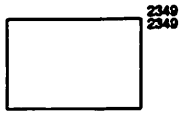


256 Byte

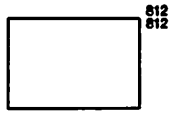


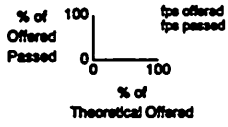
1280 Byte

512 Byte



1518 Byte





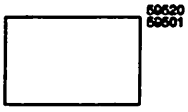
Date tested: 6/18/92 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Artel Galactica

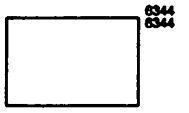
Bridge

4 eth to 4 eth

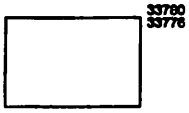
64 Byte



768 Byte



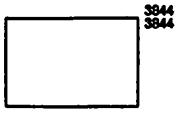
128 Byte



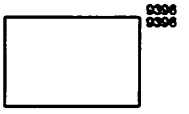
1024 Byte

256 Byte

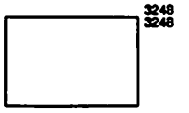
1280 Byte

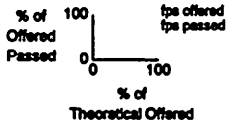


512 Byte



1518 Byte

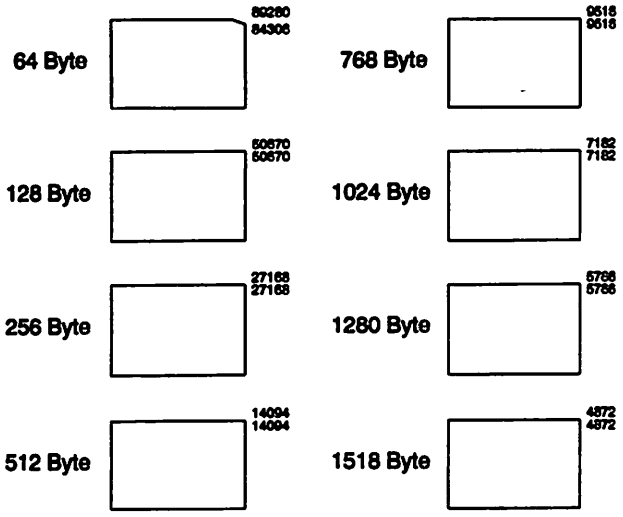




Date tested: 6/18/92 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Artel Galactica

Bridge
6 eth to 6 eth

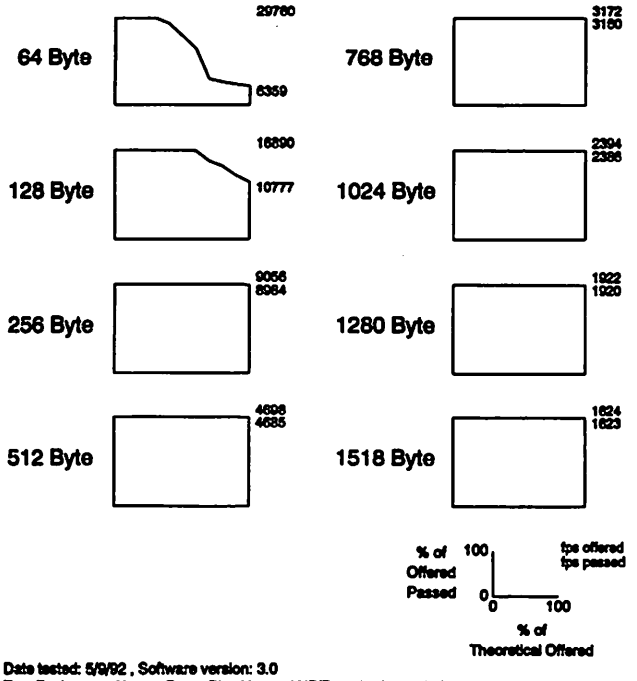


Date tested: 6/18/92 , Software version: 1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s)

Ascom Timeplex TIME/LAN 100

Bridge

2 eth to 2 eth via fddi

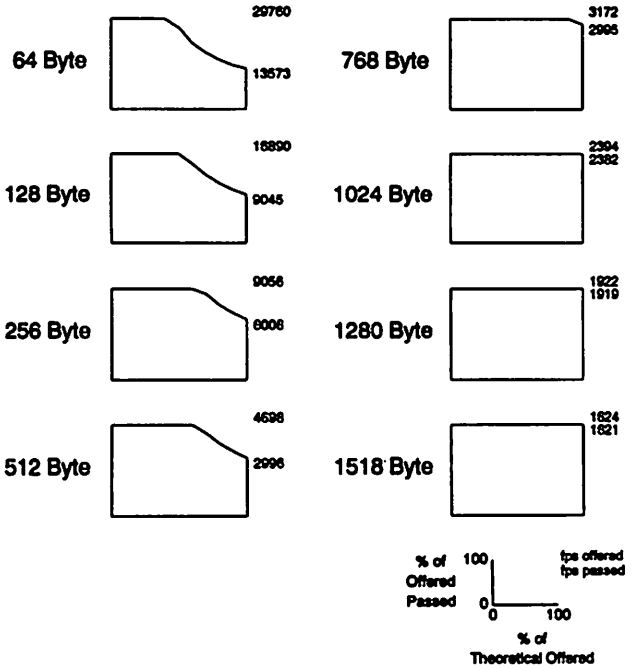


Date tested: 5/9/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br2s)

Ascom Timeplex TIME/LAN 100

TCP/IP

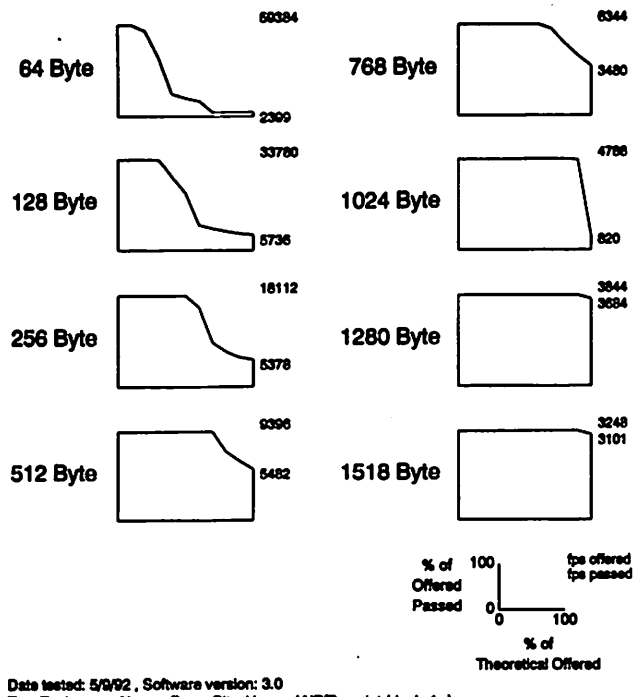
2 eth to 2 eth via fddi



Date tested: 5/10/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_tp2s)

Ascom Timeplex TIME/LAN 100

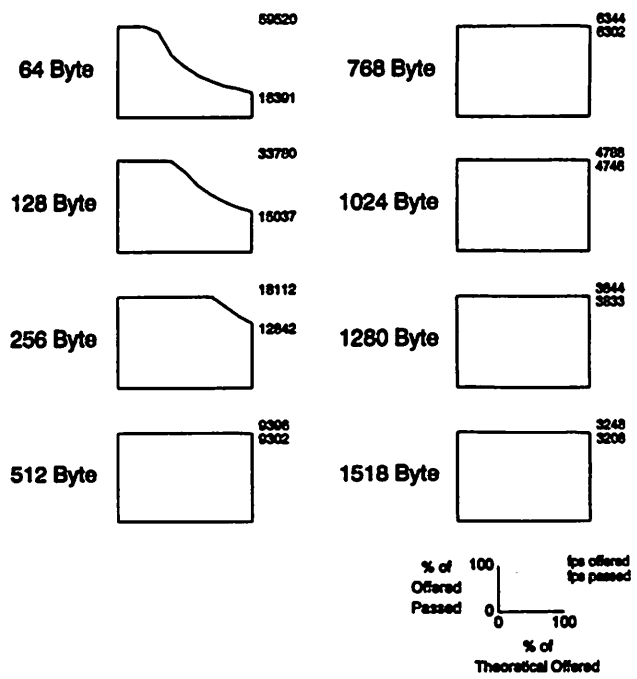
4 eth to 4 eth via fddi



Date tested: 5/9/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Ascom Timeplex TIME/LAN 100

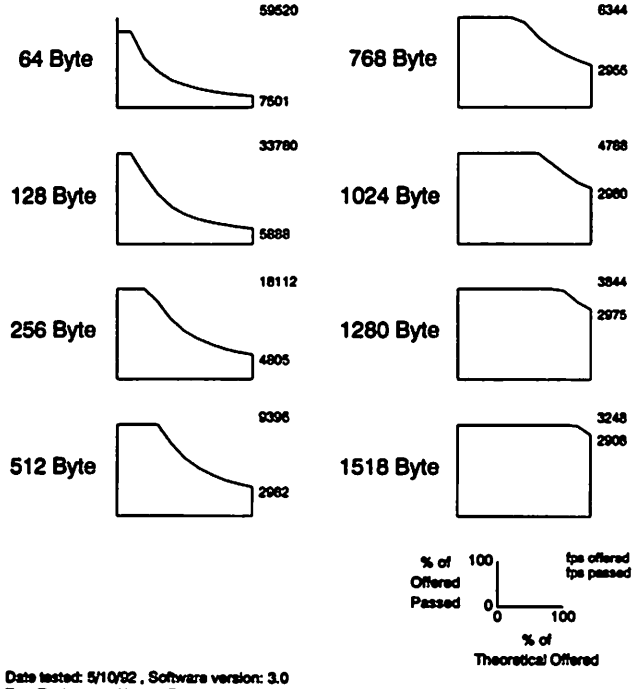
4 eth to 4 eth via fddi



Date tested: 5/10/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s.1)

Ascom Timeplex TIME/LAN 100

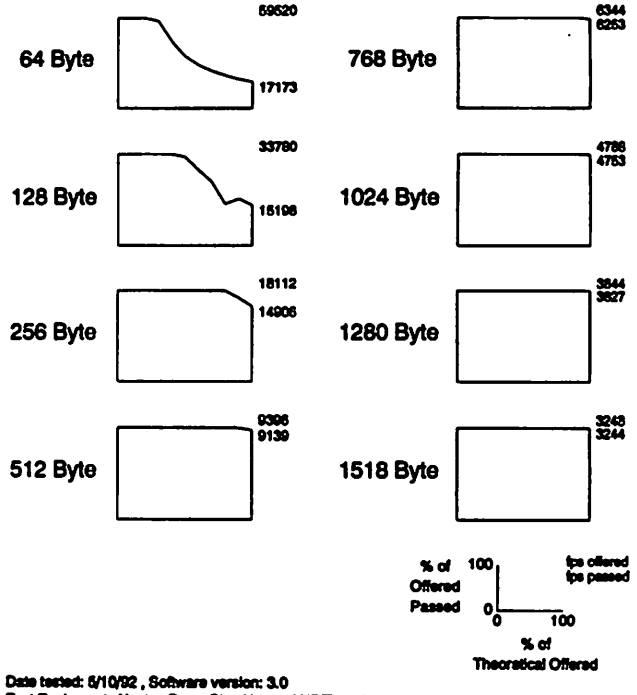
4 eth to 4 eth via fddi



Date tested: 5/10/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Ascom Timeplex TIME/LAN 100

4 eth to 4 eth via fddi, 2 way

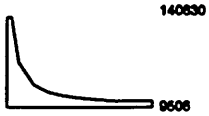


Date tested: 5/10/92 , Software version: 3.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s.1)

Ascom Timeplex TIME/LAN 100

Bridge
FDDI to FDDI

64 Byte

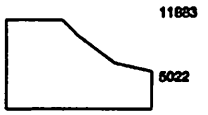


1518 Byte

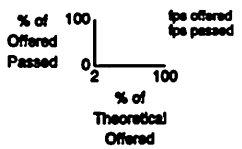
512 Byte

2048 Byte

1024 Byte



3960 Byte

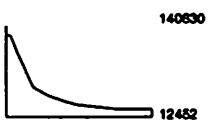


Testing Date: 5/9/92, Software version: 3.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Ascom Timeplex TIME/LAN 100

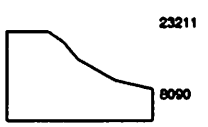
IP
FDDI to FDDI

64 Byte

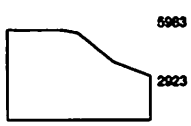


1518 Byte

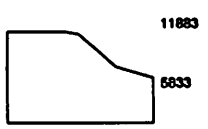
512 Byte



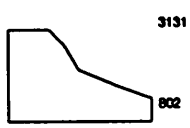
2048 Byte

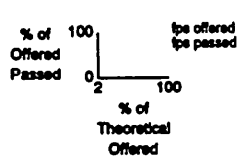


1024 Byte



3960 Byte



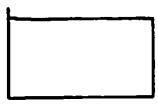


Testing Date: 5/9/92, Software version: 3.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Ascom Timeplex TIME/LAN 100

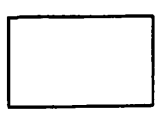
IP
FDDI to FDDI via Ethernet

64 Byte

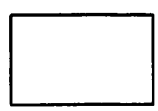


1518 Byte

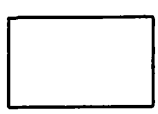
512 Byte



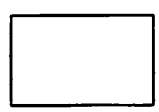
2048 Byte

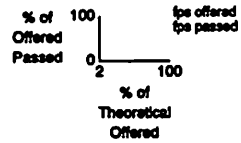


1024 Byte



3960 Byte



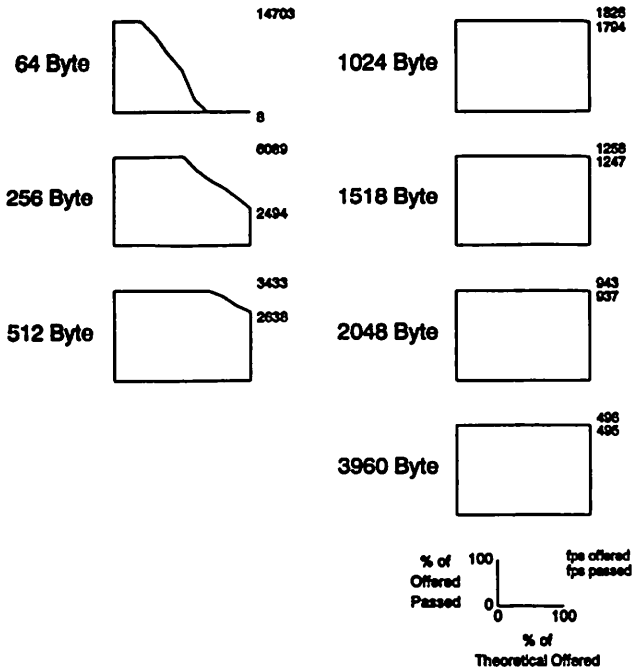


Testing Date: 5/9/92, Software version: 3.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Ascom Timeplex TIME/LAN 100

TCP/IP

16Mb token ring to 16Mb token ring

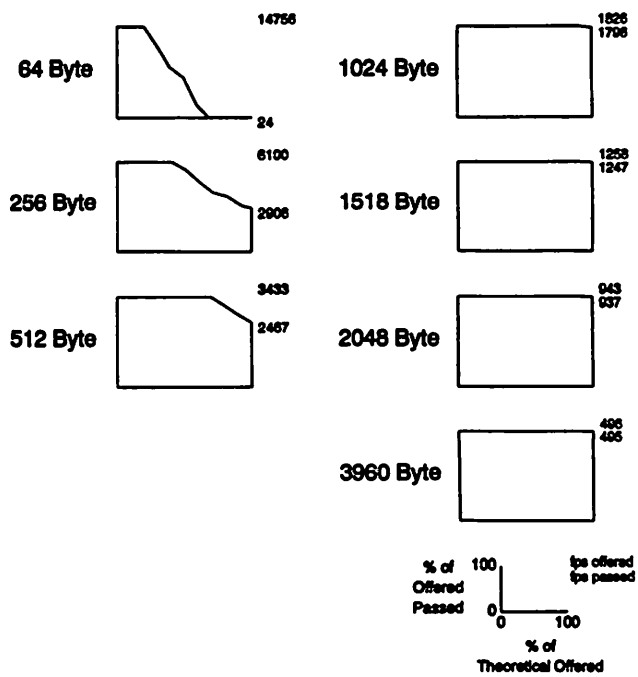


Date tested: 5/9/92, Software version: 3.0
Test Equipment: Protson tester & software-Harvard NDTL script

Ascom Timeplex TIME/LAN 100

Source Route Bridge

16Mb token ring to 16Mb token ring

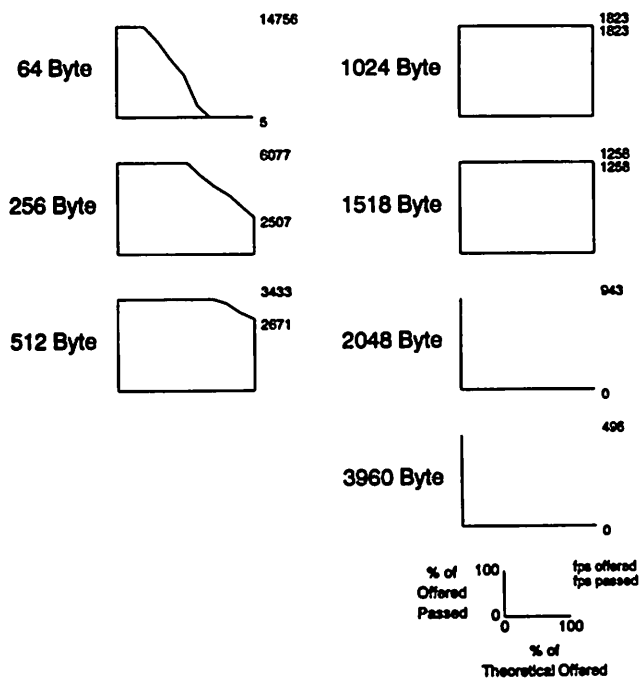


Date tested: 5/9/92, Software version: 3.0
Test Equipment: Protson tester & software-Harvard NDTL script

Ascom Timeplex TIME/LAN 100

Novell IPX

16Mb token ring to 16Mb token ring

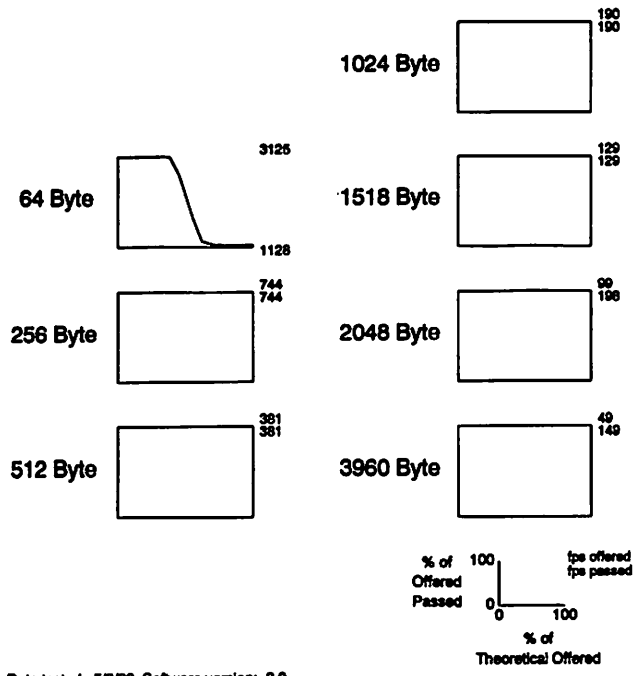


Date tested: 5/9/92, Software version: 3.0
Test Equipment: Protson tester & software-Harvard NDTL script

Ascom Timeplex TIME/LAN 100

TCP/IP

16MB token ring to 16MB token ring via t1 WAN

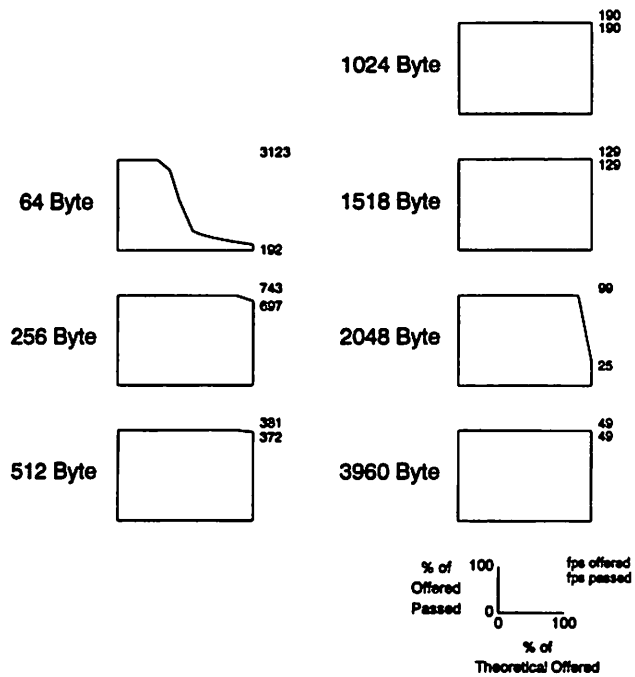


Date tested: 5/9/92, Software version: 3.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Ascom Timeplex TIME/LAN 100

SourceRouting

16MB token ring to 16MB token ring via t1 WAN

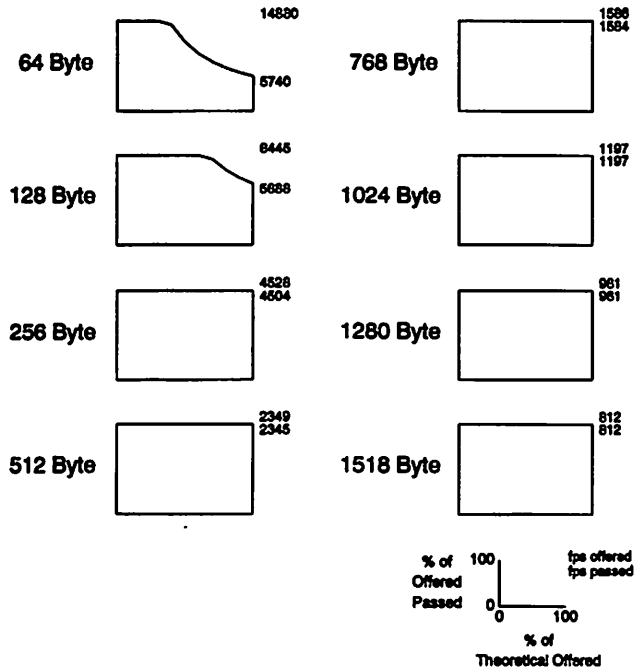


Date tested: 5/9/92, Software version: 3.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

BBN T/20

TCP/IP

1 eth to 1 eth, between cards

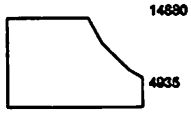


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

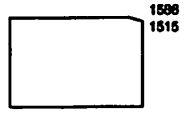
Cabletron MB25E

Bridge
1 eth to 1 eth

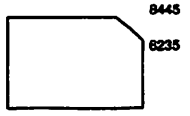
64 Byte



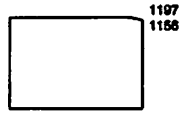
768 Byte



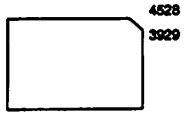
128 Byte



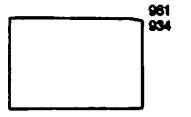
1024 Byte



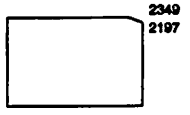
256 Byte



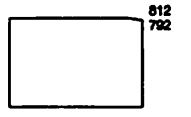
1280 Byte

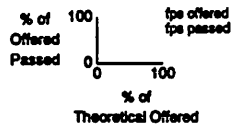


512 Byte



1518 Byte



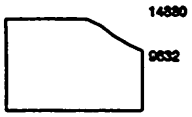


Date tested: 10/91 , Software version: -
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

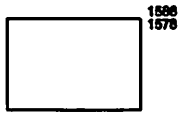
Chipcom \ 5102B-EE

Bridge
1 eth to 1 eth

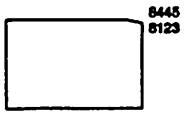
64 Byte



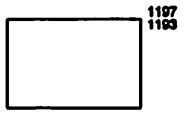
768 Byte



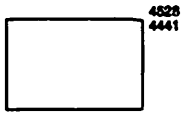
128 Byte



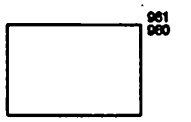
1024 Byte



256 Byte



1280 Byte



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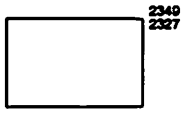
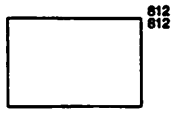
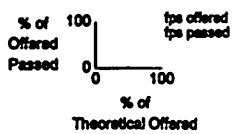


1518 Byte



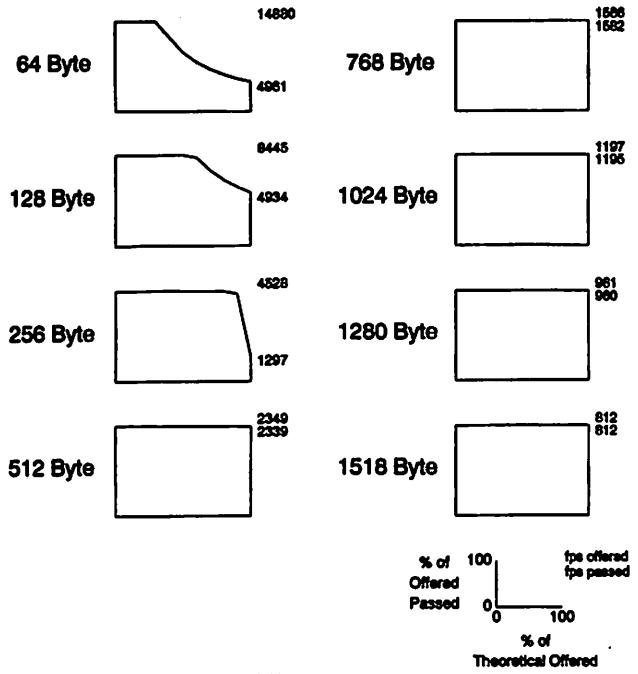


Date tested: 10/91 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Chipcom 5102R-EE

Bridge

1 eth to 1 eth, within interface card

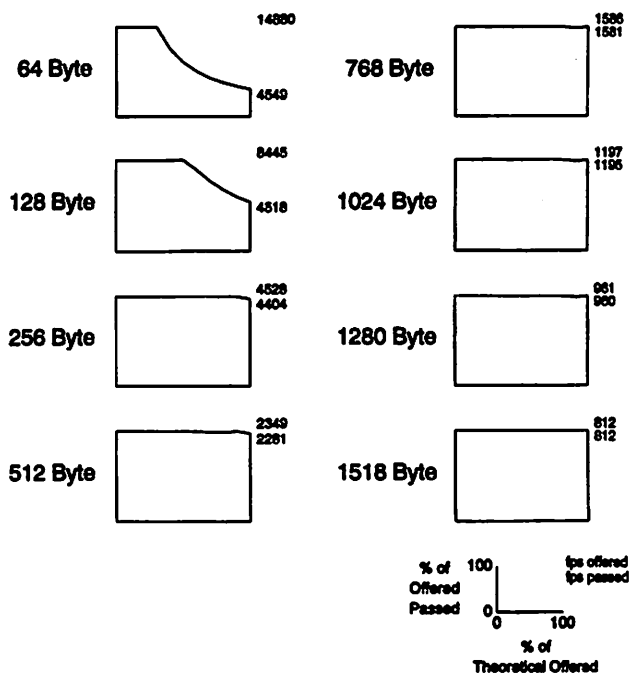


Date tested: 10/91 , Software version: 8.2(5)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Chipcom 5102R-EE

Novell IPX

1 eth to 1 eth, within interface card

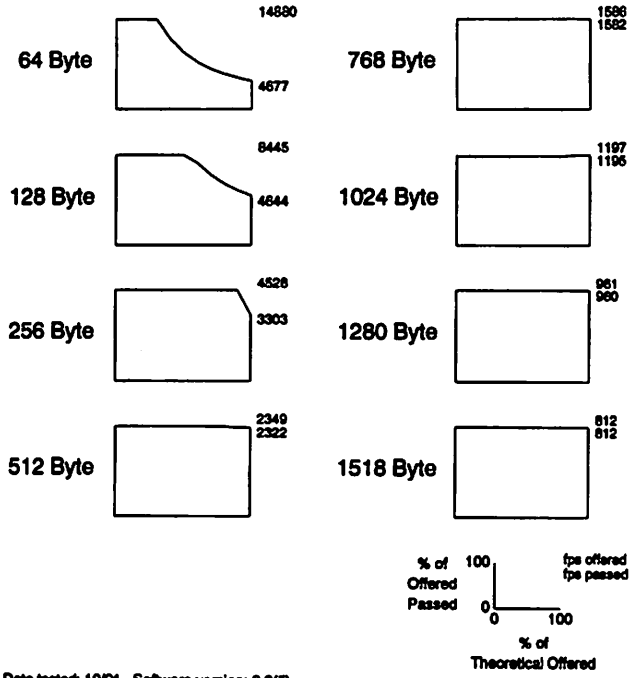


Date tested: 10/91 , Software version: 8.2(5)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipx)

Chipcom 5102R-EE

TCP/IP

1 eth to 1 eth, within interface card

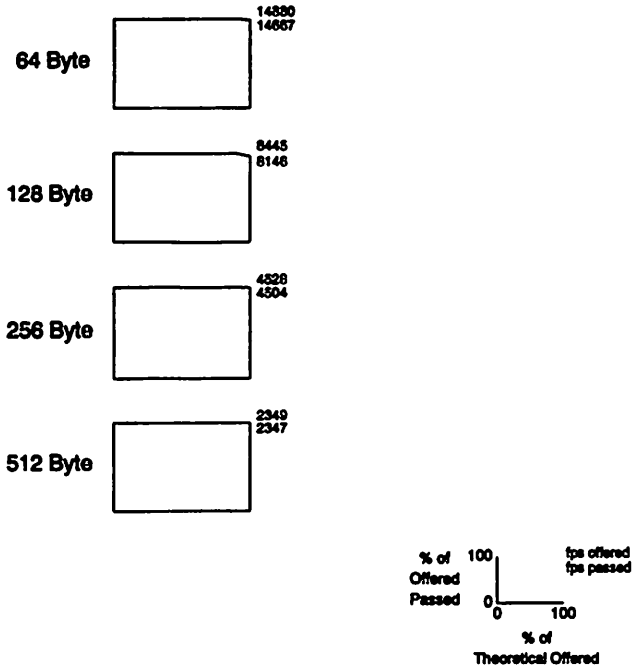


Date tested: 10/91 , Software version: 8.2(5)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Cisco Systems AGS+

AppleTalk

1 eth to 1 eth between interface cards

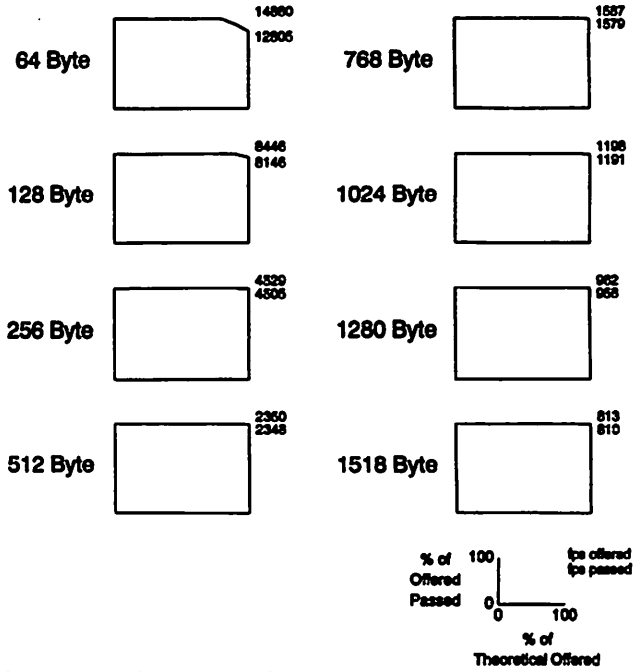


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_at)

Cisco Systems AGS+

DECnet

1 eth to 1 eth between interface cards

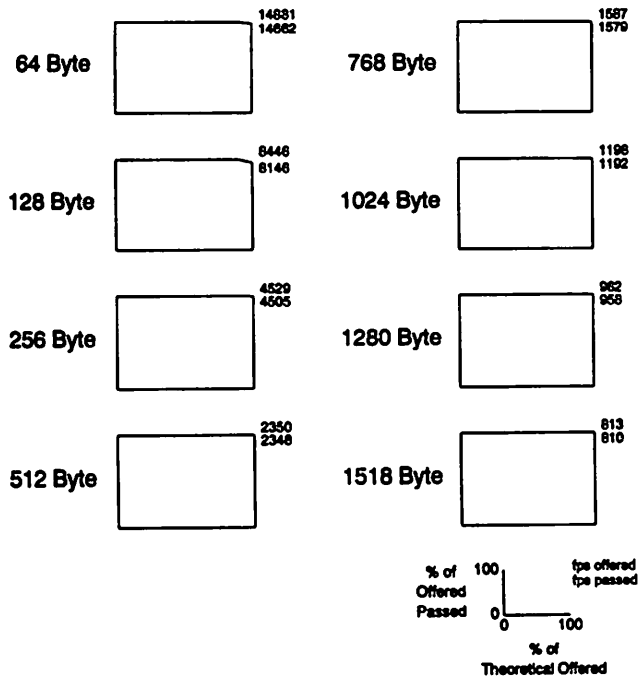


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_dn)

Cisco Systems AGS+

Bridge

1 eth to 1 eth between interface cards

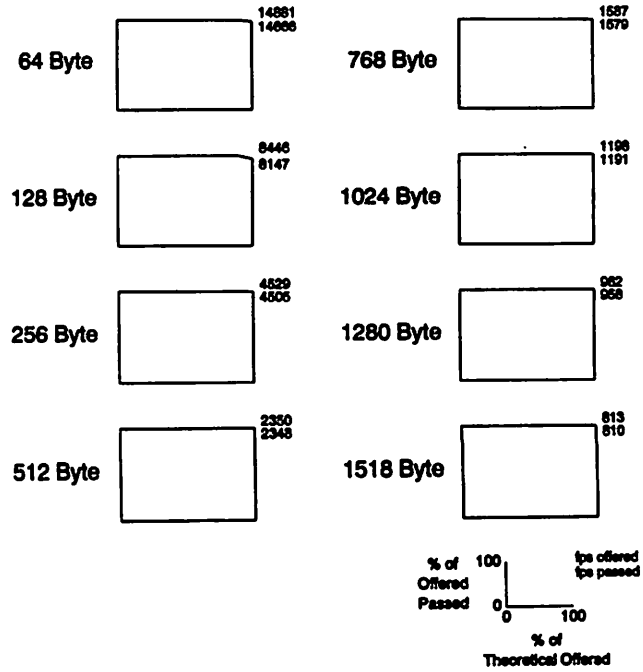


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Cisco Systems AGS+

TCP/IP

1 eth to 1 eth between interface cards



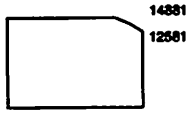
Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Cisco Systems AGS+

Novell IPX

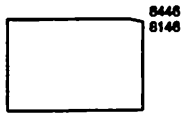
1 eth to 1 eth between interface cards

64 Byte

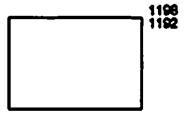


768 Byte

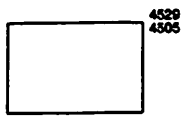
128 Byte



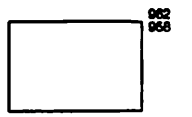
1024 Byte



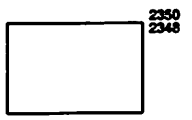
256 Byte



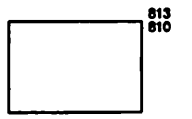
1280 Byte

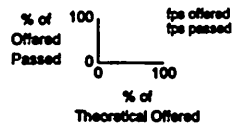


512 Byte



1518 Byte



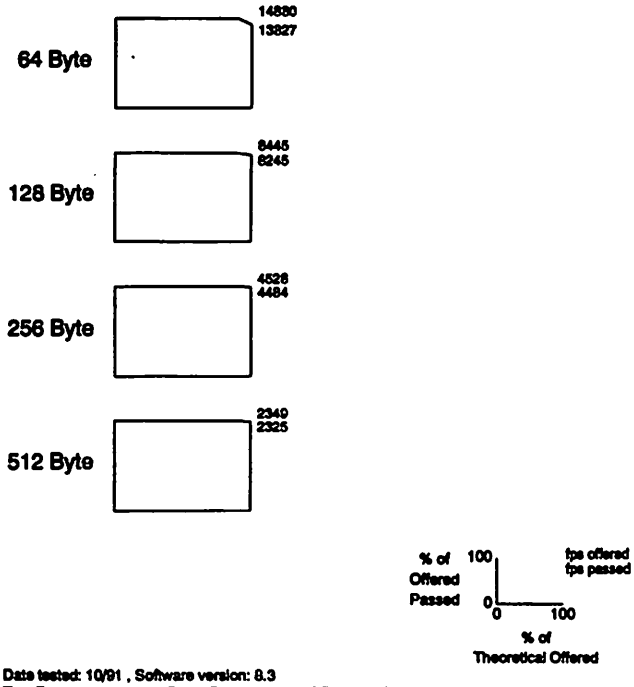


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipx)

Cisco Systems AGS+

AppleTalk

1 eth to 1 eth within an interface card

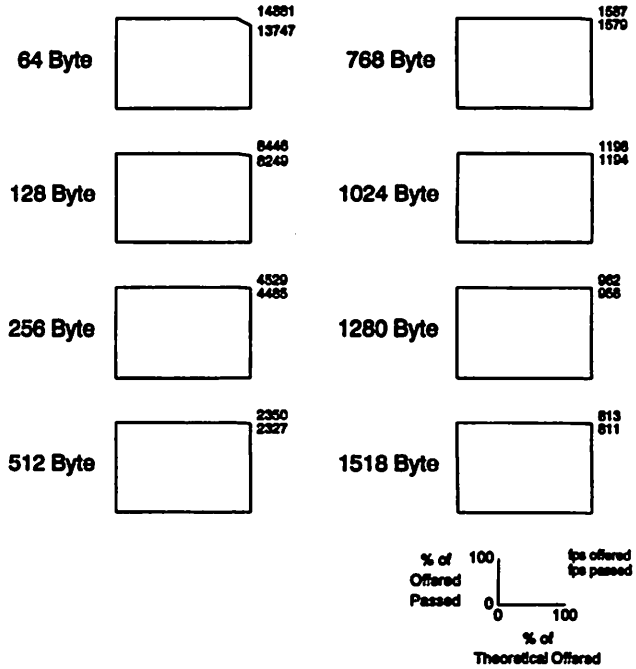


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_at)

Cisco Systems AGS+

TCP/IP

1 eth to 1 eth within an interface card

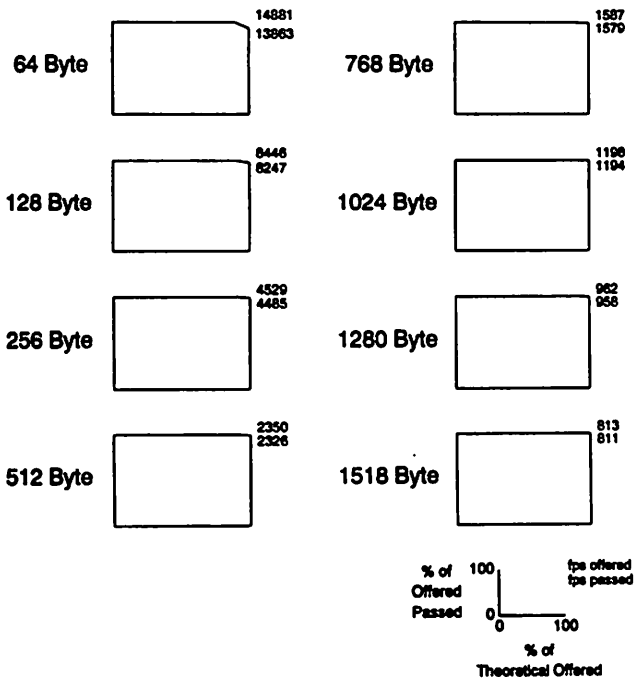


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Cisco Systems AGS+

Bridge

1 eth to 1 eth within an interface card

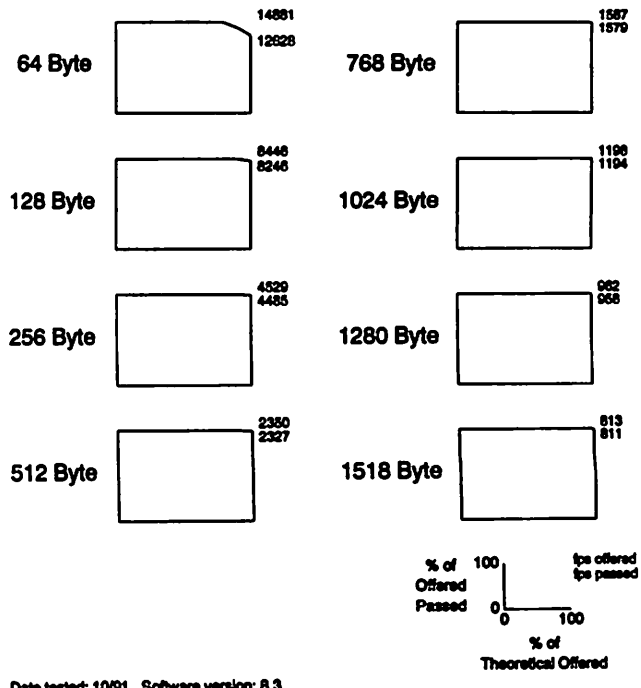


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Cisco Systems AGS+

Novell IPX

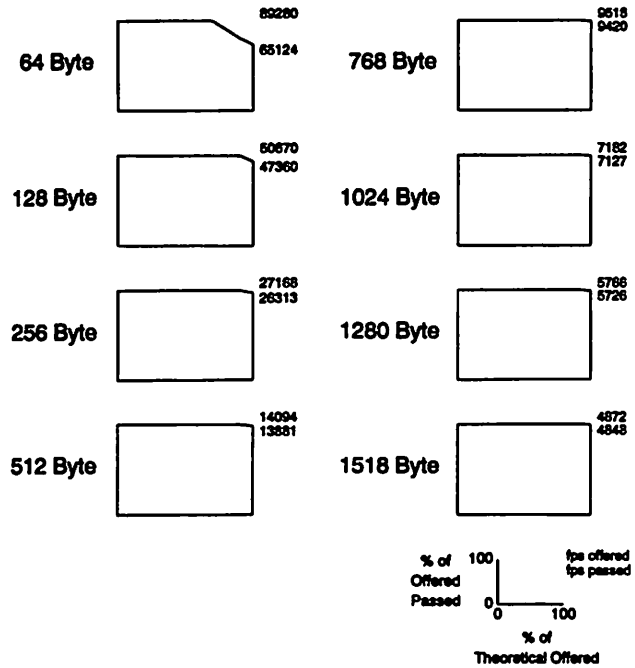
1 eth to 1 eth within an interface card



Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipx)

Cisco Systems AGS+

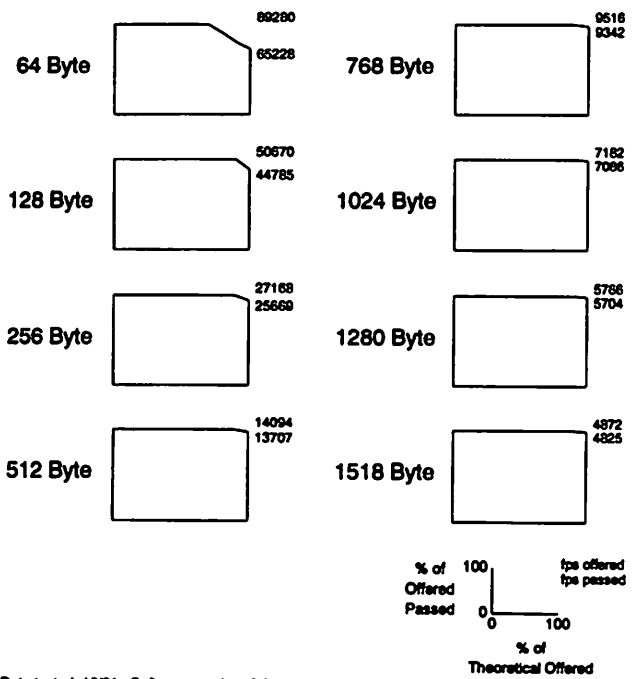
TCP/IP
6 eth to 6 eth



Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

Cisco Systems AGS+

TCP/IP
6 eth to 6 eth using MEC 6 interface cards

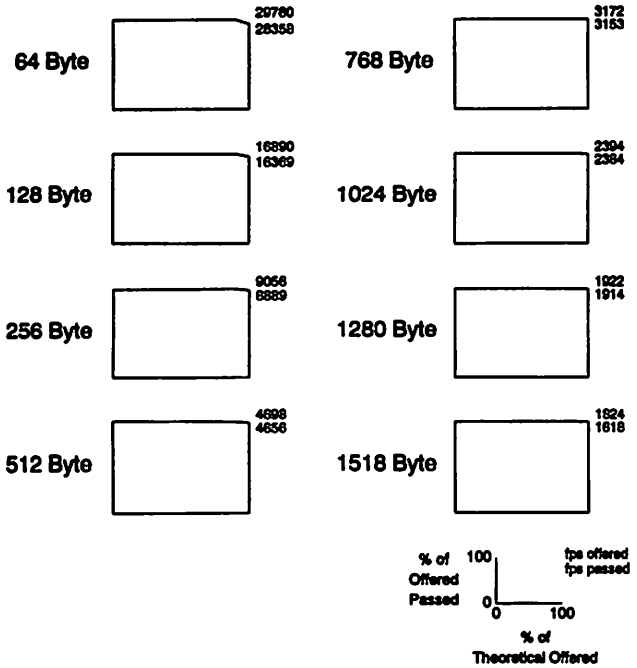


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

Cisco Systems AGS+

TCP/IP

2 eth to 2 eth via fddi

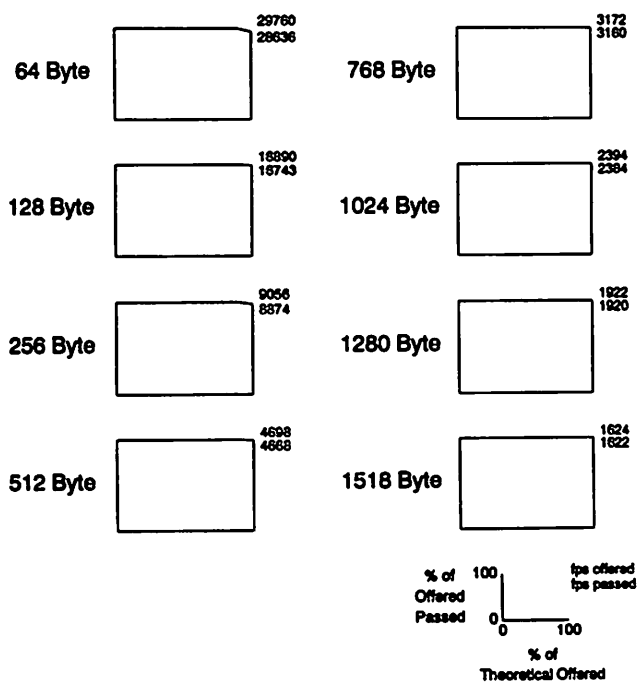


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_tp2s)

Cisco Systems AGS+

TCP/IP

2 eth to 2 eth via fddi, 2 way

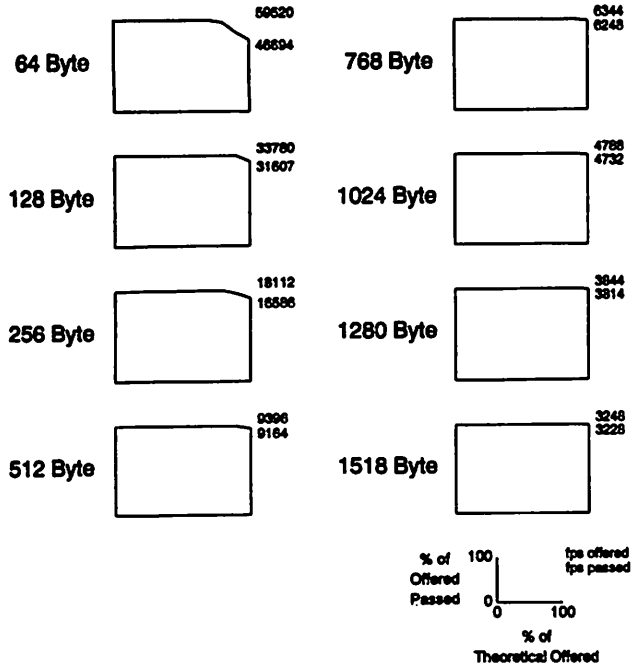


Date tested: 5/6/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip2s.1)

Cisco Systems AGS+

TCP/IP

4 eth to 4 eth via fddi

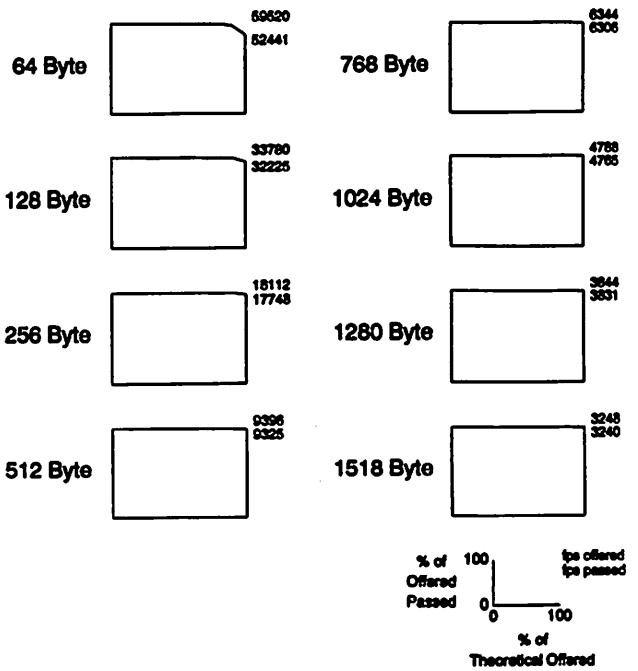


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Cisco Systems AGS+

TCP/IP

4 eth to 4 eth via fddi, 2 way

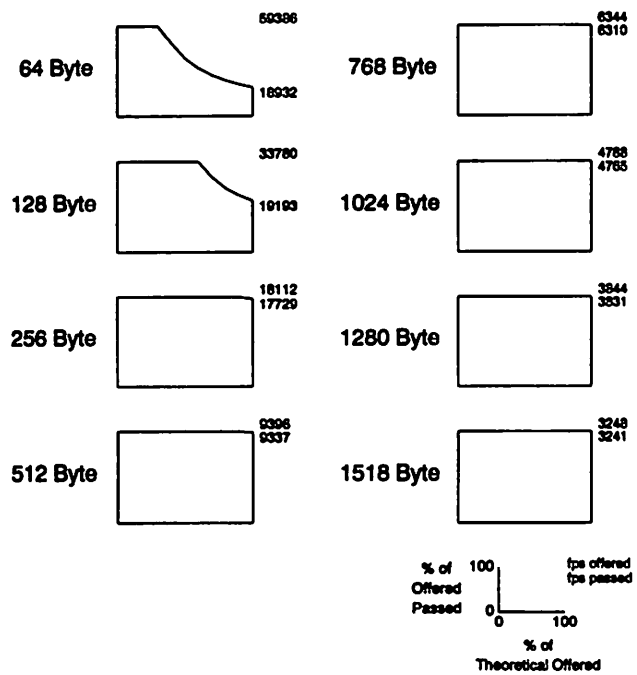


Date tested: 5/6/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s.1)

Cisco Systems AGS+

Bridge

4 eth to 4 eth via fddi, 2 way

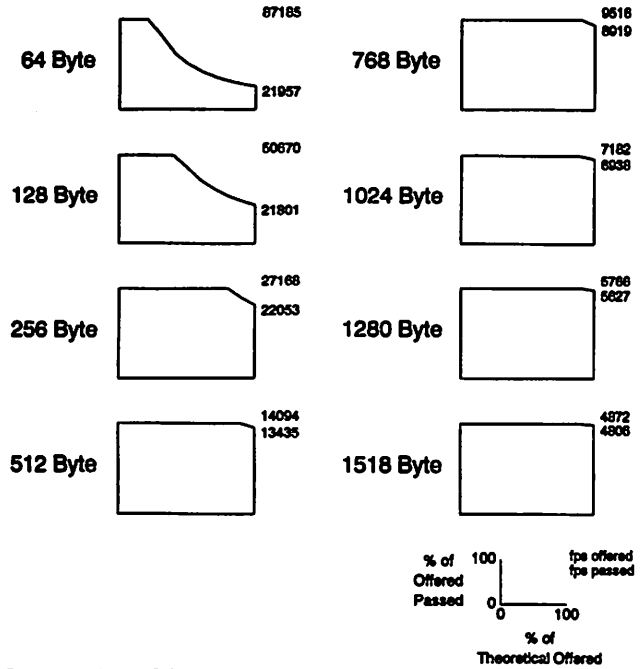


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s.1)

Cisco Systems AGS+

Bridge

6 eth to 6 eth via fddi

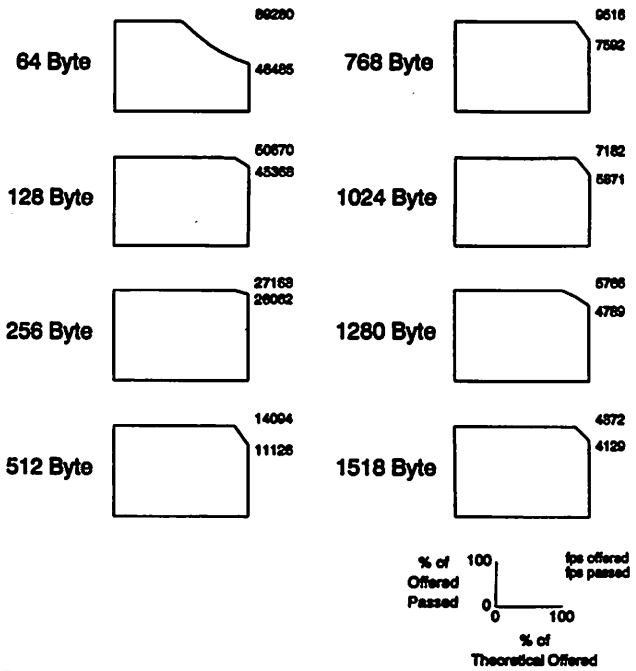


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s)

Cisco Systems AGS+

TCP/IP

6 eth to 6 eth via fddi, simple addressing

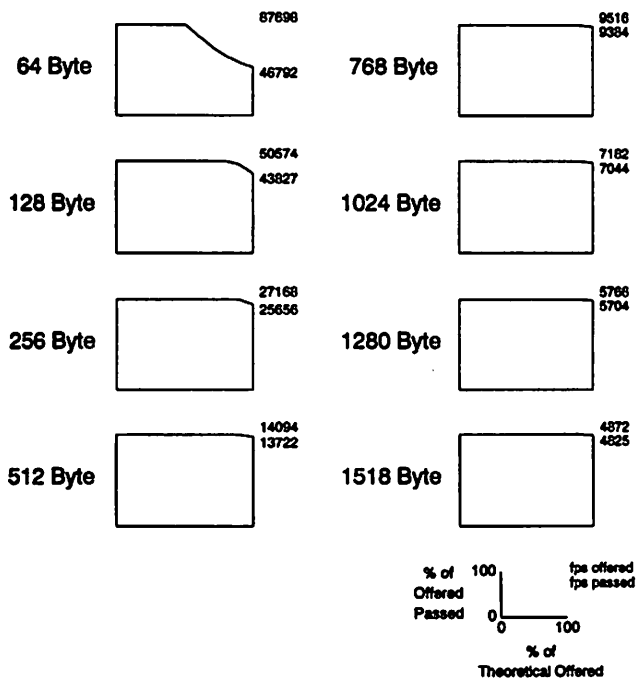


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s.1)

Cisco Systems AGS+

TCP/IP

6 eth to 6 eth via fddi

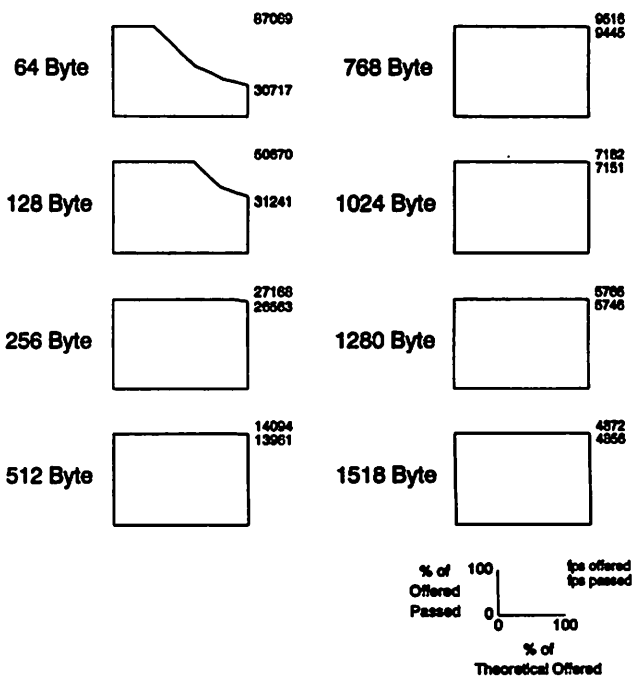


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s)

Cisco Systems AGS+

Bridge

6 eth to 6 eth via fdd2, 2 way

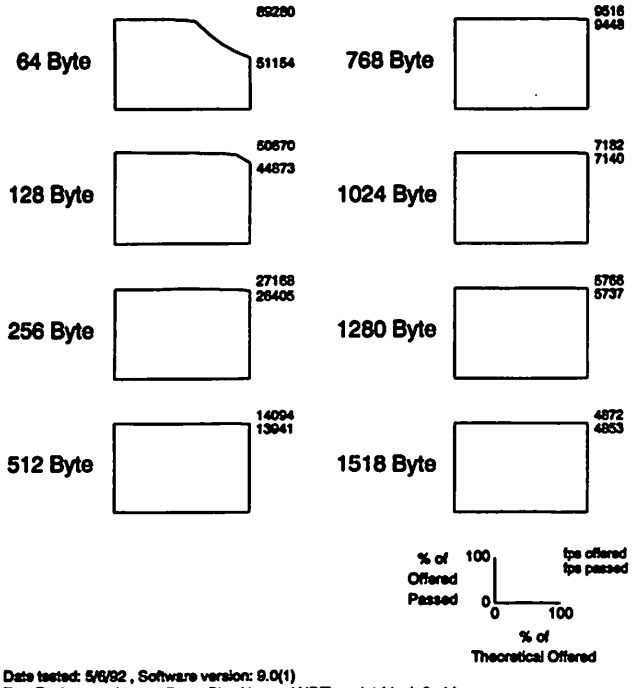


Date tested: 5/16/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s.1)

Cisco Systems AGS+

TCP/IP

6 eth to 6 eth via fddi, 2 way

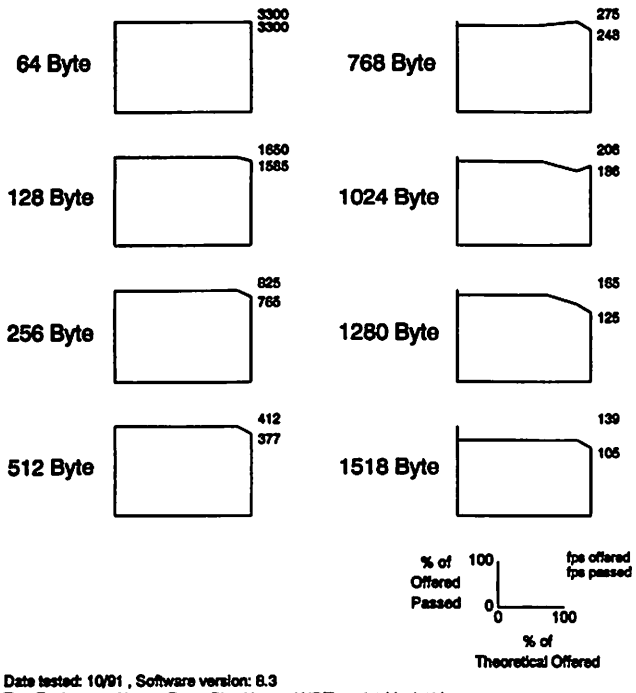


Date tested: 5/6/92 , Software version: 9.0(1)
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip6s.1)

Cisco Systems AGS+

TCP/IP

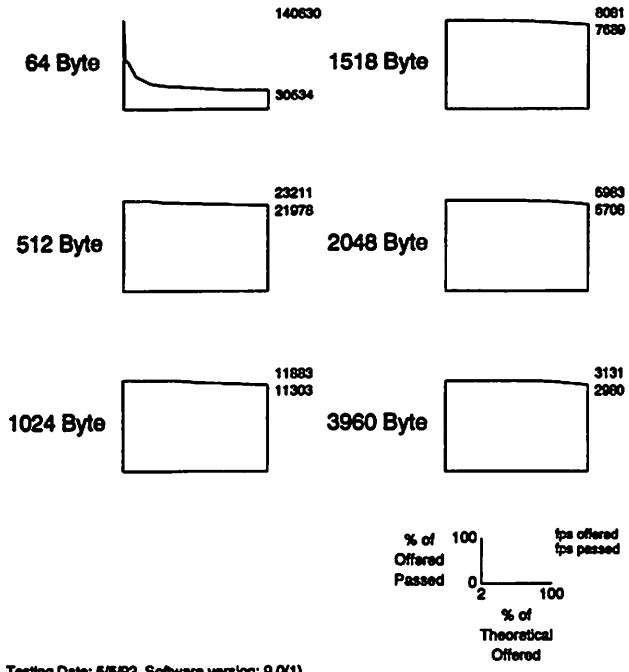
1 eth to 1 eth via T1 WAN



Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipti)

Cisco Systems AGS+

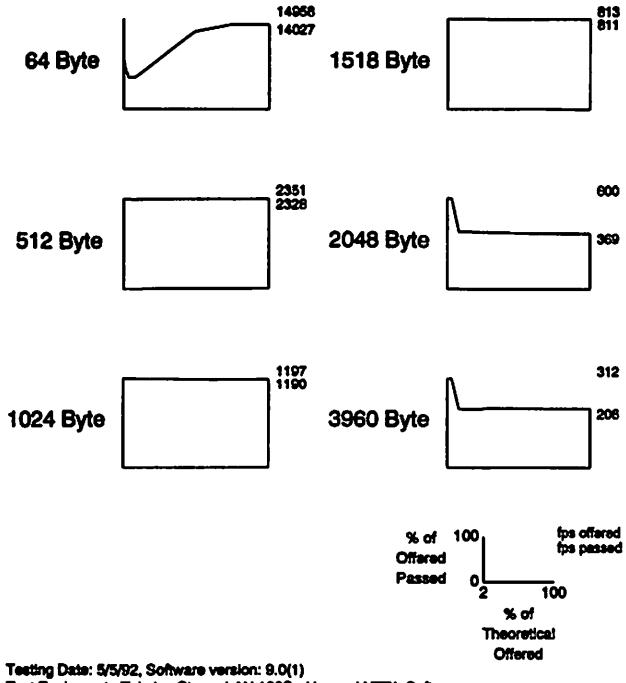
TCP/IP
FDDI to FDDI



Testing Date: 5/5/92, Software version: 9.0(1)
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Cisco Systems AGS+

TCP/IP
FDDI to FDDI via Ethernet

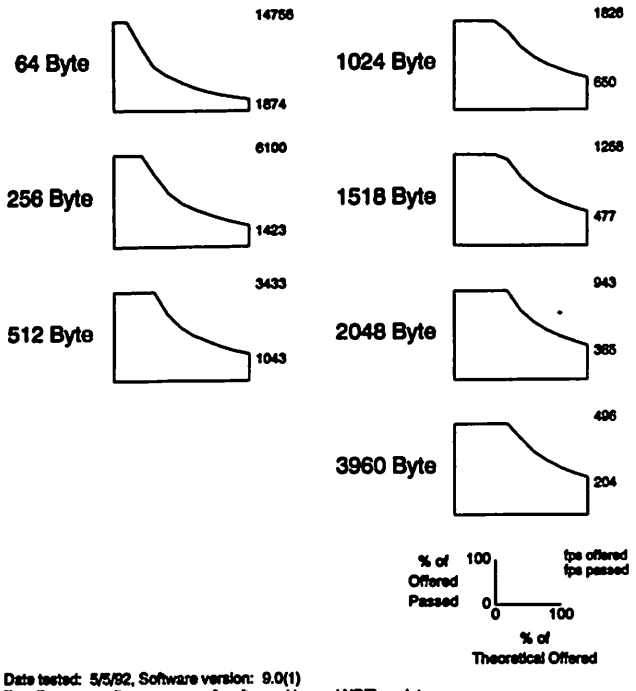


Testing Date: 5/5/92, Software version: 9.0(1)
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Cisco Systems AGS+

TCP/IP

16MB token ring to 16MB token ring

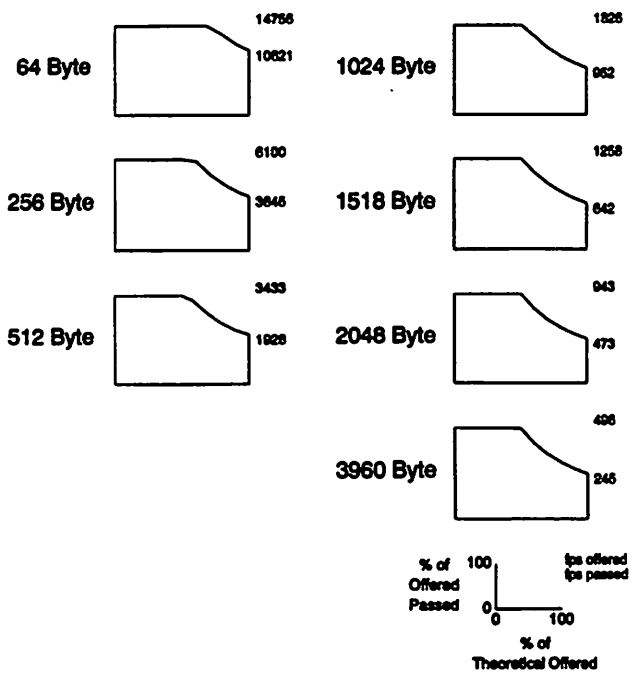


Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Protson tester & software-Harvard NDTL script

Cisco Systems AGS+

Source Route Bridge

16MB token ring to 16MB token ring

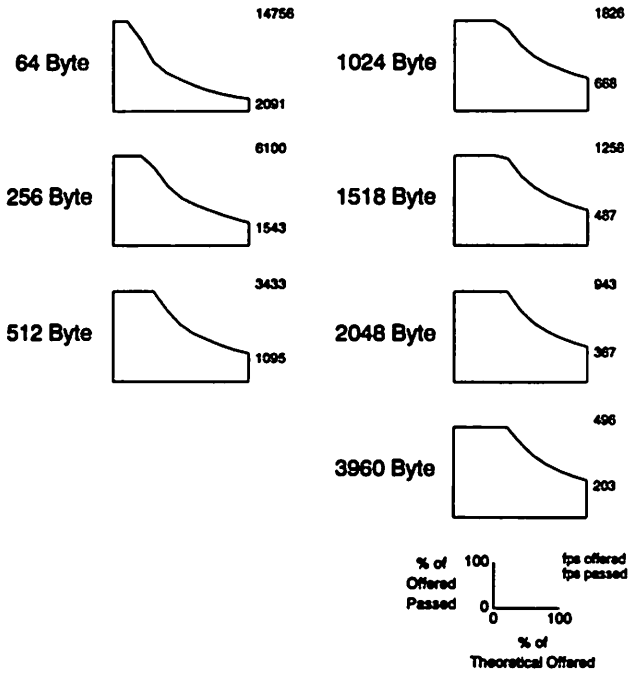


Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Protson tester & software-Harvard NDTL script

Cisco Systems AGS+

Novell IPX

16MB token ring to 16MB token ring



Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Protson tester & software-Harvard NDTL script

Cisco Systems AGS+

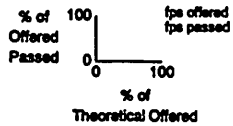
AppleTalk

16MB token ring to 16MB token ring via 56Kb WAN

64 Byte 110 110

256 Byte 27 27

512 Byte 14 14



Date tested: 5/16/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco Systems AGS+

Novell IPX

16MB token ring to 16MB token ring via 56Kb WAN

1024 Byte 6 6

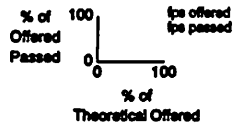
64 Byte 110 110

1518 Byte 4 4

256 Byte 27 26

2048 Byte 3 3

512 Byte 14 14



Date tested: 5/16/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco Systems AGS+

TCP/IP

16MB token ring to 16MB token ring via 56Kb WAN

48 Byte 150 150

1024 Byte 6 6

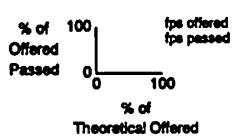
64 Byte 110 110

1518 Byte 4 4

256 Byte 27 27

2048 Byte 3 6

512 Byte 14 14

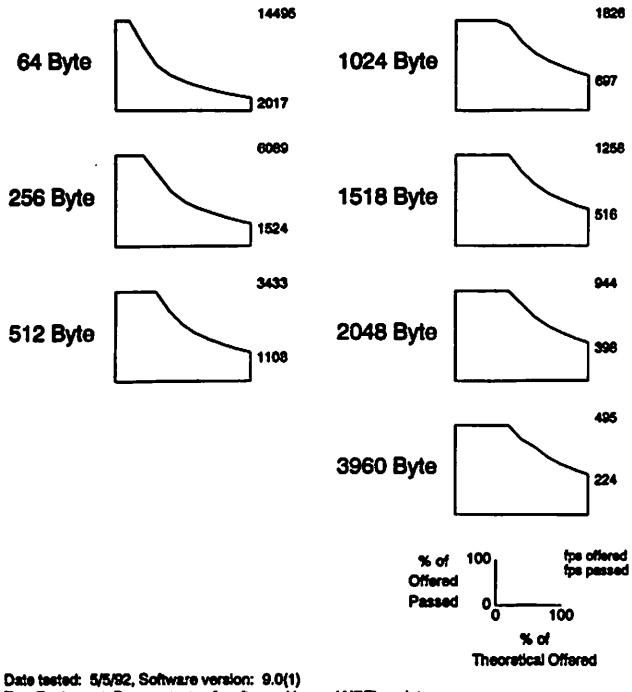


Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco Systems AGS+

TCP/IP

16MB token ring to 16MB token ring via FDDI

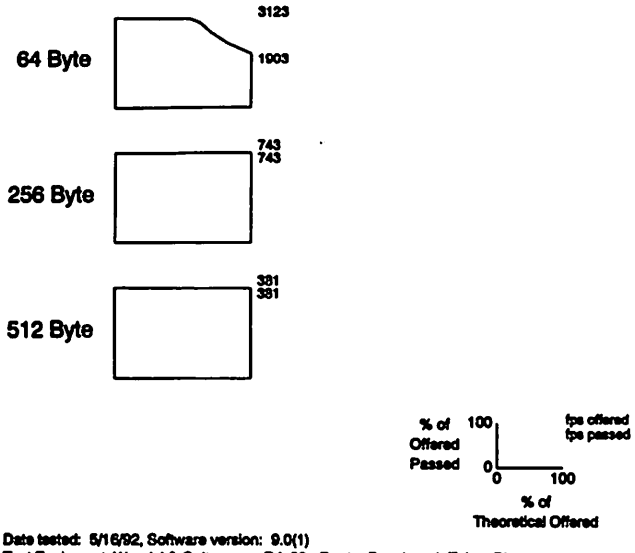


Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Protocn tester & software-Harvard NDTL script

Cisco Systems AGS+

AppleTalk

16MB token ring to 16MB token ring via t1 WAN

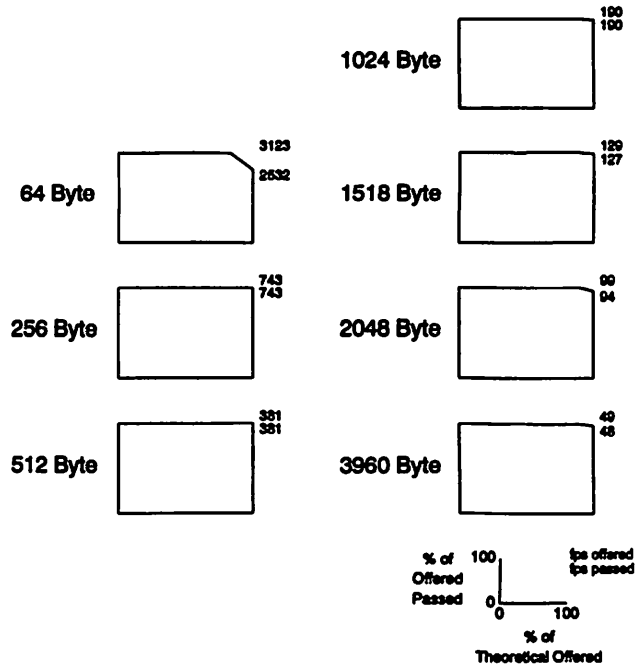


Date tested: 5/16/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco Systems AGS+

Novell IPX

16MB token ring to 16MB token ring via t1 WAN

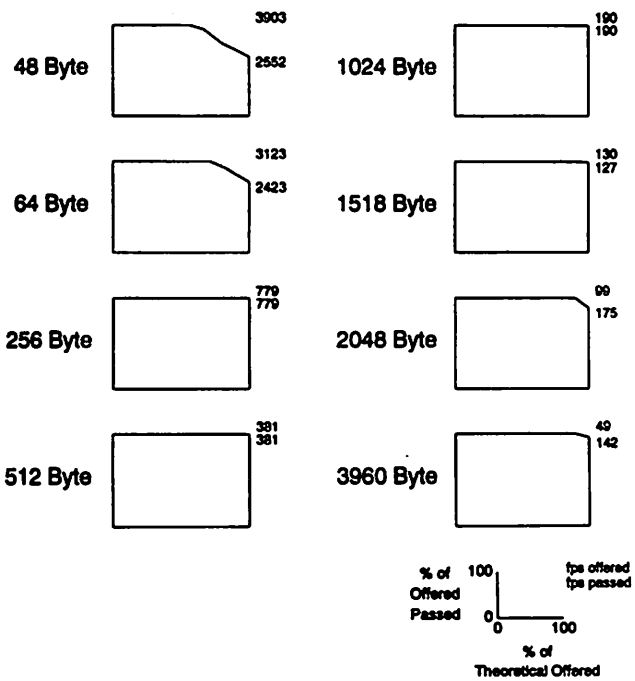


Date tested: 5/16/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco Systems AGS+

TCP/IP

16MB token ring to 16MB token ring via T1 WAN

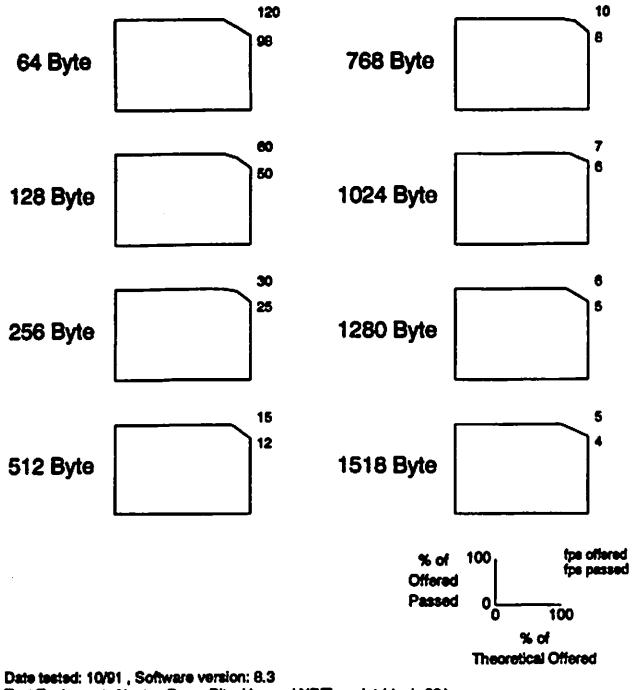


Date tested: 5/5/92, Software version: 9.0(1)
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Cisco IGS

Bridge

1 eth to 1 eth via 56Kb WAN

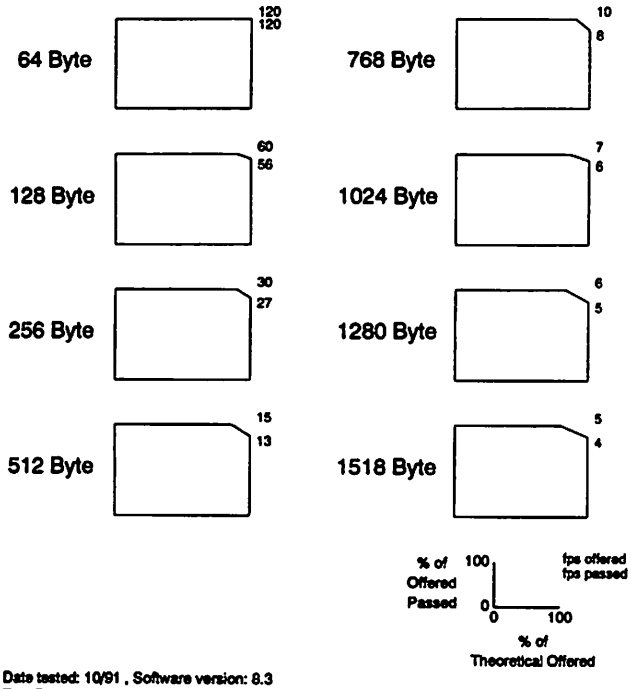


Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br56)

Cisco IGS

TCP/IP

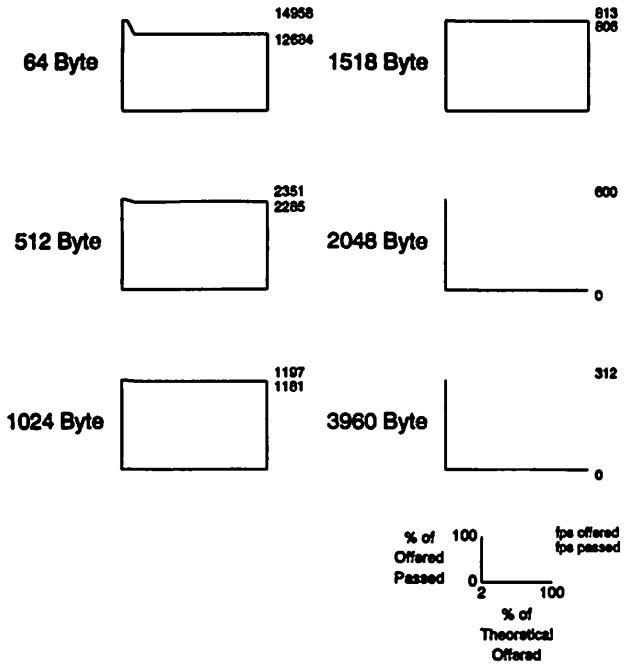
1 eth to 1 eth via 56Kb WAN



Date tested: 10/91 , Software version: 8.3
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip56)

Coral Network Corporation CX1600

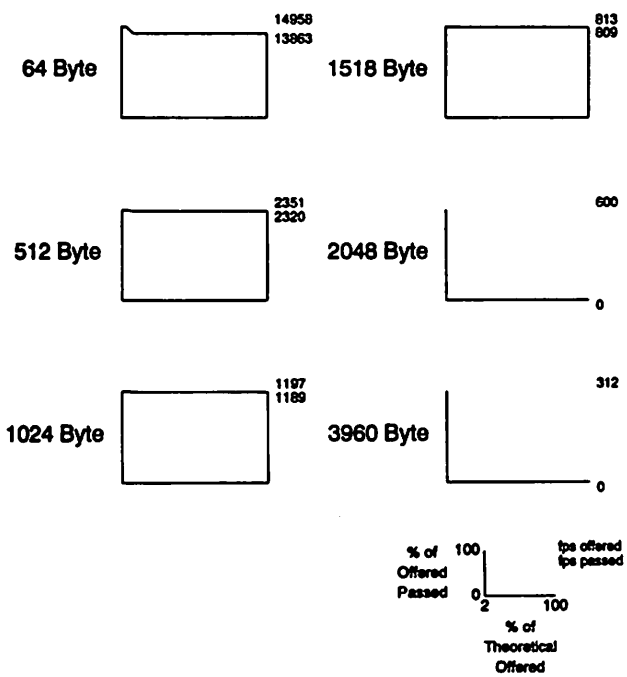
Bridge
FDDI to FDDI via Ethernet



Testing Date: 5/14/92, Software version: 1.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Coral Network Corporation CX1600

IP
FDDI to FDDI via Ethernet

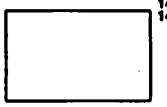


Testing Date: 5/14/92, Software version: 1.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

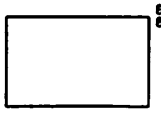
Coral Network Corporation CX1600

Bridge
FDDI to FDDI

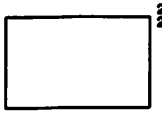
64 Byte



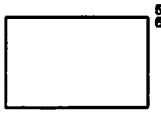
1518 Byte



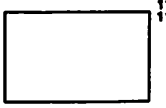
512 Byte



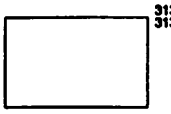
2048 Byte

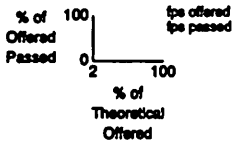


1024 Byte



3960 Byte



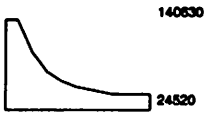


Testing Date: 5/7/92, Software version: 1.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Coral Network Corporation CX1600

IP
FDDI to FDDI

64 Byte

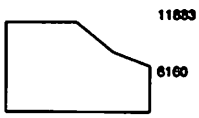


1518 Byte

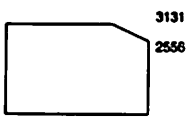
512 Byte

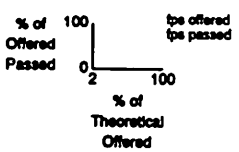
2048 Byte

1024 Byte



3960 Byte

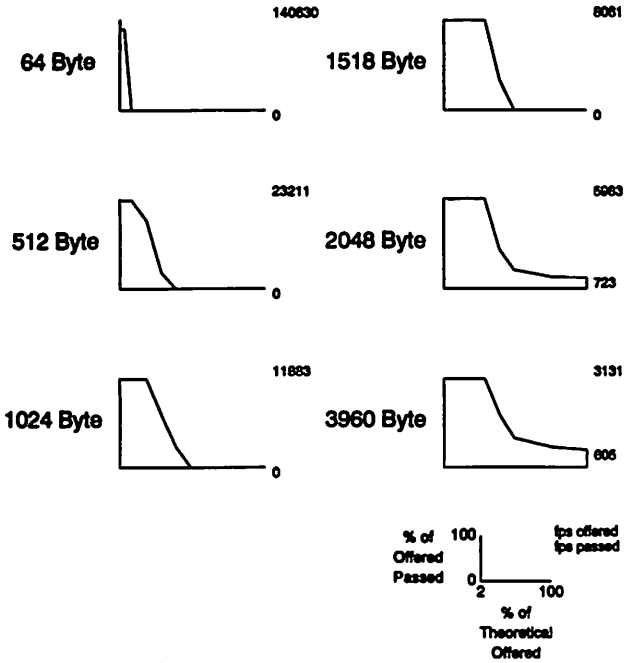




Testing Date: 5/7/92, Software version: 1.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Crescendo SBus Adapter

IP
FDDI to FDDI via SUN SS2



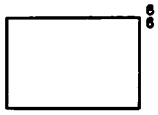
Testing Date: 4/28/92, Software version: 1.3
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Develcon 220LM3-SA

SourceRouting

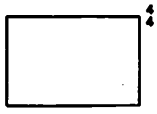
16MB token ring to 16MB token ring via 56Kb WAN

1024 Byte

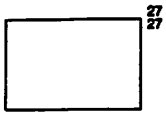


64 Byte

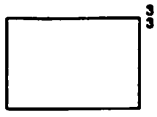
1518 Byte



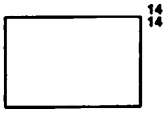
256 Byte

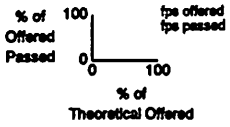


2048 Byte



512 Byte



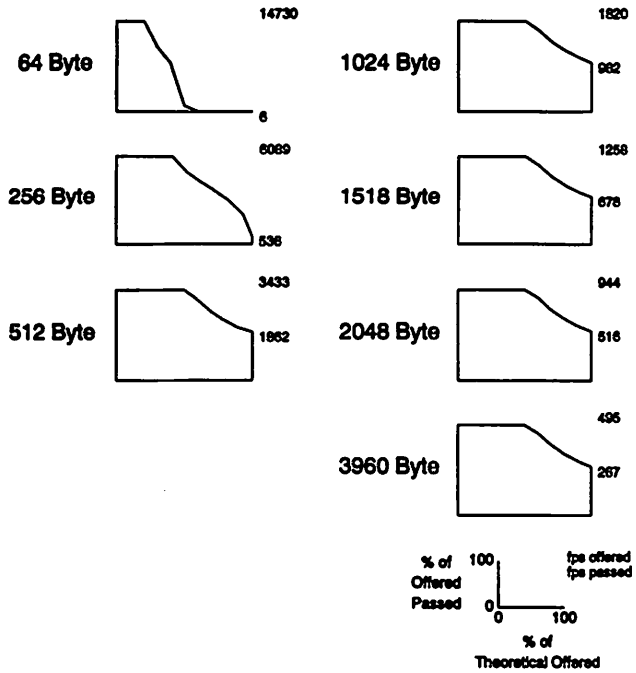


Date tested: 5/13/92, Software version: 3.0.14
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Develcon 220M-SA

Source Route Bridge

16MB token ring to 16MB token ring

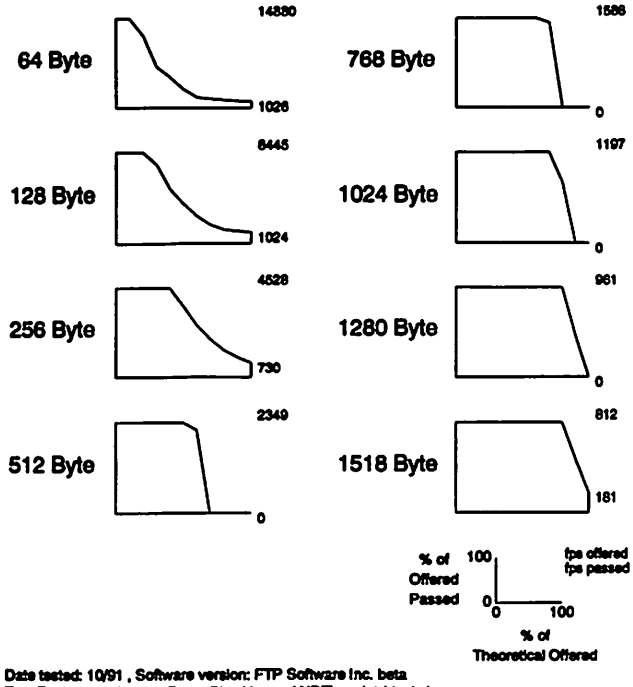


Date tested: 5/13/92, Software version: 3.4.10
Test Equipment: Proteon tester & software-Harvard NDTL script

FTP Software Inc. router software

TCP/IP

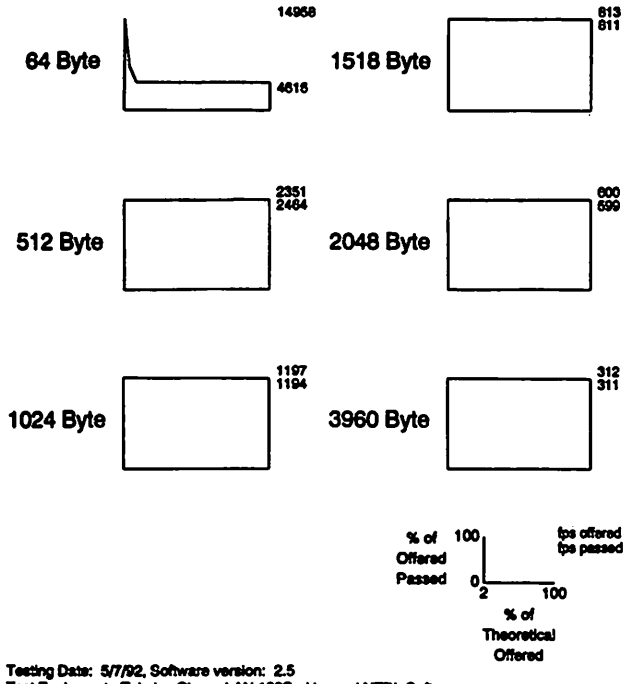
1 eth to 1 eth



Date tested: 10/91 , Software version: FTP Software Inc. beta
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_tp)

Fibronics FX8210B

IP
FDDI to FDDI via Ethernet



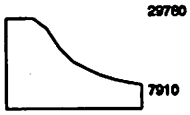
Testing Date: 5/7/92, Software version: 2.5
Test Equipment: Teksiec ChameLAN 100S - Harvard NTDL Software

Fibronics 8610

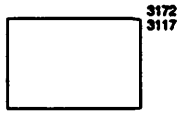
Bridge

2 eth to 2 eth via fddi

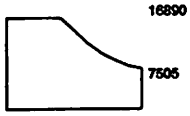
64 Byte



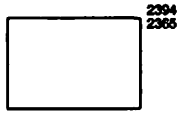
768 Byte



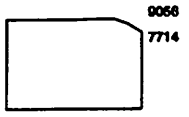
128 Byte



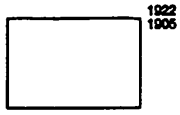
1024 Byte



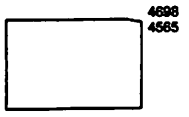
256 Byte



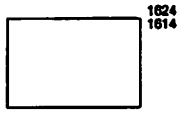
1280 Byte

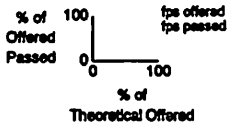


512 Byte



1518 Byte



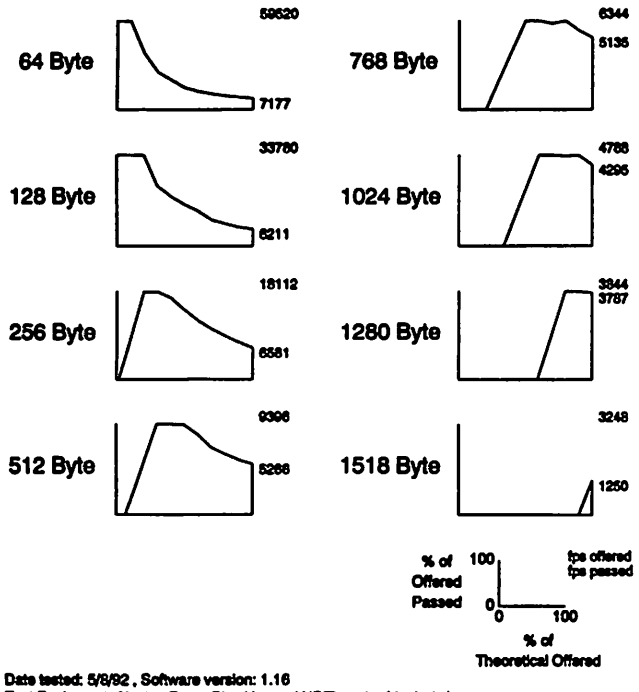


Date tested: 5/8/92 , Software version: 1.16
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br2s)

Fibronics 8610

Bridge

4 eth to 4 eth via fddi

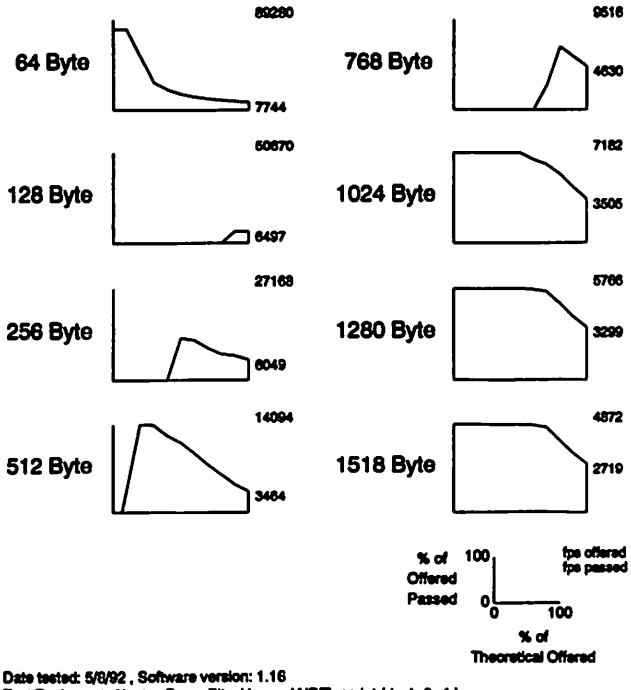


Date tested: 5/8/92 , Software version: 1.16
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Fibronics 8610

Bridge

6 eth to 6 eth via fddi

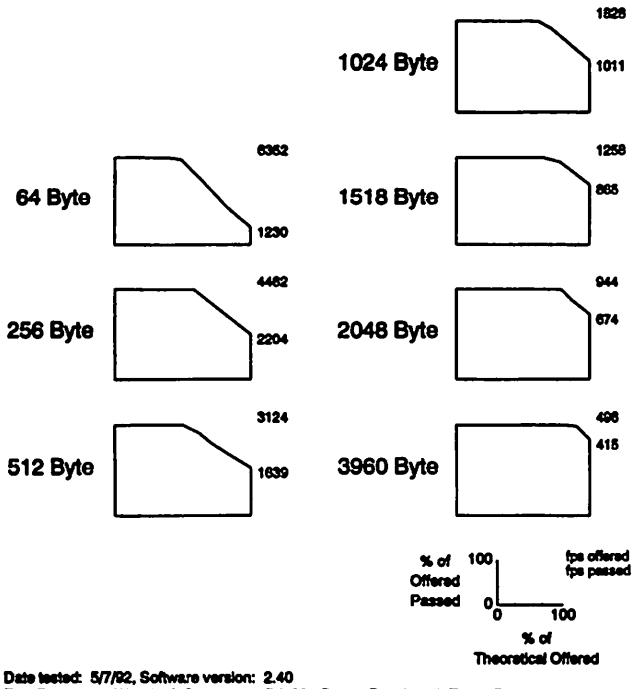


Date tested: 5/8/92 , Software version: 1.16
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s.1)

Fibronics FX8210/TT

SourceRouting

16Mb token ring to 16Mb token ring via FDDI

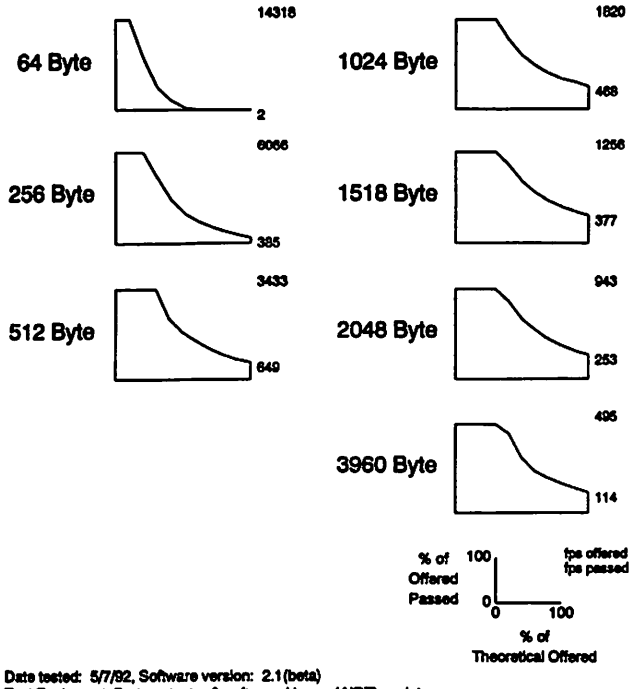


Date tested: 5/7/92, Software version: 2.40
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Fibronics FR 9500

Source Route Bridge

16Mb token ring to 16Mb token ring

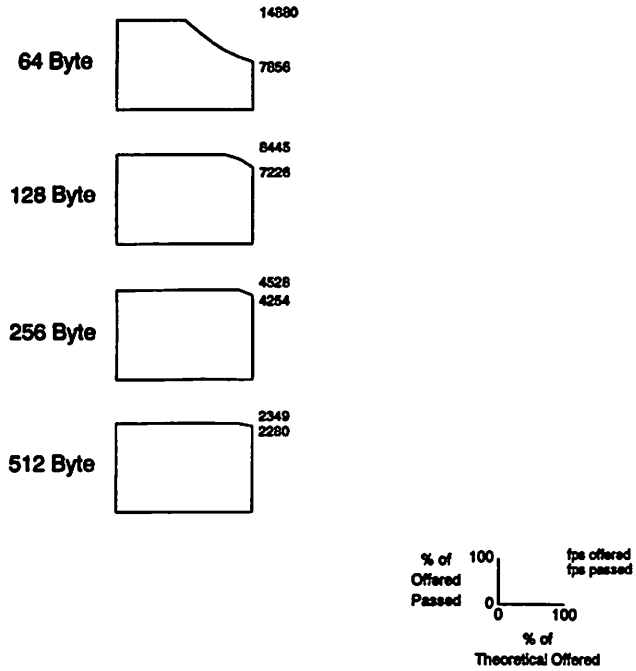


Date tested: 5/7/92, Software version: 2.1(beta)
Test Equipment: Protson tester & software-Harvard NDTL script

HP 27285A

AppleTalk

1 eth to 1 eth within an interface board

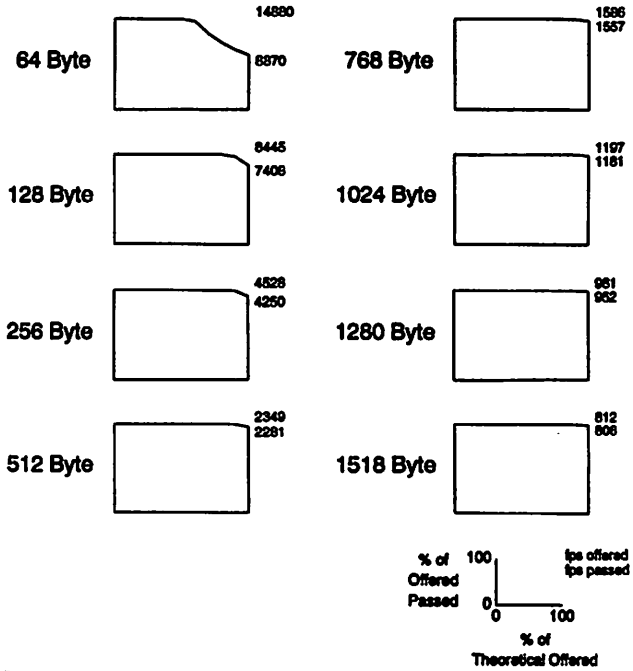


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_at)

HP 27285A

TCP/IP

1 eth to 1 eth within an interface board

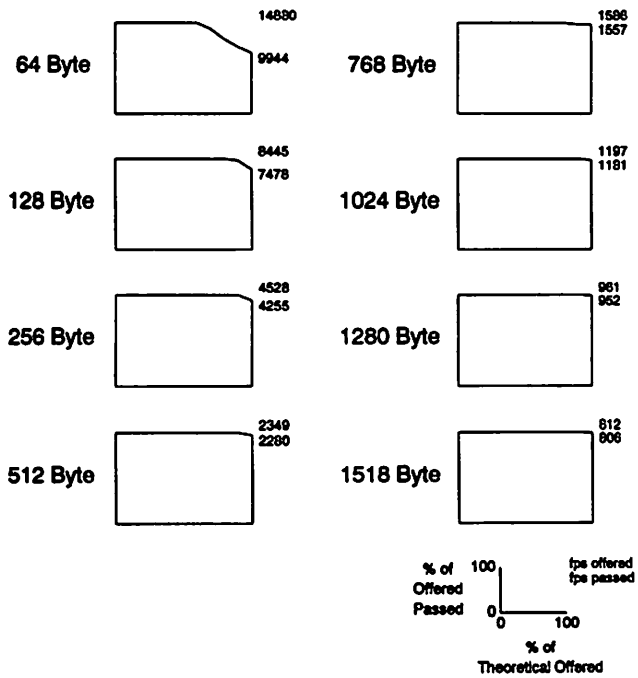


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

HP 27285A

Bridge

1 eth to 1 eth within an interface board

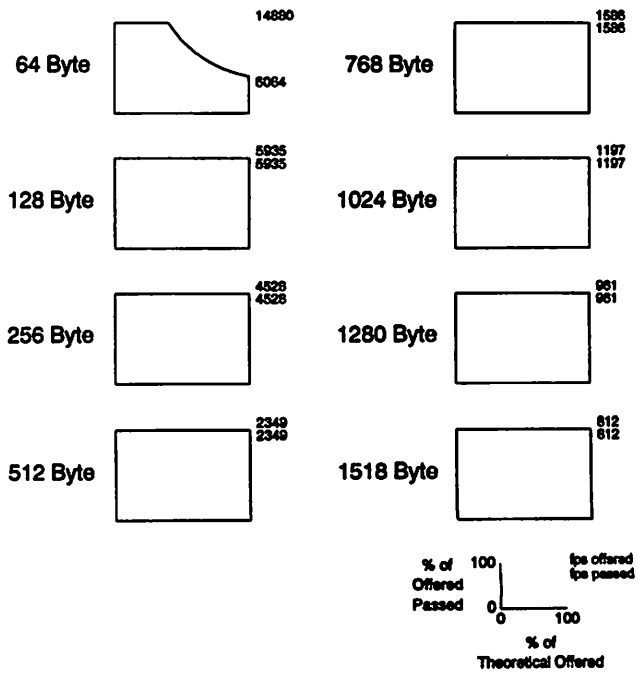


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

HP 27285A

Novell IPX

1 eth to 1 eth within an interface board



Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipx)

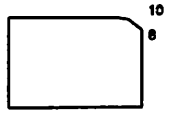
HP 27285A

TCP/IP

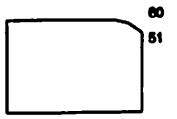
1 eth to 1 eth via 56Kb WAN

64 Byte

768 Byte

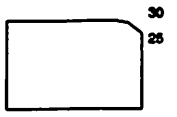


128 Byte

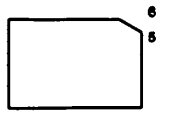


1024 Byte

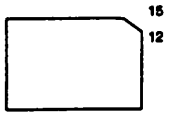
256 Byte



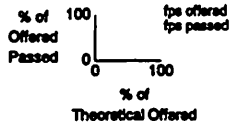
1280 Byte



512 Byte



1518 Byte

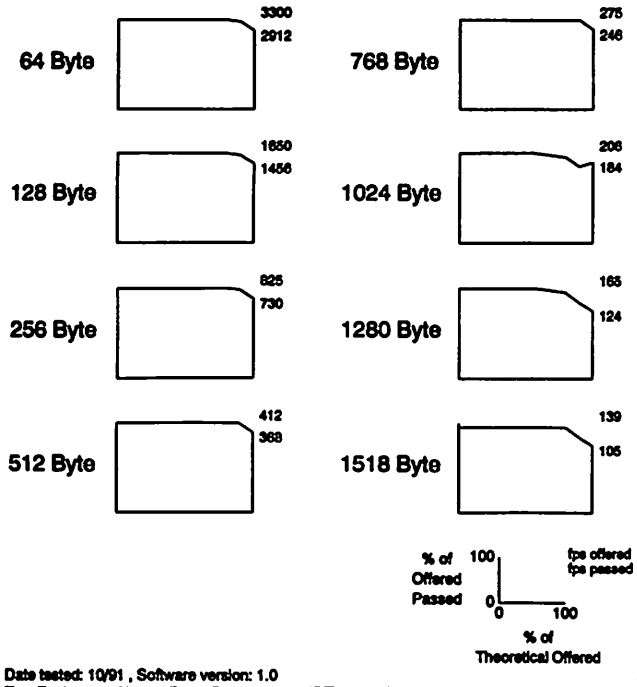


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip56)

HP 27285A

TCP/IP

1 eth to 1 eth via T1 WAN

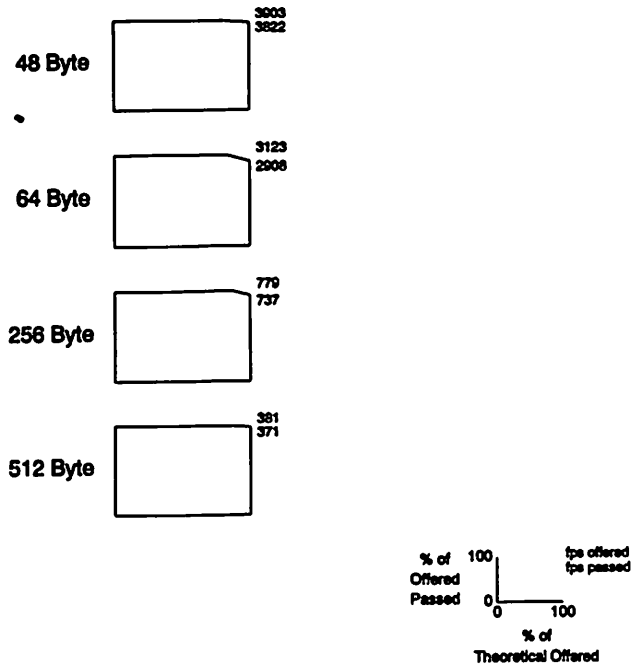


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipt1)

HP 27286A

AppleTalk

16MB token ring to 16MB token ring via T1 WAN

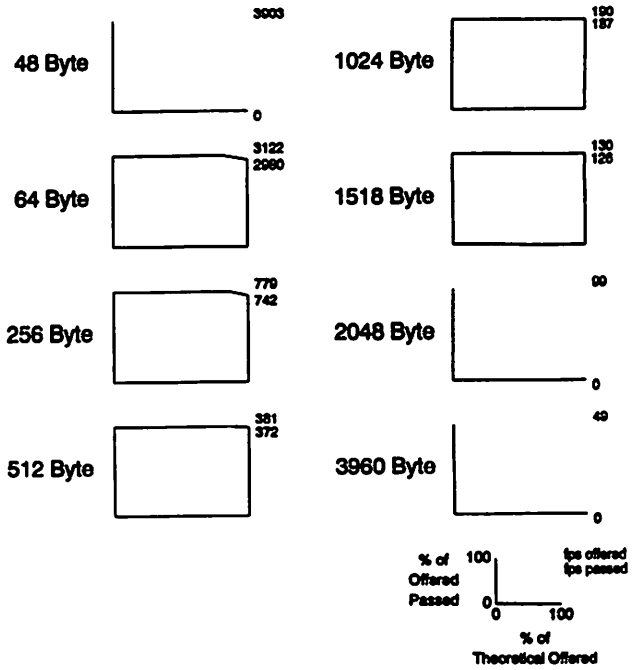


Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 27286A

Novell IPX

16MB token ring to 16MB token ring via T1 WAN

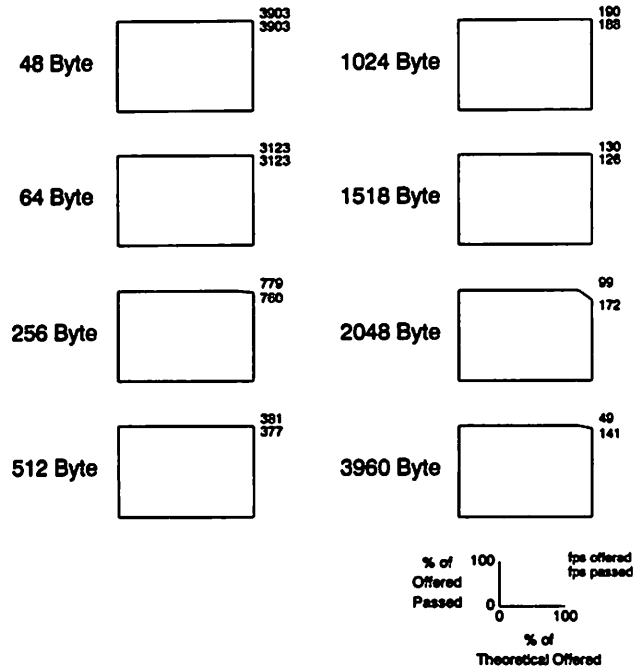


Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 27286A

TCP/IP

16MB token ring to 16MB token ring via T1 WAN

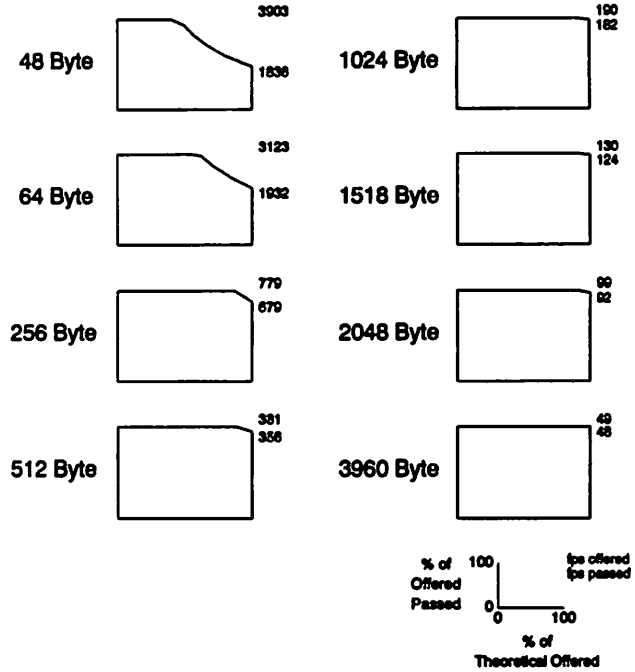


Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 27286A

SourceRouting

16MB token ring to 16MB token ring via T1 WAN



Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 27286A

AppleTalk

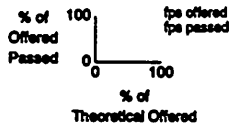
token to token via 56KB WAN

48 Byte 

64 Byte 

256 Byte 

512 Byte 

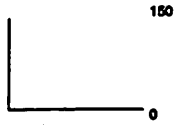


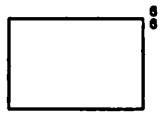
Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

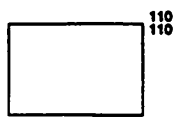
HP 27286A

Novell IPX

token to token via 56KB WAN

48 Byte 

1024 Byte 

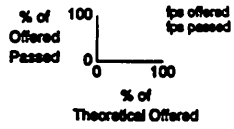
64 Byte 

1518 Byte 

256 Byte 

2048 Byte 

512 Byte 

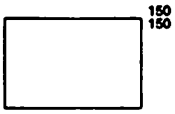


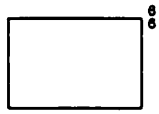
Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

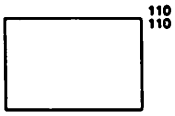
HP 27286A

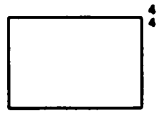
TCP/IP

token to token via 56KB WAN

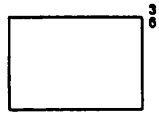
48 Byte 

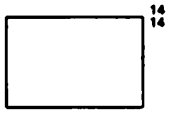
1024 Byte 

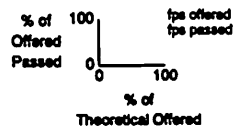
64 Byte 

1518 Byte 

256 Byte 

2048 Byte 

512 Byte 

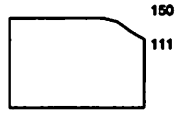


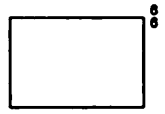
Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 27286A

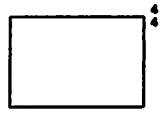
SourceRouting

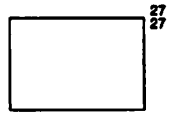
token to token via 56KB WAN

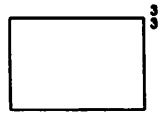
48 Byte 

1024 Byte 

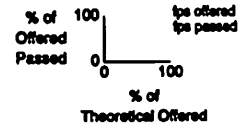
64 Byte 

1518 Byte 

256 Byte 

2048 Byte 

512 Byte 



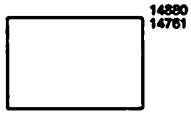
Date tested: 4/27/92, Software version: V5.70.06
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

HP 28673A

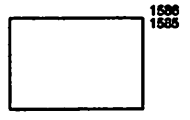
Bridge

1 eth to 1 eth within an interface board

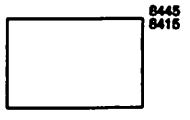
64 Byte



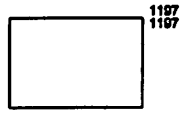
768 Byte



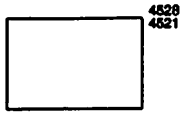
128 Byte



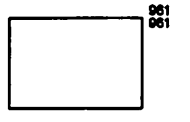
1024 Byte



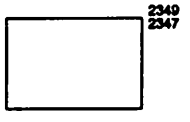
256 Byte



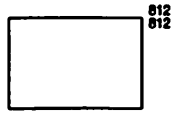
1280 Byte

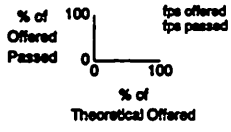


512 Byte



1518 Byte



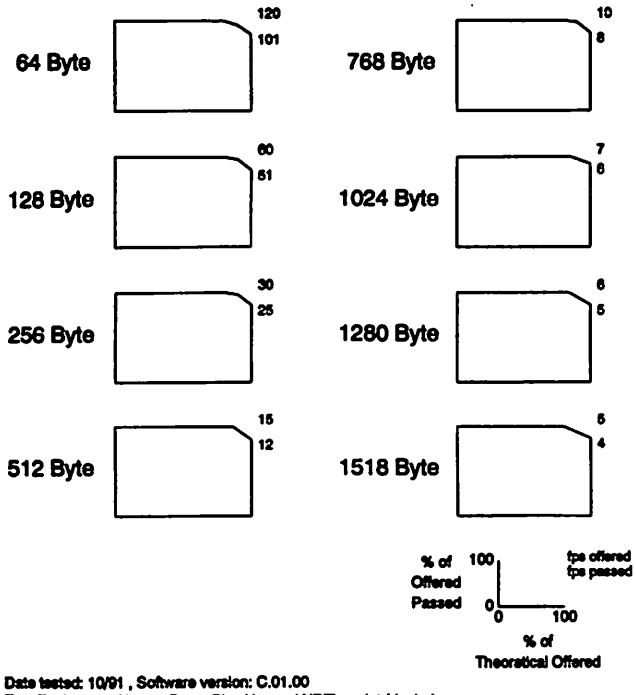


Date tested: 10/91 , Software version: C.01.00
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

HP 28674A

Bridge

1 eth to 1 eth via 56Kb WAN

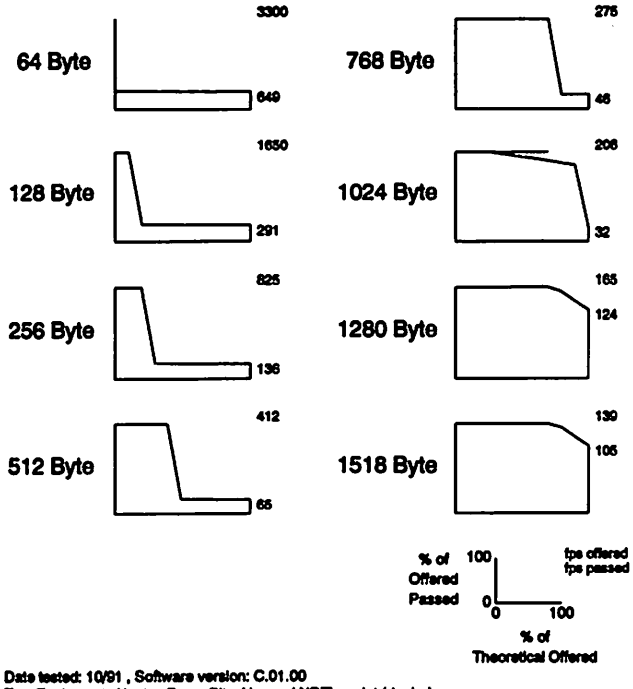


Date tested: 10/91 , Software version: C.01.00
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

HP 28674A

Bridge

1 eth to 1 eth via T1 WAN



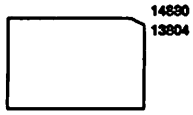
Date tested: 10/91 , Software version: C.01.00
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

HP 28681A

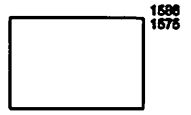
Bridge

1 eth to 1 eth within an interface board

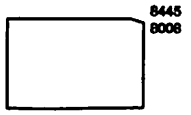
64 Byte



768 Byte



128 Byte



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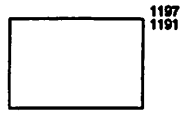
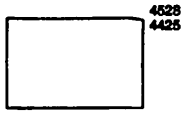
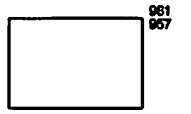


256 Byte

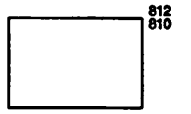


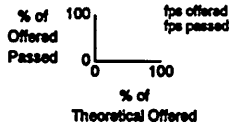
1280 Byte



512 Byte

1518 Byte





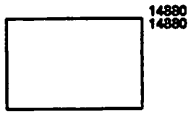
Date tested: 10/91 , Software version: 8.01.06
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Kalpana EtherSwitch

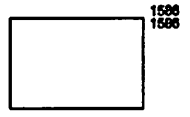
Bridge

1 eth to 1 eth, between interface cards

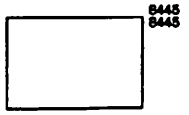
64 Byte



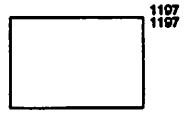
768 Byte



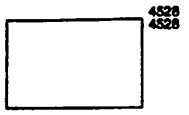
128 Byte



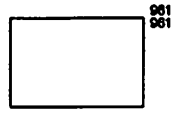
1024 Byte



256 Byte

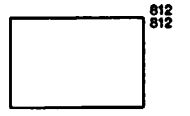


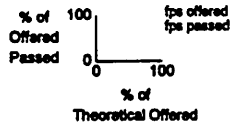
1280 Byte



512 Byte

1518 Byte





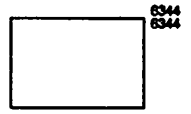
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Kalpana EtherSwitch

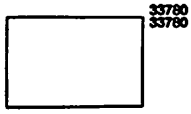
Bridge
4 eth to 4 eth

64 Byte

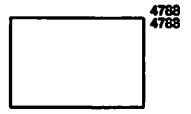
768 Byte



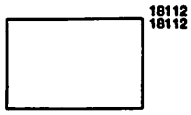
128 Byte



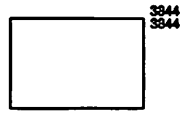
1024 Byte



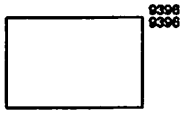
256 Byte



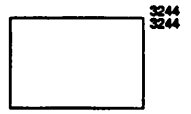
1280 Byte

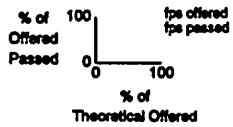


512 Byte



1518 Byte



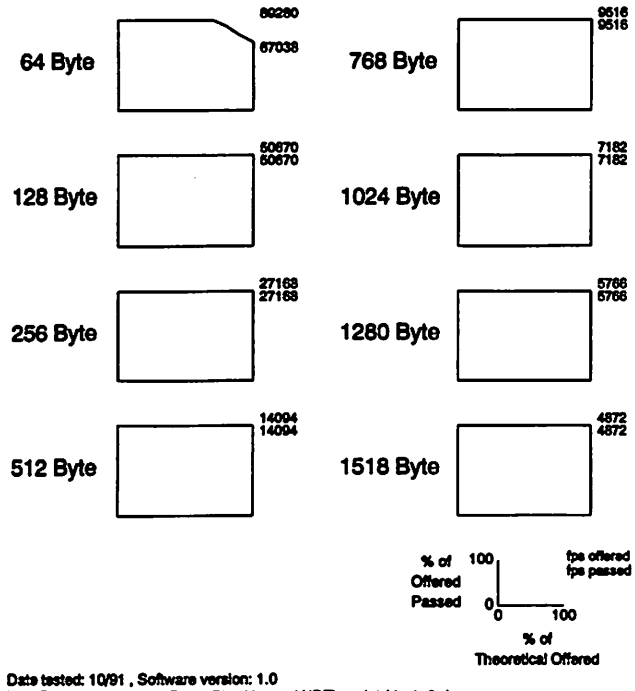


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Kalpana EtherSwitch

Bridge

6 eth to 6 eth

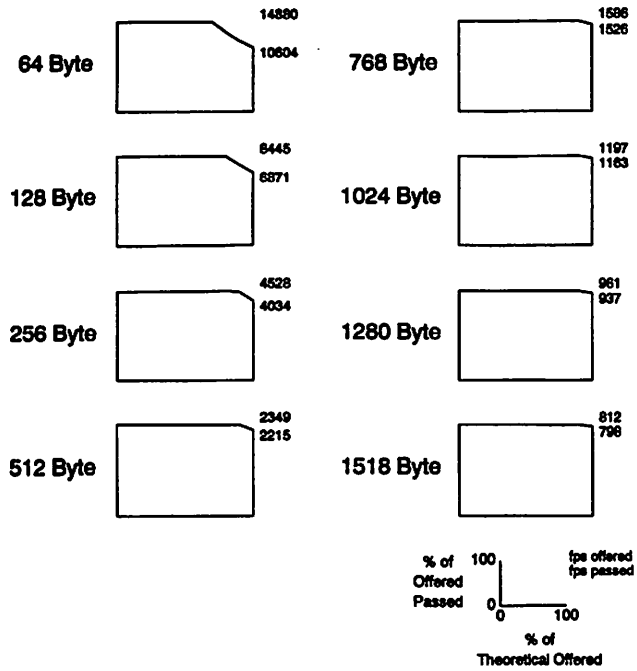


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s)

LANport PCbridge

Bridge

1 eth to 1 eth, between interface cards

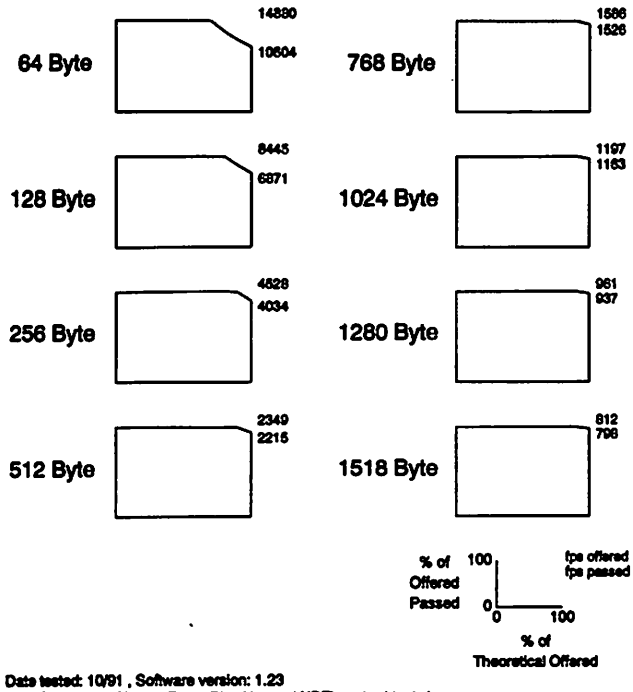


Date tested: 10/91 , Software version: 1.21
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

LANport ↘ PCroute

TCP/IP

1 eth to 1 eth, between interfaces

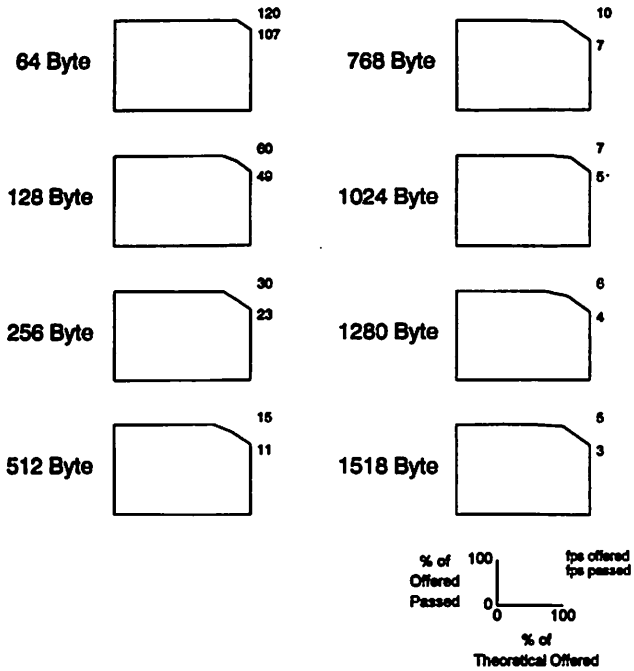


Data tested: 10/91 , Software version: 1.23
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

NAT LANB/280

TCP/IP

1 eth to 1 eth via 56Kb WAN

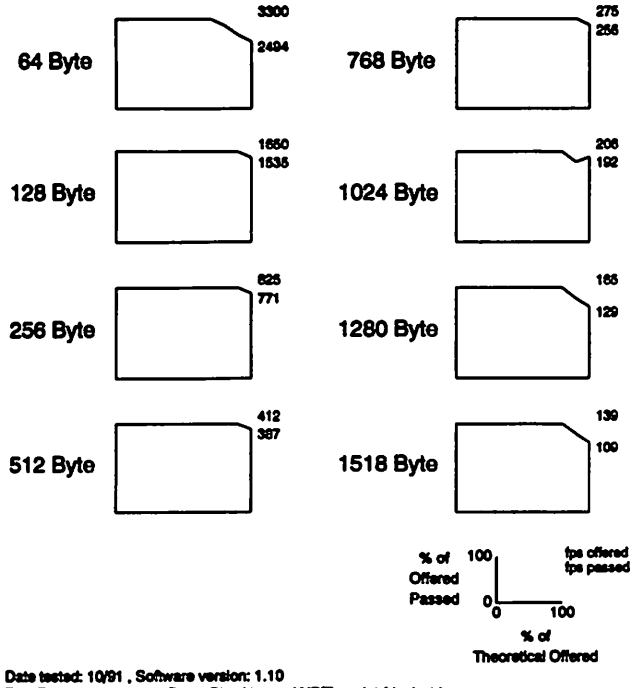


Date tested: 10/91 , Software version: 1.10
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip56)

NAT LANB/280

TCP/IP

1 eth to 1 eth via T1 WAN

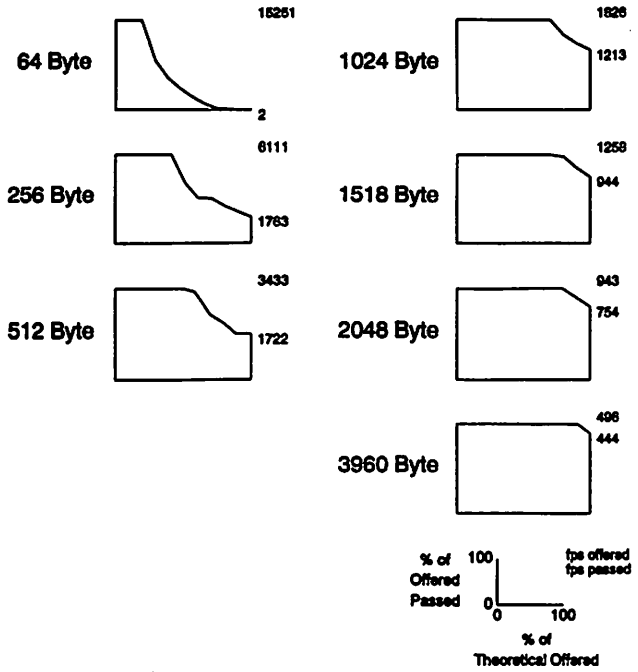


Date tested: 10/91 , Software version: 1.10
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ipt1)

Netronix TokenMaster 2000

Source Route Bridge

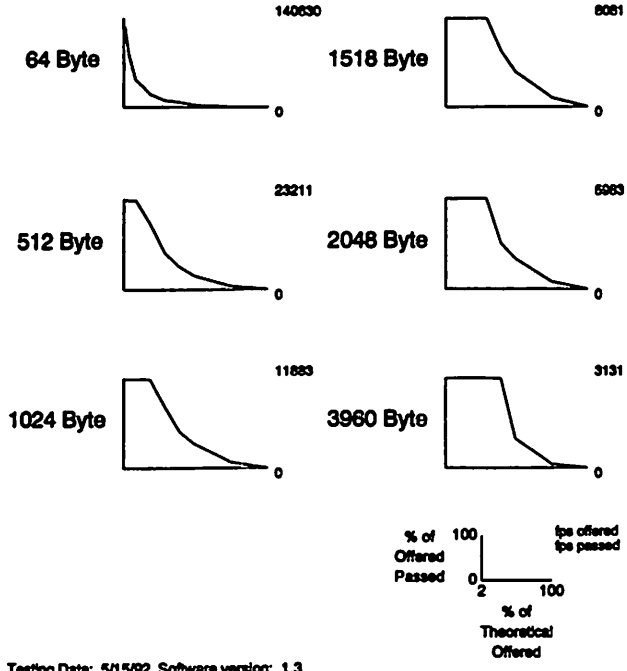
16MB token ring to 16MB token ring



Date tested: 5/14/92, Software version: 3.30
Test Equipment: Protson tester & software-Harvard NDTL script

Network Peripherals NP-SB/S

IP
fddi to fddi using SUN SS2

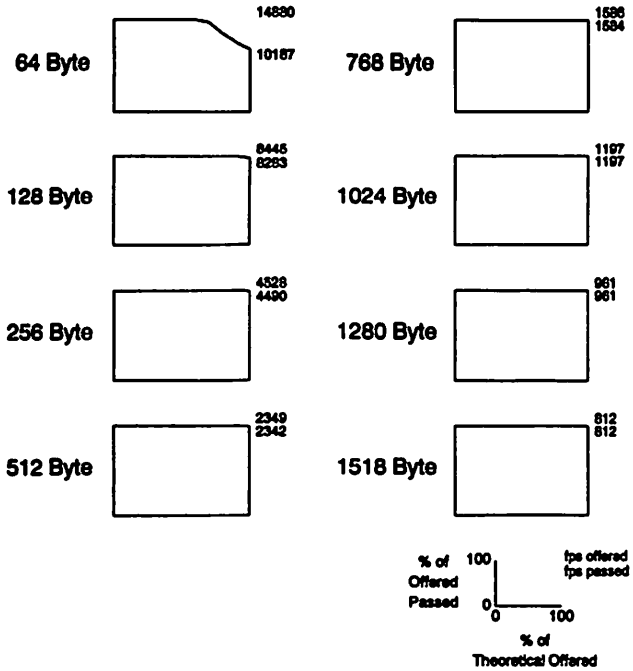


Testing Date: 5/15/92, Software version: 1.3
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Network Systems Corporation 6800

TCP/IP

1 eth to 1 eth, between interface cards



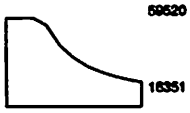
Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Network Systems Corporation 6800

TCP/IP

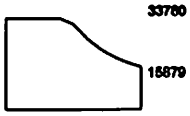
4 eth to 4 eth

64 Byte

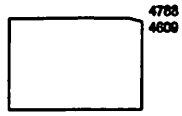


768 Byte

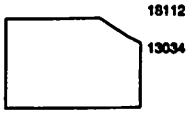
128 Byte



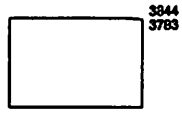
1024 Byte



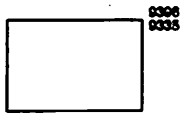
256 Byte



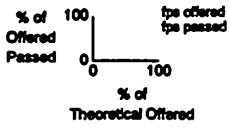
1280 Byte



512 Byte



1518 Byte

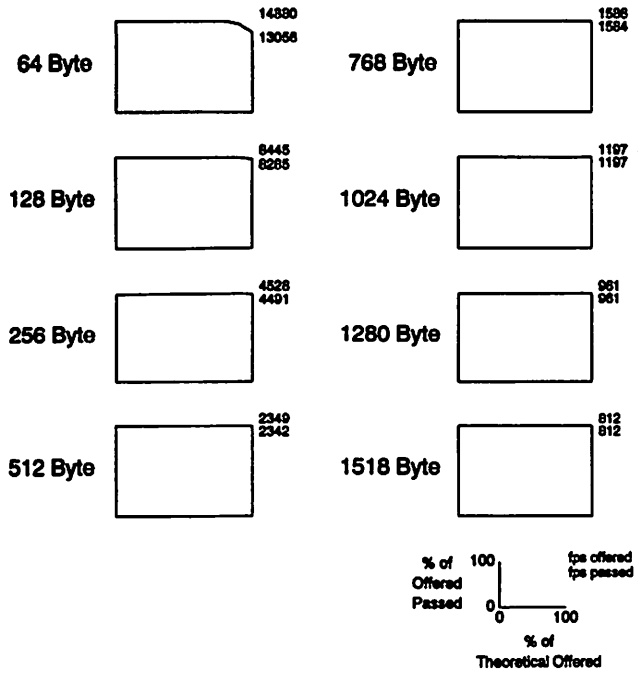


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Network Systems Corporation 6800

Bridge

1 eth to 1 eth, within an interface card

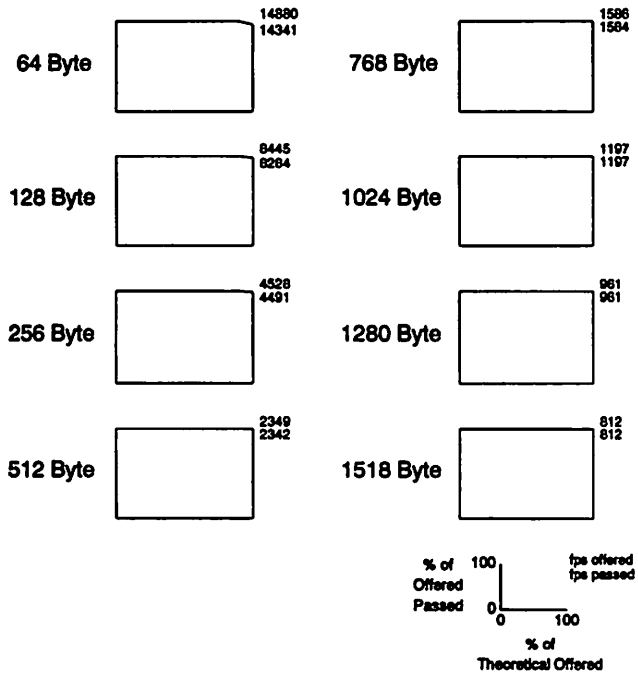


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Network Systems Corporation 6800

TCP/IP

1 eth to 1 eth, within an interface card

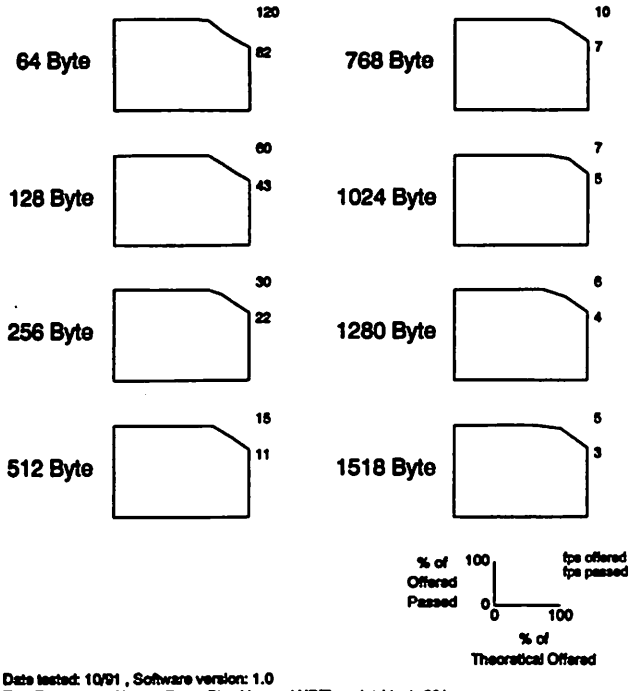


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Newbridge 8230 LittleBridge

Bridge

1 eth to 1 eth via 56Kb WAN

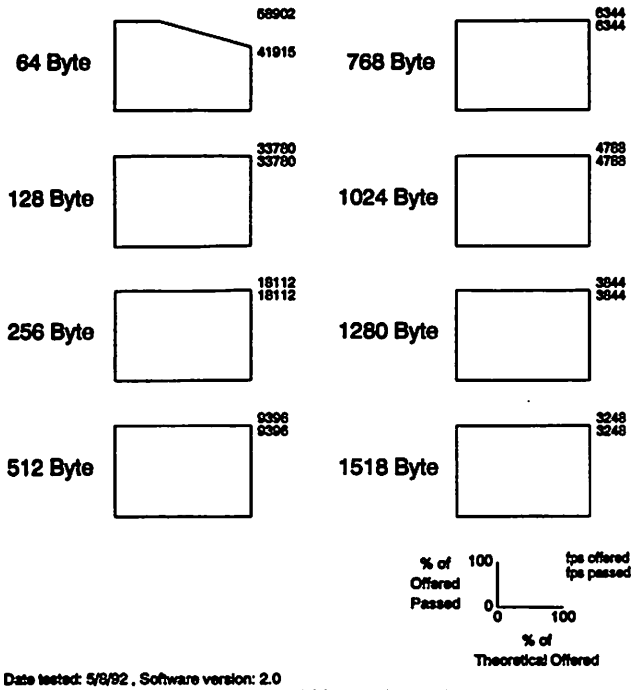


Date tested: 10/91 , Software version: 1.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br56)

Penril 2500

Bridge

4 eth to 4 eth via fddi

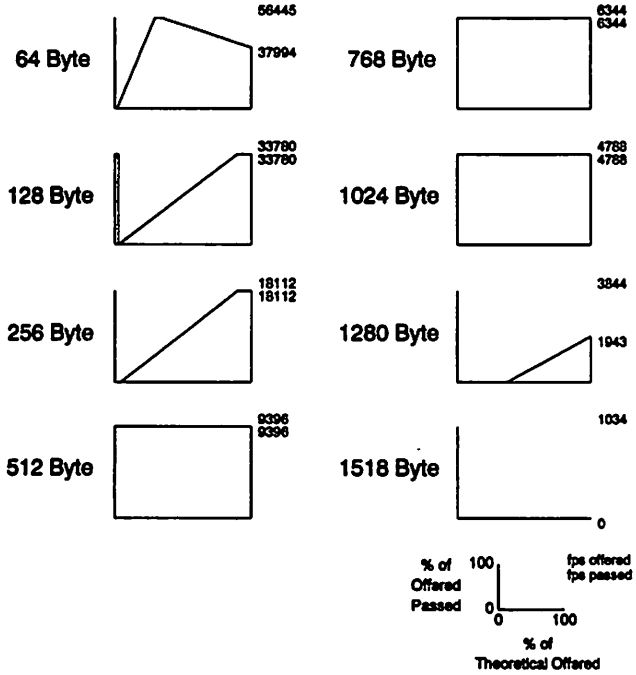


Date tested: 5/8/92 , Software version: 2.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Penril 2500

Bridge

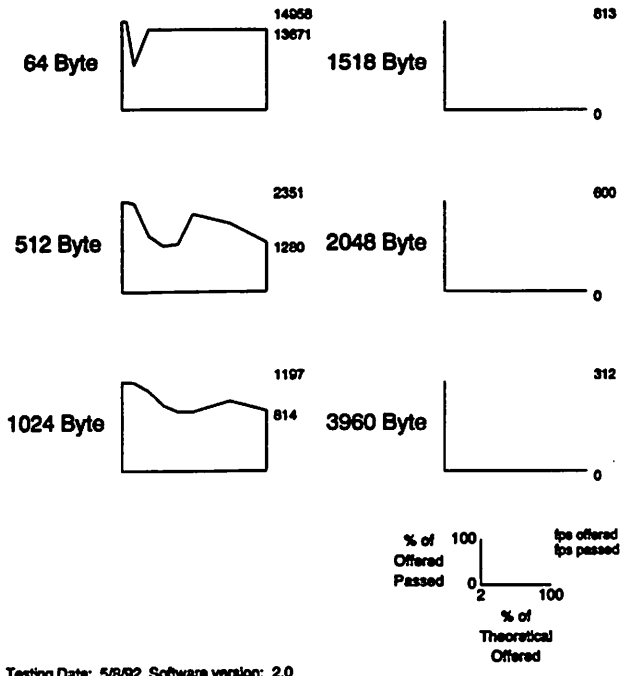
4 eth to 4 eth via fddi, 2 way



Date tested: 5/8/92 , Software version: 2.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s.1)

Penril Series 2500

Bridge
FDDI to FDDI via Ethernet

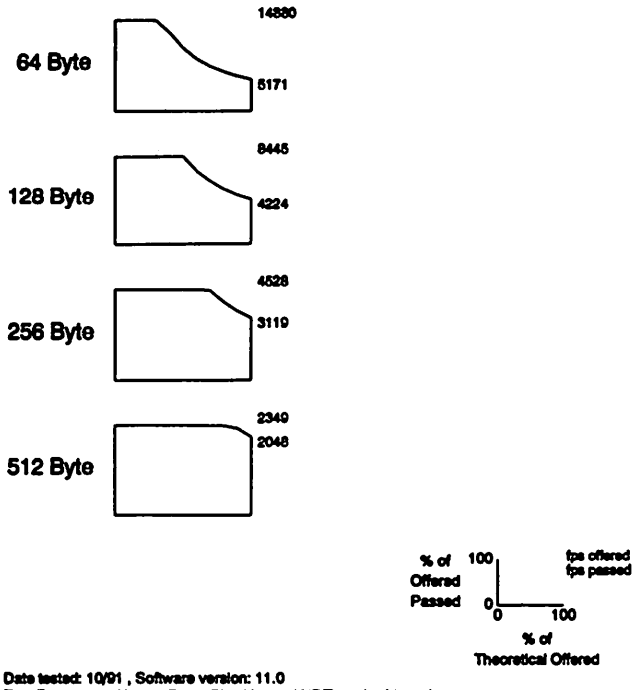


Testing Date: 5/8/92, Software version: 2.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Proteon CNX 500

AppleTalk

1 eth to 1 eth between interface boards

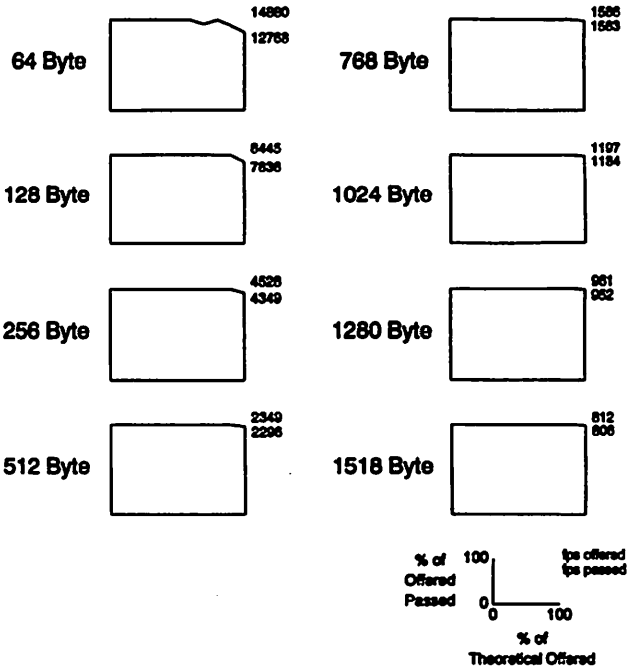


Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_at)

Proteon CNX 500

TCP/IP

1 eth to 1 eth between interface boards

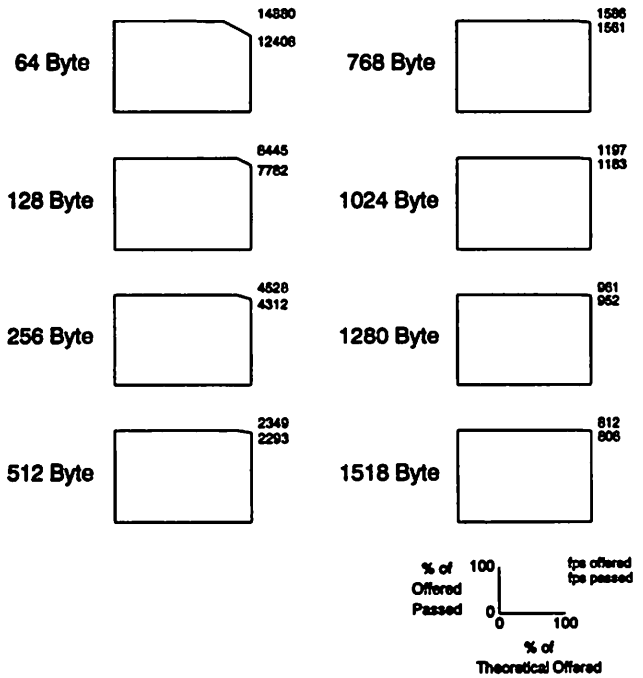


Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Proteon CNX 500

Bridge

1 eth to 1 eth between interface boards

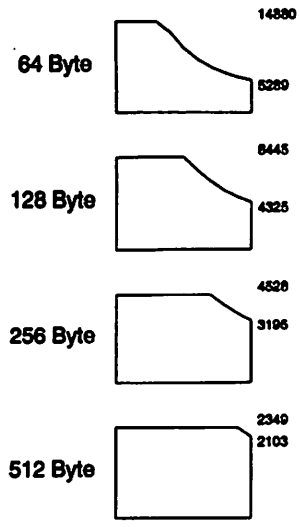


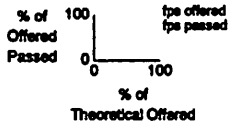
Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Proteon CNX 500

AppleTalk

1 eth to 1 eth within an interface board



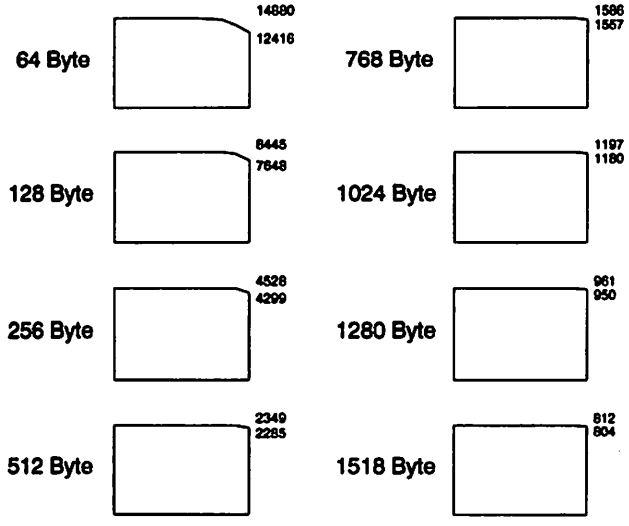


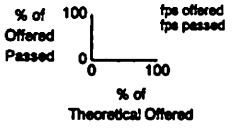
Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_at)

Proteon CNX 500

Bridge

1 eth to 1 eth within an interface board





Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

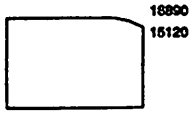
Proteon CNX 500

TCP/IP
2 eth to 2 eth

64 Byte

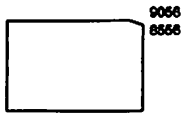
768 Byte

128 Byte



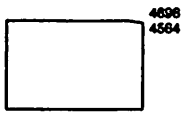
1024 Byte

256 Byte

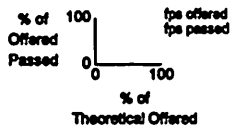


1280 Byte

512 Byte



1518 Byte



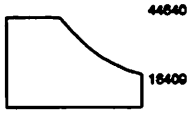
Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip2s)

Proteon CNX 500

TCP/IP

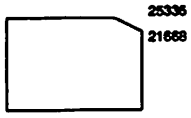
3 eth to 3 eth

64 Byte

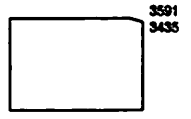


768 Byte

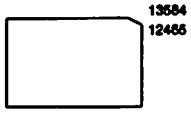
128 Byte



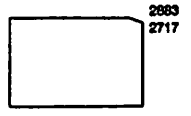
1024 Byte



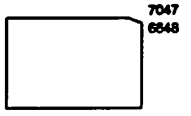
256 Byte



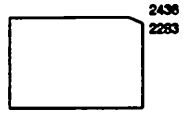
1280 Byte

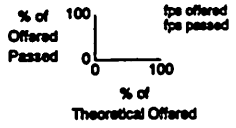


512 Byte



1518 Byte

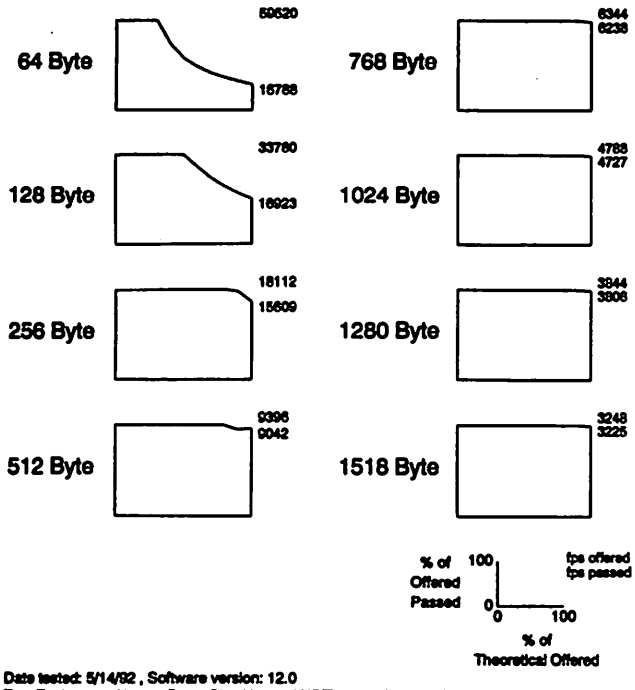




Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip3s)

Proteon CNX-500

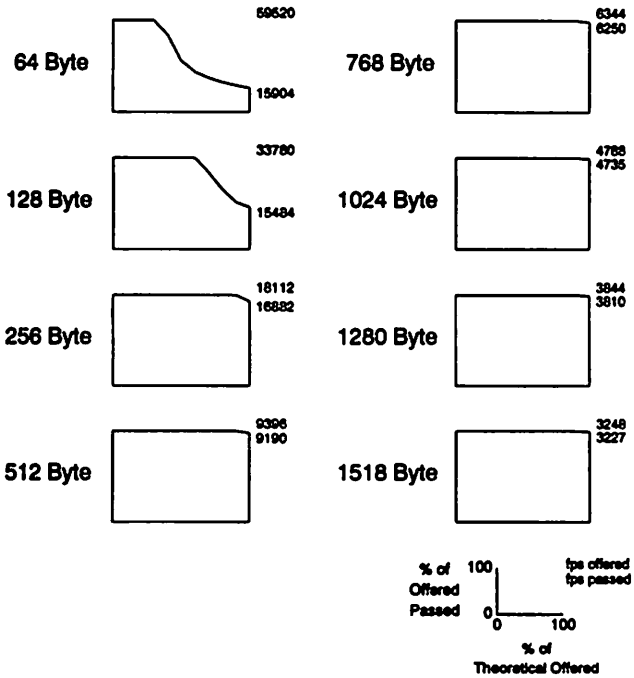
4 eth to 4 eth via fddi



Date tested: 5/14/92 , Software version: 12.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Proteon CNX-500

4 eth to 4 eth via fddi 2 way

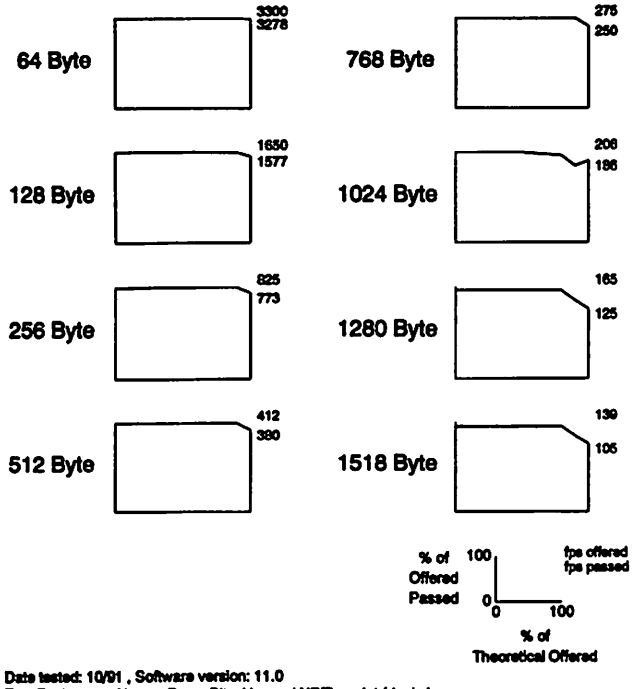


Date tested: 5/14/92 , Software version: 12.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Proteon CNX 500

TCP/IP

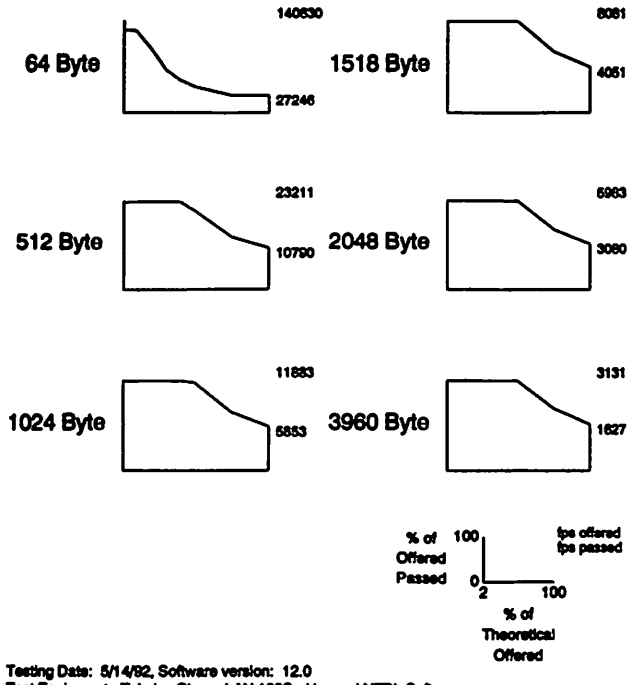
1 eth to 1 eth via T1 WAN



Date tested: 10/91 , Software version: 11.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Proteon CNX-500

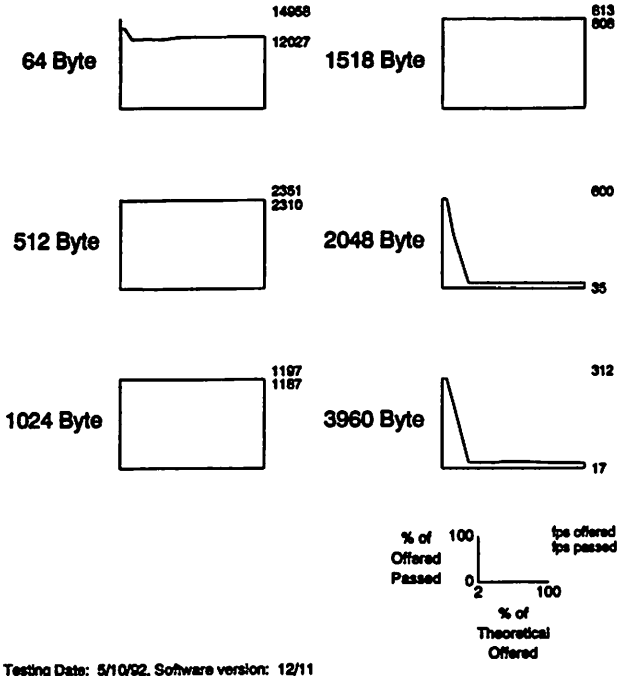
IP
FDDI to FDDI



Testing Date: 5/14/92, Software version: 12.0
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Proteon CNX-500

IP
FDDI to FDDI via Ethernet

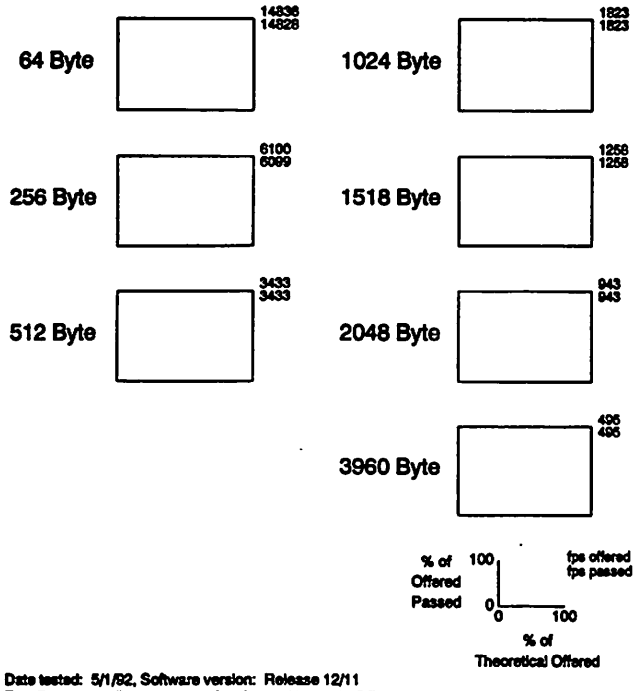


Testing Date: 5/10/92, Software version: 12/11
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Proteon CNX500

TCP/IP

16 Mb token ring to 16 Mb token ring

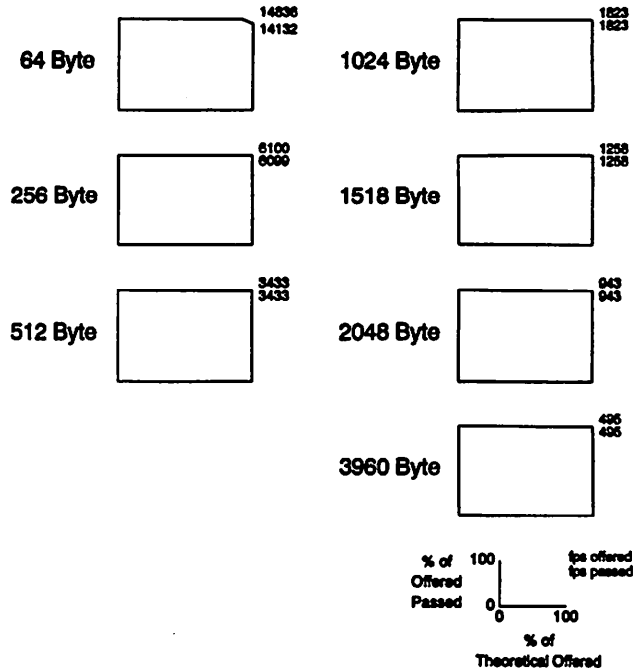


Date tested: 5/1/92, Software version: Release 12/11
Test Equipment: Proteon tester & software-Harvard NDTL script

Proteon CNX500

Source Route Bridge

16 Mb token ring to 16 Mb token ring

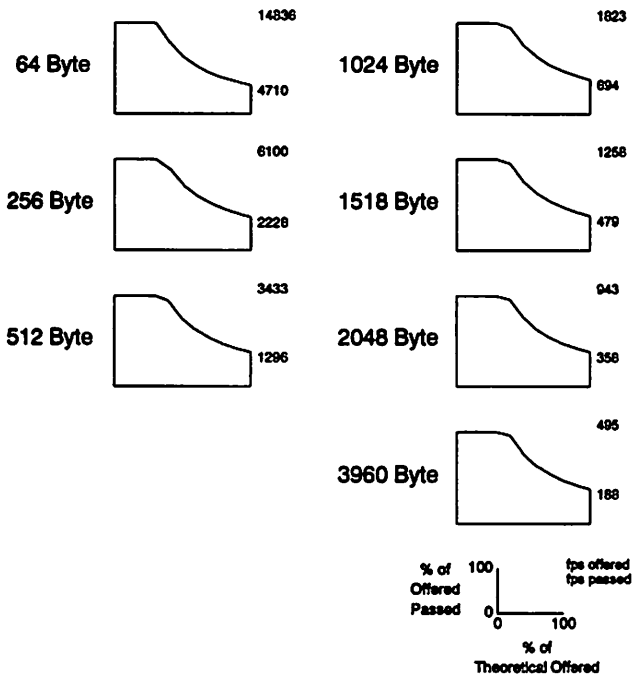


Date tested: 5/1/92, Software version: Release 12/11
Test Equipment: Proteon tester & software-Harvard NDTL script

Proteon CNX500

Novell IPX

16 Mb token ring to 16 Mb token ring

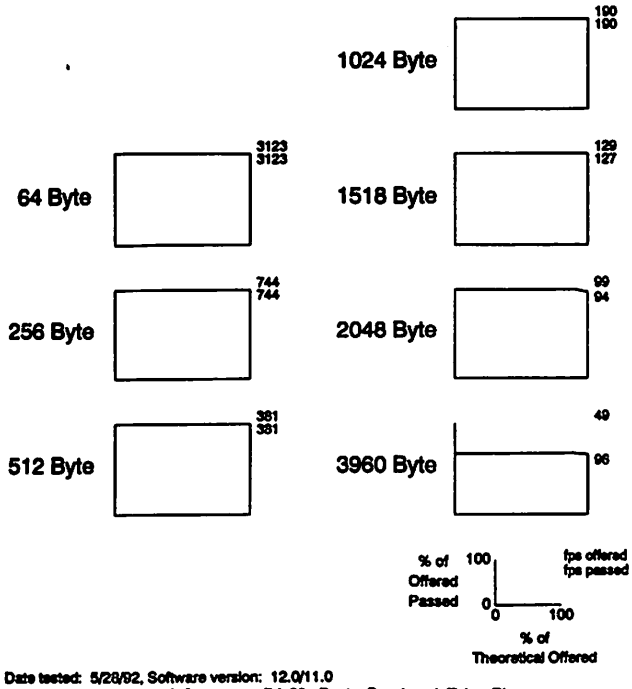


Date tested: 5/1/92, Software version: Release 12/11
Test Equipment: Proteon tester & software-Harvard NDTL script

Proteon CNX500

TCP/IP

16MB token ring to 16MB token ring via t1 WAN

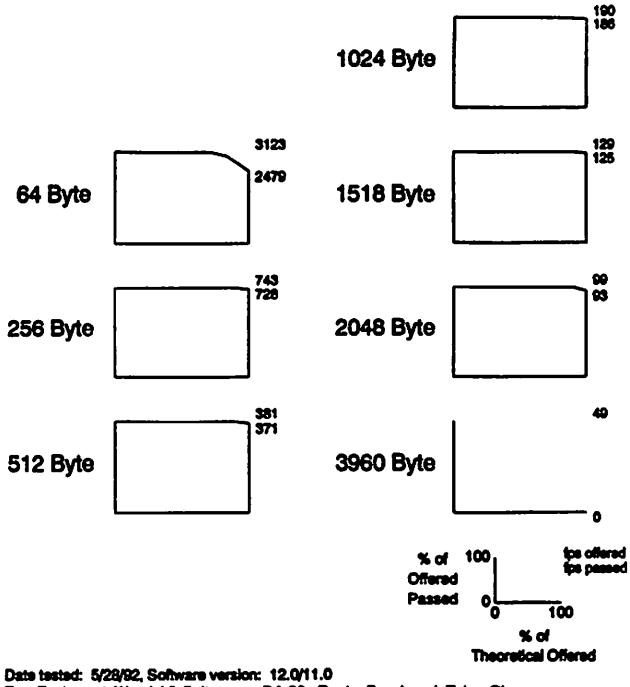


Date tested: 5/28/92, Software version: 12.0/11.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Proteon CNX500

SourceRouting

16MB token ring to 16MB token ring via t1 WAN

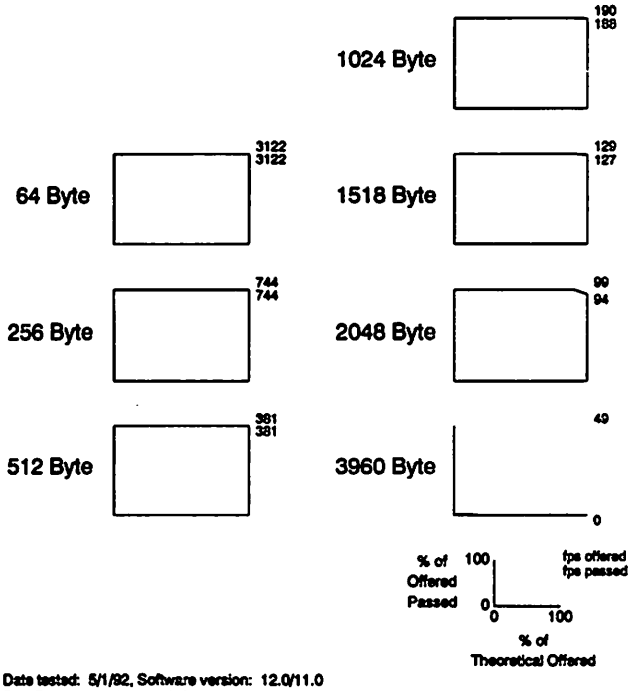


Date tested: 5/28/92, Software version: 12.0/11.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Proteon CNX500

Novell IPX

16MB token ring to 16MB token ring via t1 WAN

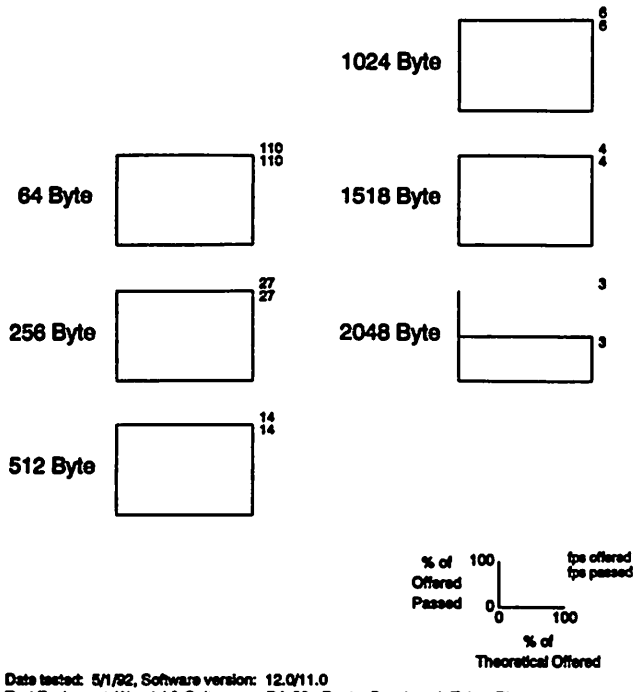


Date tested: 5/1/92, Software version: 12.0/11.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

Proteon CNX500

TCP/IP

16MB token ring to 16MB token ring via 56Kb WAN

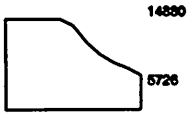


Data tested: 5/1/92, Software version: 12.0/11.0
Test Equipment: Wandel & Goltermann DA-30 - Router Benchmark-Token Ring

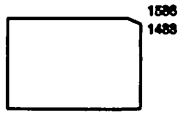
RND LEB-1

Bridge
1 eth to 1 eth

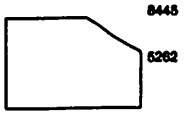
64 Byte



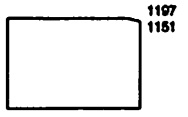
768 Byte



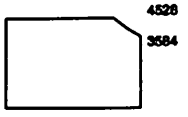
128 Byte



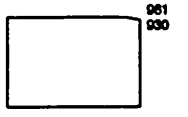
1024 Byte



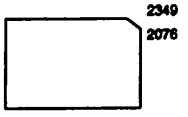
256 Byte



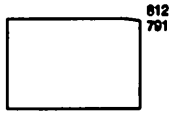
1280 Byte

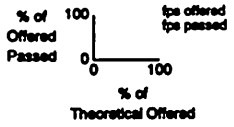


512 Byte



1518 Byte



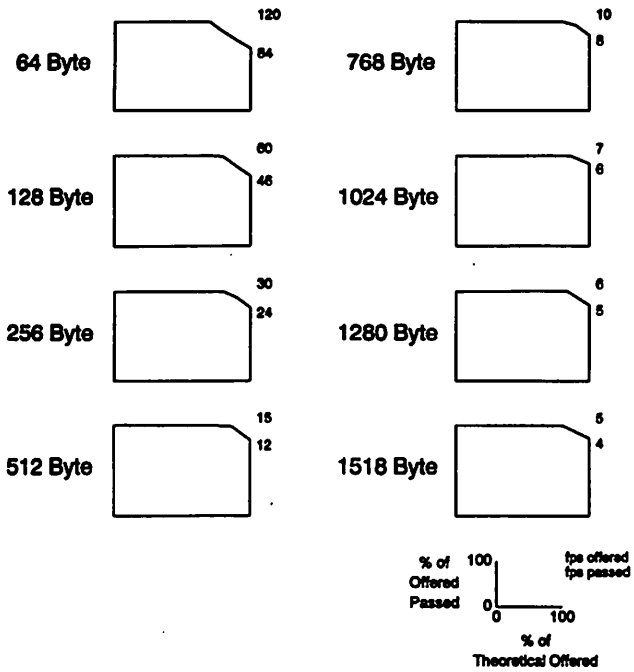


Date tested: 10/91 , Software version: 0.0 Beta
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

RND REB 10

Bridge

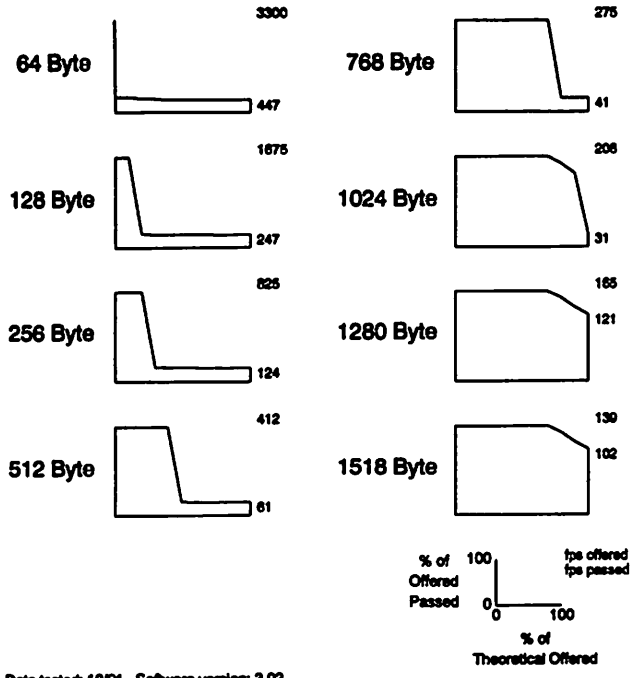
1 eth to 1 eth via 56Kb WAN



Date tested: 10/91 , Software version: 3.02
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip56)

RND ↘ REB 10

Bridge
1 eth to 1 eth via T1 WAN

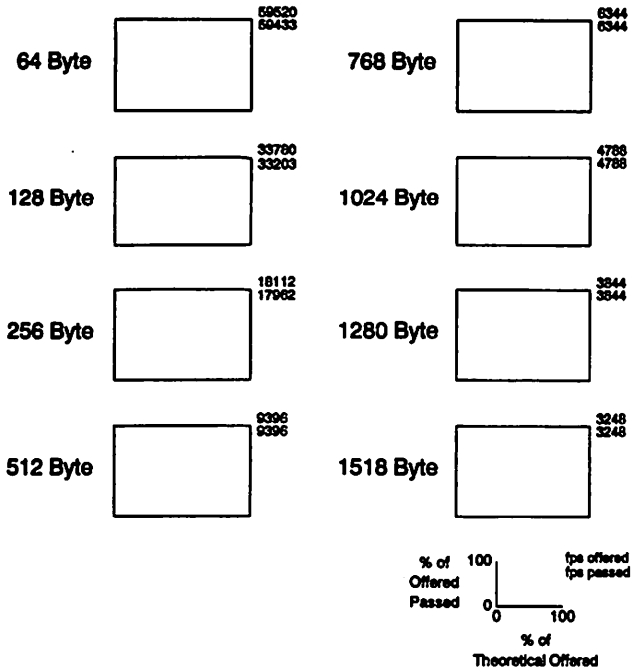


Data tested: 10/91 , Software version: 3.02
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_lpt1)

Sigma Network Systems ECS/1

Bridge

4 eth to 4 eth via fddi

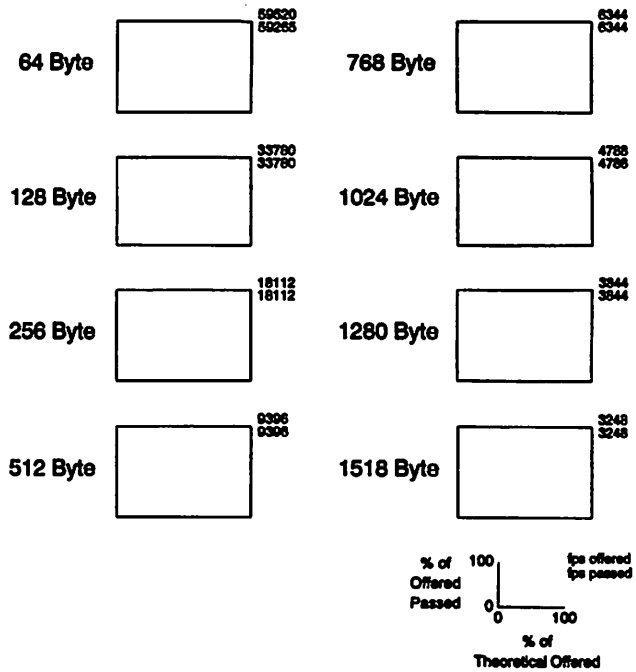


Date tested: 5/15/92 , Software version: 6.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Sigma Network Systems ECS/1

Bridge

4 eth to 4 eth via fddi, 2 way

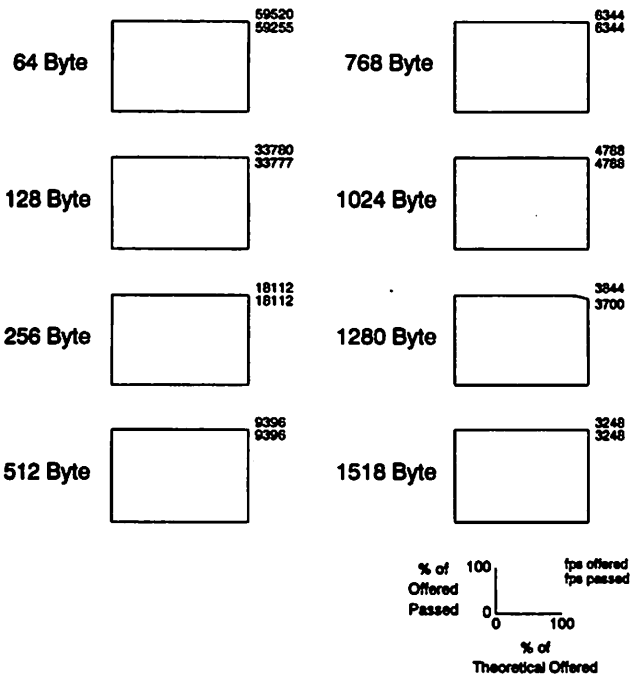


Date tested: 5/15/92 , Software version: 6.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s.1)

Sigma Network Systems ECS/1

TCP/IP

4 eth to 4 eth via fddi

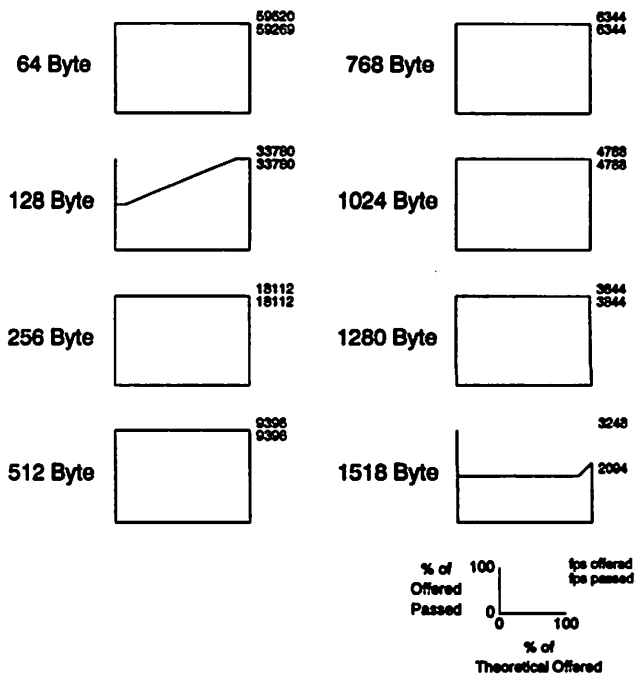


Date tested: 5/15/92 , Software version: 6.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s)

Sigma Network Systems ECS/1

TCP/IP

4 eth to 4 eth via fddi, 2 way



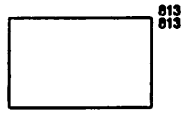
Date tested: 5/15/92 , Software version: 6.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip4s.1)

Sigma Network Systems ECS/1

bridged IP
FDDI to FDDI via Ethernet

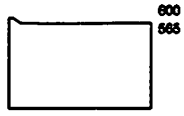
64 Byte

1518 Byte



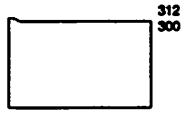
512 Byte

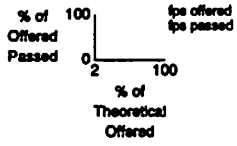
2048 Byte



1024 Byte

3960 Byte

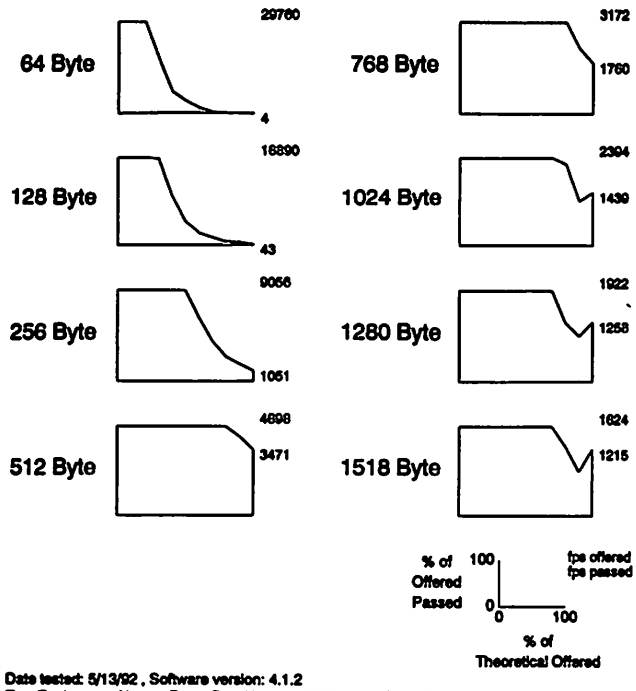




Testing Date: 5/15/92, Software version: 6.1
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

SUN Microsystems SS2 with FDDI/S

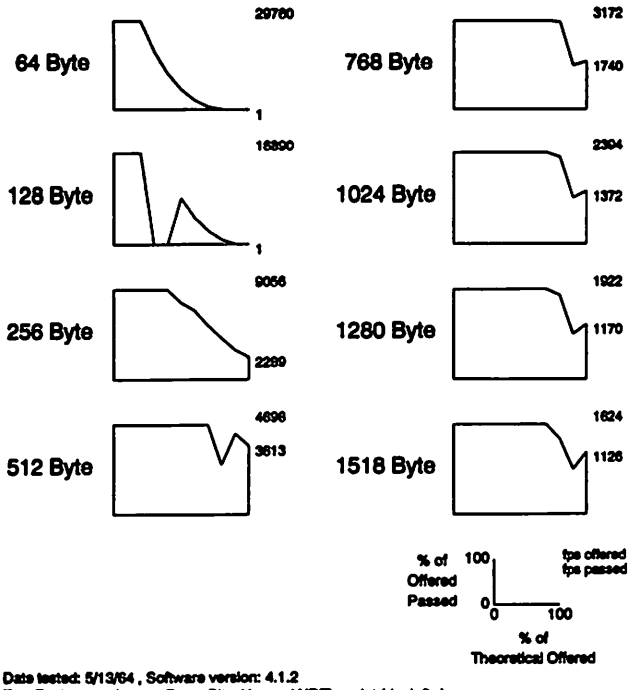
2 eth to 2 eth over FDDI 2 way



Date tested: 5/13/92 , Software version: 4.1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip2s.1)

SUN Microsystems SS2 with FFDI/S

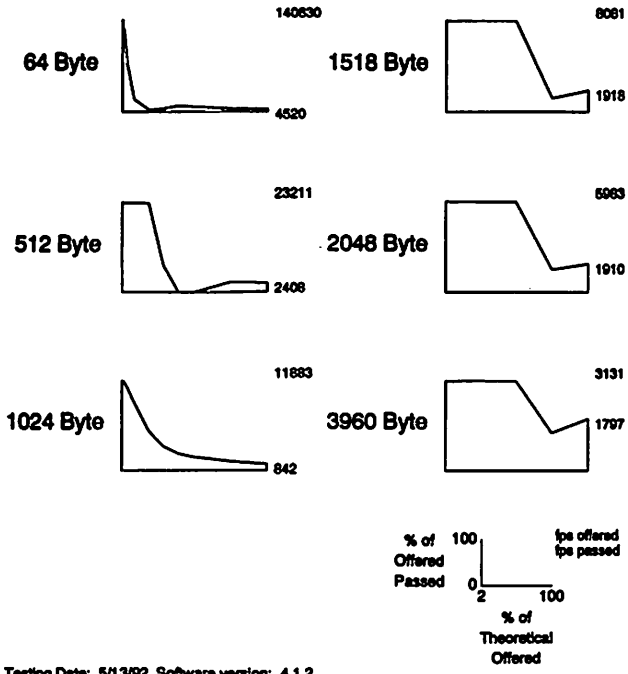
2 eth to 2 eth via ffddi



Data tested: 5/13/64 , Software version: 4.1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip2s)

SUN Microsystems FDDI/S

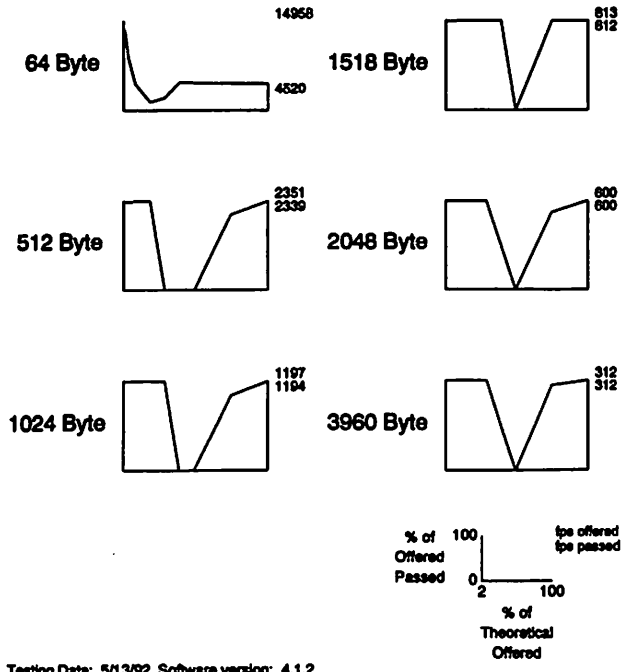
IP
FDDI to FDDI via SUN SS2



Testing Date: 5/13/92, Software version: 4.1.2
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

SUN Microsystems FDDI/S

IP
FDDI to FDDI via Ethernet

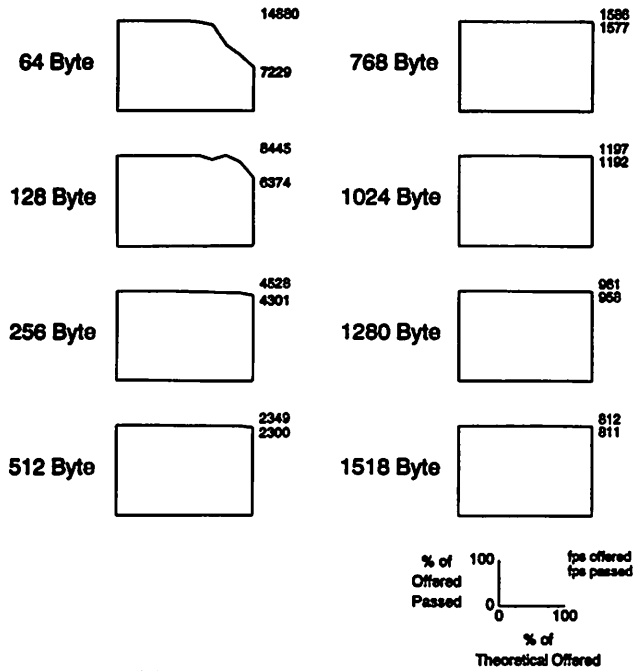


Testing Date: 5/13/92, Software version: 4.1.2
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Sun Microsystems SS2

TCP/IP

1 eth to 1 eth between interface boards



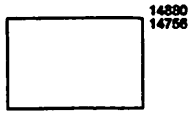
Date tested: 10/91 , Software version: 4.1.1
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_ip)

Synernetics LANPLEX 5000

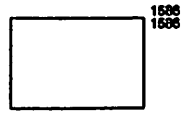
Bridge

1 eth to 1 eth between interface boards

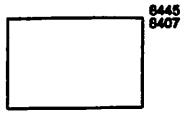
64 Byte



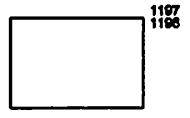
768 Byte



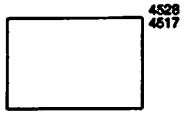
128 Byte



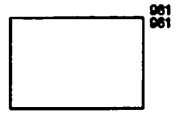
1024 Byte



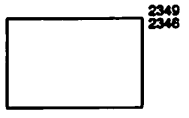
256 Byte



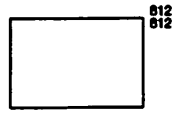
1280 Byte

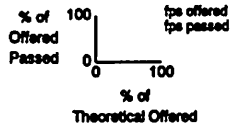


512 Byte



1518 Byte





Date tested: 10/91 , Software version: 1.0.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

Synernetics LANPLEX 5000

Bridge

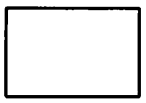
1 eth to 1 eth within an interface board

64 Byte

768 Byte

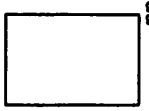
128 Byte

1024 Byte

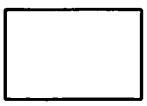


256 Byte

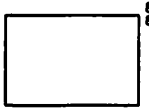
1280 Byte

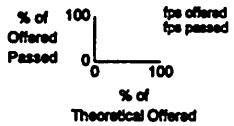


512 Byte



1518 Byte



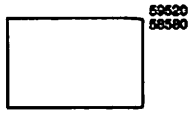


Date tested: 10/91 , Software version: 1.0.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br)

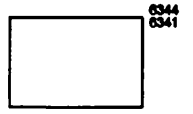
Synernetics LANPLEX 5000

Bridge
4 eth to 4 eth

64 Byte



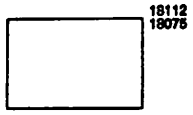
768 Byte



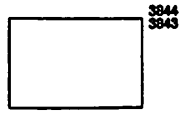
128 Byte

1024 Byte

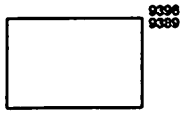
256 Byte



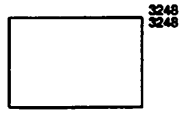
1280 Byte

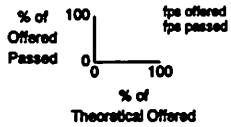


512 Byte



1518 Byte



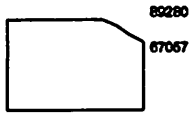


Date tested: 10/91 , Software version: 1.0.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

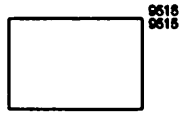
Synernetics LANPLEX 5000

Bridge
6 eth to 6 eth

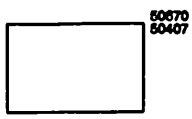
64 Byte



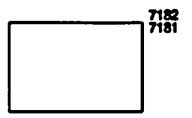
768 Byte



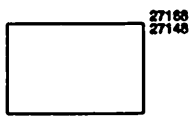
128 Byte



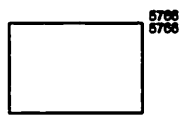
1024 Byte



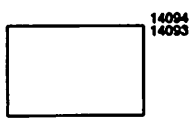
256 Byte



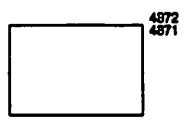
1280 Byte

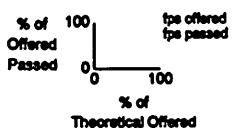


512 Byte



1518 Byte



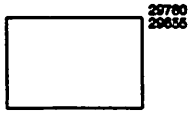


Date tested: 10/91 , Software version: 1.0.0
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s)

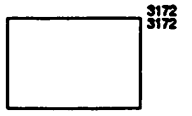
Synernetics Lanplex 5012

2 eth to 2 eth via fddi, 2 way

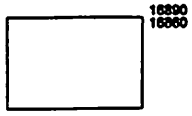
64 Byte



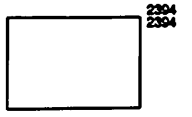
768 Byte



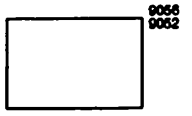
128 Byte



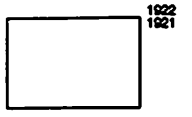
1024 Byte



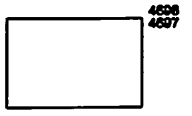
256 Byte



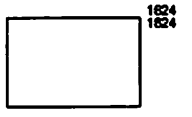
1280 Byte

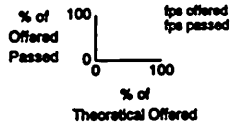


512 Byte



1518 Byte





Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br2s.1)

Synernetics Lanplex 5012

4 eth to 4 eth via fddi

64 Byte — 59520 / 58803

768 Byte — 6344 / 6341

128 Byte — 33780 / 33663

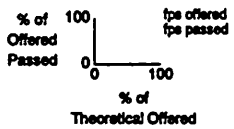
1024 Byte — 4788 / 4785

256 Byte — 18112 / 18094

1280 Byte — 3844 / 3842

512 Byte — 9396 / 9392

1518 Byte — 3248 / 3247



Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s)

Synernetics Lanplex 5012

4 eth to 4 eth via fddi, 2 way

64 Byte — 59520 / 59144

768 Byte — 6344 / 6342

128 Byte — 33770 / 33704

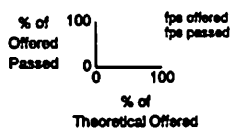
1024 Byte — 4788 / 4786

256 Byte — 18112 / 18096

1280 Byte — 3844 / 3843

512 Byte — 9396 / 9391

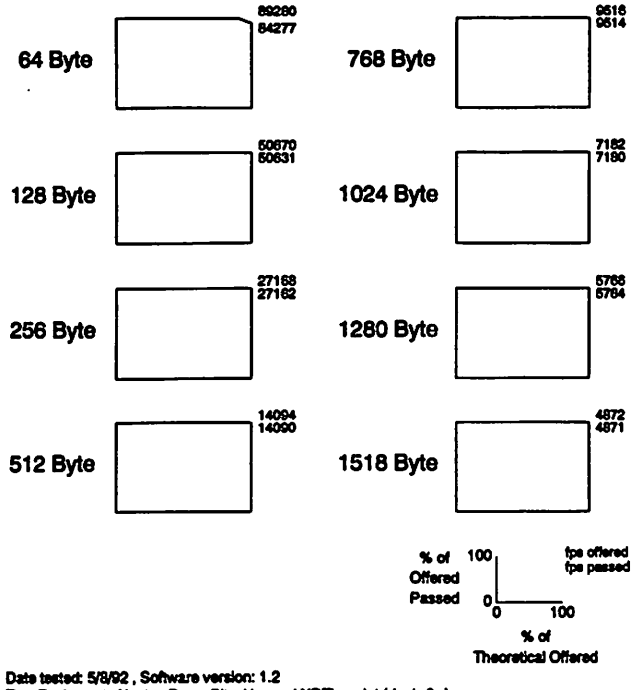
1518 Byte — 3248 / 3247



Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br4s.1)

Synernetics Lanplex 5012

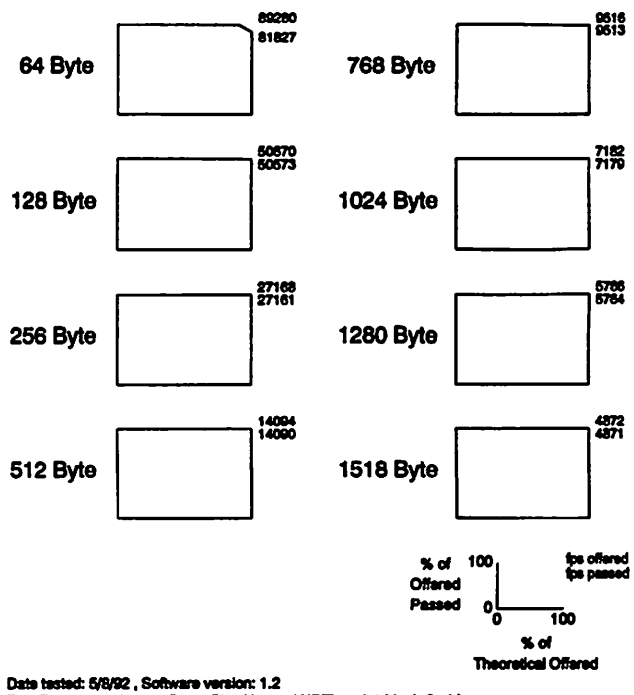
6 eth to 6 eth via fddi



Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s)

Synernetics Lanplex 5012

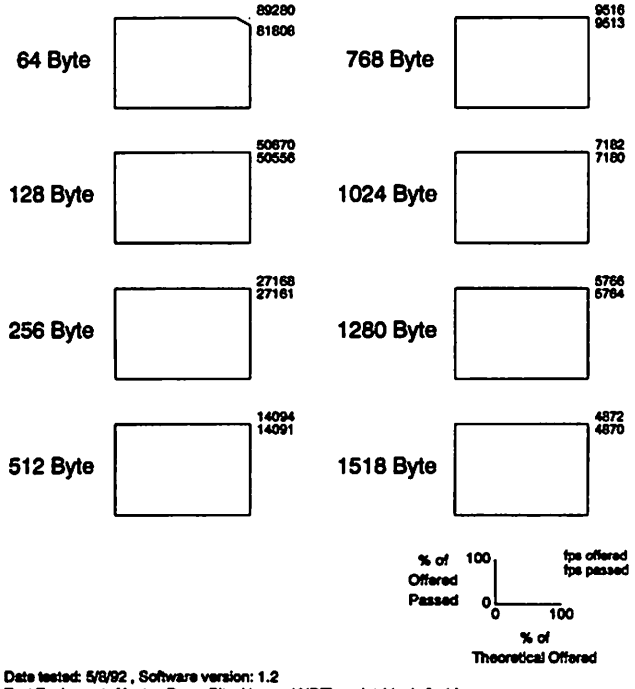
6 eth to 6 eth via fddi, 2 way



Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s.1)

Synernetics Lanplex 5012

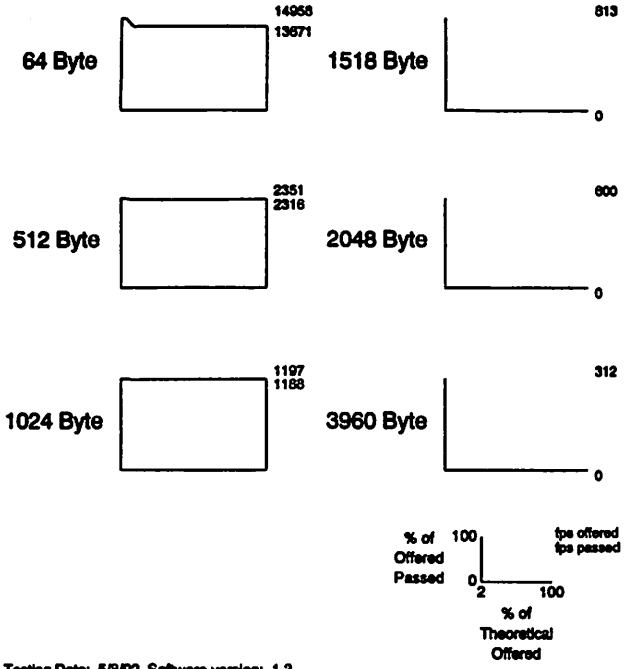
6 eth to 6 eth via fddi



Date tested: 5/8/92 , Software version: 1.2
Test Equipment: Alantec PowerBits, Harvard NDTL script (do_br6s.1)

Synernetics Lanplex 5012

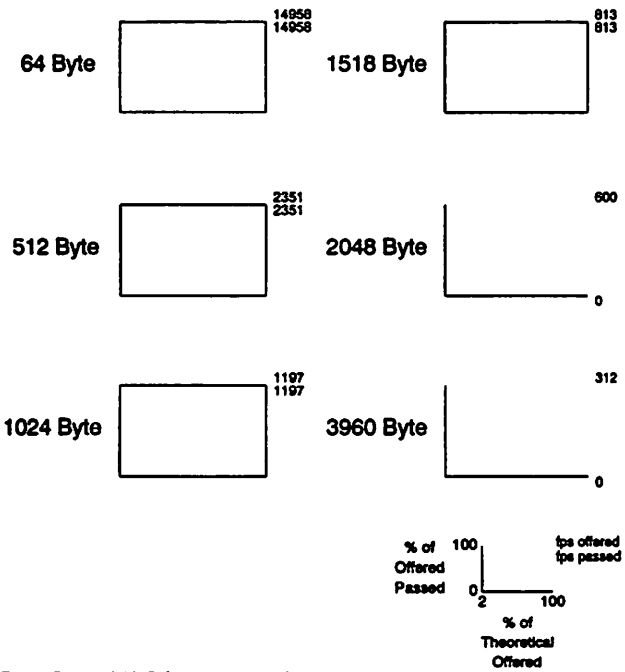
Bridge
FDDI to FDDI via Ethernet



Testing Date: 5/8/92, Software version: 1.3
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Synernetics Lanplex 5012

IP
FDDI to FDDI via Ethernet

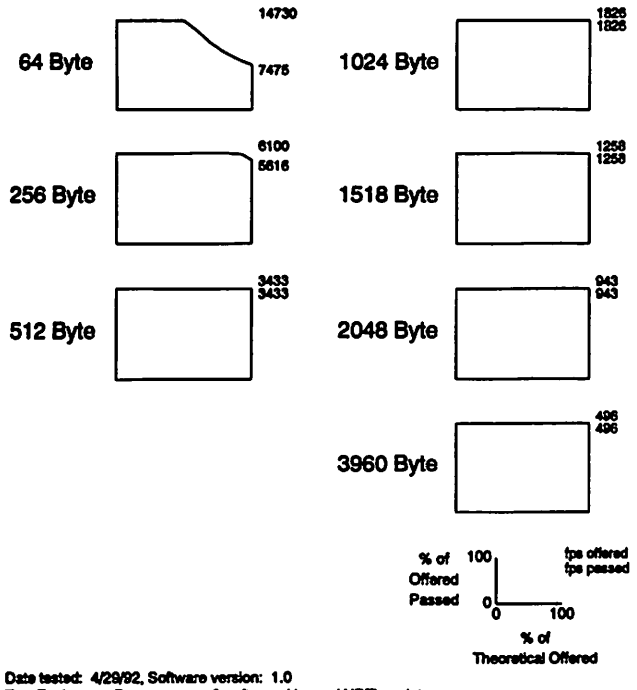


Testing Date: 5/8/92, Software version: 1.3
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software

Synoptics 3522 TR Bridge Module

Source Route Bridge

16Mb token ring to 16Mb token ring



Date tested: 4/29/92, Software version: 1.0
Test Equipment: Proteon tester & software-Harvard NDTL script

Tekelec **ChameLAN 100S**

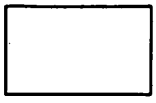
IP

fddi to fddi - tester ability, no device

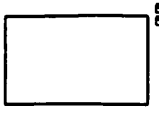
64 Byte

1518 Byte

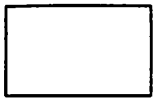
512 Byte



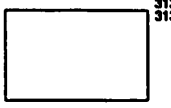
2048 Byte

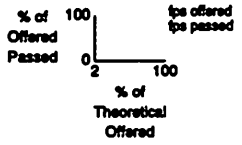


1024 Byte



3960 Byte





Testing Date: 4/24/92, Software version: 1.1
Test Equipment: Tekelec ChameLAN 100S - Harvard NTDL Software