



Networking Hardware Division Washington Systems Center (WSC) Benchmark

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▶ IBM S/390 Server Access Leadership

→ Part 1 : Considerations for S/390 Server Access

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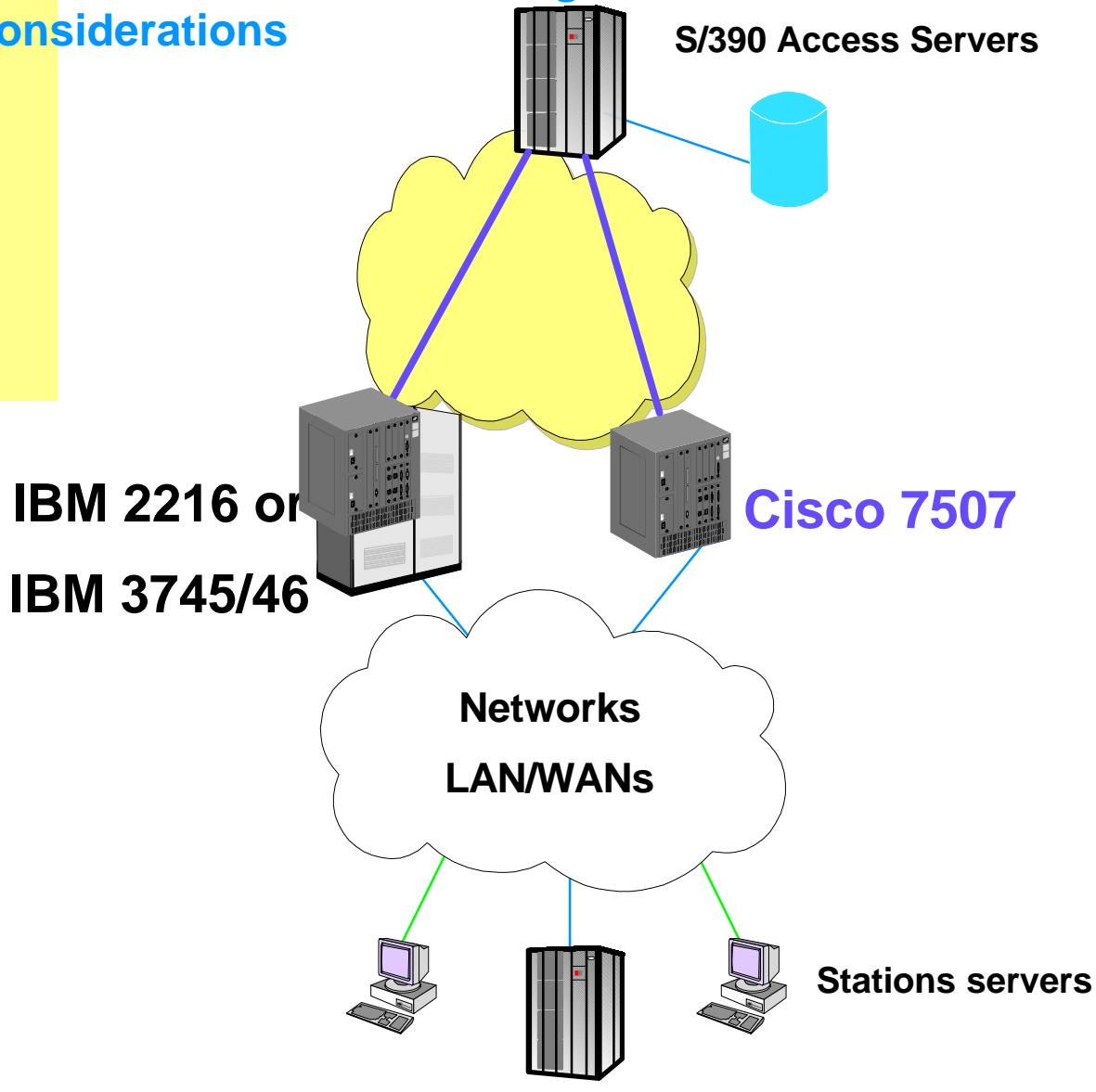
→ Part 5 : Why Choose IBM for S/390 Server Access

Benchmark objective

Provide valid, consultant-verified data to guide customers' selection of the best S/390 server gateway.

- Washington Systems Center customer benchmarking facility
- Independent verification of results: audit conducted by The Tolly Group

S/390 Access Server Testing Considerations



Host

- impact
- capacity
- cost

Channel

- impact
- capacity
- host gateway

Networks

- capacity
- cost

Station

- capacity
- cost

Benchmarking channel performance only provides a frame of reference; Actual performance will depend on the total Customer network environment and applications.



Equipment tested

All equipment configured with latest, recommended hardware and software

- ▶ IBM 2216 Multiaccess Connector Model 400
- ▶ Cisco 7507 Multiprotocol Router with CIP card RSP4 processor

S/390 server: 9021-241, 275 MIPS (5 processors), MVS/SP 5.2.2, VTAM 4.4, TCP/IP 3.2
PC's: Comm. Server 4.0 - OS/2 Warp V3



New technology benefits both 2216 and 3746

IBM has developed new high speed processor technology that is available today in two implementations:

2216 Multiaccess Connector Model 400

3746 Model 900 with Multiaccess Enclosure

In this benchmark, we tested the 2216 implementation of this new technology.

Customers can expect to receive equivalent performance using the 3746 implementation.

Source: IBM

Key customer concerns

- ▶ **Superior TCP/IP Performance**

Customer networks increasingly depend on TCP/IP as the network transport.

- ▶ **Enhanced SNA Performance**

Support for **subarea SNA**

Most customers today maintain mission-critical subarea SNA networks.

APPN Performance

APPN is an important migration option for customers enhancing their SNA networks. Sysplex support, manageability and ease of configuration are but a few of the benefits of an APPN network.



Benchmark results

Sym.

IBM DELIVERS

Industry leading IP gateway performance

TCP/IP channel throughput more than twice as fast
as Cisco

Excellence in SNA Performance with

SNA Passthrough performance

3 times as fast as Cisco for interactive
up to 70% better than Cisco for batch*
APPN throughput 300% better than Cisco**

Benchmark results

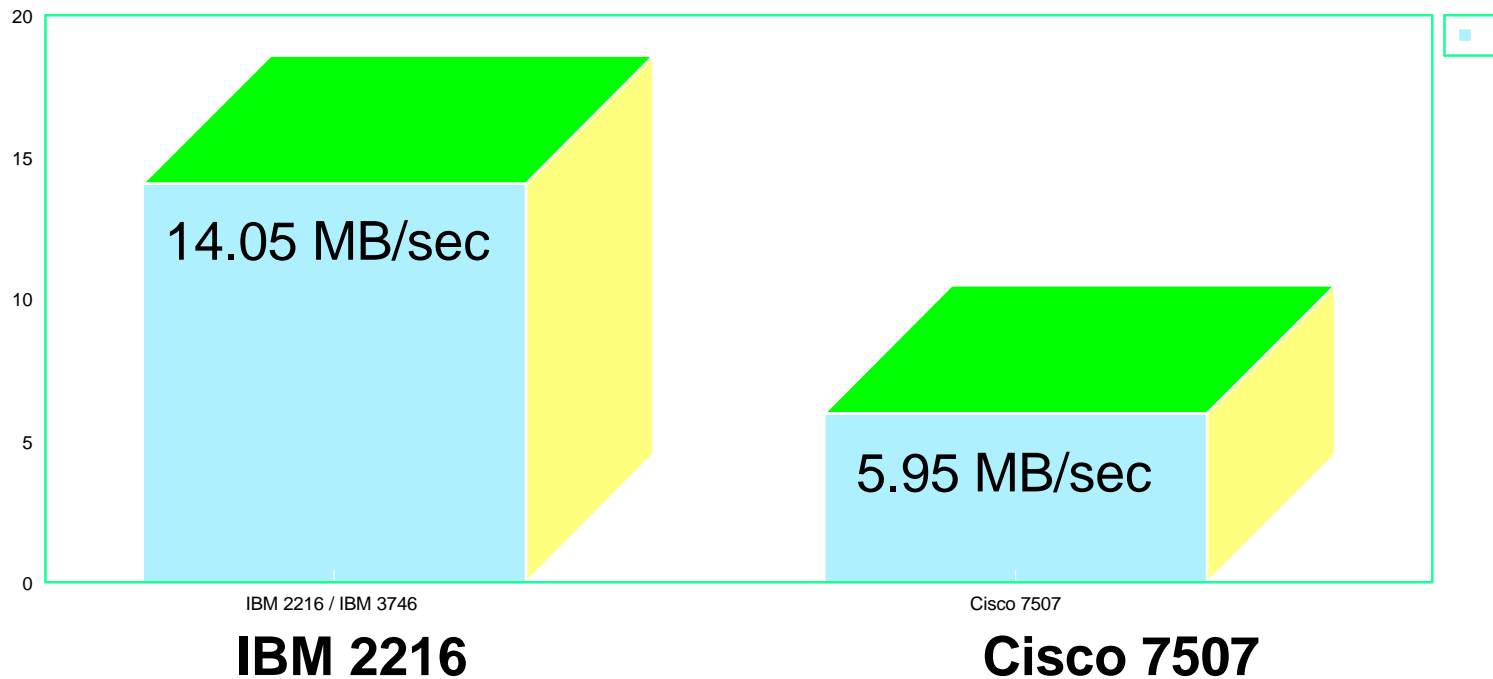
Tolly Group Benchmark Results

- Tests conducted in July and August, 1997
- Commissioned by IBM
- Detailed results to be published in The Tolly Group documents 7291, 7292, and 7293 by September 15, 1997 at www.tolly.com

Benchmark results: IP transport



IBM delivers superior performance for IP networks - more than twice as fast as Cisco.

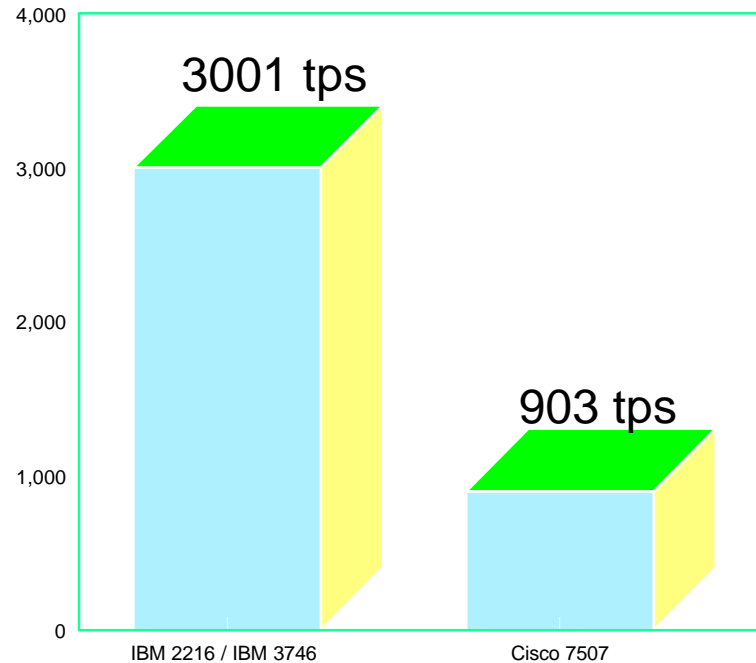


Source: The Tolly Group, August 1997

Benchmark results: SNA Passthrough



**IBM 2216 handles 3 times transactions rate of
Cisco 7507**



IBM 2216

Cisco 7507

Source: The Tolly Group, August 1997

tps - transaction per second

Note: Cisco has a limitation of a maximum of 256 real PUs on a single CIP card

Benchmark results: SNA Passthrough

**IBM 2216/3746-MAE has 70% more thruput than
Cisco 7507**



IBM 2216 or
3746-MAE

Cisco 7507

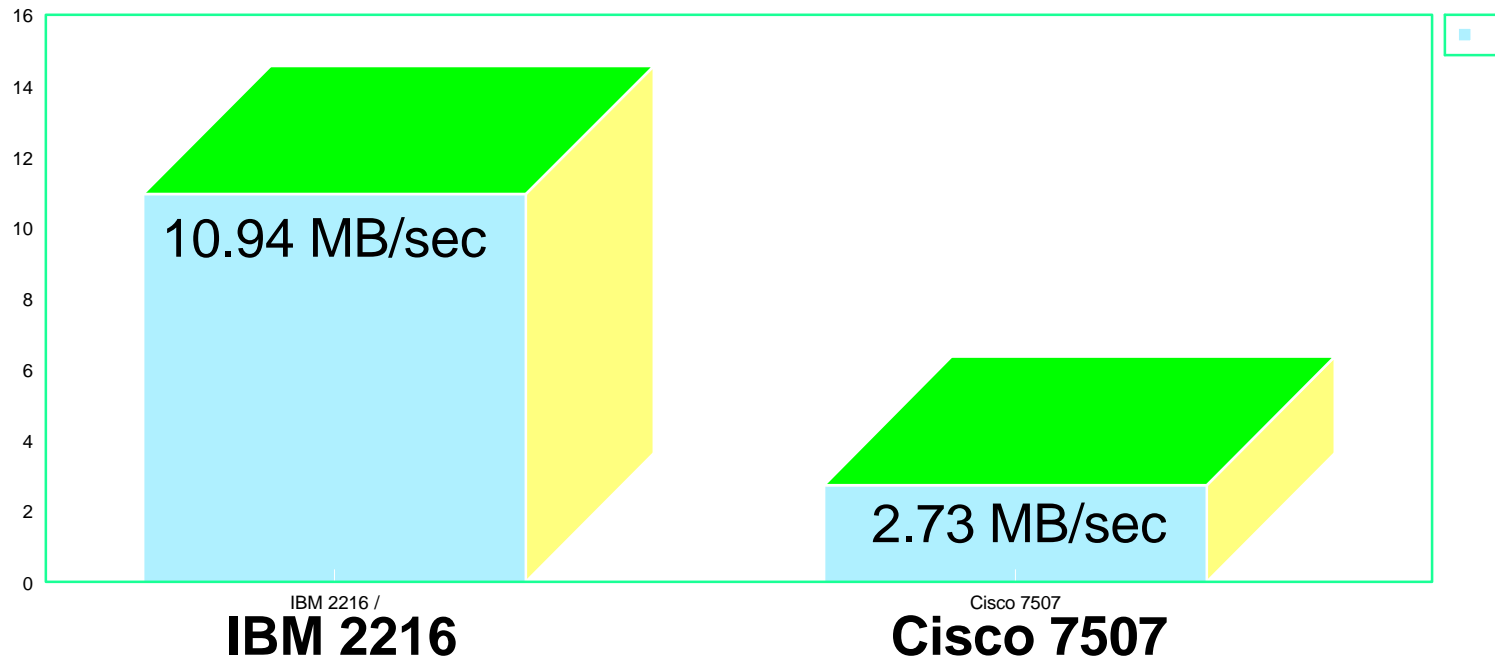
Source: IBM Washington Systems Center,
August 1997

Benchmark results: APPN



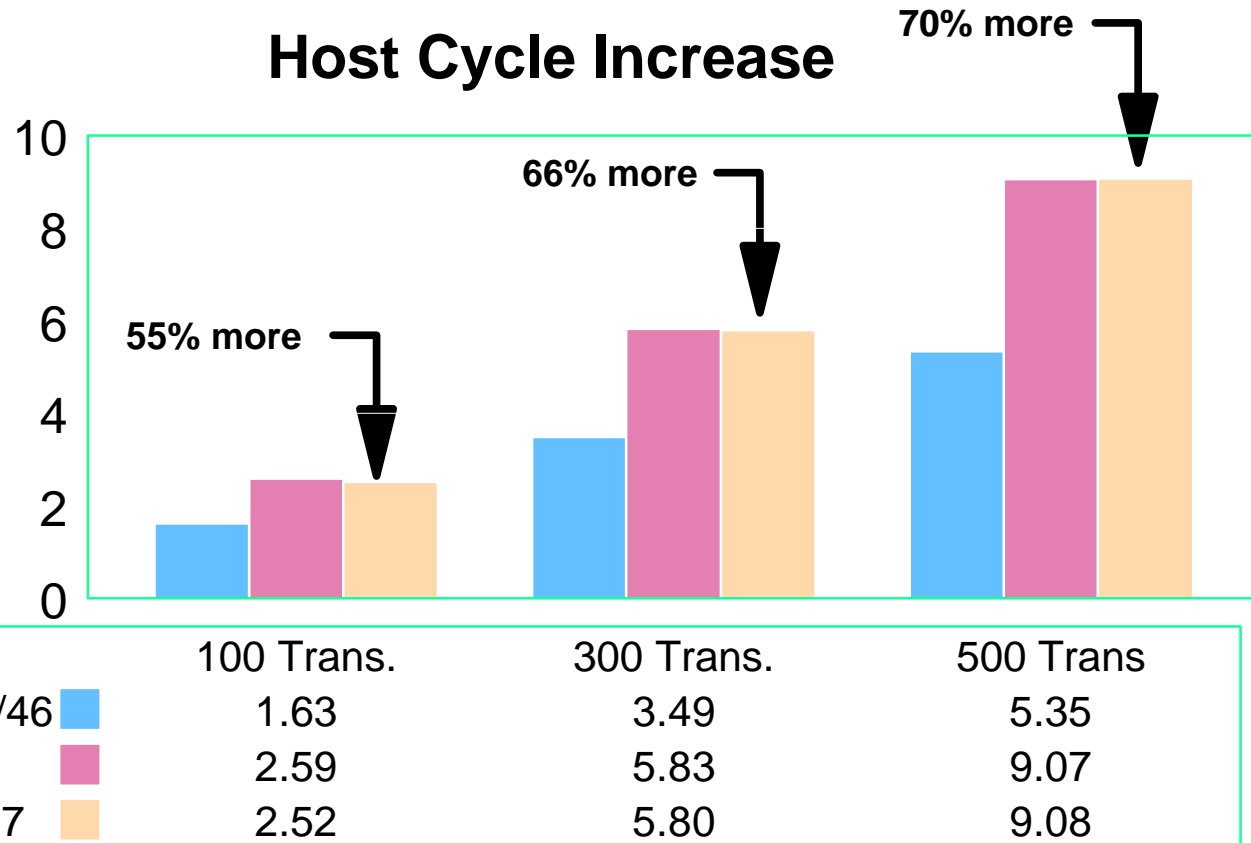
IBM delivers up to 300% better thruput compared to Cisco.*

* IBM test used HPR; Cisco test used ISR - **HPR is not available from Cisco.**



Source: The Tolly Group, August 1997

NCP Host Cycle Impact



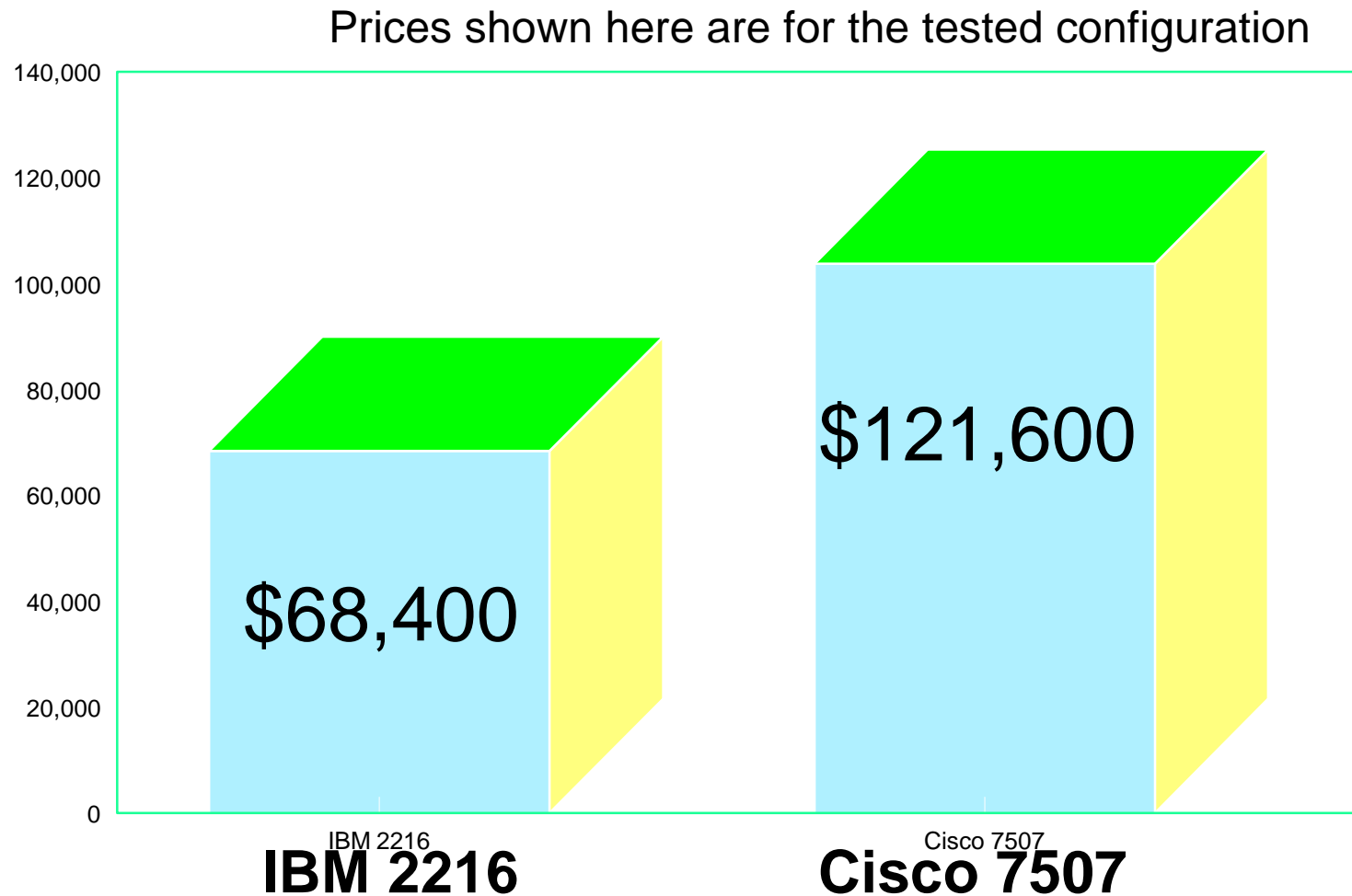
Message sizes are 128/128 Bytes

Transactions are normalized for comparison

Table shows MVS / VTAM cycles only in percent

Source: IBM Washington Systems Center,
August 1997

High end performance... Mid-range price!



Source: IBM and Cisco published list prices



Benchmark results: Key decision criteria

Scalability

IBM offers

Many options for S/390 Server Access including the largest number of connections in a single box (3746-9X0)
- up to 240 lines in addition to the 3745 capacity

Migration choices

IBM offers

Not a "one size fits all" approach

Planned evolution

- > Manageability
- > Reliability
- > Lasting value



Benchmark conclusions

- ▶ IBM is using new technology to provide customers with industry leading performance for S/390 server gateways.
- ▶ IBM delivers industry leading performance across the board - ALL networks (IP, APPN, SNA) benefit.
- ▶ Common PowerPC technology in the 2216 and 3746 means both large and small customers can benefit.
- ▶ High end performance at a midrange price :
The 2216 establishes a new price point for S/390 server access.

Backup



Equipment tested: details

All equipment configured with latest, recommended hardware and software

IBM 3746 Multiprotocol Controller Model 900

- 2 ESCON Processor Type 3
- 2 ESCON Coupler Type 2
- 2 TRP-3
- 1 TRP-2
- 6 TICs
- NCP V7R3

IBM 2216 Multiaccess Connector Model 400

- 2 ESCON connections
- 4 TR adapters

Cisco 7507 Multiprotocol Router

- 1 RSP4 processor
- 1 CIP w/ 2 ESCON connections
- 3 TR adapters
- IOS 11.1.11

S/390 server: 9021-241, 275 MIPS (5 processors), MVS/SP 5.2.2, VTAM 4.4, TCP/IP 3.2

PC's: Comm. Server 4.0 - OS/2 Warp V3

NHD Channel Gateway Solution Environments

Gateway Configuration	3746	2216	7507
TCP/IP	<i>(Test #1)</i>	<i>(Test #12)</i>	<i>(Test #19)</i>
SNA Passthru (TPNS - Int.)		<i>(Test #13)</i>	<i>(Test #20)</i>
Passthru (NetMarks-file tran)		<i>(Test # 30)</i>	<i>(Test #32)</i>
ANR	<i>(Test #2)</i>	<i>(Test #16)</i>	? <i>(Test #33)?</i>
ISR			<i>(Test # 23)</i>
DLUr - ISR			<i>(Test # 24)</i>
SNA NCP Offload	<i>(Test #4)</i>		
SNA + IP on same ESCON (NetMarks)	<i>(Test #34)</i> ISR	<i>(Test #35)</i> ISR	<i>(Test #25)</i> ISR
ISR Capacities			
- #PU/EN, Sessions			
ATM			
LAN to LAN			
TN3270 Capacity (TPNS)			<i>(Test #29)</i>

Tests in *italics* are complete and were audited by the Tolly Group.

Traffic Profiles

▪ IP

- File Transfer using Netmarks
 - 1500 bytes outbound
 - 1500 bytes inbound or outbound
 - 4000 bytes outbound
 - 4000 bytes inbound or outbound
- Largest frame size in or out (Max thruput)

▪ APPN/HPR/ISR

- File Transfer using Netmarks
 - 2000 bytes inbound/outbound
 - 4000 bytes inbound/outbound
 - 8000 bytes inbound/outbound
 - 16000 bytes inbound/outbound
- Largest frame size in or out (Max thruput)

▪ SNA-1(DLUR) & SNA Passthru

- Interactive using TPNS
 - 128 bytes inbound / 128 bytes outbound(DLUR/DLSW)
 - 128 bytes inbound / 128 bytes outbound (500/1000 Transactions per second)
 - 100 bytes inbound / 1000 bytes outbound (Max Transactions per second)
 - 100 bytes inbound / 1000 bytes outbound with DR (Max transactions per second Tps)

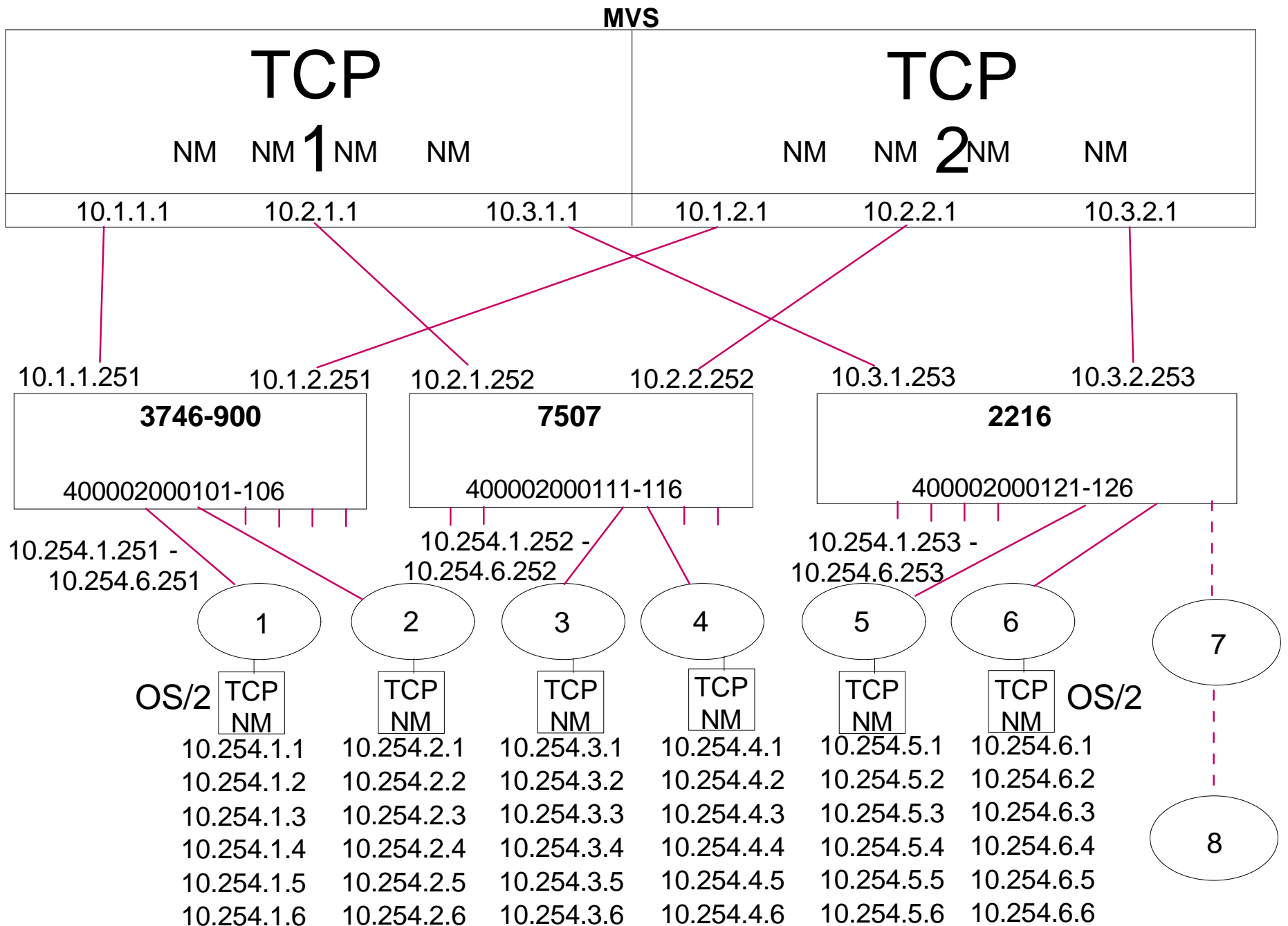
▪ SNA-2 (Host Cycles)

- Interactive using TPNS
 - 128 bytes inbound / 128 bytes outbound
 - at 100/300/500/1000 transactions per second

▪ Combined APPN/IP

- File Transfer using Netmarks
 - 4000 Bytes inbound / outbound
 - Largest Frame Size in or out (max Thruput)
 - - 70% SNA, 30% IP
 - - 50% SNA, 50% IP

NHD Test Lab Configuration - TCP/IP



2216 in IP Mode - Sample Test Setup

