BY STEPHEN FORCE

TCP/IP Upgrade

Preparing for my NaSTEC 6.0 "TCP/IP Reality Check" presentation, it struck me just how accepted Transmission Control Protocol/Internet Protocol (TCP/IP) has become in the mainstream data processing world. When I first worked with VM TCP/IP at the University of Tuebingen (Germany) Medical Center in 1988, I found it quite interesting. TCP/IP was logical, but for someone trained in SNA it seemed somewhat quirky and peculiar.

My first project with MVS TCP/IP was in 1989. The client was a major German manufacturer. The company was doing some Catia CAD engineering work on IBM RS/6000 AIX Unix workstations. These workstations were linked via TCP/IP and often needed network access to the MVS systems. TCP/IP functionality on the IBM mainframe appeared the logical choice.

TCP/IP is making vast inroads into the enterprise network. It is now, and will continue to be, a strategic product for LAN/WAN connectivity. It certainly wouldn't hurt to learn as much about TCP/IP as possible.

Writing four articles on TCP/IP for the NaSPA publications in mid-1992, I was convinced TCP/IP would largely impact enterprise data processing. Due to the open nature inherent within TCP/IP, and the ability for operating systems of any kind to interconnect, the impact of TCP/IP was inevitable.

So, I am not really surprised TCP/IP has become such a powerful force in today's network scene. Today, all major vendors support TCP/IP. It has become the defacto open system networking standard, surpassing the International Organization for Standardization (ISO) Open Systems Interconnection (OSI). Market forces have ensured this. These vendors realize the power (not to mention deep and broad market penetration) of TCP/IP and are writing programs and utilities to use it.

Preparing for the NaSTEC presentation, I contemplated the following questions:

1. Has TCP/IP really made the inroads we suspect?
2. If so, how deep and broad?
3. How is TCP/IP being used in the enterprise?
4. Which TCP/IP products do people like?
5. What products have problems, and what are possible solutions to these problems?
6. Are TCP/IP gateway products better than placing TCP/IP directly on the mainframe?
7. What tools are being used for network management and problem management (SNMP, CMOT, CMIP)?
8. Are people arbitrarily choosing IP addresses, or are they (properly) requesting an official class A, B, C or D Internet ID from the Network Information Center?

A discussion regarding these questions will be presented in a future column.

WHAT'S UP ON THE NOVELL AND MICROSOFT TCP/IP FRONT?

Meanwhile, in various laboratories worldwide, Novell (and its several recently purchased subsidiaries) and Microsoft are busy bringing TCP/IP into their various strategic products. Even though both have their own network protocols, both ship products using IP.

Indeed Microsoft has taken TCP/IP seriously by adopting TCP/IP as its enterprise networking protocol of choice supplanting NETBIOS. NETBIOS, Microsoft's standard networking protocol, will be recommended only for small workgroups' LANs. Like all Windows products providing native TCP/IP functionality, Microsoft is hoping to make great inroads into enterprisewide LAN/WANs.

Novell's solution is NetWare IP. Generally available for more than six months, NetWare IP, a NetWare Loadable Module (NLM), functions by placing IP rather than IPX/SPX packet formats on the enterprise internetwork.

EXPLOITING TCP/IP

Several vendors have written applications exploiting TCP/IP. These applications run the gamut from file transfer utilities to writing network monitoring Simple Network Monitoring Protocol (SNMP) "agents." It is possible to monitor a TCP/IP network in a number of ways. Some of the more popular monitoring software products come from companies such as IBM (NetView), Novell (NetWare Management System [NMS]) and Hewlett-Packard (OpenView), to name a few. Some of these products have impressive and intuitive graphical interfaces. Most have the capability to "learn" a system (dynamically update the monitoring software's "view" of the connected network.)

TCP/IP fits well in the open system scenario. TCP/IP sockets or Remote Procedure Calls (RPCs) written with ISO (and industry) data representation standards such as the Abstract Syntax Notation 1 (ASN.1) can easily transfer data from system to system, as well as make an application extremely portable.

SNMP is an excellent applied ASN.1 data representation example. All data are defined to the ASN.1 protocol. All network monitoring "agents" (or daemons, or whatever) must adhere to the ASN.1 standard in creating the Management Information Base (MIB) variables as well as formatting SNMP messages.

For those of us who are "chip heads" (current jargon for computer nerds) and want to write our own TCP/IP-related applications, there are many excellent tools available.

This means anyone wanting to write their own SNMP agent can as long as they use the proper data representation protocol. Several ASN.1 tools are available for a software developer to use. Some ASN.1 tools are public domain software (meaning, unsupported) which might work for some limited, noncritical applications. However, most people interested in writing programs using the ASN.1 data representation are advised to use commercially available products such as the Open Systems Solutions, Inc.'s (Princeton, N.J.) OSS ASN.1 Tools compiler product.

"CHIP HEADS" HAVE SEVERAL TCP/IP DEVELOPMENT TOOLS AVAILABLE

For those of us who are "chip heads" (current jargon for computer nerds) and want to write our own TCP/IP-related applications, there are many excellent tools available. Some, such as Microsoft's WinSock applications programming interface (API) are included in every version of Windows 3.1 (and up). This allows each Windows system to be a potential TCP/IP socket (client or server). This is powerful stuff in my book.

The Visual C+ + for Windows NT provides a good example of how WinSock API is used. Unfortunately, the example is written in C, not C+ +, but beggars can't be choosers, right?

For developers desiring to write RPC programs more easily, products such as NobleNet Inc.'s (Southboro, Mass.) EZ-RPC product might be just the ticket. I first wrote about EZ-RPC in mid-1993. Since then, EZ-RPC has been made available for other operating environments such as Novell's NetWare.

An enterprise interested in writing programs to monitor and manage a network has several possible ways to do so. Novell provides an NMS software development kit (SDK) for NetWare agent construction. This allows a developer to write specialized programs adhering to NMS philosophy.

Developers needing to manage a mixed LAN environment can chose several tools to write various components. For example, a programmer needing to report TCP/IP SNMP information to Novell's NMS can use a combination of C+ +, NMS SDK and the OSS ASN.1 compiler to write the reporting agent.

TCP/IP is making vast inroads into the enterprise network. It is now, and will continue to be, a strategic product for LAN/WAN connectivity. It certainly couldn't hurt to learn as much about TCP/IP as possible. ■

Was this column of value to you? If so, please let us know by circling Reader Response Card No. 36.

Stephen Force is a consultant and member of the Michigan NaSPA Chapter. He can be reached via NaSCOM ID: Forcsteq or CompuServe ID: 76470,2637.