APPLICATION ENVIRONMENTS DICTATE

IBM/DEC LINK

ONCE A DISJOINTED AND CONFUSING JUMBLE, NEW SOLUTIONS TO THE DEC-TO-IBM CONNECTION PROBLEM HAVE FINALLY LINKED ON COMMON GROUND TO MATCH APPLICATION NEEDS

BY BRAD HARRISON, Midwest Editor

Making the DEC-to-IBM connection is no longer achieved via a confusing bag of mixed connectivity environments. Rather, you now have a number of product choices that address a complete spectrum of application needs. All that's necessary is for you to carefully evaluate what your needs are and select a product.

The solution choices are rich enough that no overlap occurs. As such, three primary solution categories are in evidence. If you're predominantly an IBM site, you'll probably want to view DEC equipment as emulating IBM equipment or as independently addressable nodes on the IBM network. If, on the other hand, you're a tried-and-true DEC shop, the reverse will most likely be the case. And, if you don't regard your company as biased toward products from either company, you'll simply want to connect them with a bridge or, possibly, a gateway.

The latter method is becoming increasingly popular as DEC and IBM establish a peer-to-peer-type relationship.

DEC Opens the Gate

DEC's DECnet/SNA (System Network Architecture) Gateway product is one of the more common means of connecting DEC and IBM environments (Figure 1). This method appears to ensure a true peer-to-peer relationship between the two computer systems even though all connectivity software resides either within the gateway itself or on the VAX side.

The gateway, connected on one side to the SNA network and on the other to the DECnet network, appears as a native node to both networks. This solution is most often used when DEC equipment is used at the departmental level and IBM equipment manages the main corporate processing load. Interestingly, this approach is similar to—but on a much grander scale—attaching multiple personal computers to the IBM mainframe.

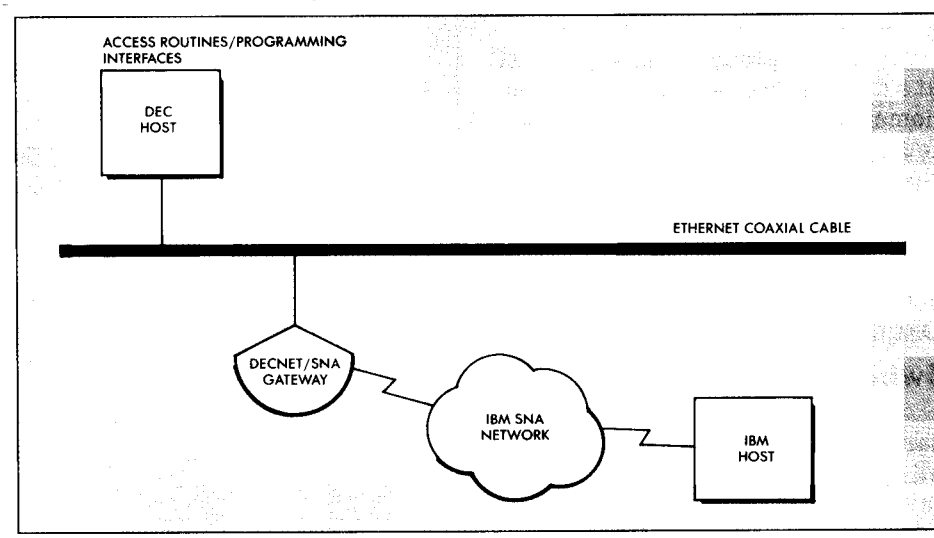
The DEC gateway is a critical element in DEC's strategy for penetrating IBM sites. "Transparent, bi-directional communications with IBM is one of DEC's eight key product strategies," says Fred Balfour, DEC's manager of LAN product marketing. Already DEC has sold more than 2000 DECnet/SNA Gateways, according to Balfour.

Slow Operation

The DEC gateway product, however, is criticized for being slow. (See "Digital's SNA Gateway Proves an Efficient, Though Slow, Link to IBM Systems," *Hardcopy*, p. 119, May, 1987.) The product is based on a 16-bit PDP-11/24, but a 32-bit MicroVAX version is expected soon. Indeed, DEC's Balfour says this upgrade can be expected soon; observers expect an announcement as early as this month.

Indeed, a MicroVAX gateway for interfacing a DECnet network to IBM minicomputers and mainframes is already shipping. The 3237 Model 400 SNA gateway product from In-

Figure 1—DEC's DECnet/SNA Gateway product connects *the DEC and IBM environments on a network-to-network basis. This gateway allows VMS systems in a DECnet network to access resources, programs, and information with an SNA network. It also allows 3270 display users within the SNA network to access DECnet-based VMS system resources.*



Table—VMS/SNA Vs. DECnet/SNA Gateway Applications and Environments

The following applications are best suited for VMS/SNA:

- Remote offices requiring both independent computing resources for office applications and access to the corporate database on the IBM mainframe.
- Government command and control systems requiring a link to the IBM mainframe for transfer of military information from mobile units.

The following applications are best suited for DECnet/SNA Gateway:

- Installations with DEC department-level systems and IBM corporate systems. The department-level systems are linked via DECnet to the corporate SNA network with a DECnet/SNA Gateway.
- Remote sites with more than one DEC computer that require access to the SNA network.
- IBM 3270 users requiring access to a corporate mail system implemented on VAX systems. The DECnet/SNA VMS DHCF access routine provides this capability.
- Sites requiring SNA access from VAXstation II systems.

The following environments are best suited for VMS/SNA:

- A large SNA network with a small number of VAX systems.
- A large SNA network and geographically dispersed single VAX systems, each requiring a separate link to the SNA network.

The following environments are best suited for DECnet/SNA Gateway:

- A large DECnet network and medium-to-heavy interface to SNA network.
- Multiple DECnet networks and medium interface to SNA network.
- Need for multiple lines to SNA network.
- Heavy VAX usage that requires off-loading network capabilities to a communications server.

terlink Computer Sciences offers a transfer rate of 800–1000 Kbits per second, as compared to the 56-Kbit-per-second transfer rate of the DEC gateway product. In addition to using the wider 32-bit word, the Interlink product interfaces directly to the IBM block channel to achieve its performance gains and, as Interlink's gateway software resides on the IBM side of the link, another performance advantage is achieved since high overhead EBCDIC-to-ASCII character conversion occurs on the IBM mainframe rather than within the gateway.

Interlink products have put DEC at a disadvantage—a short-lived phenomenon, however, according to Balfour. "You can expect DEC to be on the leading edge in its IBM connectivity offerings," he says. Meanwhile, Interlink is watching DEC closely, and considering expanding its product line to support TCP/IP as well as DECnet.

Swing the Gate

Gateway products aren't necessarily the ideal or proper solution for all applications. "A gateway tends to favor the DEC environment—especially with the DEC product," says David McCaffree, engineering manager for FlexLINK International Corp. "The DEC side offers transparent access to IBM resources whereas the IBM side doesn't."

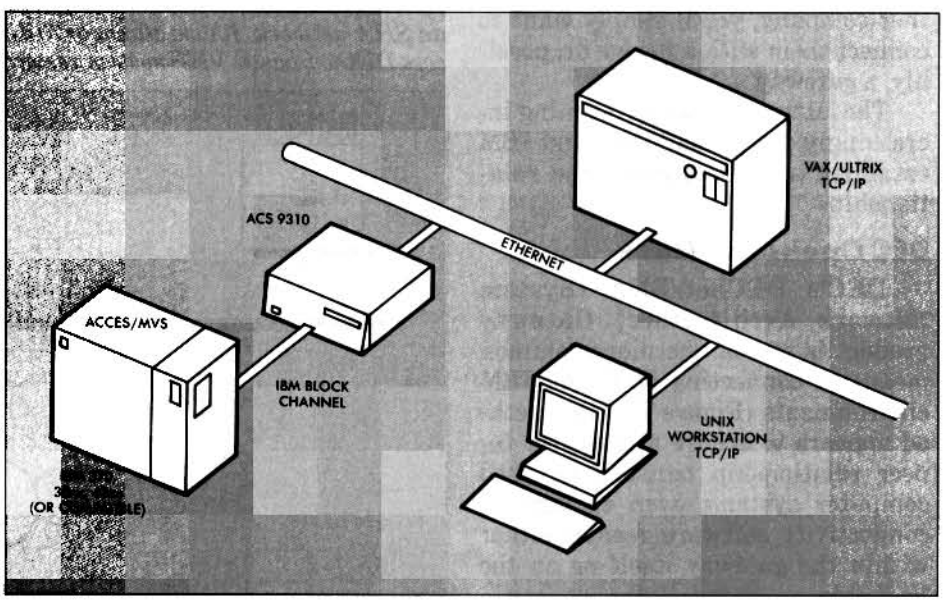
Of course, McCaffree's comments aren't unbiased—his company manufactures bridge solutions that, the company claims, balance the relationship between the two systems.

The gateway, however, is excellent for electronic mail and other text management operations where completely user-transparent communications between environments aren't critical. Kim Myhre, International Data Corp. (Framingham, MA) vice president of communications services, insists that gateways are ideal for light-load communications between company networks: "Most of the traffic between DEC and SNA networks is text transfer." Mhyre isn't convinced that the performance of the gateway is all that important.

FlexLINK's McCaffree disagrees and states that the majority of their customers typically require multiple high-speed virtual channels (FlexLINK offers up to 128). "They want immediate response in terminal emulation communications and rapid file transfer," he says.

With this apparent high demand for gateway and bridge products, you might expect a plethora of IBM products from which to choose. There is, however, just one—the 8232 TCP/IP network interconnect package for VM systems.

Figure 2—ACC's ACS 9310 emulates *an IBM product but, the company claims, runs circles around its counterpart in performance. The 9310 connects VM and MVS systems onto TCP/IP networks when the appropriate IBM or ACC-supplied software is installed on the IBM machine.*



IBM Plays Ball with DEC

IBM refuses to acknowledge any threat from DEC to its "glass houses," but is encouraging some connections between the two environments. The only reason IBM is reaching out to DEC at all—offhanded though it may be—is to get the IBM 9370 "VAXkiller" onto DEC networks. "We feel we provide an enhancement to DEC engineering installations," says Larry Molder, a product manager at IBM in Dallas. "The 9370 is especially effective in those environments." IBM salesmen see VAXes being carted away in favor of 370-architecture (9370, 30xx, or 43xx) machines. "It isn't a pretty sight," comments an engineer who witnessed one such conversion, "especially if you're a DEC salesman."

To make the DEC link, IBM's 8232 TCP/IP product puts any IBM 370-series machine running under the Virtual Machine (VM) operating system onto an Ethernet TCP/IP-based network. The VM machine functions as a TCP/IP node, communicating with VAXes, UNIX workstations, and PCs. Additionally, IBM's best kept secret—its PC/RT—can also be integrated into the network, creating two strong options for engineering and technical facilities—DEC's home turf.

But IBM is providing no support for the 8232 product under Multiple Virtual Store (MVS). A third-party company, however, is offering support for MVS on TCP/IP networks, along with a functional replacement for the 8232 product.

One-Upmanship

Advanced Computer Communications' (ACC's) ACS 9310 product is the functional counterpart to IBM's 8232 and can be used with IBM's VM software. The company also sells its Acces/MVS software for ACS 9310 support under MVS (Figure 2). Additionally, ACC offers a TCP/IP solution using Intel Corp.'s Fastpath product—also used in FlexLINK's bridge products—to put a single IBM 370-series machine on six (maximum) separate Ethernet LANs.

These TCP/IP solutions are clear examples of IBM equipment being viewed as nodes on DEC networks. However, TCP/IP capability can be used in gateway products for shops with large TCP/IP and SNA LANs that need to be incorporated as well.

TCP/IP Focus Pays Off

Mitek Systems Corp. decided early in the game to put its trust in TCP/IP gateways instead of DECnet. (See "Digital-to-IBM Networking Solutions Stress Standardization and Minimal Changes to Existing Systems," *Hardcopy*, p. 124, February 1987.) Now, with the heavy emphasis on UNIX workstations on DEC LANs, Mitek's philosophy seems to be paying off.

Mitek offers TCP/IP gateways between Ethernet-based LANs and

"Instead of gateways, many users are electing instead to purchase products that do just what they need done over a serial SNA or Binary Synchronous Communications (BSC) link."

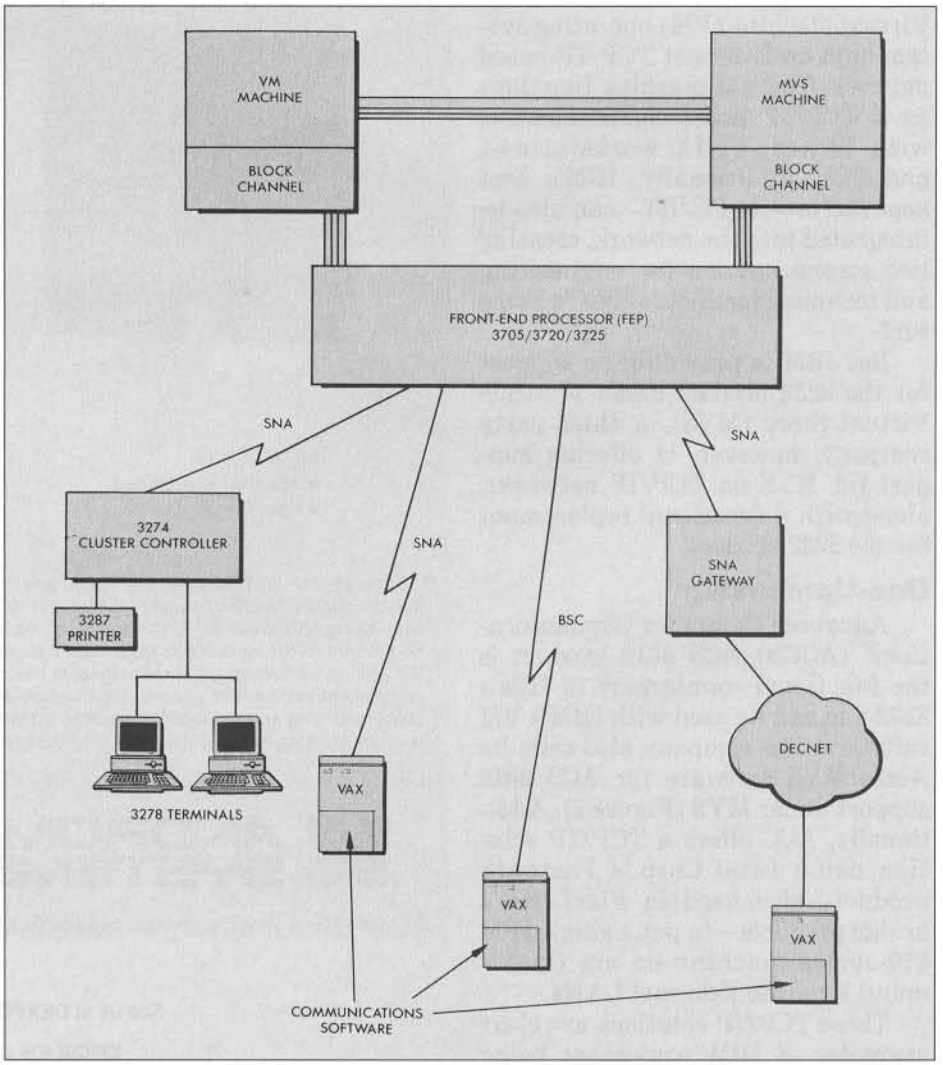
SNA networks for the entire range of IBM minicomputers and mainframes, including the System/3x computers. Its offerings for the System/3x machines are particularly important because, though 125,000 of these systems have been sold, DEC-to-IBM connectivity solutions have been slow in coming for these systems.

The Mitek gateway is capable of handling 62 virtual circuits and performs character conversion within the gateway product. The Mitek gateway can also be attached directly to the IBM block mux channel, and the communications software resides on the DEC side of the connection.

Focus on the Solution

Instead of gateways, many users are electing instead to purchase prod-

Figure 3—SNA gateway and SNA and BSC serial connections are *usually made from a VAX to an IBM front-end processor. Q-bus, Unibus, and BI bus communications controller boards are used in the RS-232 serial link products and separate processors are used for gateway products. In some cases, third-party software communications products are used on VAXes connected to an SNA network via a gateway; in these instances, the vendor supplies no connectivity hardware.*



ucts that do just what they need done over a serial SNA or Binary Synchronous Communications (BSC) link. These products are often referred to as the DEC-to-IBM emulation products (as opposed to gateway and bridge products) because they tend to make DEC equipment look like IBM equipment to the IBM host computer.

This approach works best when DEC equipment is being integrated into IBM shops, whereas the DEC network node and gateway solutions are more appropriate to putting IBM equipment on DEC networks or integrating networks from both vendors. Again, DEC offers a solution and distinguishes between applications and environments for the DECnet/SNA Gateway and VMS/SNA product as shown in the Table. All the VMS software for specific integration functions offered with DEC's gateway product is offered with its VMS/SNA product as well.

VMS/SNA and a wide range of third-party products are usually configured into IBM systems as shown in Figure 3. This integration is usually achieved using board-level products from DEC or third-party companies such as Simpact Associates Inc. and Software Results Corp. for the DEC Q-bus, Unibus, and BI bus.

The primary advantage to configuring a VAX as a component of an IBM network is that users can introduce DEC products into their IBM computing environments and still use all of their IBM network management software. "A VAX basically becomes plug compatible, moving DEC into the glass house," says Leslie Yeamans, vice president of end-user products and services at System Strategies Inc.

Other advantages to these integration strategies are that they are less expensive, may offer extremely high performance, and provide a wide range of capabilities in many different packages.

Cheaper and Specific

Specific solutions are available in inexpensive packages to provide you the functionality required to get the job done.

One example of this is the Jnet product from Joiner Associates Inc. The only package supporting Network Job Entry (NJE), Jnet brings store and forward capability to the VAX and operates via an SNA or BSC link. As opposed to other solutions, Jnet allows delayed submission of batch jobs and extensive security features, and can be combined with DEC products on a DECnet system and operate with the DECnet/SNA Gateway. If the extensive functionality of the gateway isn't required, however, you can achieve equal—or better—performance with the right plug-in communications controller.

Where's the Intelligence?

The market offers a variety of hardware capabilities for the serial

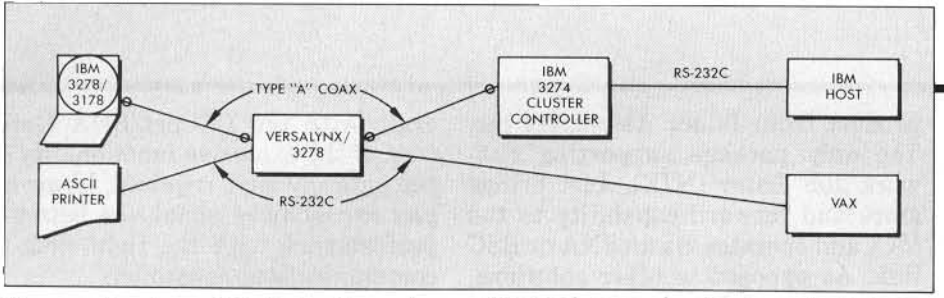


Figure 4—Local Data's VersaLynx/3278 is *a protocol converter that allows IBM 3278/3178 terminals to emulate VT220s and other ASCII terminals. The operator switches between native IBM and emulation mode by entering a predefined key sequence. No software is required—all emulation functions and character conversion are performed within the VersaLynx box.*

BSC or SNA interface. DEC uses its DPV11 and DMB32 boards for VMS/SNA communications, while Systems Strategies uses DEC's KMV1A board or Simpact's ICP 1622 for support of SNA, BSC, or X.25 communications.

Simpact also offers software support for its products, although its intelligent boards will off-load the processor of much of the communications overhead, making the software overhead negligible. The company provides VMS, Ultrix, and RSX "toolkits" for customers who wish to do their own software development.

One of Simpact's best sellers is its ICP 1632 VAXBI-to-BSC intelligent communications controller developed under its VAXBI license from DEC. The company says that at first the product didn't sell well, but this is changing fast. DEC's powerful new BI machines are bringing DEC into IBM shops—which is exactly where DEC has positioned them.

Another intelligent communications controller manufacturer supporting direct DEC-to-IBM communications with both hardware and software is Software Results. Software Results supports BSC communications, including HASP, and will soon announce an SNA product. The company will also be supporting Ultrix soon as a result of a development agreement with DEC.

The intelligence of the hardware can greatly affect performance. If most of the communications overhead is handled by the intelligent controller, the software has fewer chores, freeing up the processor. A fast DEC node that emulates IBM equipment on an SNA or BSC network is an excellent way to accomplish those specific tasks best addressed by DEC products.

Strictly Peer-to-Peer

Sometimes IBM and DEC system managers have just one concern: allowing both DEC and IBM systems to exist on a completely equal basis, transferring data between environments at the maximum possible speed.

To accomplish this, FlexLINK and Intel have joined forces to use Intel's Fastpath product to connect VAXes and IBM machines. Two types of configurations are possible when selected according to the exact performance requirements, but a standard command set is always implemented on both sides of the bridge regardless of the configuration.

Custom software is used on both sides of the bridge. DEC's DR11-W is the connection to the VAX, allowing for DMA operations. The data is taken right off the block channel, resulting in a product that reportedly improves throughput by a factor of at least two over the nearest competitor. Interlink, however, states that it has achieved the same high throughput rates with its MicroVAX gateway product (which also connects to the block channel), so the issue is still unresolved—particularly as both companies are continually improving the performance of their products.

The price tag for the FlexLINK product is approximately $100,000; and, depending on the configuration, the Interlink gateway can be equal in cost. Therefore, the traffic must be sufficient to justify the cost of these high-performance solutions.

Hitting the Niche

Inexpensive solutions to common connectivity problems that favor neither the DEC nor the IBM environment yet feature "plug-and-play" connectivity are available from Local Data. For instance, if simple terminal emulation is all that's required, the company's DataLynx/3174 product allows both IBM and DEC systems to share one terminal. All character translation and emulation occurs in the product's firmware, so no host-based software is required.

If simple file transfer is all that's required between a System 38 and a VAX, the InterLynx/5251 box can be used. Another product, the VersaLynx/3278, allows the sharing of printers and terminals by IBM and DEC systems without the use of any special software (Figure 4).

All Local Data products use standard RS-232 and coaxial connections. The DataLynx 3174 and 3274 support direct connections to SNA networks. SNA networks can be supported via IBM cluster controllers, and DECnet and TCP/IP networks can be supported via terminal servers.

For additional information about the products or services described in this article, either contact the companies directly or circle the appropriate reader service number

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