# The Case for Enterprise Extender

**With the demise of the IBM 3745, the last remnants of SNA networking will be swept away. Aubrey Harrison, who was the visionary behind the rationalization and positioning of the AT&T SNA network in Europe, explains why Enterprise Extender is the solution for intercompany mainframe connectivity and why business needs to make the change, take the pain and move on.**

By Aubrey Harrison

For many years, IBM front-end processors (3705, 3725 and 3745) have been at the heart of most Wide Area Networks (WANs). However, time is running out for this aging survivor from the days when networks were SNA from the desktop to the data center. IBM announced its withdrawal from marketing in 2002, and indicated support would be withdrawn in 2007. This fact alone should be >

enough to ensure organizations worldwide have developed and agreed upon a strategy to remove their dependencies on the 3745. Indeed, some organizations do have such a strategy and have largely executed it, while others have gone through some measure of 3745 consolidation. This usually means the remaining 3745s are located in the data center, which simply increases the impact of a 3745 failure and does nothing to remove the dependency. Unfortunately, there are others who have, thus far, taken a wait-and-see approach, maybe arguing that IBM withdrew support for 3725 years before the last 3725 was taken out of production; therefore, there's no rush to remove the 3745. After all, they may be trying to justify that it's fully depreciated, it works and if it isn't broke, don't fix it. Well, this line of thinking is very wrong.

There are clear indications from the strategies being executed by Cisco, IBM and AT&T that time is running out for the traditional data center structure of channel-attached mainframes and SNA subarea networks. Consequently, there's a need to plan the absolute removal of the business dependency on 3745s.

In many instances, the place to start is with the letters S, N, A, as most CEOs will tell you they no longer have any SNA and that it was replaced by IP years ago. As far as the desktop and WAN is concerned, this is probably true, but the situation is quite different in the data center. It's no exaggeration to claim that global business depends on SNA mainframe applications. SNA is still prevalent in banks, insurance companies, the manufacturing sector and finance houses. Over the past 20 years, major multi-national companies have spent billions of dollars developing a complex set of applications that communicate within the company (e.g., order processing to component build) and between companies (e.g., bank to credit rating company). These applications aren't being replaced—at least not in a general way—and not in the current timeframe. Therefore, the first requirement is to ensure the company decision-makers understand their dependency on SNA.

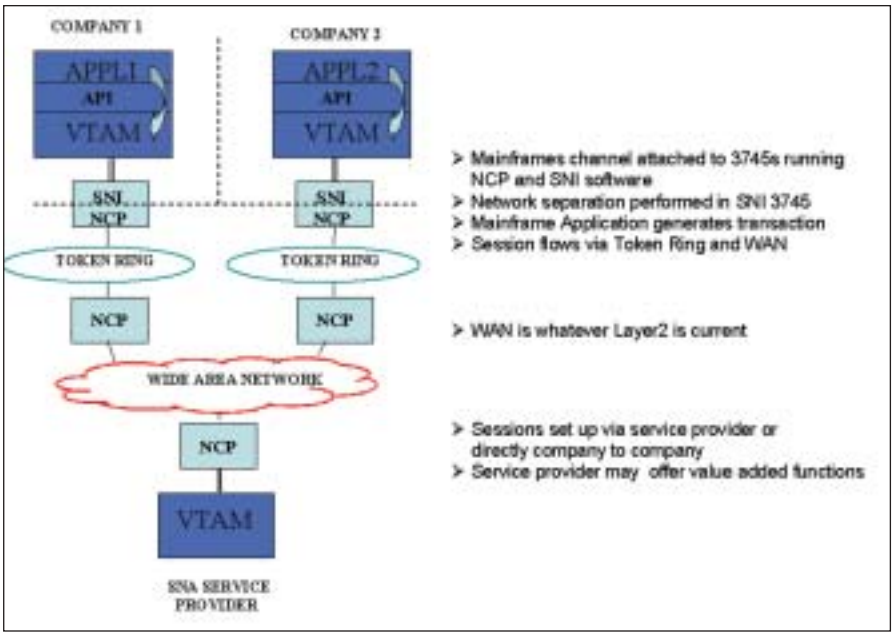


Figure 1: The SNI Environment

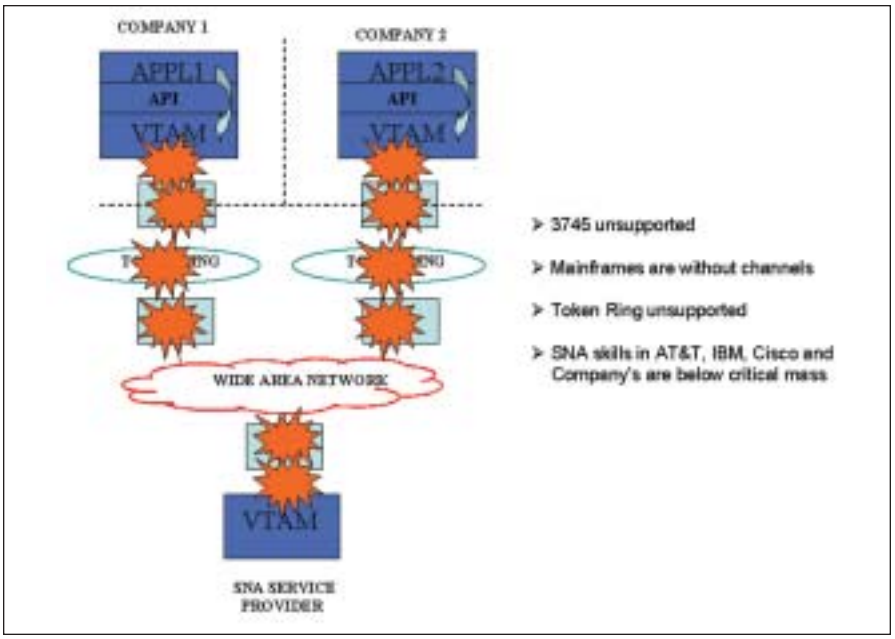


Figure 2: What Happens to the SNI Environment

While new applications, new functions and new features will be written to use the IP sockets interface, it's certain there will be a long-term requirement, say 10 years, for SNA mainframe applications and the inter-connectivity of these applications. There are two ways in which intercompany sessions can be established between SNA mainframe applications:

- Using the SNA Network Interconnect (SNI) function running on a 3745 in a subarea network
- Using the Extended Border Node feature in an Advanced Peer-to-Peer Networking (APPN).

Usually, the SNI solution is used because the replacement of subarea networks by APPN hasn't been widespread. However, the precise number of 3745s running SNI is difficult to determine, since they are used for tasks other than supporting SNI links. What is clear is that at least one 3745 is required for an SNI connection, but it's usual for there to be one at each end of an intercompany SNI link. The fact that IBM has signaled the 3745 is at end of life should be cause for concern for companies running these SNI connections. Figure 1 shows a simple SNI environment where the intercompany SNI connection could be established via either the service provider or directly between Company 1 and Company 2.

The impending demise of the 3745 isn't the only reason why organizations need to be planning how their main-

frame networking requirements will be met in the future; there are several other factors that must be considered:

- IBM is pushing OSA Express, not channel, as the network connection media for mainframes.
- In many data centers, there's a Token Ring environment, but Cisco is withdrawing support for Token Ring. Although they have a number of Token Ring cards, when they're gone, they're gone.
- AT&T, a global SNA network service provider, has withdrawn support for its SNA leased line service in Europe.
- The pool of SNA skill is dwindling. New hires don't see a career in SNA network design or systems programming, and those engineers who understand and are able to maintain the 3745 hardware are not being replaced.

Clearly, IBM, Cisco and AT&T are executing strategies that signal the end of the traditional data center structure of channel or Token Ring-attached mainframes that depend on an SNA subarea network (see Figure 2).

The combined impact of these strategies and the skill problem is (or should be) forcing companies to build a plan that will future-proof their mainframe, business-critical applications. Leaving the creation of a plan until 2007, when IBM may announce the withdrawal of 3745 support, is too late.

The CEO of every company should be asking his network manager for a plan, with dates and costs that will remove the dependencies on 3745, channel-connected mainframes, CISCO Token Ring and legacy SNA skills. Without such a plan, the transfer of business-critical data will be dependent on unsupported technology and a diminished skill pool that will be unable to make the required changes if this window of opportunity is missed.

## The Alternatives

### Rewrite the Applications

One way to resolve the problems would be to redesign and rewrite all the SNA mainframe applications so they become native IP functions that have no requirement on any legacy technology. The expectation is new functions will be written to exploit IP and the Internet, although market research suggests few organizations are planning to take the option for wholesale redesign.

One reason this option is not attractive is the cost of doing it. For example, let's say that to redesign, rewrite, test and deploy a single SNA application is a 10-person year effort, then each application will carry a price tag approaching $1million! But an application can't be rewritten in isolation; it has to be part of a comprehensive strategy to migrate away from SNA in the mainframe by all interconnected organizations, thus increasing both cost and complexity.

Consequently, SNA applications will remain in the data center for some time. Eventually, they will have to be replaced, but it's more likely that a shortage of skills, rather than a change in technology, will be the telling factor. The people who developed these applications are now either approaching retirement or have already retired, so the organization has to come to terms with the problem of continuity of skill.

### Migrate to Enterprise Extender

The replacement of SNA subarea networks by APPN, which IBM had hoped

for, never really happened. Most organizations viewed APPN as too little, too late, and there was never a compelling event to drive the migration. Instead, what has happened is APPN has been introduced through stealth; it's a prerequisite that must be in place before the advantages of Parallel Sysplex can be gained. New CMOS processors are difficult to connect to subarea networks, and if SNI is reaching end of life, then APPN Extended Border Node function is the heir apparent. By using Enterprise Extender (EE) to deliver Extended Border Node, the change to APPN becomes more palatable, is in line with current technology and skills, and is the formal IBM solution.

Implementing EE (and APPN) in the application mainframe removes all the dependencies an organization has on legacy technology and skills as well as the need for the applications to be redesigned, at least in the immediate future (see Figure 3).

An EE-enabled data center has no dependency on IBM 3745, SNI, channel-connected mainframes, Token Ring, DLSw or legacy SNA skills. What leaves the mainframe is a User Defined Protocol (UDP) datastream and its effect is to future-proof the data center against networking technology changes. SNA will have become a core data center function only—it exists solely in the application layer, not as a desktop solution, a wide area technology, as campus technology or as the intercompany connectivity provider.

### Do Nothing

Whenever a significant change is proposed, it's always good practice to examine the "do nothing" option. Suppose the organization looked at the case for migrating to EE and decided against it. What would happen? The answer is the amount of risk the organization is exposed to will increase significantly.

The organization could decide to accept this risk; however, the following has to be understood and taken into account. Part of the risk analysis needs to be the mainframe refresh cycle. Should the application mainframe be replaced by a new CMOS processor, the probability is it won't have the capability to channel connect to the 3745. Although the organization may not have any plans to refresh its mainframes, and is happy to accept the 3745 and Token Ring risk, there's another, potentially, more serious risk that must be considered.

AT&T has already withdrawn support for its SNA leased line service in Europe, and as they are exposed to the same SNA-related problems as all other organizations, one must question how long it will be before they, and other SNA service providers, completely withdraw support for traditional SNA services. This would mean the organization would have to establish and support all the SNI connections to its business partners and absorb the associated costs. At some point, one of these interconnected business partners will decide to convert to EE and then all interconnected organizations will also make the transition.

In this case, doing nothing really isn't an option.

> The case for EE is overwhelming. Technology changes will force the issue, and the only thing open is timing.

### Inhibitors

Just as the "do nothing" option needed to be examined, inhibitors to change also need to be considered. Moving to EE will solve a lot of problems, but quite obviously, this doesn't come without a cost; there can be no advantage without a disadvantage. Perhaps the three biggest inhibitors will be network security, business case and skills.

Of these, the most emotional inhibitor to EE will be the security issue. Not only does EE deliver native IP packets into the network, but these packets comprise a UDP datastream. This fact alone is often enough for the security functions in the banking networks to veto any plan to convert. Their Orwellian mantra of "SNA good, IP bad" will be heard in all the planning meetings. While security certainly is an issue that needs to be discussed, it isn't a reason to stop the change. There are solutions; in some cases, the applications themselves can implement the required security functions. However, the organization may find the solutions offered by software vendors, who have written products to specifically address the requirements for security, would be less disruptive to implement and meet their needs. Two examples are APIAS from William Data Systems, which introduces an SSL function in the application host without the need to rewrite any application code, and the SNA/APPN Security Firewall offered by NetQ, which provides for partner verification at the LU level in the VTAM Directory Services Management Exit (DSME). Network security in an Enterprise Extender environment needs serious discussion and a

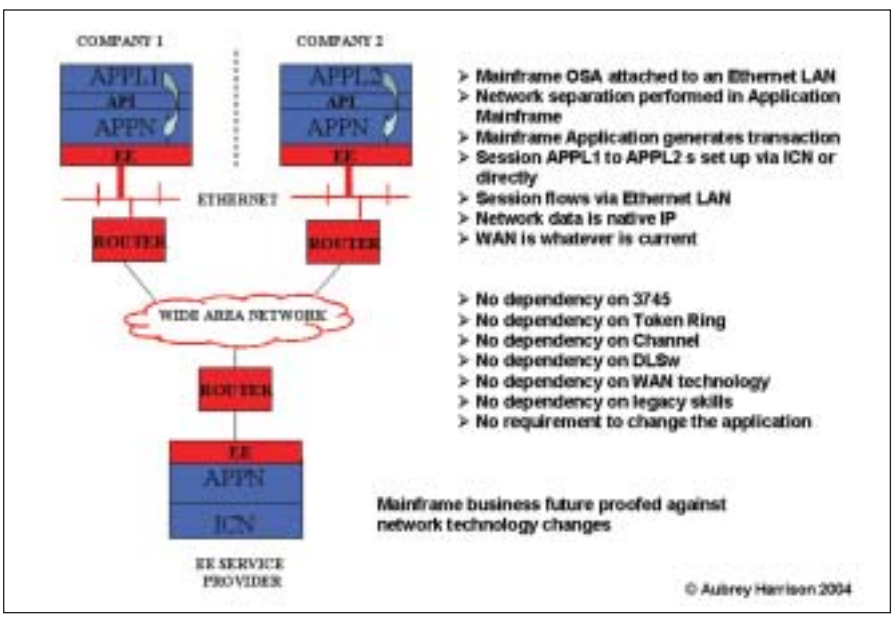


Figure 3: SNI Replaced By Enterprise Extender

strategy must be agreed upon, as options and solutions are available.

Once the security inhibitor has been resolved, questions will be asked about the business case. The 3745s will be completely depreciated and, maybe, the NCP license has been bought. So, how can the cost of change be justified? Begin by taking into account the space freed up by removing 3745s and the associated maintenance costs (keep in mind that as 3745 maintenance skill diminishes, those organizations that still have 3745s are likely to pay more). Next, look at the resource needed to support and manage the EE environment and compare it to the costs of maintaining the existing SNA and IP networks. The true cost of retaining a 3745 depends greatly on the model, the software features being used, the cost of space, the type of maintenance contract, etc., but conservatively, the cost of keeping a 3745 in the machine room is likely to be between $15,000 and $20,000 annually, whereas the same cost elements for a router will be in the region of $1,000 annually. There's no doubt that the business case will be positive.

An APPN environment is required before EE can be implemented, and many organizations are likely to claim they have very little, if any, APPN skill. The thought of coming to terms with the need to design an APPN network, as well as planning an EE migration, may be enough to convince some that the change is too big and too risky. This is not the case. Like all migration efforts, care must be taken in the design stage. The first thing to agree on is the APPN design. Where will the Border Nodes be? How many Interchange Nodes are required, etc.? While this may seem like a daunting prospect to those who have not deployed any APPN function, the reality isn't as frightening. Some basic structures need to be understood and adopted. These will form the base upon which EE will operate. The subsequent enabling of EE is comparatively trivial. The best way to explore and resolve these questions is by talking to those who have already made the change; the knowledge to help is available.

The thrust of this article has been to encourage the replacement of intercompany SNI connections by EE connections; it hasn't addressed the need to provide solutions for Boundary Function. As part of the planning to replace SNI with EE, the Boundary Function needs to be taken into account and solutions adopted. There will be various Boundary Function platforms in use; few, if any, organizations have a clean IP client desktop population. Solutions are available for Boundary Functions; e.g., 3270, X.25 even BSC, that don't depend on having an IBM 3745, although one option could be to retain one (or two) IBM 3745s to purely support the non-mainstream technology devices until they can be replaced.

In addition to the inhibitors discussed here, there will be others, such as the complexity and risk of the change and the resulting performance of IP when compared with SNA. All inhibitors need to be reviewed, discussed and resolved. The crucial thing to always keep in mind is, there are no showstoppers. Many organizations have already migrated to EE, and their experience can be used to help others navigate through the changes.

### Implementations

Once the decision to convert to EE has been made, the strategy for the intercompany EE sessions needs to be addressed. There are two options: have separate EE sessions to each business partner, or have a single session to a service provider (to which your business partners must also connect). In many ways, the service provider option is the most attractive, especially if it includes some security and management functions. The probability is both will be needed, which means the organization will need to grow the required network management, migration and security functions.

### Recommendation

The case for EE is overwhelming. Technology changes will force the issue, and the only thing open is timing. It's not a question of whether or not it's right for an organization to convert, but rather *when* is it right? Every organization that has an intercompany SNI connection today needs to formulate a technical and business plan that defines how and when they will convert to EE. The clock is ticking. The requirement is to make the change, take the pain and move on!


## About the Author

Aubrey Harrison recently retired from AT&T in the U.K., where he was the SNA networking consultant for Europe. His most recent work has been to encourage businesses to initiate plans to manage the removal of their remaining dependencies on SNA technology and skills.
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