



**-Support Integration-
A New Concept
For Today's Networks**

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In designing today's sophisticated networks, consideration must be given to how diverse hardware and software elements can be seamlessly interconnected. This means reconciling physical connections and overcoming problems related to incompatible protocols to ensure smooth interoperability among different vendors' products. Tying in additional services offered through the public switched network is also an important consideration. Problem is, rarely do in-house MIS and telecom staff have the depth, breadth of expertise, or the time to accomplish this formidable task alone.

Enter the "support integrator."

Support integration is a specialized subset of systems integration, a broad discipline concerned mainly with integrating smoothly functioning information systems with diverse hardware and software building blocks. But since these systems and subsystems almost always have complex WAN connectivity requirements, support integration is emerging as a discipline in and of itself.

Like the systems integrator, the support integrator must bring objectivity to the task of tying together multiple technologies and systems to form a seamless, unified network. Whereas the systems integrator draws upon experience in management information systems (MIS), the support integrator draws upon experience in telephony and data communications. Added value is provided through strong project management skills and accumulated experience with customer requirements in a variety of operating environments.

As more players enter the systems integration business to compete for a slice of this multi-billion dollar pie, the need for support integration becomes more apparent. After all, uptime management is an absolute requirement to maintain the integrity of mission-critical information systems that depend on the quality and availability of network services.

Support integrators must understand the differing transmission requirements of voice and data, and how to manage accordingly. They must know how equipment and line sparing, as well as failure rates, impact network availability. Support integrators bring to bear specialized skills and management tools in servicing the network, and know when and how to escalate problems to ensure timely response by any and all vendors.

Problems may be solved quickly by conducting monthly status meetings with vendor representatives. Support integration is a continuous activity that takes into account the organizational dynamics of the user, as well as changes in the external operating environment that can affect the cost of operations and network availability.

You need a well-conceived strategy to select the most qualified company as your support integrator. Since most support integrators are also hardware vendors, it pays to start the evaluation process with companies who maintain a formal wall of separation between the support/integration group and sales and marketing departments. This will ensure that your needs are not sacrificed to the vendor's need to sell you additional boxes.

Beyond that, there are a number of areas of expertise that merit evaluation before you choose a support integrator.

Multiple technologies

Since it is often necessary to combined best-of-breed solutions to get the complete performance you need, it's not unusual for today's networks to employ nine or ten technologies from as many vendors. So it's smart to look for demonstrated expertise in network design, engineering and implementation of large digital transport systems for a variety of rigorous applications, including those in retail, financial services, manufacturing, and state government environments.

Evidence of such experience should include contract awards and successfully completed projects that involve installing and implementing multi-node digital backbone networks using a variety of protocols, from wide-area ATM to gigabit Internet. Ask for references that use hardware and software products similar to those you plan to deploy on your network. When you check references, inquire about the company's ability to meet work schedules, deal with multiple vendors simultaneously, get along with staff members, and stay within budget.

Examine the firm's experience in designing and installing hybrid networks consisting of such diverse components as time division multiplexers (TDMs), statistical time division multiplexers (STDMs), and x.25 switches and packet assembler-disassemblers (PADs). With these building blocks, users may mix and match several architectures instead of feeling constrained with a single network-wide architecture. In the process, users can add elements of precision and control to network operations while effectively positioning the network to accommodate new communications services like ISDN. Moreover, these building blocks can facilitate network expansion to include satellite and wireless, if necessary, as well as fiber optic links. Even if these are not immediate concerns,

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you need a support integrator who can meet your future needs as organizational requirements change.

Look at the experience of the firm in integrating local area networks to wide area networks using such devices as gateways, bridges, and routers. Experience with these network elements help establish the breadth of a firm's knowledge of communications protocols, management systems and specialized interfaces. Find out what experience the company has integrating networks that span international locations. Does the vendor have a global presence with single-source servicing?

Finally, make sure your support integrator can back up their claims by wrapping it all up in a single maintenance agreement, including a multi-vendor contract.

Network design

Before building out your network, it is essential to perform an audit to make sure all the design tools are in place and configured for optimal deployment. In addition, make sure you can deliver sufficient bandwidth to meet the demands of the network.

Start by evaluating the firm's network design tools for establishing backbone links and local access lines. Be sure the tools can deal with such factors as line topology, traffic load, facility costs, equipment types, communications protocols, hubbing arrangements, and the differing performance parameters of voice and data. These factors must be considered simultaneously with such variables as switch performance, including queuing, blocking and reliability. Make sure that the design tool takes into account the type of traffic that the network supports: voice, data image or full streaming video - or any mix of these. This is important because of most of the current computer tools that are available address only a few aspects of the design problem and assume that the other aspects are fixed, essentially treating them as foregone conclusions.

The information requirements of computerized network design tools can be daunting. A user might need to know the transaction message sizes of major applications, for example, and how often the applications run during peak hours at each location. Equipment and facility performance parameters such as delays must be provided. Experienced response time is often needed to calibrate and validate an existing baseline configuration model before a network can be modeled with any degree of confidence.

Wireless and fiber optic interfacing

The increasing sophistication of networks requires that the support integrator have expertise in interfacing voice or data digital networks with wireless and fiber optic systems. In the case of a hardware vendor, find out how its products are being used by its customers.

For example, consider the deployment of the account vendor's diagnostic modems on an oil company's wireless network that connects numerous oil platforms in the Gulf of Mexico to network control facilities in Texas. How much customization was required to tie the modems into the wireless network? How satisfied was the customer with results? The answer to such questions will provide ample demonstration of the capability to integrate network elements to wireless.

If you want to determine a vendor's experience in interfacing to fiber optics transmission systems, find out if its broadband products are equipped with fiber termination cards to provide customers with the means to feed high-capacity fiber links.

If the company lacks direct experience in these areas, look into its strategic alliances. Some companies have fairly mature alliance programs with other hardware vendors who provide critical components of the network along with required technical expertise.

Network management

Network management systems unify communications resources and transform them into strategic assets that can improve a company's competitive position and long-term survivability. Selecting a support integrator with experience in implementing network management systems can be critical to the success of your integration plan.

Some data communications firms have demonstrated their expertise in network management by integrating host-based management systems like IBM's Netview with proprietary modem/multiplexer management systems that will also permit ties into AT&T's UNMA, which unifies the various management systems of that company's transmission products. When OSI standards are stabilized, these vendors intend to provide links into the network environments of other vendors. A vendor's expertise in developing such network management systems gives them a unique perspective with which to provide objective advice concerning all aspects of network operations. Rarely can a consultant, computer manufacturer or carrier provide an equivalent level of expertise in this key area. Enlisting a support integrator will also free up internal resources to deal with problems they are best equipped to solve.

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Project management

The project management team should have extensive experience in all facets of data and voice communications, including system design, product development, integration, installation, security issues, and problem resolution. Another critical area is the experience in network change management, which may be an ongoing activity, depending on the size and complexity of your network.

Find out if a dedicated project manager will be assigned to oversee all aspects of your integration project as well as its implementation. The program should be open to customization to meet your specific requirements. The resumé of the Project Manager who will be assigned to work with you should be furnished for your evaluation along with an organizational chart showing lines of responsibility. This information may be used to support the decision-making process related to the selection of the support integrator. It should not be changed later without your knowledge and approval.

The project management team should be well versed in the use of computerized planning tools to coordinate and track your systems implementation plan. PERT, GANTT and CPM should be among the tools used to develop and review implementation progress, so your project comes in on time and on budget.

Once the equipment is installed and integrated into an entire system, the project management team should develop and oversee customized acceptance testing with your staff. At the same time, the project management team should prescribe appropriate levels of training for your staff and be prepared to implement training if required.

The project management team should be able to assist you in identifying specific inventory control and internal billing requirements, and then to recommend, develop or customize software to meet those needs.

Facilities engineering

To successfully integrate diverse products from manufacturers, the support integrator should be staffed with professionals who understand all aspects of facilities engineering. This includes planning, scheduling and coordinating the preparation of your site, as well as managing the total implementation plan.

Does your support integrator have multiple simulation labs, so systems can be configured and tested off-site before they are deployed in your company? How about state-of-the-art circuit-testing devices protocol analysis equipment? Are their field engineers equipped with sniffer emulation?

Such capabilities ensure that your site will meet all environmental, space, and power requirements before the equipment arrives. Your support integrator should be able to configure, stage, integrate, and test entire systems before delivery to your site. This proactive project planning approach defines activities and eliminates potential problem areas early in the integration process - where they are easier and less costly to correct.

Network support services

Potential support integrators should be carefully screened for their service orientation, as well as their knowledge and capabilities in public and private networking. Their proposals should reflect an understanding of your industry, your company's competitive situation, corporate network performance objectives, and information systems environment. Your objective is to determine how flexible the potential firm will be in meeting your unique requirements, what additional resources it can draw upon, its response capability, and how far it can be trusted to act in your best interests as an independent partner.

You must also check into the support integrator's track record in servicing equipment from multiple vendors, what technical and logistical support capabilities it can bring to the relationship, and what disaster recovery services it can provide.

It's also important to evaluate the support integrator's commitment to providing technical training as evidenced by the caliber of instruction, course curriculum, and training materials.

Telco best practices and procedures

Because today's networks typically traverse the serving areas of many telephone companies, the support integrator must be completely familiar with a wide variety of operations practices and procedures. This includes administrative and technical practices and procedures governing the installation of various devices to the local loop and inside the plant.

To do this, the support integrator should track and study Bellcore Technical Advisories and Technical Requirements publications, including those governing New Equipment Building Specifications (NEBS), which covers heat dissipation, power consumption, relay

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rack mounting and alarm arrangements in central offices. The support integrator should also be familiar with the Common Language Equipment Identifier (CLEI) coding scheme used by telephone companies.

Up-to-date network service integrators

Multiple technologies, multiple protocols, and multiple vendors characterize today's network universe. Fierce competition among vendors and technologies must not limit the ability of hybrid systems to work optimally under various configurations and conditions.

That's why dealing with network service integrators out of touch with the latest developments puts your future at risk. Such individuals are quite limited in what they can offer in the way of network integration services. Make sure that the company you select has in-depth, hands-on knowledge of the transmission requirements to support key applications such as streaming video, electronic mail, electronic document interchange and remote database access. The expertise of integrators must transcend standard terrestrial copper to include wireless, satellite, and fiber. They must be conversant in digital and analog networks, trained on the latest test equipment, and comfortable with the spectrum of protocols in use today. This includes familiarity with a full range of data communication technologies from modems, multiplexers, hubs, and routers, to ATMs.

Network security and virus protection

Today's network- and Internet-dependent companies must, above all, protect the integrity of their mission-critical data and intellectual capital. That's why your network system must be safe, secure, and virus-proof. Does your support integrator have access to the latest technologies to protect your network against equipment failure and security breaches? Are they trained to deal with the continually evolving threat from new and more dangerous viruses? Can they recommend and specify the latest intrusion detection technologies, maintain secure firewalls? The answer to these questions will also help you choose an appropriate NSI.

Customer-oriented life cycle support

Look for a firm with the broadest experience in a variety of technical fields, customer applications, and operating environments. Even if some of these points don't seem relevant to your current needs, they should be evaluated with long-term requirements in mind. After all, once you have invested considerable time and effort in developing a working relationship with a NSI, you don't want to start from scratch whenever your needs change.

Your evaluation of a support integrator should reveal an infrastructure organized for immediate action, with the right methodologies, tools, and staff already in place. Beyond that, the candidate must be able to show that its resources are strategically positioned to provide network support for the lifetime of your network. This should include consulting and education, development, implementation and integration, and management and maintenance.

Above all, look for a support integrator with a strong customer focus. That means finding an independent organization that always recommends the best of breed, based on your immediate and future needs, not the needs of their marketing partners. That way the network you build and deploy today will be ready to meet the challenges of tomorrow without major re-engineering or re-tooling costs.