



NETWORK MIGRATION SERVICES

A CASE STUDY

Many large telecommunications service providers are applying Datatek Applications' off-the-shelf products to facilitate the migration of their embedded base of legacy networking equipment to alternate technologies. At the same time, Datatek has also been developing the capability to customize its software-driven products to meet very specific customer needs. Datatek's DT-6061 Embedded Network Processor is a good example of a product that was originally conceived as a platform to support the recurring need for customization. Recently, Datatek demonstrated the power of the DT-6061 and the responsiveness of its engineering team when it provided a timely and cost-effective custom solution to address a unique requirement at a major telecom service provider. This is a brief story of that effort.

THE FUTURE IS HERE

SOME BACKGROUND

Most of the well-established telecom companies serving the local exchange market have long used LMOS (Loop Maintenance Operations System) and SARTS¹ (Switched Access Remote Test System) in their internal operations. Both of these applications use 3270 terminals for user access. These terminals have for the most part been replaced with PCs running 3270 client emulation software that communicates via TCP/IP with a server providing the BiSync host gateway function. The server terminates BiSync lines from the LMOS and SARTS hosts, thus emulating 3270 terminals. One large telecom company was using a dedicated processor, locally called the Open Dynamic Network (ODN) server, to provide this 3270 server function as well as other special services, in each of three regions. Reliability was an ongoing problem – occasional failures of any of the ODN servers would bring all LMOS/SARTS operations within a given region to a halt. For this reason, and because of the high cost of maintenance of their ODN servers, this company was looking for a way to eventually migrate all of these functions to other devices.

A PLATFORM FOR CUSTOM SOLUTIONS

Having already begun to use one of Datatek's migration products in its network, this telecom company initiated discussions with Datatek in mid-2000 to explore ODN server migration solutions. Datatek's DT-6061 Embedded Network Processor quickly emerged as a key element of a proposed solution.

Let's briefly digress to present a quick overview of the DT-6061 and show why it was the right platform to address the customer's need. The DT-6061 is a NEBS-compliant compact general-purpose computer. It can be physically located anywhere there is access to an IP networking infrastructure, over which it communicates with various client devices. It supports a variety of applications, as well as combinations of these applications running simultaneously. Currently, 10 application packages (mainly doing protocol-translation functions) are available off-the-shelf. The elements common to all applications that the DT-6061 provides are the programming API, basic file services, system scheduling, the TCP/IP protocol stack, and an SNMP agent for system configuration and management. This provides a powerful and reliable software platform to support rapid implementation of custom applications.

¹ LMOS is a set of software applications that automate trouble reporting and dispatching for customer telephone lines. SARTS is an application used to administer and communicate with remote network elements for DSO and DDS special-service remote testing.



ELEMENTS OF THE MIGRATION SOLUTION

Three custom DT-6061 applications were developed by Datatek's engineering staff to facilitate the migration of ODN server functions. The TN3270 application provides the 3270 terminal-emulation function described above, which was the primary requirement. Another application, B2APRT, allows a BiSync (i.e., LMOS or SARTS) host to send print jobs to an ASCII printer. The remaining ODN service was RFC1179 print spooling, i.e., queuing print jobs from the LMOS/SARTS hosts and directing the output to a shared printer on the IP network. A print-spooler application for the DT-6061, called IP-SPOOL, was developed to integrate with B2APRT. Each instance of the B2APRT application would have a TCP/IP connection to a "virtual printer" – actually an instance of IP-SPOOL – which arbitrates access to the shared printer.

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Besides the DT-6061, the other critical hardware component of the proposed solution was the Universal Mediation Interface (UMI) module. The UMI is a migration device that acts as a common (sharable) "mediation" resource between Datakit, and IP network infrastructures, allowing any Datakit, endpoint to establish a session with any TCP/IP endpoint, and vice versa. The customer has a large Datakit, network providing connectivity between its regional ODN sites and its LMOS and SARTS hosts in its data center. Since the PC 3270 clients, DT-6061s, and

printers would all be directly connected to the IP infrastructure, UMI modules in the existing Datakit, nodes were needed to serve as gateways between the two networks. As an indication of the size of the customer's network, 37 UMIs (each of which provides up to 247 simultaneous TCP/IP sessions in this application²) were required. These replaced a much larger number of Bisync Terminal Interface Modules (about 280) in



the Datakit[®] nodes as well as a large Terminal Handler Processor (THP) associated with each ODN processor.

IMPLEMENTATION OF THE SOLUTION

The customer made the final decision to go ahead with this migration project in December of 2000. Implementation and integration of the required DT-6061 applications was accomplished rapidly, and customer acceptance testing of "beta" quality software began the following month. Some operational problems did surface, most of which turned out to be between the B2APRT application and the LMOS host. All problems were quickly addressed by Datatek's engineering

² The UMI actually supports up to 504 TCP/IP simultaneous connections, of which only 247 were usable in this case due to channel assignment constraints specific to the application.

staff however, so that by early April, the customer was able to cut over the first live users to the DT-6061 - based network. Following a steady migration of nearly 10,000 users to the new network, the last ODN processor was shut down in July. In view of the many "what if" problem scenarios the customer had initially expressed concern about, none of which ever materialized, the transparency and stability of this migration exceeded all expectations. Datatek continues to refine the DT-6061 application software in response to ongoing customer requests.

RESULTS

Datatek's flexible network migration technology and the expertise of its engineering staff came together to help this telecom customer plan and execute a painless and cost-effective evolution of its internal operations network. For the migration project just described, the cost of equipment and services purchased from Datatek was recovered in about 10 months, as result of the elimination of the recurring expense of maintaining legacy equipment. In addition, the network is now much more reliable. Each ODN server had been a single point of failure that could bring down operations in an entire region. Instead, the equivalent work load is now distributed across 14 DT-6061s (7 for 3270 server functions and 7 running B2APRT and IP-SPOOL) interconnected via TCP/IP to 37 UMIs, which makes the system far less vulnerable to any point of failure. Finally, from the perspective of the PC users, the system is much more "friendly", due to the simplification of connection-establishment procedures. The customer is now working with Datatek to plan further migration steps for the remaining legacy equipment comprising its internal operations network.

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