

The Crisis Of Complexity

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The decision could scarcely have come more quickly: Soon after the acquisition of a major bank, the CEO of one of the world's largest providers of financial services signed off on a six-figure purchase order for software that gives a virtual view of every IP address in the company. Headquarters will have a window into all the separate islands of networks that heretofore had been locally managed using spreadsheets, and it will have the ability to make system-wide changes instantaneously, even while delegating local control to preserve responsiveness.

This decision is one of many corporate responses to what has become a true crisis of complexity. The piecemeal proliferation of Web applications, datacenters and management tools has created chaos. While we all enjoy the information access benefits of the Internet and intranets, IT administrators are entangled in infrastructure.

Local management of IP addresses using spreadsheets and Perl scripts are unscalable for a worldwide enterprise, as are server management, storage and the hundreds of firewalls, SSL offload appliances, VPN appliances, intrusion detection systems, etc., that have been installed in recent years. The infrastructure has become both inefficient—with capacity utilization of individual units typically under 25 percent—and unmanageable.

This unwieldiness is most noticeable after a corporate merger that brings together conflicting IT systems. But any kind of corporate churn sends pain reverberating throughout the organization.

Managing The Web Infrastructure

Those most affected are often those who have been most successful in using the Internet to connect to customers—for example, companies in package delivery, mutual fund management, investment banking and high tech. Though each faces challenges peculiar to its industry, all share a generic pattern: Putting business processes on the Web has made their products less expensive and more convenient for customers. One mutual fund company, for example, expects trading—now largely Web-enabled—to increase seven-fold over

the next three years even as trading revenues stay flat. That means, however, that this company now has to find a way to become seven times *more efficient* just to maintain its current level of profitability.

While the solution to that problem is multi-dimensional, one of the elements that will play a key role will be to simplify the management of the complex underlying infrastructure. And the way to approach that problem is via virtualization.

The concept of virtualization has been around a long time. Thirty years ago, “virtual memory” enabled programmers to ignore the individual computer's limitations in physical memory. Fifteen years ago, frame relay allowed users to eliminate individual leased lines and pool their communications resources into “virtual” wide-area networks. Today, we have fairly well developed “virtual” storage, an emerging “virtual” compute layer that enables provisioning of applications on demand, and an even newer “virtualization” of front-end datacenter appliances.

While all those developments are important, we need to go further: The historic 1990s flood of information exchange has overflowed its banks and it's time to clean up. We require an approach to virtualization that leads to pooled enterprise-wide systems that are transparent, infinitely scalable and universally accessible. That's going to be a huge undertaking.

The good news is that progress is being made. Among our portfolio companies are Nominum, which enables virtual management of IP addresses; Inkra Networks, which virtualizes firewalls, load balancers and other appliances that have sprung up in recent years; and Netli, whose service enables datacenter consolidation by delivering global sub-second Web response from a single datacenter. Many other companies also are in the process of coming to market with virtualization-based products, services and business models.

In five years, the current crisis of complexity, however massive it appears today, will largely be a thing of the past, masked by a smooth surface of virtualized management. By then, of course, I and my colleagues in the venture capital industry will be looking for new areas of opportunity that will cause the whole cycle to repeat itself once again □

Companies Mentioned In This Article

Inkra Networks (www.inkra.com)
Netli (www.netli.com)
Nominum (www.nominum.com)