

18 *Short Topics in* **System Administration**

Jane-Ellen Long, Series Editor

Deploying the VMware Infrastructure

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Authors' Note: We have changed some names for VMware products from the first printing of this booklet in order to adhere to product name changes that the company has undertaken. These include changes from VirtualCenter to VMware vCenter and from Virtual Desktop Manager to VMware View Manager.

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This booklet is dedicated to Diane Greene and Mendel Rosenbloom for their leadership, support, and friendship.

This booklet gives you a starting point for understanding the VMware Infrastructure and deploying it for cost reduction, quicker deployments of systems, and better control of resource utilization, as well as datacenter management and high availability. Welcome to VMware Infrastructure.

John Y. Arrasjid
VCP, VMware, Inc.



Foreword

After years of working in the computer industry, we have come to realize that although almost everything has been done before, approaches to problems have changed.

The evolution in processing power and declining costs has driven many of these changes. In the early days of computing, hardware was expensive. In the 1960s, virtual machines were developed on mainframe computers, notably from IBM, to enable multiple users to share expensive resources. In the 1970s came mini-computers, such as those from Digital Equipment Corporation, which were cheaper and enabled decentralized computing at a departmental level. In both cases, remote terminals accessed these shared systems.

In the 1980s, personal computers (IBM, Apple) and UNIX engineering workstations (Sun, DEC, SGI) further popularized decentralized computing, as microprocessors became faster and cheaper. Instead of having to share a departmental computer, each user had his or her own, and virtual machines became less popular.

In parallel, during the 1980s, graphical user interfaces became popular in PCs. Client-server computing arose as a method to meld interactive local user-interfaces (either on a PC or a thin client) with a central server. The desktop PC architecture evolved into business-class servers, offering inexpensive commodity-based pricing for systems that have many of the capabilities of mini or mainframe computers. Client-server computing faded away as centralized Web-based systems started to take over, and the pendulum started to swing back towards centralized computing.

At the same time, the processors were increasingly underutilized as servers had multiple processors, each with multiple cores, and software demands flagged behind hardware capabilities. The proliferation of computers spread the workload to ever more distributed yet underutilized systems. Even desktop PCs were underutilized, because they also used faster processors.

Systems proliferated, but centralized computing continued to regain popularity as Web-based computing took hold. But unlike the central mainframes of the 1970s, the new model of centralization often consisted of a complex mesh of servers, frequently configured as multi-tiered systems.

Yet these systems were becoming harder to manage. Not only were there more of them, but they came from many vendors (not just IBM anymore), and the pace of change accelerated, which put higher demands on the need to rapidly test and deploy systems. The proliferation of desktop PCs continues to pose complex management problems.

Some concepts from the past have returned to help with this situation. Virtual machines, which were almost forgotten in the 1990s, re-emerged as a method to install and consolidate many server systems into one physical machine. Many virtual machines can run on

one host. Fast networks and CPUs now enable PCs to be hosted as virtual machines in central servers accessed from thin clients, just like the old time-sharing terminals, which improves the manageability of desktop computing. Complex, multi-tiered systems can be tested and deployed using virtual machines, which helps bring a wide array of configurations to the fingertips of developers, with no need to configure them by hand. Virtual machines present a common platform that simplifies software distribution for software developers—this helps tame the headaches of software installation and returns us to the simplicity of the “good old days” when there were few target platforms to worry about. Finally, the rise of Web-based systems has led to another reason to move back to the datacenter: cloud computing. Virtual machines offer a great solution for treating an entire cluster of servers as a single shared resource, sliced and diced according to the computing needs of the moment, not unlike the central mainframes of the past.

For the first-time user of virtualization, John Arrasjid and his co-authors have outlined and discussed the world of virtualization in layman’s terms. Along with explaining how virtualization can be applied to today’s businesses, they have shown how incredible the return on investment can be in terms of resource utilization and staff productivity. For Privacy Networks, as a software company, the ability to use virtualization has increased our sales-demo capabilities, engineering test productivity, and deployment of email archiving software for customers as a virtual appliance in a VMware environment. I (Todd Massey) am continually amazed at the uses we come up with for virtualization in our company. As you learn more about deploying enterprise-class virtualization, think outside the box—for business today, virtualization can increase productivity in ways that seem almost limitless.

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