Foreword

Cisco Systems Inc. is built on the philosophy of changing the way we work, live, play, and learn. The ability to telecommute and work remotely from any location is a large part of this change. Telecommuting is not a new concept; employees have been able to work remotely for decades. Significant benefits are associated with this practice.

Today, the ability to be productive while working remotely can occur only when required office applications and tools are accessed and used as if you were physically present in the office. The early days of dialup networking are replaced with high-speed access to the home at prices that are more cost effective. The requirement to telecommute and to access the corporate network while on business travel has played a significant role in creating an entire industry around remote access. Future trends include more prevalent broadband connectivity available from hotels, airports, and other public locations.

Over the last five years, the Information Technology organization of Cisco Systems created and maintained a dedicated Remote Access Services (RAS) department to provide support to Cisco employees in the U.S. The team, which was based at the San Jose campus in California, grew in responsibility for design, engineering, and support of remote access solutions in the Americas. The IT organizations outside of the Americas provided local remote access support to employees within their regions. The remote and corporate organizations work jointly together to develop global standards strategies and solutions.

Through the years, the team implemented and supported services that consisted of analog dial, ISDN, Frame Relay, xDSL, and VPN. In total, through a combination of in-sourced and outsourced services, the team supported 30,000 dialup users and over 16,000 users with high-speed access to their homes. This RAS team of 15 engineers, provisioners, analysts, and project managers supported more users and services than most medium-sized Internet service providers (ISPs) in the U.S. A separate helpdesk organization provided all first-level support for users globally.

I had the privilege of leading the Remote Access Services team for a 20-month period during 2000 and 2001. They are the most professional, hard-working group of individuals I have ever worked with. Providing remote access support can be thankless and frustrating when dealing with end users who believe their individual remote connectivity should have high level of support with a four-hour mean time to repair. Furthermore, supporting an engineering user base further complicates matters because home networking requirements become more complex to accommodate.

Unlike most enterprises, RAS responsibilities for Cisco also included testing and implementing new Cisco products to showcase their use within our own networks. One could say most of our network was a living lab and, although we were making frequent changes to the infrastructure, the RAS team consistently maintained greater than 99.925 percent availability each quarter. The team contributed to making product improvements and enhanced the testing of new hardware

and software by identifying product bugs that were fixed before a customer encountered the problem.

The team achieved significant results during the last fiscal year that included increasing the number of users who have broadband connectivity at home by 62 percent while decreasing average cost per user by 50 percent. The team also improved support ratios for broadband users from 1000 users per engineer to 1700 users per engineer. A member of the team, Plamen Nedeltchev, also developed a solution to address the problems with the huge number of transactions a Windows 2000 network generates, especially for an ISDN usage-based environment. His solution significantly reduced the usage costs for ISDN users and the corporation, and was significantly better than any solution recommended by Microsoft.

Plamen is a key contributor to the enhancements implemented in our remote access network, especially to addressing the requirements of development engineers who work full time from home. It was his vision to write this book for Cisco Press to address the gap of available remote access troubleshooting techniques. It is a compilation of the current knowledge and practices of one of the world's best remote access teams.

In August 2001, a reorganization of IT Infrastructure resulted in the restructuring of remote access within Cisco. Although the centralized RAS team is now disbanded, this book is a testament to their achievements and a legacy to the knowledge they possess for developing and running leading-edge remote access networks. I am proud to be associated with remote access services, and the experience I gained in my former position within Cisco will always be one of the highlights of my career.

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