

CRACKS IN CISCO'S EMPIRE

NEWS.COM SPECIAL REPORT

Convolved software is key hurdle in turnaround effort

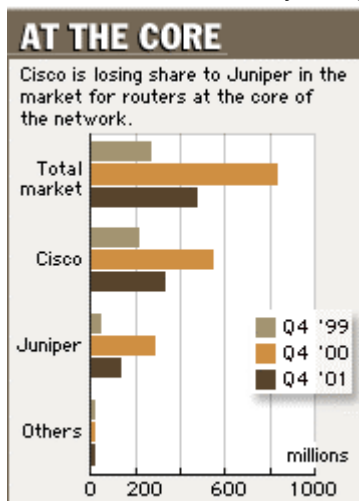
By [Ben Heskett](#)

Staff Writer, CNET News.com

March 7, 2002, 4:00 a.m. PT

A new buzzword has been added to the networking industry, one with a meaning far less technical than most: "CFN," an abbreviation for "Cisco-Free Network."

Used jokingly or not, the term is a metaphor for the daunting challenges facing Cisco Systems as it tries to resurrect its fortunes while avoiding the kind of backlash that typically befalls industry leaders. Already, inroads by upstart rivals have led some customers to question whether they can do without the networking giant's products, an unthinkable notion in years past.



A key factor in Cisco's potential vulnerability is the software that's used to direct the destination of digital information traveling along networks based on the company's hardware. While the San Jose, Calif.-based company is best known for its router hardware, critics say it has fallen behind in developing the software that serves as the brains for that equipment, which has been blamed for some high-profile outages.

As Cisco has grown to provide the largest number of Net routers in the world, the networks and software built with its products have evolved into an unwieldy hodgepodge of features and releases, according to competitors and customers. This technological jumble has slowed the company's ability to update code, provide new services, and react as quickly as smaller competitors to the needs of emerging industries.

"It's not only a key to Cisco's turnaround, but if they don't get their house in order, they'll be left behind," said Hilary Mine, executive vice president at technology consultancy [Probe Research](#). Either way, she said, Cisco faces "a very tough challenge."

Ironically, any lag in software development could be attributed in large part to Cisco's previous success. Once the most highly valued company in the world, Cisco in the late 1990s embarked on a massive campaign of acquisitions and growth that may finally be catching up to it in the form of convoluted technologies.

As a result, competitors such as Juniper Networks and Unisphere Networks have lured customers by offering a clean slate of technologies. These rivals have built new software tailored for the Internet and for popular services like virtual private networks, letting some customers replace older, or "legacy," Cisco equipment.

"A lot of our customer wins are based on software," a Juniper spokesman said.

The Byzantine state of Cisco's technologies has even led to problems in the company's internal organization. Sources say former Chief Technology Officer Judy Estrin grew frustrated by the various technology fiefdoms at the height of the Internet boom in the late 1990s. At the time, Cisco was known as a sales-driven machine that reaped huge windfalls, often at the expense of long-term equipment strategies.

Software development is "not only a key to Cisco's turnaround, but if they don't get their house in order, they'll be left behind."

-Hilary Mine, executive vice president, Probe Research

Estrin initiated a major effort to update and streamline the company's code, but sources say delays in software improvements and new features stretched into years. Making matters worse during this time, Cisco experienced some significant executive turnover at the top of its routing division.

Cisco denies that the [success](#) of competitors indicates the company has lost an edge in the market. "What you call legacy I call time-proven and hardened," said Martin McNealis, director of IP product management. "One person's definition of legacy is different from another."

Still, sources close to the company say Cisco has redoubled its efforts to address the lingering legacy issue and will be able to show concrete results in the coming months.

The breadth of Cisco's software reflects the many types of systems the company has built to expand its business, from high-end routers to low-end switches and cable modem equipment. Networking software is tied specifically to the hardware "guts" of a router. That is, the software runs on specific processors made for those systems, whether it is a general-purpose chip or one that is specifically tailored, called an Application Specific Integrated Circuit, or ASIC.

For years, Cisco strove to keep its equipment versatile enough to work with practically any networking technology while ensuring that its software could be optimized to route Net traffic.

"Cisco was very successful at supporting every protocol known to man," said Chris Lawler, vice president and general manager for Unisphere's IP Routing business unit. "That was a tremendous advantage."

But others say the strategy has created a catch-22: While Cisco sought to be all things to all people, it may have hindered its ability to cater to specific businesses. For instance, large telecommunications players such as AT&T and SBC Communications have far different--and often more sophisticated--requirements than a company connecting a few hundred computers.

Turning its wide array of technologies into a succinct system that works efficiently may be the most significant strategic hurdle for Cisco as it enters its most challenging period as a public company. Cisco's dominance in network routers has kept its revenue [relatively stable](#) compared with that of its competitors, but its stock price has plummeted since the Internet bubble burst two years ago.

The company's economic turnaround has been tested further by fierce competition from [Juniper](#) and [Unisphere](#), as well as from lesser rival [Avici Systems](#). Juniper has been able to capture roughly 30 percent of the high-end market Cisco once dominated.

Unisphere has become a significant alternative to Cisco at the so-called edge of a network, where a service provider often intersects with its business customers. The company has quickly garnered a 10 percent share of this market, based on the most recent data from market researcher [Dell'Oro Group](#).

Such gains in market share were once only a pipe dream to many in the industry, given the muscle Cisco has long flexed as the dominant provider of Internet equipment. And Cisco continues to exert its influence, as exemplified by the loyalty of its customers and the global reach of a sales force that seems to be powered by steroids.

[Infonet](#), a global telecommunications services company based in El Segundo, Calif., defends Cisco. The company has been with Cisco since the "early days," having installed its first Internet network in 1990, and is now using a fourth generation of Internet gear from the company, said Doug Laurin, director of channel marketing.

"We are sometimes too dependent on (Cisco), but they have delivered the services that we need to derive revenue from," Laurin said. "The bottom line is this: I think customers see value from using the leader."

In recent years, however, loyal Cisco customers have become equaled in number by converts to technology from competitors. Although it describes Cisco as an "important partner," the DirecTV Broadband unit of Hughes Electronics has chosen routers from Juniper for its high-speed Net service.

"We don't force customers to put different versions of software on different platforms."

-Adam Stein, director of corporate marketing, Juniper Networks

"Juniper seems to have an advantage in the marketplace because Junos, its operating system, is consistent across its product line," said Bob Sandor, vice president of network operations for DirecTV. Noting that the installation of an all-Juniper network has alleviated network problems, he said, "Prior to this, my phone was ringing at 2 in the morning."

Adam Stein, director of corporate marketing for Juniper, credits the consistency of his company's technology for such successes. "We don't force customers to put different versions of software on different platforms," he said.

Cisco's situation will get only more complicated as the demands of the networking marketplace continue to change, an environment that may play to the advantage of smaller and more nimble competitors.

As Kevin Mitchell, analyst with technology consultancy [Infonetics Research](#), said: "One of the general complaints about Cisco is if you try and turn on services beyond routing, your performance suffers." ■