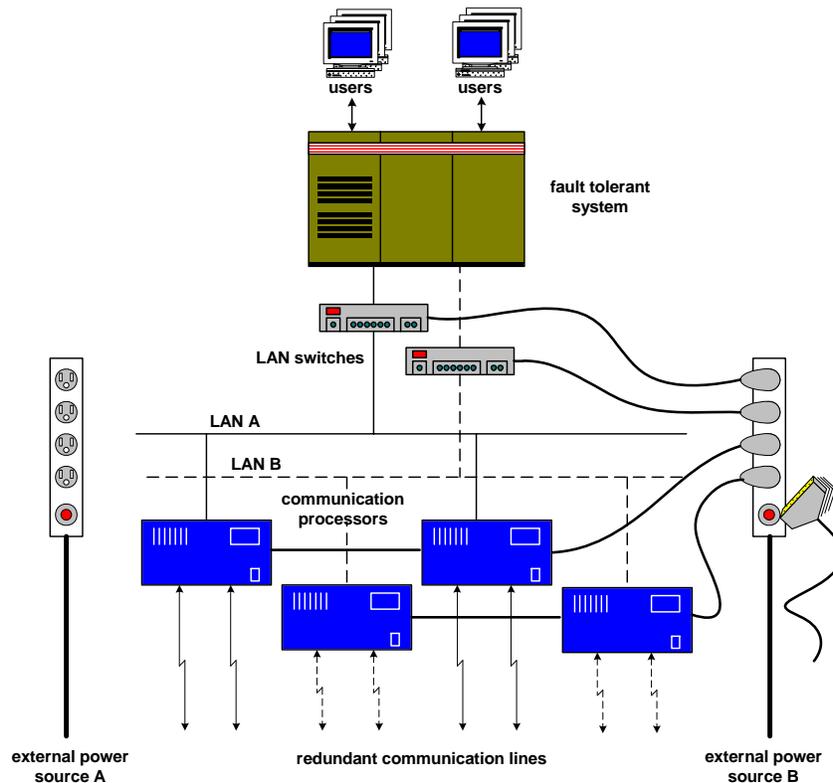


## The Case of the Flying Cable

October 2006

### The System

An early afternoon in the spring. Technicians were busy rerouting cables under the false flooring for a fault-tolerant, mission-critical system. This system depended upon its communication with the outside world to function; and to maintain fault tolerance, the system was outfitted with a totally redundant communication network. Redundant communication processors connecting to the system via redundant LANs drove redundant communication lines. The LAN switches and the communication processors were powered via a pair of independent external power sources, with the primary equipment being driven from one power source and the backup equipment being powered from the other.



What's Wrong With This Picture?

As an added precaution, the on/off switches on each of the two power strips had been disabled to prevent the power strips from being accidentally turned off. However, the circuit breaker built into each power strip was not disabled for safety reasons. The circuit breakers could be tripped manually by pushing a recessed button.

After twelve years of operation, there had never been a communication outage.

## **What Went Wrong?**

Suddenly, a cable snapped out from under the false flooring and flew through the air. Unfortunately, its unlikely target was the circuit breaker on one of the power strips driving one side of the communication subsystem. Not only did the connector on the end of the cable strike the circuit breaker, but its corner flew into the recess containing the recessed button and tripped the circuit breaker. Virtually impossible, but it happened.

No problem. After all, there were two independent external power sources. Tripping the circuit breaker would take down one side of the redundant communication system, but the other side would still be powered and would continue communication service. Right? Wrong!

Unfortunately, in the unrecorded past, both LAN switches and all communication processors had been inadvertently plugged into the same power strip. The error was never noticed until this regrettable incident. The result was that the fault-tolerant system, which had run for years with little problem, was suddenly taken out of service. Fortunately, power was restored; and the system was down for only a few moments. However, all operations came to a halt for those few heart-stopping moments while the problem was analyzed and corrected.

## **Lessons Learned**

Even being down for a few minutes violates the tenet of extreme availability. An effort was immediately launched to check all other cabling. To help prevent a recurrence of this problem due to later maintenance activities, all cable and power ends and receptacles were color-coded.

In addition, protective covers were provided over all circuit breakers. They can still be tripped or reset by reaching under the cover with a finger, but it is unlikely that a flying cable will ever again trip one.