

# Cisco Systems, Inc.



Cisco (NASDAQ: CSCO) is the worldwide leader in networking that transforms how people connect, communicate and collaborate.

## Global Product Testing Operations

### Business Needs and Challenges

Ongoing testing of Cisco products is critical to ensure quality as new enhancements and new products continually work their way through the R&D pipeline. Commercial software suitable to Cisco's unique product testing and reporting data management needs was unavailable, so Cisco Engineering developed an internal Microsoft Access database to capture, track and generate product test case data for a broad range of internal and external (customer) reporting needs.

Over a 3-year period, the functionality in the MS Access system expanded, the number of Test Engineers (the primary End Users) increased substantially, and the amount of data in the system was rapidly approaching 1 Gigabyte. Limitations of the MS Access platform were frequently evidenced, and the Test Engineering team was investing more and more of its time maintaining and supporting the MS Access application. In addition, part of Cisco's Test Engineering team located in India was using the MS Access application via a secure VPN connection, and performance and responsiveness was degrading.

Cisco was running a critical business function on a platform they were rapidly outgrowing — business continuity, user productivity and data integrity were primary concerns. Equally important, Cisco wanted a solution that preserved their 3-year investment into the unique capabilities of the MS Access application design.

### The Planning Phase

Cisco approached PCA to evaluate their situation and recommend a solution that met their current and future anticipated needs. Following a two-week assessment, PCA recommended a 3-phase approach that was aligned with Cisco's needs and concerns: stabilize the system, replace it, then maintain and extend the new system as required.

PCA's immediate objective was to replace the MS Access back-end data store with a SQL Server database. While this process would not address Cisco's need for native Internet access to the application, it would stabilize the application and substantially increase data storage capacity — reducing the risk to Cisco's testing operations. In addition, moving directly to SQL Server was reusable going forward, and provided a logical path to Phase II.

## The PCA Solution

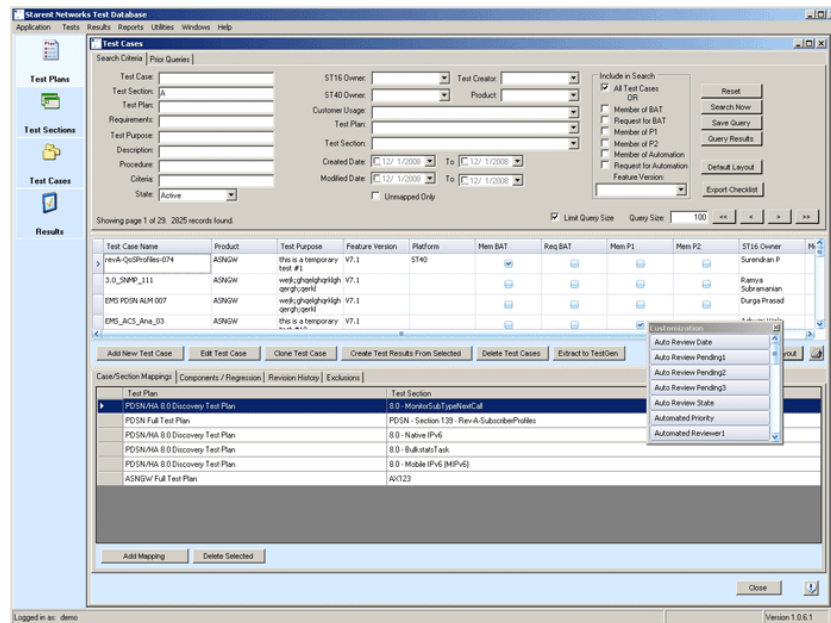
Phase I — several months after engaging PCA, the Cisco Test MS Access database was re-engineered in SQL Server, the original MS Access front-end forms and reports were connected to the new SQL Server database, the legacy MS Access data was migrated to SQL Server, and the new application was deployed into the production environment.

As a result, the Test Engineering team in India was able to conduct product testing operations in a far more stable environment, application performance substantially improved, and any concerns regarding the size of the database simply disappeared.

Phase II — now that Cisco's testing operations were stabilized, the next step in the project was to replace the MS Access front-end application interface with a native Internet .NET interface. PCA assisted Cisco for several weeks to weigh the strengths and drawbacks of a browser-based approach (ASP.NET) vs. a .NET/Smart Client solution, and Cisco elected to proceed with a Smart Client solution for two primary reasons: superior functionality and ease-of-use, and the solution would require 2-3x lower investment vs. a browser-based solution.

Over a 3-month period, PCA prototyped the new application interface in Smart Client — a process that provided both Cisco and PCA with a fast, visual means to confirm application layout and ease of use, and to exploit opportunities to streamline the application and add new capabilities necessary to support more robust test engineering needs. Cisco approved the fourth version of the Prototype design, and following PCA project budget and schedule estimates based upon the Cisco-approved Prototype design, PCA proceeded onto the development phase.

Over the ensuing 9 months, PCA gathered the detailed specifications necessary to build-out the application, and delivered an initial Beta application for Cisco testing and feedback. Weeks of rigorous testing, feedback and refinements to the application produced a production-candidate that Cisco deemed suitable for deployment into the live test engineering environment.



During the development phase, the Cisco testing staff in India continued to grow significantly, and global testing operations expanded with additional users on several different continents. In addition, Project Managers and Cisco management located around the globe increasingly relied on the system to support both internal and customer-facing reporting needs.

Cisco elected to host the SQL Server database internally, and soon realized that the PCA solution required very little I/T support for installations or updates to the new Smart Client application — a traditional I/T burden associated with globally-deployed business applications that Cisco was unexpectedly pleased to avoid.

Phase III — Cisco required new capabilities to support more sophisticated test engineering methods, additional test cases necessary to support new multimedia product platforms, and more robust internal and external reporting needs.

Cisco was bringing new multimedia platforms to market, and anticipated that extending the new system to support concurrent testing of multiple platforms represented a significant re-engineering effort. After consulting with PCA, Cisco discovered that the new system data architecture was already designed for managing multiple, discrete sets of data — and with one very small change Cisco was able to support concurrent testing of multiple platforms.

### **Taming the Reporting Animal**

As new products, more customers and test operations continued to expand, Cisco's internal and external reporting requirements began to diverge and get more specialized. The cost and time required to design and build new reports to support divergent reporting needs was a real concern, so PCA recommended that Cisco incorporate a highly-flexible Pivot Grid Reporting component within the Smart Client application as a more flexible, scalable and cost-effective approach.

The Pivot Grid control provided end users with the ability to create their own custom reports on-the-fly — slice-and-dice

test case data any way they wished — and the ability to save and share custom reports. This approach provided Cisco with the flexibility they required, and it avoided the time and expense typically associated with building and supporting individual's specialized reporting needs.

Several months following initial deployment of the new solution, PCA replaced all the static views throughout the Smart Client application with dynamic grid controls, and the result was a big win for Cisco: phone calls requesting one-off reports dropped from ~20/week to nearly zero.

*"By migrating to the Smart Client platform, we were able to retain our 3-year investment in the MS Access application design, overcome its deficiencies, and extend capabilities in a cost-effective manner. We are continually looking to deliver leading edge technology, and this requires leading edge testing capabilities. We now have that.*

*The PCA-designed Smart Client solution is a big asset recognized both internally and externally by our customers. PCA did a great job!! Their team understood the business needs and had good ideas on how to convert requirements into application capabilities. PCA has been very productive in terms of fixing problems quickly and creating new features. Project management has been effective, and really made a difference on this project."*

**Chuck Bodemann, Director of Test Engineering**