



## **White Paper Case Study:**

### **How Collaboration Improved Cyber Security at Cisco Systems, Inc.**

**Abstract:** This white paper outlines the successes realized by the Cisco Systems, Inc. Remote Operations Systems security team following the implementation of a collaborative application platform to disseminate and share knowledge. We will discuss the benefits of forming collaboration communities and how the exchange of knowledge by subject matter experts generated one of the most successful collaboration platforms in history.

## **Introduction**

In the technically evolved world we live in today, where electronic devices are increasingly becoming networked together and data flows in every imaginable direction, securing your network has never been more paramount. No matter where a security threat may be generated, the prevention and mitigation of network security attacks is fundamental to the operation of any business, small or large. Knowledge is power. By providing your front-line defenders with real-time knowledge regarding security threats, vulnerabilities, and attacks, you can arm your organization with prepared individuals ready and able to thwart any attack. A collaborative workspace is an important feature of any organization's knowledge infrastructure. In the security world, where a situation may change in a moment's notice, having a platform to communicate knowledge and the appropriate response is an absolute necessity.

In 2006, Cisco Systems, Inc. (NASDAQ: CSCO) implemented a collaborative knowledge management solution at its Remote Operations Systems facility in Austin, Texas. This business unit was responsible for the remote management of thousands of networks across the world. Key to their success was the widespread adoption of the ROSwiki, a platform designed to enhance collaboration among its user base and to coordinate, plan, and execute every aspect of their business model to enhance the services provided to their customers and improve the customer experience.

## **Community Adoption**

Any collaboration tool, even the finest on the market, will not be successful unless accepted by the user community. Through extensive market research and analysis, the development team engaged end users to learn about their needs and worked diligently to build a tool that catered to the user experience. After extensive user acceptance testing, system tweaking, and refinement, the platform became accessible to users within the Remote Operations Services community.

All people, regardless of their technical ability, bear at minimum a moderate resistance to change. Through education, however, once the adopters understood the benefit and simple ease of use, adoption of the collaboration platform became widespread. Simple, easy to follow examples enabled training facilitators to teach basic, yet extremely powerful methods to the platform users, empowering them to build the most successful collaboration community to date.

## **Knowledge Sharing**

Powerful, current information remains the key driver to most business success. If an individual or community is unable to ascertain the location of the information they require, they are at a serious disadvantage. The open, collaborative workspace employed by ROSwiki is one of its most powerful attributes. By placing the collective knowledge of an entire community in a single, central repository, users have a wealth of knowledge at their fingertips. Consolidating information from numerous disparate sources into a single location made knowledge easily accessible within the user community.

The open community also supports a collaborative knowledge workspace. By giving every user the ability to review, edit, and enhance any knowledge article they come across, each user is able to contribute to the collective intelligence of the entire community, providing expertise in areas they know best.

Naming conventions are also important in the realm of shared knowledge. In order to avoid duplicating the same or similar information in multiple locations, a strong naming convention must be adopted. Through user training, education, and administrative oversight, knowledge articles can be placed where they belong. Organizing information into a pre-determined taxonomy provides users the ability to quickly locate the knowledge they seek.

## **Administration**

Even though the wiki collaboration platform is primarily self-maintained by its user community, some administrative involvement is required. Hardware systems need to be serviced and the network infrastructure must be maintained. The creation of user accounts and the assignment of permissions also require administrative personnel to perform. The vast majority of content within the collaboration platform is developed, edited, and maintained by individual contributors operating within the community. Wikipedia, the largest online collaboration community, maintains approximately twenty full and part-time employees to moderate and support more than fifteen million articles in several languages across the globe. This staff supports a community of more than one million individual contributors.

This is the true spirit of collaboration and one in which every knowledge collaboration platform should strive to achieve: a self-supporting, self-sufficient community of users who contribute the knowledge they possess for the betterment of the entire community.

## **Enhanced Searching**

Even the most expansive and comprehensive knowledge management system will become obsolete without an efficient method to locate information. By employing the use of metadata tags to ROSwiki articles, the secure operations team was able to improve the keyword and advanced search functions to classify articles by information it deemed relevant. A custom dashboard was constructed to enable team members to search knowledge articles using the metadata fields they had identified, resulting in quick searches matching only the relevant articles they were seeking.

Forms and templates were an important part of implementing this metadata search strategy. Technical writers and systems engineers within the Remote Operations Services community were consulted to assist in the development of a standard template to which all security threat, vulnerability, and attack signature articles would conform. The splash page for the security incident management team consisted of a button to create a new knowledge article followed by the advanced metadata search function. All that was needed to create a new knowledge article was to choose a relevant article name, and press the button to create a new article. A form was then displayed with editable fields for security incident information, mitigation, and resolution followed by the metadata search criteria form. Once all fields were complete, contributors simply pressed a button to create the article and it was added to the collective knowledge repository. Even the individual contributors who were not familiar with editing markup text were able to contribute to the common body of knowledge contained within ROSwiki.

By developing an extensive knowledge repository of common and uncommon security threats, vulnerabilities, and attacks, the team was able to amass a knowledge library that could thwart even the most experienced hacker. Providing individual contributors the ability to maintain and edit the known security signatures and remediations as they changed within the public domain, the team was able to remain well ahead of the global security community with its comprehensive, collaborative knowledge base.

## **Metrics and Reporting**

Without methods to incorporate metrics and reporting, an organization has no basis by which to determine how well it is performing. Key performance indicators such as article usage, content contribution, and article ratings were established to gauge the relevance of the information contained in each article and how often it was being used. Each article contained a 'rate this article' button in addition to a comments section, so articles could be periodically reviewed and improved accordingly.

High profile security events within the system could be flagged to trigger email alerts to the appropriate team members so analysts and engineers could resolve the incident quickly and effectively. The addition of a custom metrics application allowed any user within the community to compile reports to determine

their level of involvement within the community, which users were viewing their articles, and how often their articles were viewed. A user that felt accepted within their community only added to their confidence in the system and increased their desire to contribute important information to the collective knowledge base.

### **ITIL Compliance**

At the time of the collaborative knowledge management platform's adoption, the Remote Operation Services team was amidst an Information Technology Infrastructure Library (ITIL) transformation. The selection of this particular collaboration system was based on a strong desire to adhere to the IT best practice guidelines outlined in this well known standard of best practice concepts and processes. The tools and applications available on the platform supported the advancement of service strategy, design, transition, operation, and continual service improvement in accordance with the ITIL best practices methodology.

The most immediate gains were in the area of service operation, which supports the incident and problem management processes. By collecting data and metrics during the incident management process, analysts and engineers were able to compile reports to provide to the problem management teams. Once problems had been identified and resolved, the team was able to incorporate their findings into the incident management knowledge article base so incidents could be resolved more efficiently and effectively, and with the use of fewer resources.

Immediate improvements were also realized in the service transition process, which as a service delivery organization, bears great importance. Service transition includes such areas as change, configuration, release, and knowledge management. A standard template for change requests was incorporated into the collaboration platform to serve as a set of requirements and a standard naming convention to request changes within the environment. Once the change request was complete, it transitioned into a state requesting approvals from the change management advisory board to develop and research the impact of the change prior to its release. Once approved for release, the article was assigned to a change engineer for implementation.

### **Post-Implementation Review**

Within fifteen months of its initial release, ROSwiki users had contributed more than 145,000 knowledge articles to assist them in performing their daily duties. The popularity and efficacy of the collaboration platform caught the attention of executives within Cisco's customer advocacy team. What originally



started as a way for the two hundred employees of the Remote Operations Services team to collaborate and share information blossomed into an enterprise-wide endeavor.

In November 2007, executives in the Customer Advocacy business unit introduced a revolutionary collaboration platform known as Collaboratory. At the time of its deployment, the system boasted a user community of 20,000 individuals. At the end of 2008, the community had grown to more than 165,000 users. In June 2008, Collaboratory won the coveted Collaboration Across Cisco Award, a highly distinguished honor.

Through the use of state of the art Enterprise 2.0 technology, Cisco Systems, Inc. Remote Operations Services team, as well as the greater Customer Advocacy group, made significant advances in the way its team members collaborate. Today, the company thrives, and the user community and collective knowledge base continues to grow.

### **Learn More**

WiiKno offers full life-cycle support for driving successful collaboration in addition to valuable new ways of leveraging information by designing and developing customized solutions tailored to your organization's needs. Our team utilizes Web 2.0 technologies to create collaboration solutions that harness the collective knowledge of a workforce and help reach business goals more quickly and efficiently. WiiKno's custom collaboration solutions allow for effective knowledge capture and preservation through intuitive information sharing.

To learn more about our services and solutions, please [visit our website](#) or [send us an email](#).