

Testing Firm Integrates Back-end Systems and Preserves Data Security

Thomson Prometric used the Cisco ACE XML Gateway to process all XML transactions.

EXECUTIVE SUMMARY
THOMSON PROMETRIC <ul style="list-style-type: none"> Testing and assessment services
BUSINESS CHALLENGE <ul style="list-style-type: none"> Help ensure tester privacy, test integrity, and transaction confidentiality Cost-effectively integrate five disparate back-end systems required for processing testing registration and payment
NETWORK SOLUTION <ul style="list-style-type: none"> Network Solution Flexible, cost-effective XML Web services gateway
BUSINESS RESULTS <ul style="list-style-type: none"> Reduced costs to connect new testing centers by 90 percent Saved more than US\$1 million in service-level agreement penalties, development, and help desk costs Provide auditable proof of privacy and confidentiality for test responses and results

Business Challenge

A part of The Thomson Corporation, Thomson Prometric provides academic and professional tests and testing services worldwide. More than 4000 partnering locations in 134 countries administer more than seven million licensing, certification, academic standards, and corporate training assessments annually. Thomson Prometric develops and delivers a wide range of assessment programs for information technology, government, academic, and professional associations.

Thomson Prometric continuously acquires new testing centers, but bringing them online was difficult and time-consuming. Each newly acquired testing center already has numerous applications in place—ranging from Java and Microsoft to proprietary systems—and each location had to have its technology integrated with Thomson Prometric’s

testing registration systems. Thomson Prometric relies on five separate systems, each with its own back-end database, to administer test scheduling, payment, and delivery of test results.

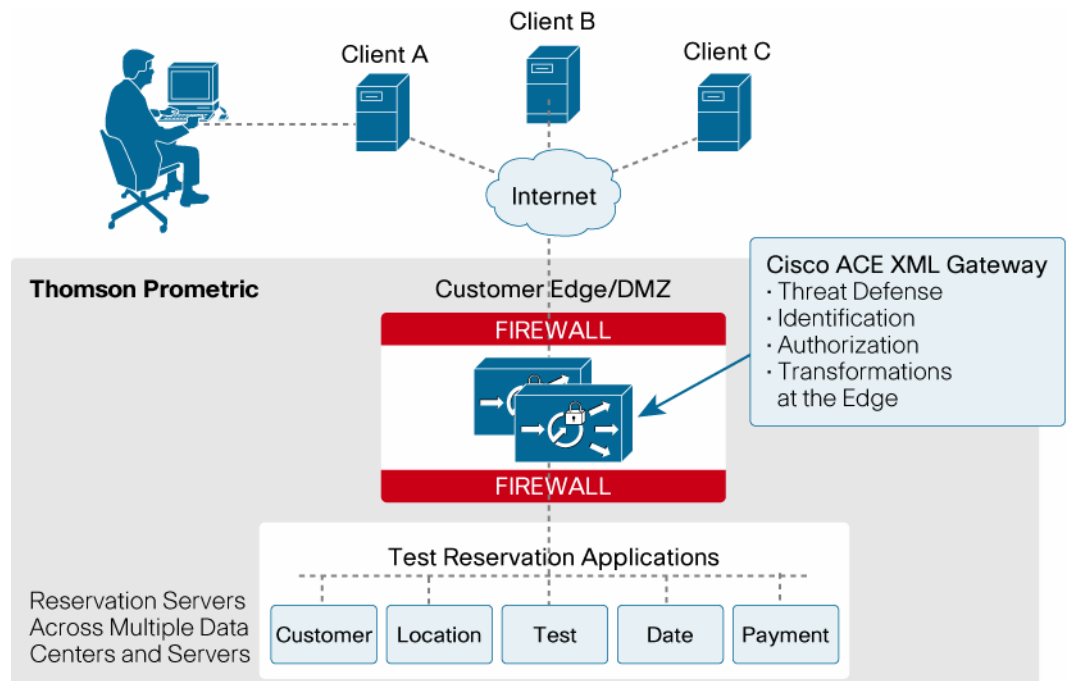
“Cisco enabled us to rapidly integrate back-end systems, comply with worldwide privacy requirements, and transform data so that every testing center and back-end application could be easily integrated. The Cisco ACE XML Gateway is an ideal, low-cost, highly scalable way to support our SOA.”

—Christopher Crowhurst, Vice President and Principal Architect, Thomson Learning

Another issue is that helping ensure the security of personal data and confidentiality of test results is mandated by law. In particular, Thomson Prometric must comply with European privacy laws, which are much stricter than those in the United States. Therefore, to provide security for personal information and confidential test results, all transactions are encrypted for transit between each customer’s location and Thomson Prometric headquarters. The company encrypts its secure socket layer (SSL) connections; it encrypts message bodies using SSLv3/transport layer security

(TLS); and each system also checks the signature on each message body. And because data must be integrated with five different back-end systems, each transaction had to be secured five times.

Figure 1.



“Our goals seemed simple,” says Christopher Crowhurst, vice president and principal architect for Thomson Learning. “We needed to ensure candidate privacy, test integrity, and confidential interactions. We wanted to conduct registration over the public Internet because it offered the most ubiquitous, cost-effective channel for all of our testing centers worldwide. Finally, we needed to accelerate the integration of new clients and reduce fines incurred for low reservation availability.”

Network Solution

Crowhurst recommended a Service Oriented Architecture (SOA) approach. Using SOA, Thomson Prometric could approach the registration process as a set of business services, with each of the five systems providing the services that it performed best. With the Cisco ACE XML Gateway, incoming data could be secured and transformed into a consistent format. A “broker” application would then mediate transactions using the appropriate services. The proposed solution offered the potential to significantly improve application processing and security, while reducing the costs associated with activating new testing centers.

Thomson Prometric’s new SOA provides a common architecture, based on Web services, through which all scheduling and registration systems communicate. Crowhurst’s team began by defining specific functionalities of the five back-end systems as business services. They then deployed Web services on application servers and used Web Services Management agents to manage the health of the various services, helping ensure that each performed correctly and optimally.

Now, connections coming from groups of testing centers over the Internet terminate at a Cisco ACE XML Gateway. The Cisco ACE XML Gateway is a network appliance that receives and sends all Extensible Markup Language (XML) Web services transactions. It enables any-to-any secure interoperability between heterogeneous connection partners, such as the five back-end systems and the 4000 testing centers. When receiving a transaction, the Cisco ACE XML Gateway defends

against XML attacks; executes authentication and authorization policies; mediates standards, data, and transports; and routes and logs the transaction. The Cisco ACE XML Gateway provides a secure, auditable record of all encryption work using signed, secure logs that track all operations and all messages and enabling auditors to review events and audit any transaction.

Technical Implementation

Messages arrive at the Cisco ACE XML Gateway in various formats, including XML and Simple Object Access Protocol (SOAP). Cisco monitors message flow, helping ensure that messages arrive and leave with the proper security and format. For example, messages from groups of testing centers are encrypted with SSLv3/TLS, and the message bodies are signed and encrypted by the business partner and Thomson Prometric. When the message arrives at the Cisco ACE XML Gateway, it removes the partner's signature and decrypts the message contents; it next applies a new form of encryption that Thomson Prometric uses for encrypting messages over its internal network.

Cisco also verifies that the message came from a trusted source and that the message body itself can be trusted. At the same time, the Cisco ACE XML Gateway transforms the wide range of message formats associated with the various clients to a standard Thomson Prometric format, making sure that all of the back-end business services always receive consistent data. The Cisco ACE XML Gateway generates a trust assertion and passes it to the Web services using SAML and bilateral SSL. Now the Web service has to know only Thomson Prometric's key—not all the keys from its many business partners. The Web service accepts messages only from Cisco, which has already performed the high-overhead security and interoperability processing, and checks to make sure that the message represents a valid candidate.

Next, the message passes to an orchestration engine to orchestrate the logic for transactions between the five different systems. For example, when the orchestration engine receives a message from Thomson Prometric's Web services, it knows that the message must go to service 1, 2, 3, 4, and 5 in a precise order for the registration to be complete.

Business Results

"Cisco enabled us to rapidly integrate back-end systems, comply with worldwide privacy requirements, and transform data so that every testing center and back-end application could be easily integrated," says Crowhurst. "The Cisco ACE XML Gateway is an ideal, low-cost, highly scalable way to support our SOA."

Today, new clients are added quickly and securely by simply adding new connections to the Cisco ACE XML Gateway. Because the Cisco ACE XML Gateway performs all security, trust assurance, and interoperability functions, new centers can be quickly brought online without having to re-program numerous interfaces and policies for all five back-end systems. Thomson Prometric reduced the costs of provisioning and integrating each new testing center by 90 percent.

The Cisco ACE XML Gateway also helps ensure compliance with strict privacy regulations. Web services and orchestration layers are not designed to enforce security policy or defend against XML attacks, so those solutions alone were not enough for Thomson Prometric. Neither could the company build defenses against every known or emerging threat into its applications—it would be extraordinarily difficult, time-consuming, and costly. Instead, the Cisco ACE XML Gateway delivers the specific functionality needed to make sure that every message coming from the clients is from a trusted entity and can be trusted. Conversely, the Cisco ACE XML Gateway verifies that every

message going from Thomson Prometric's reservation system to the clients is properly secured in transit.

The Cisco ACE XML Gateway simultaneously increased application performance, improving Thomson Prometric's ability to comply with SLAs. The company anticipates a savings of US\$450,000 in fines associated with not meeting scheduling transaction metrics. Because security and transformation activities are performed and managed at the Cisco ACE XML Gateway, these tasks do not have to be programmed into every application.

The Cisco ACE XML Gateway has also enabled Thomson Prometric to retain its substantial investment in specialized back-end systems. It can transform data regardless of whether interfaces or back-end systems change.

The new SOA improved employee productivity as well. Rather than having to dedicate technical, client services, and help desk staff to each monolithic application system, Thomson Prometric was able to free five full-time development resources and two full-time help desk staff for more strategic projects. Consequently, the company saved US\$550,000 in development costs. Crowhurst estimates that the SOA will deliver almost US\$2 million return on investment within less than three years—and a boost to the company's competitive advantage.

"We could not have all of our business partners replace their systems and we could not force them all to adopt exactly the same systems and formats," he said. "Instead, we built an architecture that can accommodate all of the inevitable variations, while helping ensure security, compliance, and high performance. We put the Cisco ACE XML Gateway to the test, and it passes with flying colors. It plays a huge role in the success of this project."

For More Information

For more information about the Cisco ACE XML Gateway, visit <http://www.cisco.com/go/ace>.

Product List

Cisco ACE XML Gateway



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