SOA/Web Services Testing

We get you past the bottlenecks!
Overview
Today, more and more companies are moving to solutions based on Service Oriented Architecture and Web Services. The increased popularity of these strategies is also driving demand for Web services testing.

Understanding Web Services
To successfully test Web services, the tester must have a good understanding of the underlying technology to identify the key challenges and devise a suitable test approach.

Web Services are based on a set of open communication standards called Service Orientated Architecture (SOA), which enables the exchange of data between the service provider and service consumer. This standardization enables communication between client/server applications programmed in different languages and running on different operating systems. Web Services communication standards use XML for representing data, XSD schema to define the format, Simple Object Access Protocol (SOAP) to enable data exchange, and Web Services Description Language (WSDL) to describe the functionality of the service.

Why Perform Web Services Testing?
Testing at the Web services layer offers a number of advantages:

• Isolating services testing eliminates the need to fully develop the front end system before testing.
It facilitates early testing and can reduce costs by identifying defects earlier in the SDLC cycle.
- It also allows the service to be tested once, irrespective of how many systems consume the service.
- It can help reduce a number of issues with system integration testing and reduce the need to test each consuming system individually.
- Services testing can emulate the end-to-end business process prior to testing it during UAT.
- It allows for negative scenario testing to ensure that exception cases are managed correctly. This may be difficult to perform as part of UAT testing.

Web Services Testing Challenges
Web services testing challenges conventional testing processes and requires significant changes in strategy if the key benefits of SOA are to be realized. Due to the extensive structure and architecture of SOA, testing has multiple challenges.

- Since Web services are composed of loosely coupled components that may be distributed over networks, we must test the application end-to-end, service-by-service, and interface-by-interface.
- Scalability and security requirements are met.
- Web services are difficult to test manually, but are an ideal candidate for automated testing.
- Web services testers must have programming skills.
- Infinite “service” consumers and users are possible.
- Ensuring interoperability with multiple components and future applications.
- Future-proofing so that services may be used by applications yet to be developed.
- Loosely-attached connections allow unanticipated applications to take advantage of ever-expanding capabilities.
- SOA is complex because it is driven by business processes that not only cross technologies but span organizations.
- Test teams require a broader set of domain and technical knowledge.

Pyramid Service Testing Solutions
Pyramid offers complete solutions for testing SOA/Web Services. Our systematic approach, API testing skills, and expertise using Web services in the latest technology and tools allow our clients to overcome challenges and issues associated with Web service testing. We offer a variety of software testing services for performance, functional vulnerability, and vulnerability assessment and validation assuring scalable, robust, compatible, integrated, and protected SOA testing services. Pyramid has extensive verification and validation experience testing in the complex SOA environment.

All of these challenges will require testers to learn new technologies and tools. Pyramid’s experienced testing team will provide guidance for Web service testing by introducing the concepts of Web service technology and architecture, understanding the challenges that are likely to be encountered by testers, and suggesting the best approach for testing.
Functionality Testing
Functional testing and regression testing are the primary testing steps for SOAs. IT professionals should quickly test Web services and set up desired regression test cases. Ease-of-use in setting up such tests encourages technologists with varying skills and responsibilities to test their Web services quickly and often. Simple test case management and setup is paramount to lowering the time required for setting up and maintaining functional and regression tests.

Performance Testing
Performance also plays a crucial role in Web services testing. QA testers, as well as network and security engineers, should test the scalability and robustness of Web services and determine the performance and endurance features of their WSDL actions. Testers should determine response times, latency, and throughput profiles for target Web services. We validate service level agreement rates and identify bottlenecks and possible architectural weaknesses and performance dependencies.

Security Testing
Pyramid’s team will assess the risk posture and robustness of a service with regard to weakness, data-leakage, data privacy, and data integrity. Using the WSDL schema as the foundation, security tests can be built to create boundary condition tests for the service, which then identifies the robustness of the service handling inputs outside of the range of expectation.

Interoperability Testing
While loading a Web services WSDL, consumer applications must determine both design-time and run-time interoperability characteristics of the target Web services. Developers should run a set of comprehensive WSI profile tests and report interoperability issues with the Web services WSDL. Adhering to WSI profiles ensures that SOA assets are interoperable and that WSDL can work within heterogeneous .NET and Java environments.

Design-time WSDL interoperability testing is not enough. Run-time interoperability testing is also necessary. Testing the interoperability of a Web service requires creating specialized test suites for a WSDL. These tests ensure that the target Web services are interoperable by actively sending specialized requests to the Web service and determining whether it responds per WSI profile specification. Comprehensive design-time WSDL WSI profile testing, combined with active run-time Web services interoperability behavior testing, ensures that IT assets can integrate independent of platform, operating system, and programming language.

Tooling
Web services testing challenges can be overcome with automated testing tools. Testing tools are critical to enable comprehensive testing of Web services. In fact, without appropriate tools much of the functional, performance, and security testing could not be conducted.

At Pyramid our experienced team will evaluate and explore custom needs of a client’s unique situation, then advise the best match for a long-term test strategy from the onset. The correct strategy should consider factors such as tool requirements, existing processes, benefits, costs, expertise, and training. Clients are advised to carry out a proof of concept to assess potential benefits. If the correct planning and processes are not put in place initially, the wrong tool is likely to be implemented, which can become a costly mistake.

Summary
Web services are the foundations of modern distributed systems. The widespread use of Web services across network devices, applications, and corporate infrastructure mandates that all IT professionals take responsibility for testing their systems’ Web services before and after publishing them to consumers. Developers, QA testers, and network and security engineers are now fully responsible and accountable for ensuring that their Web services are robust, interoperable, scalable, and secure. Pyramid’s strategy and methodology address all of the challenges of SOA testing, enabling IT professionals with varying SOAP/XML skills to quickly take control of deploying comprehensively tested Web services.

- We are equipped with all devices for testing to assure app compatibility.
- Our mobile app testing lab is state-of-the-art.
- We provide mobile app testing consultation.
- We offer testing expertise through every stage of your development process.
- We can assist with App Store Certification.

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