White Paper

Testing Wireless Data Application - TotalGlo

For Glowcomm Systems Inc, CA, USA

Client Overview

Glowcomm Systems Inc, CA, USA is a product organization that provides wireless data and device security products. The solutions are aimed at enterprises controlling/managing their mobile devices and data, from a centralized location, using available connectivity mechanisms.

Application Under Test

TotalGlo is the product that has been engineered jointly by Glowcomm and Softsmith. Softsmith's testing team provided an independent testing solution to the product. TotalGlo has a client application that can be installed over the air (OTA) and has a server application that interacts with the client application, using internet as the medium. Client application runs in pocket PCs and mobile devices such as smart phones and server application runs in an enterprise server class machine. Client devices use Microsoft Windows CE or Symbian as the operating systems. The devices are manufactured by various organizations like Dell or HP or Nokia.

Engagement Model and Process

Softsmith Infotech executed the testing project using total offshore model. The testing team consisting of test lead and testers carried out the activities from Softsmith's offshore test lab from Chennai, India. The team coordinated with Glowcomm's product manager who operates from Sacramento, CA, USA and Softsmith's program manager for CA, USA region was coordinating from Cupertino, CA, USA. Regular status concalls and technical concalls using VOIP telephones were conducted on a scheduled basis as well as on-demand basis.

Softsmith team initially prepared Master Test Plan (Test Strategy) for the whole application. Then the team prepared test scenarios and test cases that are reviewed and approved by Glowcomm team. Softsmith established test bed at offshore and conducted the installation, functionality, compatibility/interoperability, database volume and

load/stress tests from offshore facility. Defects were regularly reviewed in the triage meetings and taken to closure. Weekly builds were delivered to Glowcomm so that Glowcomm team could carry out the testing on their test bed as well.

Key Test Areas

The following list describes the key test areas, under which a set of tests were conducted.

- Normal installation using active sync and OTA modes
- Data transfer between client and server, using different packet sizes
- Data transfer between client and server, in intranet and internet
- Data transfer between client and server, using different Wi-Fi service providers and at different Hot Spots
- Device going out of range tests from server while data transfer is in progress
- Data transfer tests under various signal strengths
- Data transfer resume tests
- Packet loss tests and resumption tests
- Data encryption tests
- Data restore to client from server store
- OTA download of games, software, and songs test
- Tests on various devices like Dell Axim, HP Ipaq with Win CE 2002 and 2003 compatibility
- Tests using various band of wireless routers like LinkSys, NetGear etc
- Data volume tests when huge amount of data is transferred from client to server with varying bandwidth and signal strength
- Simultaneous data transfers from multiple clients to the server
- Device lock tests when device is marked as lost
- Data corruption tests
- Resource usage tests on devices
- Crash tests when device, server, routers or ISP going down during process in progress
- Protocol tests in 802 series
- Client contacting the server with and without firewall and proxy servers
- Usage of different Data Encryption for different set of packets to ensure security
- **Automation of critical tests using white box test stubs using embedded VC++**

Key Benefits

1. Standard and non-standard test beds enabled to unearth corner test scenarios
2. Test automation enabled to shrink test cycles across multiple test beds
3. Glowcomm team was able to see build over build coming from offshore team and testing by Glowcomm was happening in parallel
4. Tests were carried over using devices from the USA with the servers located in India, connecting via different internet service providers

Challenges Faced

No specific tools were found fit to conduct simultaneous user load tests for pocket PC applications. Hence, custom stubs were created to spawn multiple threads that actually mimic the pocket pc request packets to server.

Device compatibility test need to be carried out when a change happens in the base data transfer engine. To overcome this to save effort and time, test automation is performed using white box test stubs.