

Independent Validation & Verification Going for Gold

Experiencing down time as a result of a system crash can have a devastating effect on your operation. You need the assurance that your software will operate without failure. At **xwave** we have the expertise to detect and prevent system crashes and application freezes through the most unyielding software testing in Canada. **xwave's** Test Centres can help you minimize the risks of experiencing down time and can save your company upwards to millions of dollars a year by keeping your system's hardware and software applications running smoothly 24 hours a day, 365 days a year.

In the commercial retail market, users tend to be unforgiving of bad experiences with software. Thus, smooth operation of a suite of applications, free from system crashes and application freezes, can be a major contributor to the success of a new product. Good product etiquette requires that application and utility software install gracefully, integrate smoothly and operate flawlessly.

The most common factor in the downfall of commercial software has probably been either the infamous "General Protection Fault" dialogue window or the blue text screen displayed when Windows does not know what to do next. One of the most frequent frustrations encountered by users operating a PC occurs when the need to reboot a system costs them from three to ten minutes of down time (not to mention the difficulties shutting down a PC after a failure).

Many products now exist that provide "crash protection", but they often leave a system unstable and require a system to be rebooted to resolve the problem.

xwave's Test Centres have the expertise to detect and prevent these frustrations through rigorous software testing. Sanity, regression, exhaustive, stress and load testing on a variety of typical user configuration platforms are just some of the strategies used by **xwave's** Test Centres to minimize the risk of catastrophic failure. All strategies are backed by **xwave's** ISO-9001 certified procedures.

xwave's Test Centres' Independent Validation and Verification services can:

- Reduce the time to "gold" build (and therefore time to market);
- Ensure adherence to product specifications;
- Avoid product recalls;
- Lower project management costs;
- Build a technical support database;
- Reduce technical support costs;
- Increase product acceptance; and
- Develop a stronger customer following.

Web-enabled anomaly tracking collapses time and geographical barriers

Customers may use *xwave's* Test Centre's WebTracker technology or provide their own equivalent web-enabled anomaly reporting system. WebTracker allows participants in various test phases and environments (including external beta testers) to contribute to a tracking system via the Internet independent of geography or time. Using WebTracker and this database, development managers can categorize, prioritize, and delegate items to be addressed for improvement or repair. Company management can track statistics associated with progress toward a "bug-free" product.

Increase Sales... and... Increase Profits

Every \$1 decrease in the "per unit" average technical support cost for a product selling 200,000 units per year results in over \$200,000 added directly to the bottom line. While one or two significant bugs can drive product support costs up \$500,000 – \$1,000,000¹ per year, adequate pre-release testing may only cost between \$50,000 and \$150,000¹. Using *xwave's* Test Centres' Independent Validation and Verification services, ensures that products are properly tested prior to release. This frees up funds for new product development, instead of financing unnecessary support costs. Increased sales result as word of software quality and reliability spreads.

xwave's Test Centres' Independent Validation and Verification services include:


- Reviewing existing test procedures and product specifications to create test plans: sanity, regression, exhaustive, stress and load;
- Tracking anomalies through to resolution;
- Consolidating current anomaly reports to provide a testing "benchmark";
- Managing the web-enabled anomaly tracking system (WebTracker);
- Testing on a variety of platforms;
- Performing Windows compliance testing; and
- Testing for compatibility with common third party utilities and applications.

The Software Testing Process

Any good project requires as much time in preparation as in execution: testing is no exception. Adequate preparation ensures that the tests themselves and their results are valid.

The following steps outline the process used by *xwave's* Test Centres that contribute to the success of an Independent Validation and Verification (IV&V) project.

1. Install and run the alpha or beta version of the product to explore its functionality and "look-and-feel".
2. Write the initial Test Plan to incorporate exhaustive and sanity tests at appropriate stages of the project. The Test Plan communicates the testing activities at various stages of the project and the expectations



for each stage. A good Test Plan includes tests for common capabilities such as installation procedures, memory leak avoidance, product registration processes, operation of standard windowing functionality (move, resize, minimize, etc.), interfaces with other application software, Internet interaction if any, as well as the hardware and software configurations to be used.

A good Test Plan is central to the success of software testing, however, it is a living document that must change with the evolving product.

3. Review the product against the Test Plan as confirmation of the validity of the Test Plan itself.

4. Begin formalized testing:

- Sanity testing to verify baseline functionality;
- Regression testing to verify existing and fixed functionality;
- Exhaustive testing to verify all documented features;
- Stress testing to verify typical user operation sequences; and
- Load testing to verify proper operation with a typical number of users.

5. Receive a new product release.

For each new release:

- Revise sanity and exhaustive tests to reflect the functionality of the new release;
- Perform a sanity test;
- If successful, perform a regression test based on anomalies reported as fixed in the current release; and
- Determine the degree of exhaustive, load and stress testing required and execute the appropriate tests.

6. Repeat step 5 until the product is ready to be released as “Gold”.

Technology solutions to keep your systems operating flawlessly



xwave is focused on clients in industries and sectors where we have extensive experience including energy, telecommunications and select areas of the public sector. Our in-depth understanding of your industry enables us to offer innovative IT solutions that address your unique IT challenges.

We plan, design, build and operate IT solutions that span both corporate and operational systems. **xwave** is a truly integrated IT solutions firm.

xwave is a full-service business solutions provider with more than 1500 professionals in locations across North America.

For more information:

Visit our web site at www.xwave.com

Call toll free 1-877-44-xwave

Email us at solutions@xwave.com

Or contact your local **xwave** office.

¹ *Based on past experience; individual customer requirements and situations will vary.*



we're on your wavelength