

SEGA Improves Efficiency of Development Process by 20% with Coverity Prevent



“We saw the light with Prevent’s accurate bug analysis. Prevent is a tool that doesn’t impose a burden on developers. Instead, they are delighted to use it.”

Takashi Shoji
Department Manager, CS R & D support Dept. at
Consumer R & D Div., SEGA Corporation



SEGA Challenge

The game industry has been undergoing incredible changes. With changes in consumer thinking and lifestyles, game categories have diversified along with ever more sophisticated technical requirements for higher graphic quality, such as coding for CPU/GPU and shading techniques to render realistic shades. Game software developers’ burden has been intensified due to scaled up game development with a dramatically increased number of lines to develop. Game development now requires at least 200,000 lines for a handheld game console, 500,000 lines for a set-up type game console, and a million lines for networked PCs.

With fast-paced changes in consoles and intensifying competition, time to market is shortened, demanding faster development speed ever. Economic damage caused by bugs can be critical for game software manufacturers because of the formats that game titles are shipped in such as ROM cartridge and DVD-ROM formats. They do not facilitate bug fixing because the ROM cartridges and DVD-ROMs themselves need to be collected, making bug fixing even more difficult for bugs found just before release.

These circumstances have been challenging game software manufacturers to streamline game title development processes while improving product quality. At SEGA, developers rose to this challenge by researching advanced development tools, and decided Coverity Prevent was the best solution to help them manage the pressure of ensuring the code quality of their games prior to release.

Before implementing Prevent, SEGA did not have effective source code analysis tools. As a result, after developing a software program in accordance with coding conventions, developers needed to compile it for analysis with a syntax checker to complete the coding process. After this, they proceeded to functional testing to detect bugs. One of the main objectives was to streamline the existing development process by finding and fixing bugs in an early stage of the development process with a highly accurate analysis tool.

Solution

SEGA evaluated Coverity Prevent along with two other static analysis tools. After only two weeks, SEGA decided to implement Prevent. Usually, tool evaluation requires approximately three months. However, SEGA decided to implement Prevent quickly for a PC game title under development with 900,000 lines to be analyzed (700,000 lines for the client side and 200,000 lines for server side) and 25 developers. SEGA selected Coverity Prevent because developers believed it was clearly better than the other tools. Since the initial deployment, Prevent has been implemented in five additional projects.

The following describes the advantages and effects of the Coverity’s Prevent product as seen by Akio Setsumasa, Technical Director of CS R & D Dept. #3 at Consumer R & D Div.,SEGA Corporation.

Excellent Analysis Accuracy

Compared to other static analysis tools that generate large amounts of errors and warnings, Prevent includes far less noise (false positives) in analysis reports (less than 5%). Because defect detection is so accurate, developers spend little time searching for the cause of bugs.

Easy Setup and Complete Engineering Support

The support for installing Coverity Prevent was detailed and complete, requiring under a day from setup to the first analysis results. "Working with other tools can take one to three months to make them work," said Technical Director Setsumasa. "We were pleased to be able to implement Prevent very easily with minimal setup time."

Detecting Fatal Failures

Prevent has detected important failures that could have destroyed memory and bugs that they had not been able to resolve or detect before. Prevent also proved its effectiveness by detecting bugs that were very difficult to reproduce.

User-friendly Interface to Facilitate Developers' Work

Prevent's Defect Manager provides a project progress status at a glance, enabling developers to prioritize detected bugs and failures for more effective bug fixing. The systemized failure tracking capability shows us the fluctuation in the number of bugs at a glance. They determined that Prevent is highly effective for program development progress management due to this capability that enables us to foresee the development in advance.

Details

At SEGA, Coverity Prevent has streamlined the development process, so that developers first check code scripting with a syntax checker then conduct a nightly analysis of the latest code with Prevent. After that, developers check Prevent defect reports the next morning and fix code as needed.

In game software development, the functionality check process is the most important and time-consuming step. It is vital to check all possible usages, knowing and simulating all the controller's functional tendencies and its particular ways of display, as well as all the common user operational tendencies and habits. With Prevent, developers can find and fix bugs at an early stage, which saves time and labor in the check process, improving productivity approximately 20% in the entire development process.

"For new titles, we can speed up the development process because we can fix bugs while coding. We feel at ease when we develop new titles from scratch."

Setsumasa
Technical Director, Sega

Conclusion

At the in-house studio of SEGA in Japan, 40 developers are now using Prevent to analyze programs on a daily basis. SEGA recognizes another advantage of using Prevent in addition to overall quality improvement: a positive effect on SEGA developers who now look after each other and pay more attention to what they write because they use and trust Prevent. When executing a large project with a number of developers at different skill levels, Prevent allows developers to focus on development work by checking the code quality. Prevent saves time by facilitating localization of failures and bugs and enabling senior developers to teach new developers based on the analysis results. Prevent implementation is definitely paying off. SEGA will continue improving their product quality and development productivity by working with quantitative data related to development work, including comparison of bugs and development processes used, as well as by promoting Prevent in other departments. A summary of results includes:

- Extremely accurate analysis results, with developer identified false positive rates under 5%
- Improved development process efficiency by approximately 20% through the identification and elimination of bugs early in the development cycle
- Coverity Prevent installed in under a day and immediately produced analysis results to keep new game development on schedule

Free Trial

Request a free Coverity trial and see first hand how to rapidly detect and remediate serious defects and vulnerabilities. No changes to your code are necessary. There are no limitations on code size, and you will receive a complimentary report detailing actionable analysis results. Register for the on-site evaluation at www.coverity.com or call us at (800) 873-8193.

About SEGA Corporation

SEGA Corporation has been developed as an amusement machine manufacturer since its establishment in 1960 in Japan. SEGA promotes the following three business areas as their core business: software development and sales for home video game consoles, amusement machine development, manufacturing and sales, and amusement center development and operation. SEGA has gained international recognition as one of the best game manufacturers in the world by always providing cutting-edge products in the market. Their products are based on their excellent development capability to transmit the contents extensively as well as their incomparable technical application capability that enabled them to create a number of first-ever products.

Industry: Games

Year of Product's Initial Implementation: 2007

Sega's Software development team in Japan who mainly develop consumer game has adopted our tool.

For more information about SEGA Corporation, please visit the following Web site: <http://sega.jp>

About Coverity

Coverity (www.coverity.com), the leader in improving software quality and security, is a privately held company headquartered in San Francisco. Coverity's groundbreaking technology removes the barriers to writing and delivering complex software by automatically finding and helping to fix critical software defects and security vulnerabilities as software is written. Hundreds of companies worldwide choose Coverity because it scales to tens of millions of lines of code, has the lowest false positive rate while providing 100 percent path and value coverage. Companies like Juniper Networks, Symantec, McAfee, Synopsys, NASA, Palm and Wind River rely on Coverity's tools to find and eliminate critical defects from their mission-critical code.

Coverity Inc. Headquarters

185 Berry Street, Suite 2400
San Francisco, CA 94107 USA
U.S. Sales: (800) 873-8193
International Sales: +1 (415) 321-5237
sales@coverity.com
www.coverity.com
scan.coverity.com

Coverity Asia Pacific

Shinjuku Nomura Building 32F
1-26-2 Nishi-Shinjuku, Shinjuku-ku,
Tokyo 163-0532, Japan
Asia Pacific Region Managing Director
Rich Cerruto
Phone: +81-3-5322-2978
japan_sales@coverity.com
coverity.com/index_jp.html

Coverity UK

Coverity Limited
Magdalen Centre
Robert Robinson Avenue
The Oxford Science Park
Oxford OX4 4GA
England