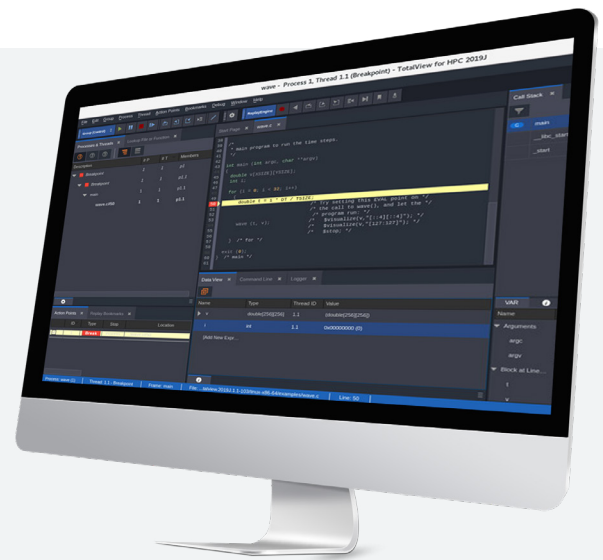


PRODUCT BRIEF

Debugging and Dynamic Analysis of Complex Code

TotalView is a software debugger for complex C, C++, and Fortran applications that have hundreds to thousands of parallel processes running. Intuitively diagnose and understand your complex code, resulting in faster resolution of bugs, memory issues, and crashes at execution.

- **Reverse debugging:** Work backwards from failure and eliminate the need to repeatedly restart the application.
- **Multi-language applications debugging:** Easily analyze and debug apps written in both Python and C/C++.
- **Simultaneous debugging:** Get complete control over program execution within a single thread or within groups of processes or threads.
- **Pinpointing and fixing bugs:** Troubleshoot difficult problems that occur in concurrent programs that take advantage of threads such as OpenMP, MPI, GPUs, or coprocessors.



Mixed Language Debugging

Many modern HPC applications are leveraging the advantages of Python and C/C++ at the same time to build complex applications. However, debugging mixed language applications is not easy. TotalView allows developers to easily understand the flow of execution across language barriers and examine the data within both languages.

- Easily set up a Python debugging session.
- View an integrated Python and C/C++ stack trace.
- Examine and compare variables in Python and C/C++.
- Utilize TotalView's reverse debugging and memory debugging technologies.

Record & Replay Execution History

Reverse debugging records the execution history of a program and makes that history available for diagnosis. TotalView's ReplayEngine makes it possible to work back from a failure, error, or crash to find the origin without repetitive restarts and stops. It allows storage of the recording to investigate the error at any time. Replay-Engine reduces the amount of time invested in troubleshooting your code.

- Freedom to explore application execution either backwards or forwards.
- Step back through execution history and review all variables.
- Go back and look at functions and variables in the context of a crash.
- Easily follow the logic of unfamiliar routines.
- Set a watchpoint and run back to find the source of unexpected data.
- Enable recording during a debug session without detaching.

“TotalView has proven to be a valuable tool for debugging our data-intensive reservoir modeling and simulation software. It helps us find bugs fast, so we can get our products to market sooner.”

Birgir Sigurjonsson, Principal Software Engineer, Roxar AS

Multiprocess Program Troubleshooting

Building a multithreaded application or transitioning from a serial to a parallel application presents significant challenges. TotalView is a source code debugger for troubleshooting complex, multiprocess programs.

- Operate with equal ease on single thread/process or with groups of threads/processes.
- Easily establish interactive debugging sessions in clusters with Reverse Connect.
- Set breakpoints with thread or process width to synchronize or use barrier constructs.
- Control the execution of threads or processes individually or in groups.
- View program data and threads/processes with parallel backtrace.
- Troubleshoot deadlocks and race conditions.
- Work with automatically defined lockstep or custom groups.

Detect & Analyze Memory Errors

TotalView includes MemoryScape, a dynamic memory analysis tool that reduces time spent on memory debugging. The powerful memory error and analysis tool has a low performance overhead with an interface that allows for identification of heap memory within a program.

- No need to recompile applications.
- Detect leaks and errors in vendor libraries.
- Track allocated, deallocated, and leaked memory blocks.
- Detect memory leaks and corrupted memory early.
- Flag memory leaks and events before they crash your application.
- Analyze memory usage patterns.
- Support for multiprocess and hybrid applications in clusters.

Get Started for Free

Sign up to evaluate TotalView at totalview.io/free-trial.