

Intel Inspector: Guide for Data Race Detection

1. Load the latest version of the Intel Inspector by executing this command:
`module load intelixe.`
2. Compile the OpenMP program you'd like to check for data races with `make`, then start the Intel Inspector GUI by calling `inspxe-gui`.
3. Click "New Project" in the "Welcome" tab or click the second icon to the left in the top bar. Enter a project name and click "Create Project".
This will open a window in which you can specify all your project settings.
4. Switch to the "Target" tab and modify the specifications for "Application" and "User-defined environment variables" accordingly.
 - a. For "Application", choose your executable.
 - b. Next, you have to set `OMP_NUM_THREADS` as a user-defined environment variable. Click "Modify" next to the input field and put `OMP_NUM_THREADS` as the variable. Set "Value" to the number of threads you'd like to run your program with, then click "OK".
5. You're done configuring your project. Click "OK" to continue to the analysis.
To check for data races, select "Threading Error Analysis / Detect Deadlocks and Data Races" in the "Welcome" tab. The analysis will start immediately.
Alternatively, click the blue play button in the top bar to add a new analysis. Then select "Threading Error Analysis" in the drop-down menu on the left and pull the button on its right down to choose "Locate Deadlocks and Data Races". Run your analysis by clicking the "Start" button.
6. Wait until all data has been collected and the "Summary" tab is displayed.
The detected errors are listed in the "Problems" window along with the code lines in which they occur. The "Filters" tab should now display that errors of type "data race" have been detected.
The "Code Location" tab marks the exact code lines where the data races cause errors. The "Timeline" window to its right will show you which threads came across the error.
7. After you've fixed your errors and recompiled your program, you can right-click your analysis in the menu on the left and choose "Re-inspect". The summary should now state that there were no problems detected.