Exposing MPI Objects for Debugging

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Motivation

- Debugging MPI applications is difficult as developers cannot inspect the state of the MPI runtime.
- The MPI Tools Working Group has proposed a standard interface between the debugger and MPI runtime [1].
- With this interface, debuggers can easily present MPI state to the developer.

Contributions

- Support for MPI handle introspection in the TotalView debugger.
- A reference introspection implementation in Open MPI.
- A demonstration of simplified MPI debugging.

Debugger access to MPI state

- MPI implementation provides functions for introspection as a library.
- Introspection functions extract data from MPI handles.
- Debugger and library interact through mutual callback functions [2].

Future Work

- Integration into TotalView’s graphical user interface.
- Validation against other MPI implementations.
- Visualization of MPI communication and processes.
- Querying MPI handle state from the debugger; filtering and showing handles matching certain criteria.

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References


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