Stack Walking Discussion

Attendees:

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Stack Walking Discussion Group

- Three major stack walking topics
  1. BlueGene support for libunwind
  2. Shadow stack optimization and C++
  3. File accesses performance

1. No BlueGene support in libunwind
   - O|SS needs better stackwalking on BlueGene
   - Three possibilities
     - Use StackwalkerAPI
     - Use HPCToolkit's stack walker
     - Fix libunwind to support BlueGene

2. Shadow stack optimization and C++

- Leave “markers” in stack after stack walk
  - Overwrite return addresses in stack
  - Faster stackwalking – can cache top of stack
  - Count function executions

- But this breaks C++ exceptions!
  - C++ RT will be confused by our modified stack

- Proposed solutions to C++ problem:
  - Intercept `throw` calls, then clean markers from stack
  - Add new entry to exception table describing markers
  - Don’t add markers to code in try blocks

3. File access performance

- StackwalkerAPI may access files (Expensive!)
  - Reading symbol names
  - Reading stackwalking debug info

- Options for fixing in STAT
  - Deliver file contents via MRNet
  - Remove file accesses from StackwalkerAPI
    - Use library/offset pairs instead of symbol names
    - Use binary analysis instead of debug info
  - Have open questions:
    - Should FE or BE do binary analysis?
    - How to deal with file versioning differences?
    - Where should any required file reads happen?