Debugging: Research Areas

- Category I: Uniquely Exascale
  - Scalability of debugger methodologies (data volumes and interfaces)
  - Concurrency and architecture driven high frequency of errors/failures (debugging under frequent failover)
  - Focus on multi-level debugging, communicating details of faults between software layers
  - Synthesis of fault information into understanding in the context of application and architecture

- Category II: Exascale plus trickle down
  - Specialized lightweight OS's
  - Automatic triggers, need compile time bridge to debugging which removes need to re-run
  - Scalable clustering of application process states and contexts, Filter/search within debugger
  - Vertical integration of debug and performance information across software layers

- Category III: Primarily Sub-exascale.
  - Excision of buggy code snippets to run at lower concurrencies
  - Heterogeneity