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