

# Capability Computing and Simulation At Sandia: Introductions

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27 November 2006

# Agenda

- **The Red Storm System: Architecture, System Upgrade and Performance Analysis**
  - Jame L. Tomkins, 01420
- **Need for Capability Computing in Vulnerability Assessment and Threat Mitigation**
  - Stephen W. Attaway, 01534
- **Questions and Answers**



# Definitions



- **Capability computing**
  - Using the most powerful computers to solve the largest and most demanding problems
  - **Workload: Large jobs, long-running jobs**
    - 1,000 - 10,000 nodes
  - Systematic support for large jobs, including high-speed networks and integrated monitoring systems
  - **Sandia a leader in Capability systems since the early 1990's: Paragon, ASCI Red, Red Storm**
- **Capacity computing**
  - Using smaller and less expensive high-performance production computing equipment
  - Parallel computations having modest computational requirements.
  - Typically Linux-based clusters
  - **Sandia is highly visible in this arena as well: Cplant, NW & ICC Clusters, Thunderbird**



# Capability Computing & Simulation

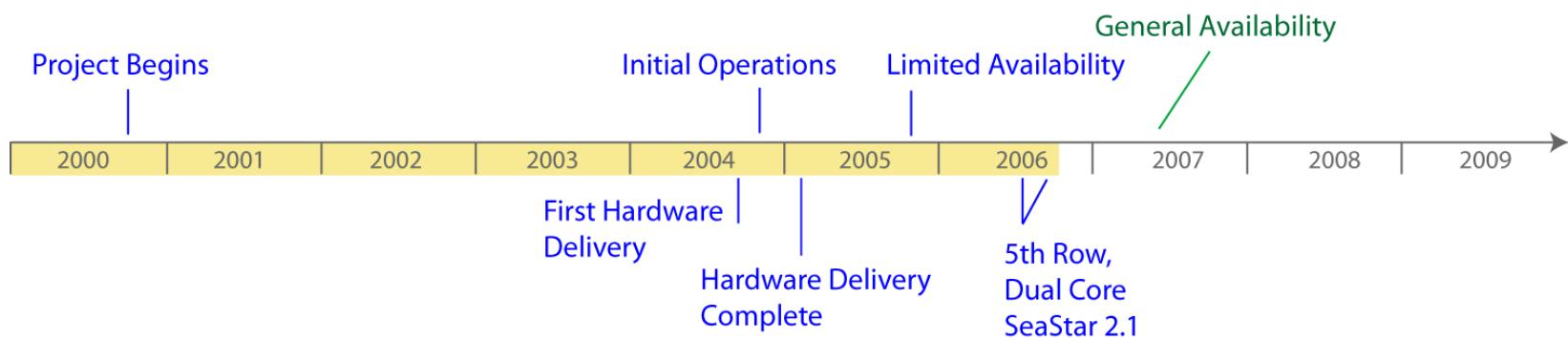


***Provide the best possible information for  
high-risk decision making***

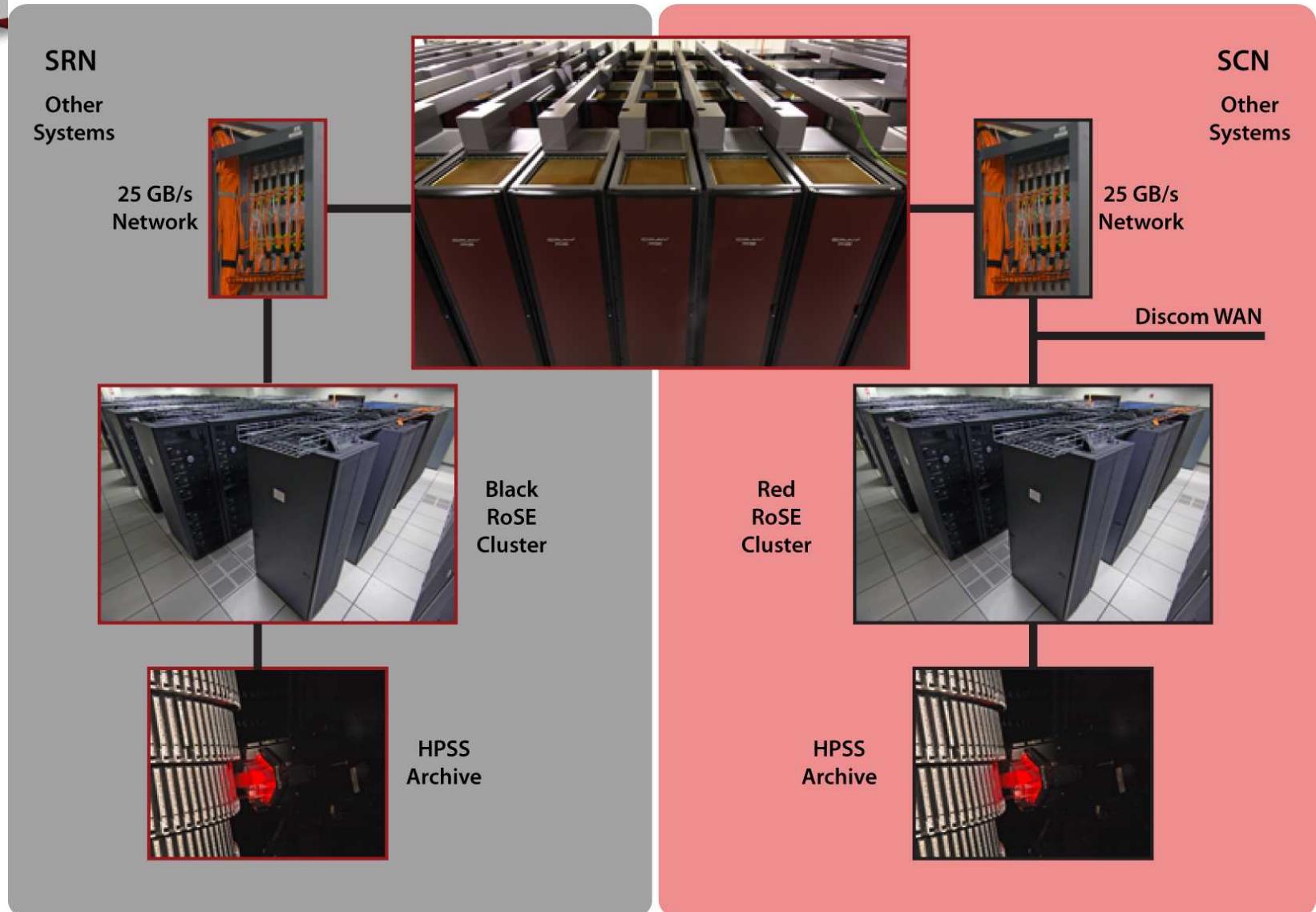
- **Capability: Largest systems, hardest problems**
- **Red Storm: SNL's newest capability system**
  - 101.4 Trillion Operations/sec
- **Tri-Labs shared resource**
  - Usage related to the Nuclear Weapons program
  - Users from all 3 Labs: LANL, LLNL, SNL
  - Both Classified and Unclassified problems



# Red Storm Timeline



# Architected Red Storm Environment



# Agenda

- **Red Storm - Jim Tomkins**
- **Capability-based Simulation - Steve Attaway**
- **Questions and Answers**