



Agency Priority Goal Action Plan

Achieve Exascale Computing

Goal Leader:

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Theme(s): General Science, Space and Technology

Overview

Goal Statement

- By September 30, 2018, DOE will complete the design of the first of two exascale machines.
- By September 30, 2019, DOE will complete design of the second of two exascale machines.

Challenge

- Accelerate development of an exascale computing system for delivery of a first machine in 2021 and a second, with a different architecture, in 2022. NNSA will deploy their own exascale system in 2023.

Opportunity

- Develop and deliver the next generation of integrated high performance computing (HPC) capability by engaging in mutually supportive research and development in hardware and software to create a capable exascale computing system that integrates hardware and software capability delivering approximately 100 times the performance of current 10 petaflop systems across a range of applications representing government needs.
- Maintaining the Nation's global primacy in high-performance computing is more critical than ever to ensure our national security, our continuing role as a science and innovation leader, and our economic prosperity.

Goal Structure & Strategies

- Employ the principles of Project Management to guide major acquisitions.
- Focus on investments that support a broad range of scientific disciplines.
- Finalize exascale designs as soon as possible to provide a clear target for science applications.
- Strong engagement between the exascale project and High Performance Computing (HPC) facilities.
- Continuous deployment of exascale software on testbed systems for testing and to inform applications development.

Summary of Progress – Final

- FY18 Q4: The final design of the first exascale machine was completed. The procurement contract for this machine signed by Argonne National Laboratory.
- FY19 Q1: The technical design review for the second exascale machine was completed on 11/28/2018.
- FY19 Q2: Performance baseline (CD-2/3) for the second exascale machine was approved on March 12, 2019. ORNL completed build contract negotiations and submitted the contract to DOE for review and approval on March 25, 2019.
- FY19 Q3: ORNL signed the Non-Recurring Engineering (NRE) contract for the exascale system on March 1, 2019.
- FY19 Q3: ORNL signed and awarded the build contract for the exascale system on May 6, 2019. This was completed ahead of the planned Q4 completion date.

Statement of Goal Achievement and Next Steps

Goal Statement

- By September 30, 2018, DOE will complete the design of the first of two exascale machines. **Met**
- By September 30, 2019, DOE will complete design of the second of two exascale machines. **Met**

APG Status: **Achieved**

Next Steps:

- Does DOE have an FY 2020-2021 APG in this topic area? **Yes**

Key Milestones

Milestone Summary		
Key Milestone	Milestone Due Date	Milestone Status
Technical Design review for the first of two exascale machines	Q1, FY18	Complete, December 6, 2017
Performance baseline approved for the first of two exascale machines, begin build contract negotiations	Q2, FY18	Complete, January 18, 2018
Signing of Non-Recurring Engineering contract for the first of two exascale machines	Q3, FY18	Complete, June 8, 2018
Final design completed, procurement contract for the first of two exascale machines signed	Q4, FY18	Complete, September 30, 2018
Technical Design review for the second of two exascale machines	Q1, FY19	Complete, November 28, 2018
Performance baseline approved for the second of two exascale machines, begin build contract negotiations	Q2, FY19	Complete, March 12, 2019
Signing of Non-Recurring Engineering (NRE) contract for the second of two exascale machines	Q3, FY19	Complete, March 1, 2019
Final design completed, procurement contract for the second of two exascale machines signed	Q4, FY19	Complete, May 6, 2019

Additional Information

Contributing Programs

Organizations:

- Office of Science
- National Nuclear Security Administration

Program Activities:

- Advanced Scientific Computing Research (SC)
- Advanced Simulation and Computing (NNSA)

Other Federal Activities:

- Part of the National Strategic Computing Initiative

Stakeholder / Congressional Consultations

The Department has provided numerous House and Senate briefings on the exascale projects and incorporates congressional direction and guidance as necessary.