

Contents

	<i>Page</i>
Chapter 1: High-Performance Computing and Information Infrastructure ‘for Science and Engineering	1
Introduction	1
High-Performance Computing: A Federal Concern	2
Multiple Goals for an Initiative	3
An Infrastructure for Science	5
Science and Information Technology Are Closely Linked	5
A National Infrastructure for Research and Education	6
The Current Federal Picture	8
Recent Studies	8
The Government’s Role Is Changing	11
The Structure of Federal Policy	12
Major Strategic Concerns	13
Breadth of Scope	13
Long-Range Planning Needs	13
Chapter2: Policy Considerations for High-Performance Computing	15
Advancing Computer Technology	15
Difficulties and Barriers	15
Providing Access to Resources	16
Difficulties and Barriers	16
Support Strategies	17
Expanding and Improving Usage	20
Difficulties and Barriers	21
Computational Centers	22
Purposes for Federal High-Performance Computing Programs	22
Chapter3: High-Performance Computers: Technology and Challenges	25
Computers and the R&D Process	25
Modes of Research Computing	25
Implications for Federal Programs	26
The Evolution of Computer Technology	26
Government and Computer R&D.....	26
Computer Performance \$.....	31
Appendix A: Supercomputer Centers	33

Boxes

<i>Box</i>	<i>Page</i>
A. Black Holes: The Mysteries of the Universe	6
B. Supertyphoon Hope	7
C. The Building Blocks of Modern Computer Hardware	28

Figure

<i>Figure</i>	<i>Page</i>
I. Estimated Proposed Funding Levels for Federal High-Performance Computing Program	1

Table

<i>Table</i>	<i>Page</i>
A-1. Federal Unclassified Supercomputer Installations	34