



---

EXECUTIVE SUMMARY OF THE REPORT TO THE PRESIDENT

# Review of the Networking and Information Technology Research and Development Program

---

Executive Office of the President  
President's Council of Advisors on  
Science and Technology

December 2024



EXECUTIVE OFFICE OF THE PRESIDENT  
PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY  
WASHINGTON, D.C. 20502

President Joseph R. Biden, Jr.  
The White House  
Washington, D.C.

Dear Mr. President,

One of the strongest areas of U.S. leadership is in innovation and commercial growth in computing and communication technology. This broad area of research and development (R&D) has been a driver of our economy—and of striking societal changes—for several decades: consider the impacts of personal computers, the internet, and cellular phones. Investments made by the U.S. government in previous decades provided the foundation for unprecedented commercial investments in networking and information technology (NIT) in the past few years. Federal R&D in NIT is as relevant today as it ever has been with the explosive growth of large language models and artificial intelligence (AI).

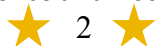
The Networking and Information Technology Research and Development (NITRD) Program was established by legislation to foster U.S. leadership in NIT areas over 30 years ago, with the goal of coordinating NIT R&D activities across the Federal Government. Subsequent legislation mandated three-year independent reviews of the NITRD Program to be prepared for Congress by an advisory committee to be established by the President, and since 2005 the President has designated the President's Council of Advisors on Science and Technology (PCAST) to provide these reviews. For the following report, we convened a working group drawn from academia and industry and met with relevant government actors across the agencies as well as within the NITRD coordinating office.

The first question in a review of any 30-year-old program is whether it is still serving an important function and serving it well. We are pleased to be able to report our first finding, that the NITRD program continues to be useful and cost-effective. We are, in fact, impressed by the value that the NITRD program continues to provide. Our report goes on to recommend improvements and updates that can allow NITRD to reach more of the government entities that it should support, and also to play its needed role in the rapid and dramatic developments raised by the current “special moment of AI.”

NITRD is playing an invaluable role in one of the more important areas of R&D for our nation. Federal investments are maintaining and building the leadership of the United States in a key component of our collective future. Coordination of the cross-government investments in networking and information technology R&D is essential to ensure that this crucial technology area serves public sector needs while also providing a foundation for future private sector growth. We are enthusiastic about the prospects for NITRD's work, and hope that our report will help inform its next stages.

Sincerely,

Your President's Council of Advisors on Science and Technology



# Executive Summary

In 1991, Congress passed the High-Performance Computing Act ([P.L. 102-194](#)) to support national-level R&D coordination in the field of computing and communications technology by establishing what is now known as the Networking and Information Technology Research and Development (NITRD) Program. Current statute ([15 USC 5501](#) et seq.) calls for periodic review of program functions and structure, responsibility for which has been delegated to the President’s Council of Advisors on Science and Technology (PCAST). This report constitutes PCAST’s independent review of the NITRD Program.

For over three decades, the NITRD Program has played a crucial role in the coordination of networking and information technology (NIT) research and development (R&D). The NITRD Program has remained an exemplar of effective government coordination by serving as a valuable forum for advancing federally funded NIT R&D. NITRD Program entities— including the NITRD National Coordination Office (NCO), the National Science and Technology Council NITRD Subcommittee (SC) and its respective Interagency Working Groups (IWGs)—facilitate interagency convenings and provide central points of contact for agencies to coordinate their NIT-related R&D activities. The NITRD NCO also produces an annual budget report that identifies federal agency R&D investments in various areas of NIT, with budget trends broken down into NITRD Program-specific budget categories (called program component areas) and facilitates the development of strategy documents by NITRD entities.

While the NITRD Program is effective, PCAST sees opportunities to strengthen and improve its activities to provide an even greater positive impact for the Nation in this time of remarkable technological change. PCAST has identified the following nine findings and seven recommendations for revitalizing the Program while continuing to ensure that federal NIT R&D resources are effectively stewarded.

## **Findings**

**Finding 1:** The NITRD program continues to be useful and cost-effective.

**Finding 2:** The NITRD NCO’s communication strategy, its products, and their cadence, are not always well matched to the existing or potential customer base.

**Finding 3:** The NITRD NCO has over time become too narrow in its outreach.

**Finding 4:** The NITRD program and NCO are missing opportunities to:

- A. Provide meaningful benefit to a broader customer base of federal officials, including those in the budgeting process and those making informed technology acquisition decisions;
- B. Connect a broader set of stakeholders from academia and industry to NIT R&D efforts;
- C. Serve as a resource and institutional memory (including across agencies and across administrations) for a broader range of customers and programs than at present.

**Finding 5:** The inherent inertia of the interagency process leads to PCAs that more resemble the state-of-the-art in information technology a decade ago than what would today best serve the purposes of the NITRD Program’s authorizing legislation as forward-looking guidance.

**Finding 6:** Budget reporting via the PCAs could be made more meaningful by creating sub-categories that clarify different uses of NIT.

**Finding 7:** The NSTC NITRD IWGs are valuable. They would benefit from greater flexibility in their number, definitions, and lifetimes, more like the present FTACs and CoPs and less tied (even if only implicitly) to the PCAs. This shift would also free up the PCAs for redefinition towards more strategic and modern definitions.

**Finding 8:** AI’s long-term societal significance could be comparable to the invention of the internet, and greater than high-performance computing was in its time—the original impetus for founding NITRD.

**Finding 9:** We believe an opportunity exists for NITRD to contribute to, and in some cases lead, activities being undertaken government-wide in response to the [Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence](#).

## **Recommendations**

**Recommendation 1.** The NITRD NCO should undertake a structured review of its existing report products to improve the cadence and level of detail to better match the needs of current and prospective customers.

**Recommendation 2.** The NITRD NCO should construct and execute a multi-pronged plan aimed at expanding its customer base, by:

- A. Identifying current customers and surveying them as to how NITRD Program convenings and written products can more effectively meet their needs.
- B. Reaching out to potential new customers and stakeholders, educating them about the NITRD Program, and exploring how NITRD products (existing or new) might help them in meeting their responsibilities.
- C. Identifying appropriate metrics of success, for example, requests for information/meetings, web hits, etc.

**Recommendation 3.** The NCO should develop a list of convenings of executive branch entities (councils, committees, etc.) working in the areas of information technology and data science, and should assess where NITRD might contribute present and future institutional memory and R&D perspective by being, even if silently, “in the room.” NITRD should reach out to those entities and propose mutually beneficial interactions.

**Recommendation 4.** The NITRD NCO should utilize its statutory authority to undertake a zero-base refresh of the PCAs. The new PCAs should be future-looking and encourage agency R&D both on and using today’s and tomorrow’s most relevant technologies, while also making PCAs more useful as budget-reporting categories for policymakers.

**Recommendation 5. Agencies' budget reporting against the PCAs should, for each PCA, give the breakdown of its dollar amount into four subcategories:**

- A. R&D on that PCA, i.e., advancement of that PCA as a subfield of information and data science and technology.**
- B. R&D using that PCA to advance the agency's mission.**
- C. Infrastructure investment, exclusive of operating expenses, that support that PCA.**
- D. Infrastructure operational expenses that support that PCA.**

**Recommendation 6. The NITRD NCO and NSTC NITRD Subcommittee should clearly separate the organization of their convening efforts (IWGs, FTACs, and CoPs) from the definition of the PCAs. The number, definitions, and lifetimes of all the convenings should be flexible, variable, and customer-driven.**

**Recommendation 7. The activities of NITRD entities should more specifically address the "special moment of AI." The NITRD NCO should reach out to increase its involvement with, and usefulness to, the plethora of new federal activities in AI, augmenting or leading as appropriate.**

**[Download the full report](#)**