

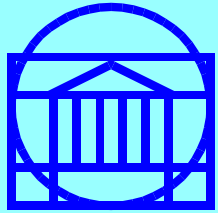
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# ***NCI: National Compiler Infrastructure Overview***

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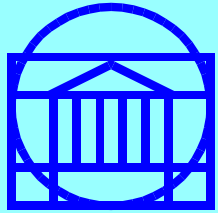


# *The Problem*

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## **Inadequate compiler infrastructure impedes progress in high-performance computing**

- ▲ **Compiler development currently lags hardware development cycle**
- ▲ **Inadequate infrastructure traps systems software on outdated, expensive hardware**
- ▲ **Barrier to entry in compiler research is high**
- ▲ **Difficult to share, reuse, or combine software resulting from research efforts**

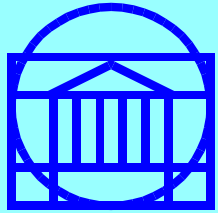


# *A Solution*

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## **A National Compiler Infrastructure**

**A high-quality, flexible, open compilation infrastructure that supports research, education, and commercial development**



# ***Impact of NCI***

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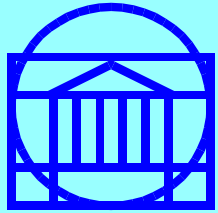
## **◆ Increase quality and impact of U.S. compiler research**

### **▲ Quality**

- Researchers can build on state-of-the-art platforms**
- Focuses attention on research issues rather than on building infrastructure**

### **▲ Impact**

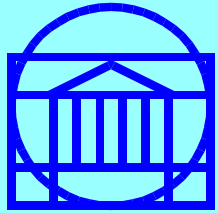
- Common infrastructure increases probability research products used by other research groups and U.S. industry**



# ***Impact of NCI***

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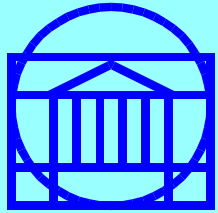
- ◆ **Accelerate pace of U.S. compiler research**
  - ▲ **More groups can engage in compiler research**
  - ▲ **Research results can be readily shared**
- ◆ **Improve quality of education in compilers and software development environments**
  - ▲ **Compiler infrastructure for instruction**
  - ▲ **Compiler infrastructure for class projects**
  - ▲ **Example of large-scale design**



# ***Impact of NCI***

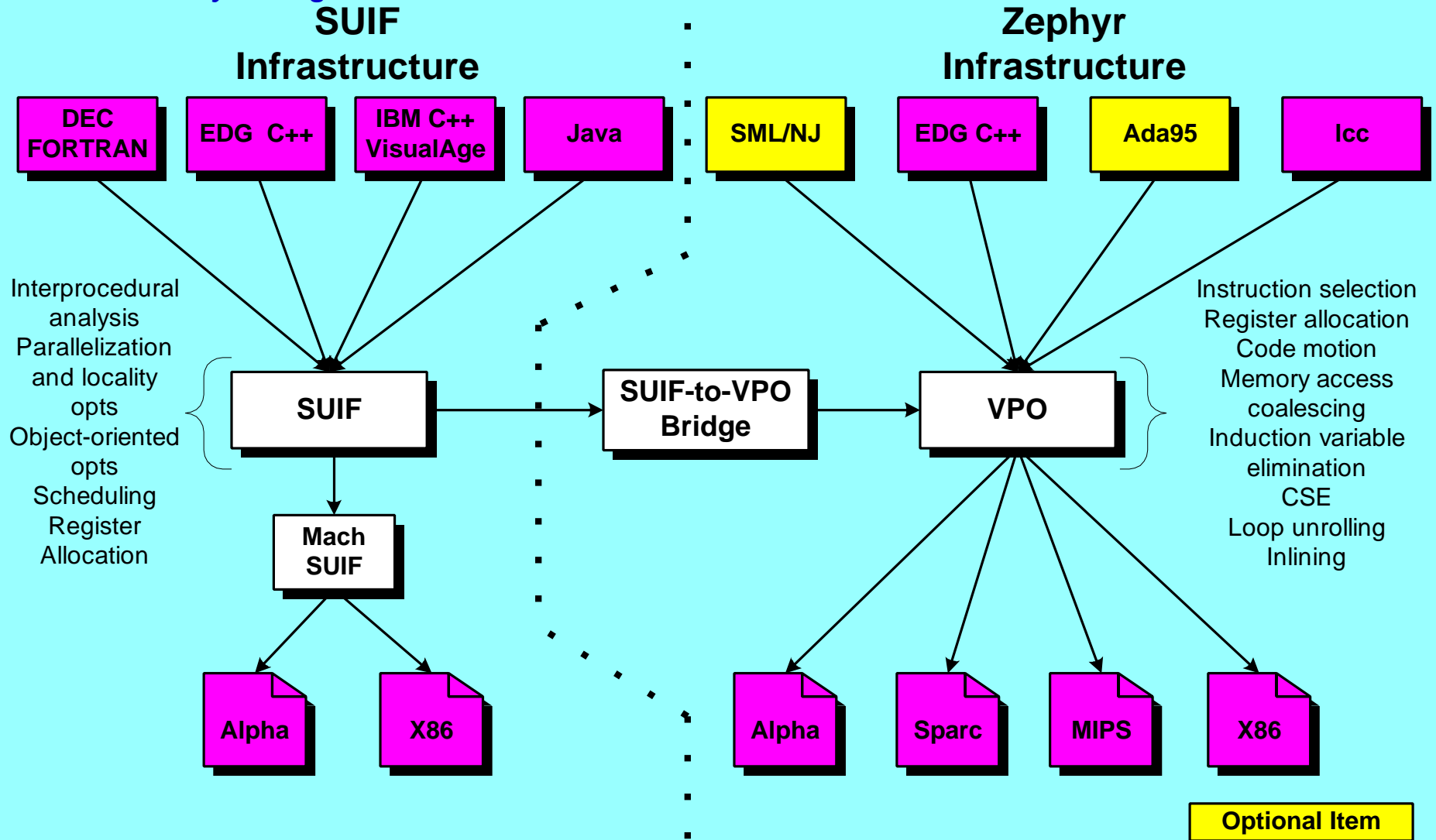
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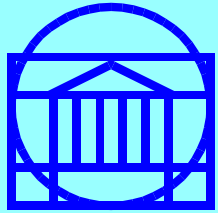
- ◆ **Increase competitiveness of U.S. Industry**
  - ▲ **Reduce shortage of compiler experts**
  - ▲ **Reduction of barriers to adoption of new languages and machines could create new markets**



# The Big Picture

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# ***NCI Participants***

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**Andrew Appel - Princeton University**  
**Keith Cooper - Rice University**  
**Jack Davidson - University of Virginia**  
**Urs Hölzle - UC Santa Barbara**  
**Monica Lam - Stanford University**  
**David Moore - Portland Group**  
**Martin Rinard - MIT**  
**Mike Smith - Harvard University**  
**Linda Torczon - Rice University**

**URL: <http://www.cs.virginia.edu/nci>**