Challenges and Solutions for Peta- and Exa-Sacle Programming: "Systems" Perspective

Richard L. Graham
Computer Science and Mathematics Division
National Center for Computational Sciences

When Exa-scale system will come ?

- **In 1990/2000 who would have imagined 150,000 way parallelism ?**

- **It will come**
  - **It probably will NOT look like what we expect**
  - **Probably simpler than we expect**

Issues on Peta- and Exa-scale programming:

- **What issues are solved or are being solved ?**
  - **Are there any ?**

- **What issues will be remained at the end ?**
  - **Compilers**
  - **O/S**
  - **Communication libraries**
  - **File system**

  - **Some what an issue of funding and collaboration**

Programming style:

- **What kind of programming style remain ?**
  - **"MPI" - but will it look like today's MPI ? (just like today's Fortran is not 1990's Fortran)**
  - **PGAS**
  - **Hybrid**

- **Does the user have to describe Hybrid code ?**
  - **Yes, but with help from tools**

Your challenge:

- **Application software**

- **System software**
    - **Simplicity in the face of complex systems**
    - **Manageability**
    - **Usability**

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Your free opinion on Peta- and Exa-scale application/system software

- **Taming complexity is key**

- **Compose-able**

- **Dial-able level of detail**

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