CCA
Common Component Architecture

Welcome to the
Common Component Architecture Tutorial

CCA Forum Tutorial Working Group
http://www.cca-forum.org/tutorials/
tutorial-wg@cca-forum.org

JPL Lawrence Livermore National Laboratory Los Alamos NATIONAL LABORATORY ornl OAK RIDGE NATIONAL LABORATORY Sandia National Laboratories

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Who Are We?
(And Where Did We Come From?)

- ACTS Toolkit Interoperability Effort (Late 1990's)
  - Part of DOE 2000, Many Tool Integration Projects
    - "One-to-One", Leading to N^2 Solutions… ☹
- Common Component Architecture Forum (1998)
  - Goal: To Develop a General Interoperability Solution
  - Grass Roots Effort to Explore High-Performance Components for Scientific Software
- SciDAC Center for Component Technology for Terascale Simulation Software (CCTTSS, 2001)
  - Part of New DOE Scientific Simulation Program
  - Technology Development in Several Thrust Areas…

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The Common Component Architecture (CCA) Forum

- Define Specifications for *High-Performance* Scientific Components & Frameworks
- Promote and Facilitate Development of Domain-Specific *"Standard" Interfaces*
- Goal: *Interoperability* between components developed by different expert teams across different institutions
- Quarterly Meetings, Open membership…

Mailing List: *cca-forum@cca-forum.org*

http://www.cca-forum.org/

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Center for Component Technology for Terascale Simulation Software (CCTTSS)

- DOE SciDAC ISIC ($16M over 5 years)
  - SciDAC = Scientific Discovery through Advanced Computing
  - ISIC = Integrated Software Infrastructure Center
- *Subset* of CCA Forum
- Develop CCA technology from current prototype stage to full production environment
- Increase understanding of how to use component architectures effectively in HPC environments
- Participants: (Funded by the Office of Mathematical, Information and Computational Sciences (MICS))

Lead PI: Rob Armstrong, SNL *<rob@sandia.gov>*

http://www.cca-forum.org/ccttss/

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CCTTSS Research Thrust Areas and Main Working Groups

- Scientific Components
  - Scientific Data Objects

    Lois Curfman McInnes, ANL (curfman@mcs.anl.gov)

- "MxN" Parallel Data Redistribution

    Jim Kohl, ORNL (kohlja@ornl.gov)

- Frameworks
  - Language Interoperability / Babel / SIDL
  - Component Deployment / Repository

    Scott Kohn, LLNL (skohn@llnl.gov)

- User Outreach

    David Bernholdt, ORNL (bernholdtde@ornl.gov)

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Acknowledgements

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Tutorial Agenda

Wednesday 16 October 2002

Welcome	Craig Rasmussen	5 min
Why Use Components in HPC Software?	Dan Katz	30 min
CCA Concepts	Dan Katz	30 min
A Simple CCA Example	Rob Armstrong	15 min
Language Interoperability Using Babel	Craig Rasmussen	40 min
Break		15 min
Writing CCA Components	Rob Armstrong	30 min
How to Create Ccaffeine Components	Rob Armstrong	30 min
More Complex CCA Applications	Jim Kohl	20 min
CCA Status and Plans	Jim Kohl	10 min
Q & A Session		15 min

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Next: The Sausage Grinder Talk