

# HPEC 2000

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## Session 3

# Software Standards and Their Applications

**Richard Games**

**rg@mitre.org**

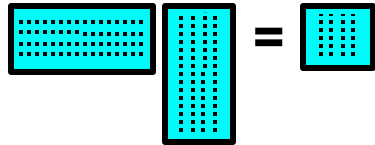
# Why APIs?

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- ***Application programming interfaces (APIs):* A set of conventions and rules that provide a documented way for software, such as an application, to interface to other software, such as an operating system or another application**
- **Portability -- APIs mask underlying differences**
- **Ease of use -- APIs as tools**
- **High performance -- vendors implement APIs**

# HPEC APIs

## Vector / Signal Processing



## Comm / Data Reorganization



## Community APIs

- Vector/Signal/Image Proc Lib (VS IPL)

- Message Passing Interface (MPI)

- Real-Time MPI (MPI/RT)

- Data Reorganization Interface (DRI)

- High Performance CORBA

 Established

 Emerging

 Under Development

# Convergence

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- **HPL - A Portable Implementation of the High-Performance Linpack Benchmark for Distributed-Memory Computers (Version 1.0, 9 September 2000)**
  - **A. Petitet, R. C. Whaley, J. Dongarra, A. Cleary**
  - **MPI and VS IPL**
  - **Top 500 Benchmark**
  - **[www.netlib.org/benchmark/hpl](http://www.netlib.org/benchmark/hpl)**

# APIs

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- **VSIPL --James Lebak, MIT Lincoln Laboratory**
- **MPI/RT -- Tony Skjellum, MPI Software Tech**
- **Data Reorganization -- Ken Cain, MITRE**
- **High Performance CORBA -- Jim Kulp, Mercury**

# Applications

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- **Implementing VS IPL Using Intelligent Compiler Technology -- Steve Paavola, Sky Computers**
- **APIs, Benchmarking & Power of Abstraction -- Arkady Kanevsky, Mercury**
- **A Parallel Algorithm for Matched Field Processing using MPI and VS IPL -- Randy Judd, SPAWAR**
- **COTS Software Portability Standards and VS IPL Benchmarks -- Roelan Teachey, Lockheed Martin**