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## GRID Challenges

European Microsoft Innovation Center

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# EMIC and Microsoft

## ▶ EMIC

- ▶▶ Located in Aachen, Germany
- ▶▶ Microsoft's first collaborative research and design center
  - ▶▶ Involved in 12 active IST projects
  - ▶▶ Examples: Trustcom, NextGrid, Secse
- ▶▶ 2 focus WS/Security technologies and mobile/wireless

## ▶ Microsoft and GRID

- ▶▶ Large investment and driver of Service Oriented Architecture (SOA) and Web Service (WS) computing
  - ▶▶ WS Specifications, WS Platform (.NET), Indigo
- ▶▶ Recently have become much more involved in High-Performance Computing (HPC)
  - ▶▶ HPC Version of Windows, Windows powered compute clusters, .NET implementations of GRID technologies

## How We Look at GRID

- ▶ **GRID is a large scale distributed computing that is a mixture of:**
  - ▶▶ High Performance Computing (Clustering, Load Balancing, multi-CPU, ...) and
  - ▶▶ Service Oriented Systems (Web Services, SOA)
- ▶ **Microsoft is currently focusing on both**
- ▶ **EMIC is specifically focusing on service orientation**
  - ▶▶ GRID computing will push and drive the capabilities of web services
  - ▶▶ Web services will help GRID computing become more mainstream, interoperable and manageable

# Primary Research Challenges

- ▶ **Security**
  - ▶▶ Industry won't use GRID computing outside of their trusted network until security is improved
  - ▶▶ Today's models/technologies are static and too tightly coupled
    - ▶▶ It is hard to dynamically setup relationships with any real trust
- ▶ **Web service capabilities and SOA**
  - ▶▶ GRID needs to become loosely coupled between nodes
  - ▶▶ WS specs need to represent that (many upcoming specs are not loosely coupled)
- ▶ **Development technologies and models for GRID applications**
  - ▶▶ Distributed applications have to be as easy to write as normal applications are now
  - ▶▶ Today's models and tools assume the developer understands how distributed computing works and effects their application
- ▶ **Manageability**
  - ▶▶ Cycle sharing and resource virtualization has a number of unique manageability challenges
  - ▶▶ Today's management technologies don't automatically work in GRID scenarios
  
- ▶ The research focus should be on getting the technologies right first (you can tell when they get adopted) and then standardization

## CoreGRID Advances

- ▶ **Common services that are needed in GRID operating systems / middleware**
- ▶ **New technologies and model for development**
- ▶ **Manageability technologies**

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The Microsoft logo is displayed in a large, bold, white font. Below it, the text "European Innovation Center" is written in a smaller, white, italicized font. The background is a blue gradient with faint, abstract patterns.

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**Vielen Dank für Ihre  
Aufmerksamkeit**