GAT: Grid Application Toolkit

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AEI-MPG

THIS WILL NOT BE ON THE TEST

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Outline

- ## Introduction to GAT
  - Philosophy and aims of GAT

- ## Architecture of GAT
  - Introduction to the GAT architecture

- ## Adaptors to GAT
  - Overview of GAT adaptors

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Introduction to GAT

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- **Background**
  - Speaker Background
  - GridLab Background

- **Introduction to GAT**
  - What is GAT?
  - Philosophy and Aims of GAT
  - Example use of GAT
  - Summary

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Outline

Background
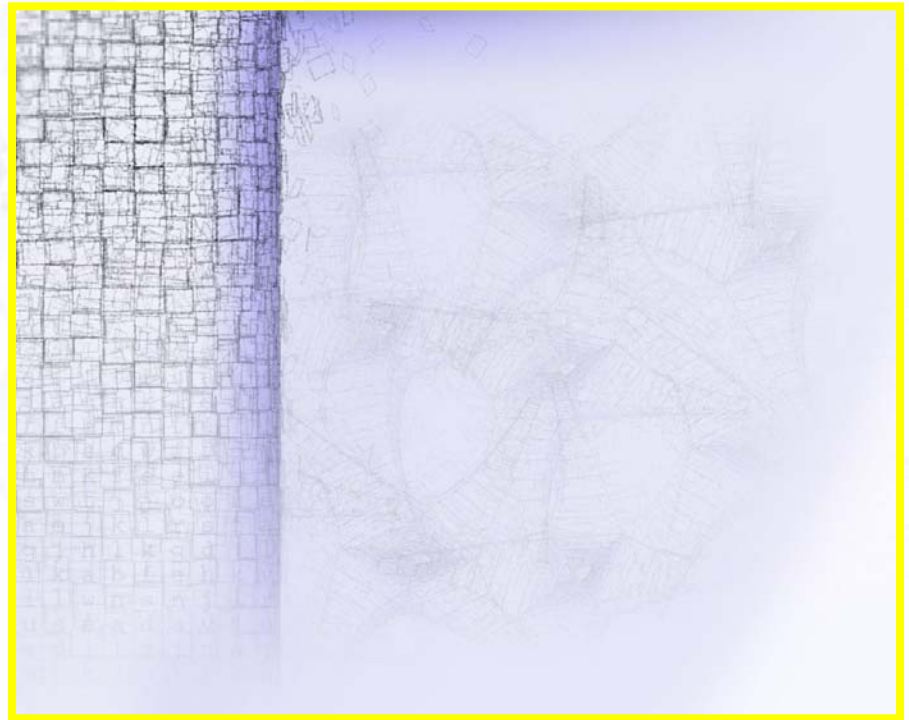
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Speaker Background

- High energy theoretical particle physicist

- Spent a number of years in software industry
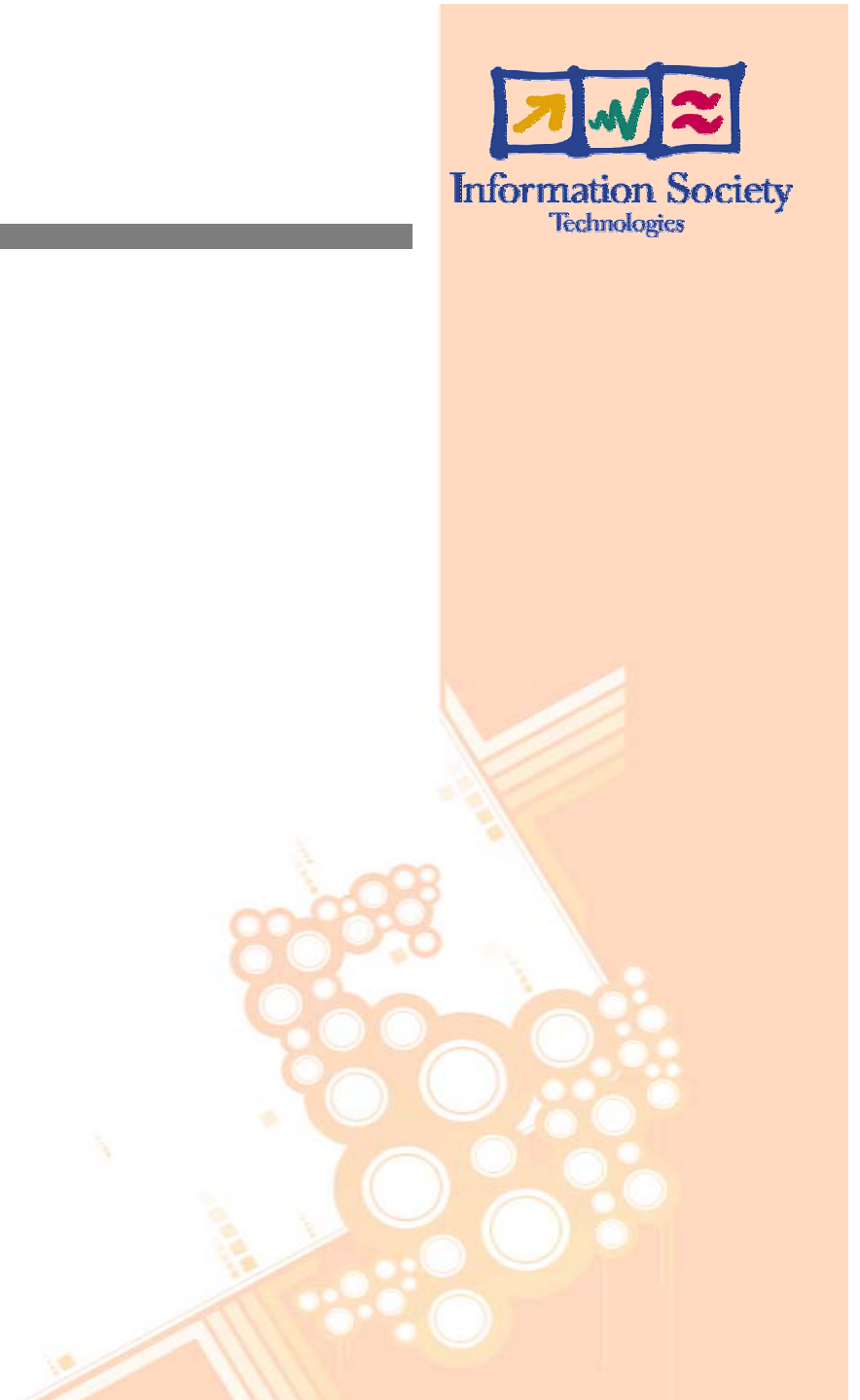
- Joined the GridLab project a year ago

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GridLab Background

- **EU Project Funded by 5th Framework**
  - PSNC, AEI, ZIB, MASARYK, SZTAKI
  - ISUFI, Cardiff, NTUA, Chicago, ISI
  - Wisconsin, Sun, Compaq,…

- **12 Work Packages covering**
  - Grid Portals
  - Mobile Users
  - Grid Services
  - Applications
  - Testbed
  - GAT: Grid Application Toolkit

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What is GAT?

- GAT: Grid Application Toolkit

API and Toolkit for developing and running portable grid applications independently of the underlying grid infrastructure and available services

- GAT implements the GAT-API
- GAT is used by applications to access grid services

- **GAT Adaptors**
  - Connect GAT to grid services
  - Allow for multiple providers (GRAM, UNICORE,…)

- **GAT Engine**
  - Provides runtime delegation of GAT-API calls to apropos adaptors

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Philosophy and Aims of GAT

- Applications make GAT-API calls for operations which may be grid related
- Applications link against GAT
- Applications run irrespective of infrastructure deployment
    - GAT Engine loads all available adaptors
    - Upon a call to the GAT-API the GAT Engine determines the apropos adaptor to provide the "grid operation"
    - Upon "grid operation" failure another adaptor may be called
    - There exist a set of default adaptors which provide default local capabilities
- Grid applications can thus be compiled, linked, and tested without any available grid services
- The same application executable can run in a "full grid environment."

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Philosophy and Aims of GAT

- GAT does not aim to replace existing "grid infrastructure."

- GAT aims to provide a simple, clear interface to many different infrastructures
  - GRAM
  - Condor
  - Unicore
  - GridFTP
  - RFT
  - …

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Example use of GAT

```
GATContext gc = new GATContext();
SecurityContext sc = ...

// Prime sc with credentials

gc.addSecurityContext(sc);

SoftwareResourceDescription srd = ...

CheckpointableSimpleJob csj =
 new CheckpointableSimpleJob(gc, srd);
csj.submit();

// Wait until csj is running

csj.checkpoint();
```

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Summary

The GAT is a adaptation layer which insulates application development *and use* from underlying grid technologies, thus allowing applications to be developed and used in the absence of a grid, and yet an unmodified executable can still take full advantage of the grid in a partially or fully depolyed grid environment.

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