GAT: Grid Application Toolkit

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AEI-MPG
THIS WILL NOT BE ON THE TEST
Outline

Introduction to GAT
- Philosophy and aims of GAT

Architecture of GAT
- Introduction to the GAT architecture

Adaptors to GAT
- Overview of GAT adaptors
Introduction to GAT

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Outline

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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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.”
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 an adaptation layer which insulates application development \textit{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 deployed grid environment.