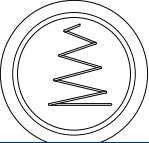


AGMS Project Overview

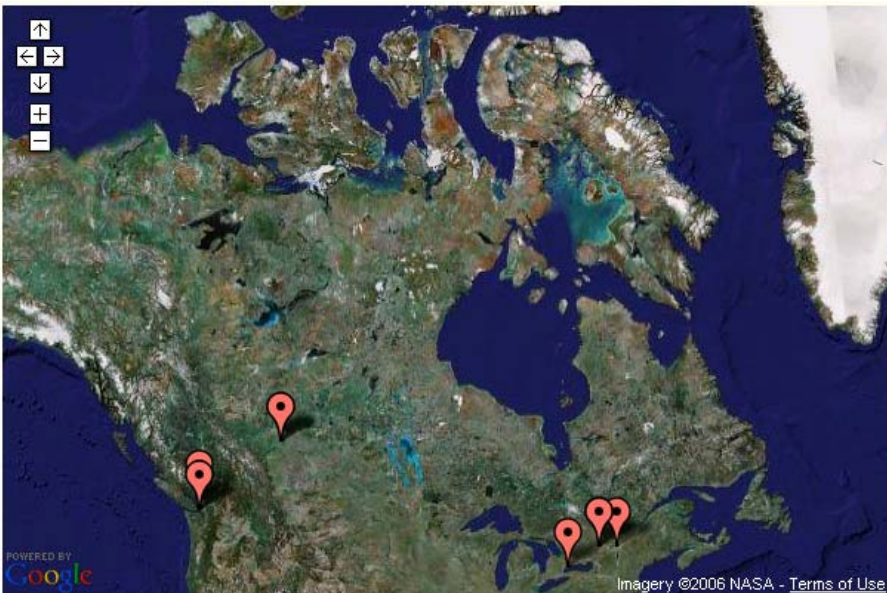
Ron Desmarais and Hausi Müller

- Grid Background
-
- A proposal for an Autonomic Grid Management System (AGMS)
- Implementing an AGMS
- An Application to test system performance
- Progress Report

University of Victoria, Victoria, British Columbia, Canada



Grid Background: GridX1

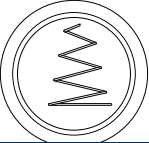


Active BaBar 0 Pending BaBar 0
Active LCG 707 Pending LCG 4639
Total Sites 8

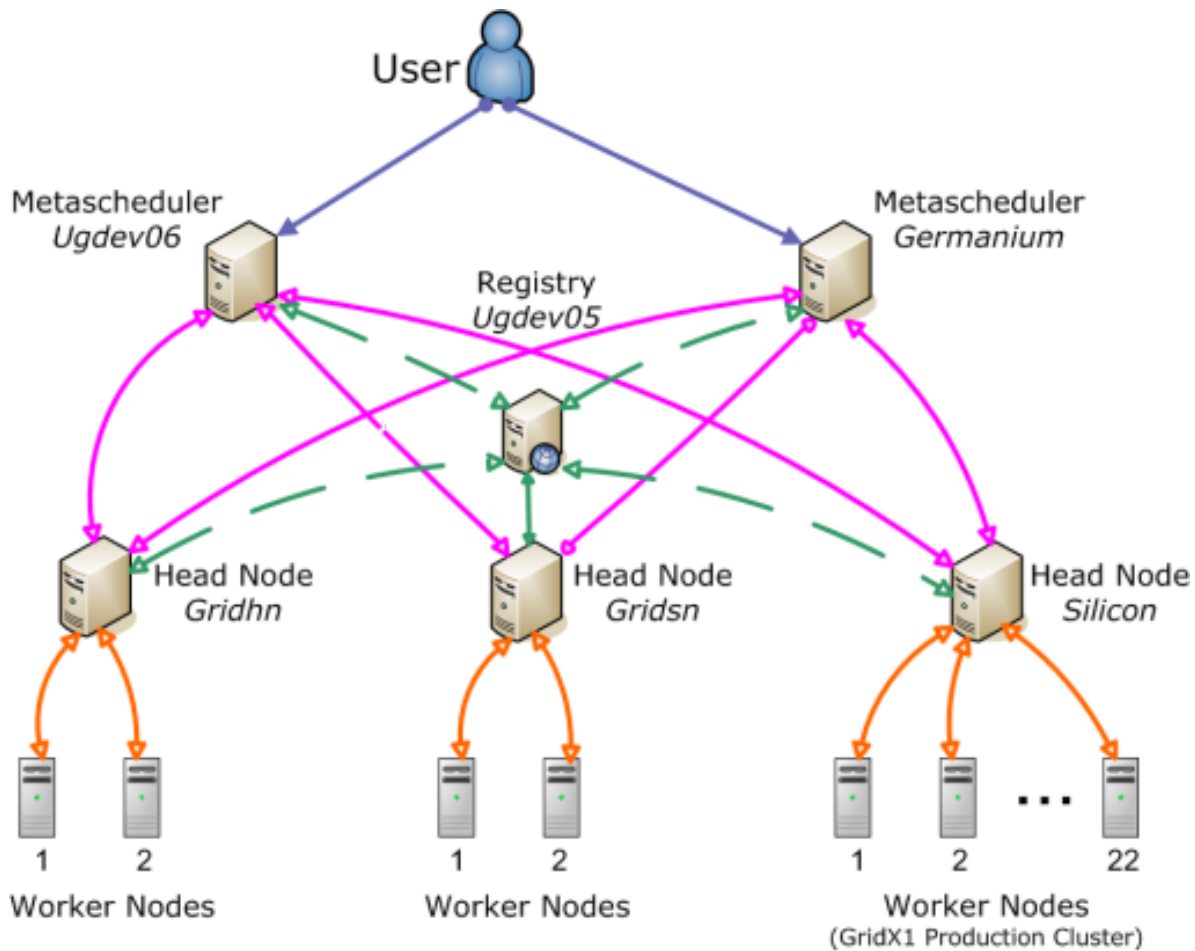
Show LCG Show BaBar All Resources

Resource Name	LCG Active	LCG Pending	BaBar Active	BaBar Pending	Total	LCG Active	LCG Pending	BaBar Active	BaBar Pending
lgce02.nic.ualberta.ca	0	4444	0	0	4444				
hep.westgrid.ca	221	6	0	0	227				
lgce01.triumf.ca	111	77	0	0	188				
lgce02.triumf.ca	111	77	0	0	188				
bigmac-lcg-ce.physics.utoronto.ca	163	23	0	0	186				
mercury2.uvic.ca	91	0	0	0	91				
lgc-ce.lps.umontreal.ca	10	12	0	0	22				
venus.sao.nrc.ca	0	0	0	0	0				
Totals	707	4639	0	0	5346				

- Created a Canadian Grid based on Globus 2 Middleware (2003)
- Part of the LCG centered at CERN

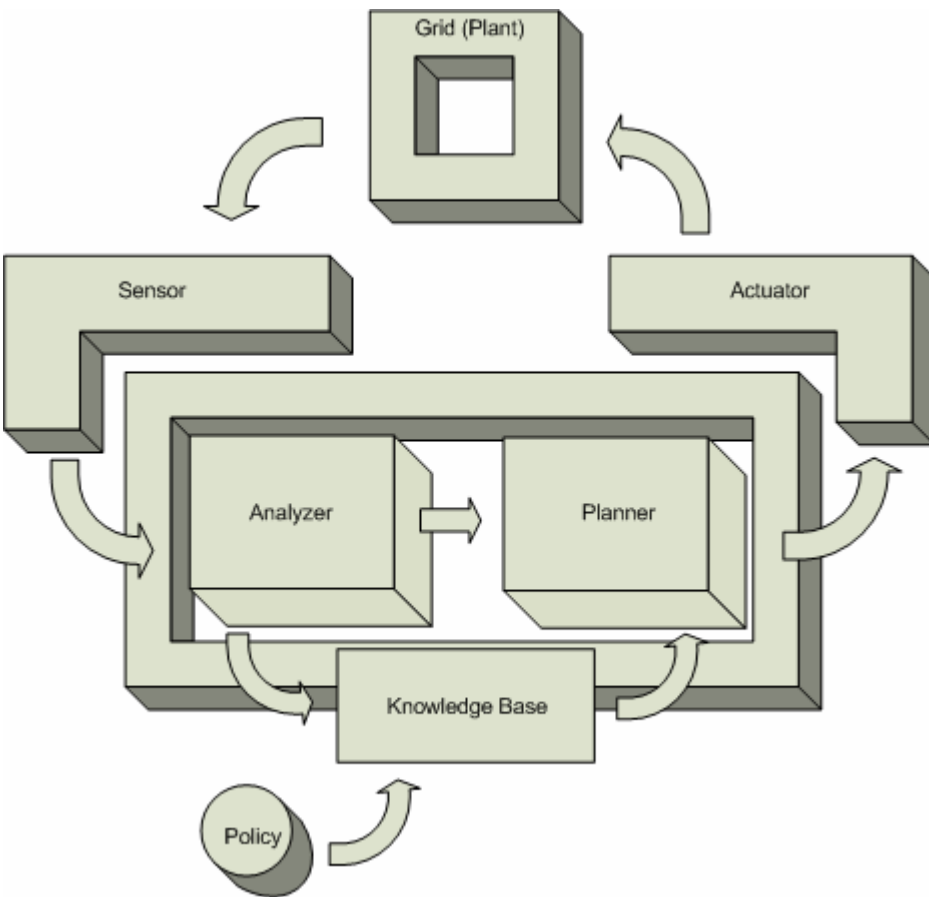


Grid Background: Grid Component Overview

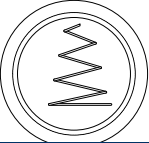




Proposal: AGMS

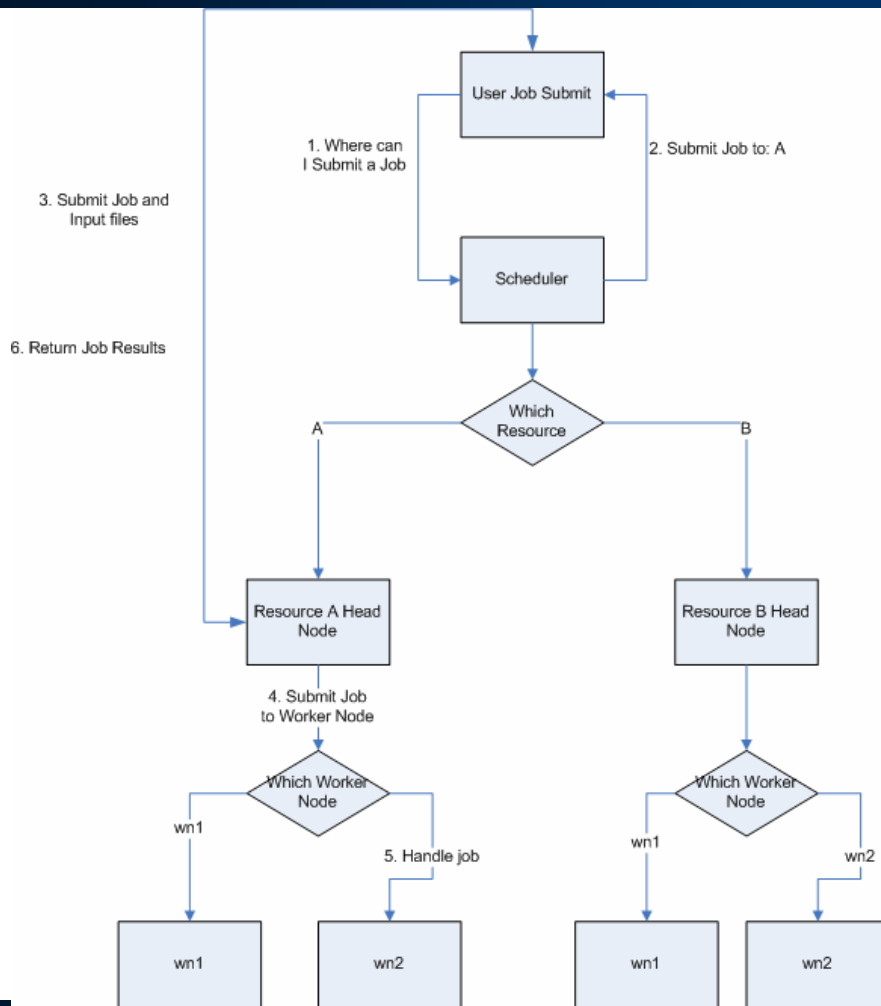


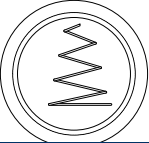
- Sensor: used to sense grid work flow events
- Analyzer: used to make sense of the sensor data
- Planner: used to create a corrective or preventative maintenance procedure
- Actuator: used to execute the procedure created by the planner



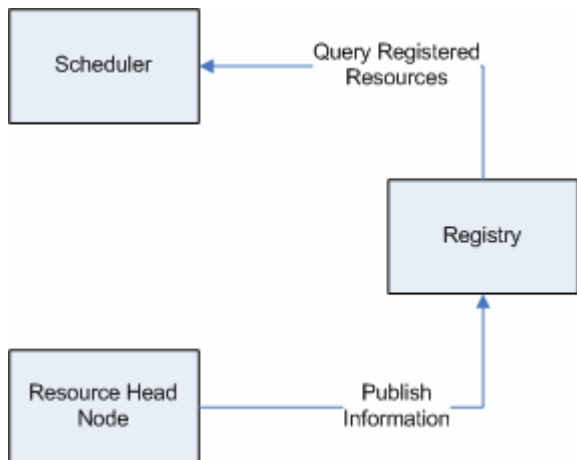
Proposal: Job Submission Work flow

- Job Submitted by user
- Meta scheduler selects resource
- User submits to resource
- Resource selects worker node to run job
- Job completes and returns result to user

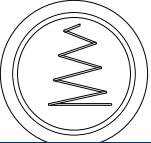




Proposal: Grid Operations Work Flow

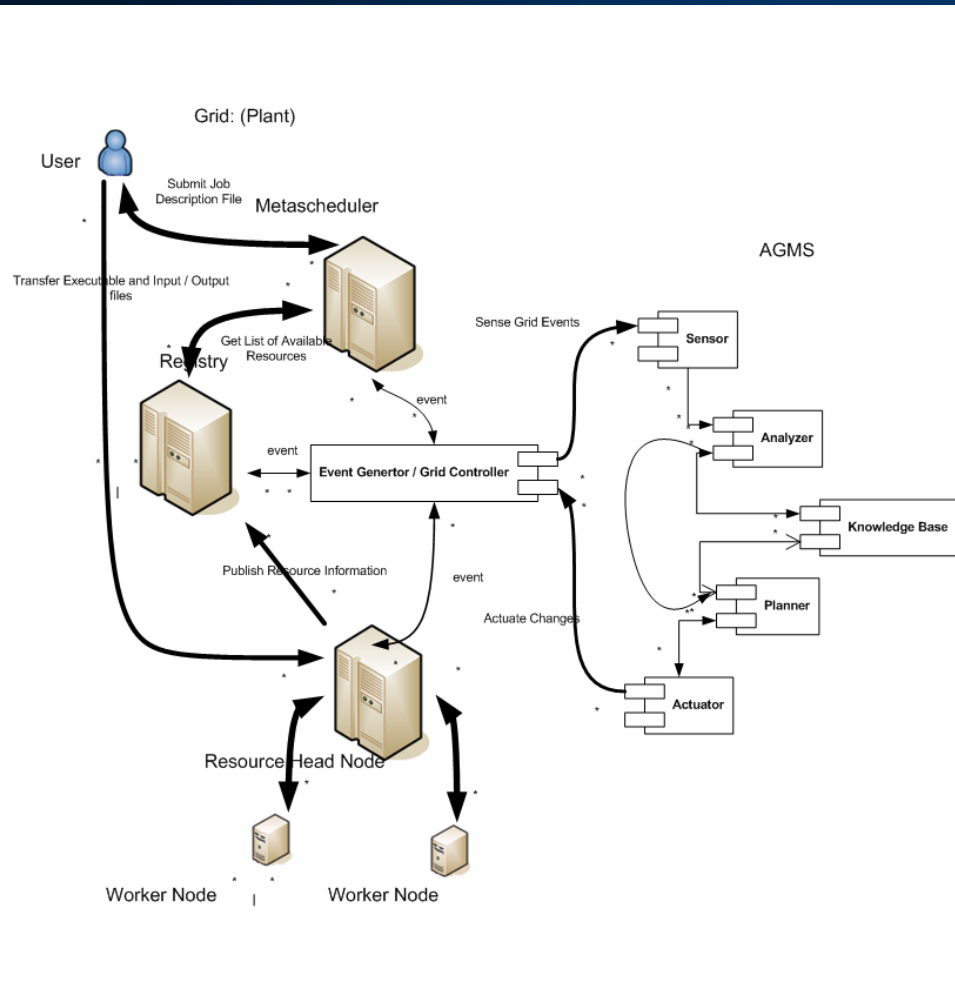


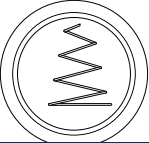
- Resource registers status to registry
- Scheduler periodically checks registry for services and resources



Implementation: Grid with an AGMS

- An AGMS component will have to be created to run on grid resources to generate grid events and allow the AGMS to implement grid changes.





Plan: For Implementing and Testing

Implementation:

1. Create a Test bed grid with GridWay or Condor Meta schedulers
2. Measure and record grid performance by submitting test jobs and using a monitoring system
3. Create an AGMS with tools such as IBM's Autonomic Toolkit to monitor and actuate grid resources and services

Testing

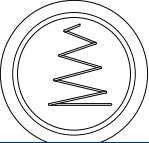
- Job Submission Resiliency:
 - Record number of lost jobs on a typical grid and compare to lost jobs when using an AGMS
- Grid Services Reliability:
 - Record service failures with and without an AGMS
- Create Application of Interest



A Grid Application

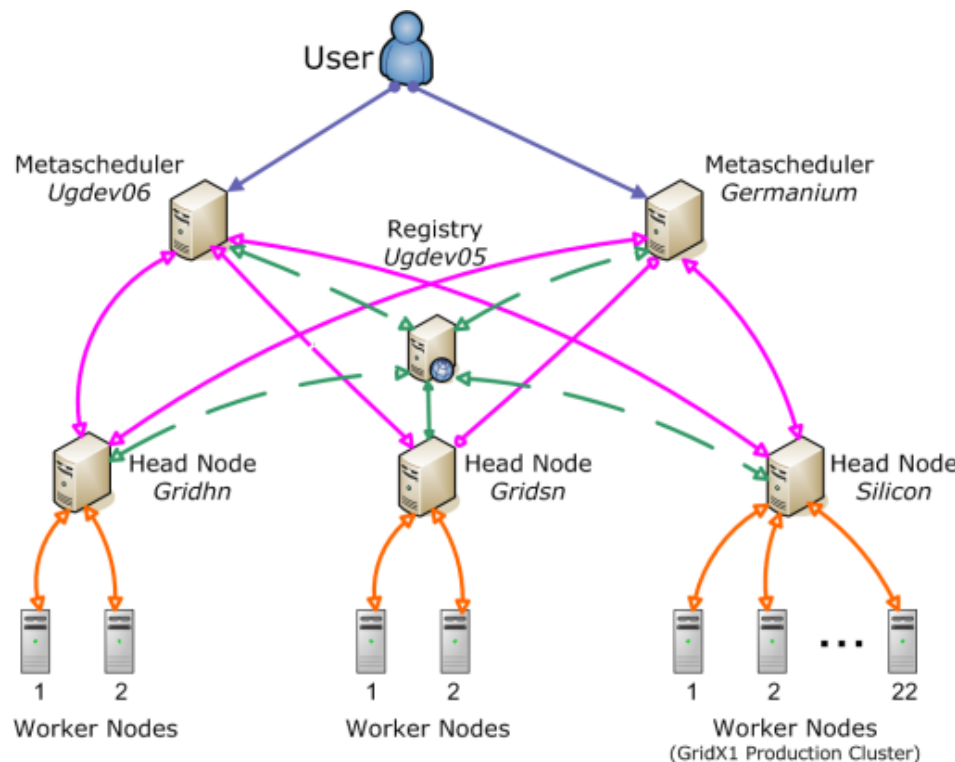
- A Job could be a Physical Job in which a Grid could control.
- The Job Work flow would include both a computational and physical component.

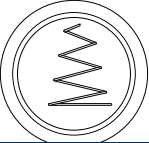




Work Done: Test Bed

- A small test bed has been put together using Globus 4 Grid Middleware.





Work Done: Monitoring / Actuating

- A web server:
 - Used to provide administrator access/control to the Java Monitors/Sensors.
 - Uses Servlets to control the Java Monitor / Actuator.
- Monitor / Sensor and Actuator:
 - Used to monitor and Prob Grid Resources
 - Java Program using the JSAM library to submit GRAM Jobs to Grid Resources (Actuator) and store results to be used later (sensor data).
- Globus Registry:
 - Using Globus 4 MDS to register grid resources to.
- Globus Scheduler:
 - Using the current Condor-g based scheduler.



Work To Do:

- Complete Sensors / Actuator:
- Setup AGMS Machine using IBM's Autonomic Toolkit.
- Interface Autonomic Components to the Java Monitor/Sensors and Actuators.
- Develop Autonomic Control System (Analyzer and Planner).
- Interface Web Service to control and sense Robotic Arm / Radio Controlled Devices.



Questions?

Questions?