TEAM INFINITE TUPLES

http://www.cs.rit.edu/~bdi8241/adhoc/

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Overview

- Paper 1: Wireless Grids

- Paper 2: Ad-hoc grid enviroment

- Paper 3: Collaborative Problem-Solving
  Framework for Mobile Devices

- Our design

Wireless Grids

Goal:

Allow mobile devices to share their resources and create a wireless grid environment

Problem:

What type of infrastructure is best suited for allowing a variety of mobile devices to share their resources. The part of the infrastructure that we are studying is the enabling middleware

Wireless Grids (cont.)

Solution:

Combine existing software to solve the following problems of resource description, resource discovery, coordination systems, trust establishment, and clearing mechanisms

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Ad-hoc Grid Environment

Goal:

Allow every computer and device in a network to form a dynamic ad-hoc grid

Problem:

How to rapidly deploy applications on an ad-hoc grid, where the topology is not static

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Ad-hoc Grid Environment (cont.)

Solution:

Create a service-oriented middleware which will allow the application level to be developed seperately from the service components.

I.E nodes on a grid network

Collaborative Problem-Solving Framework for Mobile Devices

Goals:
    As mobile devices become more and more common, so does their ability to be used in collaborative grid applications

Problems:
    The nature of mobile wireless networks is that they are unreliable. How to distribute work load among nodes that may enter/leave the network at any moment.

Collaborative Problem-Solving Framework for Mobile Devices (cont)

Their Solution:
Create a framework for a wireless grid. 4 parts.

Initiator: Wireless device that initials a task
Subordinate: Device that helps solve a task.
Keep Alive Server: Wireless devices advertise themselves to this. Keeps track of available devices.
Brokering Service: Distributes workload across the available nodes. Redistributes work as nodes enter/leave network

Collaborative Problem-Solving Framework for Mobile Devices (cont)

How we are using this:

- All the problems mentioned we will have to deal with.
- Their solution proposes a more centralized version with servers. We will design it pure ad-hoc
- The user experience will be similar. Any node in the network can initiate problems, and all others will help work with it.
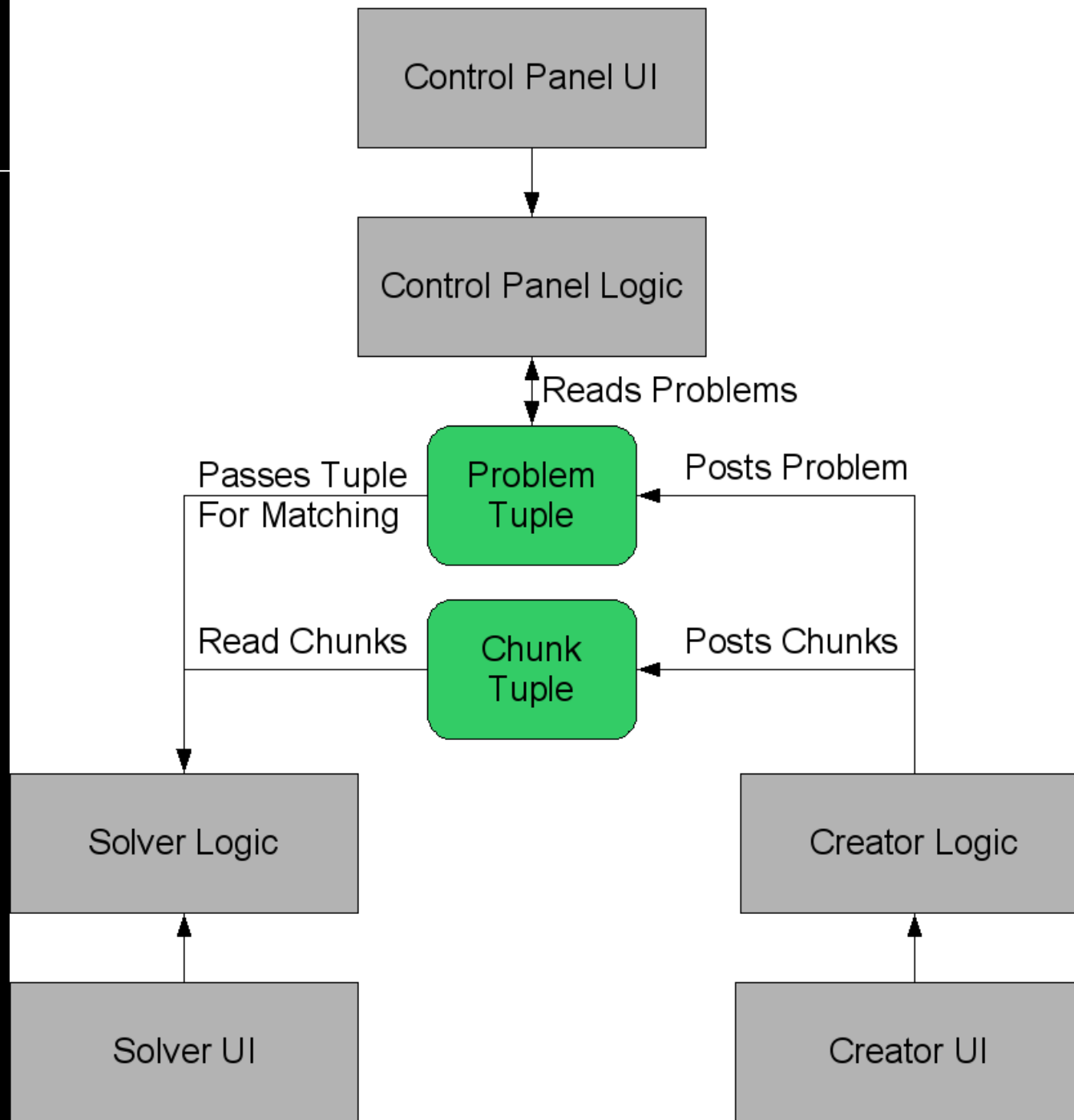
Product Design:
• A application that runs on multiple computers, that communicate together with Tupleboard.
• Problem Creator: Create new fractal problems to solve
• Problem Viewer: View completed and in progress problems. View performance statistics.
• Control Panel: Set number of problems to work on, statistics, etc.
• Problem Solver: Decides what problems and what chunks to work on. Will create threads to work on individual chunks of problems.

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Product Design:
- Communication through 2 tuple types
- Problem Tuple: Contains formula, parameters, Name, poster, number of chunks.
- Chunk tuple: Contains copy of Problem tuple, Chunk number and parameters, Data (Empty or complete), metric.
- The Chunk tuples act as the state of the problem. They are initially empty, but will be updated as more chunks of the problem are completed.

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