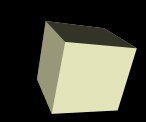
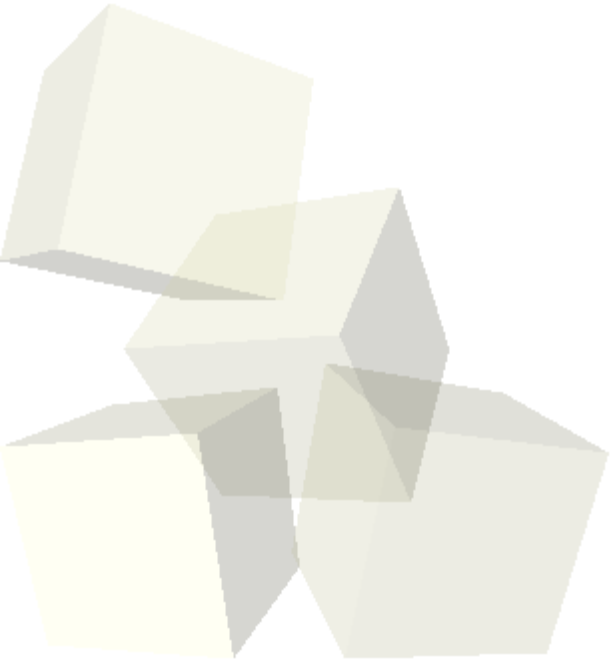


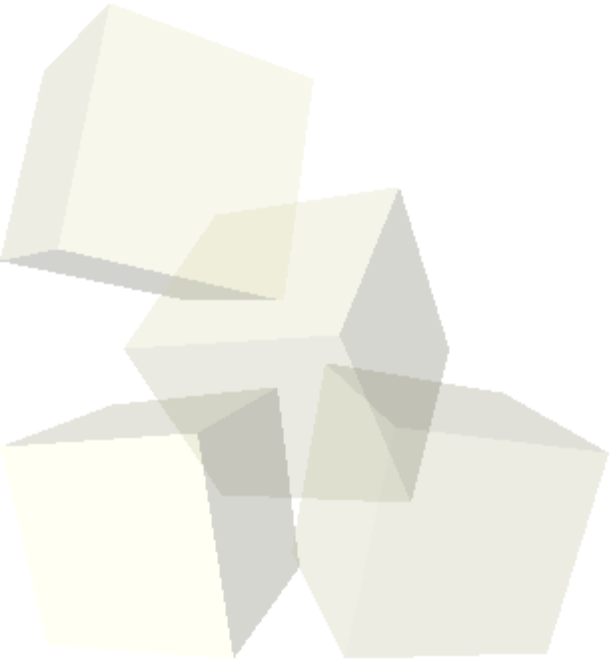
RMI and Networking

4-25-2006



Opening Discussion

- What did we talk about last class?
- Do you have any questions about the assignment?



Difficulties in Networking

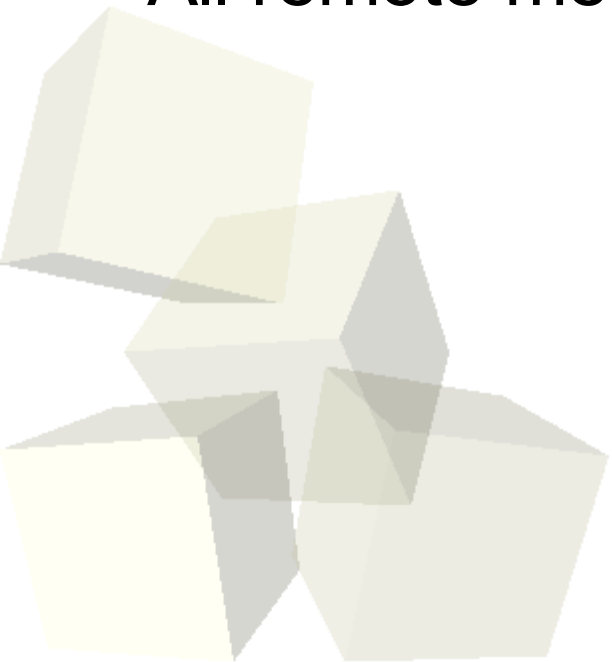
- The code that we did last time didn't have this problem, but we could add it in fairly easily. Most networked programs can send lots of different types of messages to the other program. Having the server figure out what message the client is sending can be a significant task.
- What would we need to do to have our earlier program be able to send something other than, and in addition to, trees?

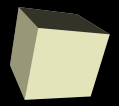
Remote Method Invocation

- Java has built in a system that makes communication across the network even easier than it was with java.net, though unlike java.net, it can't be used with programs written in other languages.
- With RMI you can have references to "remote objects". These are objects that are on another computer but you interact with them as if they were local.

Remote Interfaces

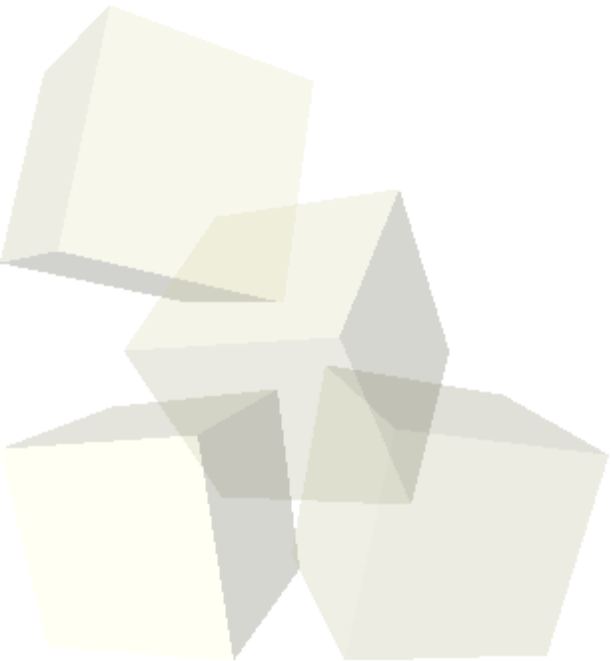
- The entity you get for an object remotely is actually not the object itself, but an interface that object implements. The interface must extend java.rmi.Remote.
- The implementation class should also extend java.rmi.server.UnicastRemoteObject.
- Note that this implies that the implementation can have more functionality than the remote interface does.
- All remote methods can throw java.rmi.RemoteException.





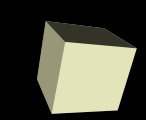
Passing

- Different types of objects are passed differently
  - Remote objects - any object that extends java.rmi.Remote is passed as a remote object. You get a skeleton that does network communication.
  - Serializable objects - If an object is not Remote it must be serializable and then it is passed by value.
  - Primitives - No pass by reference of primitives



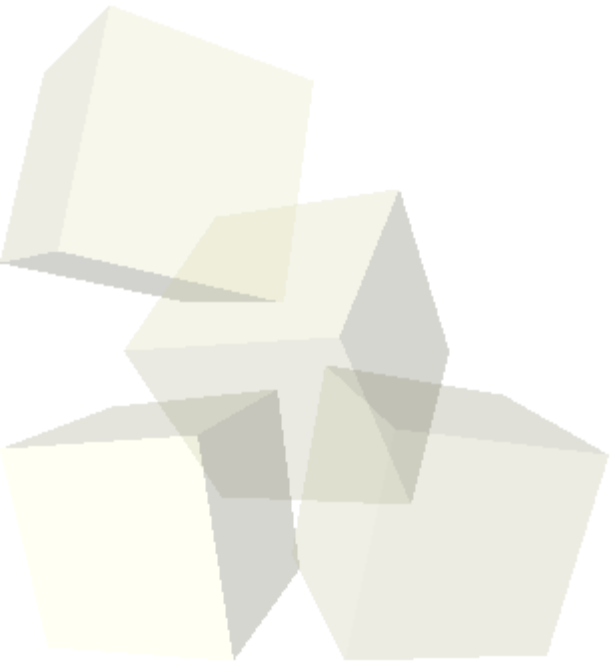
Registering and Lookup

- Once you have a remote object, it can pass you others, but getting the first one takes a different approach.
- An object can register itself with the RMI registry using the rebind method of java.rmi.Naming. (You have to start a local registry with rmiregistry first.)
- Objects can get a remote reference to a registered object using the lookup method of java.rmi.Naming.



Code

- Now we get to try to write something fun using RMI. We could also take this opportunity to add more stuff to our drawing program and try to work out some of the bugs.



Minute Essay

- You are given a network application that you have to write and you can choose between RMI, TCP, and UDP. What types of requirements in the application will help you decide which one to pick?
- Next class we wrap things up.
- Remember to turn in assignment #7 today.