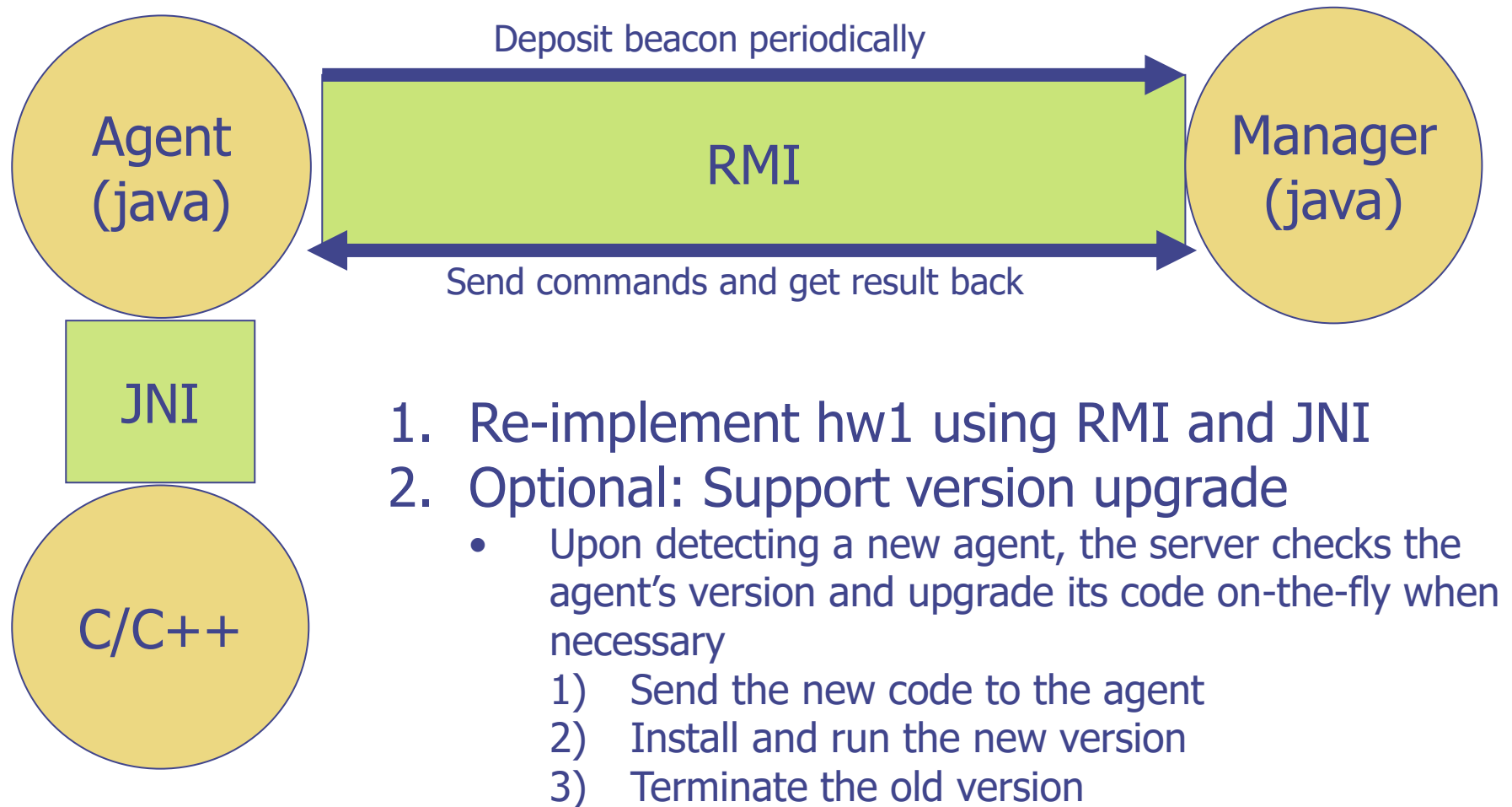


Programming Homework 3



Manager Design: Two threads

- ◆ Manager: maintain a list of beacons, print out if an agent is gone
- ◆ BeaconListenerRegister: register one remote object providing this interface:

```
public interface BeaconListener extends java.rmi.remote
{
    public int deposit(Beacon b); // put b to the list
}
```

- ◆ If a beacon, say b, is from a new agent, the manager gets the client's local time and version by making two RMI calls which pass these objects

```
public class GetLocalTime
{
    int time;
    char valid;
}

public class GetVersion
{
    int version;
}
```

Agent Design: Two Threads

- ◆ BeaconSender: periodically deposits a beacon to manager using RMI

```
class BEACON
{
    int          ID;           /* randomly generated at startup */
    int          StartUpTime; /* the time when this client starts */
    String        CmdAgentID; /* the registry string of CmdAgent */
}
```

- ◆ CmdRegister: registers a remote object that provides this interface:

```
public interface CmdAgent extends java.rmi.remote
{
    public Object execute(String CmdID, Object CmdObj);
}
```

CmdAgent.execute()

◆ Pseudo code

```
public Object execute(String CmdID, Object CmdObj)
{
    if (CmdID.equal("GetLocalTime")
    {
        return C_GetLocalTime((GetLocalTime) CmdObj);
    }
    else
    ...
}
```

◆ C_GetLocalTime() must be implemented in C/C++

```
jobject C_GetLocalTime execute(jobject CmdObj)
{
    1. Set CmdObj.valid = 0
    2. Get current system time and store it to CmdObj.time.
    3. If step 2 is successful, set CmdObj.valid = 1
    4. return CmdObj
}
```

Code Submission and Testing

- ◆ Submit your code through your Canvas account by the deadline
- ◆ You may be asked to run your code on your computer to show it works properly
 - Run the server
 - Open several consoles
 - Run a client on each console
 - ◆ the server should be able to detect when a new client shows up by printing out the client's OS and startup time
 - Terminate one client
 - ◆ the server should be able to detect the client dies by printing out a message
 - Terminate one client and run the client again immediately
 - ◆ the server should be able to detect the client dies and resurrects