Master Worker Programming Model
Master/Worker model

CometCloud shared space

Robust/Secure Master

Request Handler

Secure Worker

Proxy

Unsecured workers

Clusters/Grids/Clouds
Flow to start master/worker

1. Application Starter
2. Comet starter
3. Peer
4. Master
5. Overlay control server
6. Peer
7. Worker
8. Remote control
9. Overlay control server
10. Peer
11. Worker
12. Node
13. Node
Call Diagram – Starting Comet
Source code – template

- Starting source package
  - tassl.automate.programmodel.masterworker.sample

- Two pairs of master/worker
  - SimpleMaster.java, SimpleWorker.java
  - AppMaster.java, AppWorker.java

- Core implementation you should do
  - TaskTuple
  - Master: insertTask, setResult
  - Worker: computeTask
Matrix Multiplication

\[ \text{Matrix } A \times \text{Matrix } B = \text{Matrix } X \]
Master Worker

Master
- Read matrices dimension $A_{n,q}$ and $B_{q,m}$ from input file
- Generate matrices $A_{n,q}$ & $B_{q,m}$ randomly
- Create $n \times m$ tasks and insert into the space
  - Each task contains $1,n \times n,1$ vectors
Worker
- Pull and execute one task at a time
- Perform vector multiplication & return sum
Master
- Gather results to matrix $C$ & print to screen

Comet shared space

Master

Workers

Results

Insert results into the space or directly send results to the master
Configuration

- Overlay configuration files
  - nodeFile, portFile, exceptionFile
    - Comet.NodeType MASTER|WORKER|REQUEST_HANDLER

- Properties files
  - chord.properties, squid.properties, comet.properties
  - and your additional application properties

- Examples in
  - CometCloud-lite\simple_run
Configuration

- chord.properties
  - chord.ID_BITS

- squid.properties
  - squid.SPACEDIMENSIONS
  - squid.BIT_LENGTH
  - squid.DO.KEY_TYPE

- comet.properties
  - MasterClass
  - WorkerClass
  - TaskClass
  - RoutingKeys
Run procedure – Secure worker

- Run overlay control server in each node
  - java -cp $CLASSPATH
tassl.automate.overlay.OverlayControlServer 4444

- Run your application starter
  - java -cp $CLASSPATH
Run procedure – Isolated (unsecured) worker

- Run overlay control server on one or more request handler nodes
- Start a proxy with RequestHandlerList
  - `java -cp $CLASSPATH tassl.automate.cloudburst.RequestHandlerProxy`
- Run your application starter
  - This will start your master and request handlers
- Start isolated workers
  - Set `IsolatedProxy` in `comet.properties`
  - `java -cp $CLASSPATH tassl.automate.cloudburst.CloudBurstStarter -propertyFile comet.properties -propertyFile`
Questions?