

Grid programming with components:
an advanced **COMP**onent platform for an
effective invisible grid

GridCOMP
Effective Components for the Grids



GridCOMP

Autonomic Features

22 Sep 2008 - Bruxelles

UNIFI & ISTI-CNR

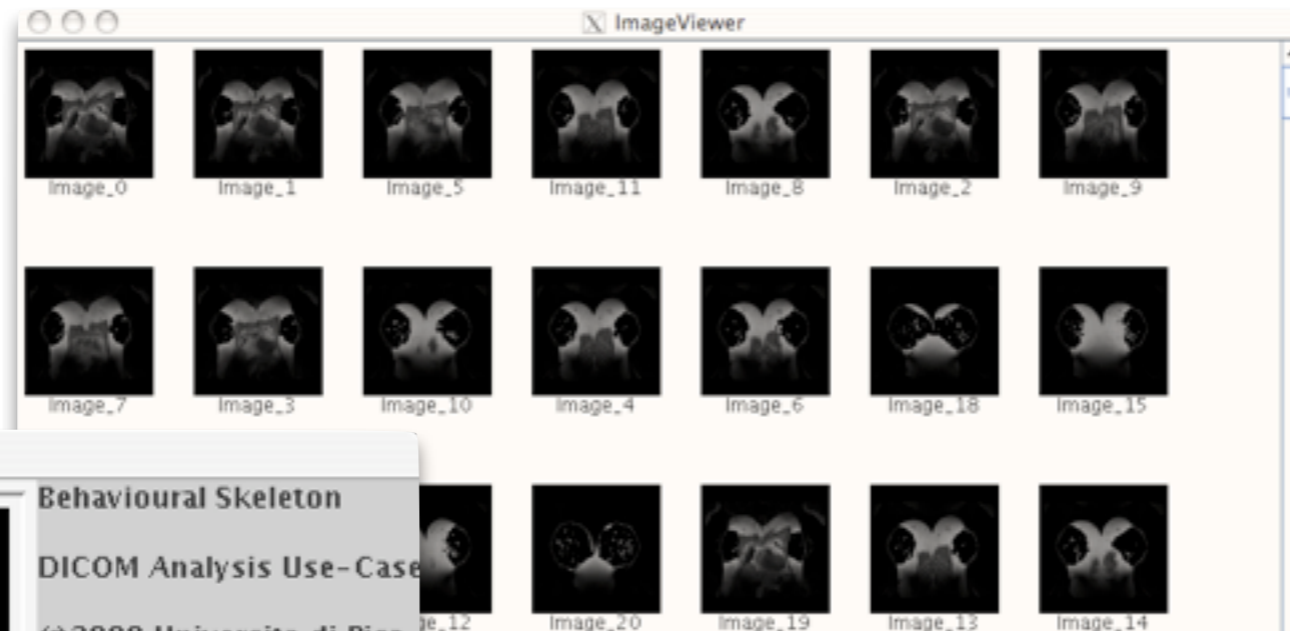


Dicom demo: rationale

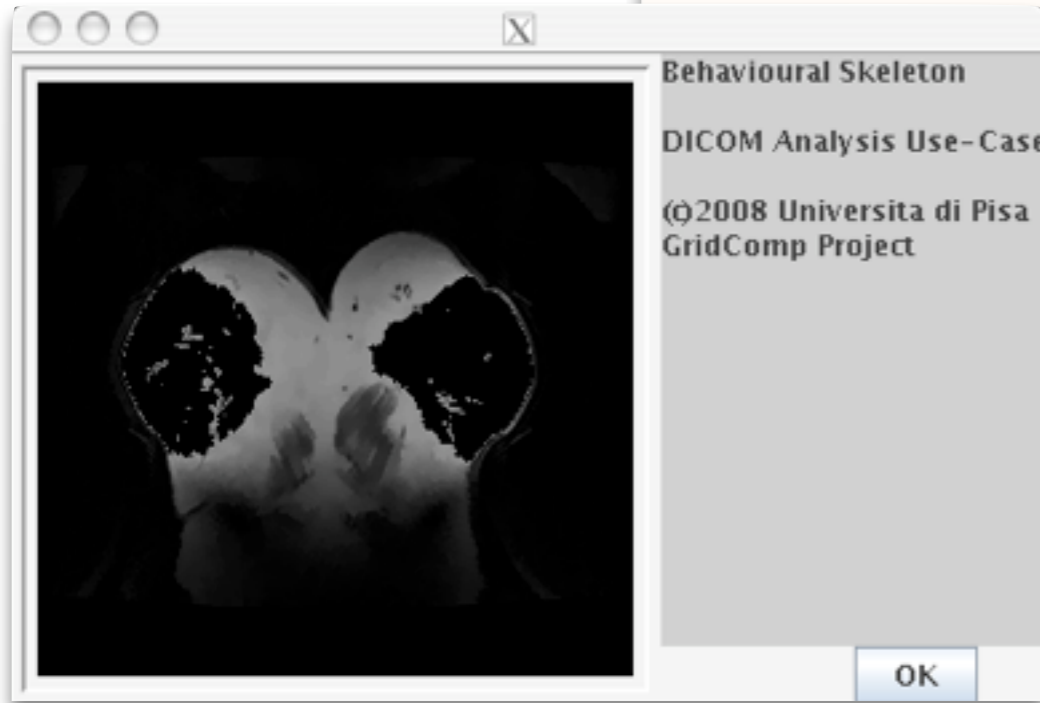
- What it is?
 - **X-ray images images analysis (mammographic density)**
- Which GridCOMP WP3 results does it exploit?
 - **Stateless, stream-based functional replication**
 - **Active “farm” behavioural skeleton**
 - **Self-optimising autonomic features**
- What you should expect?
 - **N. of workers is dynamically adjusted with w.r.t. the actual platform status and application behaviour**
- Modus operandi
 - **Platform load is artificially changed during the run**

Dicom demo: screen output

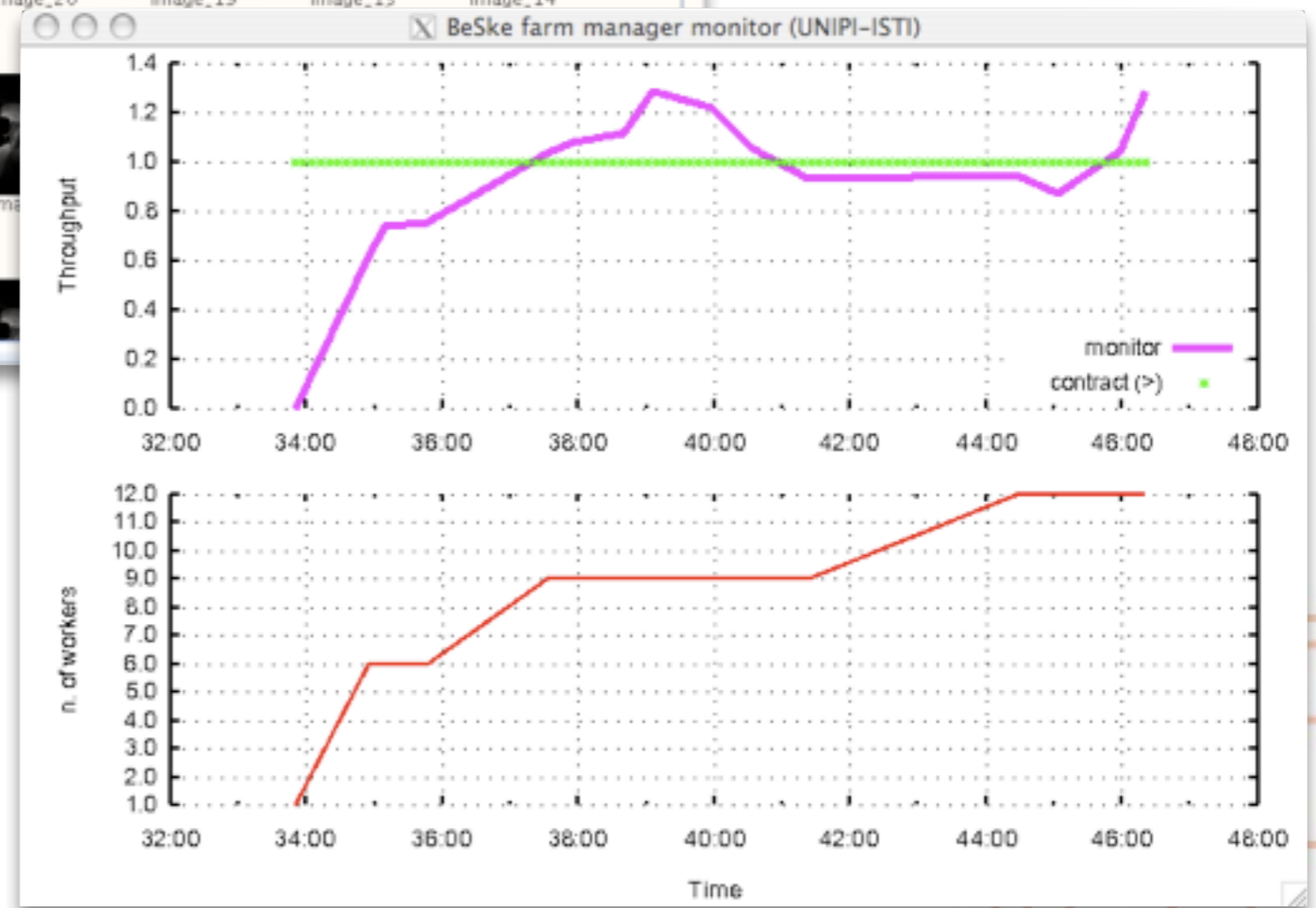
image detail



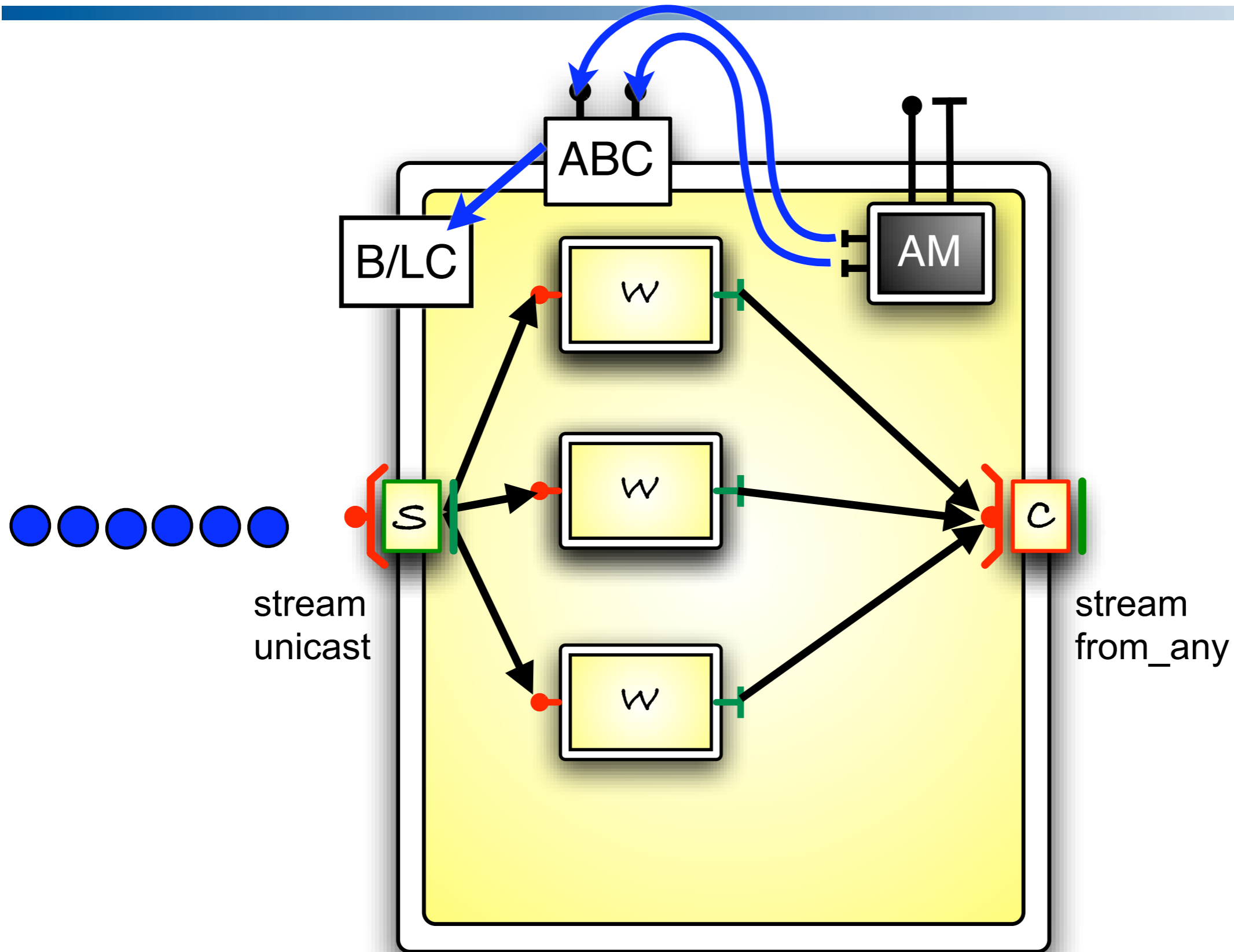
thumbnails of processed images



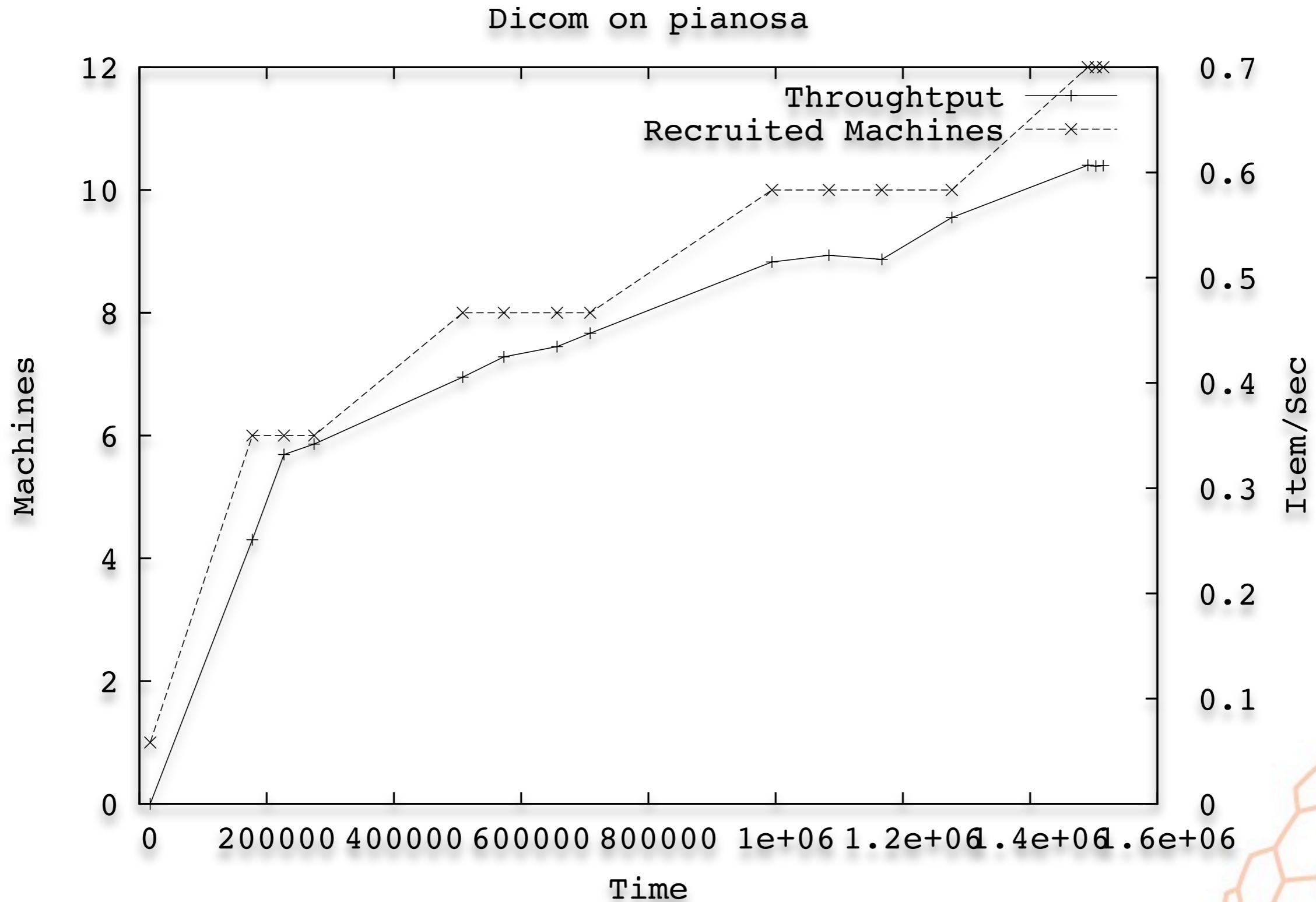
manager activity monitor & reaction



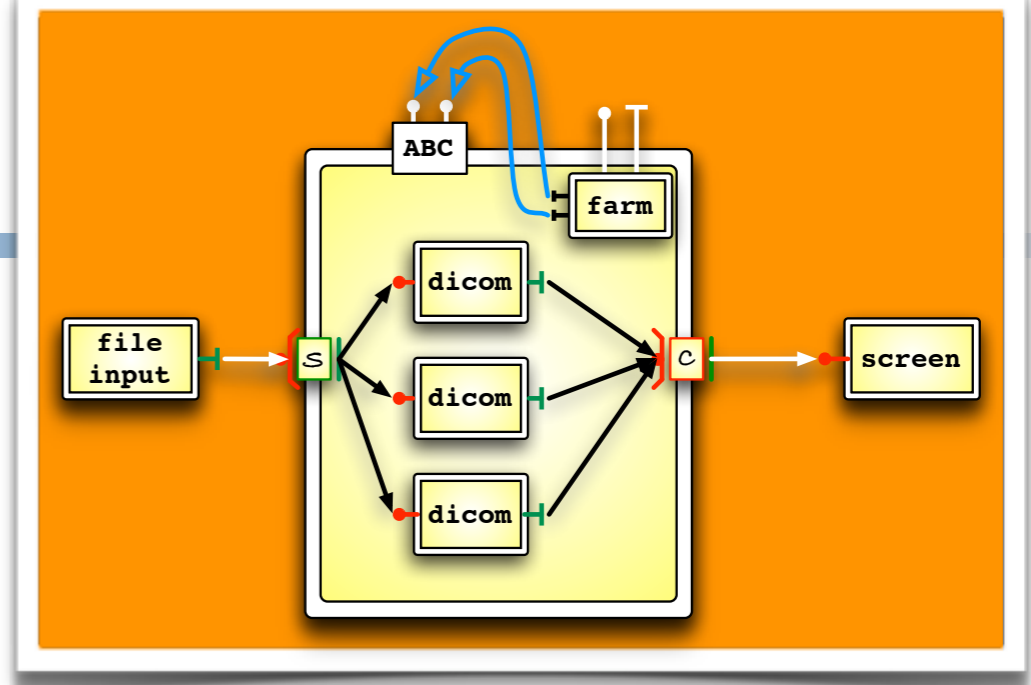
Dicom demo: "farm" behavioural skeleton



Dicom demo: dynamic recruiting of resources



Dicom demo: rationale



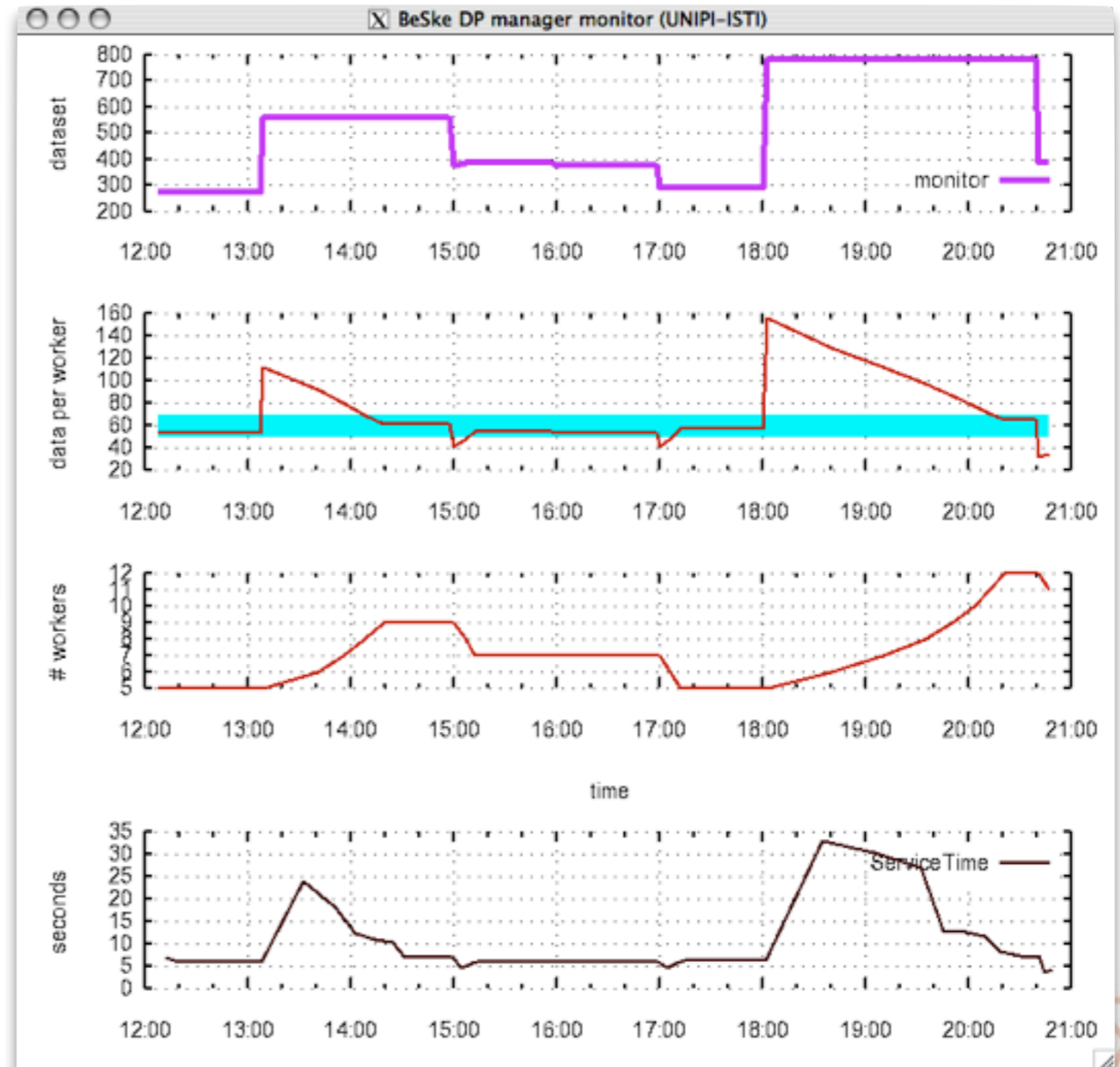
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IBM app mockup demo: rationale

- What it is?
 - **IBM fingerprint app mockup**
- Which GridCOMP WP3 results does it exploit?
 - **Stateful, service-based functional replication**
 - **Active “data-parallel” behavioural skeleton**
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 - **N. of workers is dynamically adjusted with w.r.t. the dataset size to keep almost constant data-per-worker size (i.e. memory footprint and service execution time)**
- Modus operandi
 - **Dataset size is changed during the run**

IBM app mockup demo: screen output

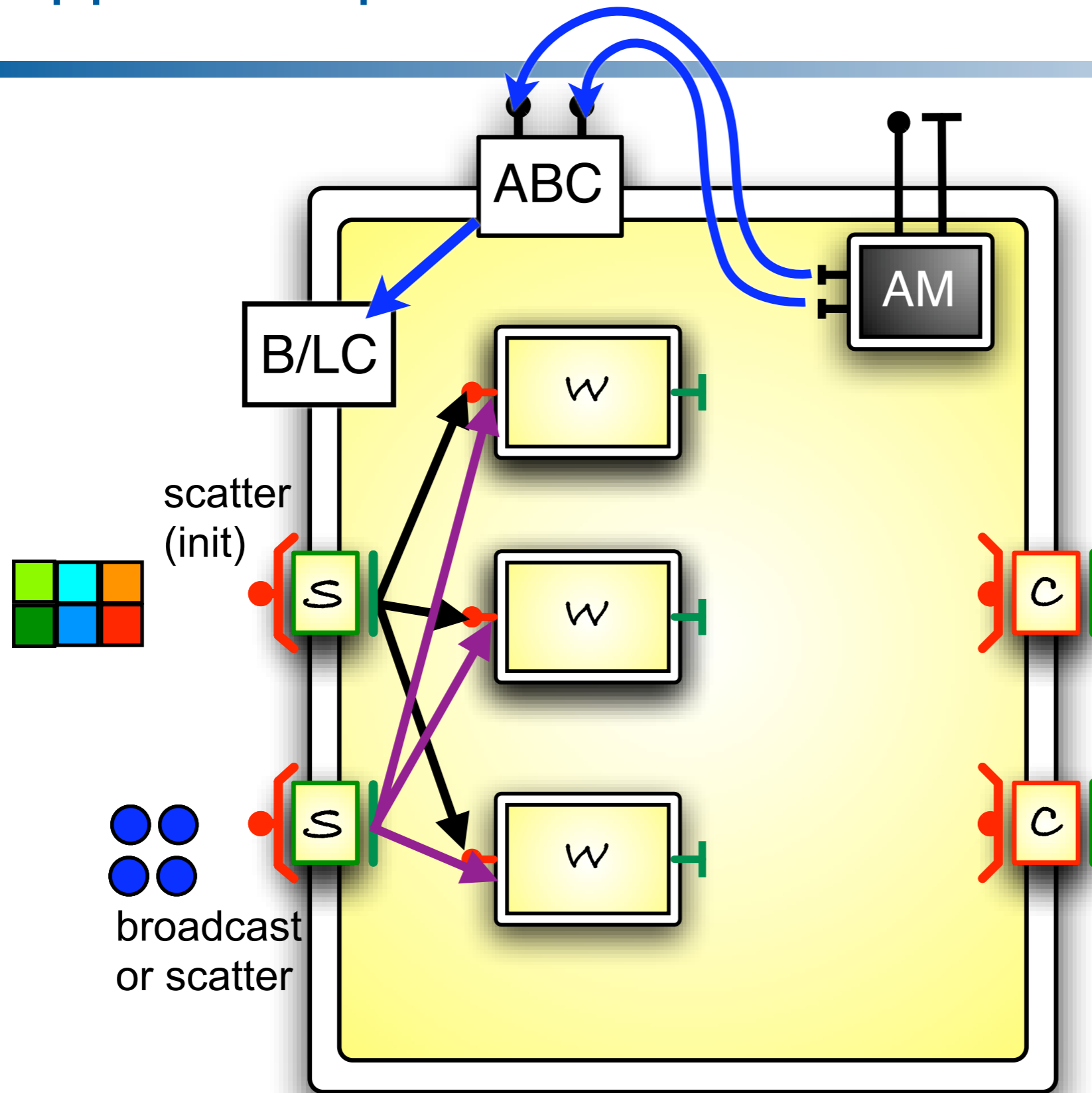
```
Default (98,28)
[java] Jul 16, 2008 11:46:23 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: 1216201583113 34406 54.0 5
[java]
[java] [WORKER0 on vis169b.inria.fr] Search task 196 in partition [0-53]
[java] Jul 16, 2008 11:46:25 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: Setting QoS information for method searchMatch
[java] Jul 16, 2008 11:46:25 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: #method:searchMatch#time:1216201585125#rate:54.0#workers:5
[java] Jul 16, 2008 11:46:25 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: 1216201585125 36418 54.0 5
[java]
[java] [WORKER1 on vis169b.inria.fr] Search task 196 in partition [54-107]
[java] [WORKER2 on vis169b.inria.fr] Search task 196 in partition [108-161]
[java] [WORKER3 on vis169b.inria.fr] Search task 196 in partition [162-215]
[java] [WORKER4 on vis169b.inria.fr] Search task 196 in partition [216-269]
[java]
[java] >>>>>>>>>> [Main] Item FOUND in 9185 msec <<<<<<<<<<<<
[java]
[java] ----- [Main] Search match for item 102-----
[java] Jul 16, 2008 11:46:27 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: Setting QoS information for method searchMatch
[java] Jul 16, 2008 11:46:27 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: #method:searchMatch#time:1216201587143#rate:54.0#workers:5
[java] Jul 16, 2008 11:46:27 AM gridcomp.manager.map.impl.MapAutonomicManager setupQoS
[java] INFO: 1216201587144 38437 54.0 5
[java]
```



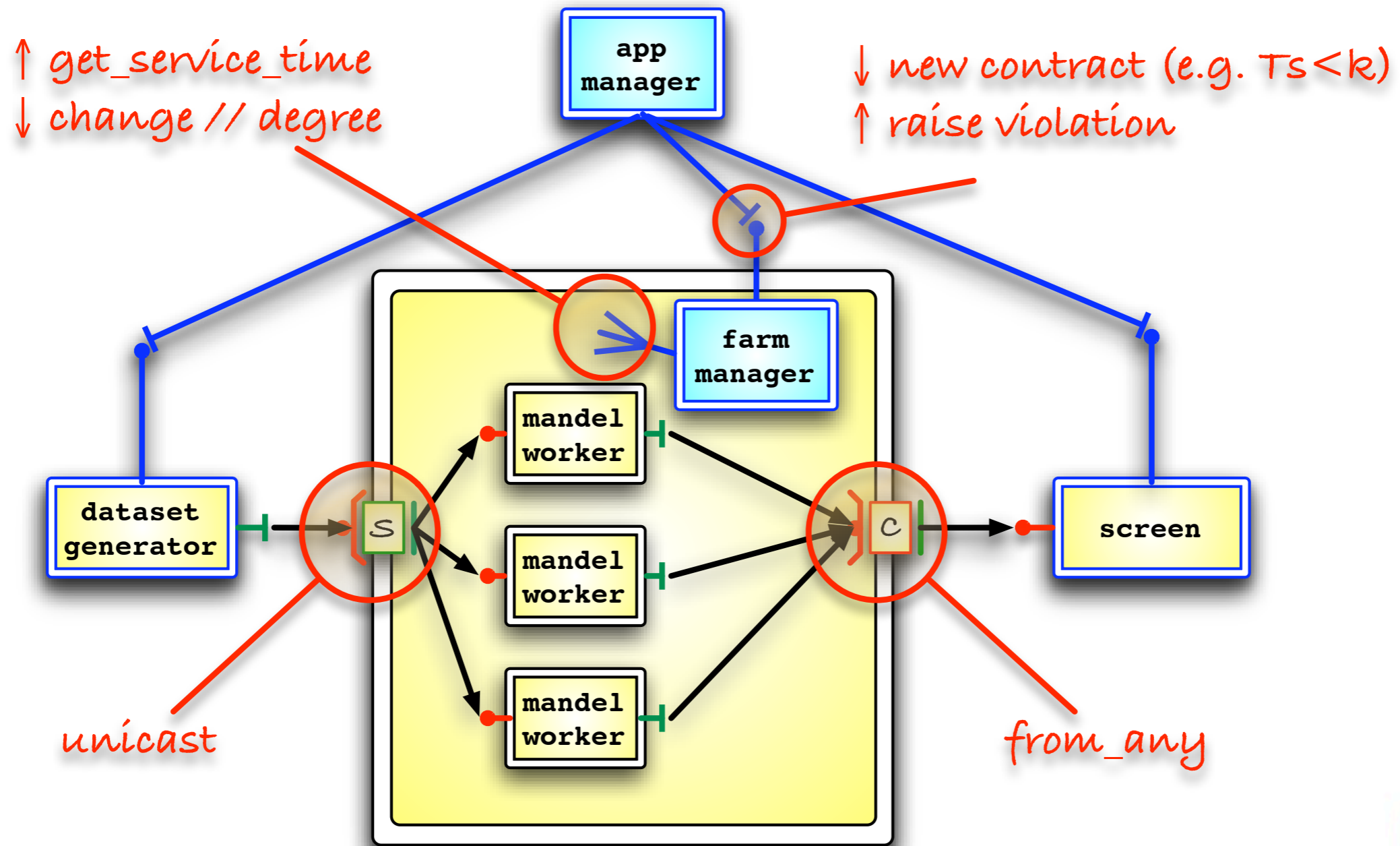
“fingerprint” matching results

manager activity monitor & reaction

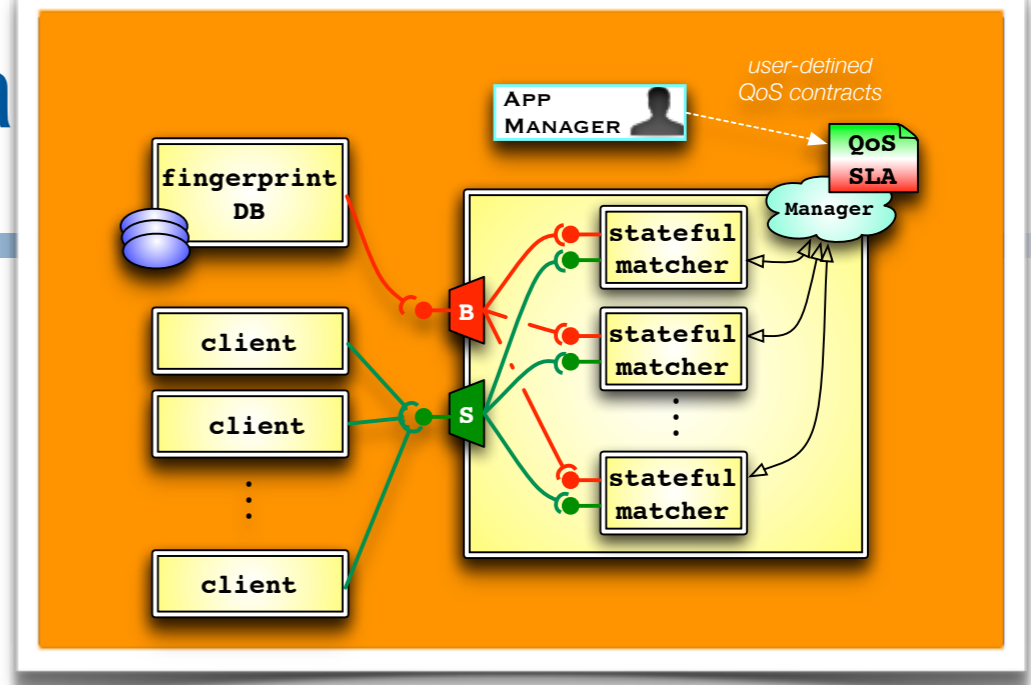
IBM app mockup: stateful “DP” behavioural skeleton



Mandelbrot example (two-level management)



IBM app mockup demo: rationale



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IBM app mockup: contract (JBoss drools)

```
rule "CheckHigherBound"  
  when  
    $arrivalBean : PartitionSizeBean(value >=70)  
    $count : CounterBean( value > 2 )  
  then  
    $arrivalBean.fireOperation(ManagerOperation.ADD_EXECUTOR);  
    $count.reset( ); retract($arrivalBean); update( $count );  
end
```

```
rule "CheckLowerBound"  
  when  
    $arrivalBean : PartitionSizeBean(value <= 50)  
    $count : CounterBean( value > 2 )  
  then  
    $arrivalBean.fireOperation(ManagerOperation.REMOVE_EXECUTOR);  
    $count.reset( ); retract($arrivalBean); update( $count );  
end
```

```
rule "Count"  
  salience -10  
  when  
    $arrivalBean : PartitionSizeBean( )  
    $count : CounterBean( value <= 2 )  
  then  
    $count.incValue(); retract($arrivalBean); update( $count );  
end
```

