TM/PCS User Experience

ThruPut Manager Production Control Services (PCS)

or

How to drive more batch faster than ever before!
Agenda

• Humana Background
• Humana Environment
• ThruPut Manager Components at Humana
• TM Timeline and Challenges - SLM
• TM Timeline and Challenges - PCS
• Conclusions
Humana Inc., headquartered in Louisville, Kentucky, is a leading health care company that offers a wide range of insurance products and health and wellness services that incorporate an integrated approach to lifelong well-being.

- Headquartered in Louisville KY
- 35,000 Employees
- $9.3 Billion Revenue
- Stock Ticker: HUM
- [http://www.humana.com](http://www.humana.com)
# Humana Computing Environment

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/Type of Batch Jobs</td>
<td>1.4 million batch jobs per month – 65% of the jobs are production</td>
</tr>
<tr>
<td>Hardware</td>
<td>z196 machines across two data centers</td>
</tr>
<tr>
<td>Batch Scheduler</td>
<td>We use CA 7. This is a requirement for PCS.</td>
</tr>
<tr>
<td>Resource Capping</td>
<td>Manage our software cost exposure within our 4-hour averages by constraining our peak utilizations</td>
</tr>
</tbody>
</table>
### Humana TM Component Status

<table>
<thead>
<tr>
<th>Version</th>
<th>Item Description</th>
<th>When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>DCS (Dataset Contention Services) JBS/JLS (Job Binding Services)</td>
<td>1996</td>
</tr>
<tr>
<td></td>
<td>We took advantage of getting jobs to the right system and managed the input queue velocity for certain troublesome jobs. We have about 1,600 lines of rules.</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>DBS (Drive Booking Services)</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Ensures required drives are available before batch execution. This works better than the limiting services (JLS) by being more accurate on the number of drives available.</td>
<td></td>
</tr>
<tr>
<td>AE</td>
<td>SLM (Service Level Manager)</td>
<td>2007</td>
</tr>
<tr>
<td></td>
<td>We use the FastPath with existing job classes and priorities. The work was previously categorized via the JAL Rules. Started with test workloads and then moved onto production. We had previously used WLM initiators.</td>
<td></td>
</tr>
<tr>
<td>AE</td>
<td>PCS (Production Control Services)</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td>PCS extends the scheduling goals of CA 7 Workload Automation to the z/OS execution arena. PCS enhances SLM by providing better control of load via predefined priority and by dynamic management of critical path workload.</td>
<td></td>
</tr>
</tbody>
</table>
Humana TM Development Timeline - SLM

Benefits

- SLM manages resource constraints by knowing your ‘resources’
- Drive Booking Services (DBS) managing drive availability that require real or virtual tape drives
- JSS manages delays within DFHSM recalls and virtual volumes being staged
- SLM did a better job of selecting high priority work than WLM inits and did a better job of short jobs (under 15 secs)
- WLM was likely to over initiate whereas SLM provides more intelligent control
- SLM SMF records provide improved job delay data for analysis

Considerations

- Since AE understands the resources a job needs it can also manage them to optimize software licensing
- SLM effectively prioritizes software license constrained workloads to maximize throughput in a ‘constrained container’
- SLM was operational before PCS. We have JAL Rules that support SLM but is now ignored due to PCS being installed
- Optionally, DBS can reserve or limit drives for a given workload pool
- Read the manual! The actions that AE will take may not match up with your previous reality. Examples include DCS, DFHSM Recalls, etc.
- Conversion from SE to AE was relatively easy. Existing SE JAL rules were used in AE.
Humana TM Development Timeline - PCS

**Benefits**

- Automates managing production deadlines with less manual operation intervention
- PCS and Service Level Manager (SLM) work together where SLM receives directions (“Job GPS”) from PCS to drive the most efficient route to job completion
- Designed to work with our CA7 schedule including understanding deadlines
- Understands the data sets and tapes needed
- Computes and updates the critical path through CA7 job streams
- Computes slack time (how much time do I need to rerun from the end job for reruns) during job selection
- Identifies Culprit jobs (What jobs contribute to the late job streams? “Obstacle jobs”)

**Considerations**

- Do not define all jobs high priority
- Work with the business as well as performance to ensure the correct priority is defined
- TM SMF data provided data to monitor PCS decisions

**Humana Background | Humana Environment | TM Components | TM Timeline - SLM | Conclusions | Contact**

Share Atlanta - 2012
Conclusions

• Automation within the operations space continues to be critical to IT organizational success

• Batch service levels are maintained with less technical effort
  - The job scheduler product is enhanced with sophisticated and business driven job selection
  - Manual operations intervention on job prioritization is minimized
  - Peak batch intervals are intelligently managed programmatically with history and end job deadlines
  - Frees scheduling to focus on exceptions rather than job priorities

• Cost Containment
  - Improved efficiency above WLM to batch workload management to drive down cost (more jobs complete in less time). This lowers our 4-hour average for variable licensing charges.
  - Containment of software to smaller systems to contain license costs
Contact Information

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## TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AE</td>
<td>Automation Edition</td>
</tr>
<tr>
<td>SE</td>
<td>Standard Edition</td>
</tr>
<tr>
<td>Fast Path</td>
<td>Using existing job classes and priorities. This simplifies the lines of JAL Rules needed because a pre-existing table that specify job classes and priorities are used.</td>
</tr>
<tr>
<td>JAL</td>
<td>Job Action Language. This is rule logic that is processed as jobs enter the JES2 input queue which adds resource requirements, system affinities, job classes, scheduling constraints, etc..</td>
</tr>
<tr>
<td>TM/PCS</td>
<td>Production Control Services</td>
</tr>
<tr>
<td>TM/SLM</td>
<td>Service Level Manager (SLM)</td>
</tr>
<tr>
<td>TM/DBS</td>
<td>Drive Booking Services (DBS) is part of AE</td>
</tr>
<tr>
<td>TM/UCS</td>
<td>User Control Services</td>
</tr>
<tr>
<td>JSS</td>
<td>Job Setup Services (DFHSM, Virtual volumes, Silo Ejects, etc)</td>
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</tbody>
</table>

Other ThruPut Manager concepts at: [http://www.mvssol.com/page_product_overview_components.htm](http://www.mvssol.com/page_product_overview_components.htm)