Building AI into Mainframe Batch Automation; can you afford not to?

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Session NK

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Agenda

- What's Artificial about Automation?
- What Batch Processing Challenges?
- What Batch Processing Opportunities?
- Why now? Nobody's died yet…
- Yes, you can automate 'Capping', but…
- OK – We've automated, but how do we know it's working?

What's Artificial about Automation?

Artificial Intelligence: In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals…

Source: Poole, Mackworth & Goebel 1998, via Wikipedia

Meet T*i*M

z/OS Environment Perception:

- Performance (Velocity, Performance Index)
- Utilisation (CPU, Resources)
- Availability (CPC, LPAR, software, hardware)

Actions to meet Batch Workload Completion Goals:

- Business critical Jobs prioritised
- CPC & Initiator performance optimised
- Unnecessary delays eliminated
- Service escalation when necessary

What Batch Processing Challenges?

- Lack of innovation & investment
- Data volume growth – increased I/O & CPU demand
- Overnight window intrusion, internal & external
- Cost cutting targets – capacity limit setting
- Processor & I/O speeds increased – manual interventions still slow
- Knowledge of legacy systems & business relevance disappearing
- JES Exit maintenance skills becoming scarce
- JCL standards & change control still at user/owner level
- JES2 was a ‘Blank Slate’ and the blackboard still has large gaps…

JES2 Is Blank Slate

- JES2 does heavy lifting of spooling—kudos to IBM
- Otherwise, IBM gave us…
  - Initiators
    - Address space
    - JES2 code requests work to process and JES2 services as needed
    - Customer decides how many and where located
  - Job classes
    - Rudimentary means to classify and organize jobs
    - Customer decides how to exploit efficiently
  - Oh … and Exits
    - Opportunity to be clever and daring
    - Customer decides how to make use of them

Results in Not So Blank Slate

- Initially, it worked well or was tolerable
- As volume and complexity increased, so did incidents
  - Job class structures and standards often became inadequate and unmanageable
  - Under/over-initiation of jobs
  - Race conditions
  - Competition for resources results in initiator idling
  - Resource hogging by industrious users
  - Defeatable JCL standards enforcement

What Batch Processing Opportunities?

- ‘All the right Jobs, not necessarily in the right order…’
- Form an Orderly Queue
- ‘More speed, less haste…’
- ‘Look after the pennies, and the pounds will look after themselves…’
- Don’t Delay!

What Batch Processing Opportunities?

1. Prepare the Queue

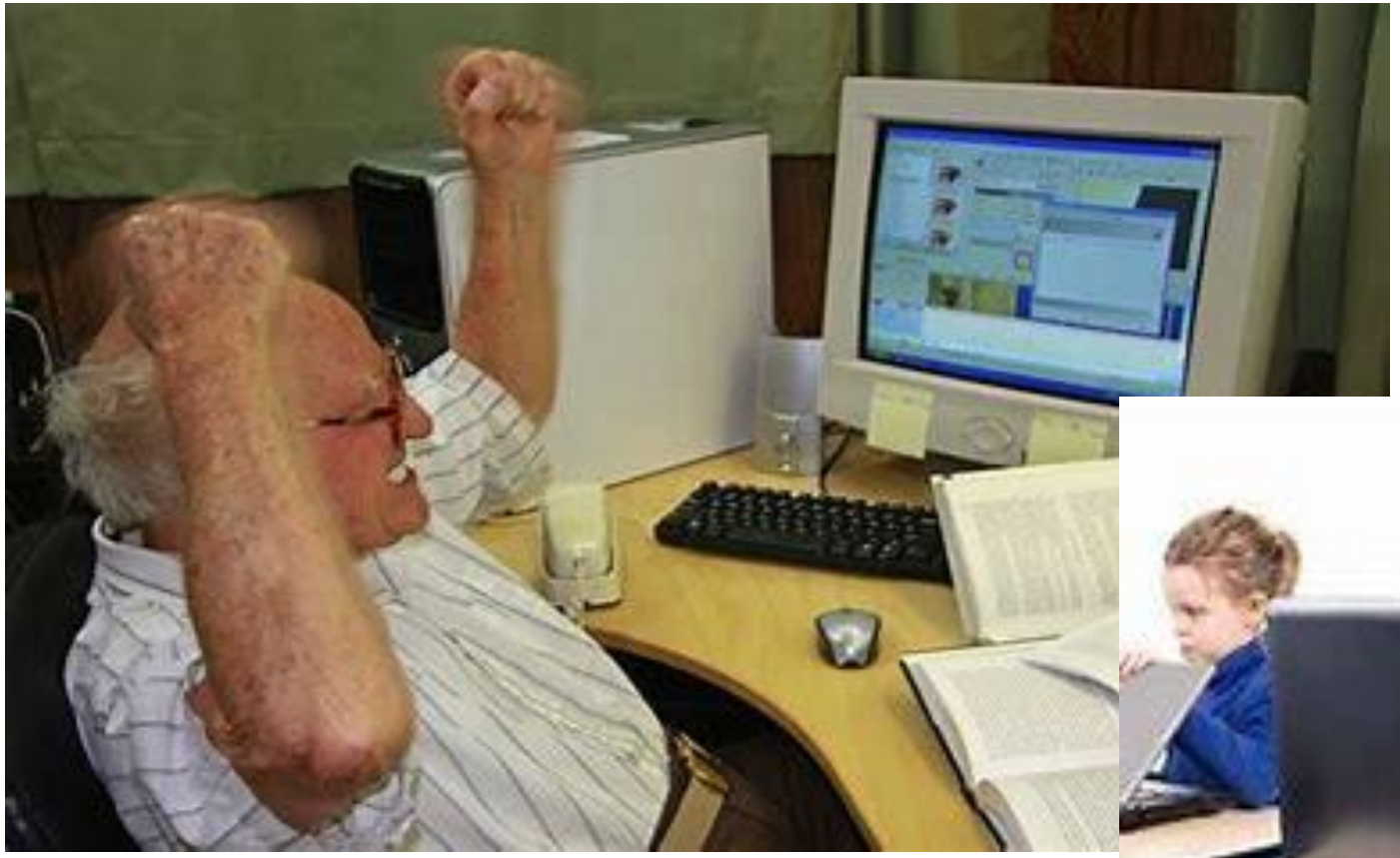
What Batch Processing Opportunities?

2. Review the Queue

What Batch Processing Opportunities?

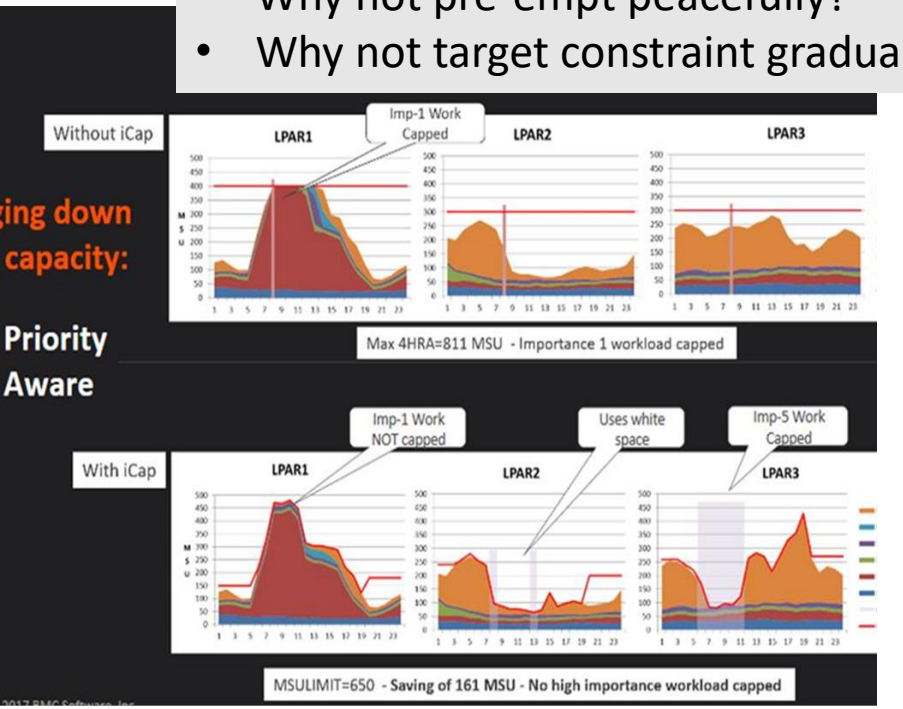
3. Control the Queue

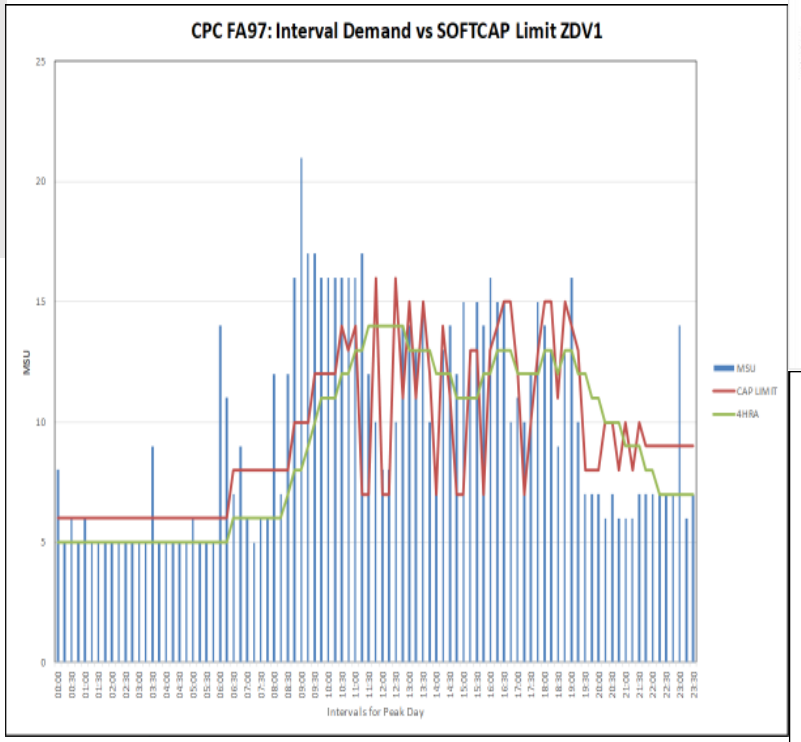
Why now? Nobody's died yet…

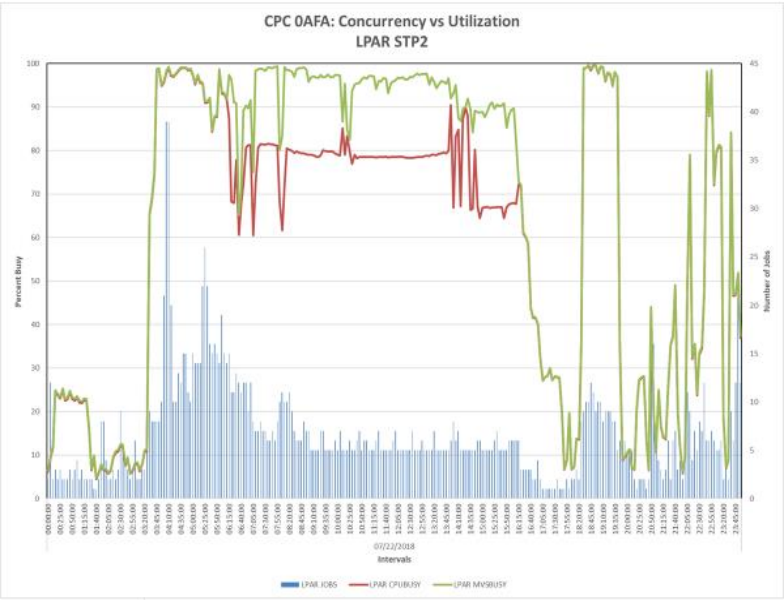


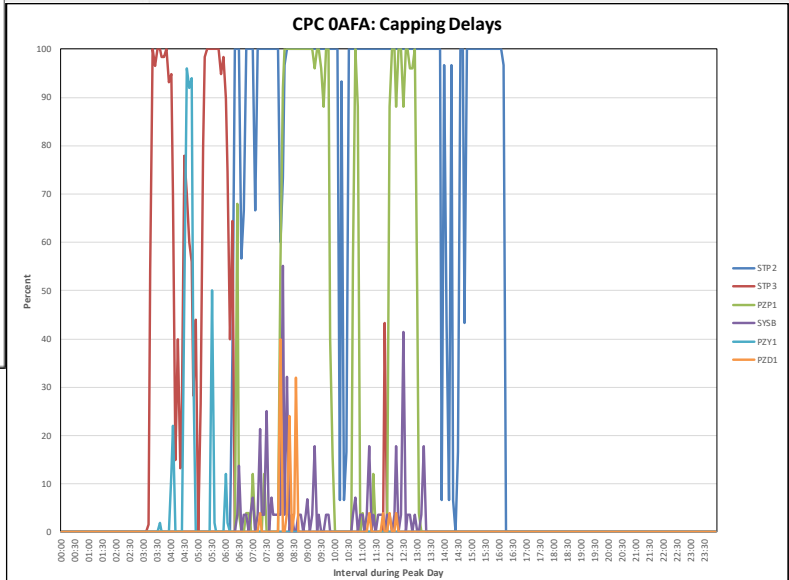
Yes, you can automate ‘Capping’, but…

- What are you actually achieving?
- What do you really want to ‘Cap’?
- Why react aggressively?
- Why not pre-empt peacefully?
- Why not target constraint gradually?

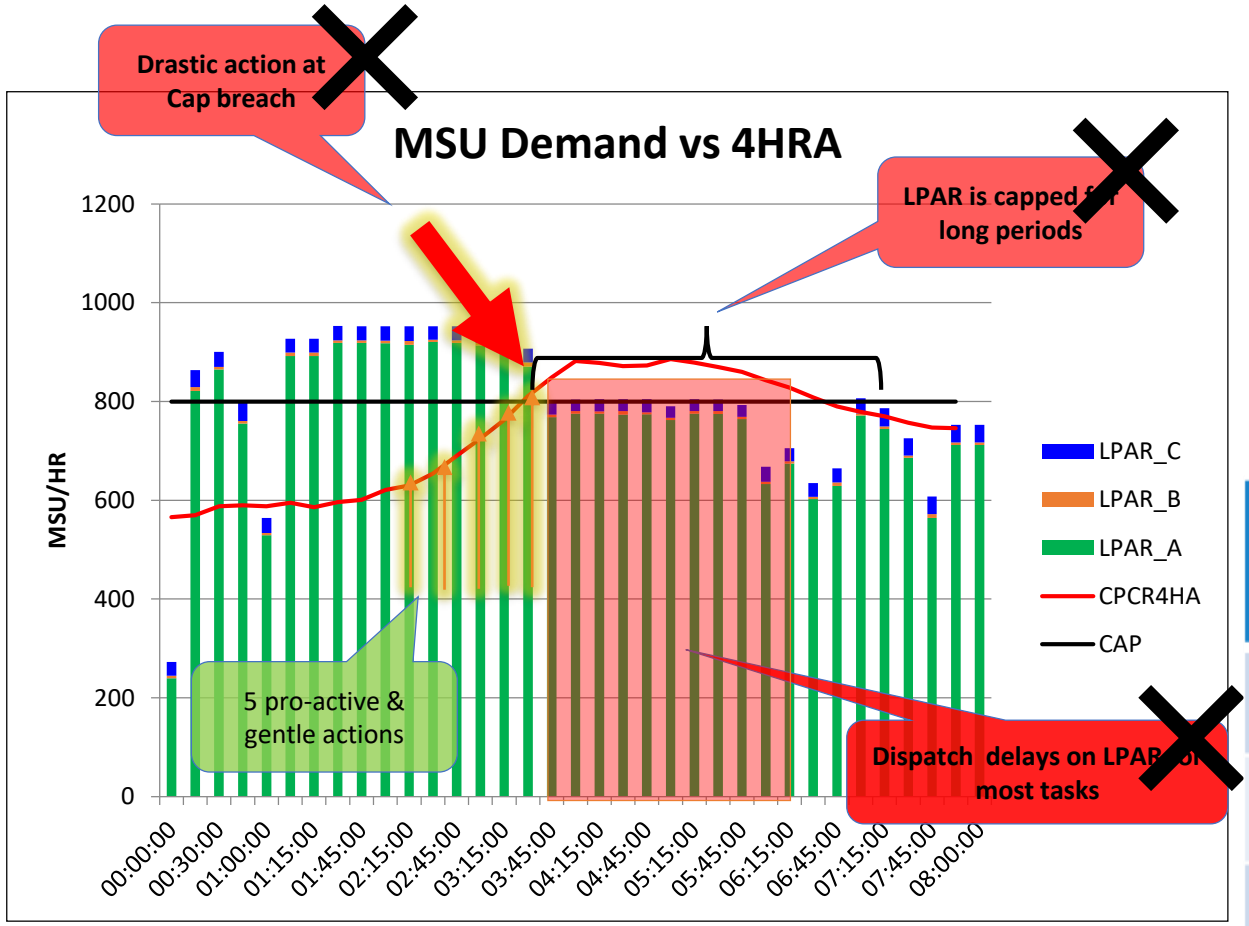








Why not avoid Capping?

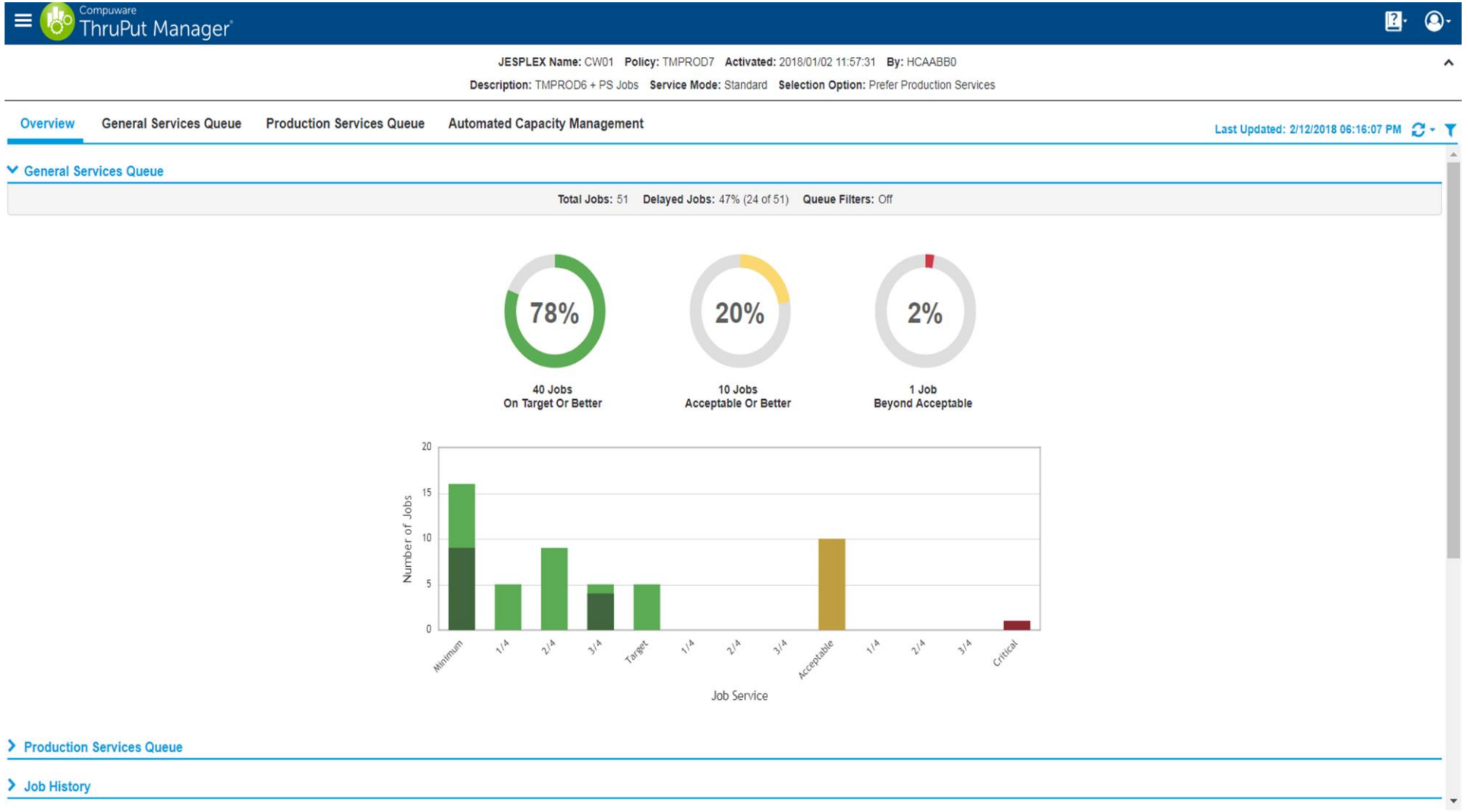


Capacity Level	Percentage of Target	4HRA trigger	ACM automated action
5	80%	800	Move low test batch to RG with 3 CP's max
4	85%	850	Limit low test to 10 jobs & all test batch to RG with 2 CP's max
3	90%	900	Move test and dev batch to RG with 2 CP's max
2	95%	950	Limit dev to 10 jobs & test and dev batch to RG with 1 CP max
1	99.9%	999	No test initiation & test, dev and low prod to RG with .5 CP max

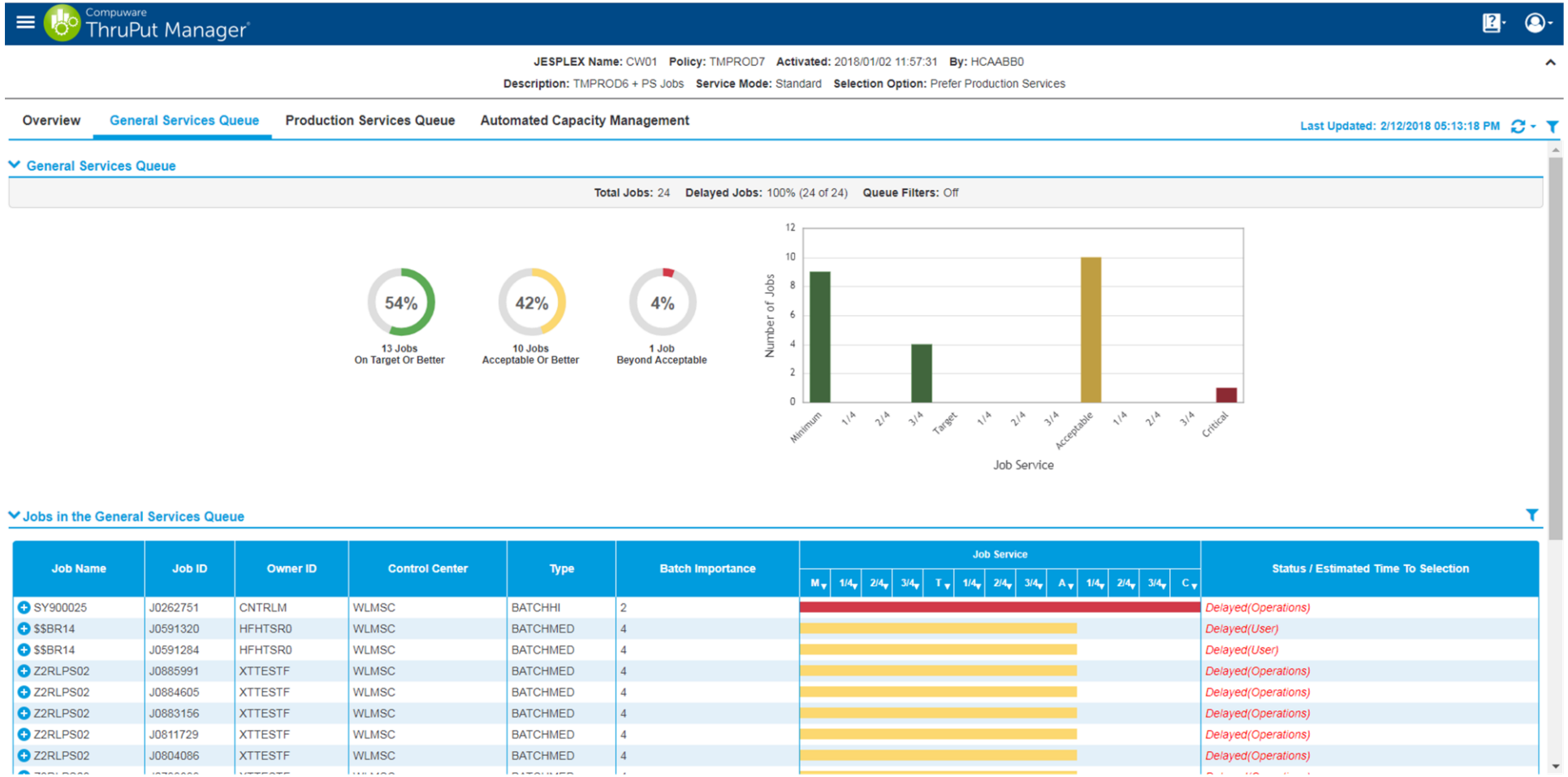
How do we know it's all working?

- A helicopter view would help…
- I have a dashboard for most of my vital Production services
- We'd love to re-sort our batch workload data to aid analysis
- Input queue service performance indication?
- Click-click technology to locate issues?
- An on-going history of R4HA and constraint levels?
- Some Job history metrics would be useful…

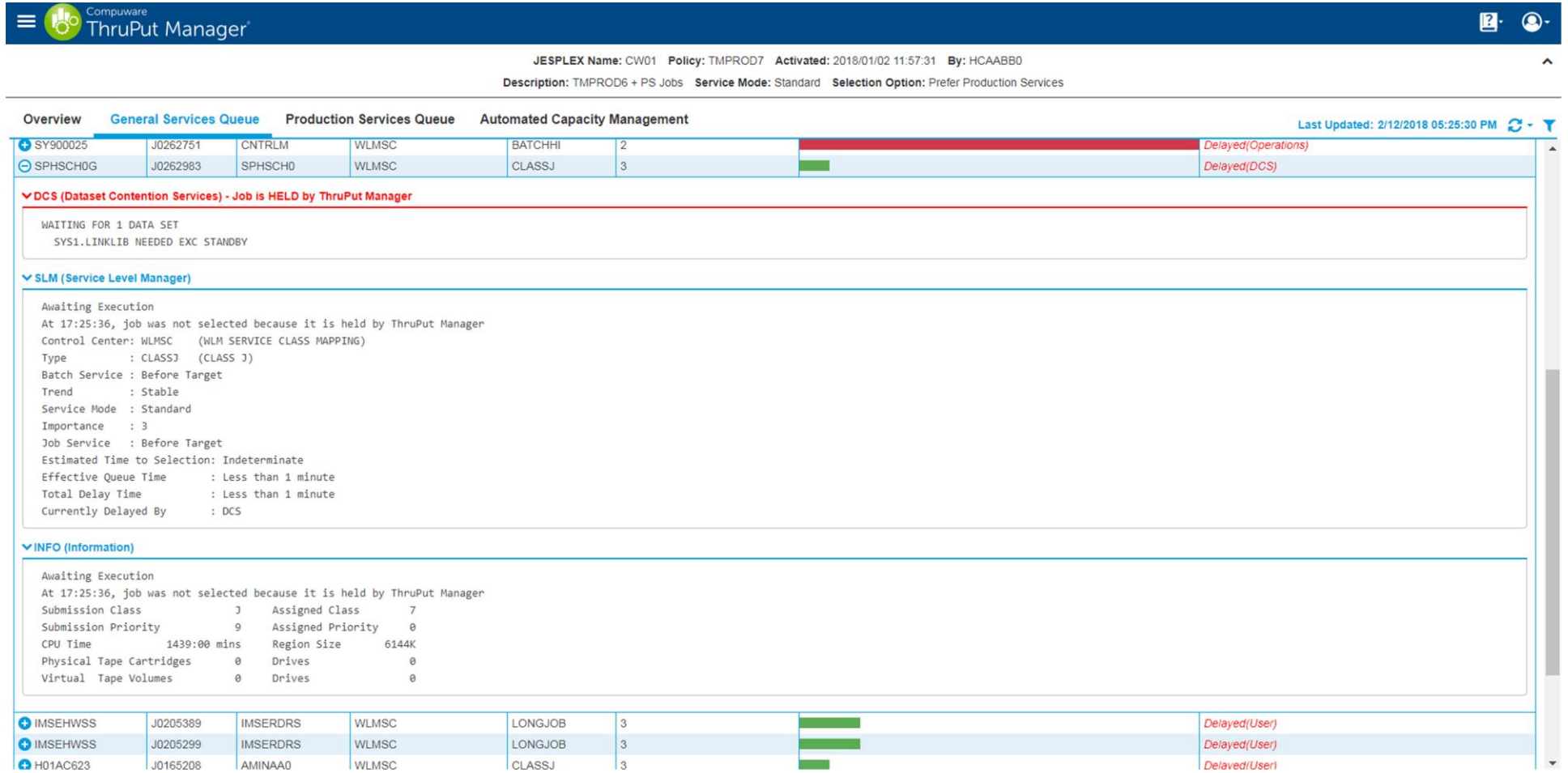
Overview Tab – General Services Queue



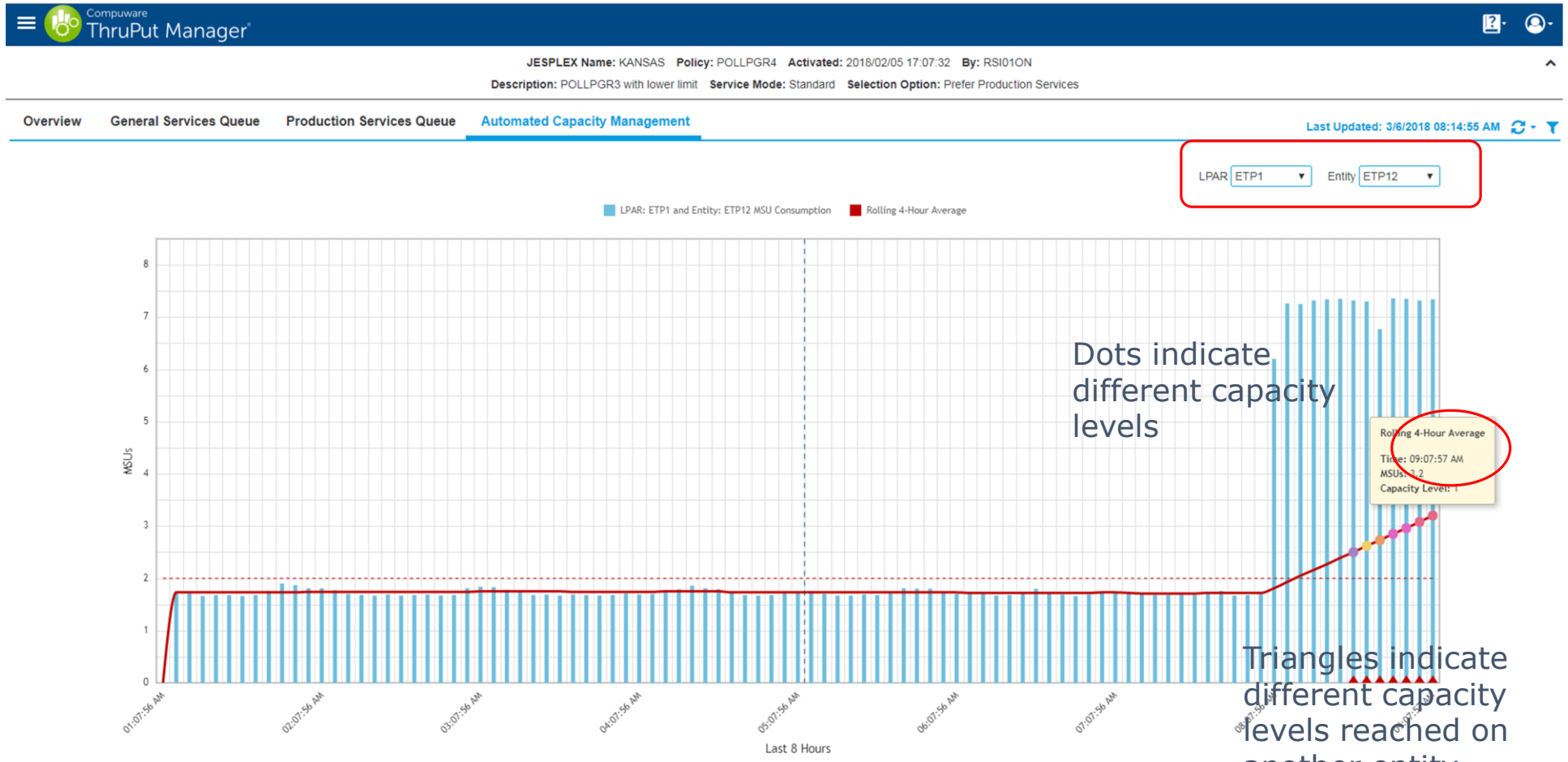
General Services Tab



Detailed Job Data



Automated Capacity Management Tab



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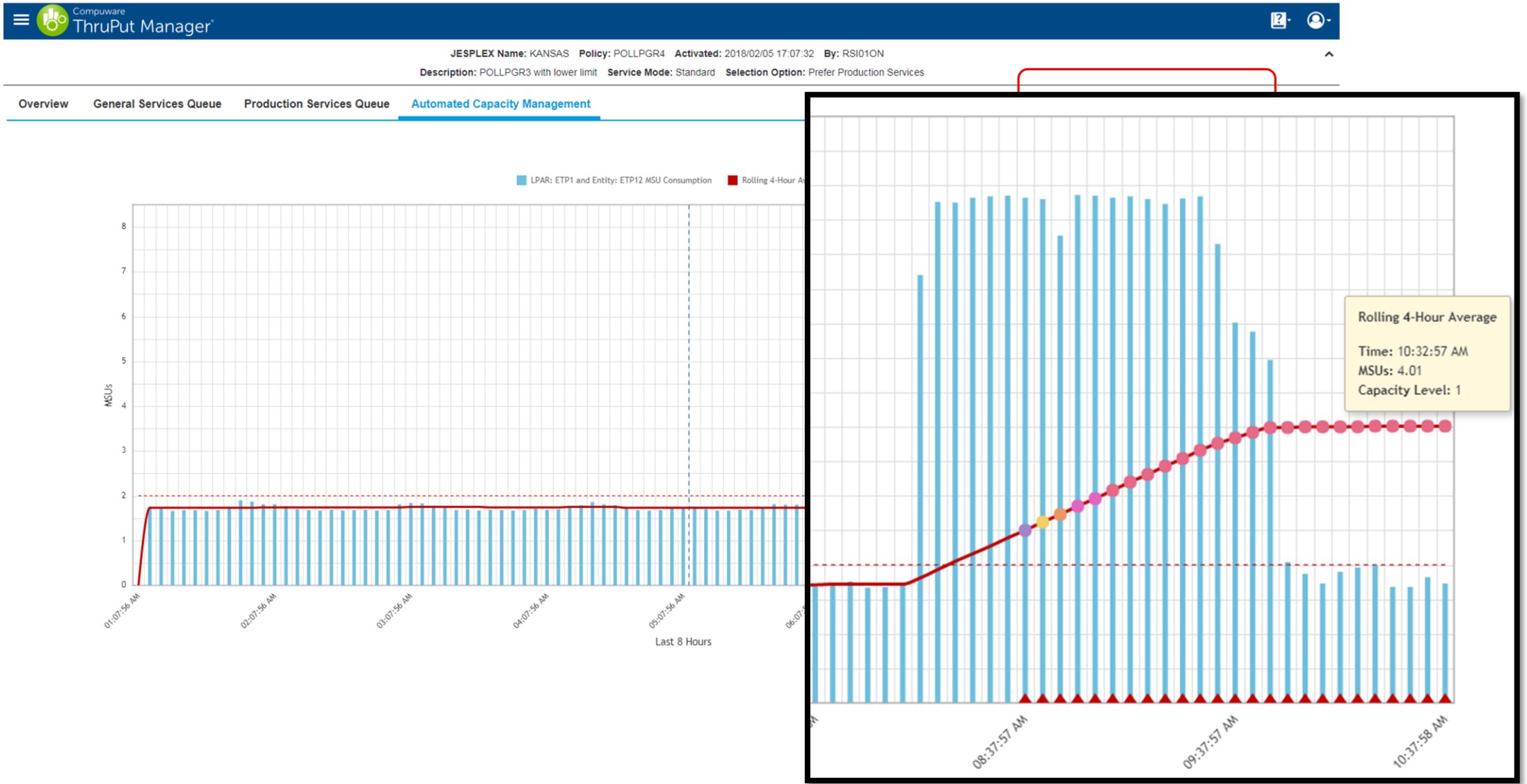

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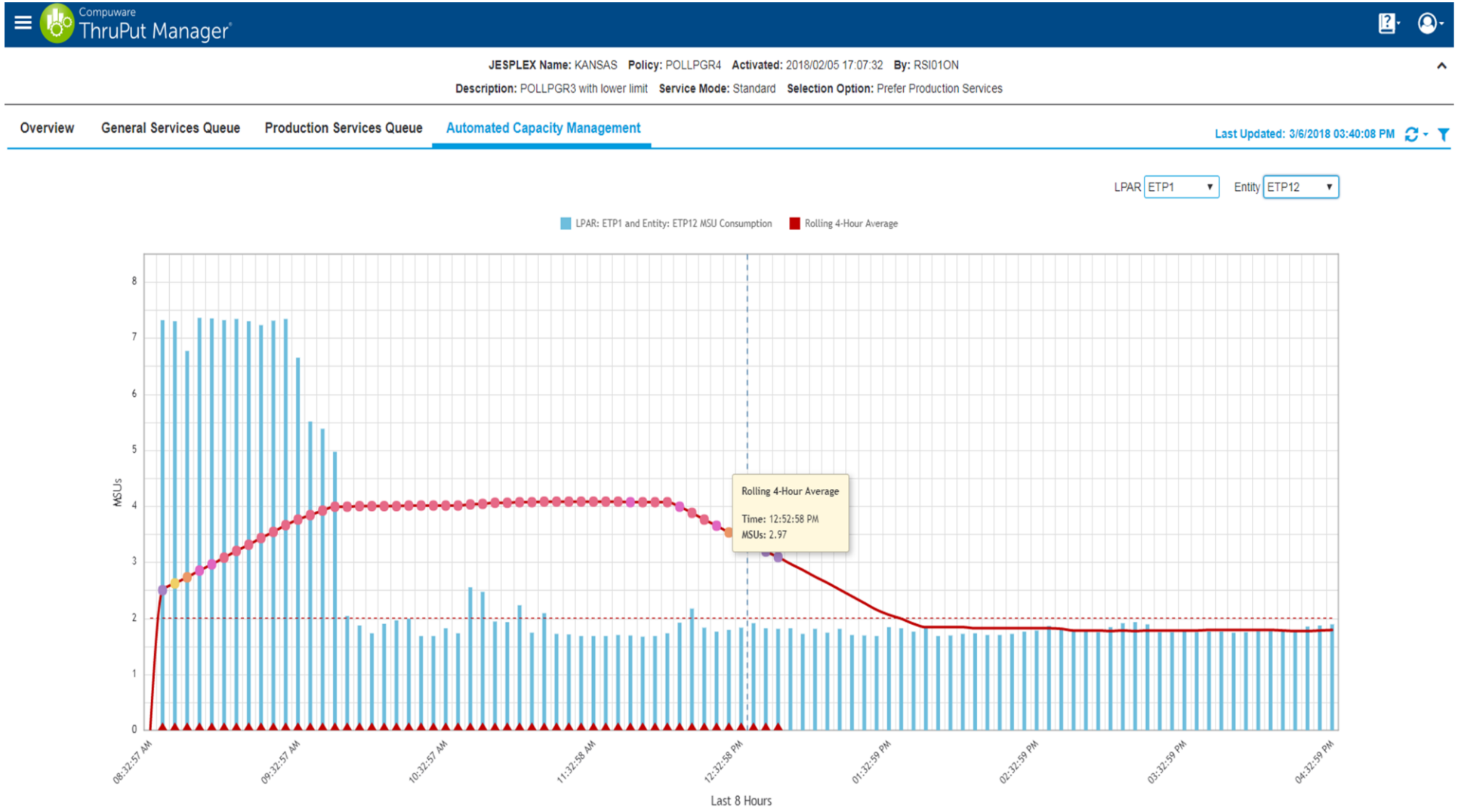

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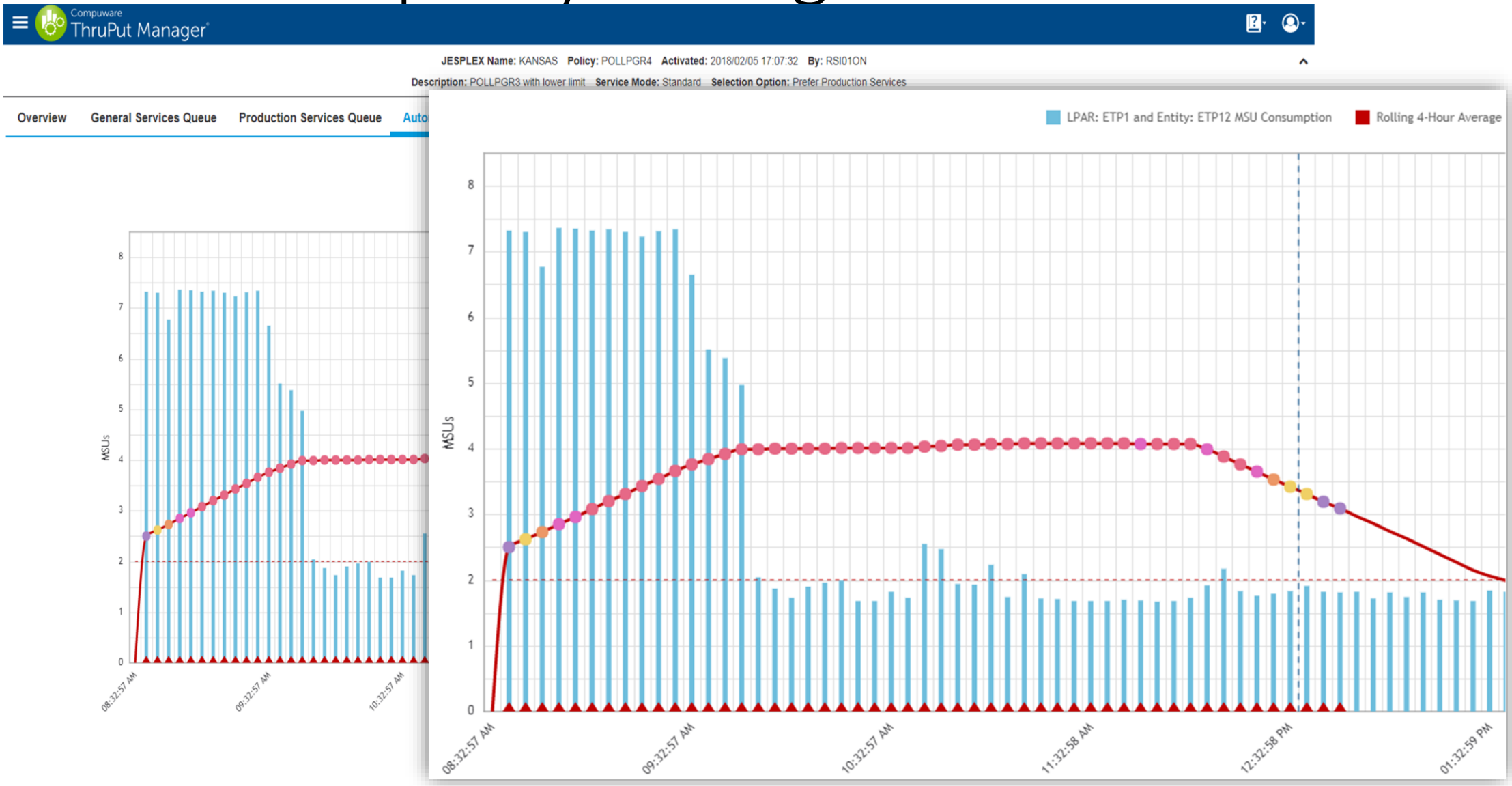
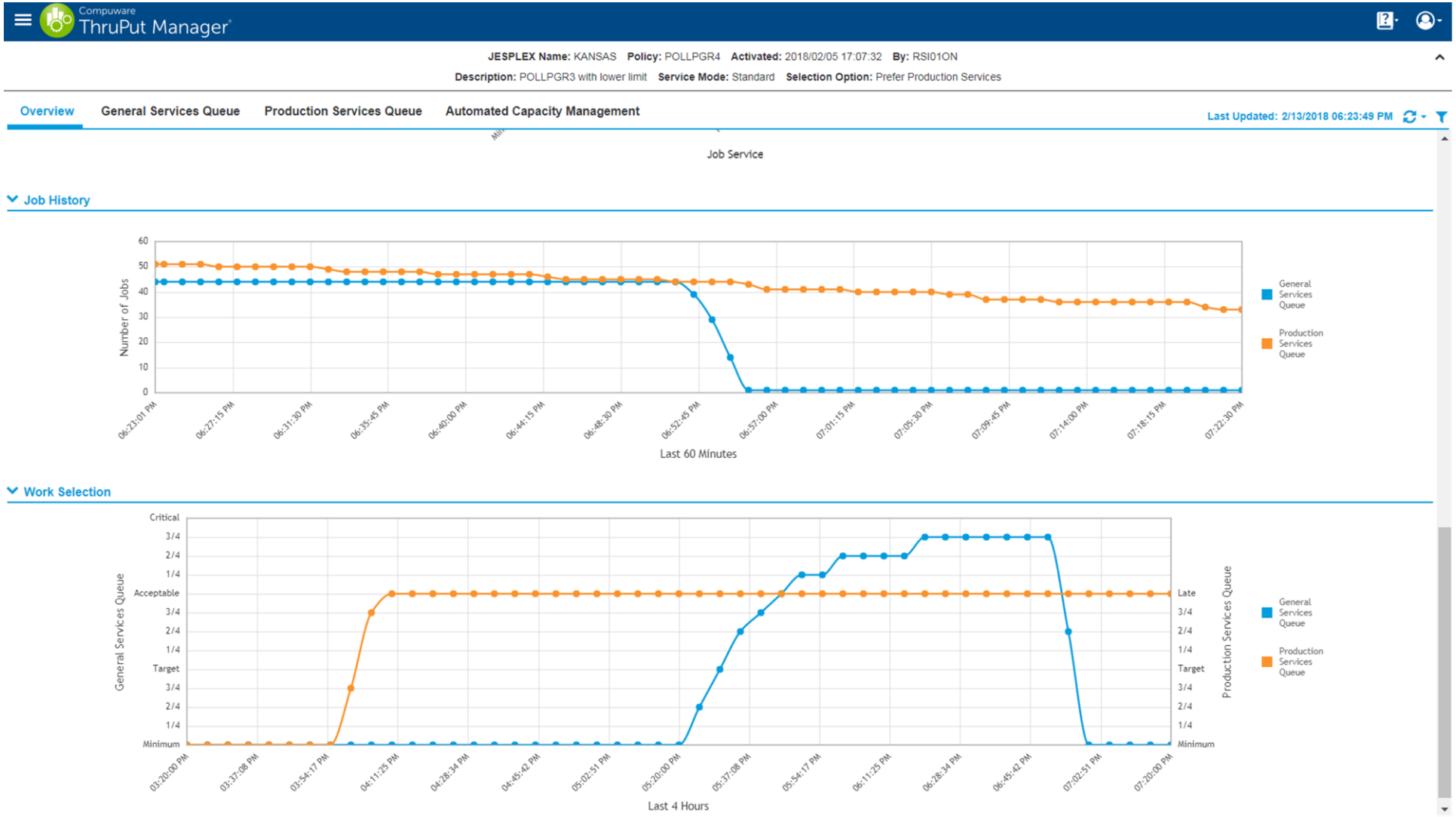


Job History and Work Selection



Why modernise your Batch environment?

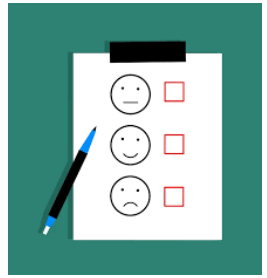
VS

We want your feedback!

- Please submit your feedback online at ….
  - ➢http://conferences.gse.org.uk/2018/feedback/nn

- Paper feedback forms are also available from the Chair person

- This session is NK



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