Discover Your Hidden Million Dollar Mainframe Treasure!

Monitor and Reduce your CPU Peaks

David McPherson

October 2018

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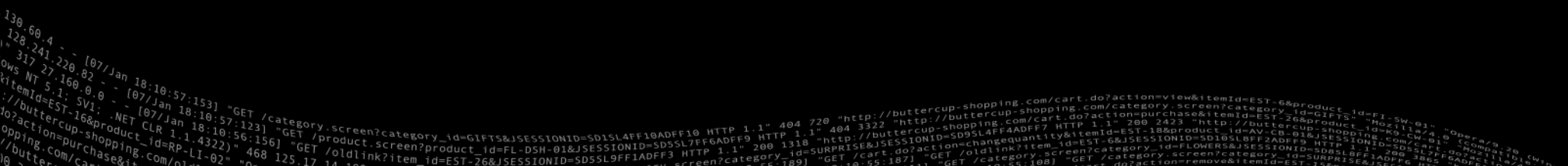
Session Contents

1. Introduction
2. The Hidden Treasure within IBM’s MLC billing model
3. My Treasure Chest – How we saved $1 Million per year
4. The Treasure Map – Where to find your hidden treasure
5. Treasure Hunting Tools
6. Key Takeaways
7. Q & A

Introduction

David McPherson

- 25 years mainframe
  - Developer
  - Application Support
  - Operations Architect
- Currently Manage a Team of 5 in Technology Operations
  - Automating support tasks
  - CPU peak reduction
  - Splunking the mainframe



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Introduction

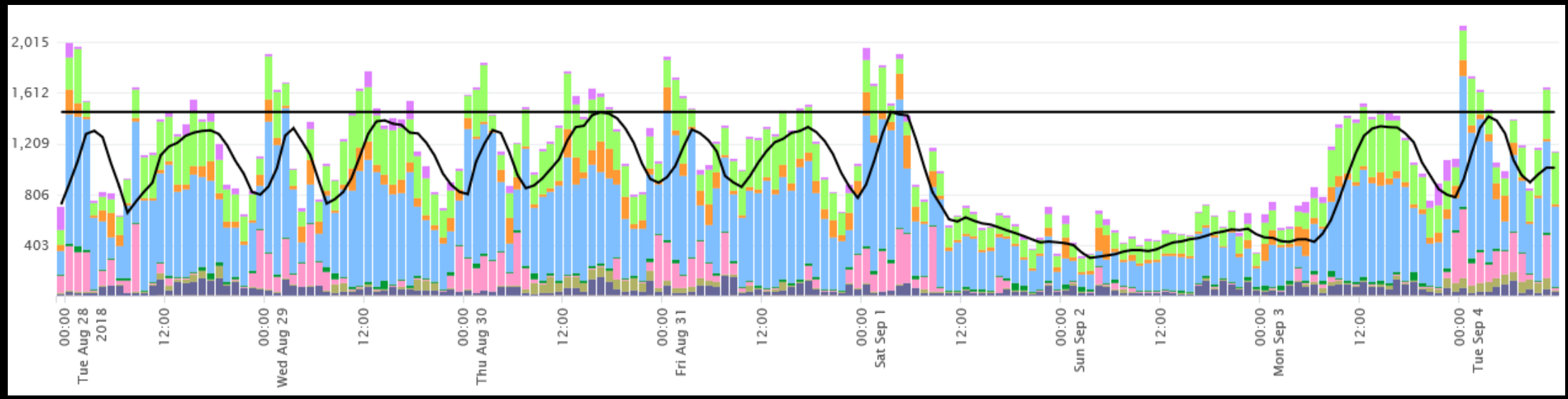
- One of the 50 biggest banks in the world (according to Wikipedia)
- Two z13 Mainframes
  - 24 Logical Partitions (LPARs)
  - CPU capacity of 26,000 MIPS (3100 MSUs)
- Software
  - IMS & Hogan
  - CICS & VisionPlus
  - DB2 & WebSphere
  - Syncsort Ironstream to pass mainframe data to Splunk

The Hidden Treasure

Reduce CPU Peaks - Save $$$$

How does MLC “Sub-capacity Pricing” work?

1. Sum CPU of all LPARs
2. Calculate a 4 Hour Rolling Average (4HRA)
3. The MLC is calculated based on the peak 4HRA within the month

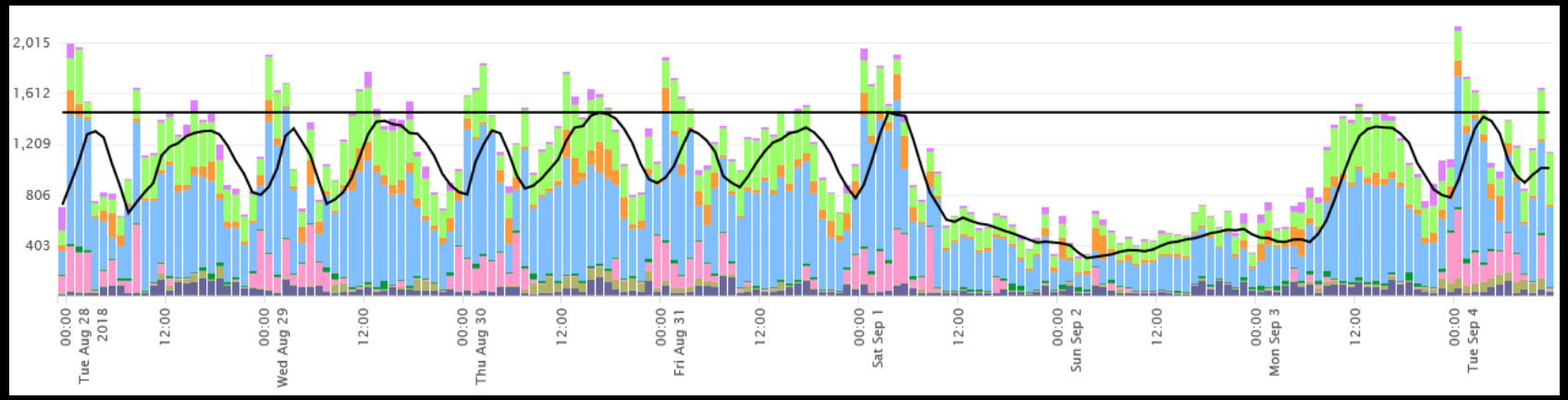


IBM's Monthly License Charge (MLC)

Each software product is billed only for those LPARs where that product is installed

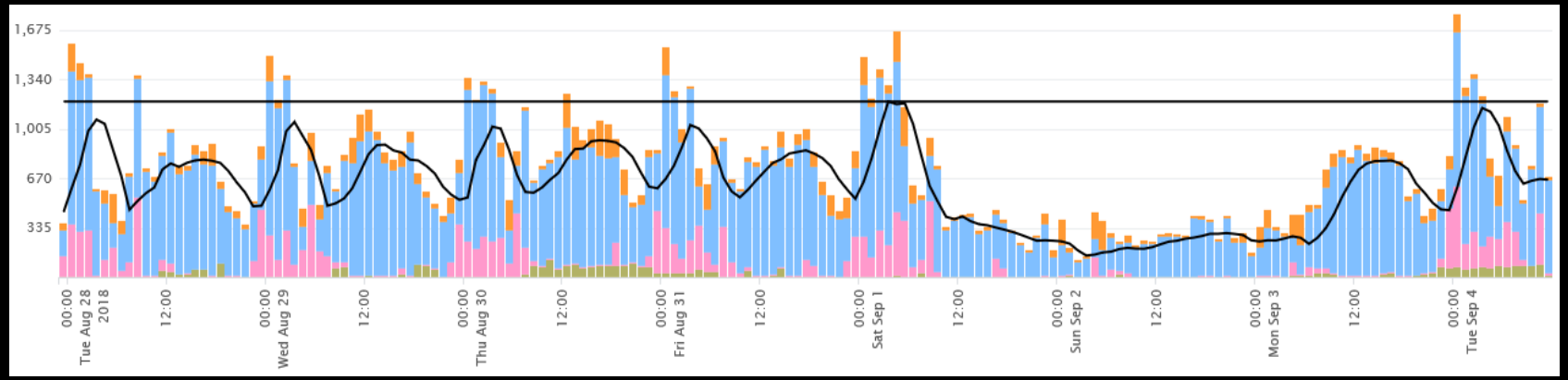
4HRA for product A

- Afternoon peaks driven by the green LPAR are as high as the overnight batch peaks



4HRA for product B

- Product B does not run on the green LPAR so it is excluded.
- Overnight batch period is clearly the peak



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Counting the Treasure - Live MLC Dashboard

MF CPU Monthly License Charge

Monthly License Charge - Aug $0,000,000

SYS1 zOS	SYS1 DB2/MQ	SYS1 CICS	SYS1 IMS	SYS1 COBOL
Peak 857 (-23) DEHJPZ	Peak 857 (-13) DEHJPZ	Peak 663 (-7) DHPWZ3	Peak 148 (+13) HIOPW	Peak 653 (-7) DHIP
				
SYS2 zOS	**SYS2 DB2/MQ**	**SYS2 CICS**	**SYS2 IMS**	**SYS2 COBOL**
Peak 1,156 (-24) BCFUXY	Peak 1,139 (-11) BCFXY1	Peak 918 (-2) CFLUY1	Peak 832 (-8) CFLXY1	Peak 950 (+30) CFUX
				
$000,000 +00/MSU	$000,000 +00/MSU	$000,000 +00/MSU	$000,000 +00/MSU	$000,000 +00/MSU

Eye Candy…

- Educates about product peaks
- Conveys controllability

Does not tell a user…

- When a peak occurred
- Actions to reduce

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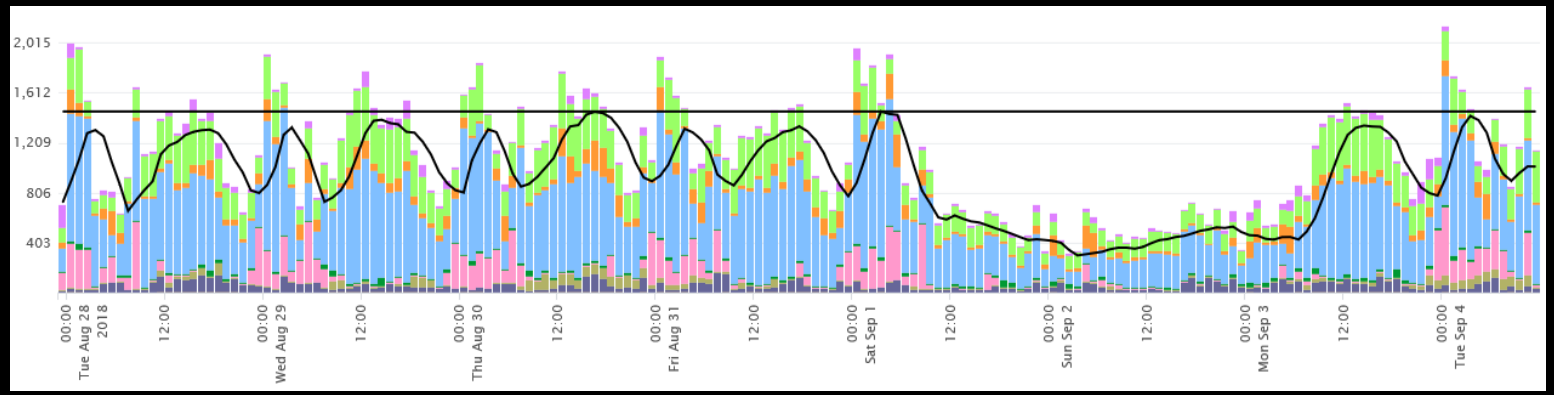
My Treasure Chest

Savings Obtained > 5% of MLC

- Tuning
  - Improved design
  - zIIP Compression
  - Syncsort MFX
  - Redundant jobs



- Dynamic batch delays – 170 jobs (532 MSUs) delayed
- Changed LPARs of 60 jobs
- Dynamic LPAR selection – job runs on the quieter CPC
- Dynamic LPAR capping (cut 2% from peaks)

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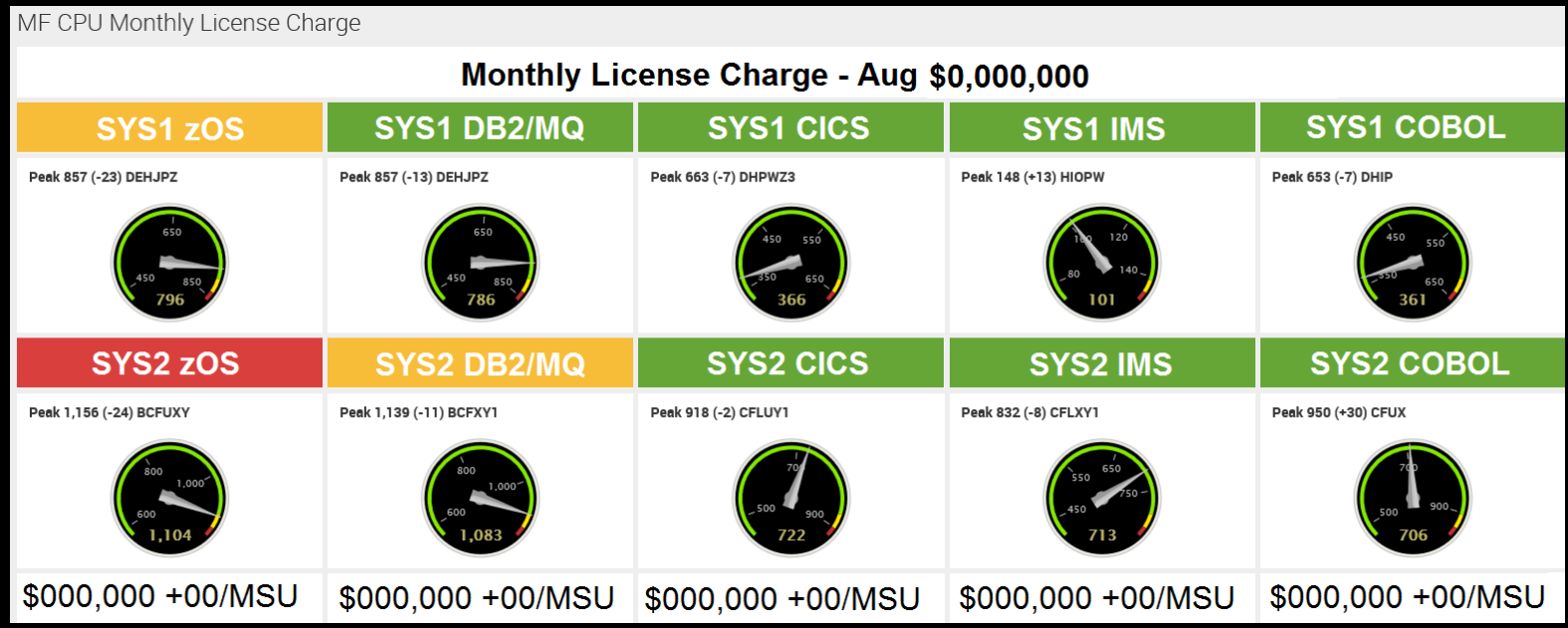
Your Treasure Hunt Begins…

Objective…

- Reduce MLC by lowering the 10 different product peaks
  - zOS
  - DB2 & MQ
  - IMS
  - CICS
  - COBOL
  - x2 Mainframe Systems



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Finding Your Treasure

Where should you start digging?

- When are your recurring peak periods?
- Are you currently in a peak?
- Which jobs/tasks contribute to the peaks?
- Where are the biggest savings?
- How do you encourage others to join your quest?

Finding Your Treasure

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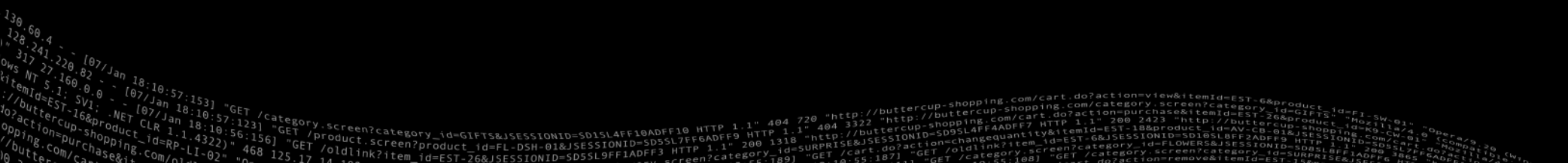
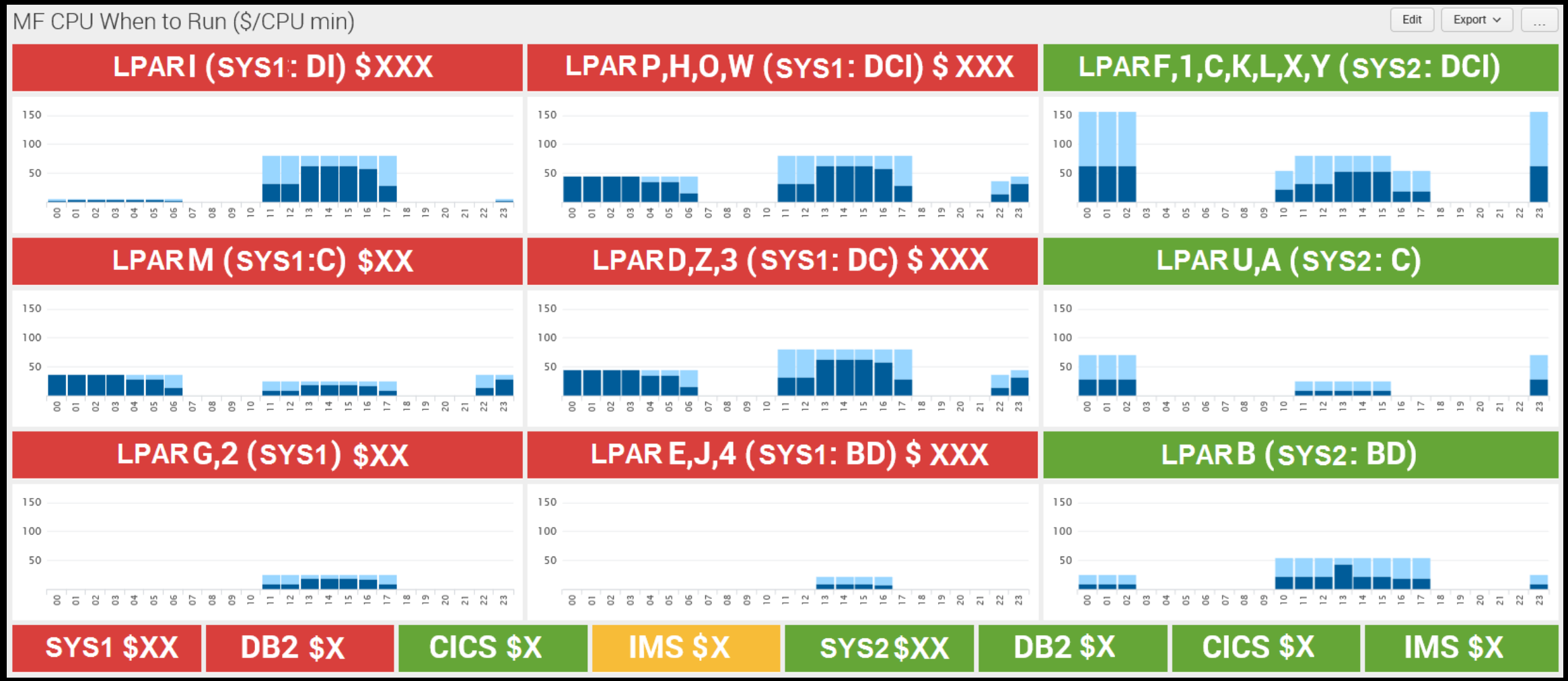
We need a Treasure map

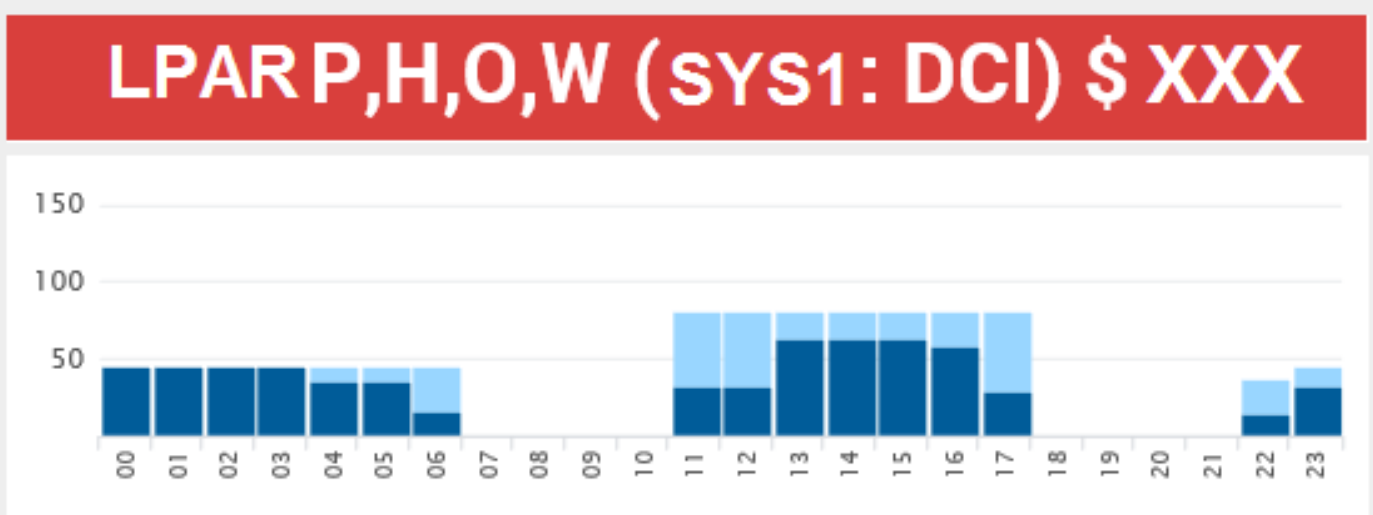


Treasure Map



- Cost of running on different LPARs and at different times

Data for Map



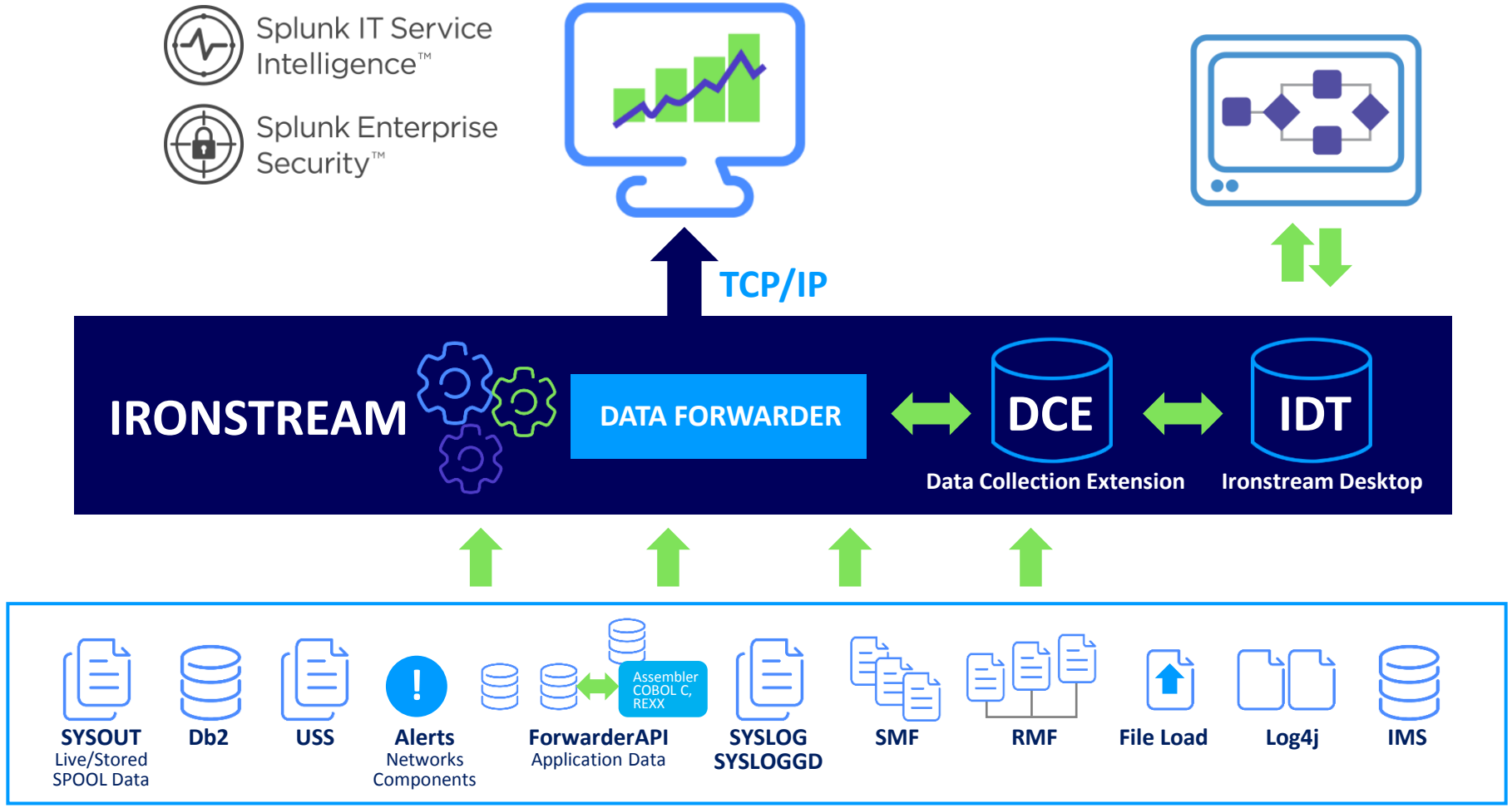
Static Data

- Products on each LPAR
- Price per Product

Hourly

- CPU consumption of each LPAR
  - Batch query to BMC Mainview
  - SMF 30

Ironstream® Architectural Overview



Product Peaks Dashboard

- Reveals Time-of-Day Patterns
- Pie chart showing contributing LPARs at peak

Does not tell a user…

- Alternate LPARs
- Cost of their consumption – a job or an LPAR can contribute to multiple product peaks

Application Health Monitoring

Basics

- SYSLOG
  - ACF or RACF violations
  - DB2 locks
- System Status
  - CPU
  - Memory
- CICS transactions (via SMF)
  - Response times
  - Transaction rates
- SYSOUT
  - Error monitoring

Customized

- Batch Monitoring (SYSLOG or SMF)
  - Forecast completion times
  - Failures
  - Job History
- Incoming/Outgoing files
- IMS queues (via batch & API)
- MQ stats
- Calendar matching
- User logon/logoff
- Disk Space

Key Takeaways

1. Identify your problem first, then design the dashboard that helps you solve it
2. Understand your billing model
3. Big savings – easily obtained

Q&A

David McPherson

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Thank You

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