Capacity Management Analytics on System z

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Agenda

- The value of capacity management
- IBM Capacity Management Analytics Solution
  - Overview
  - Architecture and Components
  - What's new in CMA 1.2
  - Demo

The Business of 'IT' is NO Different!

Why capacity management is important

Helps consolidate and reduce costs

- Reduces HW, SW and labor costs
- Reduces number of physical servers required to run workloads
- Reduces number of required SW licenses
- Reduces penalties due to missed business SLAs

Helps ensure application availability and performance

- Avoids capacity shortages that negatively impact consumer satisfaction and discourage consumers from doing future business with your company
- Ensures adequate capacity to satisfy current business requirements, future planned business requirements and urgent, unplanned business requirements.

Helps optimize resource utilization

- Provides insight into the key business indicators that drive capacity requirements
- Maximizes resource utilization while ensuring adequate performance
- Avoids resource bottlenecks by balancing workload demands across resources

Questions capacity management can answer

System and workload characteristics, performance and trending

- How is my environment performing?
- What's driving the demand on my capacity?
- Is my IBM Workload Manager environment properly tuned?
- Am I achieving my performance goals?
- Are capacity constraints causing bottlenecks and what is being impacted?
- What anomalies occurred that impacted resource usage, performance or both?

System and workload optimization, prediction and forecasting

- Do I have windows of available capacity to which I can move workloads and applications in order to alleviate bottlenecks during peak processing?
- Can I better balance my resource usage across servers, logical partitions (LPARs) and virtual machines (VMs) and defer a capacity upgrade?
- Do I have enough available capacity to add new workloads and applications to my current environment?
- When will I need to upgrade capacity in the future to support the planned addition of new workloads and applications?

IBM Capacity Management Analytics

The Analytics Platform for Cost effective, optimal use of IT Infrastructure capacity : Today, tomorrow, beyond

A single, integrated cost-effective solution for zEnterprise & Distributed Infrastructures

- System management
- Problem identification and resolution
- Capacity forecasting and monitoring
- Software Cost Analysis

Manage the complete time horizons

- Historical reporting of past performance
- Forecasting future requirements
- Near Real-time anomaly detection

Jump-start your time to value and ease implementation

- Built on IBM's ease-of-use analytics
- Includes prepackaged, interactive reports
- Optional services and education

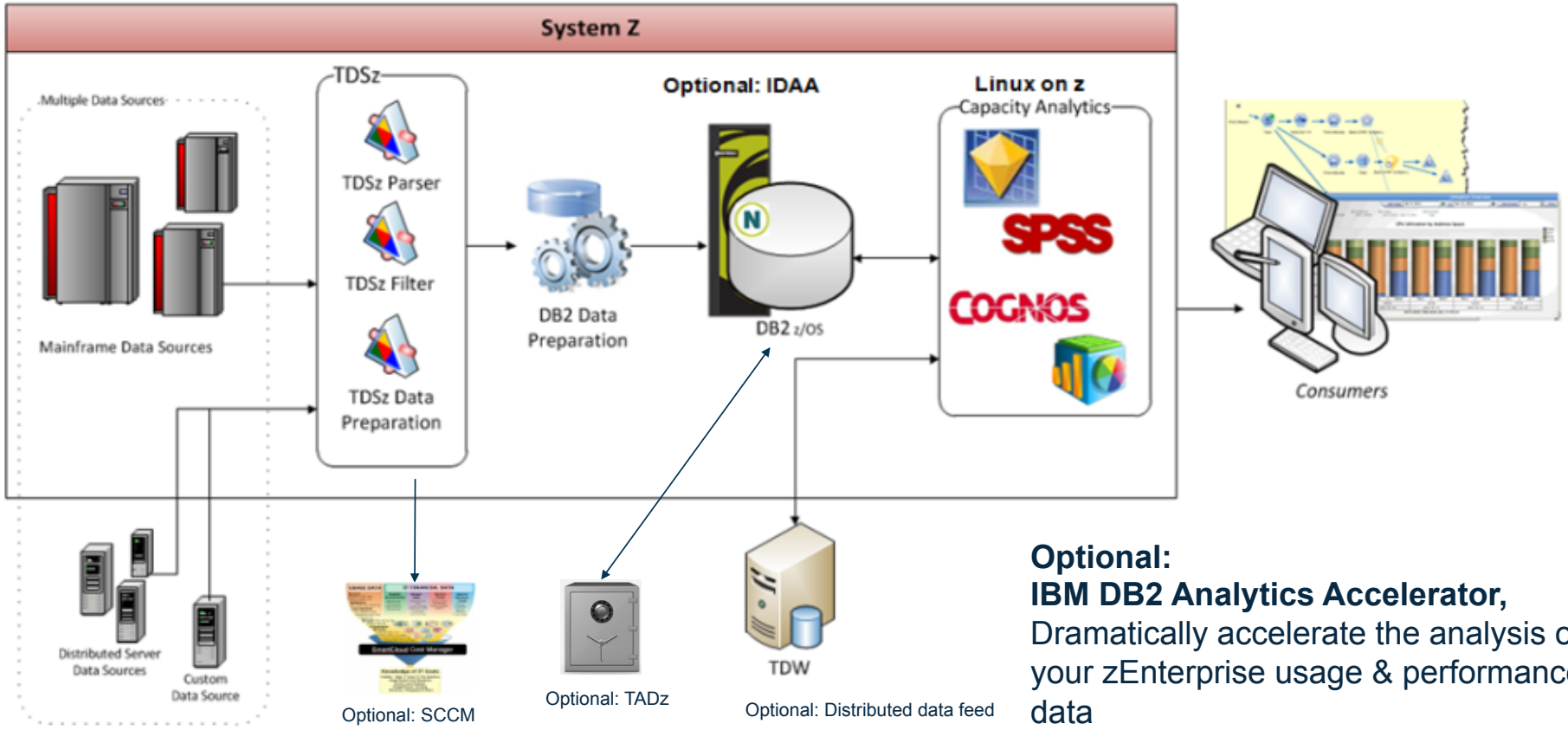
IBM Capacity Management Analytics, Solution Components

Tivoli Decision Support for z/OS enables the data collection for the solution and builds the capacity warehouse in DB2 for z/OS

Cognos Business Intelligence provides the range of analysis capabilities necessary for optimizing zEnterprise

SPSS Modeler with Scoring Adapter can help you use predictive analytics to forecast future requirements for zEnterprise

SPSS Scoring Adapter for DB2 for z/OS provides real-time anomaly detection

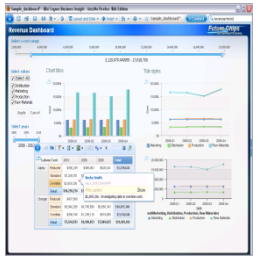


Optional:
IBM DB2 Analytics Accelerator, Dramatically accelerate the analysis of your zEnterprise usage & performance data

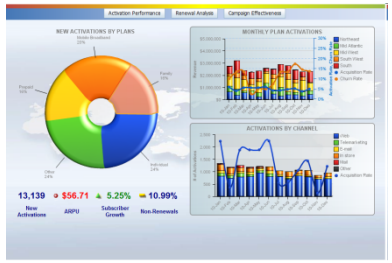
Data Collected

SMF RMF	Table	TABLESP	Vol	Description	Reports
70	MVSPM_LPAR_H MVSPM_SYSTEM_H MVSPM_LPAR_MSU_T	DRLSMP4 DRLSMP6 DRLSMP4A	low	RMF Processor Activity	CEC/LPAR Utilization, zServer, SCA
71	MVSPM_PAGING_H	DRLSMP22		Paging Activity	zServer Monitoring Dashboard
72	MVSPM_GOAL_ACT_H MVSPM_WORKLOAD2_H	DRLSMP3 DRLSMP35	high	RMF Workload Activity & Storage	WLM reports
73	MVSPM_CHANNEL_H	DRLSMP07	high	RMF Channel Path Activity	zServer Monitoring Dashboard
74	MVSPM_DEVICE_H	DRLSMP11	high		
78	MVSPM_VS_CSASQA_H	DRLSMP29		RMF Virtual Storage and I/O	Storage reports
39	MVSPM_PROD_T MVSPM_PROT_INT_T	DRLSMPB DRLSMP4C	low	Product MSU utilization	SCA
104	$P_OPERATING_SYS_$I $P = A,W,X,Z, $I = H,T	DRL	low	Distributed systems – CIM agents	Distributed systems
110	CICS_T_TRAN_T	DRLSCU01	high	CICS statistics	CICS Anomaly Detection
119	TCP_TCPSERV_PORT_H	DRLSTCP0	high		Network Reportlet

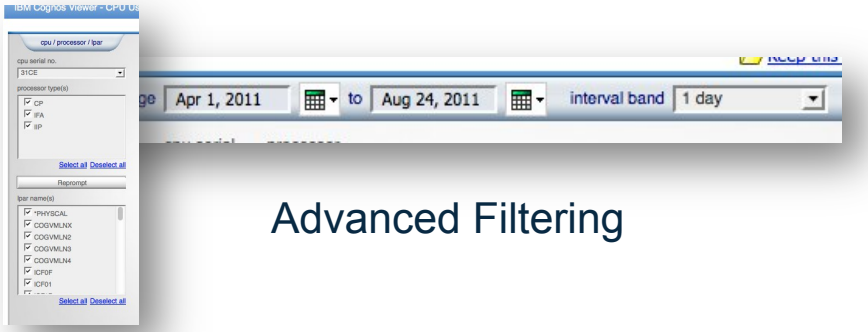
Built on IBM's ease-of-use analytics solution



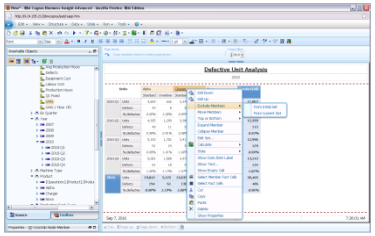
A workspace with greater power, intuitive navigation & cleaner look



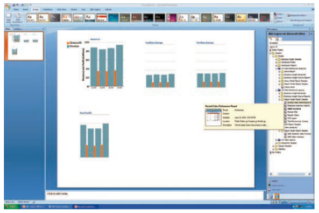
Pixel perfect reporting



Advanced Filtering



Seamlessly shift to more advanced analysis interaction

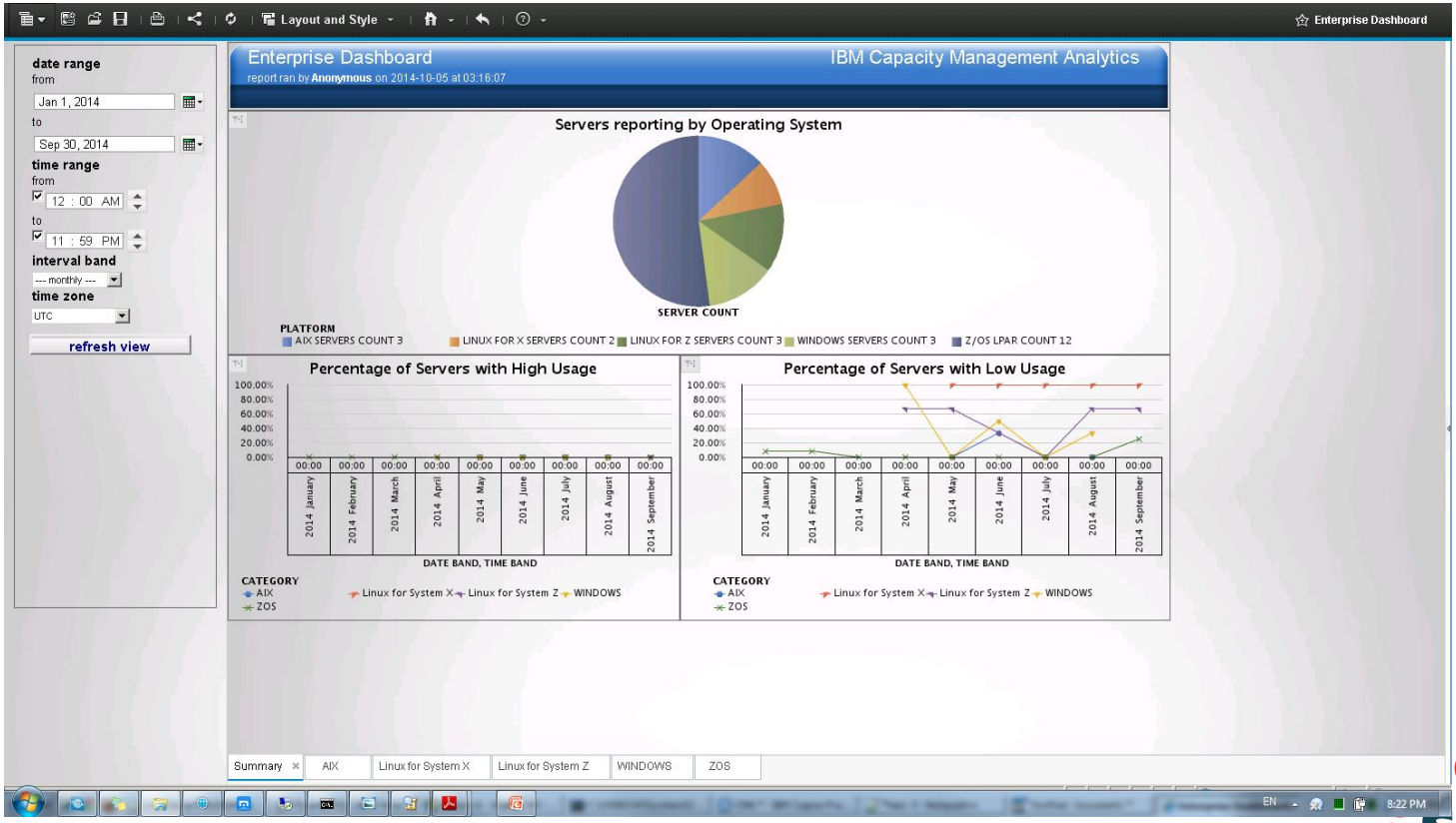


Communicate your analysis using Microsoft Office

Analytics on the go with Mobile devices and disconnected interaction

IBM Capacity Management Analytics: Systems Management

IBM Capacity Management Analytics' dashboard and report capabilities provide executives, managers, and capacity and performance specialists with custom views to analyze, visualize and make informed decisions.

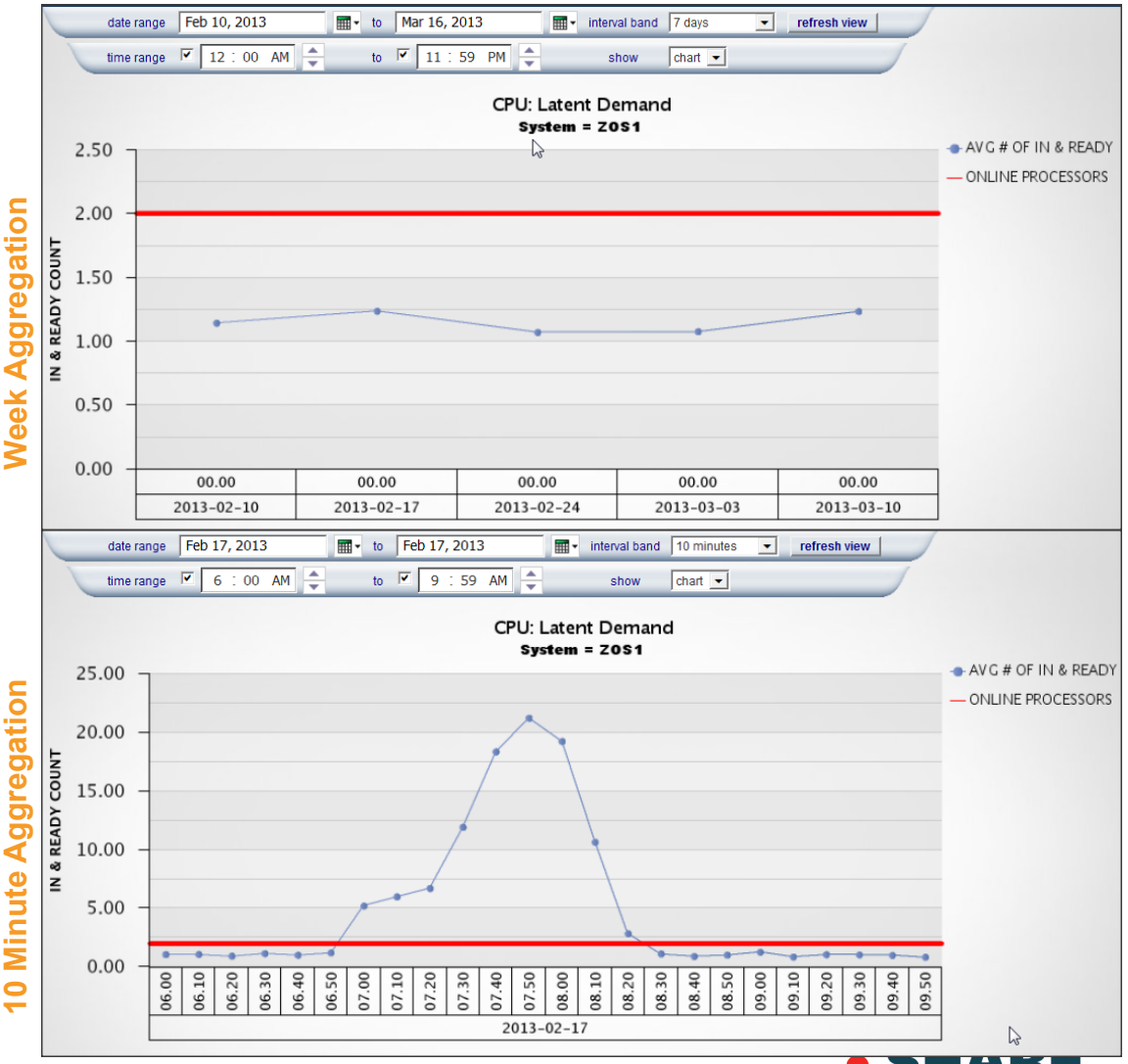


IBM Capacity Management Analytics: Problem ID and Resolution

Take a top-down view of System z capacity management

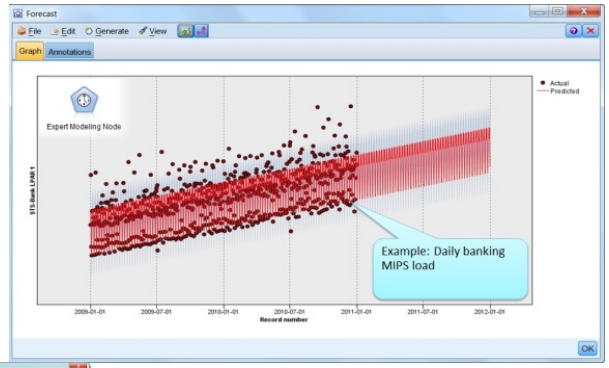
Start with the “big picture” view and then drill down to greater detail as a means of identifying and resolving capacity management issues

Perform simple ad hoc analysis to predict potential issues before they impact the business

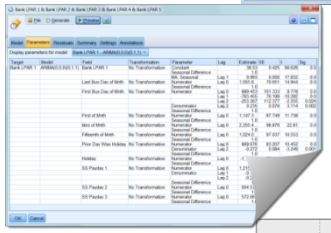


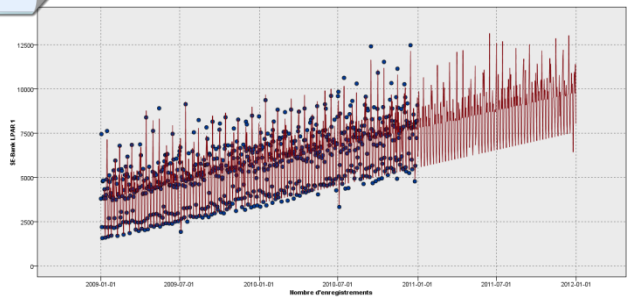
Predictive Analytics, Capacity Forecasting and Real-time scoring

Predictive analytics can help organizations use their data to make better decisions by allowing them to draw reliable, data-driven conclusions about current conditions and future events.



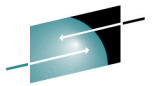
Future capacity requirements can be forecasted to help ensure that sufficient capacity is available when the business needs it.





Real-time scoring of transactions can be performed, enabling you to compare them with forecasts.

Capacity Management Analytics V1.1 - Reports



MIPS Used – zServer / LPAR Level
Analyze CPU usage by processor type (CP, IFL, zIIP, etc) at the mainframe/CEC level and identify the LPARs driving the usage.

MIPS Used - System Level (Captured vs Uncaptured)
Analyze a system's capture ratio to determine if CPU time consumed by system related processes (uncaptured CPU time) is too high.

MIPS Used - Service Class Period Level
Analyze the workloads (service classes) driving CPU usage on a system and the workloads possible to move to zIIP / zAAP from CP.

zIIP & zAAP What-ifs Workspace
Analyze zIIP / zAAP eligible usage in MIPS & engines, and provide two what-if scenarios to show how much zIIP / zAAP MIPS and engines will increase by moving the zIIP/zAAP eligible workloads from CPs to zIIPs / zAAPs.

MIPS Used – zServer / LPAR Level w/Forecast
Analyze future CPU usage based on the results of the SPSS predictive analytics CPU forecast model.

Latent Demand
Determine if latent demand (hidden capacity demand) exists on a system due to the number of tasks wanting to be dispatched exceeds the number of processors/engines online to a system. Both z/OS 1.12 below or above are supported.

CPU

Workload Manager

IBM Capacity Management Analytics Solution Kit
(Prebuilt Interactive Reports & Models)

zServer Monitoring Dashboard Workspace
Provides a quick visual status of a zServer and its LPARs. What is the LPAR configurations, general MIPS usage, top N DASD I/O and Channel bad performance points in the whole machine? What are status of CPU, memory, I/O and network of a LPAR?

Dashboard

Delays by Importance Level
Analyze the types of delays impacting each WLM importance level (highest importance to lowest importance). Is your most important work being negatively impacted by delays?

Delays by Service Class Period
Analyze the types of delays impacting each WLM service class period. Which service class periods assigned to an importance level are being negatively impacted by delays?

Memory

CSA/ECSA/SQA/ESQA Utilization
Analyze peak/max utilization for the common virtual storage areas: CSA, ECSA, SQA & ESQA. Unplanned system outages can occur when available CSA or ECSA storage is exhausted.

Performance Indexes
Analyze how well Workload Manager is doing with goal achievement. How often are WLM goals being met (PI <= 1) or missed (PI > 1)?

Model

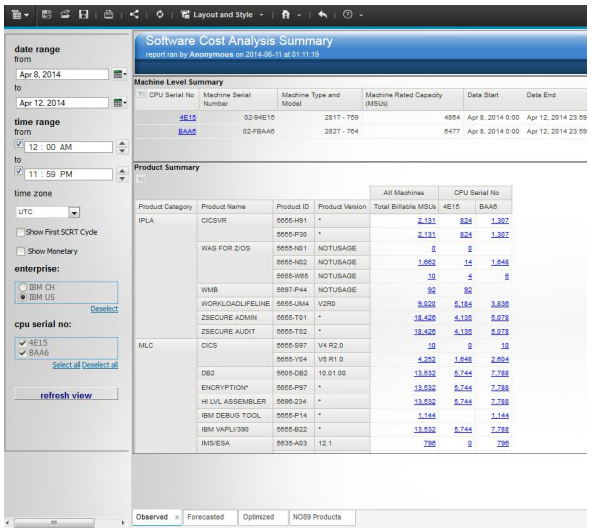
LPAR CPU Forecast
SPSS predictive analytics model that forecasts LPAR CPU usage at the hour, day and month levels.

Capacity Management Analytics V1.1 – Fixpack 1

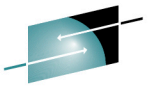
- Feature
  - zIIP & zAAP Usage reporting and recommendations
  - zIIP & zAAP Usage in WLM Service Class Reports
  - Latent Demand reports support z/OS 1.12
  - zServer Monitoring Dashboard exploiting Cognos workspace
- Usability
  - Change the Framework Manager Model to use Dynamic Query
  - Enhance the documentation for the pre-installation steps
  - Descriptions of specific CMA objects in Report Authoring & their filters and parameters
    - (e.g. DATE-BAND, TIME_BAND)
  - Forecast Stream
    - LOGPATH parameter added
    - Prompts enabled in hourly forecast stream
  - New parameter to specify the input data location
  - Models folder now created in the Forecast folder
  - Additional installation improvements
- Performance
  - Optimized query data item expression for User Name
  - Optimized some queries for 3 WLM reports
  - Added render variables to reports to reduce unnecessary main query execution
  - SPSS Streams to pre-calculate and aggregate Channel and Device information

What's NEW with Capacity Management Analytics v1.2 NEW: Sept 9th, 2014

- **Software Cost Analysis**: Assists in managing z/OS software costs and enabling users to identify where and when workloads need to be adjusted and when additional capacity is required
- **Real-time anomaly detection**: Ability to improve systems management response time with a tool that can detect CICS transaction anomalies in real time
- **Distributed Capacity Management**: Ability to provide a set of reports to manage capacity for distributed systems. A workspace is also provided that integrates both zEnterprise machines and distributed systems.



Capacity Management Analytics V1.2 - Reports



SCA: LPAR MSU Utilization
Analyze MSU utilization per LPAR, and identify the products driving the usage in observed scenario, forecasted scenario, and optimized scenario.

SCA: Product MSU and Price
Analyze billable MSU composition of a registered IBM product from each LPAR on a CPC, and estimate the monetary value in the 3 scenarios, observed, forecasted and optimized.

SCA: NO89 Products Matrix
Analyze the unregistered IBM products' allocation on each LPAR and CPC.

SCA: NO89 Product MSU and Price
Analyze billable MSU composition of a unregistered IBM product from each LPAR on a CPC, and estimate the monetary value in the 3 scenarios, observed, forecasted and optimized.

SCA: Summary Workspace
Analyze MSU utilization and monetary value and identify the drivers for MSUs and cost for all registered IBM products for CPCs within an enterprise for each scenario.

Software Cost Analysis

CPU

Linux for System Z/X - CPU Usage
Analyze CPU usage from both virtual & physical perspective

Windows- CPU Usage
Analyze CPU usage from both virtual & physical perspective

AIX - CPU Usage
Analyze CPU usage from both virtual & physical perspective

Enterprise Dashboard Workspace
Provides an overall status of all supported servers across the enterprise, including the number of servers, % of servers with high/low usage, and top/bottom 10 of the high/low usage servers by operating systems.

IBM Capacity Management Analytics Solution Kit
(Prebuilt Interactive Reports & Models)

Dashboard

Memory

Linux for System Z/X - Memory Usage
Analyze memory usage form both physical & virtual perspective

Windows- Memory Usage
Analyze memory usage form both physical & virtual perspective

AIX - Memory Usage
Analyze memory usage form both physical & virtual perspective

Model

SCA: Forecast
SPSS predictive analytics model That forecasts MSU utilization of each product & LPAR at hour and month level.

SCA: Optimization
SPSS analytics model that recommend the optimal LPAR & product placement combination to reduce overall billable MSU based on forecast.

CICS Anomaly Detection
SPSS analytics model that detects anomalous CICS transactions from response time and CPU time perspective.

Capacity Management Analytics – V1.2

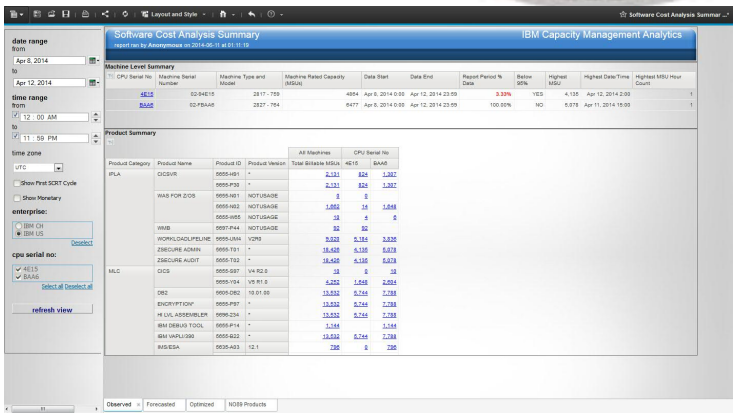
- Feature
  - Sofware Cost Analysis
    - zEnterprise MLC & IPLA sub-capacity MSU/cost analysis
    - Product cost/MSU forecasting
    - Product cost optimization recommendation
    - Enterprise Summary Dashboard
  - Predictive Analytics
    - CICS Transaction Anomaly Detection Models & Batch Scoring
  -
  - Distributed Systems Management
    - Linux for System z utilization
    - Linux on x86 utilization
    - AIX utilization
    - Windows on x86 utilization
  - Enterprise/Data Center Monitoring Dashboard
- Platform
  - Modeler Gold
    - Text Analytics, C&DS, Decision Management, Rules & Simulation
- Usability
  - Congos Workspace exploitation
- Performance
  - Cognos DMR exploitation
  - Cognos Workspace Exploitation
  - Calculation pushdown into DB2 via views
  - Pre-calculation SCA information via SPSS Streams

Capacity Management Analytics: Solution Kit – Software Cost Analysis

Provides the ability to better manage z/OS software costs and identify where and when workloads need to be adjusted and when additional capacity is required

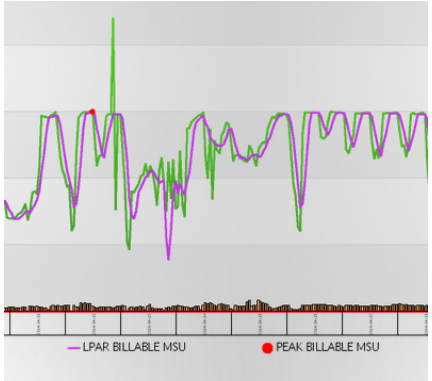
Answers cost questions such as:

- How much MSU is consumed in LPAR(s) and where is the billable peak? Which products contribute to the peak and by how much MSU?
- How much should be billed on the whole z machine (CEC) for SCRT cycles? or other date ranges?
- What is the total billable MSU and cost for all z machines in an enterprise?

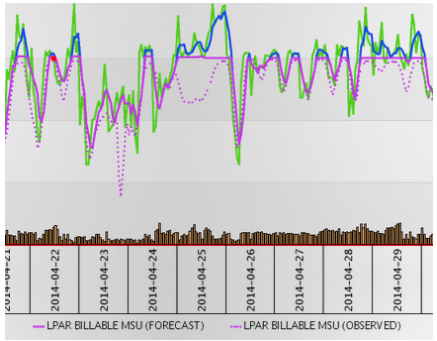


Software Cost Analysis – Three Scenarios

Observed: Track product MSU usage and costs at LPAR and Server level, identifying peak intervals and tracking 4 hour rolling average (4HRA).



Forecasted: Predict future MSU and cost usage based on forward utilization model.



Optimized: Suggest alternative LPAR / product configurations to take advantage of white space and reduce billable MSU where possible.

SUGGESTED ACTIONS IN OPTIMIZED SCENARIO

CPU SERIAL NO = 4E15, LPAR_SYSTEM ID = J80_J80, TIME ZONE = UTC

FROM CPU SERIAL NO	FROM LPAR	FROM SYSTEM	TO CPU SERIAL NO	TO LPAR	TO SYSTEM	PRODUCT NAME	PRODUCT ID	PRICING STRUCTURE	MOVE ALL	MOVING MSU
4E15	J80	J80	7744	STLAB71	SY71	CICS TS for z/OS V4	5655-S97	MLC-IWP Adjusted	YES	N/A
						CICS TS for z/OS V5	5655-Y04	MLC-IWP Adjusted	YES	N/A
						CICS VSAM Recovery V3	5655-H91	Reference-based	YES	N/A
				STLAB73	SY73	IBM Multi-site Workload Lifeline V2	5655-UM4	Execution-based	YES	N/A
						Not Defined	5610-A01	Execution-based	YES	N/A
						WebSphere Application Server for z/OS V7	5655-N02	Execution-based GSSP	YES	N/A
						WebSphere Message Broker for z/OS V8	5697-P44	Execution-based GSSP	YES	N/A
			99FF	JL0	JL0	DB2 10 for z/OS	5605-DB2	MLC	YES	N/A
						IMS V12	5635-A03	MLC-IWP Adjusted	YES	N/A
						IMS V13	5635-A04	MLC-IWP Adjusted	YES	N/A
						WebSphere MQ for z/OS V7	5655-R36	MLC	YES	N/A

Health Warning

- Moving Workloads is not so simple…
  - There are often application dependencies hidden from products like CMA
  - e.g. CICS transaction affinities
- CMA allows users to specify which products must be kept on same LPAR
- Traditional methods for reducing MIPS are still important
  - e.g. application tuning, SQL optimization

Software Cost Analysis – Additional Notes

- Does NOT replace SCRT
- Uses the same data & same rules
- Needs the SCRT NO89 listings
- Pricing Structures Supported
  - MLC
  - IPLA: Execution Based, Reference Based, zOS Based
  - IWP
  - GSSP
- License Charges Supported
  - AWLC, AEWLC, MWLC, VWLC, EWLC, zNALC,
  - VUE001, VUE007, VUE020,
- Monetary Value
- Forecasting MSUs at the LPAR & Product level
- Looking into Optimizations & Recommendations

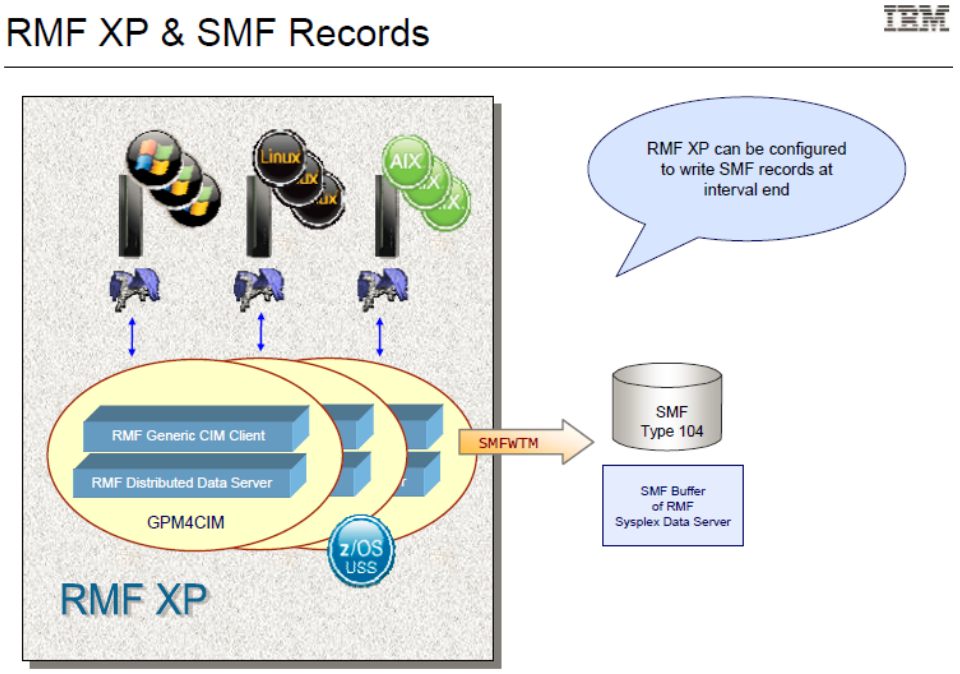
Capacity Management Analytics: Solution Kit – Distributed Components

- Linux for System z
  - CPU Usage report
  - Memory Usage report
- Linux for System X
  - CPU Usage report
  - Memory Usage report

AIX
- CPU Usage report
- Memory Usage report

Windows
- CPU Usage report
- Memory Usage report

- Enterprise Dashboard workspace
  - Shows high level information for all the supported servers across the enterprise.

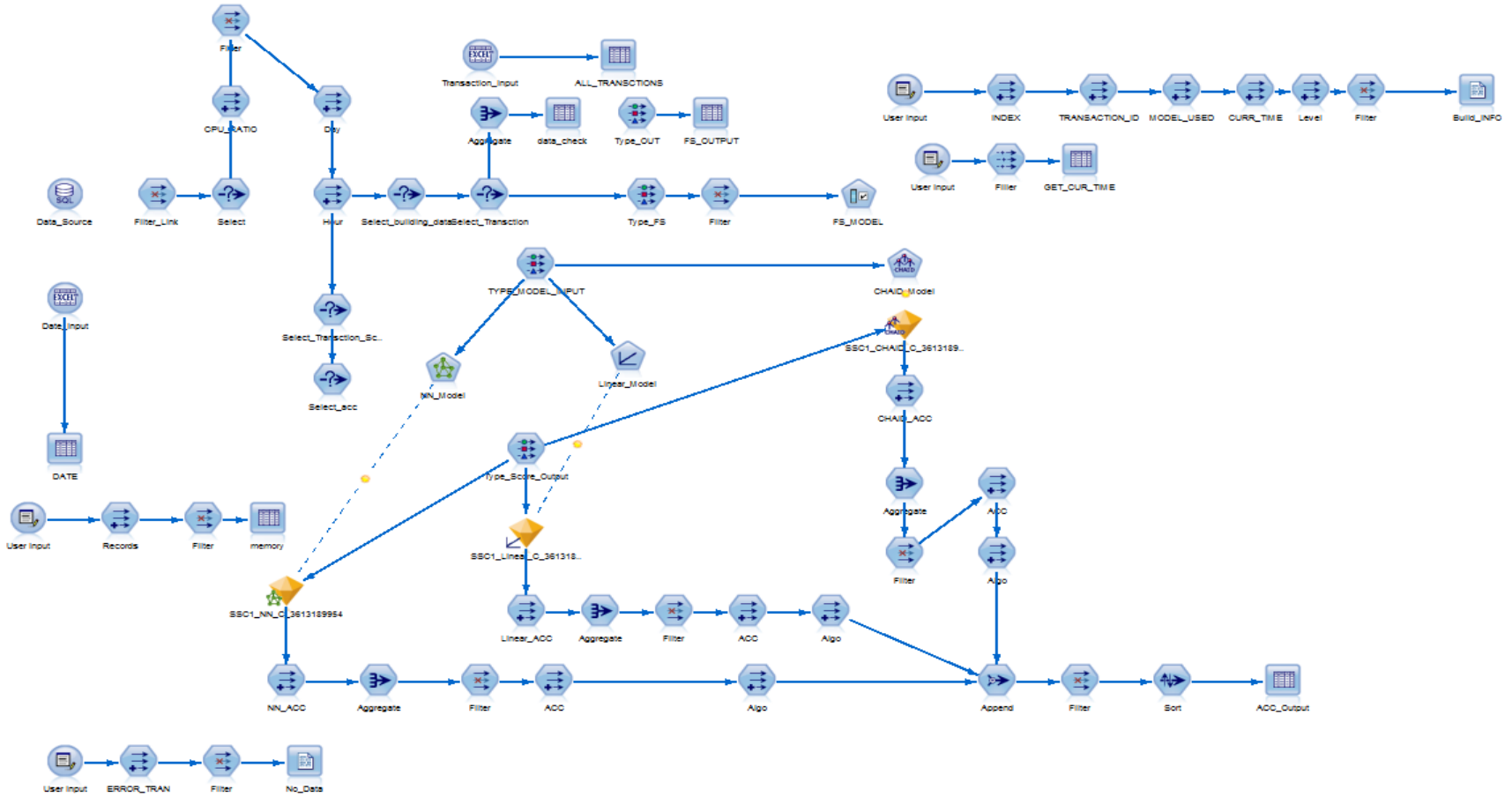


Capacity Management Analytics: Near real-time Anomaly Detection

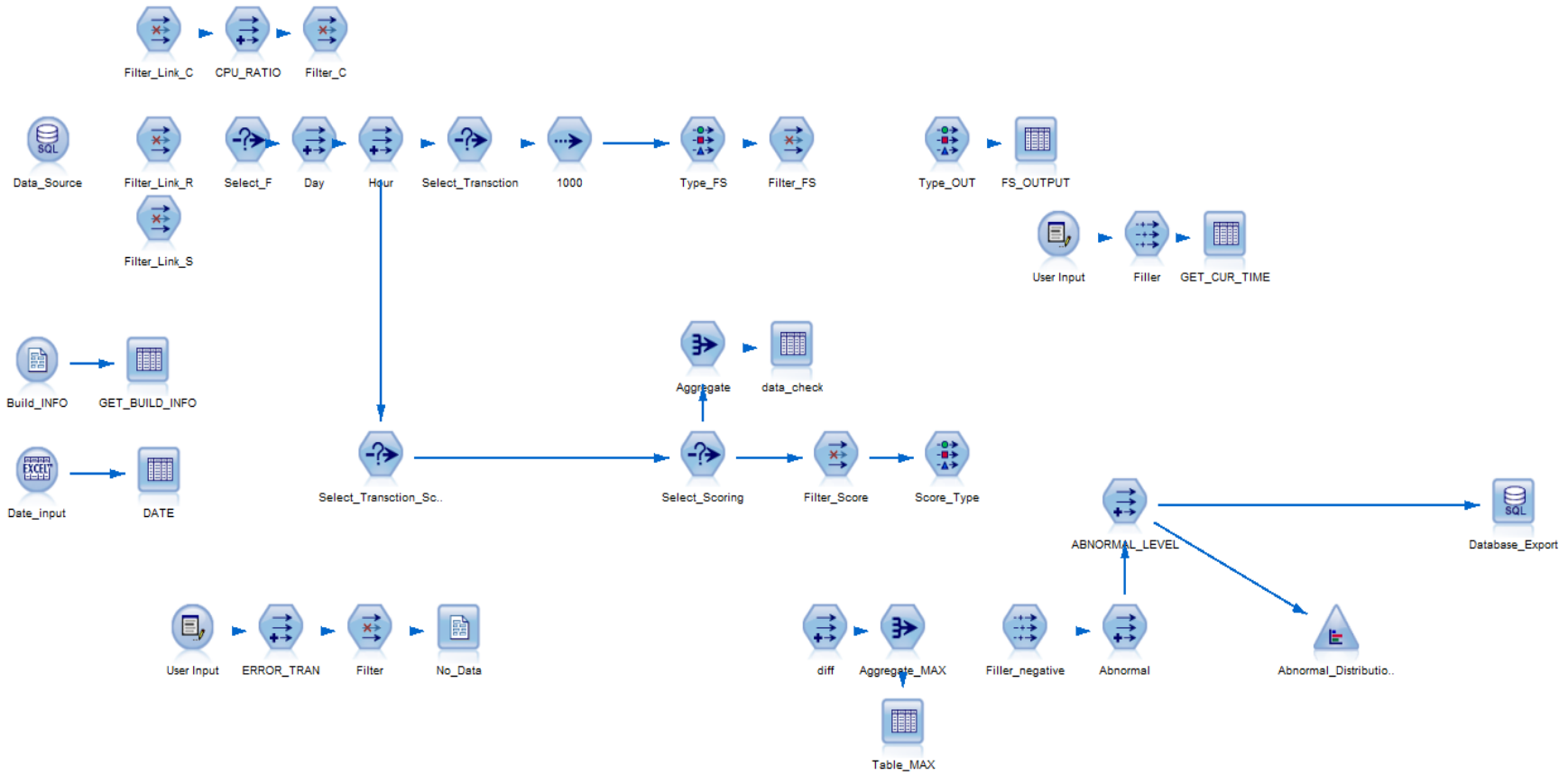
Provides anomaly detection analysis on CICS transaction data. Helps customer find out which CICS transaction is anomaly. And customer can use our result to tuning or fix problem of their production environment.

Based on transaction CPU utilization and elapsed time

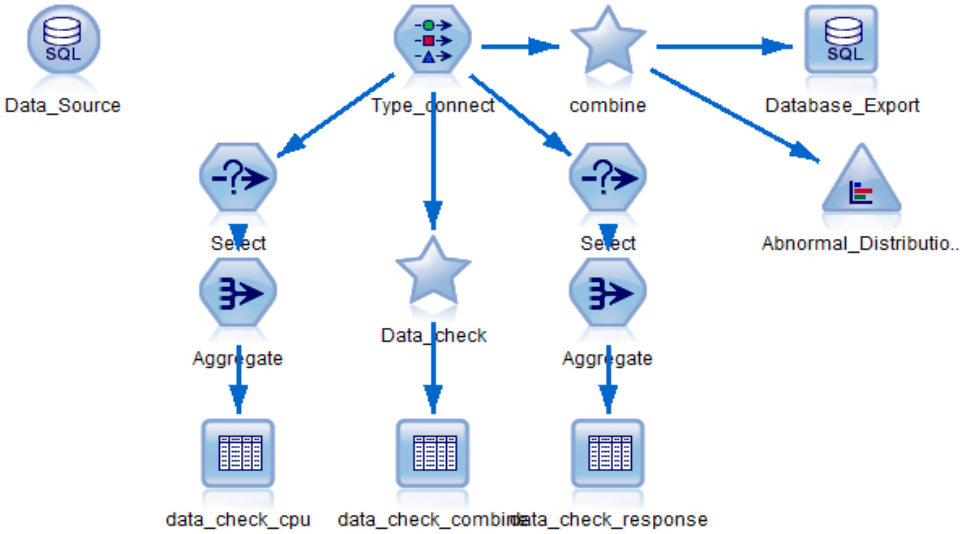
Anomaly Detection Snapshots – CPU anomaly detect building stream

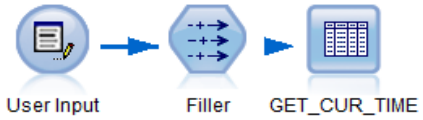


Anomaly Detection Snapshots – Anomaly detect scoring stream



Anomaly Detection Snapshots – Anomaly classification stream





IBM Capacity Management Analytics @Work
A Danish bank increases efficiency in its IT environment with advanced analytical monitoring and management

Real-time analytics
of IT workloads, even while millions of records are being processes

Trends and patterns
can easily be identified, revealing the root causes of performance issues

Millions of dollars
of potential savings through more efficient implementation and faster corrective action

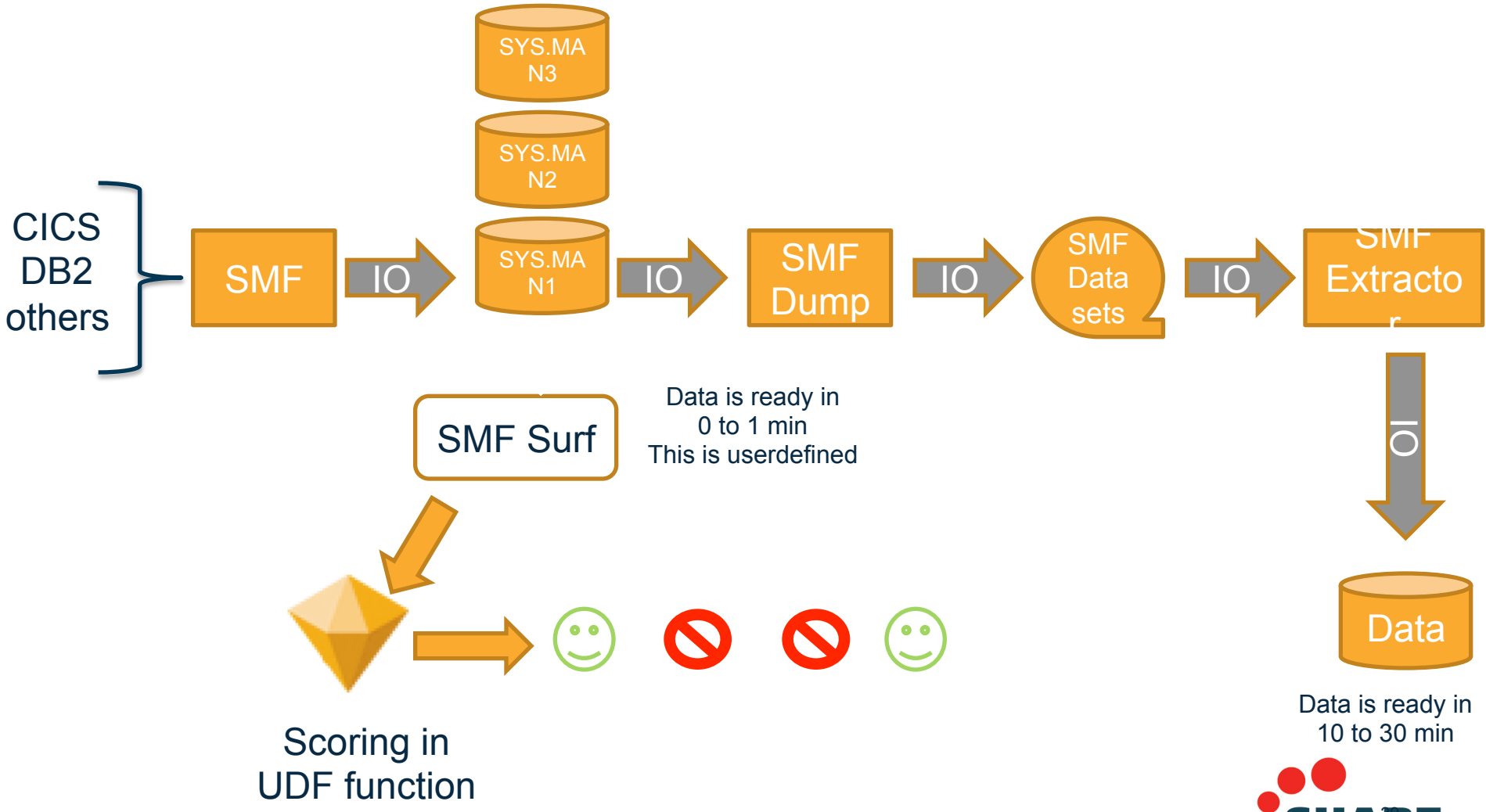
Solution Components

- IBM® SPSS® Modeler
- IBM SPSS Collaboration & Deployment Services
- IBM zEnterprise®

Business Challenge: Seeking to save costs across many areas of IT, this Danish bank sought deeper insight into the inner workings of jobs executing on its mainframe. To enable smarter processing, it needed to understand why certain workloads consumed more CPU resources than they should.

The Solution: The bank will implement a predictive analytics platform that will enable users to identify jobs that are likely to "misbehave" or create difficulties. Jobs will be analyzed, monitored and managed more actively, even while thousands of records per second are being processed in real time. This insight will lead to more efficient development and implementation and the ability to take corrective action, thus potentially saving millions of dollars.

A Look Under the Covers



IBM Capacity Management Analytics @Work An Italian insurer leverages analytics to reduce costs, consumption and storage

Integrated solution
spans from historical data analysis to forecasting future requirements

Improved performance
and capacity data analysis provide a rich context of structured big data

Up to 70% savings
on CPU consumption for existing queries along with reduced storage usage

Solution Components

- IBM® Capacity Management Analytics
  - Tivoli Decision Support for z/OS
  - Cognos BI
  - SPSS Modeler
- IBM DB2 Analytics Accelerator

Business challenge: This Italian insurer lacked a unique tool to collect, analyze and access data. Storage constraints also restricted analysis of historical data. It sought a solution to espouse its cost-reduction initiative with reduced MIPS consumption and storage while supporting short-and long-term business needs.

The Solution: With IBM's Capacity Management Analytics solution, the insurer can collect SMF detailed data in a structured way, calculate on-the-fly performance and make capacity forecasts based on historical data. The IBM DB2 Analytics Accelerator was leveraged to reduce response time and space usage and improve the performance of the company's capacity analytics.

IBM Capacity Management Analytics @Work
A national health administration predictively manages IT capacity with advanced analytics

Integrated solution
helps manage mainframe capacity cost-effectively

Real-time analytics
of current activity compared with expected usage, and accurate forecasting of future requirements

Rapid time-to-value
with prepackaged, interactive and dynamic reports that jumpstart capacity management capabilities

Business Challenge: With major legislative changes, this government agency was expecting considerable growth in workload for its mainframe systems. Managing mainframe capacity manually, using spreadsheets, was labor-intensive and error-prone. Moreover, without timely reporting, forecasting and predicting resource requirements was difficult.

The Solution: With IBM Capacity Management Analytics, they got a single, integrated solution that can help them manage their System z investment efficiently and cost-effectively for optimal results. The agency selected an IBM Capacity Management Analytics because of the "out-of-the-box" reports and models as well as ease of use and customization available to them..

Solution Components

- IBM® Capacity Management Analytics for zEnterprise®

CMA_ V.next Early Access and Beta Program

The **IBM Capacity Management Analytics V.next Early Access and Beta Program** will be coming in early 2015, we will build on the strong foundation established ; via reporting and modeling and more integration.

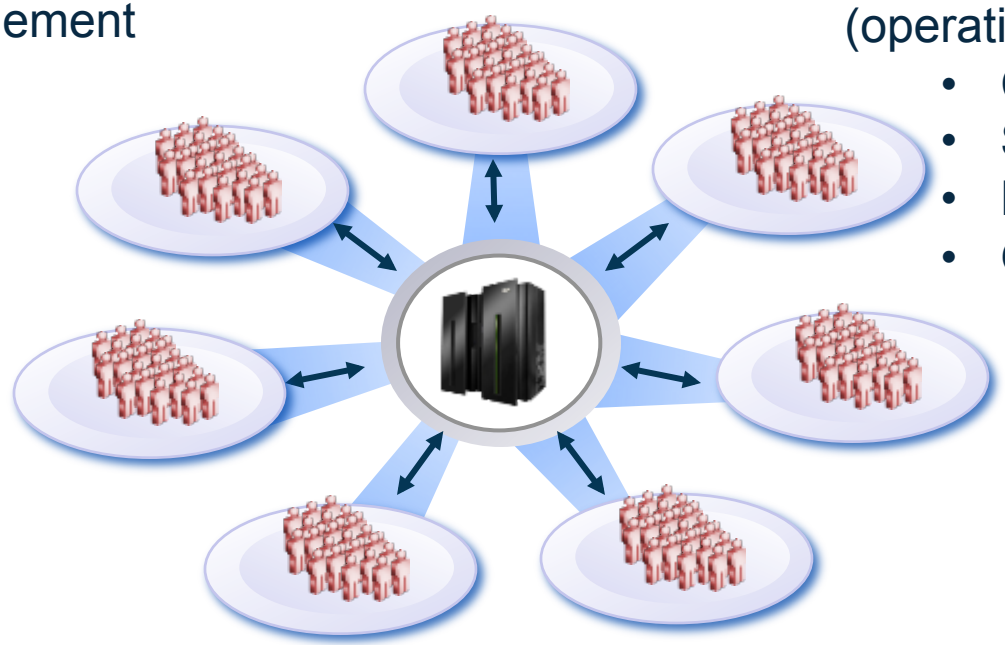
We are looking for customers and business partners worldwide who would like to test the new capabilities and help shape the content of the release under development.

To see the full program announcement, and to learn how to sign up, please email us

bklutz@us.ibm.com

Laying the Groundwork with IBM Capacity Management Analytics

1. Solve IT's pains with IBM Capacity Management Analytics

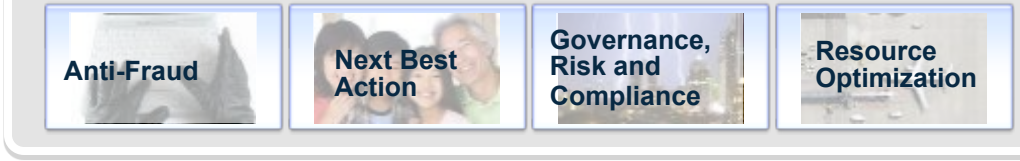


2. Leverage that success and bring analytics to the data, target customer facing (operations) departments

- Customer Service
- Sales Marketing
- Marketing
- Order Entry

3. Leverage that success and present enterprise analytics standardization and consolidation on zEnterprise

zEnterprise solutions take a data-centric approach towards business analytics that works from a single view of the truth



IBM zEnterprise® Analytics System 9700 / 9710 with IBM DB2® Analytics Accelerator

Analytics software. These are the tools that deliver actionable insights from data.
Predictive View (Analyze)

Data warehouses, marts, etc. These sources support reporting and predictive model creation.
Historical View (Report)

The operational systems that house the book of record. These sources are critical to day-to-day business processes.
Real-Time View (Collect)

Our System z analytics solutions shift the focus from optimizing IT outcomes to optimizing business outcomes by collapsing data views

Problems:

- Significant effort spent copying and moving data – resulting in veracity/security issues
- Business does not have access to the most current view
- Complicated, bifurcated infrastructure requiring multiple skill types
- No single point of management
- Business continuity concerns

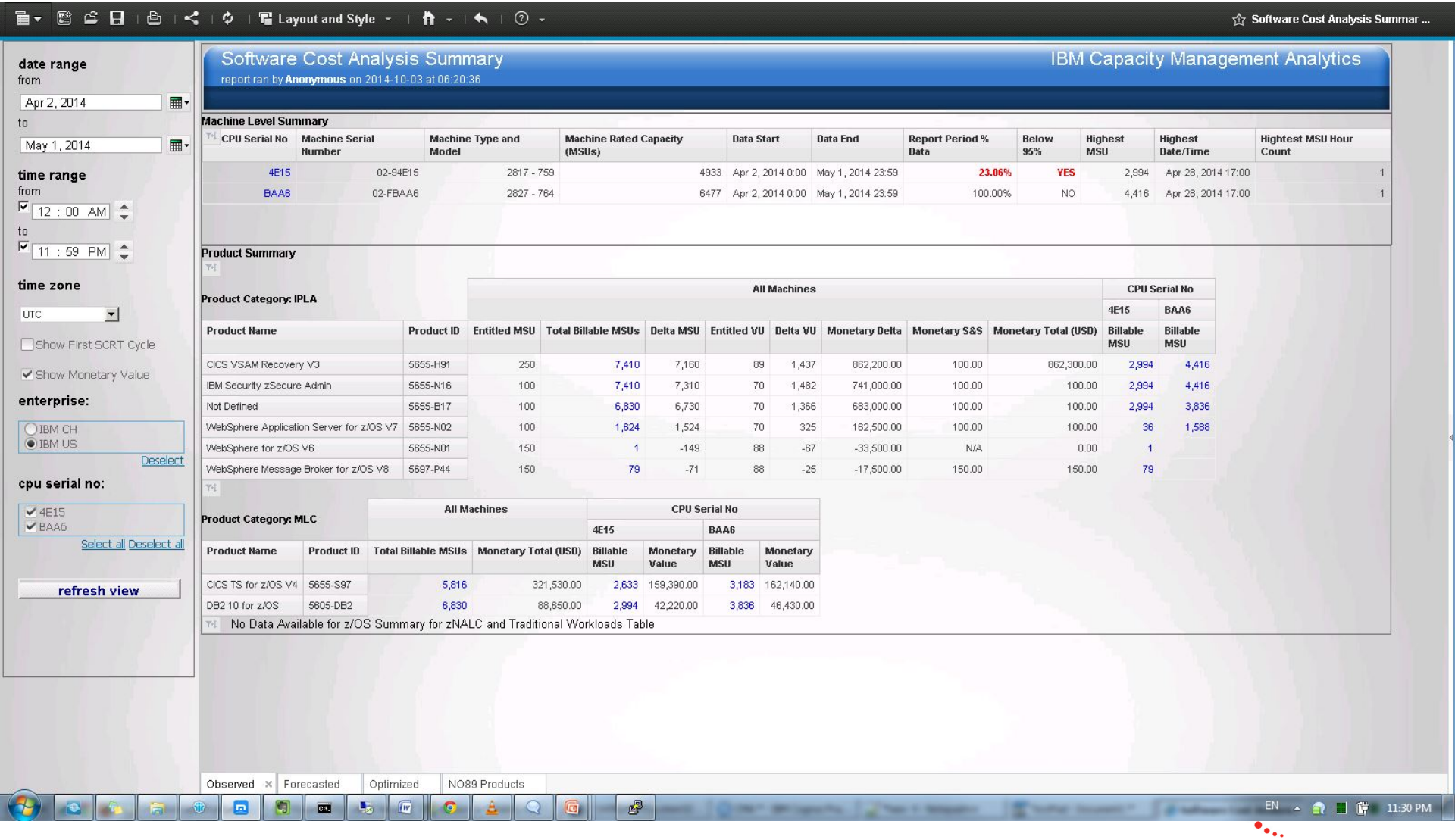
Advantages:

- Less movement of data, resulting in higher quality and less risk of loss
- Integration with core systems delivers most accurate view to the business
- Integrated architecture leveraging existing environment
- Single view simplifies management
- Business continuity inherited from core systems

Capacity Management Analytics

THE DEMO

Software Cost Analysis – Summary Observed



Layout and Style | Software Cost Analysis Summar ...

date range
from
Apr 2, 2014
to
May 1, 2014
time range
from
12 : 00 AM
to
11 : 59 PM
time zone
UTC
Show First SCRT Cycle
Show Monetary Value
enterprise:
IBM CH
IBM US
Deselect
cpu serial no:
4E15
BAA6
Select all Deselect all
refresh view

Software Cost Analysis Summary

IBM Capacity Management Analytics

report ran by **Anonymous** on 2014-10-03 at 06:20:36

Machine Level Summary

CPU Serial No	Machine Serial Number	Machine Type and Model	Machine Rated Capacity (MSUs)	Data Start	Data End	Report Period % Data	Below 95%	Highest MSU	Highest Date/Time	Hightest MSU Hour Count
4E15	02-94E15	2817 - 759	4933	Apr 2, 2014 0:00	May 1, 2014 23:59	23.06%	YES	2,994	Apr 28, 2014 17:00	1
BAA6	02-FBAA6	2827 - 764	6477	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	4,416	Apr 28, 2014 17:00	1

Product Summary

Product Category: IPLA

		All Machines								CPU Serial No	
										4E15	BAA6
Product Name	Product ID	Entitled MSU	Total Billable MSUs	Delta MSU	Entitled VU	Delta VU	Monetary Delta	Monetary S&S	Monetary Total (USD)	Billable MSU	Billable MSU
CICS VSAM Recovery V3	5655-H91	250	7,410	7,160	89	1,437	862,200.00	100.00	862,300.00	2,994	4,416
IBM Security zSecure Admin	5655-N16	100	7,410	7,310	70	1,482	741,000.00	100.00	100.00	2,994	4,416
Not Defined	5655-B17	100	6,830	6,730	70	1,366	683,000.00	100.00	100.00	2,994	3,836
WebSphere Application Server for z/OS V7	5655-N02	100	1,624	1,524	70	325	162,500.00	100.00	100.00	36	1,588
WebSphere for z/OS V6	5655-N01	150	1	-149	88	-67	-33,500.00	N/A	0.00	1	
WebSphere Message Broker for z/OS V8	5697-P44	150	79	-71	88	-25	-17,500.00	150.00	150.00	79	

Product Category: MLC

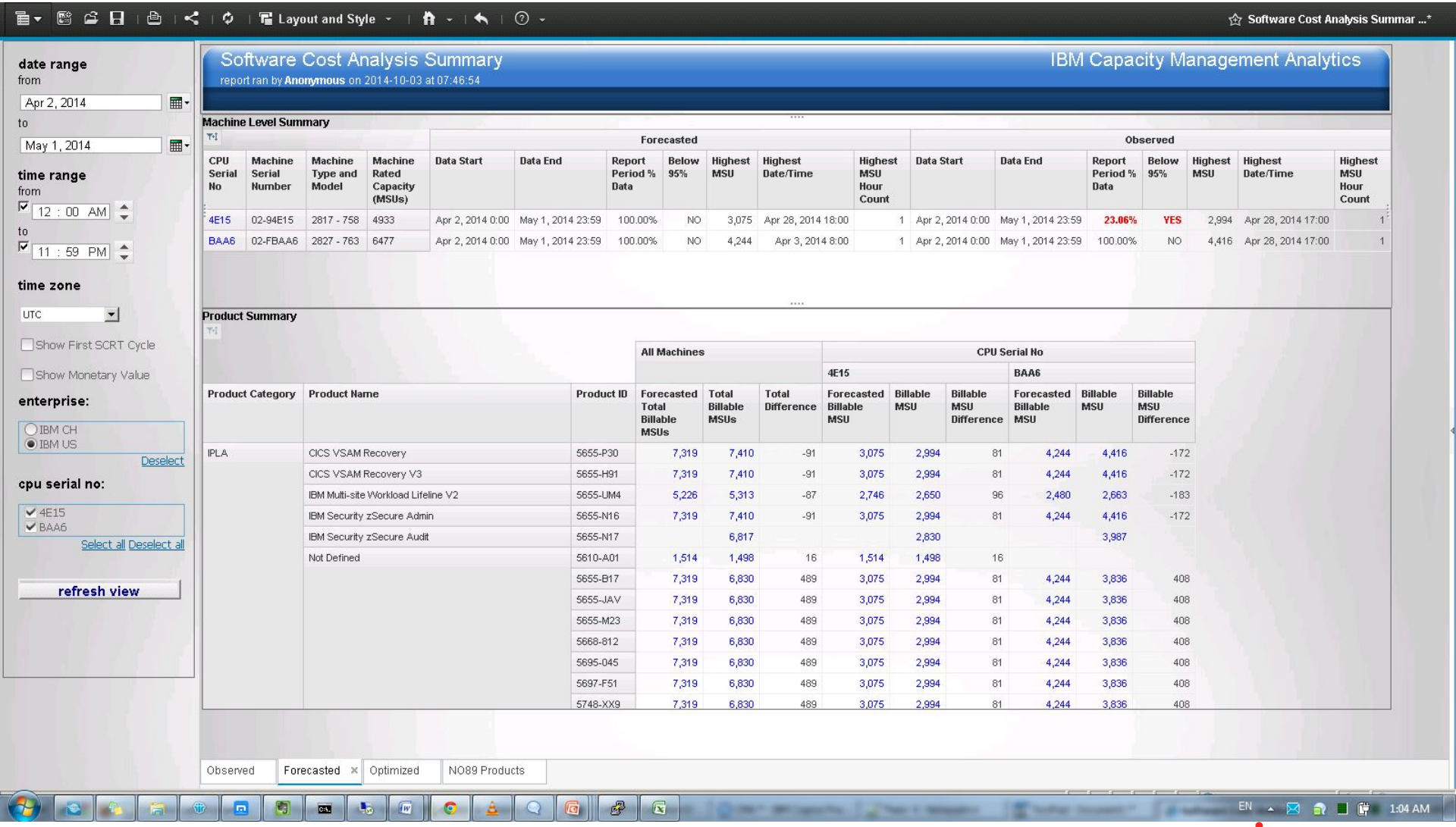
		All Machines		CPU Serial No			
				4E15		BAA6	
Product Name	Product ID	Total Billable MSUs	Monetary Total (USD)	Billable MSU	Monetary Value	Billable MSU	Monetary Value
CICS TS for z/OS V4	5655-S97	5,816	321,530.00	2,633	159,390.00	3,183	162,140.00
DB2 10 for z/OS	5605-DB2	6,830	88,650.00	2,994	42,220.00	3,836	46,430.00

No Data Available for z/OS Summary for zNALC and Traditional Workloads Table

Observed | Forecasted | Optimized | NO89 Products

EN 11:30 PM

Software Cost Analysis – Summary Forecast



Layout and Style | Software Cost Analysis Summar ...*

date range
from
Apr 2, 2014
to
May 1, 2014

time range
from
12 : 00 AM
to
11 : 59 PM

time zone
UTC

Show First SCRT Cycle

Show Monetary Value

enterprise:
IBM CH
IBM US
Deselect

cpu serial no:
4E15
BAA6
Select all Deselect all

refresh view

Software Cost Analysis Summary

report ran by **Anonymous** on 2014-10-03 at 07:46:54

IBM Capacity Management Analytics

Machine Level Summary

				Forecasted							Observed						
CPU Serial No	Machine Serial Number	Machine Type and Model	Machine Rated Capacity (MSUs)	Data Start	Data End	Report Period % Data	Below 95%	Highest MSU	Highest Date/Time	Highest MSU Hour Count	Data Start	Data End	Report Period % Data	Below 95%	Highest MSU	Highest Date/Time	Highest MSU Hour Count
4E15	02-94E15	2817 - 758	4933	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	3,075	Apr 28, 2014 18:00	1	Apr 2, 2014 0:00	May 1, 2014 23:59	23.06%	YES	2,994	Apr 28, 2014 17:00	1
BAA6	02-FBAA6	2827 - 763	6477	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	4,244	Apr 3, 2014 8:00	1	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	4,416	Apr 28, 2014 17:00	1

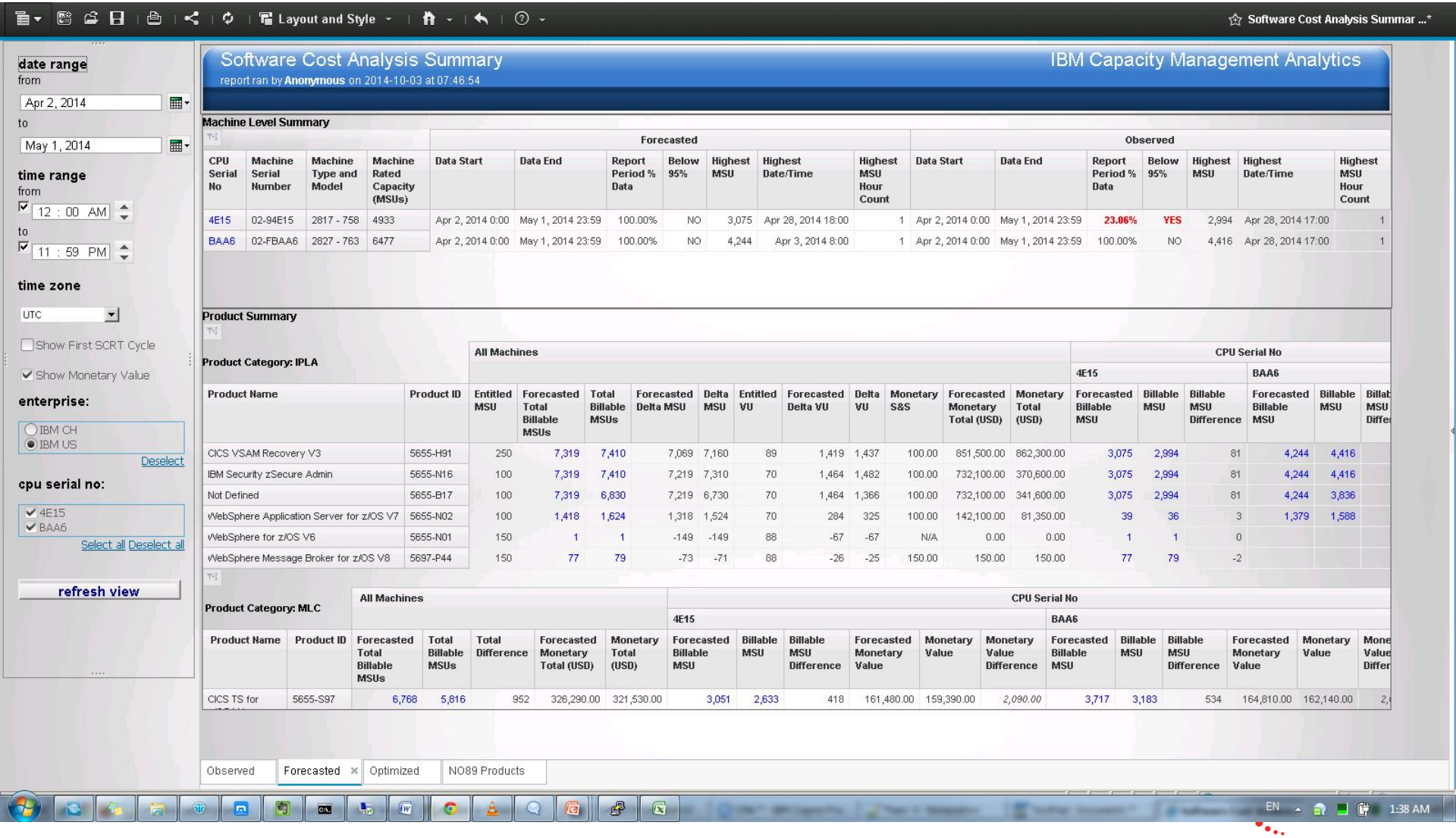
Product Summary

			All Machines			CPU Serial No					
						4E15			BAA6		
Product Category	Product Name	Product ID	Forecasted Total Billable MSUs	Total Billable MSUs	Total Difference	Forecasted Billable MSU	Billable MSU	Billable MSU Difference	Forecasted Billable MSU	Billable MSU	Billable MSU Difference
IPLA	CICS VSAM Recovery	5655-P30	7,319	7,410	-91	3,075	2,994	81	4,244	4,416	-172
	CICS VSAM Recovery V3	5655-H91	7,319	7,410	-91	3,075	2,994	81	4,244	4,416	-172
	IBM Multi-site Workload Lifeline V2	5655-UM4	5,226	5,313	-87	2,746	2,650	96	2,480	2,663	-183
	IBM Security zSecure Admin	5655-N16	7,319	7,410	-91	3,075	2,994	81	4,244	4,416	-172
	IBM Security zSecure Audit	5655-N17		6,817			2,830			3,987	
	Not Defined	5610-A01	1,514	1,498	16	1,514	1,498	16			
		5655-B17	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5655-JAV	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5655-M23	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5668-812	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5695-045	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5697-F51	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408
		5748-XX9	7,319	6,830	489	3,075	2,994	81	4,244	3,836	408

Observed | Forecasted | Optimized | NO89 Products

EN 1:04 AM

Software Cost Analysis – Summary Forecast $



Layout and Style | Software Cost Analysis Summar ...*

date range
from
Apr 2, 2014
to
May 1, 2014

time range
from
12 : 00 AM
to
11 : 59 PM

time zone
UTC

Show First SCRT Cycle
Show Monetary Value

enterprise:
IBM CH
IBM US
Deselect

cpu serial no:
4E15
BAA6
Select all Deselect all

refresh view

Software Cost Analysis Summary

report ran by **Anonymous** on 2014-10-03 at 07:46:54

IBM Capacity Management Analytics

Machine Level Summary

CPU Serial No	Machine Serial Number	Machine Type and Model	Machine Rated Capacity (MSUs)	Forecasted: Data Start	Forecasted: Data End	Forecasted: Report Period % Data	Forecasted: Below 95%	Forecasted: Highest MSU	Forecasted: Highest Date/Time	Forecasted: Highest MSU Hour Count	Observed: Data Start	Observed: Data End	Observed: Report Period % Data	Observed: Below 95%	Observed: Highest MSU	Observed: Highest Date/Time	Observed: Highest MSU Hour Count
4E15	02-94E15	2817 - 758	4933	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	3,075	Apr 28, 2014 18:00	1	Apr 2, 2014 0:00	May 1, 2014 23:59	23.06%	YES	2,994	Apr 28, 2014 17:00	1
BAA6	02-FBAA6	2827 - 763	6477	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	4,244	Apr 3, 2014 8:00	1	Apr 2, 2014 0:00	May 1, 2014 23:59	100.00%	NO	4,416	Apr 28, 2014 17:00	1

Product Summary

Product Category: IPLA

Product Name	Product ID	All Machines: Entitled MSU	Forecasted Total Billable MSUs	Total Billable MSUs	Forecasted Delta MSU	Delta MSU	Entitled VU	Forecasted Delta VU	Delta VU	Monetary S&S	Forecasted Monetary Total (USD)	Monetary Total (USD)	CPU Serial No: 4E15 Forecasted Billable MSU	4E15 Billable MSU	4E15 Billable MSU Difference	CPU Serial No: BAA6 Forecasted Billable MSU	BAA6 Billable MSU	BAA6 Billable MSU Diffe
CICS VSAM Recovery V3	5655-H91	250	7,319	7,410	7,069	7,160	89	1,419	1,437	100.00	851,500.00	862,300.00	3,075	2,994	81	4,244	4,416	
IBM Security zSecure Admin	5655-N16	100	7,319	7,410	7,219	7,310	70	1,464	1,482	100.00	732,100.00	370,600.00	3,075	2,994	81	4,244	4,416	
Not Defined	5655-B17	100	7,319	6,830	7,219	6,730	70	1,464	1,366	100.00	732,100.00	341,600.00	3,075	2,994	81	4,244	3,836	
WebSphere Application Server for z/OS V7	5655-N02	100	1,418	1,624	1,318	1,524	70	284	325	100.00	142,100.00	81,350.00	39	36	3	1,379	1,588	
WebSphere for z/OS V6	5655-N01	150	1	1	-149	-149	88	-67	-67	N/A	0.00	0.00	1	1	0			
WebSphere Message Broker for z/OS V8	5697-P44	150	77	79	-73	-71	88	-26	-25	150.00	150.00	150.00	77	79	-2			

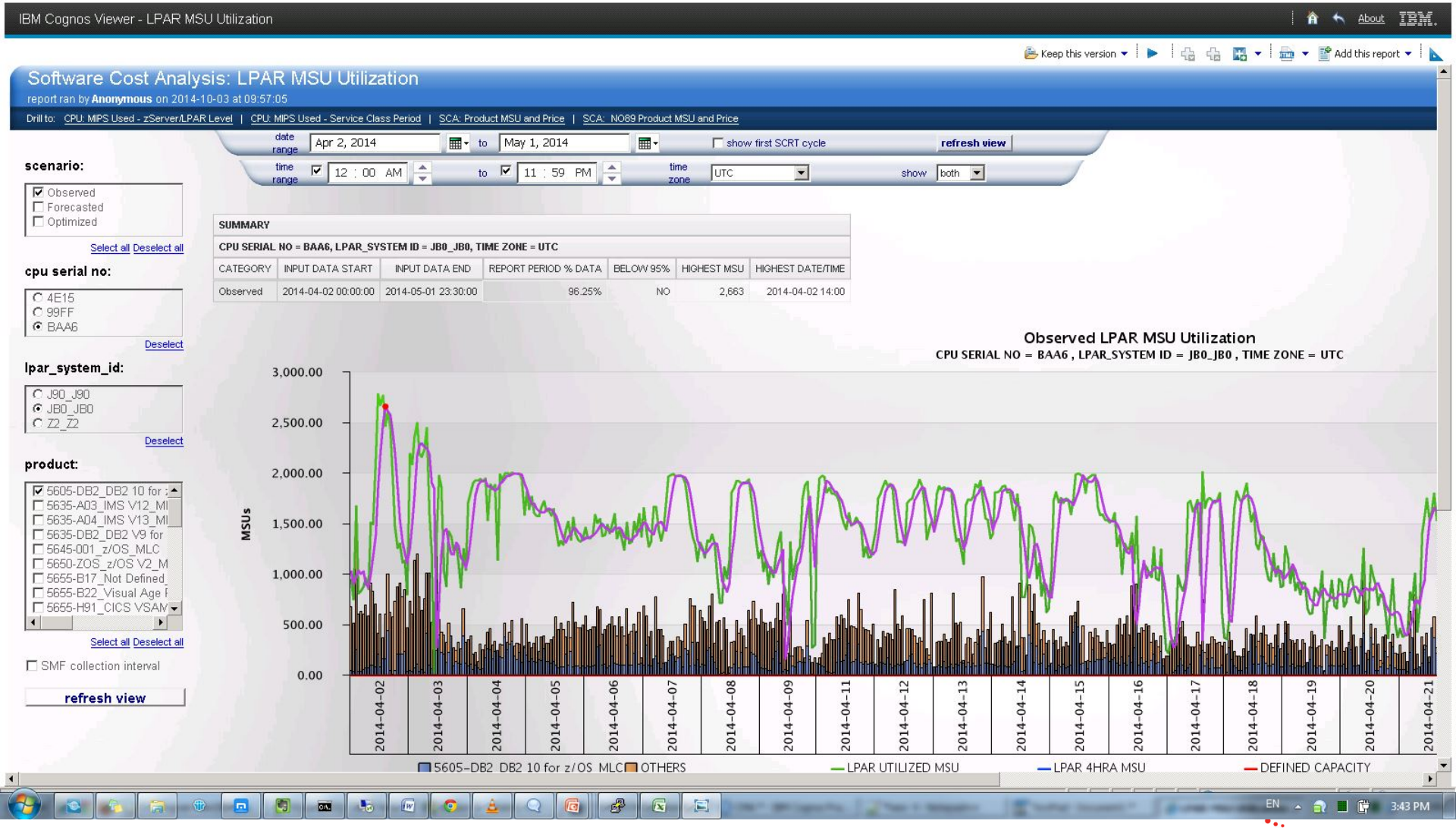
Product Category: MLC

Product Name	Product ID	All Machines: Forecasted Total Billable MSUs	Total Billable MSUs	Total Difference	Forecasted Monetary Total (USD)	Monetary Total (USD)	CPU Serial No: 4E15 Forecasted Billable MSU	4E15 Billable MSU	4E15 Billable MSU Difference	4E15 Forecasted Monetary Value	4E15 Monetary Value	4E15 Monetary Value Difference	CPU Serial No: BAA6 Forecasted Billable MSU	BAA6 Billable MSU	BAA6 Billable MSU Difference	BAA6 Forecasted Monetary Value	BAA6 Monetary Value	Mone Value Differ
CICS TS for	5655-S97	6,768	5,816	952	326,290.00	321,530.00	3,051	2,633	418	161,480.00	159,390.00	2,090.00	3,717	3,183	534	164,810.00	162,140.00	2,

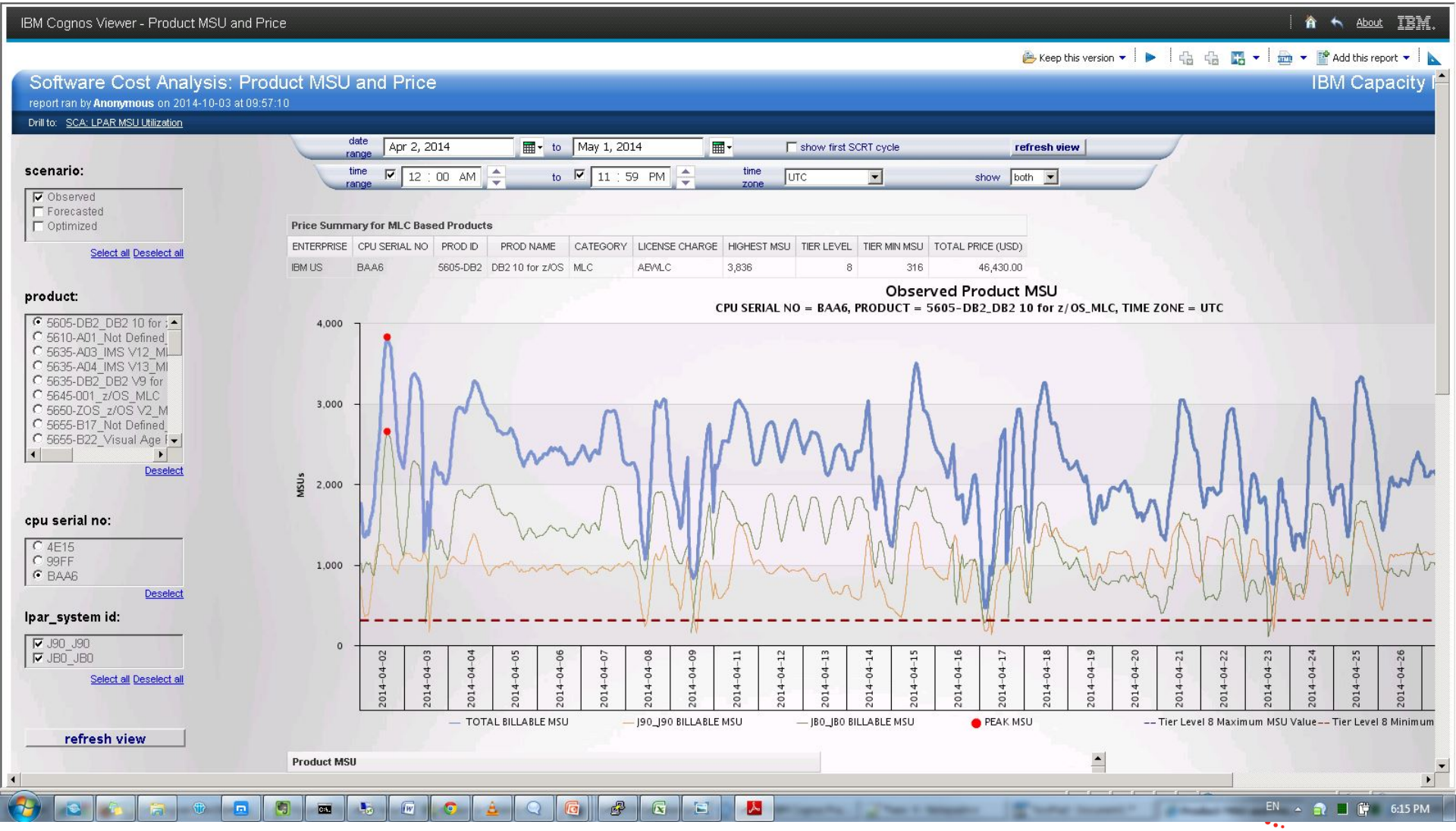
Observed | Forecasted | Optimized | NO89 Products

EN 1:38 AM

Software Cost Analysis – LPAR MSU

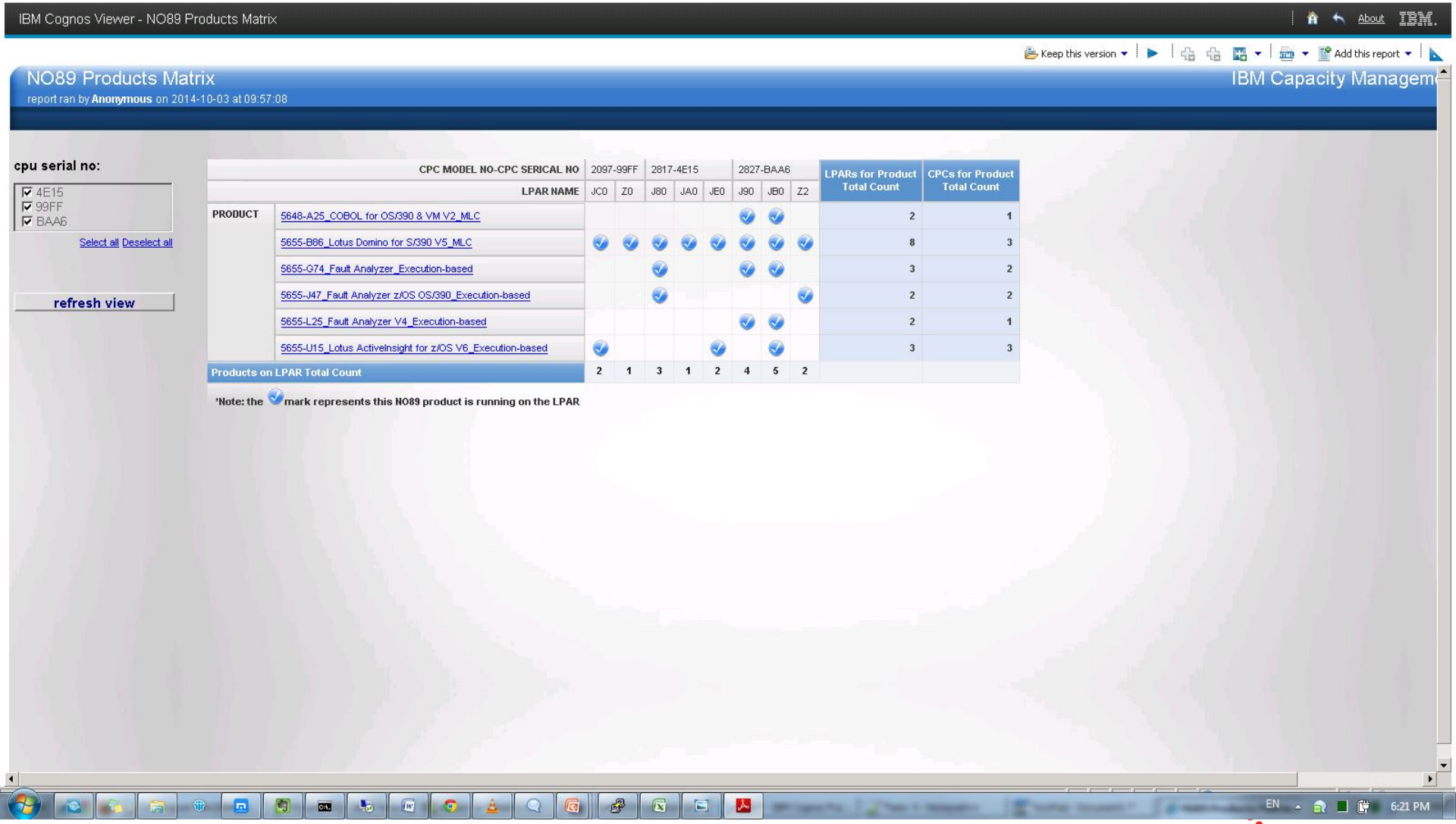


Software Cost Analysis – Product MSU

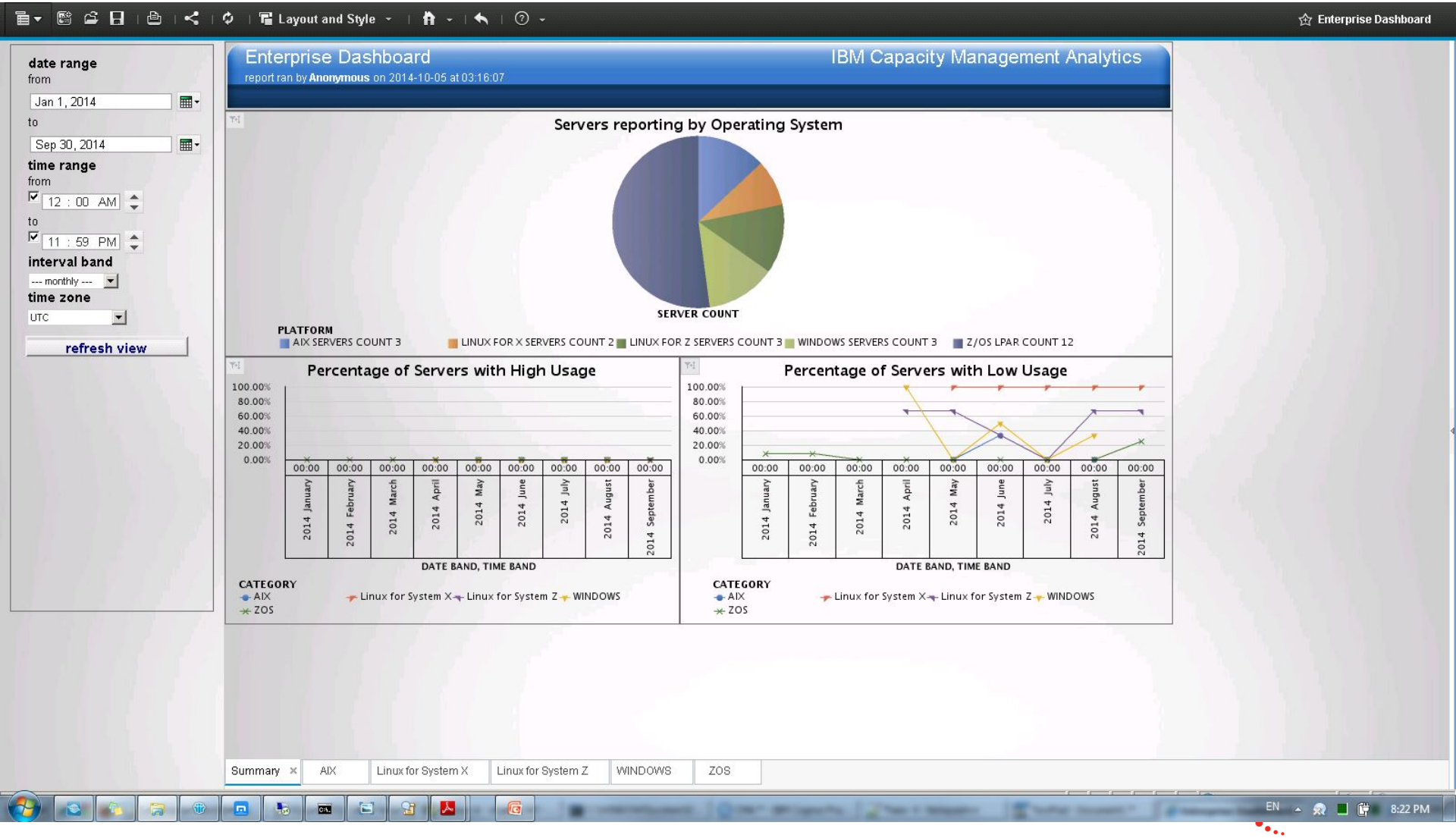


Software Cost Analysis – NO89 MSU

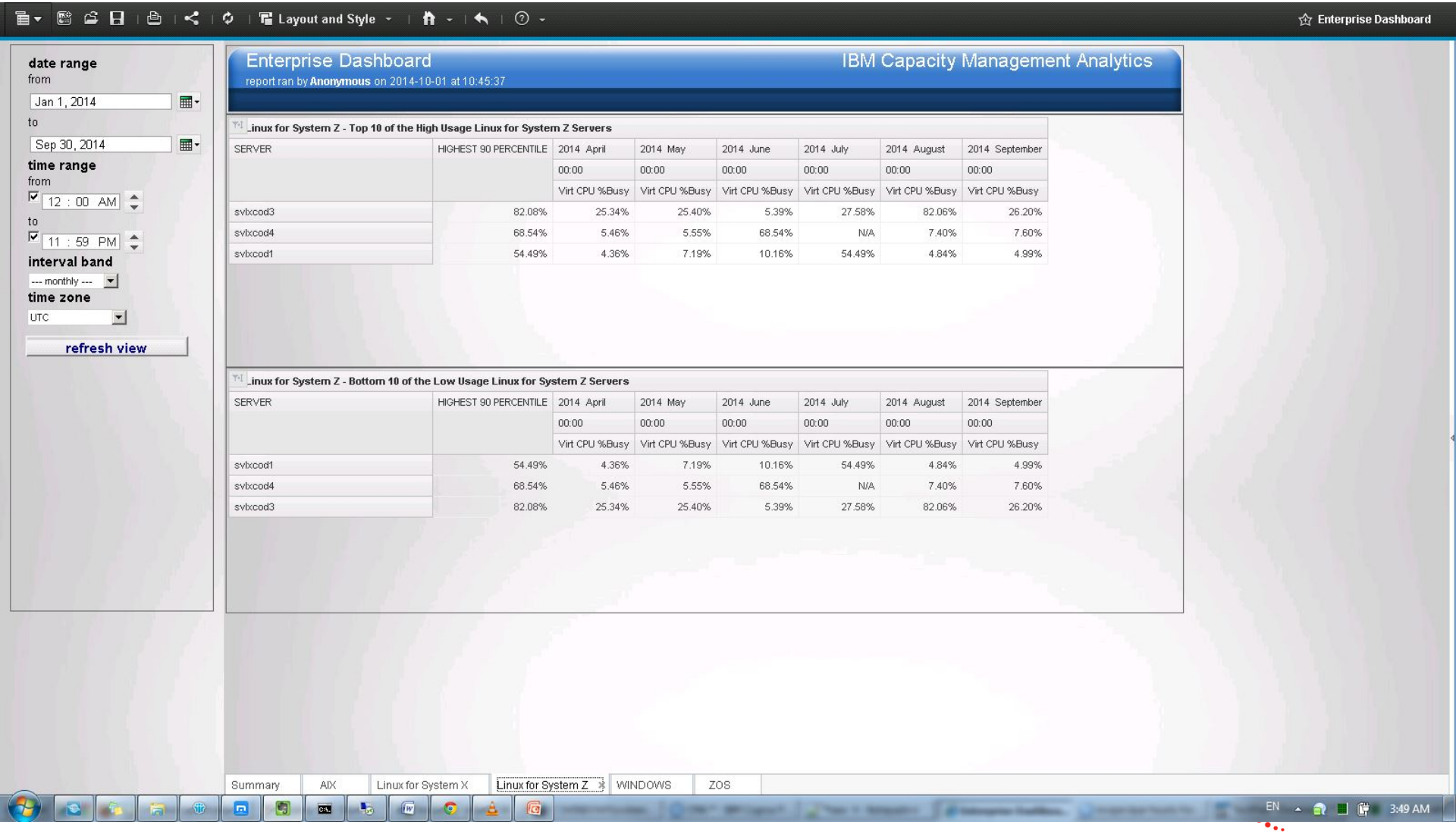
Software Cost Analysis – NO89 Matrix



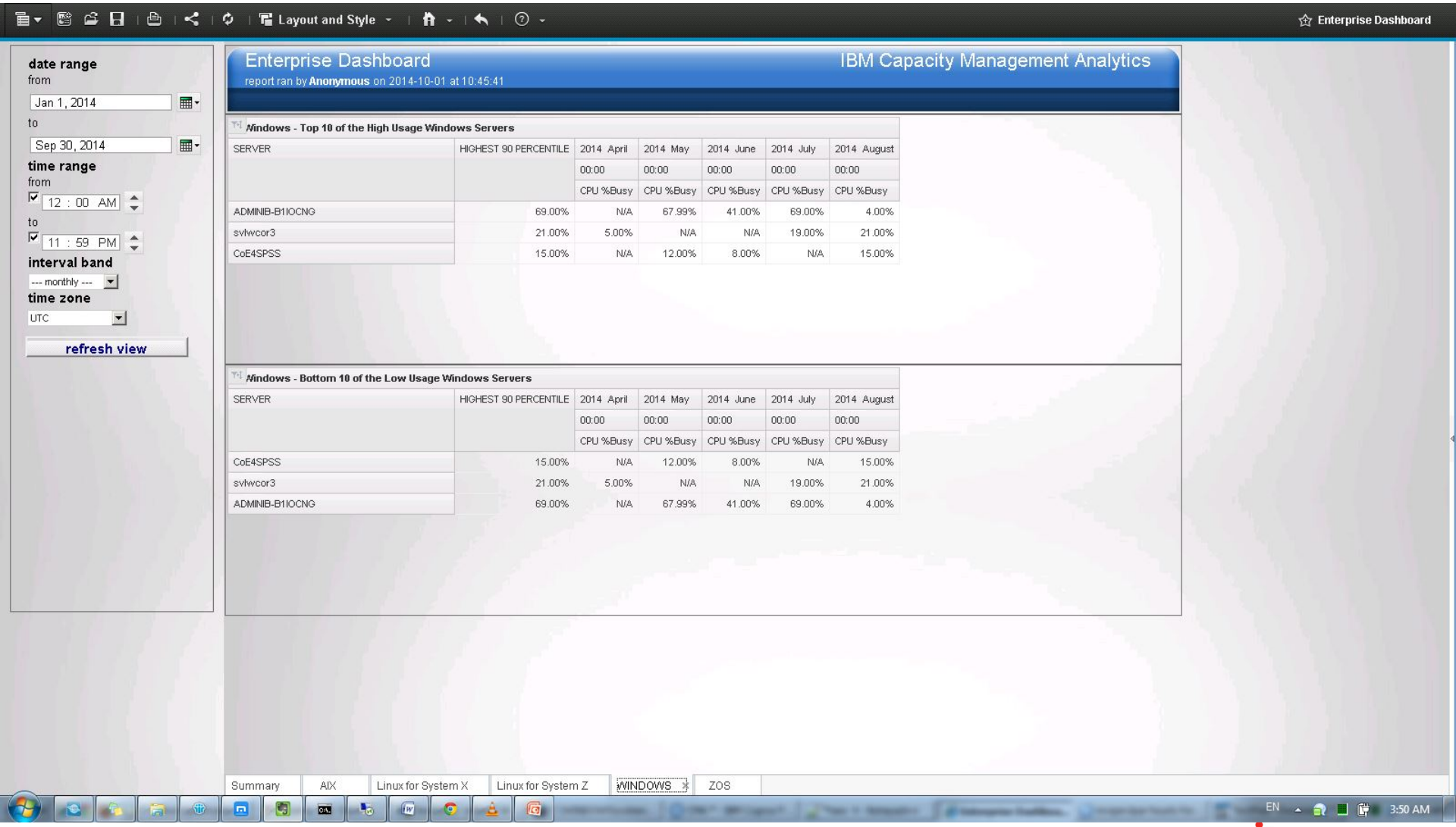
Enterprise Dashboard in workspace – Summay



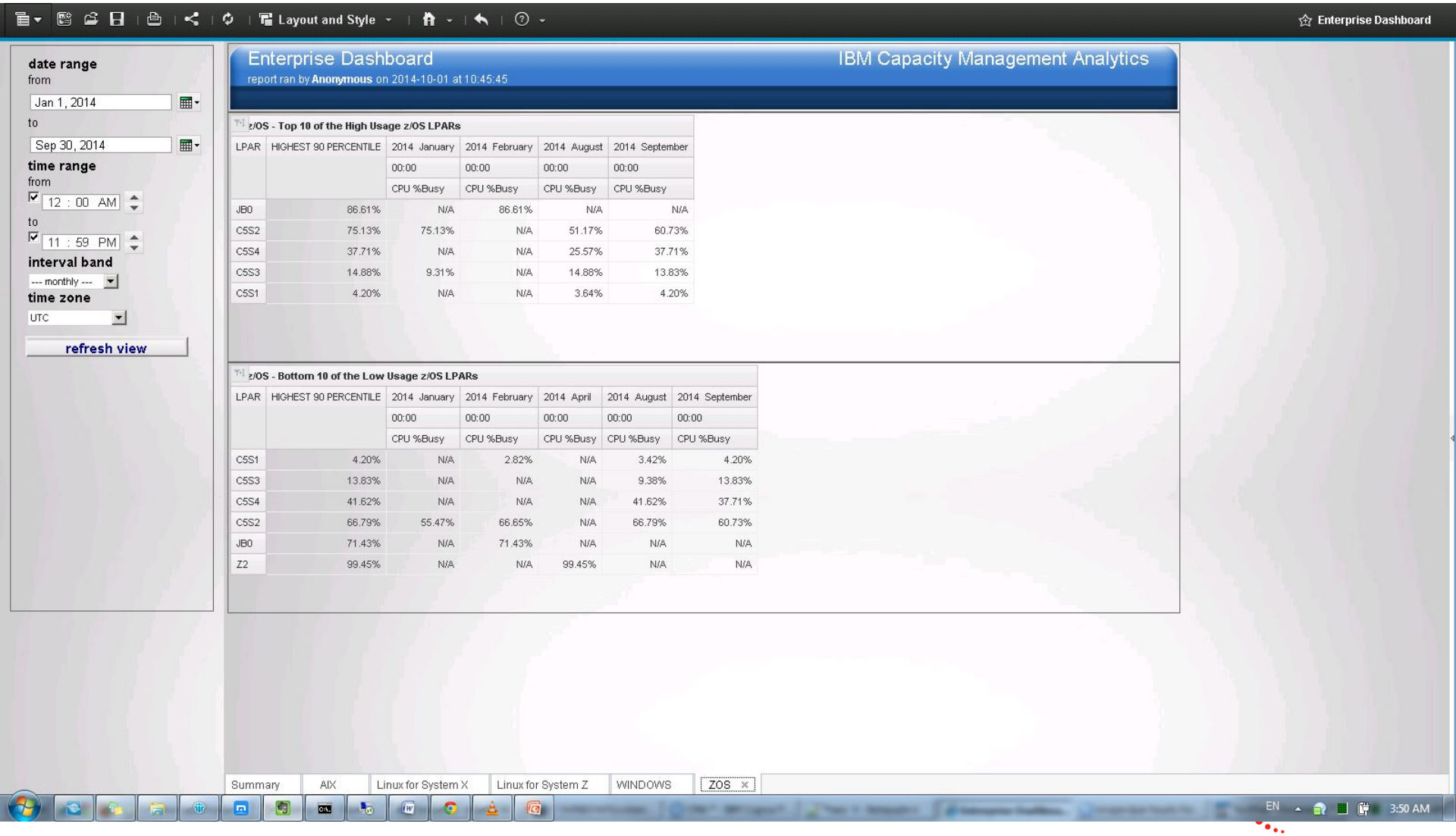
Enterprise Dashboard in workspace – Linux for System z



Enterprise Dashboard in workspace – Windows

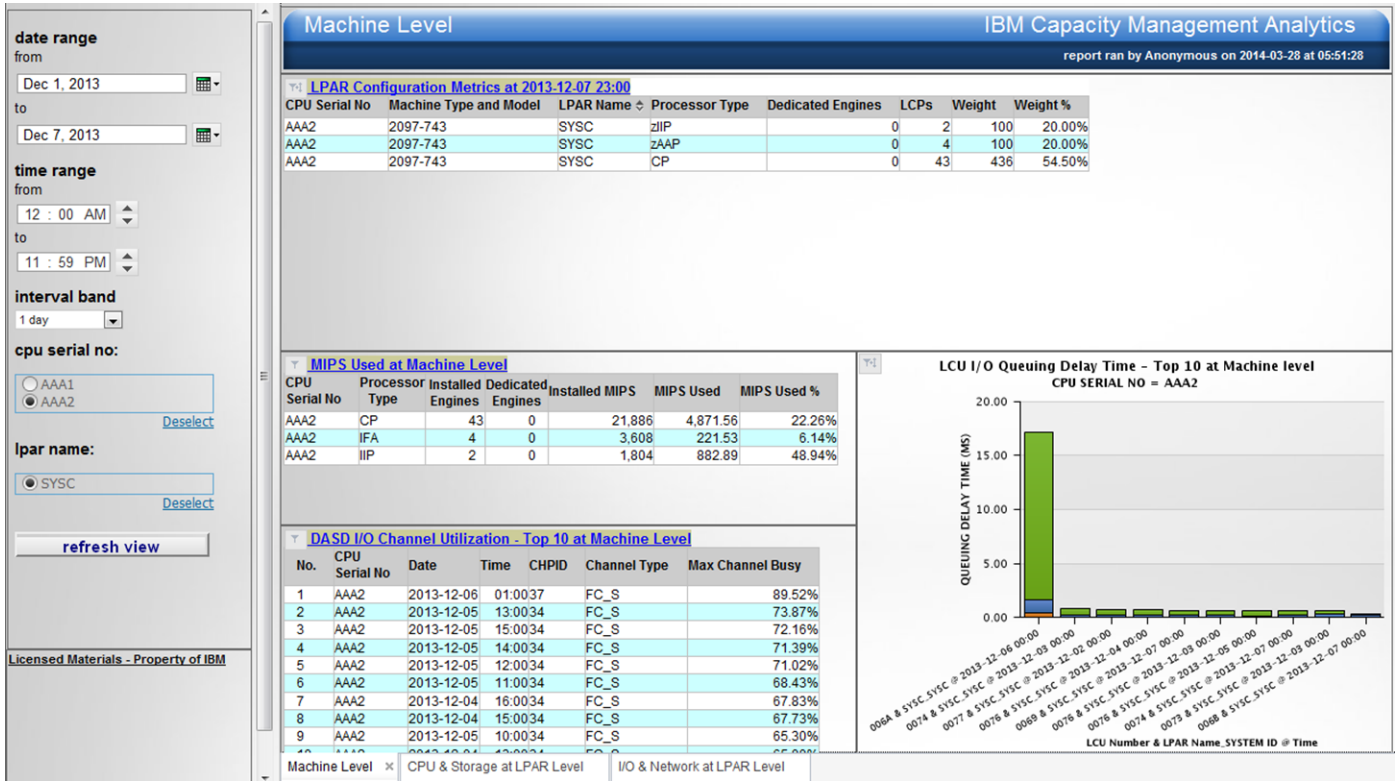


Enterprise Dashboard in workspace – z/OS



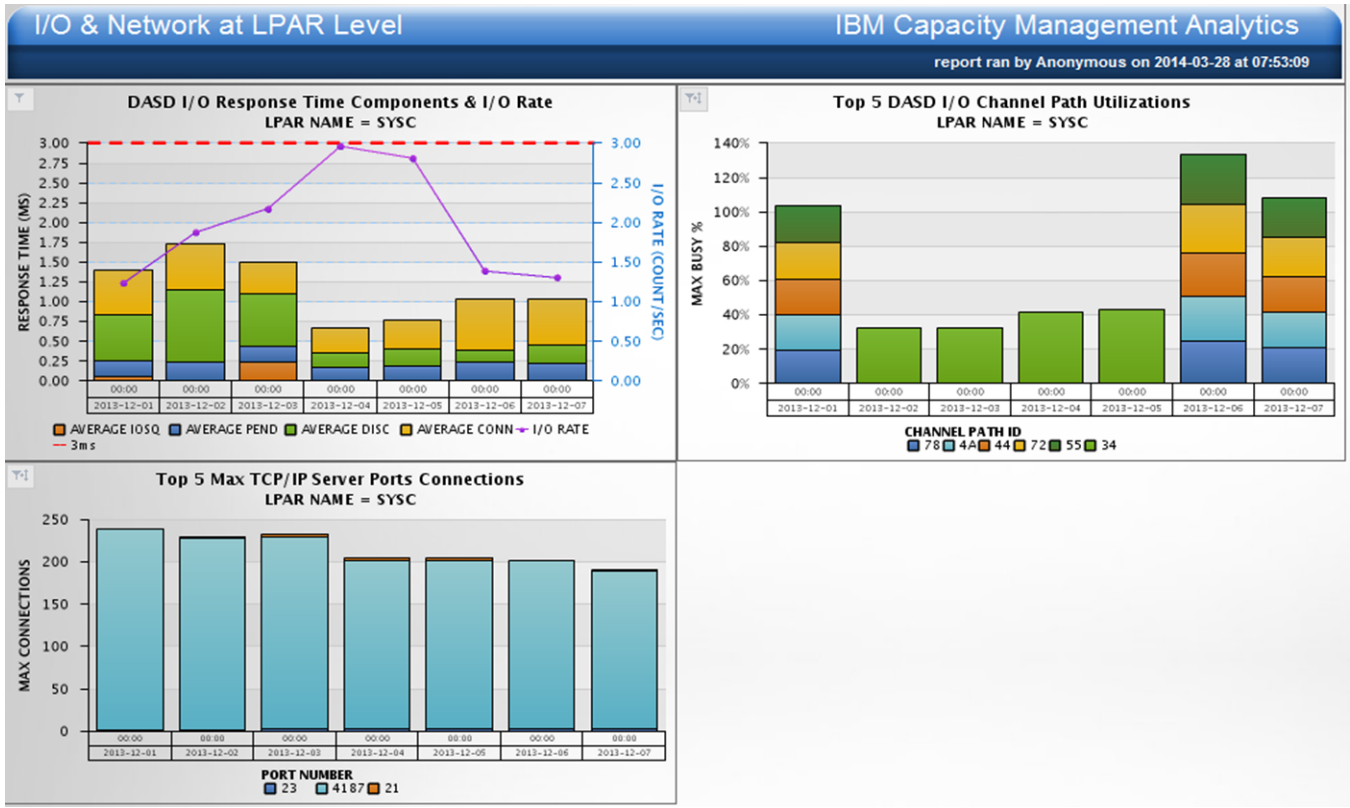
zEnterprise Monitoring Dashboard – Machine Level

- zServer monitoring dashboard based on Cognos workspace
- Partition configuration details
- Channel and logical control unit activity & queuing



zEnterprise Monitoring Dashboard – I/O & Network

- Also based on Cognos workspace
- DASD statistics
- TCP/IP connections by port number



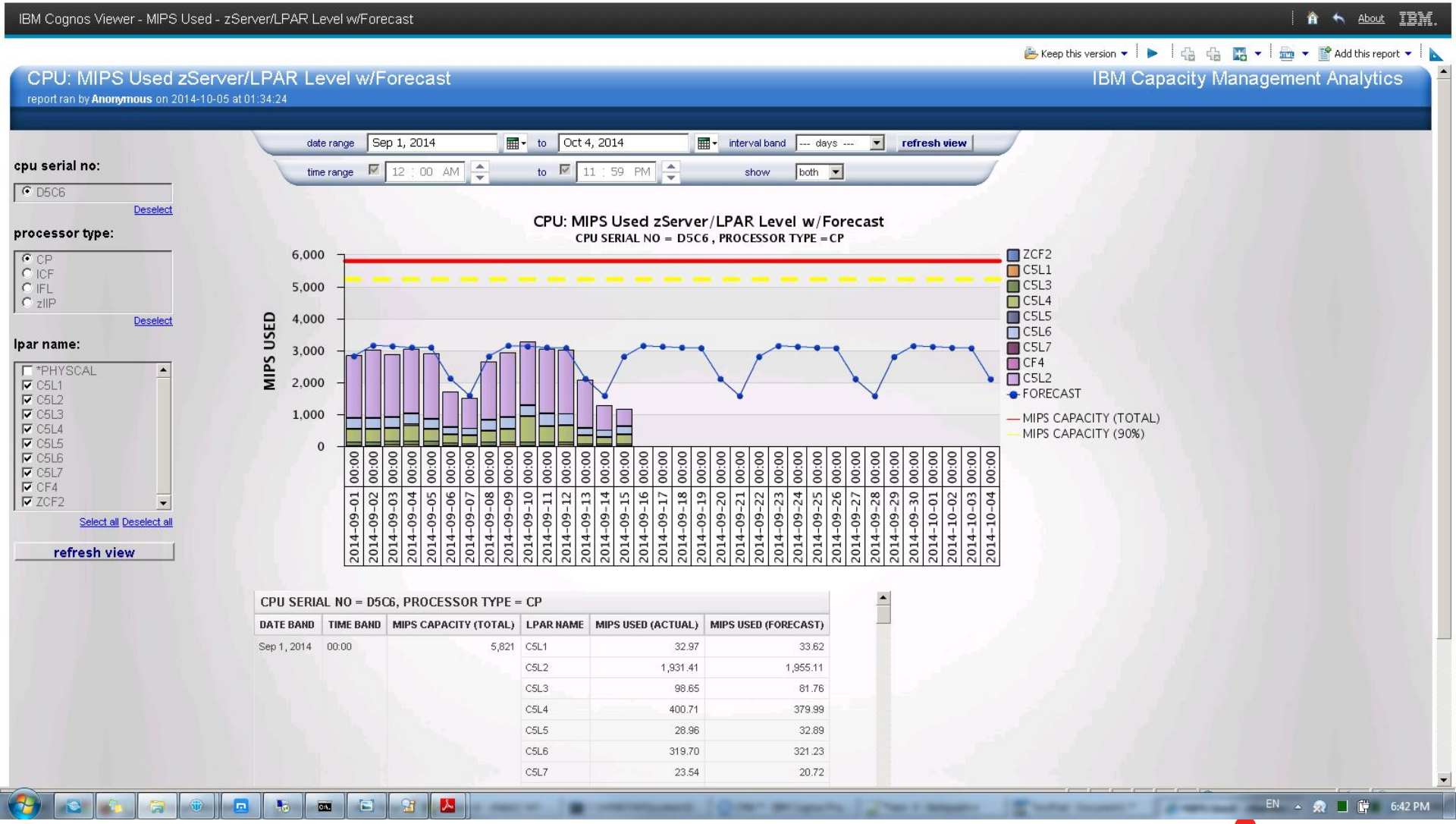
zIIP/zAAP What if Workspace

- System z Integrated Information Processor (zIIP) & System z Application Assist Processor (zAAP)
- Specialty processors have lower hardware acquisition costs and zIIP's & zAAP's don't impact software pricing based on capacity

Question: Are these resources being properly leveraged?

* What if not based on Cognos TM1

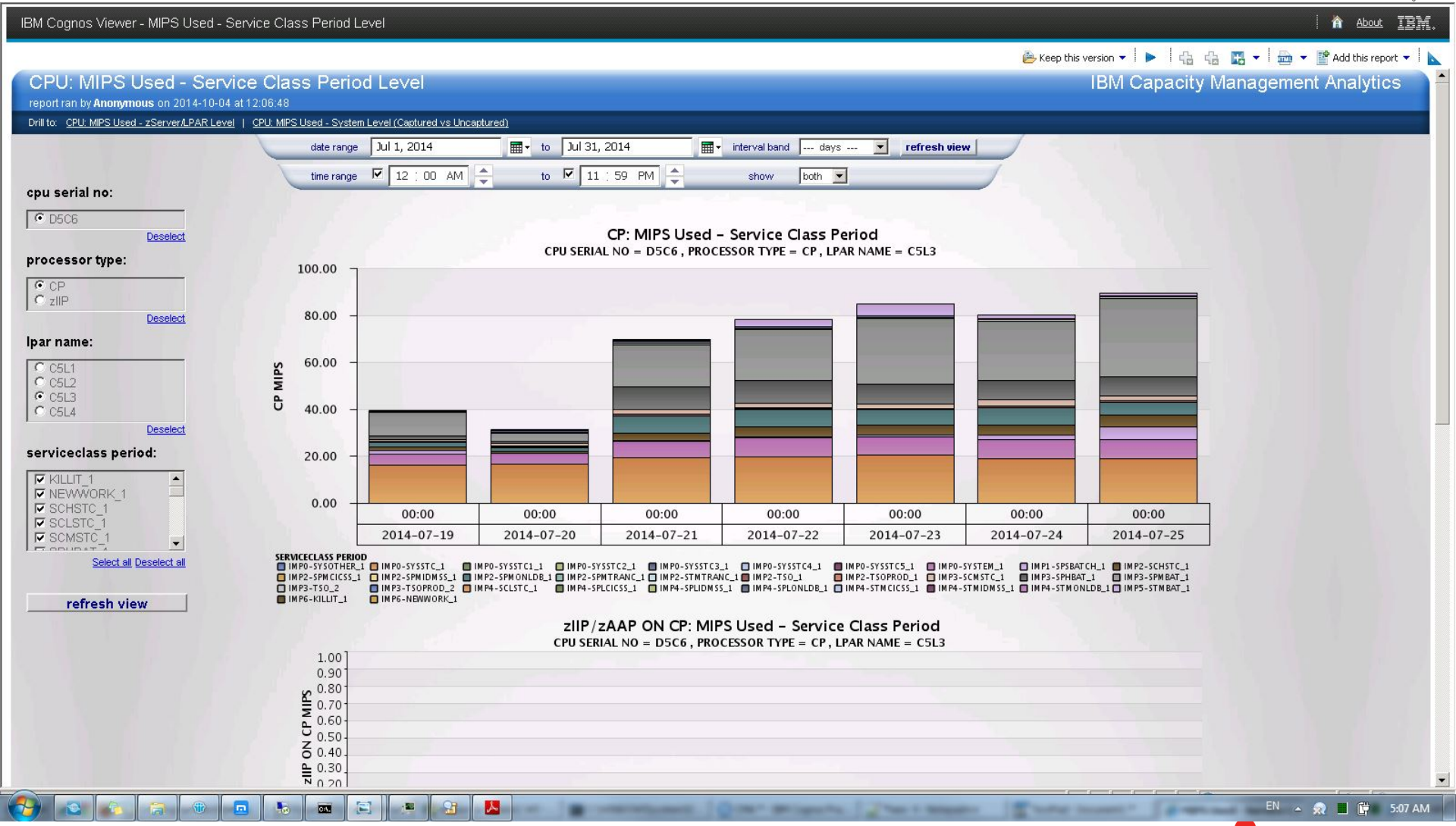
zServer LPAR Level MIPS Used with Forecast



CPU SERIAL NO = D5C6, PROCESSOR TYPE = CP

DATE BAND	TIME BAND	MIPS CAPACITY (TOTAL)	LPAR NAME	MIPS USED (ACTUAL)	MIPS USED (FORECAST)
Sep 1, 2014	00:00	5,821	C5L1	32.97	33.62
			C5L2	1,931.41	1,955.11
			C5L3	98.65	81.76
			C5L4	400.71	379.99
			C5L5	28.96	32.89
			C5L6	319.70	321.23
			C5L7	23.54	20.72

MIPS Used by Service Class Period Level



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