

CA SYSVIEW 13.7 CA Cross-Enterprise APM 3.0 Update

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CA Technologies

Wednesday, August 14, 2013 6:00 PM
Session Number 14044



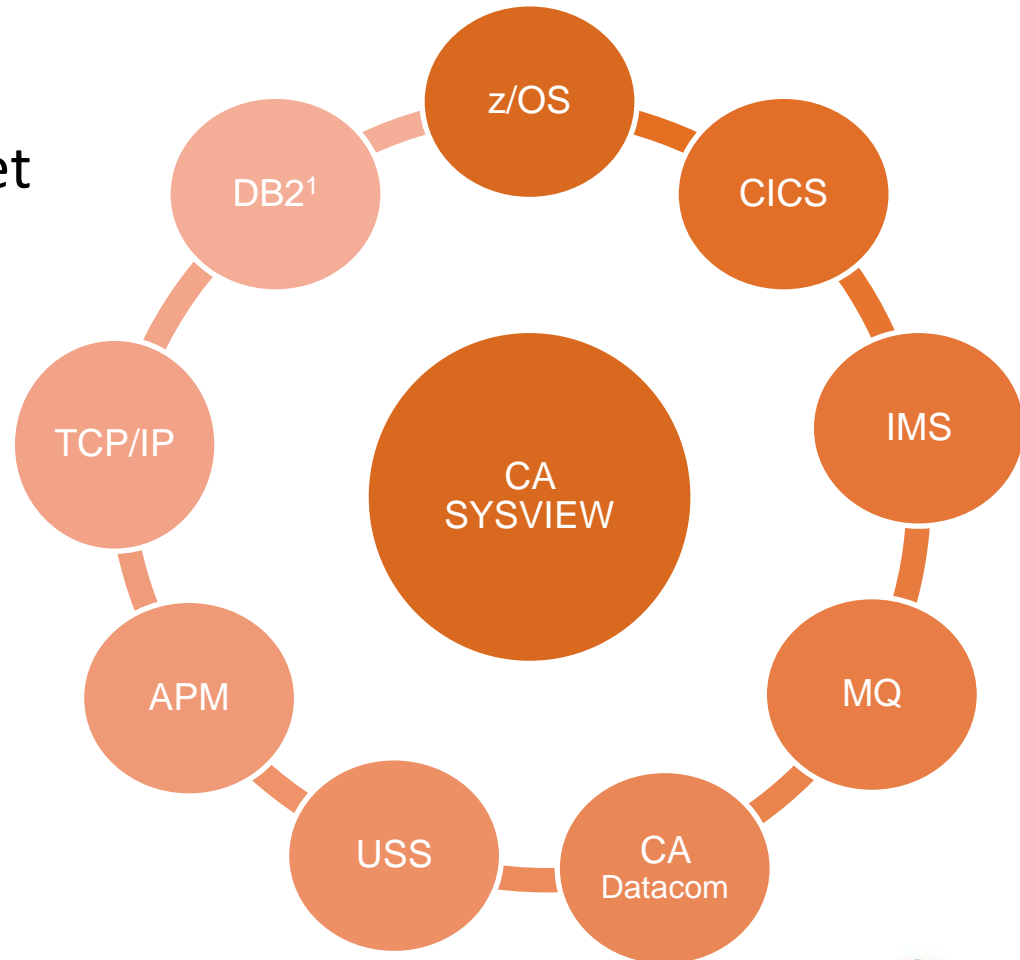
Agenda

- CA SYSVIEW 13.7 Product Update
 - Solution overview
 - New features
 - Product Roadmap
- CA Cross-Enterprise APM 3.0 Product Update
 - Solution overview
 - New features
 - Product Roadmap
- Customer Experience

CA SYSVIEW Overview

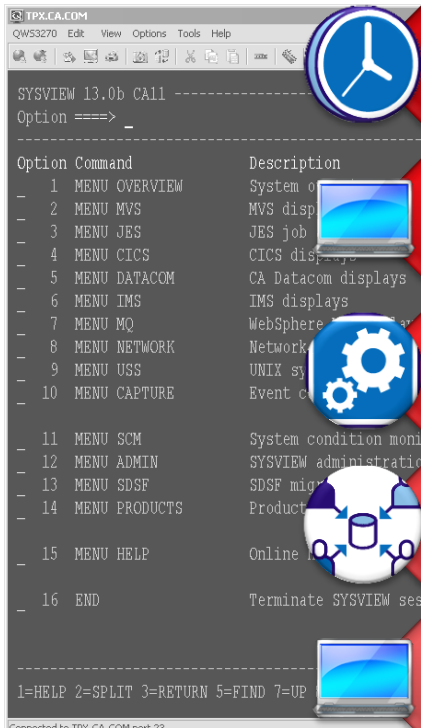
CA SYSVIEW is a real-time and historical mainframe system monitor.

- Multiple optional interface options to meet your needs
 - Traditional 3270 “green screen” VTAM, ISPF, TSO, CICS or CA Roscoe.
- Graphical Management Interface (GMI)
 - Windows client
 - Browser based



1 – DB2 feature requires CA Insight for DB2

CA SYSVIEW key features




TPX.CA.COM
QWS3270 Edit View Options Tools Help
SYSVIEW 13.0b CA11
Option ==>>> _


Option	Command	Description
1	MENU OVERVIEW	System overview
2	MENU MVS	MVS displays
3	MENU JES	JES job displays
4	MENU CICS	CICS displays
5	MENU DATACOM	CA Datacom displays
6	MENU IMS	IMS displays
7	MENU MQ	WebSphere MQ displays
8	MENU NETWORK	Network displays
9	MENU USS	UNIX system displays
10	MENU CAPTURE	Event capture displays
11	MENU SCM	System condition monitor
12	MENU ADMIN	SYSVIEW administration
13	MENU SDSF	SDSF migration
14	MENU PRODUCTS	Product displays
15	MENU HELP	Online help
16	END	Terminate SYSVIEW session

1=HELP 2=SPLIT 3=RETURN 5=FIND 7=UP


Connected to TPX.CA.COM port 23




Real-time and historical mainframe system monitor




Centralized threshold based alerting and data capture




Drill-down problem determination




Multiple interface options



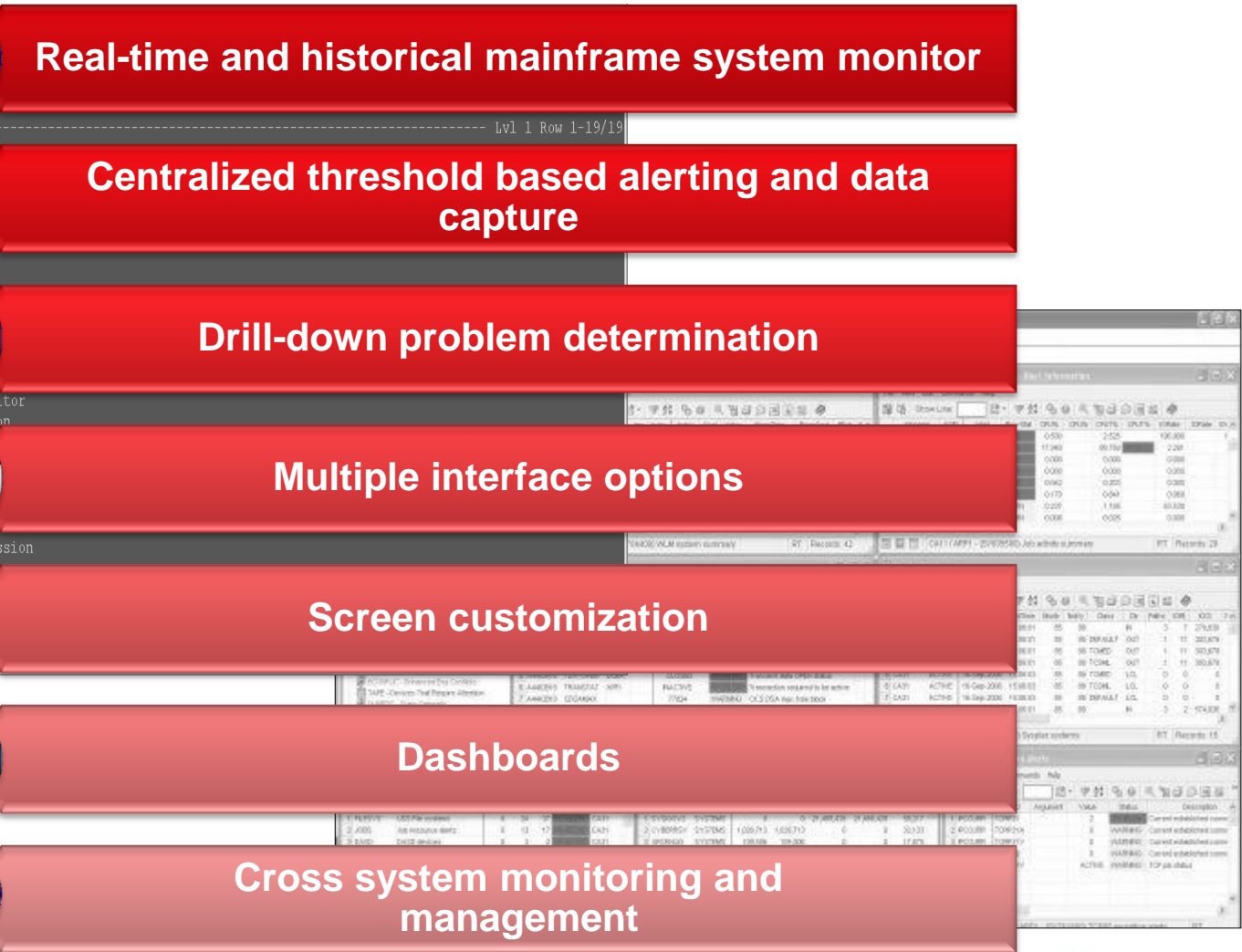
Screen customization



Dashboards



Cross system monitoring and management



Multiple screenshots of the CA SYSVIEW interface showing various data tables and system status indicators. The tables contain columns for system names, status, and other metrics. For example, one table shows system names like 'CA11' and 'CA21' with associated status and performance data.

CA SYSVIEW Overview

- Integration with CA Insight for DB2 for DB2 information within the CA SYSVIEW panels (r13.5)
- zIIP offload of the CA SYSVIEW data collection and user address space (r13.0 and r.13.5)
- Integration with CA OPS/MVS for easy Automation from alerts
- Integration with CA Mainframe Application Tuner for command line or threshold based invocation of a MAT session
- Integration with CA APM for end to end application monitoring

CA SYSVIEW r13.7

New\Enhanced Features

- CA Chorus Infrastructure Management for Networks and Systems integration
 - The CA products CA SYSVIEW, CA NetMaster NM for TCP/IP, and CA Insight contribute to this role to offer the following usability features:
 - Time Series data graphing
 - Real-time network and systems performance reporting
 - Real-time access to state and event data
 - Object-based navigation for near real-time performance monitoring
 - In-context domain documentation
 - Hover text

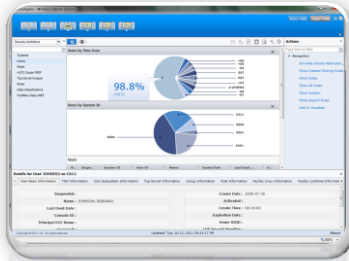
CA SYSVIEW r13.7

CA Chorus Integration



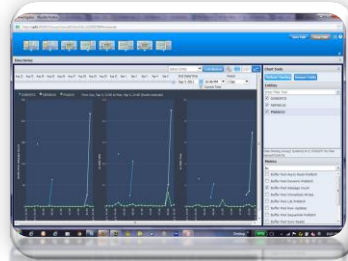
Integrated Workspace

- Singular interaction model
- Fast Learning Curve



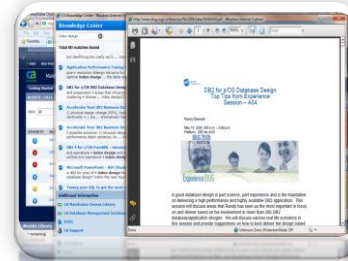
Role-Based Navigation

- Matches Job Functions
- Leverage resources across platforms



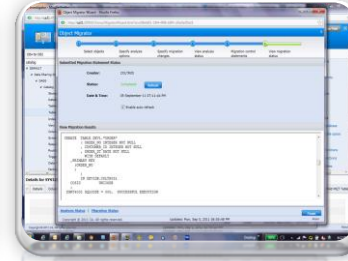
Graphical Diagnostics

- Data in human readable formats
- Solve problems faster



Knowledge Management

- Community knowledge and expertise at users fingertips
- Increases the whole team's efficiency

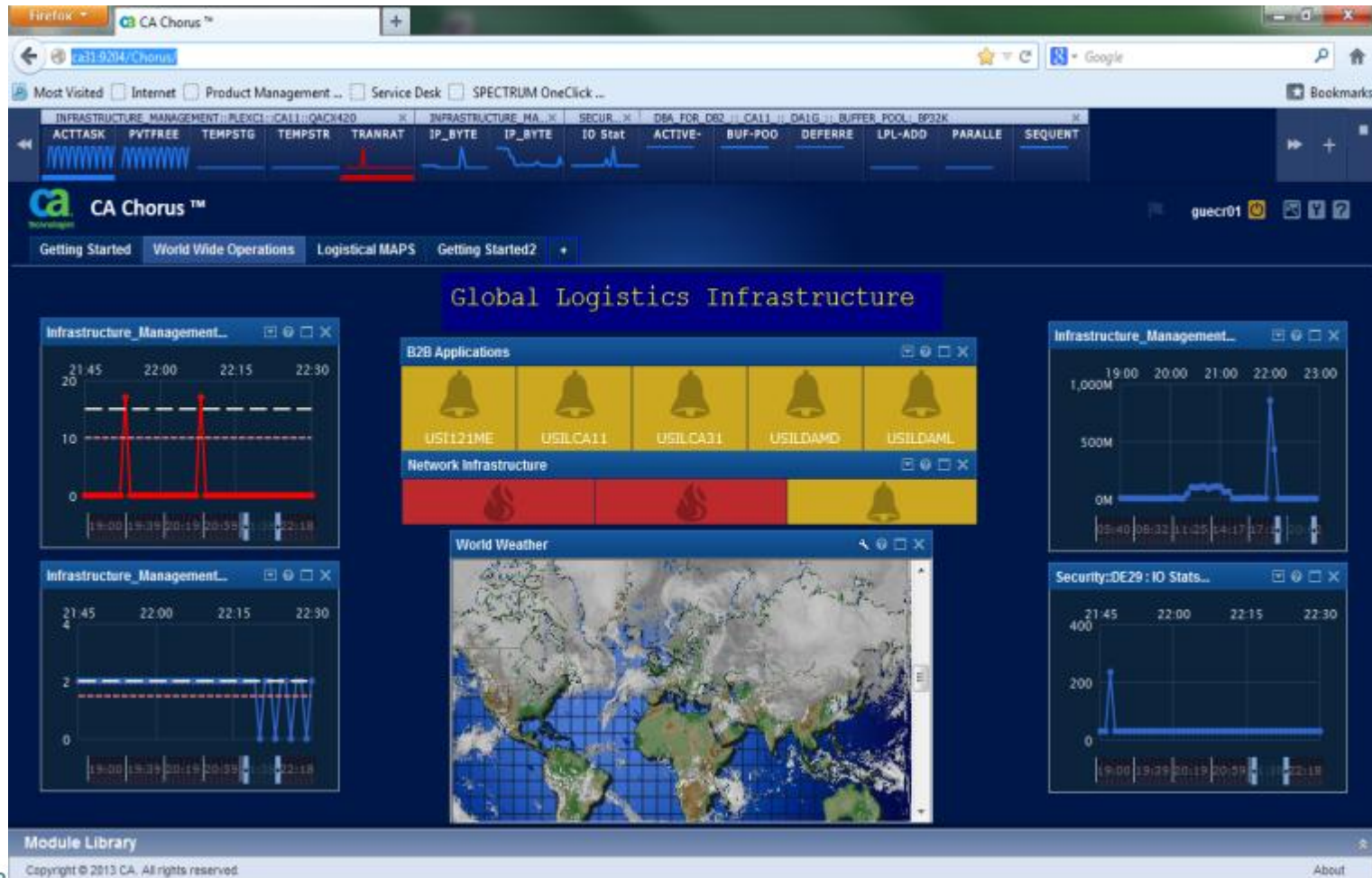


Process Automation

- Wizard-like process tools
- Reduces possibility of errors

CA SYSVIEW r13.7

- CA Chorus integration for Infrastructure Management



CA SYSVIEW r13.7

New\Enhanced Features

- New PARMLIB member replaces GEN assembly/link process. (GSVXssid, default GSVXGSVX)
 - This allows you to easily run multiple instances and versions of SYSVIEW on one LPAR
 - This allows you to easily add or remove SYSVIEW Options and Features
- Deployment of CA SYSVIEW using CA Chorus Software Manager - CSM
 - (Formerly CA Mainframe Software Manager – MSM)

CA SYSVIEW r13.7

- The installation process has been enhanced.
- **SYSVIEW LPA Library - CNM4BPLA**
 - The CA SYSVIEW installation now includes a new *hlq.CNM4BPLA* library that is in PDS format. The CNM4BPLA library contains modules that are required to be loaded into LPA using either of the following methods:
 - The Dynamic Install utility, GSVXINST
 - Permanently defining the modules to an IEAPLAXx member of SYS1.PARMLIB

CA SYSVIEW r13.7

- Enhanced SYSVIEW Administration features
 - The ASADMIN command displays information about the SYSVIEW address spaces running on your system. It shows the status of the various tasks running in those address spaces and provides line commands, such as START and STOP, that allow you to control the task execution.
 - Time Series Facility tasks necessary for CA Chorus integration have been added to ASADMIN
 - *MVSTSF*
 - *IMSTSF*
 - *MQTSF*
 - *CICSTSF*
 - *TSFLOGR*

CA SYSVIEW r13.7

- ASADMIN Panel

```

SYSVIEW ----- ASADMIN, Address Space Administration -----
Command =====> _                               Scroll *====> PAGE
----- Lvl 2 Row 46-60/216 Col 1-79/719
Formats DEFAULT CONFIG CPU REQUEST STORAGE SUMMARY ZIIP
Options NOCNFM SUMM SERV USER AUX NOSSID NORELS IJOB ITASK MODEL
-----
Cmd      Jobname  Task      Id        Status    Parms
-----
          SYSVIEW *        *        ACTIVE
          .      MAIN    MAIN    ACTIVE
          .      AMS     AMS     ACTIVE
          .      APPLMON          INACTIVE
          .      AUDIT   AUDIT   ACTIVE
          .      CICSLOGR          MODEL
          .      CICSLOGR CICSLOGR ACTIVE
          .      DATALIB DATALIB ACTIVE
          .      IMSCQS          INACTIVE
          .      IMSDATA IMSDATA ACTIVE
          .      IMSLOGR          MODEL
          .      IMSSPOC IMSSPOC ACTIVE
          .      IMSTSF  IMSTSF  ACTIVE
          .      JOBS    JOBS    ACTIVE
          .      MQSDATA MQSDATA ACTIVE
-----
1=HELP 2=SPLIT 3=RETURN 5=FIND 7=UP 8=DOWN 9=SWAP 10=LEFT 11=RIGHT 12=RECALL

```

CA SYSVIEW r13.7

- Control Statements within PARM members
 - Allows you to add if, then, else logic
 - EQ, GT, LT, NE, CN, NC
 - Example:)IF 'SYSA SYSB SYSC' CN &SYSNAME
- New PARM members added
 - MESSAGE - The definitions in this member are used to control or alter the default processing of a CA SYSVIEW generated message.
 - GROUPS - The parameter library data set member GROUPS has been enhanced to include new logical group types.
 - Ex: IMS External Subsystem, Database Areas, JES Output Classes, WLM Report Classes

CA SYSVIEW r13.7

- Enhanced parm member SCHEDULE
 - The Event Scheduling facility is an event driver that is able to perform a variety of functions at a specified time or recurring interval. This facility can be used to initiate functions within SYSVIEW as well as outside the SYSVIEW boundaries.
 - New – CICS MON for CICS data collection
 - New – Time Series Data Collection Events for CA Chorus IM
- Many existing commands have been enhanced to include more data.

Within SYSVIEW – ‘TOPICS – Release Guide

CA SYSVIEW Roadmap

- Planned for next release (r13.9) – currently in beta, planned Q3 2013
 - IDMS Support
 - Exception Alerts Summary Panel
 - Concatenated product libraries (system, site, user)
 - zOS 2.1 support

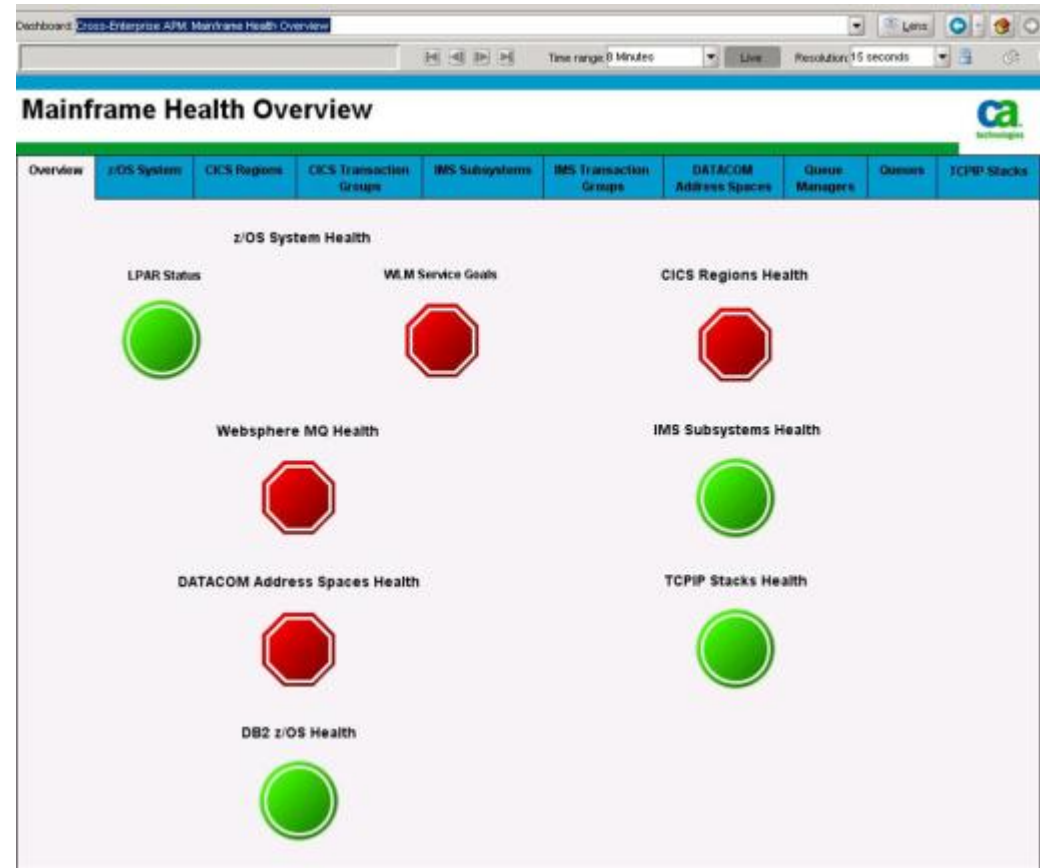
* These are planned and could change for actual product release.

CA Cross-Enterprise APM 3.0

- Solution Overview
- New Features
- Product Roadmap

CA Cross-Enterprise APM Overview

- CA Cross-Enterprise APM is the integration between CA APM and the mainframe, providing real-time performance information on zOS, CICS, IMS, WebSphere MQ, Datacom, DB2 and TCPIP



CA Cross-Enterprise APM Overview

- Integrates with your existing CA APM environment
 - CA APM is formerly known as CA Wily or Introscope
 - CE APM Agent is deployed on each LPAR you wish to monitor
 - Connects to your existing Enterprise Manager and appears as another agent
 - Ships with out of the box dashboards for mainframe metrics
 - Same CA APM features and functionality you're accustomed to for metric grouping and alerting
 - Extends the Cross-Process Trace into CICS or IMS on the mainframe
 - Supports MQ, Web Services and CTG into CICS, or MQ into IMS

CA Cross-Enterprise APM 3.0

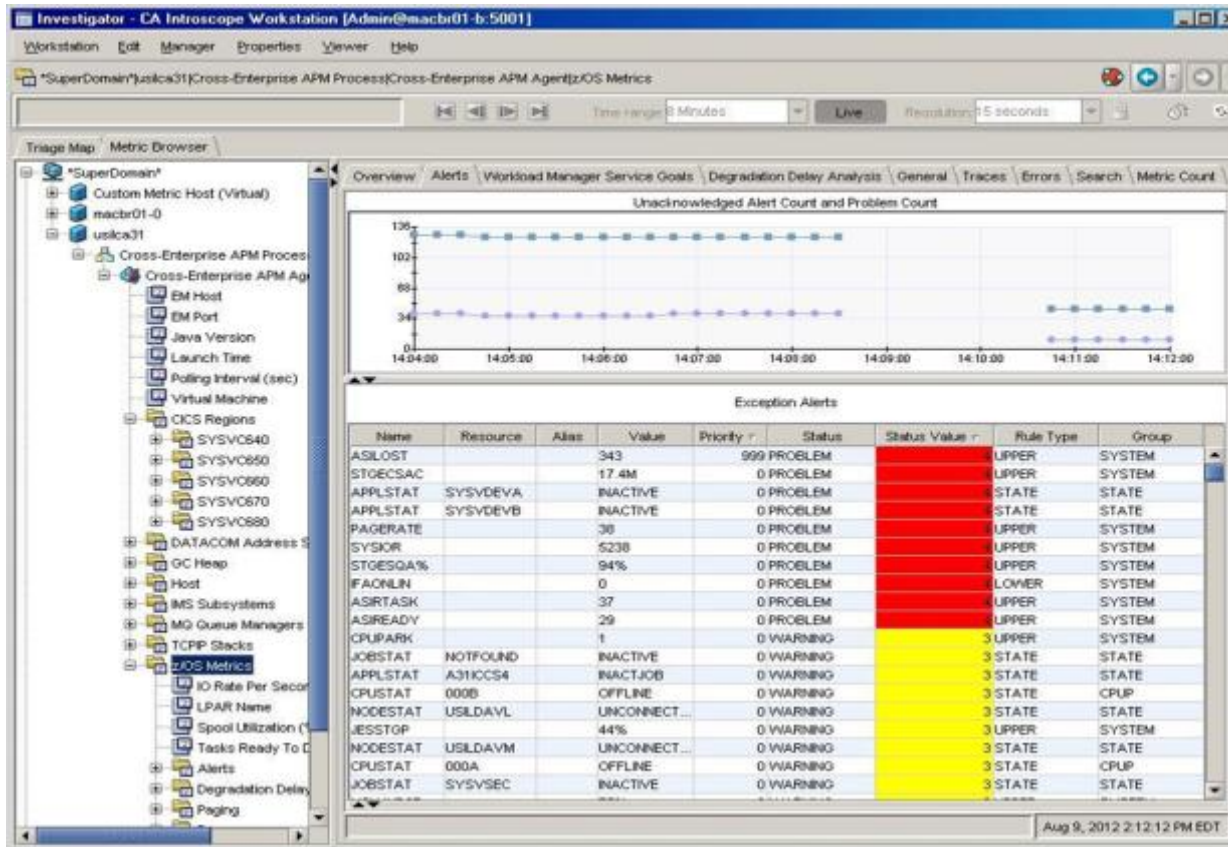
- New features require CA APM r9.5 Enterprise Manager
- Enhanced DB2 data collection and dashboards
- New CA-SYSVIEW Metrics, Dashboards, & Typeviews
 - Overview – Metrics, Dashboards, & Typeviews
 - Metrics
 - z/OS Alerts
 - z/OS Degradation Delay Analysis
 - z/OS Workload Manager Service Goals
 - CICS Alerts
 - CICS Degradation Analysis

CA Cross-Enterprise APM 3.0

- Improved Error Handling
 - Better log messages for common configuration errors
- Sunsetted z/OS PowerPack which had z/OS job performance metrics
 - Replaced all functionality from this PP into CE APM 3.0
- Added MVS alerts*, degradation analysis and WLM Service Goals typeviews from CA SYSVIEW.
 - *Alerts requires CA SYSVIEW to be licensed
- Added CICS alerts* and degradation analysis typeviews from CA SYSVIEW
 - *Alerts requires CA SYSVIEW to be licensed

CA Cross-Enterprise APM 3.0

CA-SYSVIEW customer defined z/OS Alerts metrics are now available. Two metrics, Problem Count and Alert Count, provide integer type metrics for which APM alerts can be customer defined.

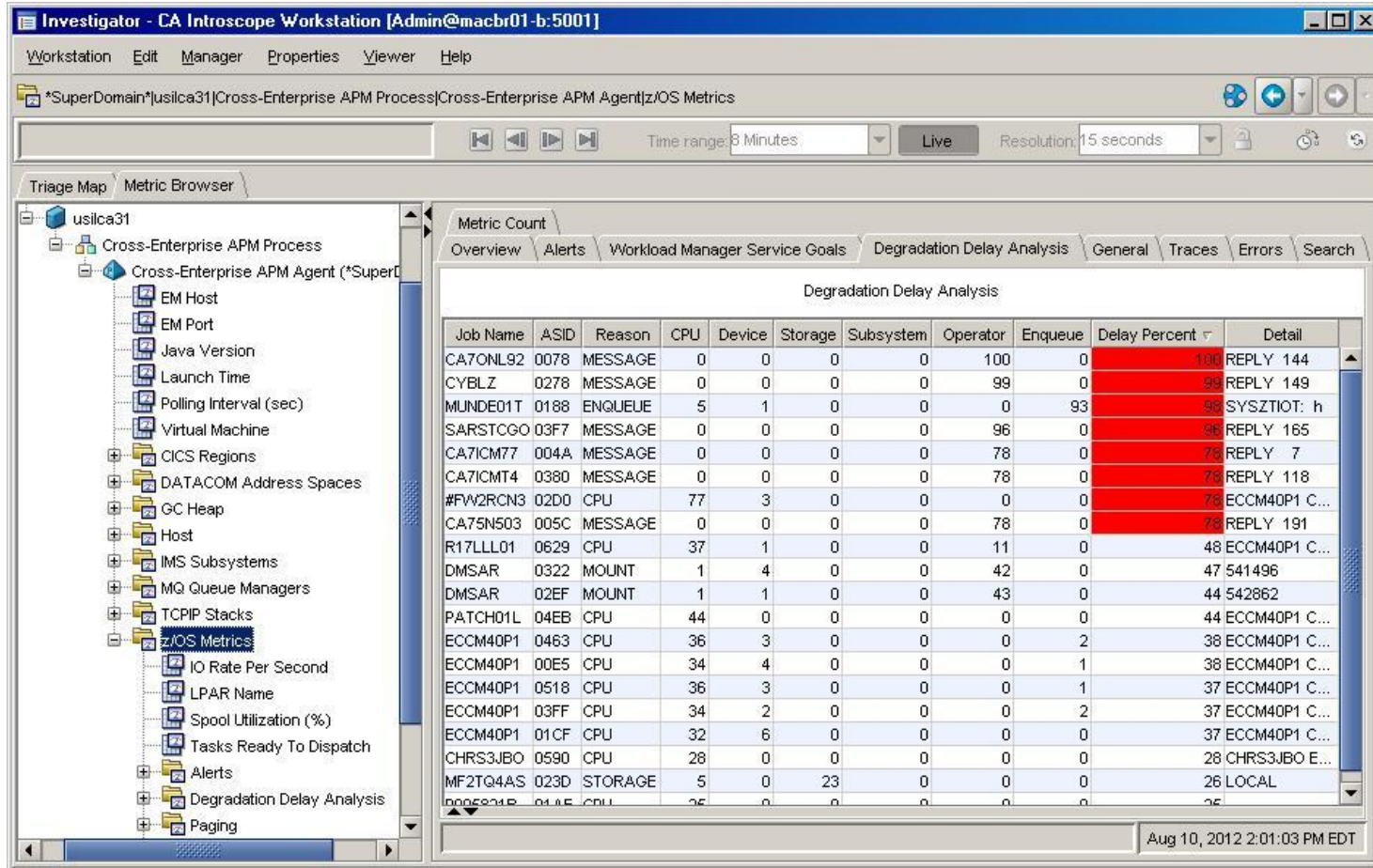


CA Cross-Enterprise APM 3.0

- CA-SYSVIEW Defined z/OS Degradation Delay Analysis metrics are now available for jobs.
- Delayed Jobs:
 - Top 20 worst Job Name/ASID by delay percent
 - There is one folder for each delayed job containing metrics for that job
 - When a job is no longer in top 20 the metrics and folder go gray and disappear
 - Typeviews are only used to get current Job performance information

CA Cross-Enterprise APM 3.0

New zOS Degradation Analysis Typeview



The screenshot displays the CA Introscope Workstation interface. The left pane shows a tree view of metrics for 'usilca31', with 'zOS Metrics' selected. The main pane shows a 'Degradation Delay Analysis' table with columns for Job Name, ASID, Reason, CPU, Device, Storage, Subsystem, Operator, Enqueue, Delay Percent, and Detail. The table lists various jobs and their associated metrics, with several rows highlighted in red to indicate degradation.

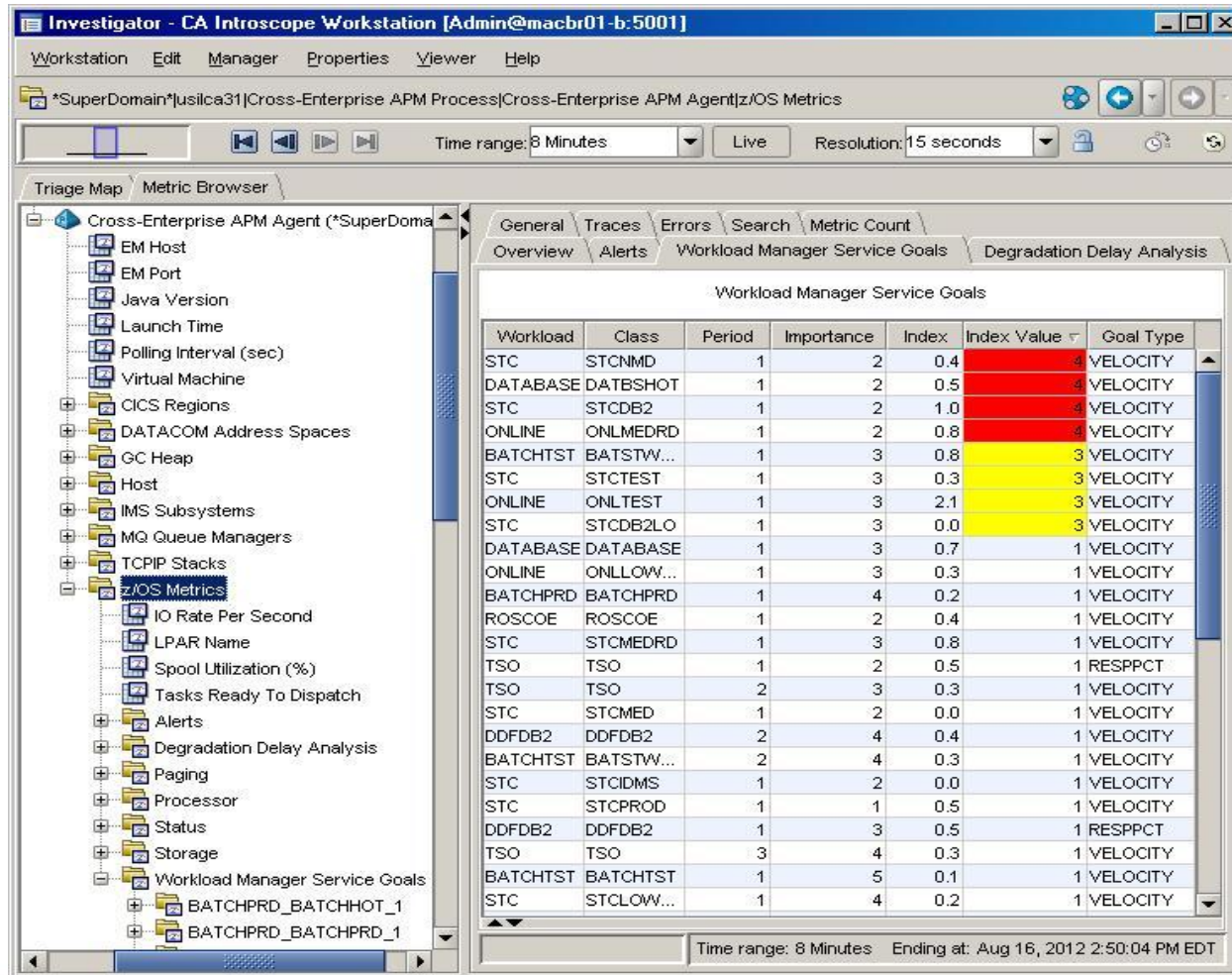
Job Name	ASID	Reason	CPU	Device	Storage	Subsystem	Operator	Enqueue	Delay Percent	Detail
CA7ONL92	0078	MESSAGE	0	0	0	0	100	0	100	REPLY 144
CYBLZ	0278	MESSAGE	0	0	0	0	99	0	99	REPLY 149
MUNDE01T	0188	ENQUEUE	5	1	0	0	0	93	98	SYSZTIOT: h
SARSTCGO	03F7	MESSAGE	0	0	0	0	96	0	96	REPLY 165
CA7ICM77	004A	MESSAGE	0	0	0	0	78	0	78	REPLY 7
CA7ICMT4	0380	MESSAGE	0	0	0	0	78	0	78	REPLY 118
#FW2RCN3	02D0	CPU	77	3	0	0	0	0	78	ECCM40P1 C...
CA75N503	005C	MESSAGE	0	0	0	0	78	0	78	REPLY 191
R17LLL01	0629	CPU	37	1	0	0	11	0	48	ECCM40P1 C...
DMSAR	0322	MOUNT	1	4	0	0	42	0	47	541496
DMSAR	02EF	MOUNT	1	1	0	0	43	0	44	542862
PATCH01L	04EB	CPU	44	0	0	0	0	0	44	ECCM40P1 C...
ECCM40P1	0463	CPU	36	3	0	0	0	2	38	ECCM40P1 C...
ECCM40P1	00E5	CPU	34	4	0	0	0	1	38	ECCM40P1 C...
ECCM40P1	0518	CPU	36	3	0	0	0	1	37	ECCM40P1 C...
ECCM40P1	03FF	CPU	34	2	0	0	0	2	37	ECCM40P1 C...
ECCM40P1	01CF	CPU	32	6	0	0	0	0	37	ECCM40P1 C...
CHRS3JBO	0590	CPU	28	0	0	0	0	0	28	CHRS3JBO E...
MF2TQ4AS	023D	STORAGE	5	0	23	0	0	0	26	LOCAL
0005231R	0115	CPU	26	0	0	0	0	0	26	LOCAL

CA Cross-Enterprise APM 3.0

- CA-SYSVIEW customer defined Workload Manager Service goal metrics are now available.
- Customer defined standard z/OS business centric service goals:
 - The purpose z/OS Workload Manager (WLM) is to provide a service contract between the user and the operating system.
 - WLM classifies the work running on z/OS into service classes and defines goals for them.
 - WLM manages workload distribution, workload balancing, and resource distribution to workloads.
- Generates Service Goal violation alerts:
 - WLM generates alerts with status levels – none, normal, warning, problem
 - Converted to APM alert that is displayed on the SYSVIEW dashboards.

CA Cross-Enterprise APM 3.0

New zOS Workload Manager Service Goals Typeview



Investigator - CA Introscope Workstation [Admin@macbr01-b:5001]

Workstation Edit Manager Properties Viewer Help

*SuperDomain\jusilca31\Cross-Enterprise APM Process\Cross-Enterprise APM Agent\z/OS Metrics

Time range: 8 Minutes Live Resolution: 15 seconds

Triage Map Metric Browser

Cross-Enterprise APM Agent (*SuperDoma

- EM Host
- EM Port
- Java Version
- Launch Time
- Polling Interval (sec)
- Virtual Machine
- CICS Regions
- DATAKOM Address Spaces
- GC Heap
- Host
- IMS Subsystems
- MQ Queue Managers
- TCPIP Stacks
- z/OS Metrics
 - IO Rate Per Second
 - LPAR Name
 - Spool Utilization (%)
 - Tasks Ready To Dispatch
 - Alerts
 - Degradation Delay Analysis
 - Paging
 - Processor
 - Status
 - Storage
 - Workload Manager Service Goals
 - BATCHPRD_BATCHHOT_1
 - BATCHPRD_BATCHPRD_1

General Traces Errors Search Metric Count

Overview Alerts Workload Manager Service Goals Degradation Delay Analysis

Workload Manager Service Goals

Workload	Class	Period	Importance	Index	Index Value	Goal Type
STC	STCNMD	1	2	0.4	4	VELOCITY
DATABASE	DATBSHOT	1	2	0.5	4	VELOCITY
STC	STCDB2	1	2	1.0	4	VELOCITY
ONLINE	ONLMEDRD	1	2	0.8	4	VELOCITY
BATCHTST	BATSTW...	1	3	0.8	3	VELOCITY
STC	STCTEST	1	3	0.3	3	VELOCITY
ONLINE	ONLTEST	1	3	2.1	3	VELOCITY
STC	STCDB2LO	1	3	0.0	3	VELOCITY
DATABASE	DATABASE	1	3	0.7	1	VELOCITY
ONLINE	ONLLOW...	1	3	0.3	1	VELOCITY
BATCHPRD	BATCHPRD	1	4	0.2	1	VELOCITY
ROSCOE	ROSCOE	1	2	0.4	1	VELOCITY
STC	STCMEDRD	1	3	0.8	1	VELOCITY
TSO	TSO	1	2	0.5	1	RESPPCT
TSO	TSO	2	3	0.3	1	VELOCITY
STC	STCMED	1	2	0.0	1	VELOCITY
DDFDB2	DDFDB2	2	4	0.4	1	VELOCITY
BATCHTST	BATSTW...	2	4	0.3	1	VELOCITY
STC	STCIDMS	1	2	0.0	1	VELOCITY
STC	STCPROD	1	1	0.5	1	VELOCITY
DDFDB2	DDFDB2	1	3	0.5	1	RESPPCT
TSO	TSO	3	4	0.3	1	VELOCITY
BATCHTST	BATCHTST	1	5	0.1	1	VELOCITY
STC	STCLOW...	1	4	0.2	1	VELOCITY

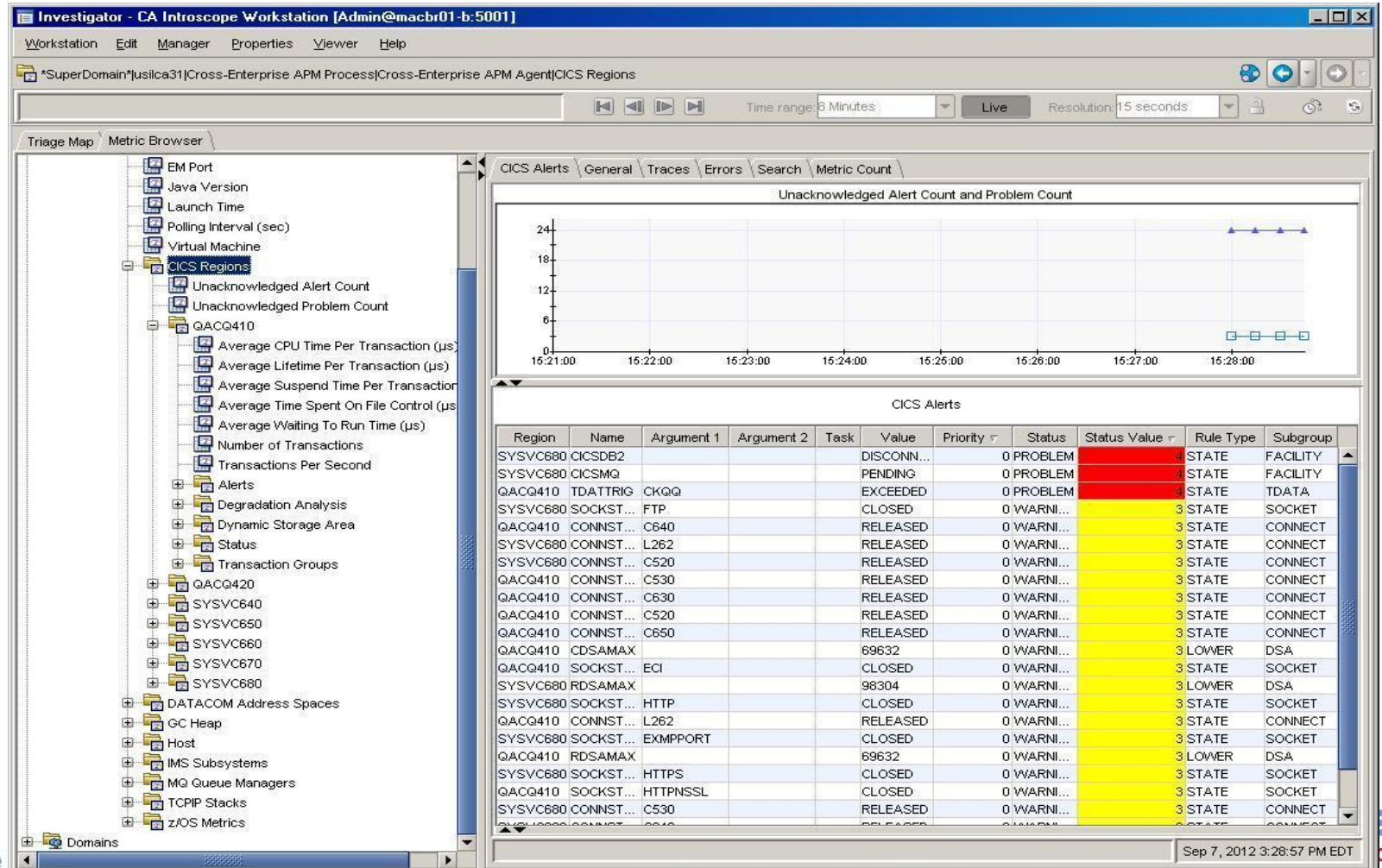
Time range: 8 Minutes Ending at: Aug 16, 2012 2:50:04 PM EDT

CA Cross-Enterprise APM 3.0

- CA-SYSVIEW Degradation Analysis metrics are now available for CICS Regions.
- Region resource timings:
 - Average delay and percent of overall delay (for all jobs running in the region).
 - One folder for each resource for which there is a delay.
 - Allows analysis of what may be causing a problem on the region.
- Folder Name:
 - *CICS Regions|Degradation Analysis|<Resource>*
 - *Only shows when there are delays*
- Key Metrics:
 - *Resource*
 - Displays the name of the resource for which timings were collected .
 - *Like CPU Time, Dispatch Time, Suspend Time, etc.*

CA Cross-Enterprise APM 3.0

New CICS Alerts Typeview – multiple regions



The screenshot displays the CA Introscope Workstation interface. On the left is a 'Triage Map' tree showing a hierarchy of metrics and alerts. The main area is divided into two sections: a graph and a table.

Unacknowledged Alert Count and Problem Count Graph:

The graph shows two data series over time from 15:21:00 to 15:28:00. The Y-axis represents the count, ranging from 0 to 24. The top series (blue triangles) shows a count of 0 until approximately 15:27:00, where it spikes to 24. The bottom series (green squares) remains at 0 throughout the period.

CICS Alerts Table:

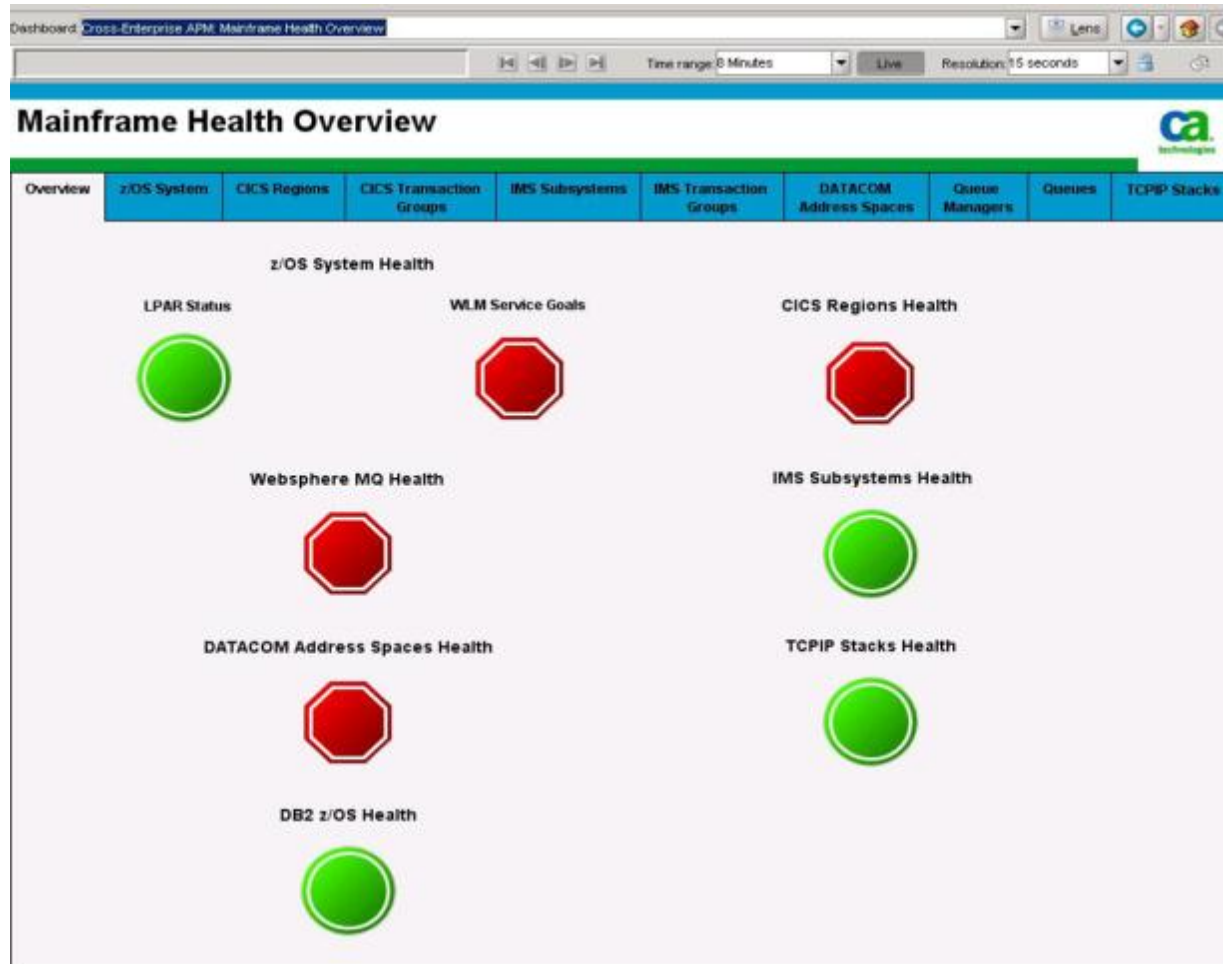
Region	Name	Argument 1	Argument 2	Task	Value	Priority	Status	Status Value	Rule Type	Subgroup
SYSSVC680	CICSDB2			DISCONN...		0	PROBLEM	4	STATE	FACILITY
SYSSVC680	CICSMQ			PENDING		0	PROBLEM	4	STATE	FACILITY
QACQ410	TDATTRIG	CKQQ		EXCEEDED		0	PROBLEM	4	STATE	TDATA
SYSSVC680	SOCKST...	FTP		CLOSED		0	WARNI...	3	STATE	SOCKET
QACQ410	CONNST...	C640		RELEASED		0	WARNI...	3	STATE	CONNECT
SYSSVC680	CONNST...	L262		RELEASED		0	WARNI...	3	STATE	CONNECT
SYSSVC680	CONNST...	C520		RELEASED		0	WARNI...	3	STATE	CONNECT
QACQ410	CONNST...	C530		RELEASED		0	WARNI...	3	STATE	CONNECT
QACQ410	CONNST...	C630		RELEASED		0	WARNI...	3	STATE	CONNECT
QACQ410	CONNST...	C520		RELEASED		0	WARNI...	3	STATE	CONNECT
QACQ410	CONNST...	C650		RELEASED		0	WARNI...	3	STATE	CONNECT
QACQ410	CDSAMAX			69632		0	WARNI...	3	LOWER	DSA
QACQ410	SOCKST...	ECI		CLOSED		0	WARNI...	3	STATE	SOCKET
SYSSVC680	RDSAMAX			98304		0	WARNI...	3	LOWER	DSA
SYSSVC680	SOCKST...	HTTP		CLOSED		0	WARNI...	3	STATE	SOCKET
QACQ410	CONNST...	L262		RELEASED		0	WARNI...	3	STATE	CONNECT
SYSSVC680	SOCKST...	EXMPPORT		CLOSED		0	WARNI...	3	STATE	SOCKET
QACQ410	RDSAMAX			69632		0	WARNI...	3	LOWER	DSA
SYSSVC680	SOCKST...	HTTPS		CLOSED		0	WARNI...	3	STATE	SOCKET
QACQ410	SOCKST...	HTTPSSL		CLOSED		0	WARNI...	3	STATE	SOCKET
SYSSVC680	CONNST...	C530		RELEASED		0	WARNI...	3	STATE	CONNECT

CA Cross-Enterprise APM 3.0

- The new DB/2 Insight Dashboards are accessible from the SYSVIEW “Mainframe Health Overview” dashboard.
- SYSVIEW “Mainframe Health Overview” dashboard:
 - Single dashboard for all mainframe status
 - Added “WLM Service Goals” alert
 - Added “DB2 z/OS Health” alert
 - *Double click to access “DB2 z/OS Health” dashboard*
- DB2 Health dashboards:
 - Changed in 9.5 to have consistent look with SYSVIEW dashboards
 - Double click accessible from “Mainframe Health Overview” dashboard
 - Click on “DB2 z/OS Health” alert

CA Cross-Enterprise APM 3.0

New Mainframe Health Overview Dashboard



CA Cross-Enterprise APM 3.0

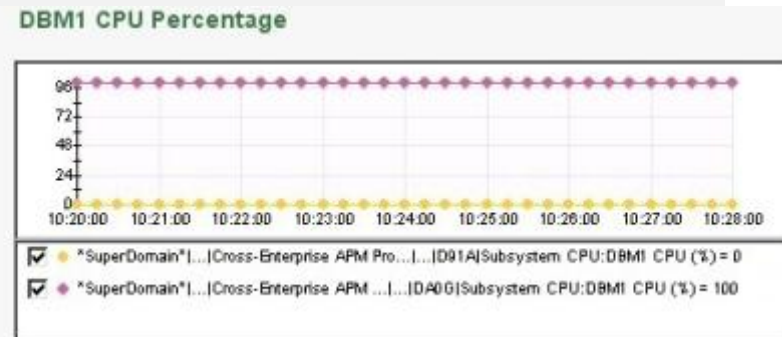
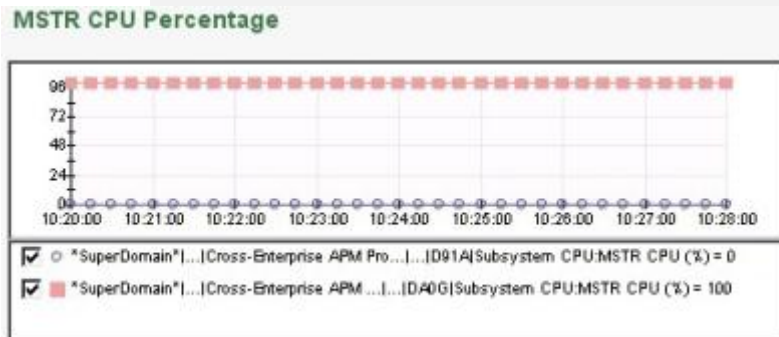
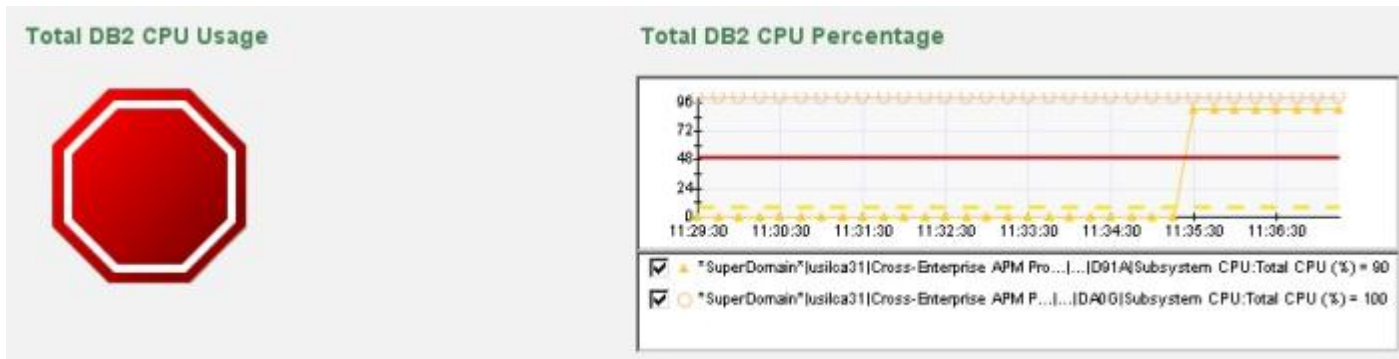
DB2 z/OS Performance Overview

<< Mainframe Health Overview



CA Cross-Enterprise APM 3.0

- Metric value graphed for all monitored DB2 subsystems
- Metrics with threshold values are shown first
 - Including status icon they occupy whole row
- Threshold values are displayed on the graph



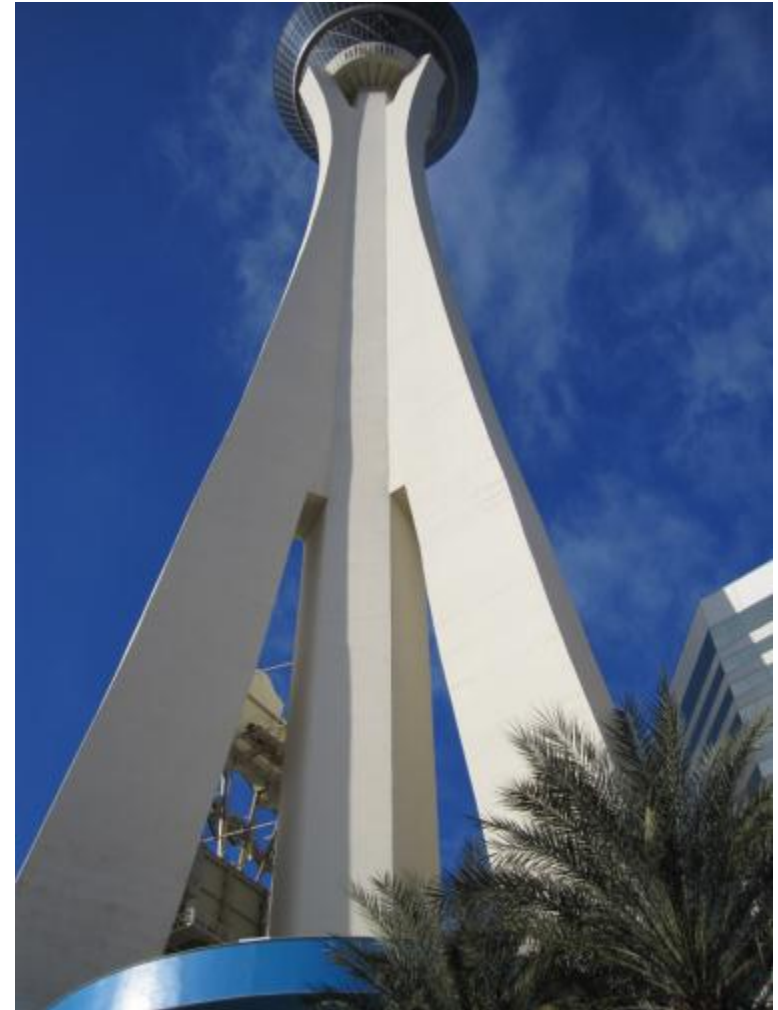
CA Cross-Enterprise APM Roadmap

- Items we are considering for future releases:
 - DB2 for z/OS – data sharing groups
 - IMS alerts and status to APM
 - MQ alerts and status to APM
 - Additional protocol for transaction tracing

Customer Experience

Monitoring off the Mainframe with CA APM

- Significant applications exist outside the mainframe
- The z/OS mainframe is typically the destination of activity but it no longer originates from a 3270 green screen
- CA APM provides metrics from z/OS and cross platform transaction tracing



Application Health Dashboard

Workstation Dashboard Properties Viewer Favorites Help

Dashboard: [Copy of Intra-J CEM Overview](#)

Time range: Live Resolution: 15 seconds

Application Health and Overview

Overview	CEM Transactions	CEM Responses Per Interval	Application Triage	GC Usage	Oracle	DB2	Ajax Calls	All Execute Method Requests	All Invoke Method Requests	All Process Method Requests	Custom Key Metrics	Top 10 EJB Method Requests	JMS	MQ Channel Traffic	MQ Queue Traffic
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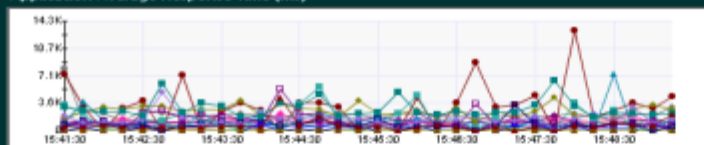
User Experience



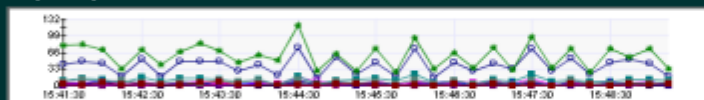
Overall

- Response Time
- Overall Defects
- Responses per Interval

Application Average Response Time (ms)



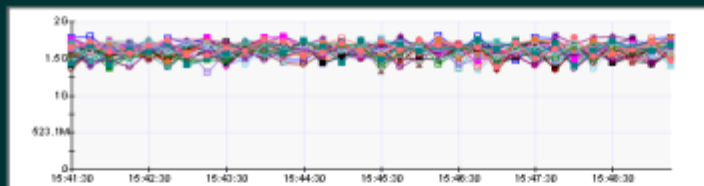
Responses per Interval



Key Resources

GC Bytes In Use

GC Bytes in Use



% of Time spent in GC in last 15 mts

% of Time spent in GC in last 15 mts

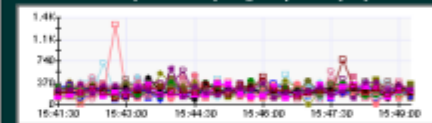


Back Ends

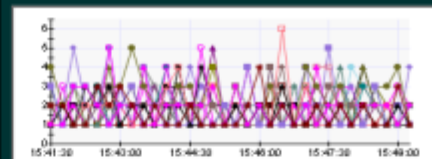
Oracle SQL Average Response Time (ms)



JMS executiveSyncGateway Avg Resp Time (ms)



ConnectionPool - InUseConnectionCount



Agents

Connected Agents



CA APM Customer Experience



Requirements

- Single pane of glass

Construction

- New WILYZOS task Java using JZOS Launcher and CA SYSVIEW

Operation

- Low overhead agent and data collection on the mainframe
- CA APM now has an “agent” on z/OS for tracing and metrics
- Focus on Dashboards and Metrics

Deployed for all z/OS LPARS

Augmented APM previously deployed

CA APM Customer Experience

z/OS System Health Powered by CA SYSVIEW

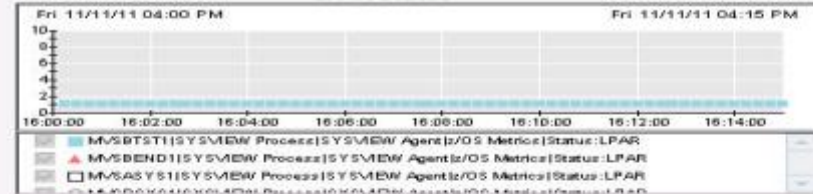


Overview	z/OS System	CICS Regions	CICS Transaction Groups	IMS Subsystems	DATAKOM Address Spaces	Queue Managers	Queues	TCPIP Stacks
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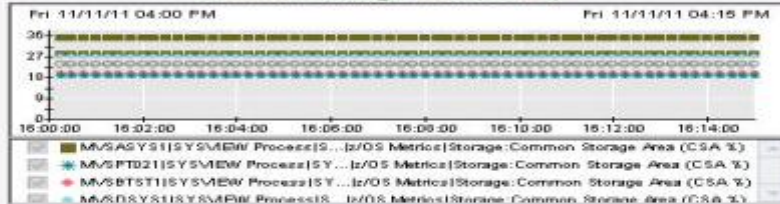
LPAR Status



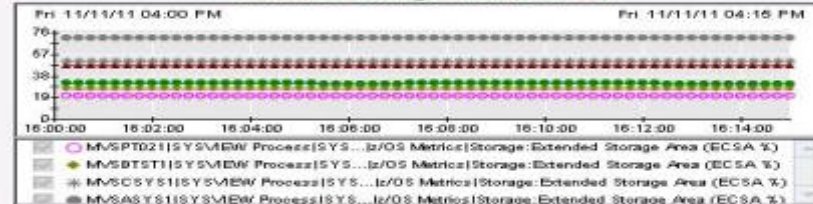
LPAR Status



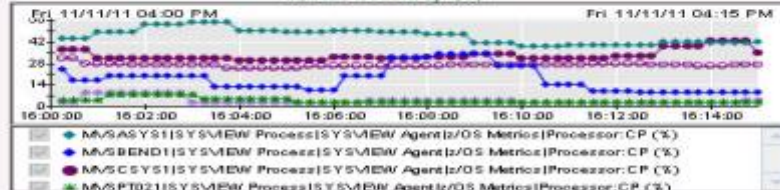
Common Storage Area (CSA %)



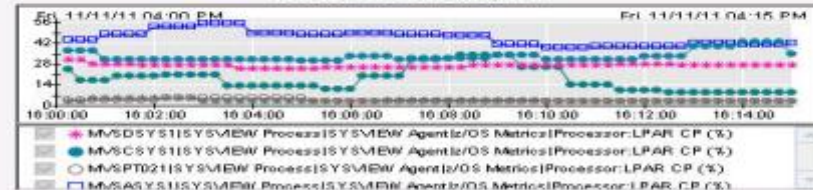
Extended Storage Area (ECSA %)



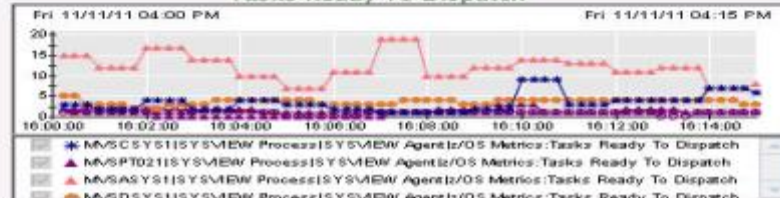
z/OS CP Busy (%)



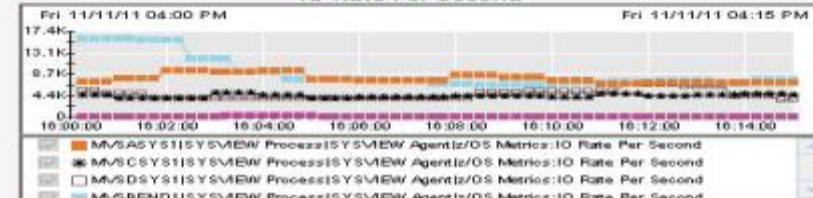
z/OS LPAR CP Busy (%)



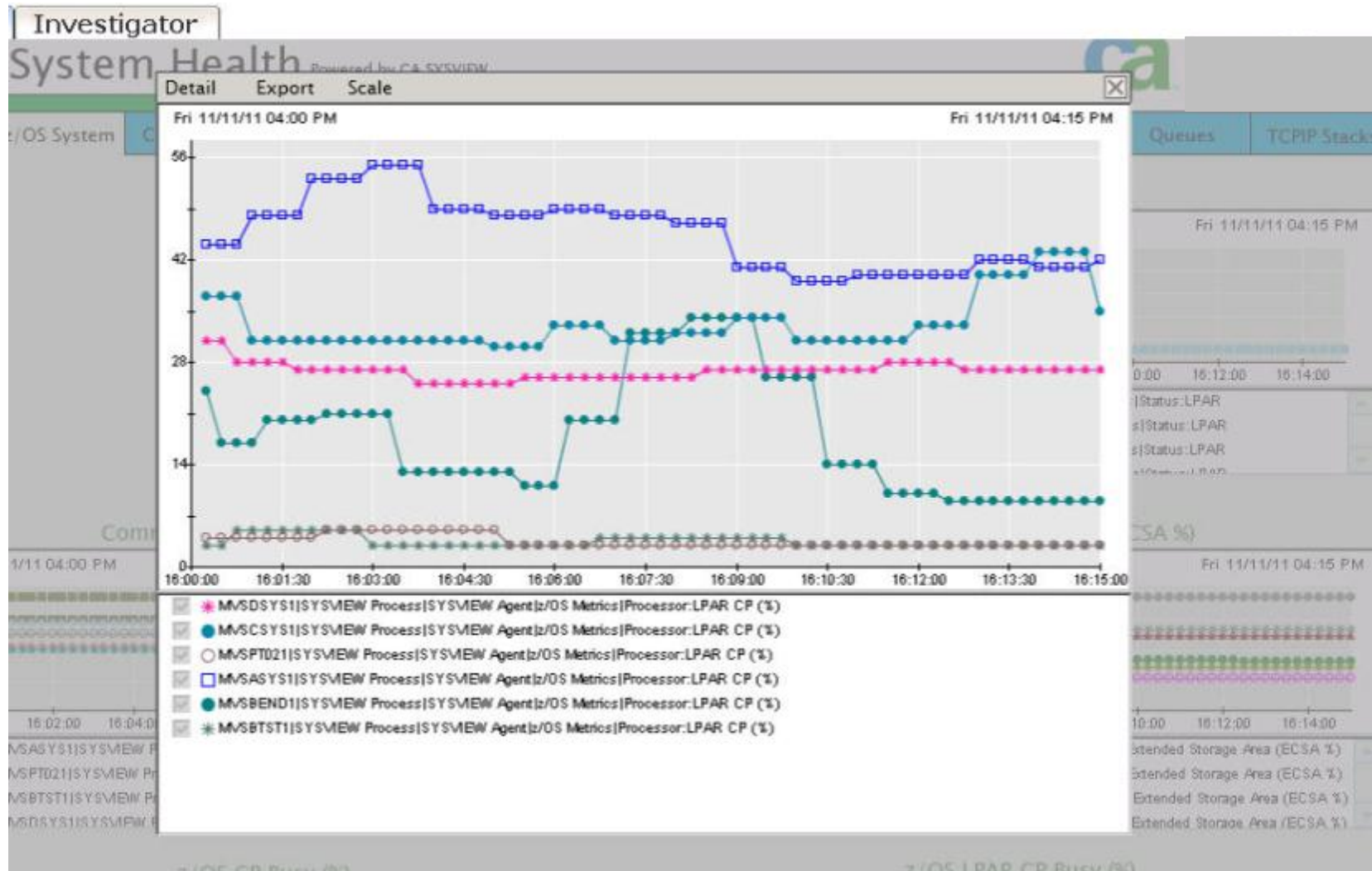
Tasks Ready To Dispatch

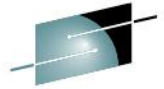


IO Rate Per Second



CA APM Customer Experience





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Technology · Connections · Results

Questions? Comments?



Session Number 14044

- Please provide feedback

[Share.org\BostonEval](https://share.org/BostonEval)

Thank you!





- **Tom Quinn** is a Principal Consultant, Mainframe Technical Sales at CA technologies responsible for mainframe performance monitoring products. Tom joined CA in 2009, bringing with him over 15 years of technical and leadership experience in Information Technology. Having worked for a large Mid-Western insurance company in mainframe system and application performance, Tom understands the technical challenges a large organization can face and utilizes his ITIL and ScrumMaster experience to discover and build customer solutions. You can reach him at tom.quinn@ca.com.