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<table>
<thead>
<tr>
<th>Trademark</th>
<th>Trademark</th>
<th>Trademark</th>
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</thead>
<tbody>
<tr>
<td>AIX*</td>
<td>FICON*</td>
<td>POWER7*</td>
<td>System z*</td>
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<tr>
<td>BladeCenter*</td>
<td>IBM*</td>
<td>PR/SM</td>
<td>Tivoli*</td>
</tr>
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<td>CICS*</td>
<td>IBM (logo)*</td>
<td>Smarter Banking*</td>
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</tr>
<tr>
<td>Cognos*</td>
<td>POWER*</td>
<td>System p*</td>
<td>zEnterprise*</td>
</tr>
<tr>
<td>DataPower*</td>
<td>Power Systems</td>
<td>System x*</td>
<td>z/OS*</td>
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<td>DB2*</td>
<td>POWER4</td>
<td>System z10*</td>
<td>z/VM*</td>
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Some Background

Systems are more complex and more integrated than ever

- Errors can occur anywhere in a complex system
- Difficult to detect, difficult to diagnose, symptoms / problems can manifest hours/ days later
- Problem can grow, cascade, snowball
- Volume of data is unmanageable – need information and insight.
- Systematic ‘soft failures’ (sick but not dead) much harder to detect – several anomalies can build up over time
IBM System z Advanced Workload Analysis Reporter (IBM zAware)

Smarter Computing – with Integrated Expert Diagnostics

- **IBM zAware with Expert System Diagnostics Gets it Right, Fast**
  - IBM zAware helps improve problem determination in near real time so you can rapidly and accurately identify problems and speed up time to service recovery
    - Analyzes massive amounts of system data to identify problematic messages, providing information to feed other processes or tools, enabling faster corrective action
    - Can help you identify issues that could place your service levels at risk
    - High speed analytics on log data provides a near real time view of current system state
      - Cutting edge pattern recognition techniques examine your unique system behavior to help pinpoint deviations
      - Historical data, machine learning and mathematical modeling combine to understand the nuances of your environment

- **Benefits**
  - Can reduce problem determination efforts
  - Can proactively identify and help you diagnose problems quickly to plan recovery actions and reduce impact to service levels
  - Easy to use modern interface with quick drill-down capabilities
### IBM z/OS Solutions Address Problem Determination

<table>
<thead>
<tr>
<th>Solutions Available:</th>
<th>Rules based</th>
<th>Analytics / Statistical model</th>
<th>Examines message traffic</th>
<th>Self Learning</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>- z/OS Health Checker</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Rules based to screen for conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- z/OS PFA</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Early detection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- z/OS RTD</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>After an incident</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM zAware</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Diagnosis Useful before or after an incident</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• IBM zAware uniquely analyzes messages in context to determine unusual behaviors
• IBM zAware uniquely understands and tunes its baseline to compare against your current activity
• IBM zAware does **not** depend on other solutions, manual coding of rules, and is always enabled to watch your system
How can IBM zAware Improve Problem Determination?

**Identify a possible z/OS incident**
- Which image is having unusual behavior?
  - Examines unique message behaviors
  - High score generated by unusual messages or message patterns
- When did the behavior start?
  - For a selected 10 minute interval either the current 10 minute interval or past intervals
    - Which messages are unusual?
    - How often did the message occur?
    - When did the message start to occur?
- Were similar messages issued previously?
  - Understands message characteristics and message patterns

**Identify behavior after a change has been made**
- Are unusual messages being issued after a change?
  - New software levels (operating system, middleware, applications)
  - Updated system settings or system configurations

**Diagnose intermittent problems**
- Are new unusual messages being issued when an intermittent problem occurs?
  - Are more messages issued than expected?
  - Are messages issued out of a normal pattern?

*Finds anomalies that would be difficult to detect*

Reduces time and effort to identify and diagnose problematic messages
IBM zAware – IBM System z Advanced Workload Analysis Reporter

- Monitors z/OS OPERLOG including all messages written to z/OS console, including ISV and application generated messages
- Detects things typical monitoring systems miss due to:
  - Message suppression (message may be too common)
    - Useful for long-term health issues
  - Uniqueness (message not common enough)
    - Useful for real-time event diagnostics
- Color-coded, easy-to-use web browser GUI
- XML Output can feed other products

Ability to drill down for details on anomalies
Sample Output - Interval View

When drill down, see JES2 resource shortage.

<table>
<thead>
<tr>
<th>Anomaly Score</th>
<th>Interval Contribution Score</th>
<th>Message Context</th>
<th>Rules Status</th>
<th>Appearances Count</th>
<th>Time Line</th>
<th>Message ID</th>
<th>Message Example</th>
<th>Rarity Score</th>
<th>Component</th>
<th>Cluster ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.226</td>
<td>new</td>
<td>None</td>
<td>1</td>
<td></td>
<td>EYUXS1004W</td>
<td>MBBCM08 Interval Timing queue element shortage detected</td>
<td>101</td>
<td>EYUXS</td>
<td>-1</td>
</tr>
<tr>
<td>1</td>
<td>0.226</td>
<td>new</td>
<td>None</td>
<td>1</td>
<td></td>
<td>EYUXS10069</td>
<td>MBBCM08 Interval Timing queue element shortage relieved</td>
<td>101</td>
<td>EYUXS</td>
<td>-1</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>in_context</td>
<td>IMPORTANT</td>
<td>16</td>
<td></td>
<td>HASP050</td>
<td>JES2 RESOURCE SHORTAGE OF TGS - 100% UTILIZATION REACHED</td>
<td>50</td>
<td>HASP</td>
<td>102</td>
</tr>
<tr>
<td>0.999</td>
<td>10.974</td>
<td>undusted</td>
<td>None</td>
<td>57</td>
<td></td>
<td>IEE043J</td>
<td>A SYSTEM LOG DATA SET HAS BEEN QUEUED TO SYSPUT CLASS M</td>
<td>2</td>
<td>IEE</td>
<td>-1</td>
</tr>
<tr>
<td>0.998</td>
<td>6.706</td>
<td>undusted</td>
<td>None</td>
<td>7</td>
<td></td>
<td>EYUCL00189</td>
<td>MBBCM08 Send Link Task terminated for MRO Network connection with CMAS MRACMRM</td>
<td>74</td>
<td>EYUCL</td>
<td>-1</td>
</tr>
<tr>
<td>0.998</td>
<td>6.519</td>
<td>undusted</td>
<td>None</td>
<td>4989</td>
<td></td>
<td>ITPM138</td>
<td>AD5WVCR G3APA001 G2LUA001-1 LU IS NOW INACTIVE 00:03:56.36</td>
<td>27</td>
<td>ITP</td>
<td>-1</td>
</tr>
<tr>
<td>0.987</td>
<td>4.427</td>
<td>undusted</td>
<td>None</td>
<td>40</td>
<td></td>
<td>IEC0701</td>
<td>209.220, NETVIEW, NETVIEW, DSLOGS, 883C, NE</td>
<td>12</td>
<td>IEC</td>
<td>-1</td>
</tr>
</tbody>
</table>
A Closer Look Inside **IBM zAware**

IBM zAware uses its own LPAR
Self contained firmware stack

**z/OS 1.13 plus PTFs or higher for monitored clients**

Manage IBM zAware
Firmware partition
(similar to CF)
IBM zAware Infrastructure

**Firmware Stack**
- **IBM zAware Server**
  - Server
  - Transport
  - Alert
  - Analytics Engine
  - Parser

**z/OS Client**
- **IXGWRITE Thread**
  - Put data in logstream
- **Logger Task**
  - ZAI SERVER
  - dub
  - loop
  - awakened
- **Client**
  - USS
- **Transport**

**Consoles**
- IXGLOGR

**PR/SM**
- Network Transport

**IXGWRITE**
- SYSPLEX.OPERLOG
  - Log stream
- ZAI(YES)
- ZAIDATA('OPERLOG')

**Operlog data**
IBM zAware Operating Requirements

- **zEC12 to host IBM zAware Server**
  - IBM zAware requires it’s own LPAR and runs it’s own self-contained firmware stack.
    - This will reduce the number of LPARs available for customer use
  - IBM zAware processor resources can be IFL or General Purpose CP
  - Memory and DASD resources are dependent on the number of monitored clients, amount of message traffic, length of time data retained
    - Memory - Min 6GB + 256 MB
    - DASD ~ 500GB (ECKD)
  - Network: HiperSockets or OSA ports – for both gathering of instrumentation data, and outbound alerting/communications
    - Need dedicated IP address for partition

- **zAware Monitored Clients**
  - IBM zAware monitored clients can be on any System z Server running z/OS 1.13 + PTFs
    - IBM zEnterprise EC12 (zEC12), 196 (z196), IBM zEnterprise 114 (z114), etc., and can share log files via IP network with IBM zAware server

- **90 days historical syslog or OPERLOG data to initially prime IBM zAware**
IBM zAware LPAR Setup ...

Customize Image Profiles: SSYS:SOSP1F : SOSP1F : General

- Profile name: SOSP1F
- Assigned for activation

- Description: zAware Partition
- Partition identifier: 1F
- Mode:
  - ESA/390
  - ESA/390 TPF
  - Coupling facility
  - LINUX only
  - zVMM
  - zAware

- Clock Type Assignment:
  - Standard time of day
  - Logical partition time offset

- Ensure that the image profile data conforms to the current maximum LICCC configuration.
IBM zAware LPAR Setup ...

Customize Image Profiles: SSYS:SOSP1F : SOSP1F : Processor

- SSYS:SOSP1F
  - SOSP1F
    - General
    - Processor
    - Security
    - Storage
    - Options
    - Firmware

Group Name: DEFAULT

- Logical Processor Assignment
  - Dedicated central processors
  - Not dedicated central processors

Not Dedicated Processor Details
Initial processing weight: 10 (1 to 999)
Initial capping

Number of processors - Initial: 1 Reserved: 1
IBM zAware LPAR Setup ...
IBM zAware LPAR Setup...
IBM zAware LPAR Setup …
IBM zAware LPAR Setup ...

Customize Image Profiles: SSYS:SOSP1F: SOSP1F: Firmware

- Host name: WSCZAWRE1
- Master userid: AWARE1
- Master password: ********
- Confirm master password: ********

Network Adapters

- Select CHPID VLAN IP address Mask/Prefix
  - 0C 9.82.24.99 24

Default gateway: 9.82.24.1

DNS Servers

- Select IP address
  - 9.82.22.2
  - 9.82.22.3
IBM zAware LPAR Setup ...

TSYSENSE: Customize/Delete Activation Profiles - Mozilla Firefox: IBM Edition

ACTB0PSV

When your request to save the set of parameters has completed successfully, this task will be exited.

Additional actions may be required to activate these changes. Reference the PR/SM Planning Guide.

Do you want to continue with the save?

OK Cancel
Logger Client Implementation

Read and Plan

- Understand and plan configuration for **IBM zAware** monitored client and **IBM zAware** server
  - IBM System z Advanced Workload Analysis Reporter Guide
  - z/OS Planning for Installation
  - z/OS MVS Setting Up a Sysplex
  - z/OS MVS Planning: Operations
  - z/OS Communications Server IP Configuration Guide
  - z/OS UNIX Systems Services Planning Guide
Update PARMLIB Members

- SYS1.PARMLIB Members:
  - IEASYSxx – IXGCNF=xx
  - IXGCNFxx
  - COUPLExx
  - Others as required – e.g CONSOLxx
IBM zAware Requirements …

- Requirements described in publication:
  *IBM System z Advanced Workload Analysis Reporter Guide*

  - SYS1.PARMLIB Updates:
    - IXGCNFxx
      
      ZAI SERVER(hostname) PORT(nnnnn)
      LOGBUFMAX(value) LOGBUFWARN(nn)
      LOGBUFFULL(MSG | QUIESCE)

  - Define/Update SYPLEX.OPERLOG Logstream
    - ZAI(YES) ZAIDATA('OPERLOG')

  - Network
    - Configure network scheme to include above host/port info

  - Ensure z/OS OMVS & Resolver, z/OS Communications Server and TCP/IP are available (started)
Logger address space:

D LOGGER,STATUS,ZAI[,options]  Logger address space status info

Logger address space resources and LOGR CDS info:

D LOGGER,IXGCNF,ZAI  parameter settings

D Logger,L [,options]  LOGR CDS logstream view options
D Logger,C [,options]  Logger @ space log stream connection

SETLOGR & SET {options}
Operations and Commands…

D LOGGER,ST,ZAI,VERIFY
IXG386I ZAI LOGSTREAM CLIENT CONNECT ATTEMPT IN PROGRESS 030
FOR DISPLAY ZAI,VERIFY
STATUS: RETRIEVING IP ADDRESS
IXG601I 13.49.55 LOGGER DISPLAY 031
SYSTEM LOGGER STATUS
SYSTEM  SYSTEM LOGGER STATUS
-----  -----------------------
SYSD  ACTIVE

ZAI LOGSTREAM CLIENTS: ACTIVE
BUFFERS IN USE:  00 GB 0000 MB
ZAI VERIFY INITIATED, CHECK FOR MESSAGES IXG37X, IXG38X

LOGGER PARAMETER OPTIONS
KEYWORD     SOURCE     VALUE
----------------- -------- -------------------------------------
ZAI
SERVER     HOST  IPL (00) WSCZAWARE1.WSCLAB.WASHINGTON.IBM.COM
PORT                      IPL (00) 2001
LOGBUFMAX  IPL (00) 01
LOGBUFWARN  IPL (00) 80
LOGBUFFULL  IPL (00) MSG
IXG386I ZAI LOGSTREAM CLIENT CONNECT ATTEMPT IN PROGRESS 032
FOR DISPLAY ZAI,VERIFY
STATUS: IP ADDRESS RETRIEVE SUCCESSFUL
IXG386I ZAI LOGSTREAM CLIENT Established 033
Operations and Commands…

**D LOGGER,C,LSN=*,Detail**
- Reveal z/OS IBM zAware log stream client state for listed connected log streams on the system

**D LOGGER,L,LSN=***
- Reveal log stream ZAI/ZAIDATA settings for listed log streams in LOGR CDS

**D LOGGER,{C | L},...[,ZAI]**
- Reveal info for log streams only when ZAI(YES) specified for them
Operations and Commands…

DISPLAY LOGGER,C,LSN=*,D,ZAI

The IXG601I messages sample output would be displayed as follows:

IXG601I 15.03.55 LOGGER DISPLAY 118
CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM D2
LOGSTREAM STRUCTURE #CONN STATUS
--------- --------- ------ ------
SYSPLEX.OPERLOG LOGGER_STR1 000001 IN USE
DUPLEXING: STRUCTURE, LOCAL BUFFERS
GROUP: PRODUCTION ZAI CLIENT: YES - QUIESCED
JOBNAME: CONSOLE ASID: 000B
  R/W CONN: 000000 / 000001
  RES MGR./CONNECTED: *NONE* / NO
  IMPORT CONNECT: NO

NUMBER OF LOGSTREAMS: 000001
Common Setup Issues

- Logger CDS is not formatted at the right level (HBB7705)
- ZAI SERVER( *ip_addr | host-name*) PORT (nnnnn) specification
- ZAI(YES) or ZAIDATA(‘OPERLOG’) not specified for SYSPLEX.OPERLOG logstream
- IXGLOGR Address Space not granted permissions to USS segment
- OMVS, TCPIP and/or Communications Server stack is not active
- Resolving system logger problems:
  - z/OS IBM zAware logstream client errors
    - IXG371 – New topic that covers common setup issues – consult z/OS MVS Diagnosis: Reference
Connect to the IBM zAware GUI

IBM zAware

The IBM System z Advanced Workload Analysis Reporter (IBM zAware) provides a smart solution for detecting and diagnosing anomalies in z/OS systems. Its analysis of current events, compared to models of normal system behavior, provides nearly real-time detection of anomalies. Through this graphical user interface (GUI), you can view analytical data and use it to diagnose the cause of past or current anomalies.

Analysis
The Analysis page displays analytical data that provides a clear visual indication of systems that are experiencing anomalous behavior. Through a secondary page, the Interval view, you can pinpoint and diagnose the cause of this behavior.

Notifications
View informational and error notifications pertaining to zAware’s processing.

System Status
View information about the z/OS systems that are connected to IBM zAware.

Administration
Through the Administration menu, you can use these functions to manage IBM zAware operations:

- **Training Sets**: View information about the generation of system behavior models.
- **Configuration**: Manage storage devices, manage security mechanisms, view the sysplex topology, and assign priming data to build system behavior models.
Connect to the IBM zAware GUI

IBM zAware

The IBM System z Advanced Workload Analysis Reporter (IBM zAware) provides a smart solution for detecting and diagnosing anomalies in z/OS systems. Its analysis of current events, compared to models of normal system behavior, provides nearly real-time detection of anomalies. Through this graphical user interface (GUI), you can view analytical data and use it to diagnose the cause of past or current anomalies.

Analysis

The Analysis page displays analytical data that provides a clear visual indication of systems that are experiencing anomalous behavior. Through a secondary page, the interval view, you can pinpoint and diagnose the cause of this behavior.

Notifications

View informational and error notifications pertaining to zAware's processing.

System Status

View information about the z/OS systems that are monitoring.

Administration

Through the Administration menu, you can use the following options:

- Training Sets: View information about the graphical expressions of complex topology, and assign priming data to build system behavior models.
- Configuration: Manage storage devices, management agents, and data sources.

IBM zAware User Login

UserID:

Password:

Log in  Cancel  Help
Configuration Settings - Analytics

Configure Settings

- Analytics
- Data Storage
- Security
- Sysplex Topology
- Priming Data

Instrumentation data retention time:
365 days

Training models retention time:
365 days

Analysis results retention time:
365 days

Training period:
90 days

Training interval:
7 days

Apply  Restore
**Configuration Settings – Data Storage**

### Configure Settings

#### Analytics

<table>
<thead>
<tr>
<th>Device</th>
<th>Status</th>
<th>Device Type</th>
<th>Capacity (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8a0a</td>
<td>In Use</td>
<td>33900c</td>
<td>22.15</td>
</tr>
<tr>
<td>8a0d</td>
<td>In Use</td>
<td>33900c</td>
<td>22.15</td>
</tr>
<tr>
<td>8a0f</td>
<td>In Use</td>
<td>33900c</td>
<td>22.15</td>
</tr>
<tr>
<td>8a0a</td>
<td>In Use</td>
<td>33900c</td>
<td>22.15</td>
</tr>
<tr>
<td>8a0c</td>
<td>Available</td>
<td>33900c</td>
<td>—</td>
</tr>
<tr>
<td>8a0b</td>
<td>Available</td>
<td>33900c</td>
<td>—</td>
</tr>
<tr>
<td>8a05</td>
<td>Available</td>
<td>33900c</td>
<td>—</td>
</tr>
</tbody>
</table>

**Last Refresh:** Thu Aug 30 2012 14:28:23 GMT-0400 (Eastern Daylight Time)
The Bulk Load Utility

- **AIZBLK in SYS1.SAMPLIB**
  - Copy REXX Exec AIZBLKE from SYS1.SAMPLIB to your SYSEXEC data set
  - Create a data set containing your 90 days of historical syslog
    - Input to AIZBLK
  - Follow directions in the JCL comments
  - Run the JOB
Configuration Settings – Priming Data …

**Priming message data** is available for the systems listed below. To assign this data to sysplexes, select systems from the left and add them to sysplexes on the right. Once the data has been added to the desired sysplexes, click the **Assign...** button to confirm and proceed with the assignment.

**Assign Historical Data...**

Historical message data will be assigned to sysplexes as indicated below. Once completed, this assignment cannot be undone. Click **OK** to proceed with the assignment.

<table>
<thead>
<tr>
<th>Historical Data by System</th>
<th>Sysplex to Assign</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSD</td>
<td>WSCZPLEX</td>
</tr>
<tr>
<td>SYSB</td>
<td>WSCZPLEX</td>
</tr>
<tr>
<td>SYSA</td>
<td>WSCZPLEX</td>
</tr>
<tr>
<td>SYSC</td>
<td>WSCZPLEX</td>
</tr>
</tbody>
</table>

**OK**  **Cancel**
Configuration Settings – Priming Data

P...
Configuration Settings – Priming Data

Primed message data is available for the systems listed below. To assign this data to sysplexes, select systems from the left and add them to sysplexes on the right. Once the data has been added to the desired sysplexes, click the Assign button to confirm and proceed with the assign.
Configuration Settings – Priming Data

Configure Settings

- Analytics
- Data Storage
- Security
- Sysplex Topology
- Priming Data

Priming message data is available for the systems listed below. To assign this data into sysplexes, select systems from the left and add them to sysplexes on the right. Once the data has been added to the desired sysplexes, click the Assign... button to confirm and proceed with the assign.

Sysplex Topology

- W3C2PLEX
  - SYSA
  - SYSB
  - SYSC
  - SYSD

Priming message data by system:

- Add >
- Add All >>
- < Remove
- << Remove All

Assign...
Creating Training Sets

### Training Sets

#### Managed Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Sysplex</th>
<th>Training Progress</th>
<th>Last Training Result</th>
<th>Last Training Result Time</th>
<th>Current Model Built</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSA</td>
<td>WSCZPLEX</td>
<td></td>
<td>Not Trained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSB</td>
<td>WSCZPLEX</td>
<td>In Progress</td>
<td>Not Trained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSG</td>
<td>WSCZPLEX</td>
<td></td>
<td>Not Trained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSD</td>
<td>WSCZPLEX</td>
<td></td>
<td>Not Trained</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Current Training Status Details (Click on training statuses above to view details)*

**Refresh** | Last Refresh: Thu Aug 16 2012 10:16:08 GMT-04:00 (Eastern Daylight Time)
## Training Sets - Completion

### Managed Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Sysplex</th>
<th>Training Progress</th>
<th>Last Training Result</th>
<th>Last Training Result Time</th>
<th>Current Model Built</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSA</td>
<td>WSCZPLEX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSB</td>
<td>WSCZPLEX</td>
<td></td>
<td>Complete</td>
<td>August 16, 2012 10:15:44 AM Eastern Daylight Time</td>
<td></td>
</tr>
<tr>
<td>SYSC</td>
<td>WSCZPLEX</td>
<td></td>
<td>Not Trained</td>
<td>August 16, 2012 10:15:44 AM Eastern Daylight Time</td>
<td></td>
</tr>
<tr>
<td>SYSD</td>
<td>WSCZPLEX</td>
<td></td>
<td>Not Trained</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Current Training Status Details (Click on training statuses above to view details)

- **Refresh**
- **Last Refresh**: Thu Aug 16 2012 16:16:34 GMT-0400 (Eastern Daylight Time)
Connect Monitored Client to IBM zAware Server

Connect to remote server/host 9.82.24.151 using lu/pool TCP15122 and port 23
Training Sets ...

![Screenshot of the zAware interface showing managed systems and training sets.

- Sysplexes: W3CZPLEX
- Training Progress:
  - W3CZPLEX: Complete
  - W3CZPLEX: Not Trained

- Last Training Result:
  - W3CZPLEX: Not Trained

- Last Training Result Time:
  - W3CZPLEX: August 16, 2012 10:15:44 AM Eastern Daylight Time

- Current Model Built:
  - W3CZPLEX: —

- Actions:
  - Request Training
  - Cancel Training

- Current Training Status Details (Click on training statuses above to view details)

- Refresh: Last Refresh: Thu Aug 16 2012 10:17:55 GMT-0400 (Eastern Daylight Time)
System Status

System Status displays the IBM zAware analytics engine status, as well as monitored systems information for z/OS systems connected to IBM zAware. Click the start button ( ) to start the analytics engine, and the stop button ( ) to stop it.

Analytics engine status: Running

IBM zAware Monitored System Data Suppliers:

<table>
<thead>
<tr>
<th>System</th>
<th>Sysplex</th>
<th>Status</th>
<th>Instrumentation Data Type</th>
<th>Connect Start Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSB</td>
<td>WSCZPLEX</td>
<td>Active</td>
<td>OFERLOG</td>
<td>September 20, 2012 4:59:54 PM Eastern Daylight Time</td>
</tr>
<tr>
<td>SYSC</td>
<td>WSCZPLEX</td>
<td>Active</td>
<td>OFERLOG</td>
<td>September 20, 2012 5:00:01 PM Eastern Daylight Time</td>
</tr>
<tr>
<td>SYSD</td>
<td>WSCZPLEX</td>
<td>Active</td>
<td>OFERLOG</td>
<td>September 20, 2012 5:00:06 PM Eastern Daylight Time</td>
</tr>
<tr>
<td>SYSA</td>
<td>WSCZPLEX</td>
<td>Active</td>
<td>OFERLOG</td>
<td>September 24, 2012 1:23:50 AM Eastern Daylight Time</td>
</tr>
</tbody>
</table>

Refresh Last refresh: Mon Sep 24 2012 15:04:25 GMT-0400 (Eastern Daylight Time)
## Notifications

### IBM zAware

**Notifications**

**Message ID** | **Message Text** | **Message Date/Time**
--- | --- | ---
AFT0001 | Train Request for Managed System WSCZPLEX-SYSD started [Thu Aug 30 00:00:01 UTC 2012] | Wed Aug 29 2012 20:00:01 GMT-04:00 (Eastern Daylight Time)
AFT0001 | Train Request for Managed System WSCZPLEX-SYSD completed successfully [Thu Aug 30 00:00:06 UTC 2012] | Wed Aug 29 2012 20:00:06 GMT-04:00 (Eastern Daylight Time)
AFT0001 | Train Request for Managed System WSCZPLEX-SYSE started [Thu Aug 30 00:00:06 UTC 2012] | Wed Aug 29 2012 20:00:06 GMT-04:00 (Eastern Daylight Time)
AFT0001 | Train Request for Managed System WSCZPLEX-SYSE completed successfully [Thu Aug 30 00:00:11 UTC 2012] | Wed Aug 29 2012 20:00:11 GMT-04:00 (Eastern Daylight Time)
AFT0001 | An internal error for WSCZPLEX-SYSG has occurred processing BuildUserRules. | Wed Aug 29 2012 20:00:11 GMT-04:00 (Eastern Daylight Time)
AFT0001 | Train Request for Managed System WSCZPLEX-SYSG failed (rc: 13) [Thu Aug 30 01:00:11 UTC 2012] | Wed Aug 29 2012 20:00:11 GMT-04:00 (Eastern Daylight Time)

[Refresh] [Last Refresh: Thu Aug 30 2012 14:20:06 GMT-04:00 (Eastern Daylight Time)]
IBM zAware Analysis

Analysis

The System Anomaly Scores graph shows message analysis data for each system in ten minute intervals. For each interval, the bar height indicates the color reflects the commonality of the messages occurring during that interval. Click on an interval bar to access detailed message information. To view a date selector. To customize which systems are shown in the graph, click the Change Source button.

Date: October 26, 2012

Analysis Source: WSCZPLEX

Interval Anomaly Scores by System

<table>
<thead>
<tr>
<th>System</th>
<th>Anomaly Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSCZPLEX.SYSA</td>
<td></td>
</tr>
<tr>
<td>(UTC)-4</td>
<td></td>
</tr>
<tr>
<td>WSCZPLEX.SYSA</td>
<td></td>
</tr>
<tr>
<td>(UTC)-4</td>
<td></td>
</tr>
</tbody>
</table>

Timeline (UTC)

Zoom level:

Interval anomaly score key:
The System Anomaly Scores graph shows message analysis data for each system in ten minute intervals. For each interval, the bar height indicates the number of unique messages and the bar color reflects the commonality of the messages occurring during that interval. Click on an interval bar to access detailed message information. To view messaging analyses from other days, use the date selector. To customize which systems are shown in the graph, click the Change Source button.

Date: October 28, 2012

Interval Anomaly Scores by System

System | Anomaly Scores
--- | ---
WSCZPLEX.SY8A (UTC) | 1
WSCZPLEX.SY8A (UTC) | 1

Interval anomaly score key:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Difference</td>
</tr>
<tr>
<td>99.5</td>
<td>Significantly Different</td>
</tr>
<tr>
<td>101</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Zoom level:
IBM zAware Analysis

Interval View for System SYSA

The Messages table provides detailed analysis information for each message that occurred during the indicated time interval. To view message details for other intervals, use the date and time interval selectors. Click the Return to Analysis button to go back to the Analysis view.

Date: October 20, 2012
Time interval (UTC): 21:50 – 22:00

Analysis Source:
WSCZPLEX.SYSA
Interval anomaly score:
101.0

Messages

<table>
<thead>
<tr>
<th>Anomaly Score</th>
<th>Interval Contribution Score</th>
<th>Message Context</th>
<th>Rules Status</th>
<th>Appearance Count</th>
<th>Time Line</th>
<th>Message ID</th>
<th>Message Example</th>
<th>Rarity Score</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>51.387</td>
<td>new</td>
<td>None</td>
<td>820</td>
<td>IXG251</td>
<td>IGD172734 ALLOCATION HAS FAILED FOR ALL VOLUMES SELECTED FOR DATA SET</td>
<td>101</td>
<td>IXG</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>25.553</td>
<td>new</td>
<td>None</td>
<td>92</td>
<td>IXG301</td>
<td>SYSTEM LOGGER FAILED TO OFFLOAD DATA FOR LOG STREAM IFASMIF.ALL.SYS.DATA IN STRUCTURE</td>
<td>101</td>
<td>IXG</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>25.556</td>
<td>new</td>
<td>None</td>
<td>91</td>
<td>IGD17272</td>
<td>VOLUME SELECTION HAS FAILED FOR INSUFFICIENT SPACE FOR DATA SET</td>
<td>101</td>
<td>IGD</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5.541</td>
<td>new</td>
<td>None</td>
<td>3</td>
<td>IXG3721</td>
<td>ZAI LOGSTREAM CLIENT MANAGER ERROR FOR LOGSTREAM SYSPLEX.OPERLOG</td>
<td>101</td>
<td>IXG</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>4.885</td>
<td>new</td>
<td>None</td>
<td>2</td>
<td>IXG3841</td>
<td>ZAI LOGSTREAM CLIENT ERROR OCCURRED FOR LOGSTREAM SYSPLEX.OPERLOG REASON: OMVS</td>
<td>101</td>
<td>IXG</td>
<td></td>
</tr>
<tr>
<td>0.949</td>
<td>2.998</td>
<td>undistributed</td>
<td>None</td>
<td>1</td>
<td>IFB0031</td>
<td>LOGREC DATA SET FORMAT ERROR:17,5B,30</td>
<td>100</td>
<td>IFB</td>
<td></td>
</tr>
</tbody>
</table>
IBM zAware, Automation, Event Management and PD Tools

NetView processing …
- Query zAware (10 minute interval)
- If anomaly detected
  - Generate ‘anomaly’ message
  - Generate Event
- SME - Browse NetView CANZLOG to perform problem determination

- NetView samples provided to generate anomaly message and event(s)
  - Available for download from Service Management Connect
- NetView integration referenced from IBM zAware Redbook
- IBM Services (optional) available to install and configure zAware and NetView
IBM zAware Configuration Examples

- **Simple**
  - Single site / organization 1 CPCs
  - Single site / organization 2 zEC12 CPCs
  - Single site / organization 1 zEC12 and 1 z196 or z114 CPCs

- **Complex**
  - Multiple site / organization multiple zEC12 CPCs
  - Single site / organization 1 zEC12 and multiple z196 and z114 CPCs

- **More Complex**
  - Single site / organization multiple zEC12 CPCs with z/OS running on zVM
  - Mask CPC or CU failure. Mask site failure with GDPS

- **Recommendations:**
  - IBM zAware should fit into organization and monitoring structure
  - *Don’t split z/OS images contained within a sysplex between multiple IBM zAware instances*
  - *IBM zAware should be within a single “security zone” / firewall*
  - Obtain a DR license if DR approach is symmetrical
  - Obtain a backup alternative license to handle failure of CPC running IBM zAware
IBM zAware can communicate with any z/OS LPAR running z/OS 1.13 with OA38747 installed. 

z/OS guest running under z/VM is also supported.
All zEC12 Site

- Single active IBM zAware
- IBM zAware feature on both zEC12 CPCs only one active
- On CPC failure automation starts alternate IBM zAware

IBM zAware can communicate with any z/OS LPAR running z/OS 1.13 with OA38747 installed
Mixed Site (zEC12 and z196 or z114)

- Single IBM zAware active for site only on zEC12

IBM zAware can communicate with any z/OS LPAR running z/OS 1.13 with appropriate APARs installed
All zEC12 two site

- Single IBM zAware for Site A
- Single IBM zAware for Site B
All zEC12 Site / Multiple Security Domains

- IBM zAware for each security domain (green and orange)

IBM zAware

firewall

z/OS Sysplex A

z/OS Sysplex B
All zEC12 Site – CPC Failure

- Single active IBM zAware
- IBM zAware feature on both zEC12 CPCs only one active
- On CPC failure automation starts alternative IBM zAware

IBM zAware
All zEC12 Site – Disaster Recovery

- z/OS LPARs on DR site must run same workload as Production site
- Single active IBM zAware on both zEC12 CPCs only one active
- On site failure GDPS starts alternative IBM zAware

IBM zAware

IBM zAware can communicate with any z/OS LPAR running z/OS 1.13 with OA38747 installed
IBM zAware – Smarter Computing needs Smarter Monitoring

*Delivers Sophisticated Detection and Diagnostic Capabilities*

- IBM zAware can help protect against rare anomalies, sick-but-not-dead events and inadvertent mistakes
- IBM zAware offers easy to use interface to that fits into existing monitoring structure
- IBM zAware helps problem diagnosis and resolution

*The next generation of systems monitoring* - IBM zAware
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Oct 21 – 25, 2013 | Orlando, Florida

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