Information Management

The future runs on System z

# IBM Management Console Workshop

Christopher Holtz
IMS and DB2 Modernization Architect

© 2014 IBM Corporation. IBM Confidential

# Agenda

- Introduction and Goals of the Workshop
  - IBM Administration Console Strategy
    - What is it?
    - Who is it for?
    - High level demo
- Installation
  - Where to install?
  - The Installation Process
  - SMP and Installation Manager
  - Maintenance
- IBM Administration Console Deep Dive
  - Base Product and included support for IMS and DB2
  - IMS and DB2 Autonomics
  - IMS and DB2 Extensions
- Futures and Round Table Discussion

Information Management

The future runs on System z

# Overview…

## IBM Management Console Workshop

Christopher Holtz
IMS and DB2 Modernization Architect

© 2014 IBM Corporation. IBM Confidential

# Agenda

- Rationale
- Overview of Management Console 1.1
- Strategy
- Technology
- Demo

# The Growing DB2 z/OS Skills Gap

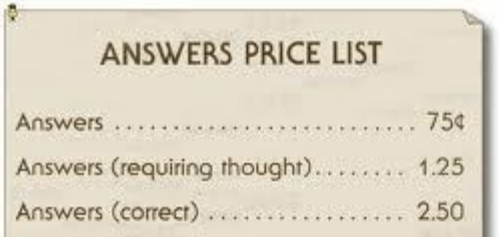
MIND THE GAP

- Expert DB2 z/OS skills are dwindling
  - Experienced DBAs and SysProgs continue to retire
  - New DBAs and SysProgs take years to become “experienced”
  - Industry wide – modern employees spend less time in a single role
    - Becoming less likely to find as many 25+ year experienced DBAs and SysProg

- Yet, the need for expert DBA / SysProg skills is growing
  - Demands for 24x7 high performance operation continue to increase
  - Allowed outage windows are shrinking and are less frequent
    - Maintenance done in those windows is more important than ever
  - Increasing system complexity makes planning, maintaining, and troubleshooting more difficult and time consuming

- IMS DBAs / SysProgs must become more efficient, more quickly

# IBM Tools Answer…



ANSWERS PRICE LIST

| | |
|---|---|
| Answers | 75¢ |
| Answers (requiring thought) | 1.25 |
| Answers (correct) | 2.50 |

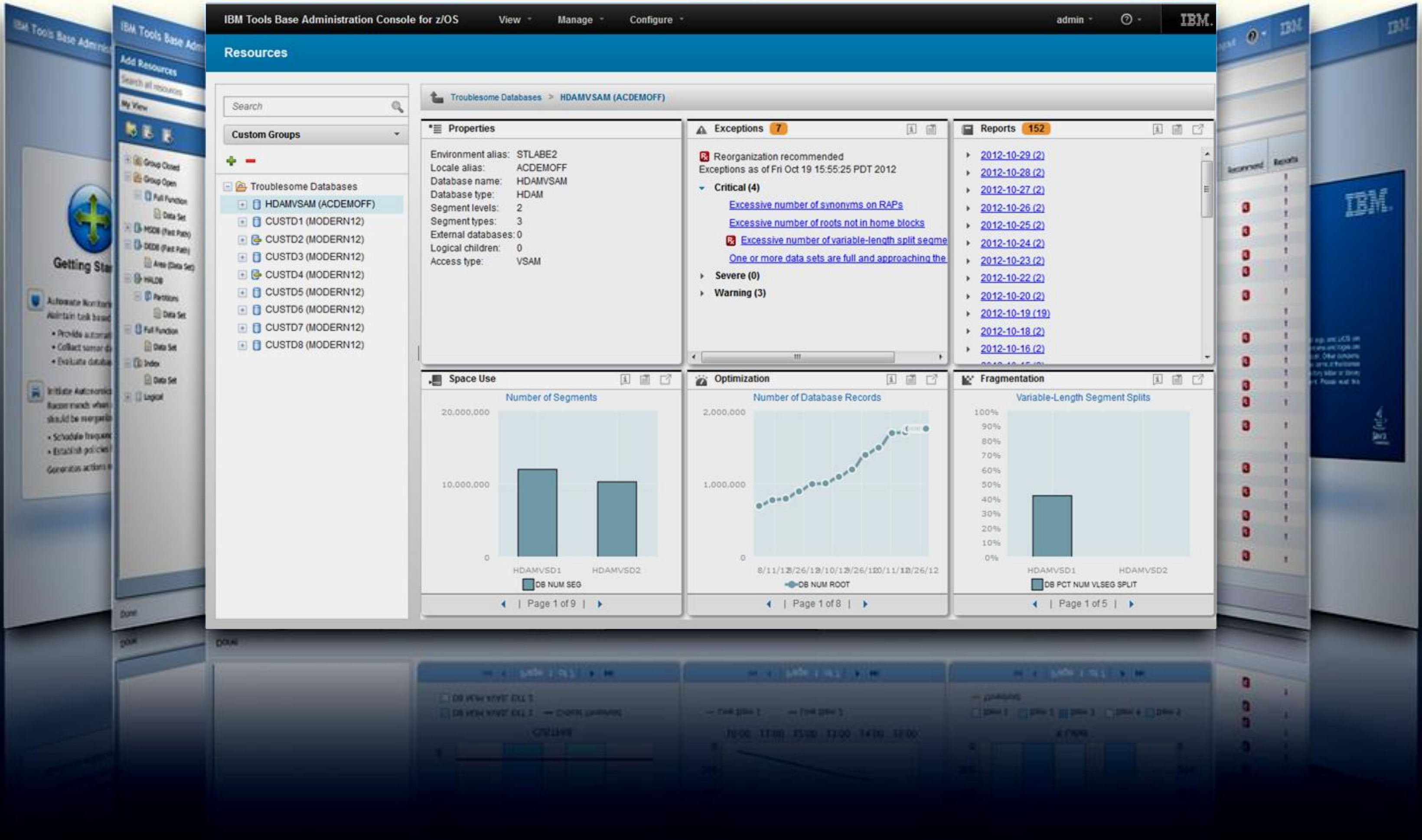
- Autonomics
  - Automate the routine collection of data
  - Automate the simple analysis of this data
  - Automate the obvious decisions based off this analysis
  - Automate the straight-forward execution of decisions

- Advanced Graphical Interfaces
  - Consolidate and simplify information from various sources
  - Simplify the presentation of complex information (visuals)
  - Shorten the learning curve (integrated assistance and doc)

- Convergence of our Tools
  - IBM Tools start working together and leverage each others functions

    "Sum is greater than the total of its parts"

# Introducing the new…
# IBM Management Console for IMS and DB2 for z/OS 1.1


IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
Space Use
Number of Segments
20,000,000
10,000,000
0
HDAMVSD1
HDAMVSD2
DB NUM SEG
Page 1 of 9
Optimization
Number of Database Records
2,000,000
1,000,000
0
8/11/12 8/26/12 9/10/12 9/26/12 10/11/12 10/26/12
DB NUM ROOT
Page 1 of 8
Fragmentation
Variable-Length Segment Splits
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
HDAMVSD1
HDAMVSD2
DB PCT NUM VLSEG SPLIT
Page 1 of 5
Getting Started

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

Critical (4)
- Excessive number of synonyms on RAPs
- Excessive number of roots not in home blocks
- Excessive number of variable-length split segme
- One or more data sets are full and approaching the

Severe (0)

Warning (3)

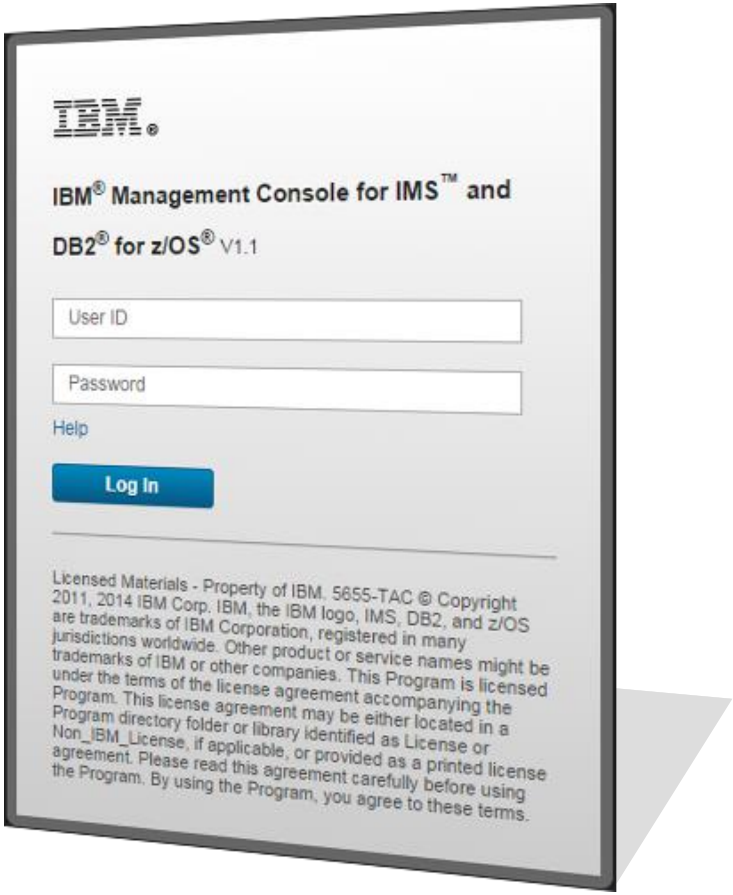
- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

# IBM Management Console
## *for IMS and DB2 for z/OS*

- Provides a single, holistic easy-to-use interface to manage IMS and DB2 systems and databases
  - Zero-install web-based interface
  - Consolidate information from IMS, DB2 and tools to paint a more complete picture from across the entire enterprise
  - Reduced time for problem identification and resolution through tight integration with IMS and DB2 Autonomics
  - Dramatically reduced learning curve for new users of IMS and DB2

- Now available as a separately orderable *no-charge* product ***(5655-TAC)***
  - Extensible by growing number of products and solution packs adding value beyond the base

- Direct transparent upgrade from IBM Tools Base Admin Console 1.4 to Management Console 1.1

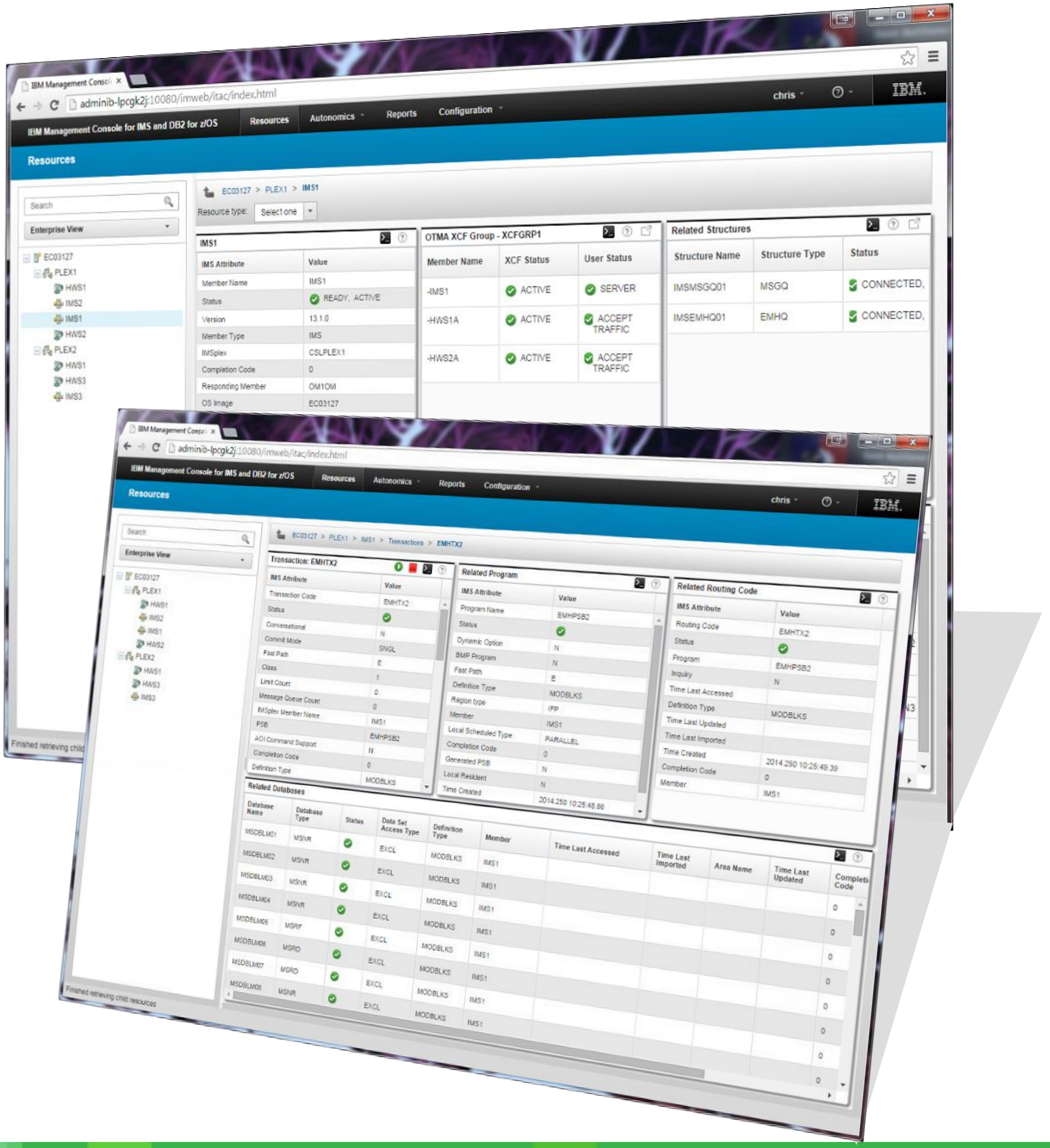


IBM® Management Console for IMS™ and DB2® for z/OS® V1.1

Licensed Materials - Property of IBM. 5655-TAC © Copyright 2011, 2014 IBM Corp. IBM, the IBM logo, IMS, DB2, and z/OS are trademarks of IBM Corporation, registered in many jurisdictions worldwide. Other product or service names might be trademarks of IBM or other companies. This Program is licensed under the terms of the license agreement accompanying the Program. This license agreement may be either located in a Program directory folder or library identified as License or Non_IBM_License, if applicable, or provided as a printed license agreement. Please read this agreement carefully before using the Program. By using the Program, you agree to these terms.

# IBM Management Console for IMS and DB2 for z/OS

- Drill down from the IMSPLEX level through:
  - IMSPLEX members
  - IMS Connect
  - IMS Subsystems
  - Transactions
  - Programs
  - Routing Code
  - Databases
- Identify, stop, start IMS resources
- Explore resource relationships
- OM Command Builder


IBM Management Console
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
Resources
Search
Enterprise View
EC03127
PLEX1
HWS1
IMS2
IMS1
HWS2
PLEX2
HWS1
HWS3
IMS3
EC03127 > PLEX1 > IMS1
Resource type:
Select one

IMS1

| IMS Attribute | Value |
|---|---|
| Member Name | IMS1 |
| Status | ✓ READY, ACTIVE |
| Version | 13.1.0 |
| Member Type | IMS |
| IMSplex | CSLPLEX1 |
| Completion Code | 0 |
| Responding Member | OM1OM |
| OS Image | EC03127 |

OTMA XCF Group - XCFGRP1

| Member Name | XCF Status | User Status |
|---|---|---|
| -IMS1 | ✓ ACTIVE | ✓ SERVER |
| -HWS1A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |
| -HWS2A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |

Related Structures

| Structure Name | Structure Type | Status |
|---|---|---|
| IMSMSGQ01 | MSGQ | ✓ CONNECTED, |
| IMSEMHQ01 | EMHQ | ✓ CONNECTED, |

Finished retrieving chil

EC03127 > PLEX1 > IMS1 > Transactions > EMHTX2

Transaction: EMHTX2

| IMS Attribute | Value |
|---|---|
| Transaction Code | EMHTX2 |
| Status | ✓ |
| Conversational | N |
| Commit Mode | SNGL |
| Fast Path | E |
| Class | 1 |
| Limit Count | 0 |
| Message Queue Count | 0 |
| IMSplex Member Name | IMS1 |
| PSB | EMHPSB2 |
| AOI Command Support | N |
| Completion Code | 0 |
| Definition Type | MODBLKS |

Related Program

| IMS Attribute | Value |
|---|---|
| Program Name | EMHPSB2 |
| Status | ✓ |
| Dynamic Option | N |
| BMP Program | N |
| Fast Path | E |
| Definition Type | MODBLKS |
| Region type | IFP |
| Member | IMS1 |
| Local Scheduled Type | PARALLEL |
| Completion Code | 0 |
| Generated PSB | N |
| Local Resident | N |
| Time Created | 2014.250 10:25:48.86 |

Related Routing Code

| IMS Attribute | Value |
|---|---|
| Routing Code | EMHTX2 |
| Status | ✓ |
| Program | EMHPSB2 |
| Inquiry | N |
| Time Last Accessed | |
| Definition Type | MODBLKS |
| Time Last Updated | |
| Time Last Imported | |
| Time Created | 2014.250 10:25:49.39 |
| Completion Code | 0 |
| Member | IMS1 |

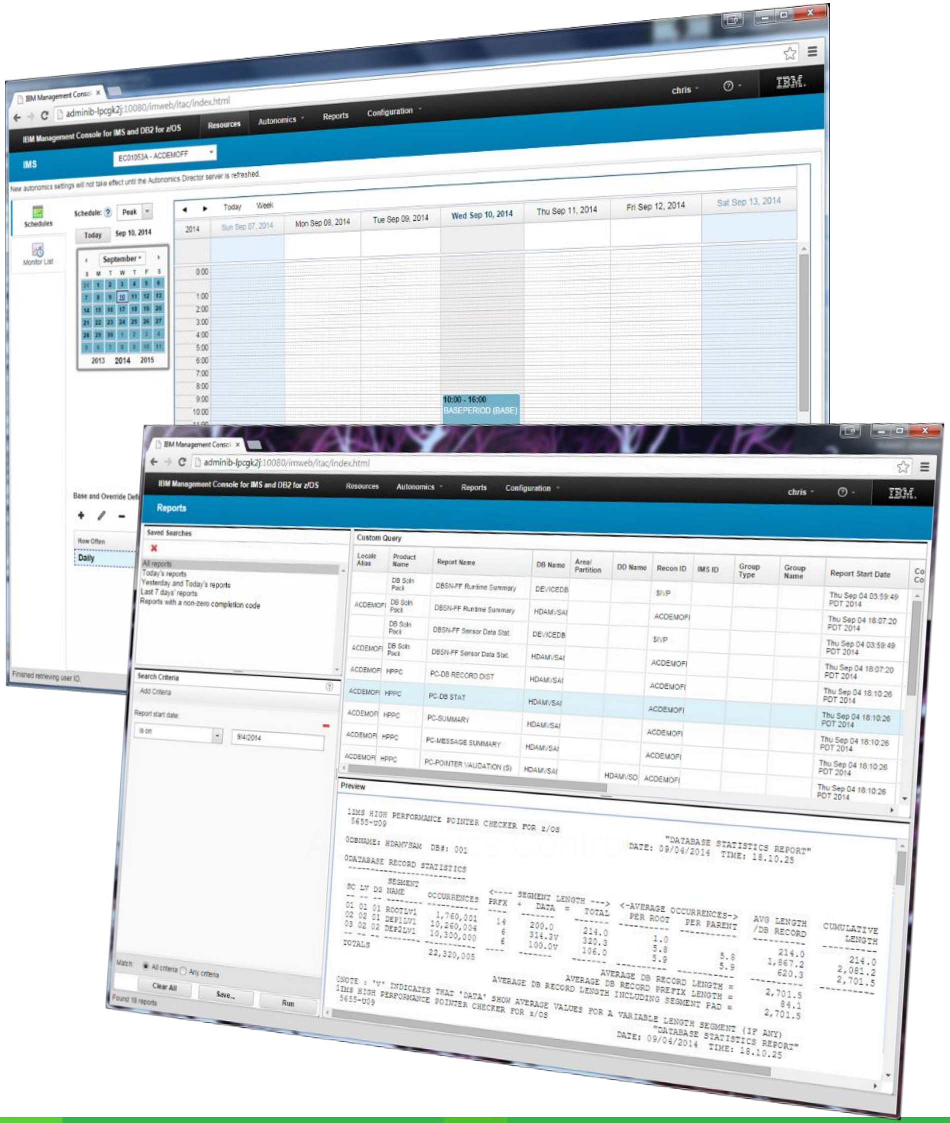
Related Databases

| Database Name | Database Type | Status | Data Set Access Type | Definition Type | Member | Time Last Accessed | Time Last Imported | Area Name | Time Last Updated | Completi Code |
|---|---|---|---|---|---|---|---|---|---|---|
| MSDBLM01 | MSNR | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM02 | MSNR | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM03 | MSNR | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM04 | MSNR | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM05 | MSRF | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM06 | MSRD | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM07 | MSRD | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |
| MSDBLM08 | MSNR | ✓ | EXCL | MODBLKS | IMS1 | | | | | 0 |

Finished retrieving child resources

# IBM Management Console for IMS and DB2 for z/OS

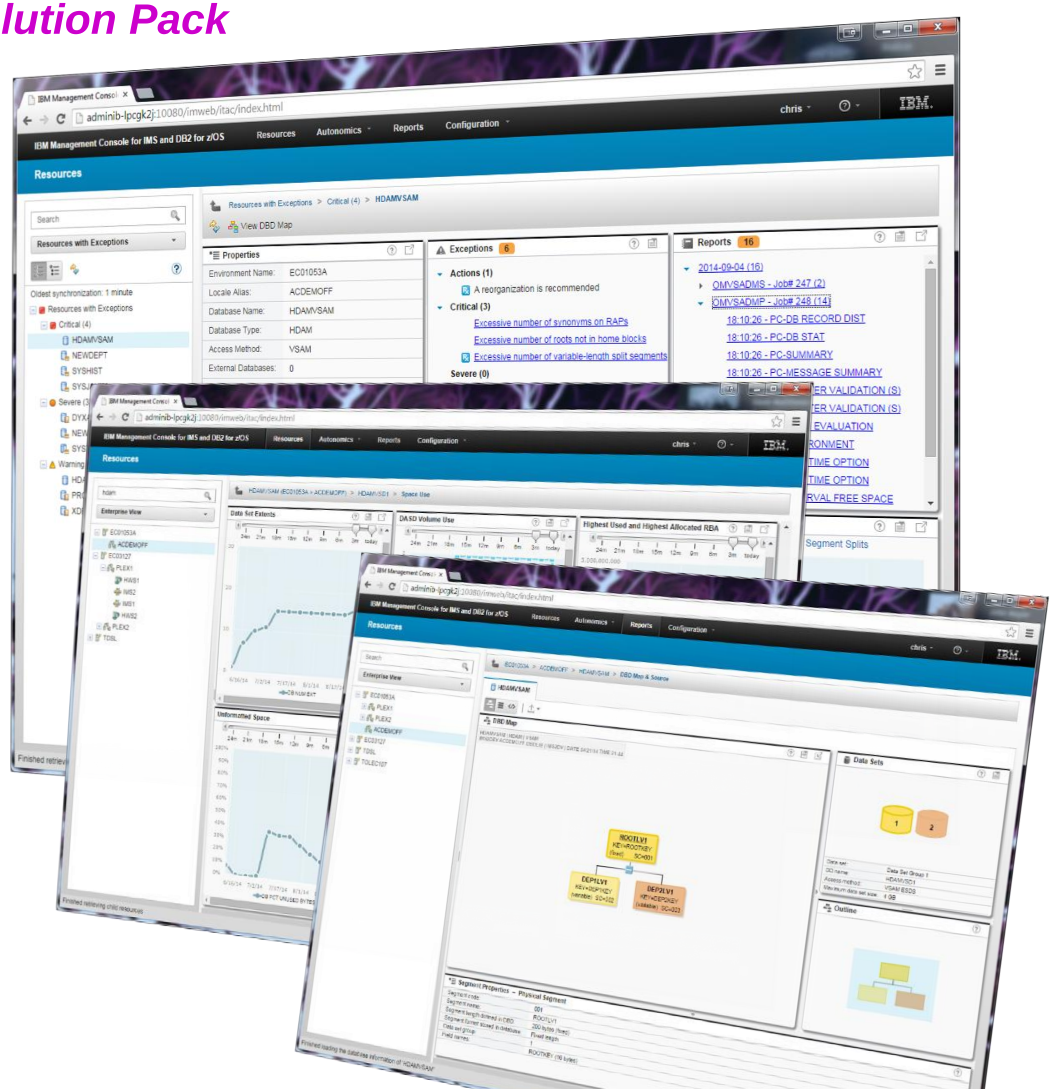
- Graphical control of IMS Autonomics Director
  - Define monitor lists, setup peak times and maintenance windows
- Web access to IMS reports from a variety of Tools
  - Search and filter by type, date, completion code, etc


IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
IMS
Schedules
Monitor List
Schedule: Peak
Today
Week
10:00 - 16:00
BASEPERIOD (BASE)
Reports
Saved Searches
Custom Query
Search Criteria
Add Criteria
Preview
Clear All
Save...
Run

# IBM Management Console for IMS and DB2 for z/OS

*Extended with the IMS FF/FP Solution Pack*

- Extended IMS Autonomics and Database information
- Easily identify and diagnose symptoms and recommended actions through IMS Database Autonomics
- Identify trends and make projections through database sensor charts
- Visualize IMS FF/FP Databases through **Library Integrity Utilities**


IBM Management Consol
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
Resources
Search
Resources with Exceptions
Resources with Exceptions > Critical (4) > HDAMVSAM
View DBD Map
Space Use
DASD Volume Use
Highest Used and Highest Allocated RBA
Segment Splits
Data Set Extents
Unformatted Space
DBD Map
Data Sets
Outline

Oldest synchronization: 1 minute

- Resources with Exceptions
  - Critical (4)
    - HDAMVSAM
    - NEWDEPT
    - SYSHIST
  - Severe
  - Warning

Properties

| | |
|---|---|
| Environment Name: | EC01053A |
| Locale Alias: | ACDEMOFF |
| Database Name: | HDAMVSAM |
| Database Type: | HDAM |
| Access Method: | VSAM |
| External Databases: | 0 |

Exceptions 6

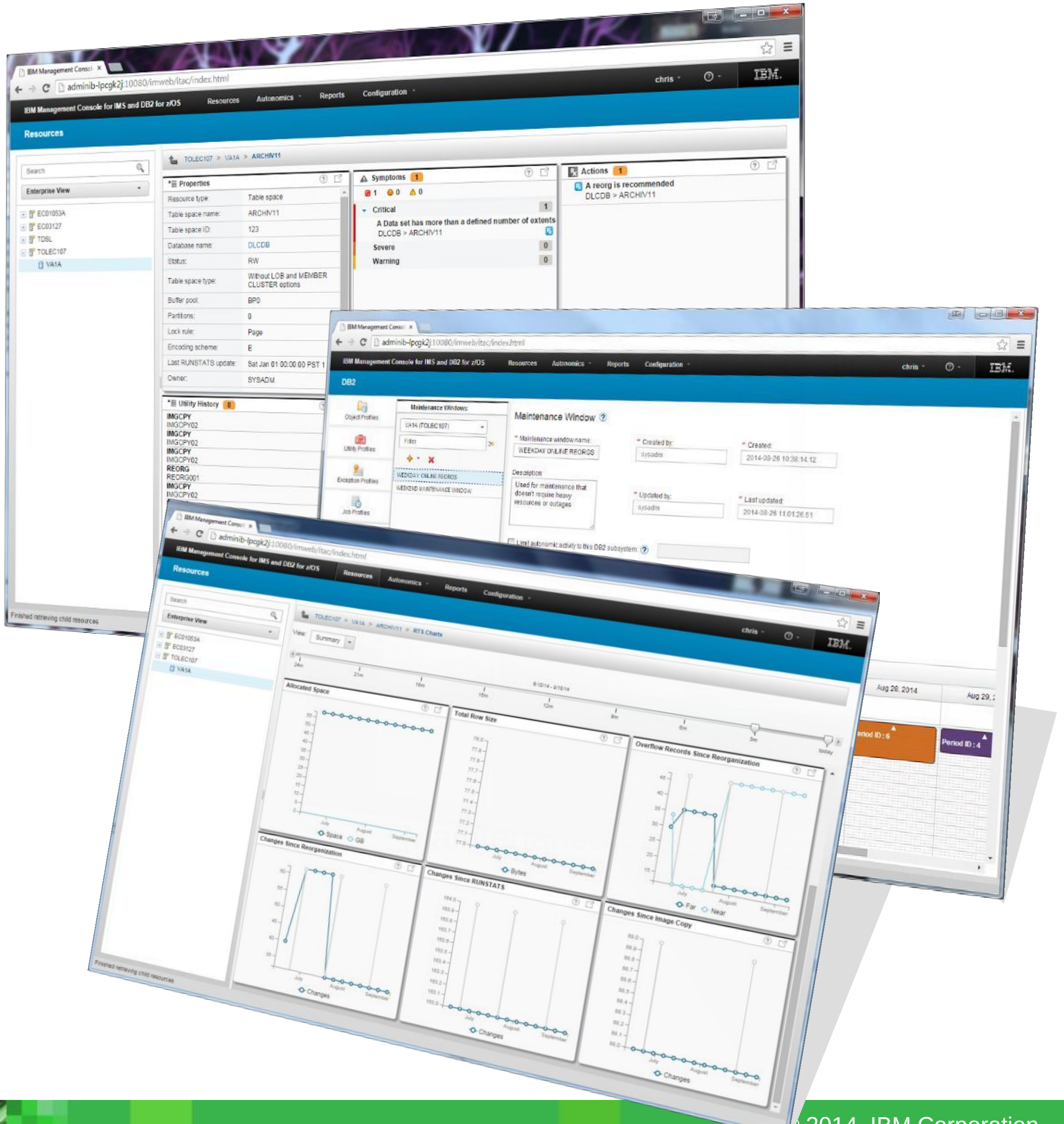
- Actions (1)
  - A reorganization is recommended
- Critical (3)
  - Excessive number of synonyms on RAPs
  - Excessive number of roots not in home blocks
  - Excessive number of variable-length split segments
- Severe (0)

Reports 16

- 2014-09-04 (16)
  - OMVSADMS - Job# 247 (2)
  - OMVSADMP - Job# 248 (14)
    - 18:10:26 - PC-DB RECORD DIST
    - 18:10:26 - PC-DB STAT
    - 18:10:26 - PC-SUMMARY
    - 18:10:26 - PC-MESSAGE SUMMARY

# IBM Management Console for IMS and DB2 for z/OS

- Progressive drill down through variety of DB2 object dashboards
- **Autonomics Director for DB2 for z/OS** (in the *no-charge* Tools Base) enables:
  - Charting of DB2 object statistics through RTS snapshots with
  - Autonomics control to define profiles and maintenance windows
  - Integrated support for the DB2 Admin Task Scheduler


IBM Management Consol
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
Resources
Search
Enterprise View
EC01053A
EC03127
TDSL
TOLEC107
VA1A
TOLEC107 > VA1A > ARCHIV11
Properties
Symptoms 1
Actions 1
Utility History 8

| Properties | |
|---|---|
| Resource type: | Table space |
| Table space name: | ARCHIV11 |
| Table space ID: | 123 |
| Database name: | DLCDB |
| Status: | RW |
| Table space type: | Without LOB and MEMBER CLUSTER options |
| Buffer pool: | BP0 |
| Partitions: | 0 |
| Lock rule: | Page |
| Encoding scheme: | E |
| Last RUNSTATS update: | Sat Jan 01 00:00:00 PST 1 |
| Owner: | SYSADM |

Symptoms: 1 0 0

Critical 1

A Data set has more than a defined number of extents
DLCDB > ARCHIV11

Severe 0

Warning 0

Actions: A reorg is recommended
DLCDB > ARCHIV11

Utility History:
IMGCPY
IMGCPY02
IMGCPY
IMGCPY02
IMGCPY
IMGCPY02
REORG
REORG001
IMGCPY
IMGCPY02
IMGCPY
IMGCPY02

DB2
Object Profiles
Utility Profiles
Exception Profiles
Job Profiles
Maintenance Windows
VA1A (TOLEC107)
Filter
Maintenance Window

Maintenance Windows: WEEKDAY ONLINE REORGS; WEEKEND MAINTENANCE WINDOW

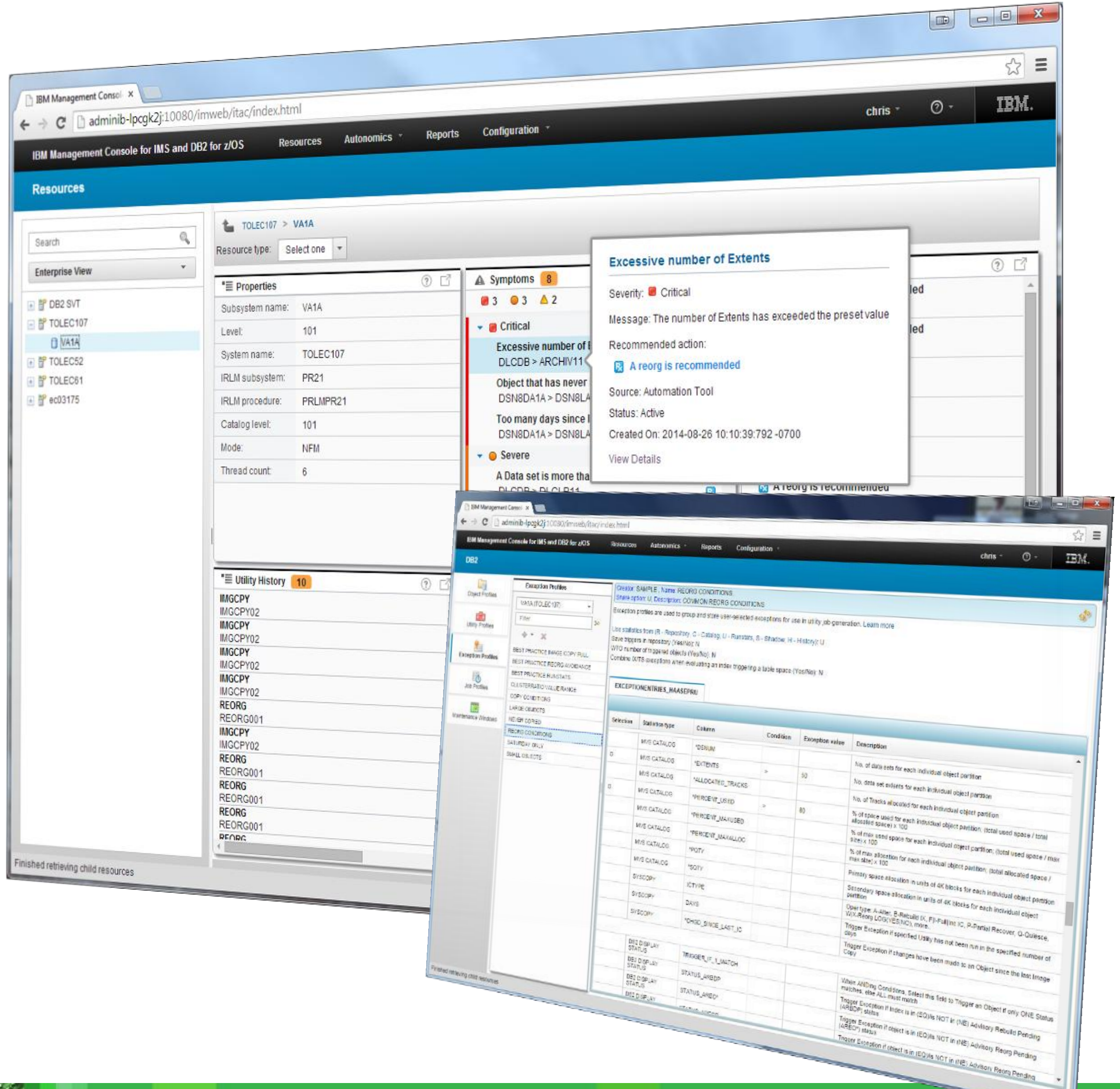
* Maintenance window name: WEEKDAY ONLINE REORGS
* Created by: sysadm
* Created: 2014-08-26 10:38:14.12
Description: Used for maintenance that doesn't require heavy resources or outages
* Updated by: sysadm
* Last updated: 2014-08-26 11:01:26.51
☐ Limit autonomic activity to this DB2 subsystem:

TOLEC107 > VA1A > ARCHIV11 > RTS Charts
View: Summary
Allocated Space
Space
GB
Total Row Size
Bytes
Overflow Records Since Reorganization
Far
Near
Changes Since Reorganization
Changes Since RUNSTATS
Changes Since Image Copy
Changes
July
August
September
Aug 28, 2014
Aug 29
Period ID : 6
Period ID : 4
Finished retrieving child resources

# IBM Management Console for IMS and DB2 for z/OS

## *Extended with the DB2 Utility Solution Pack*

- Identification and Diagnosis of symptoms and recommended actions for REORGs, ICs, Runstats
- Reporting on historical utility execution including timestamp, elapse time, system output, etc
- Graphical interfaces to define Automation Tool Object, Utility, Exception, and Job Profiles


IBM Management Console
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
Resources
Search
Enterprise View
DB2 SVT
TOLEC107
VA1A
TOLEC52
TOLEC61
ec03175
TOLEC107 > VA1A
Resource type: Select one
Symptoms 8
3 3 2
Utility History 10
Finished retrieving child resources

Properties

| | |
|---|---|
| Subsystem name: | VA1A |
| Level: | 101 |
| System name: | TOLEC107 |
| IRLM subsystem: | PR21 |
| IRLM procedure: | PRLMPR21 |
| Catalog level: | 101 |
| Mode: | NFM |
| Thread count: | 6 |

Critical
Excessive number of
DLCDB > ARCHIV11
Object that has never
DSN8DA1A > DSN8LA
Too many days since
DSN8DA1A > DSN8LA
Severe
A Data set is more tha

**Excessive number of Extents**

Severity: Critical

Message: The number of Extents has exceeded the preset value

Recommended action:

A reorg is recommended

Source: Automation Tool

Status: Active

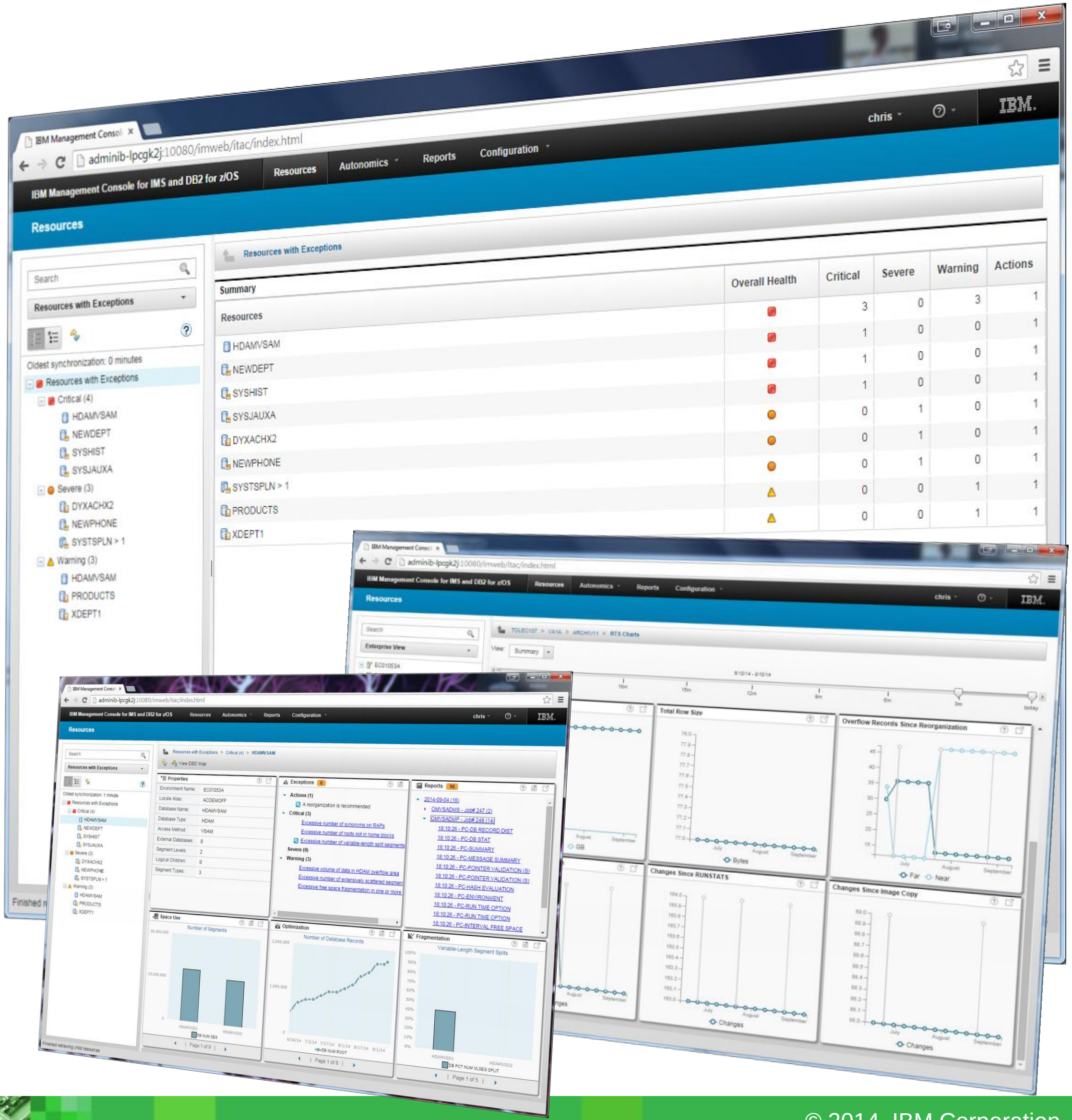
Created On: 2014-08-26 10:10:39:792 -0700

View Details

IMGCPY
IMGCPY02
IMGCPY
IMGCPY02
IMGCPY
IMGCPY02
IMGCPY
IMGCPY02
REORG
REORG001
IMGCPY
IMGCPY02
REORG
REORG001
REORG
REORG001
REORG
REORG001

# IBM Management Console for IMS and DB2 for z/OS

- Quickly identify and drill down to databases and objects that need your attention from a single starting point
- Easily manage by exception and recommendation, taking action before problems occur
- Rapidly interpret statistical trends to verify and project
- Shorten the learning curve for new administrators
- …all from a **unified IMS and DB2** interface

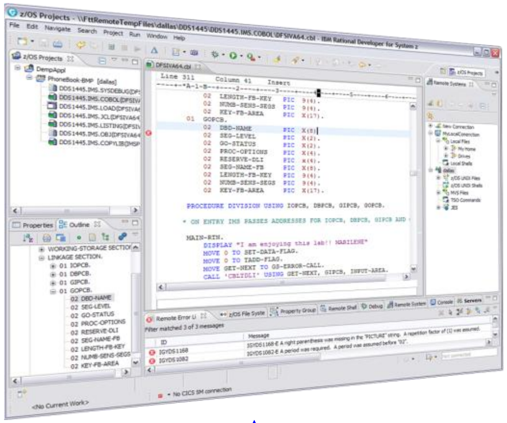

IBM Management Console
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
Resources
Search
Resources with Exceptions
Oldest synchronization: 0 minutes
Resources with Exceptions
Critical (4)
HDAMVSAM
NEWDEPT
SYSHIST
SYSJAUXA
Severe (3)
DYXACHX2
NEWPHONE
SYSTSPLN > 1
Warning (3)
HDAMVSAM
PRODUCTS
XDEPT1
Summary

Resources with Exceptions

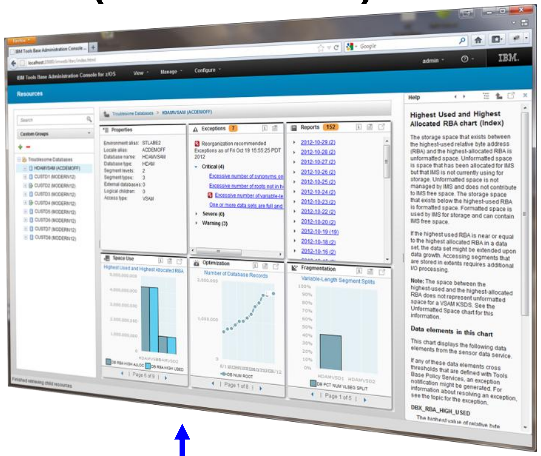
| Resources | Overall Health | Critical | Severe | Warning | Actions |
|---|---|---|---|---|---|
| Resources | 🟥 | 3 | 0 | 3 | 1 |
| HDAMVSAM | 🟥 | 1 | 0 | 0 | 1 |
| NEWDEPT | 🟥 | 1 | 0 | 0 | 1 |
| SYSHIST | 🟥 | 1 | 0 | 0 | 1 |
| SYSJAUXA | ● | 0 | 1 | 0 | 1 |
| DYXACHX2 | ● | 0 | 1 | 0 | 1 |
| NEWPHONE | ● | 0 | 1 | 0 | 1 |
| SYSTSPLN > 1 | ⚠ | 0 | 0 | 1 | 1 |
| PRODUCTS | ⚠ | 0 | 0 | 1 | 1 |
| XDEPT1 | | | | | |

# IMS and DB2 Tools User Interface Strategy

## Eclipse
(development)



## Web Browser
(administration)



**Developers**

**Administrators**

**BTS**

**RDz**

**Optim***

**TCP/IP**

**Reorg Expert**

**Index Builder**

**Pointer Checker**

**Buffer Pool Analyzer**

**Image Copy**

**Policy Services**

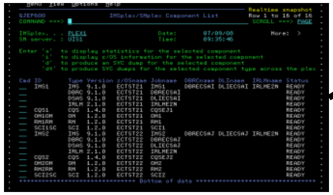
**Problem Investigator**

**Sysplex Manager**

**Performance Analyzer**

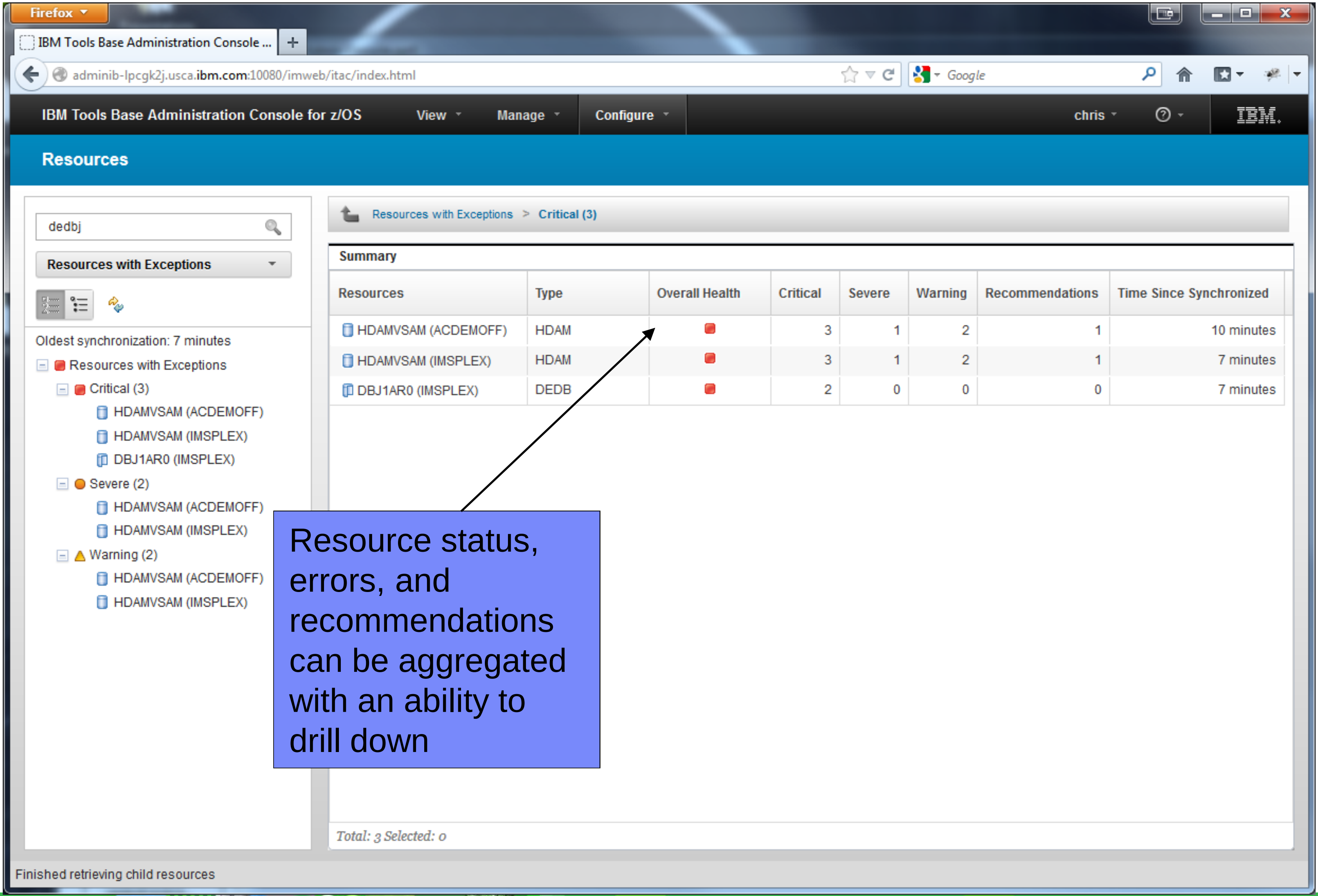
**Queue Control Facility**

## ISPF



```
  Menu  View  Options  Help
 ---------------------------------------------------------------- Realtime snapshot
 GJEP600                 IMSplex/SMplex Component List             Row 1 to 16 of 16
 COMMAND ===> _                                                    SCROLL ===> PAGE

 IMSplex. . . PLEX1                 Date:      07/09/08        More:  >
 SM server. : UIS1                  Time:      09:35:46

 Enter 's'  to display statistics for the selected component
       'i'  to display z/OS information for the selected component
       'd'  to produce an SVC dump for the selected component
       'dt' to produce SVC dumps for the selected component type across the plex

 Cmd ID      Type Version z/OSname Jobname   DBRCname DLIname  IRLMname Status
 ___ IMS1    IMS  9.1.0   ECTST21  IMS1      DBRECSAI DLIECSAI IRLME2N  READY
 ___         DBRC 9.1.0   ECTST21  DBRECSAI                             READY
 ___         DSAS 9.1.0   ECTST21  DLIECSAI                             READY
 ___         IRLM 2.1.0   ECTST21  IRLME2N                              READY
 ___ CQS1    CQS  1.4.0   ECTST21  CQSEJ1                               READY
 ___ OM1OM   OM   1.2.0   ECTST21  OM1                                  READY
 ___ RM1RM   RM   1.2.0   ECTST21  RM1                                  READY
 ___ SCI1SC  SCI  1.2.0   ECTST21  SCI1                                 READY
 ___ IMS2    IMS  9.1.0   ECTST22  IMS2      DBRECSAJ DLIECSAJ IRLME2N  READY
 ___         DBRC 9.1.0   ECTST22  DBRECSAJ                             READY
 ___         DSAS 9.1.0   ECTST22  DLIECSAJ                             READY
 ___         IRLM 2.1.0   ECTST22  IRLME2N                              READY
 ___ CQS2    CQS  1.4.0   ECTST22  CQSEJ2                               READY
 ___ OM2OM   OM   1.2.0   ECTST22  OM2                                  READY
 ___ RM2RM   RM   1.2.0   ECTST22  RM2                                  READY
 ___ SCI2SC  SCI  1.2.0   ECTST22  SCI2                                 READY
 ******************************* Bottom of data ********************************
```

# Drill down on Exceptions from an Enterprise-wide View


Firefox
IBM Tools Base Administration Console ...
adminib-lpcgk2j.usca.ibm.com:10080/imweb/itac/index.html
Google
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
chris
IBM.
Resources
dedbj
Resources with Exceptions

Resources with Exceptions > **Critical (3)**

Oldest synchronization: 7 minutes

- 🟥 Resources with Exceptions
  - 🟥 Critical (3)
    - HDAMVSAM (ACDEMOFF)
    - HDAMVSAM (IMSPLEX)
    - DBJ1AR0 (IMSPLEX)
  - ● Severe (2)
    - HDAMVSAM (ACDEMOFF)
    - HDAMVSAM (IMSPLEX)
  - △ Warning (2)
    - HDAMVSAM (ACDEMOFF)
    - HDAMVSAM (IMSPLEX)

**Summary**

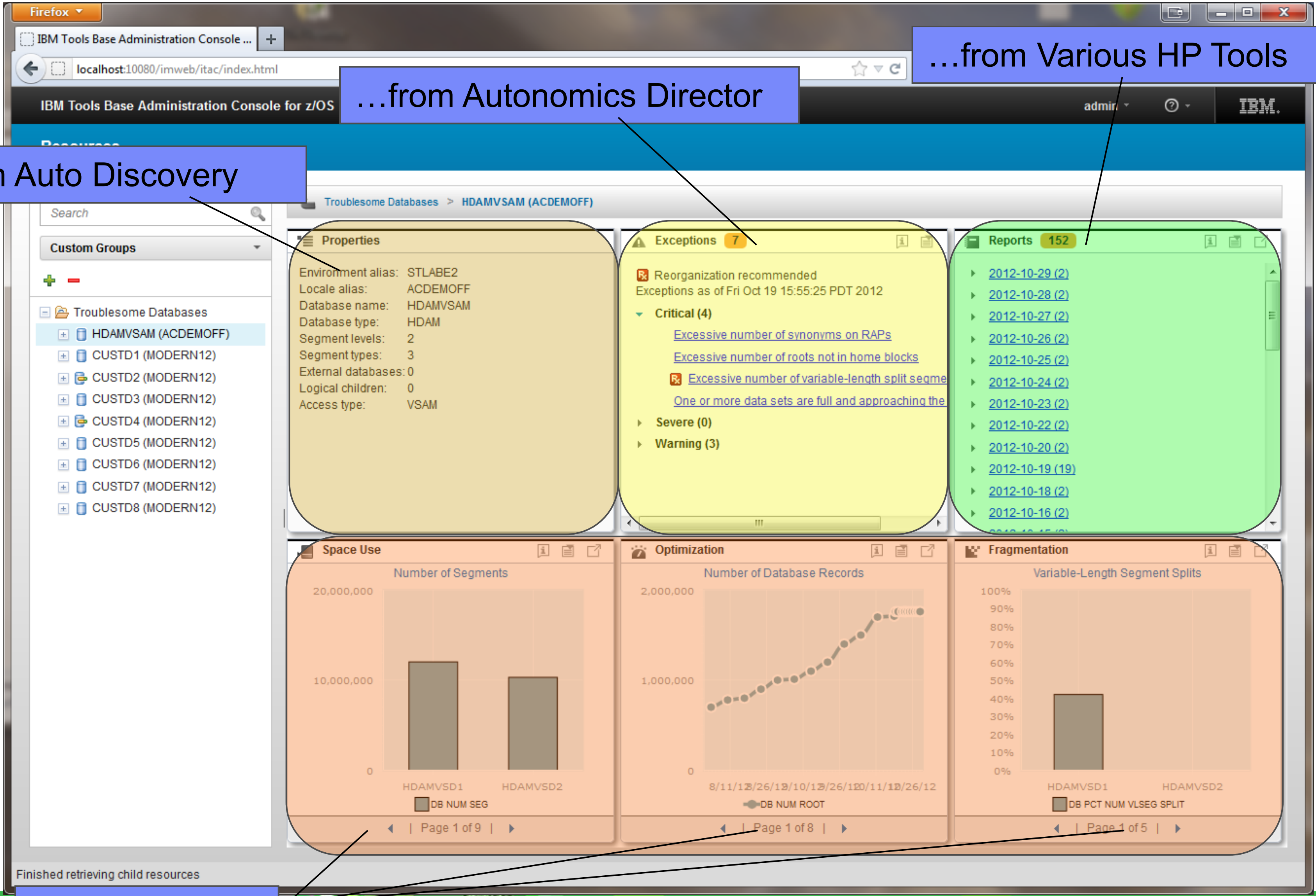
| Resources | Type | Overall Health | Critical | Severe | Warning | Recommendations | Time Since Synchronized |
|---|---|---|---|---|---|---|---|
| HDAMVSAM (ACDEMOFF) | HDAM | 🟥 | 3 | 1 | 2 | 1 | 10 minutes |
| HDAMVSAM (IMSPLEX) | HDAM | 🟥 | 3 | 1 | 2 | 1 | 7 minutes |
| DBJ1AR0 (IMSPLEX) | DEDB | 🟥 | 2 | 0 | 0 | 0 | 7 minutes |

*Total: 3 Selected: 0*

Finished retrieving child resources

Resource status, errors, and recommendations can be aggregated with an ability to drill down

# Holistic View of IMS Databases


Firefox
IBM Tools Base Administration Console ...
localhost:10080/imweb/itac/index.html
IBM Tools Base Administration Console for z/OS
admin
IBM
Resources
Search
Custom Groups
Space Use
Number of Segments
20,000,000
10,000,000
0
HDAMVSD1
HDAMVSD2
DB NUM SEG
Page 1 of 9
Optimization
Number of Database Records
2,000,000
1,000,000
0
8/11/12
8/26/12
9/10/12
9/26/12
10/11/12
10/26/12
DB NUM ROOT
Page 1 of 8
Fragmentation
Variable-Length Segment Splits
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
HDAMVSD1
HDAMVSD2
DB PCT NUM VLSEG SPLIT
Page 1 of 5

Troublesome Databases
- HDAMVSAM (ACDEMOFF)
- CUSTD1 (MODERN12)
- CUSTD2 (MODERN12)
- CUSTD3 (MODERN12)
- CUSTD4 (MODERN12)
- CUSTD5 (MODERN12)
- CUSTD6 (MODERN12)
- CUSTD7 (MODERN12)
- CUSTD8 (MODERN12)

Troublesome Databases > HDAMVSAM (ACDEMOFF)

**Properties**

| | |
|---|---|
| Environment alias: | STLABE2 |
| Locale alias: | ACDEMOFF |
| Database name: | HDAMVSAM |
| Database type: | HDAM |
| Segment levels: | 2 |
| Segment types: | 3 |
| External databases: | 0 |
| Logical children: | 0 |
| Access type: | VSAM |

**Exceptions 7**

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

- Critical (4)
  - Excessive number of synonyms on RAPs
  - Excessive number of roots not in home blocks
  - Excessive number of variable-length split segme
  - One or more data sets are full and approaching the
- Severe (0)
- Warning (3)

**Reports 152**

- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

Finished retrieving child resources

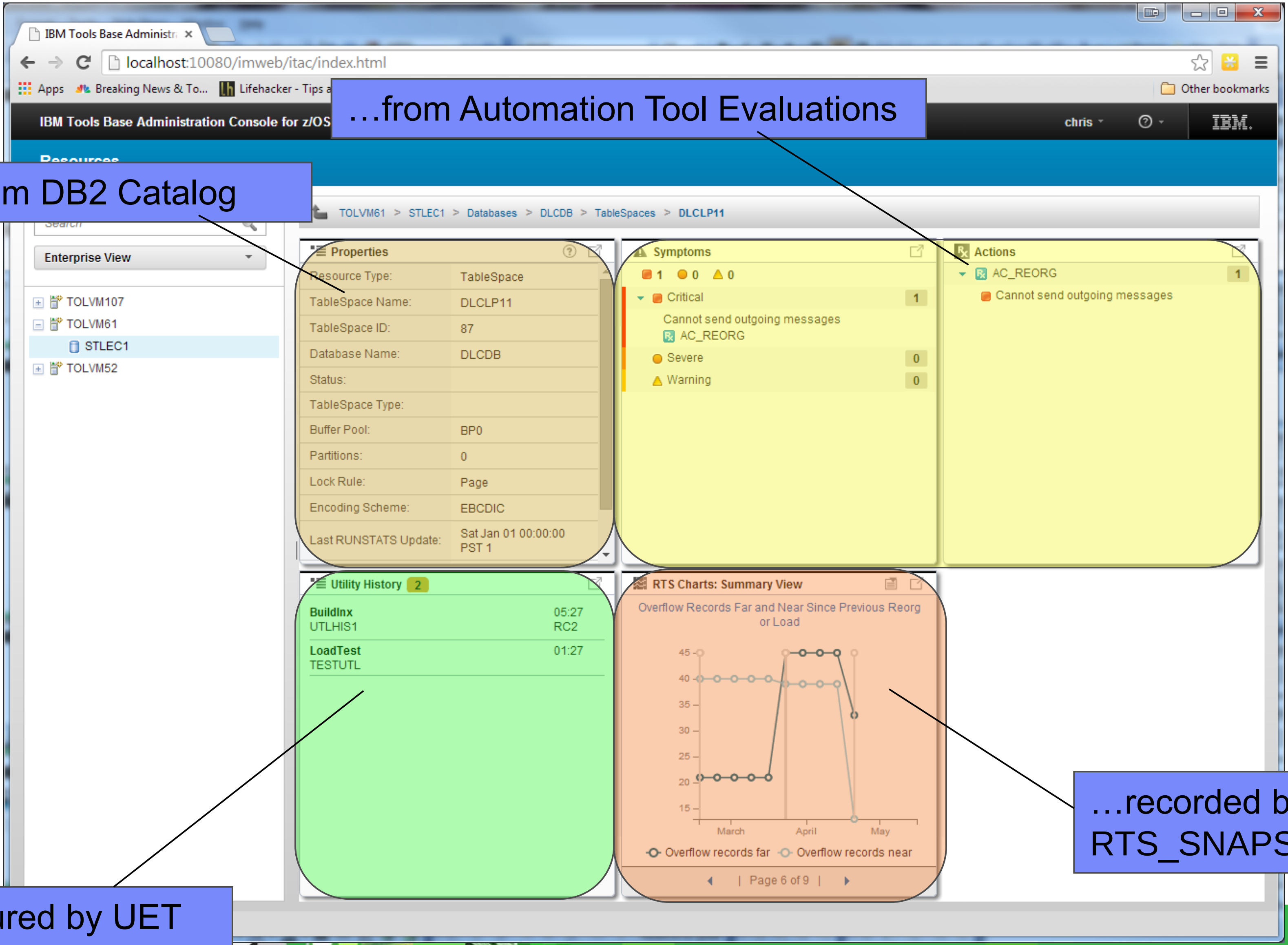
…from Various HP Tools

…from Autonomics Director

…from Auto Discovery

…from Sensors

# Holistic Dashboards of DB2 Objects



IBM Tools Base Administr...
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips a
Other bookmarks
IBM Tools Base Administration Console for z/OS
chris
Resources
Search
Enterprise View
TOLVM107
TOLVM61
STLEC1
TOLVM52
TOLVM61 > STLEC1 > Databases > DLCDB > TableSpaces > DLCLP11

**Properties**

| | |
|---|---|
| Resource Type: | TableSpace |
| TableSpace Name: | DLCLP11 |
| TableSpace ID: | 87 |
| Database Name: | DLCDB |
| Status: | |
| TableSpace Type: | |
| Buffer Pool: | BP0 |
| Partitions: | 0 |
| Lock Rule: | Page |
| Encoding Scheme: | EBCDIC |
| Last RUNSTATS Update: | Sat Jan 01 00:00:00 PST 1 |

**Symptoms**

🟥 1 ● 0 ⚠ 0

| | |
|---|---|
| Critical<br>Cannot send outgoing messages<br>AC_REORG | 1 |
| Severe | 0 |
| Warning | 0 |

**Actions**

| | |
|---|---|
| AC_REORG<br>Cannot send outgoing messages | 1 |

**Utility History** 2

| | |
|---|---|
| **BuildInx**<br>UTLHIS1 | 05:27<br>RC2 |
| **LoadTest**<br>TESTUTL | 01:27 |

**RTS Charts: Summary View**

Overflow Records Far and Near Since Previous Reorg or Load

45
40
35
30
25
20
15
March
April
May
Overflow records far
Overflow records near
Page 6 of 9

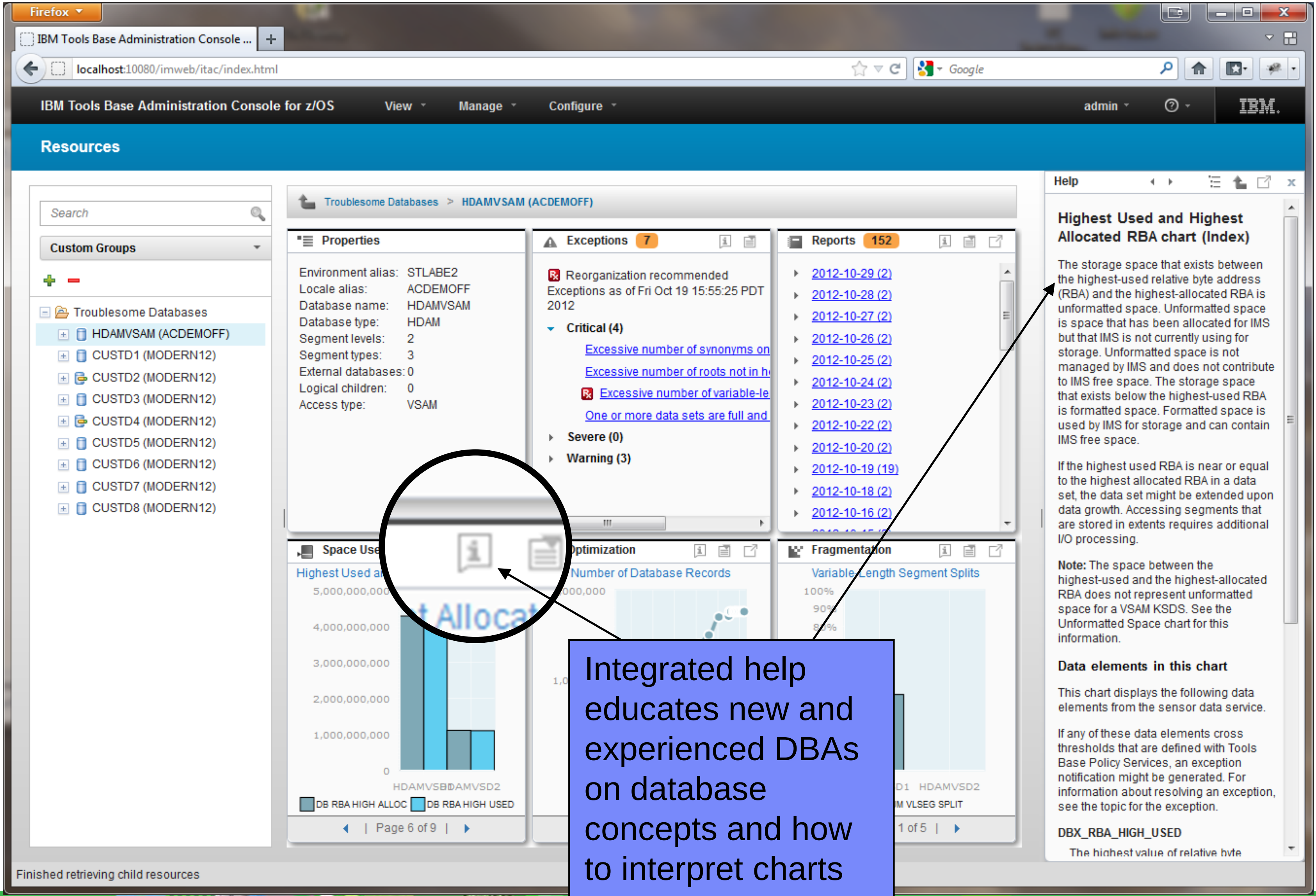
…from Automation Tool Evaluations

…from DB2 Catalog

…recorded by RTS_SNAPSHOT

…captured by UET

# Integrated Help Throughout


Firefox
IBM Tools Base Administration Console ...
localhost:10080/imweb/itac/index.html
Google
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
2012-10-29 (2)
2012-10-28 (2)
2012-10-27 (2)
2012-10-26 (2)
2012-10-25 (2)
2012-10-24 (2)
2012-10-23 (2)
2012-10-22 (2)
2012-10-20 (2)
2012-10-19 (19)
2012-10-18 (2)
2012-10-16 (2)
Space Use
Highest Used a
5,000,000,000
4,000,000,000
3,000,000,000
2,000,000,000
1,000,000,000
0
HDAMVSBDAMVSD2
DB RBA HIGH ALLOC
DB RBA HIGH USED
Page 6 of 9
t Allocat
Optimization
Number of Database Records
Fragmentation
Variable-Length Segment Splits
100%
90%
80%
HDAMVSD2
M VLSEG SPLIT
1 of 5
Help
Finished retrieving child resources

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

Critical (4)
- Excessive number of synonyms on
- Excessive number of roots not in h
- Excessive number of variable-le
- One or more data sets are full and

Severe (0)

Warning (3)

**Highest Used and Highest Allocated RBA chart (Index)**

The storage space that exists between the highest-used relative byte address (RBA) and the highest-allocated RBA is unformatted space. Unformatted space is space that has been allocated for IMS but that IMS is not currently using for storage. Unformatted space is not managed by IMS and does not contribute to IMS free space. The storage space that exists below the highest-used RBA is formatted space. Formatted space is used by IMS for storage and can contain IMS free space.

If the highest used RBA is near or equal to the highest allocated RBA in a data set, the data set might be extended upon data growth. Accessing segments that are stored in extents requires additional I/O processing.

**Note:** The space between the highest-used and the highest-allocated RBA does not represent unformatted space for a VSAM KSDS. See the Unformatted Space chart for this information.

**Data elements in this chart**

This chart displays the following data elements from the sensor data service.

If any of these data elements cross thresholds that are defined with Tools Base Policy Services, an exception notification might be generated. For information about resolving an exception, see the topic for the exception.

**DBX_RBA_HIGH_USED**

The highest value of relative byte

Integrated help educates new and experienced DBAs on database concepts and how to interpret charts

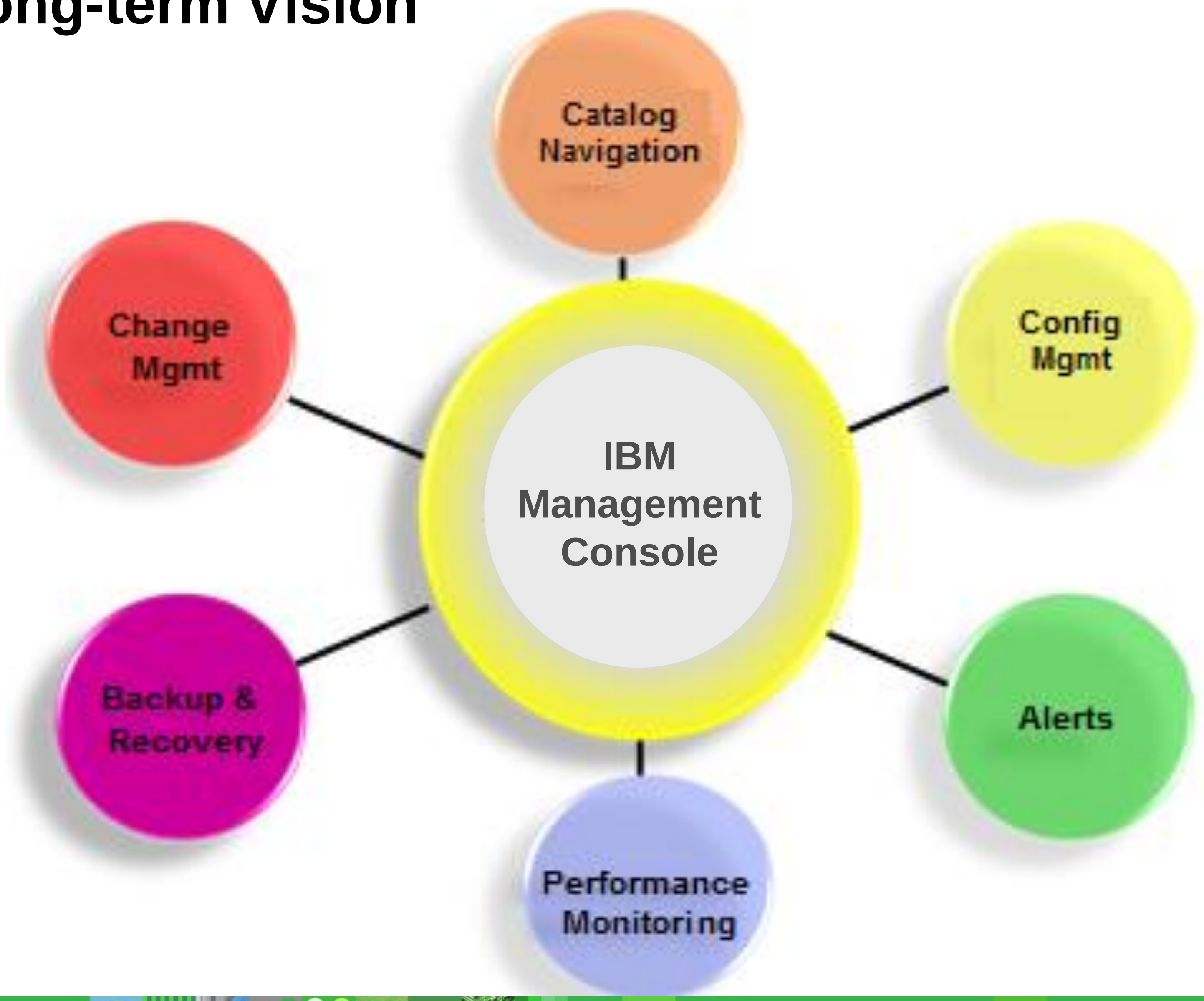
# Target Audience

- Main function today and who is it for?

  - IMS DBAs
  - IMS System Programmers
  - DB2 DBAs

  - New class of first responder?

# Long-term Vision


Catalog Navigation
Change Mgmt
Config Mgmt
IBM Management Console
Backup & Recovery
Alerts
Performance Monitoring

# Technology and Design

…a quick divergence into some technology

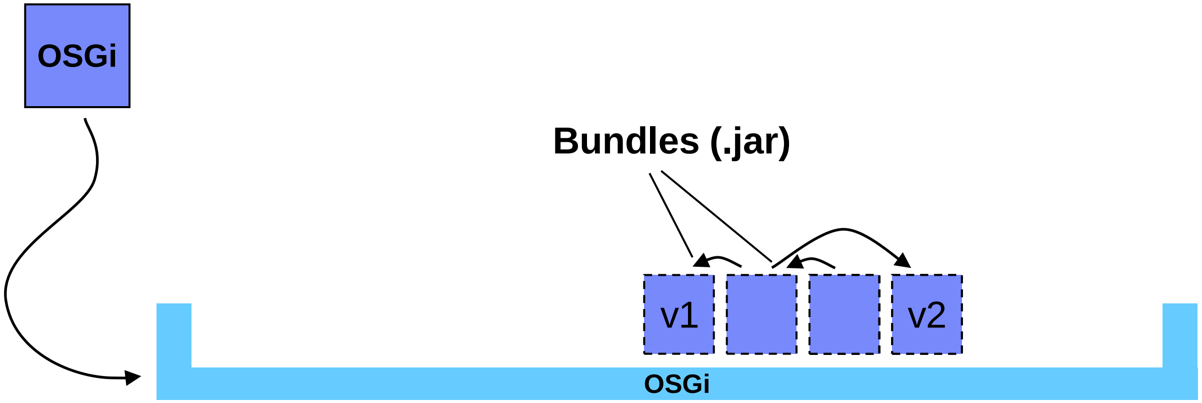
# General Technology Goals

- Build a strategic platform that can be easily and dynamically be extended to support any number of Tools
- Create as many integration / extension points as possible so it doesn't feel like 30 separate UIs under one umbrella
- Take the extensible eclipse OSGi model and bring it to the web

# Open Services Gateway initiative (OSGi)

- Open Services Gateway initiative Alliance
  - Founded by Ericsson, IBM, Motorola, Sun Microsystems and others in March 1999
- Open Services Gateway initiative framework
  - …is a dynamic modular service platform for Java
- June 2004
  - Eclipse 3.0 replaces it homegrown plugin infrastructure for OSGi and starts contributing back to OSGi
  - Making OSGi the heart of all IBM eclipse products
    - Individual products develop and ship “plugins”
    - Each plugin contributes to the eclipse environment (services or UI)

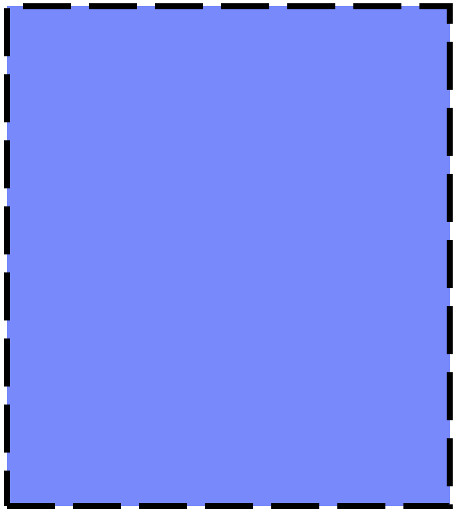
# Open Services Gateway initiative (OSGi)


OSGi
Bundles (.jar)
v1
v2
OSGi

**Life-cycle:**

INSTALLED
RESOLVED
STARTING
ACTIVE
STOPPING
UNINSTALLED

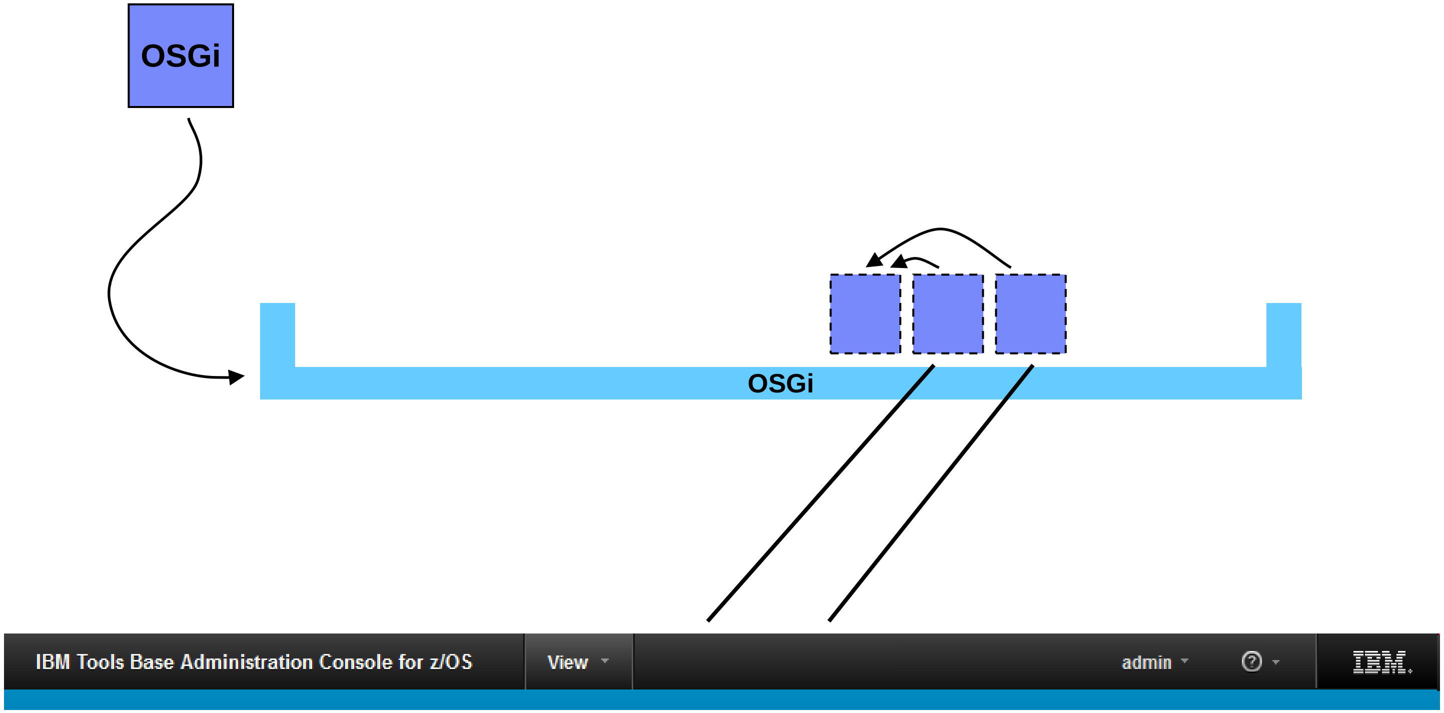
# Open Services Gateway initiative (OSGi)



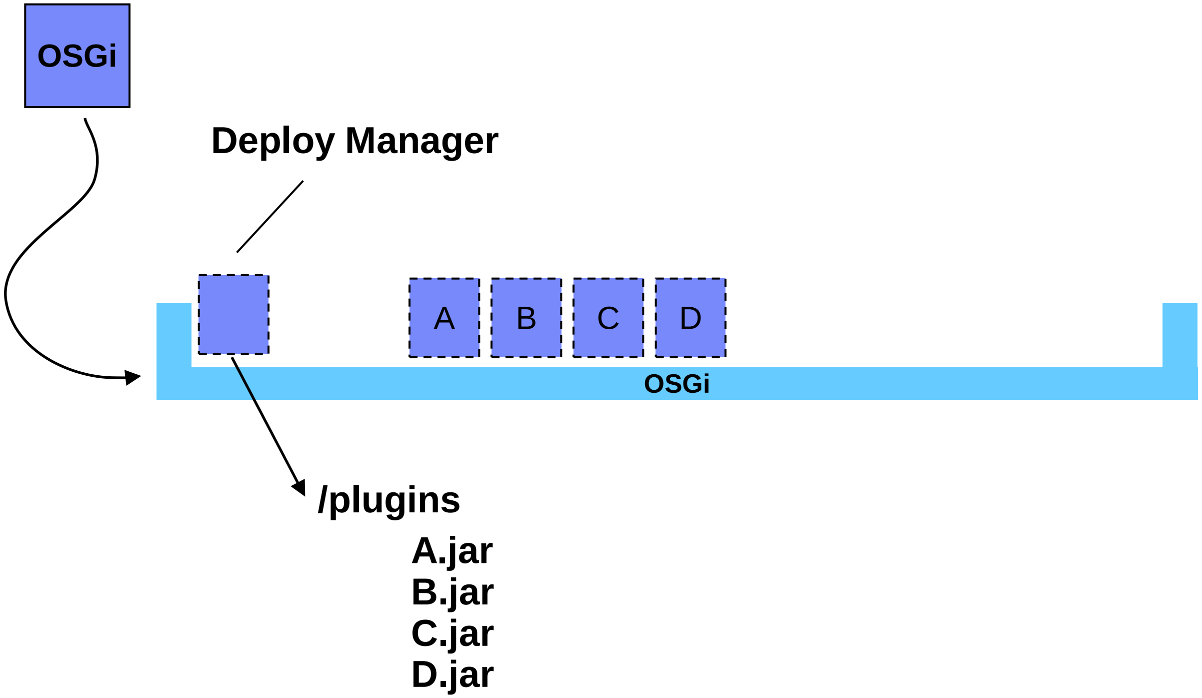
**MANIFEST.MF**

```
Bundle-Name: My Bundle
Bundle-Version: 1.0.0.qualifier

Bundle-Activator: my.bundle.Activator

Import-Package: other.bundle.packageA;version="1.3.0",
                other.bundle.packageB,
                other.bundle.packageC
Export-Package: my.bundle.package
```

# Dependency Injection (Extension Plug-ins)

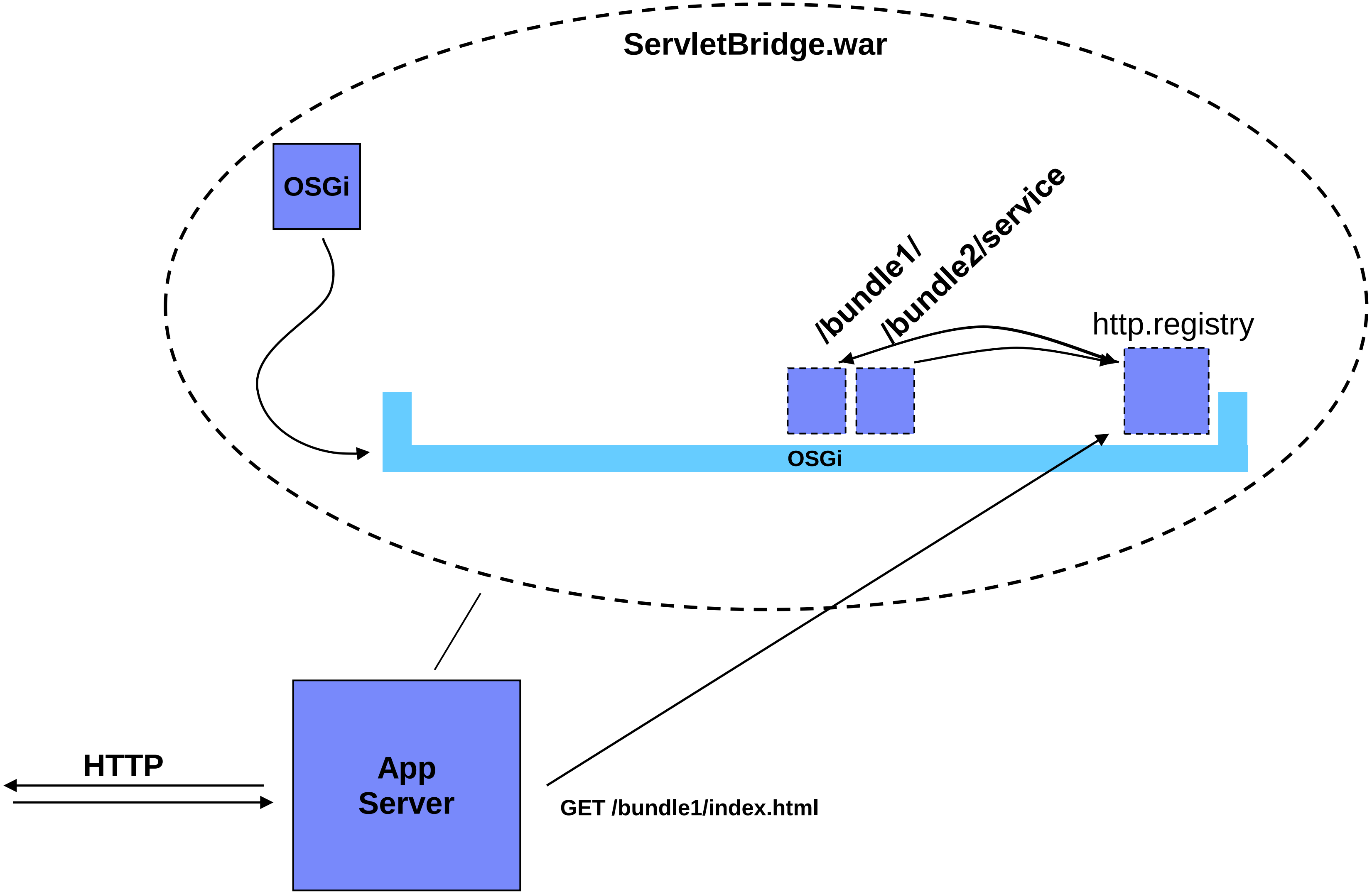

OSGi
OSGi
IBM Tools Base Administration Console for z/OS
View
admin
IBM.

# Dynamic Plug in Loading

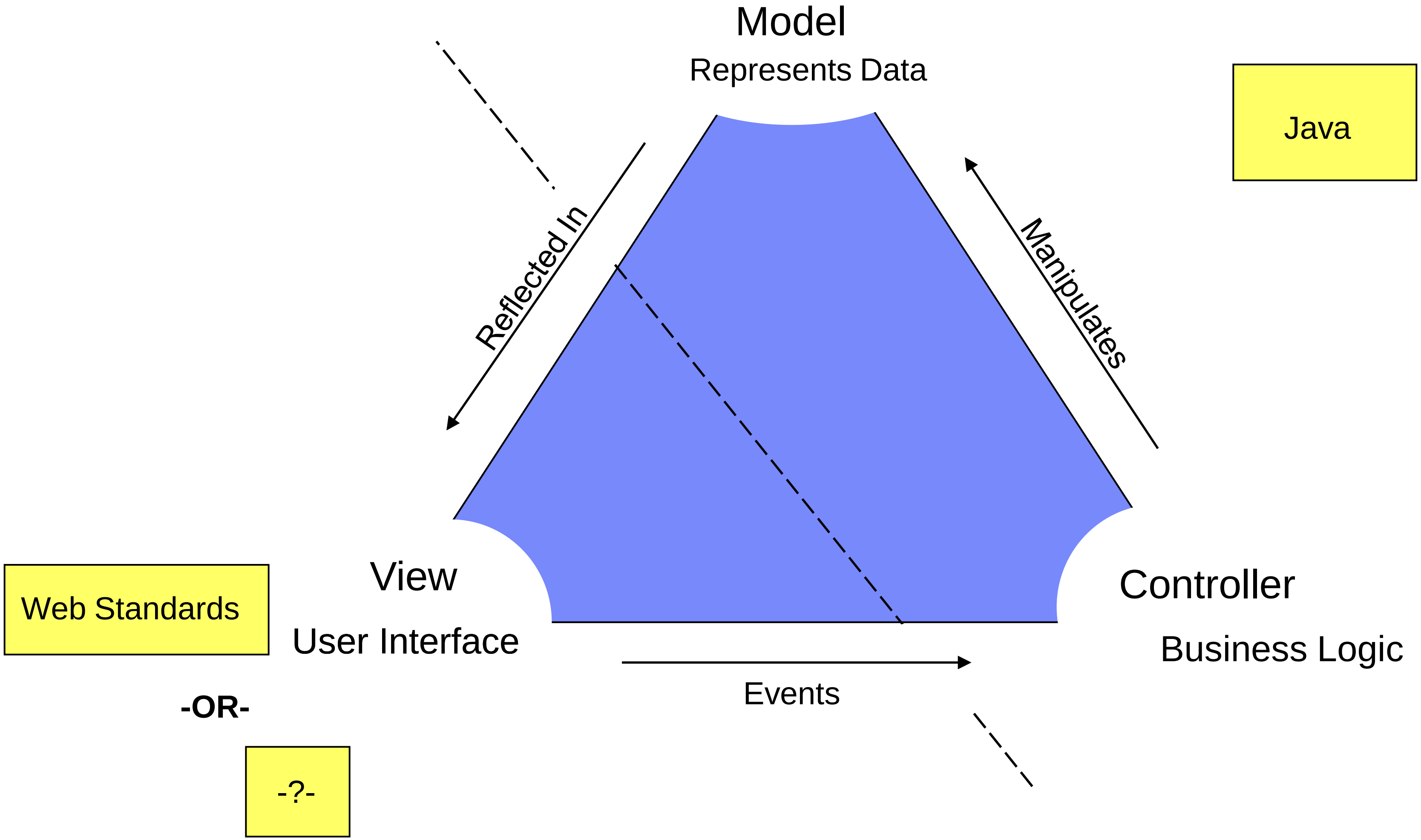

OSGi
Deploy Manager
A
B
C
D
OSGi
/plugins
A.jar
B.jar
C.jar
D.jar

Deploy Manager Bundle (this is how eclipse works)

# Web Access into OSGi (ServletBridge)


ServletBridge.war
OSGi
/bundle1/
/bundle2/service
http.registry
OSGi
HTTP
App Server
GET /bundle1/index.html

# Presentation / Logic Split (Model View Controller)



Model

Represents Data

Java

Reflected In

Manipulates

Web Standards

View

User Interface

Controller

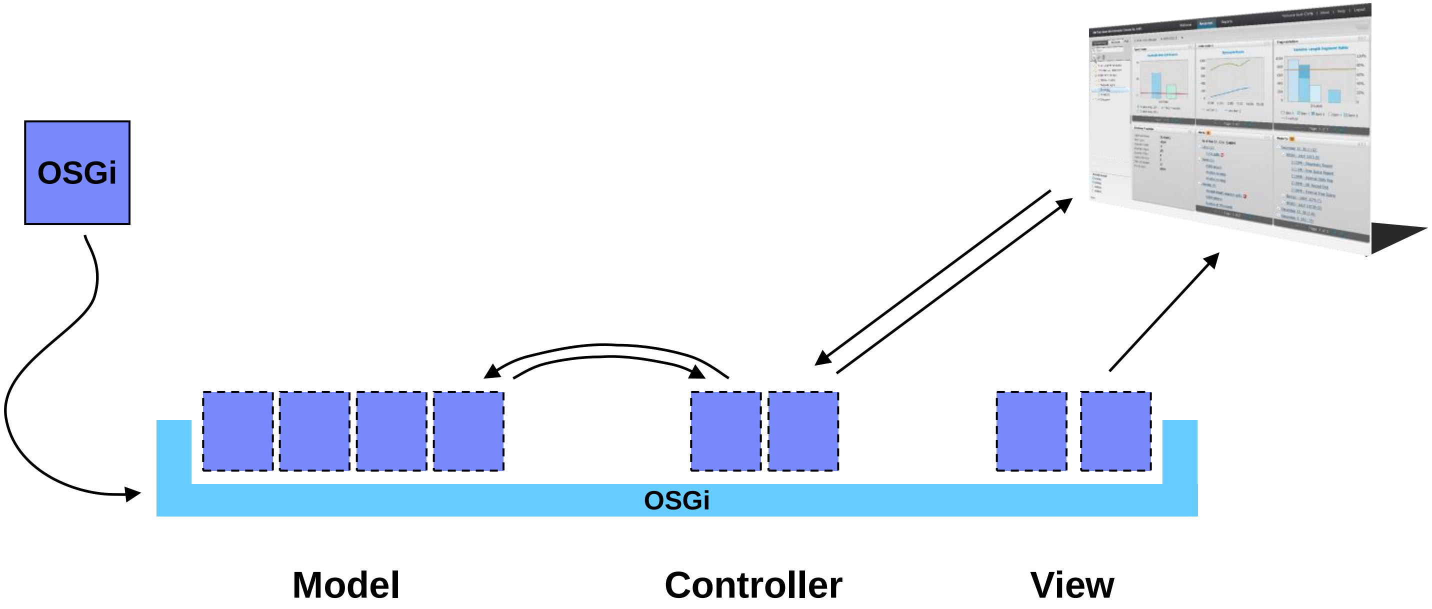
Business Logic

Events

-OR-

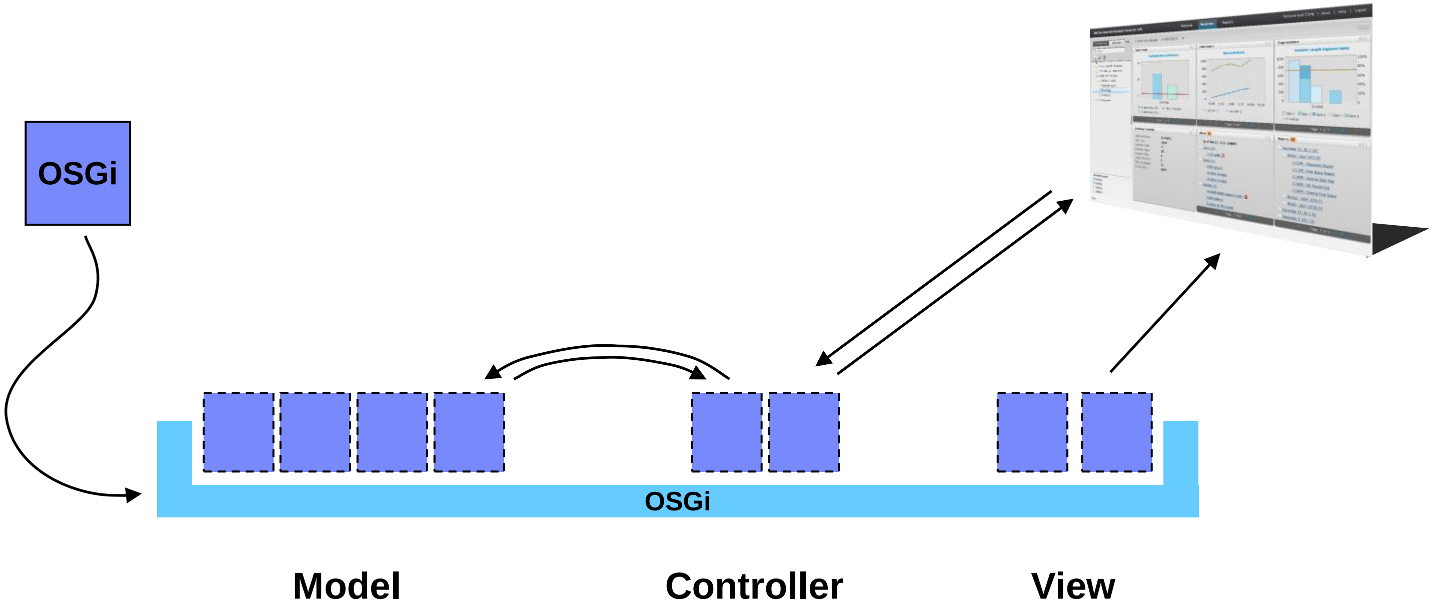
-?-

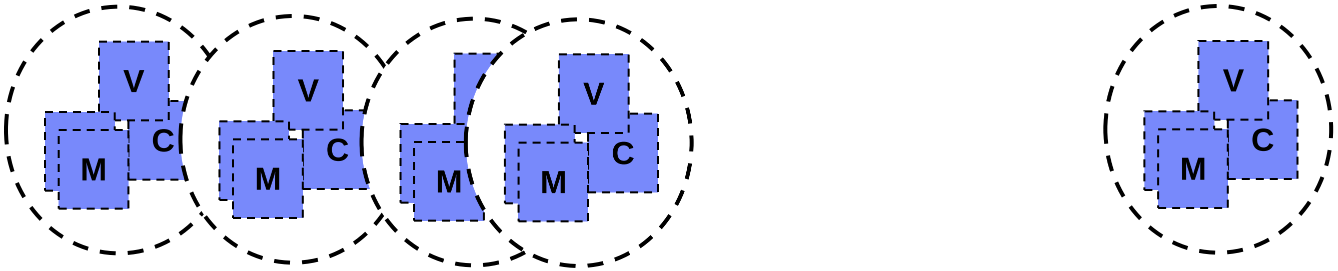
# MVC and OSGi


OSGi
OSGi
Model
Controller
View

Break plugins into MVC groups

# MVC and OSGi

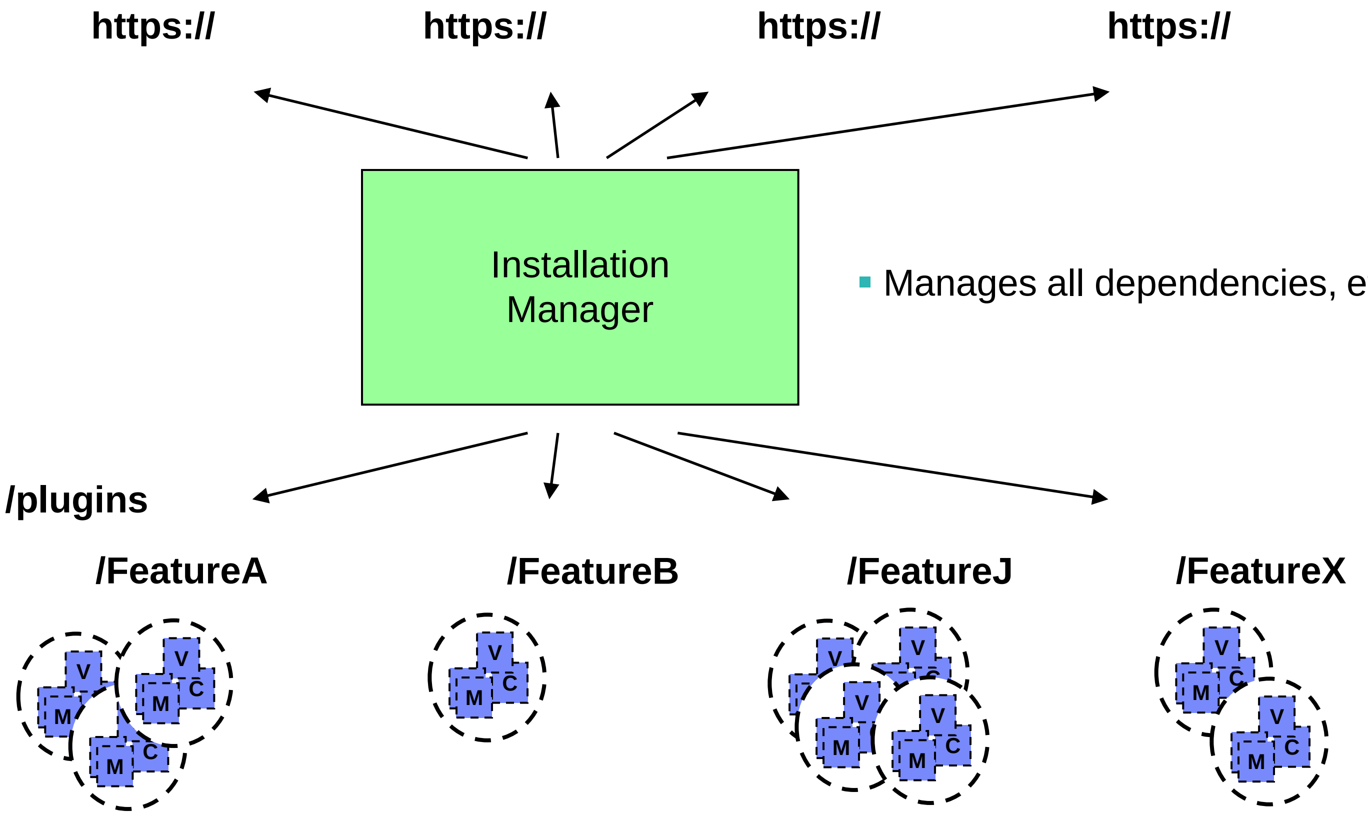

OSGi
OSGi
Model
Controller
View


V
C
M
V
C
M
M
V
C
M
V
C
M

Package MVC triplets for each product that extends the Management Console

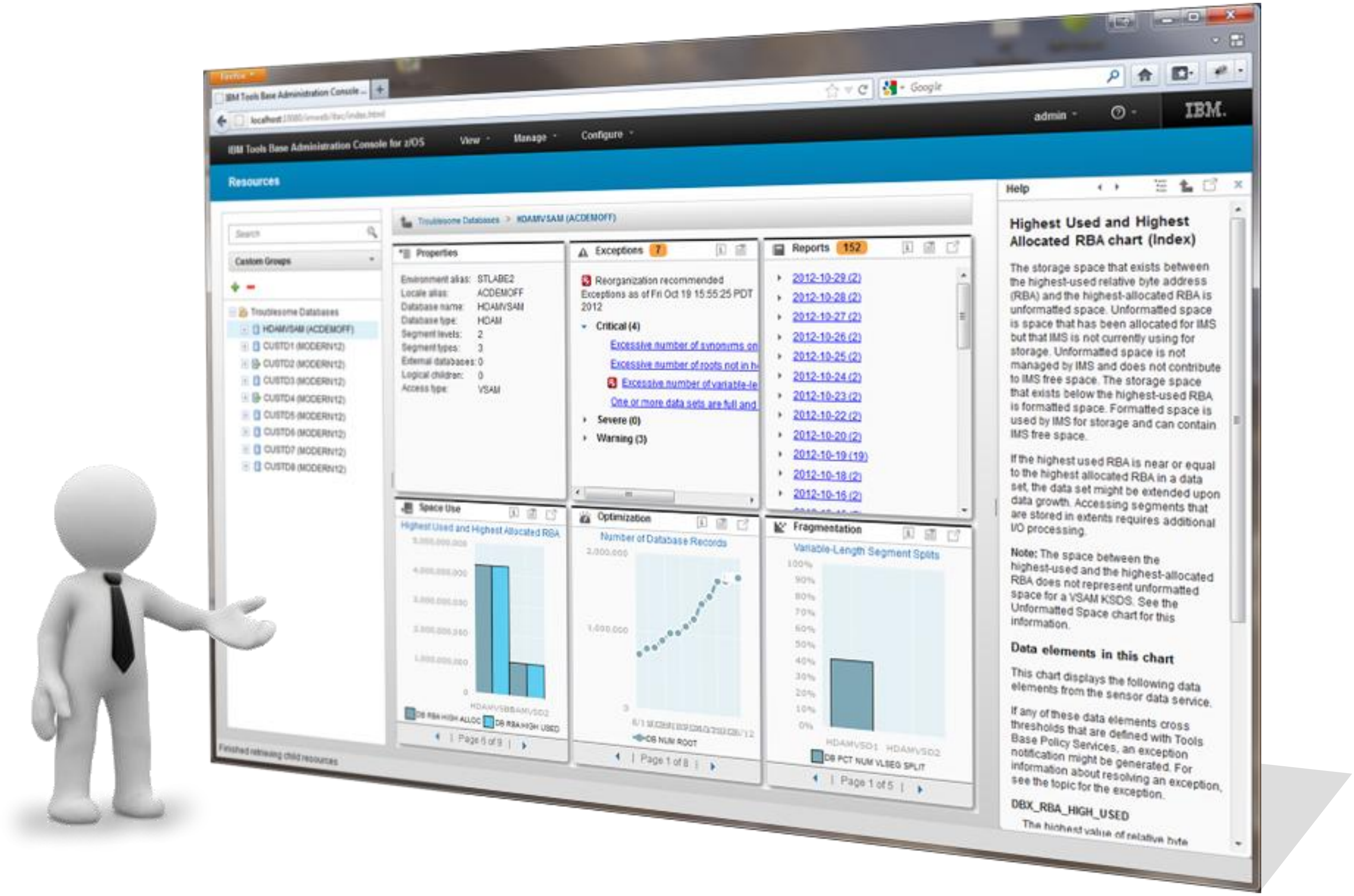
# IBM Installation Manager

(managing packages and dependencies)


https://
https://
https://
https://
Installation Manager
/plugins
/FeatureA
/FeatureB
/FeatureJ
/FeatureX
V
M
C

- Manages all dependencies, etc

# IBM Management Console Demo


IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
Space Use
Highest Used and Highest Allocated RBA
Optimization
Number of Database Records
Fragmentation
Variable-Length Segment Splits
Help

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

Critical (4)
- Excessive number of synonyms on
- Excessive number of roots not in h
- Excessive number of variable-le
- One or more data sets are full and

Severe (0)

Warning (3)

- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

**Highest Used and Highest Allocated RBA chart (Index)**

The storage space that exists between the highest-used relative byte address (RBA) and the highest-allocated RBA is unformatted space. Unformatted space is space that has been allocated for IMS but that IMS is not currently using for storage. Unformatted space is not managed by IMS and does not contribute to IMS free space. The storage space that exists below the highest-used RBA is formatted space. Formatted space is used by IMS for storage and can contain IMS free space.

If the highest used RBA is near or equal to the highest allocated RBA in a data set, the data set might be extended upon data growth. Accessing segments that are stored in extents requires additional I/O processing.

**Note:** The space between the highest-used and the highest-allocated RBA does not represent unformatted space for a VSAM KSDS. See the Unformatted Space chart for this information.

**Data elements in this chart**

This chart displays the following data elements from the sensor data service.

If any of these data elements cross thresholds that are defined with Tools Base Policy Services, an exception notification might be generated. For information about resolving an exception, see the topic for the exception.

**DBX_RBA_HIGH_USED**

The highest value of relative byte

Finished retrieving child resources

*The future runs on System z*

# Installation…

## IBM Management Console Workshop

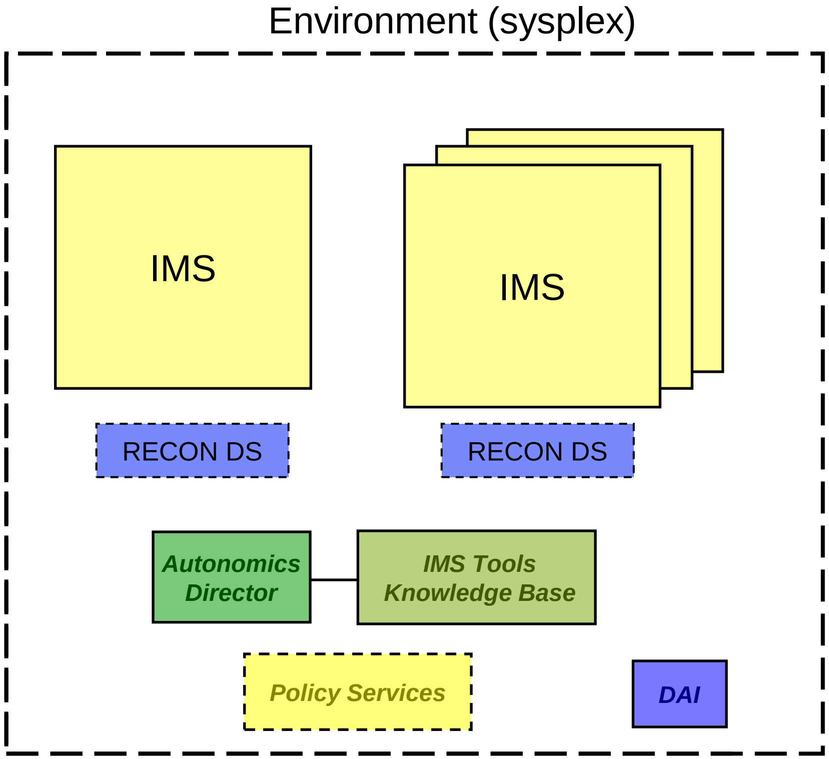
Christopher Holtz
IMS and DB2 Modernization Architect

© 2014 IBM Corporation. IBM Confidential

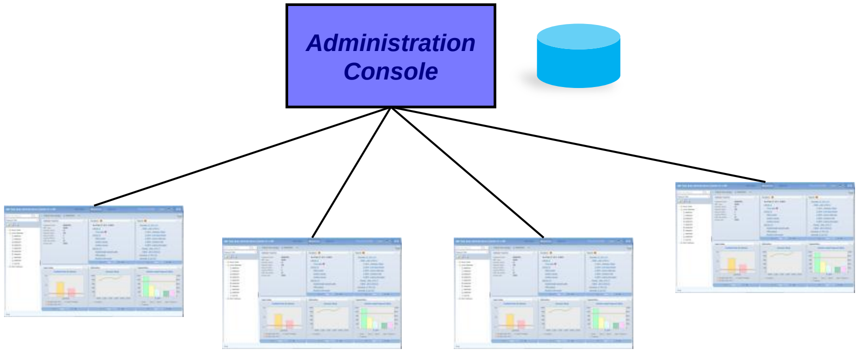
# Agenda

- Order of Installation
- Understanding Management Console Installation
  - Conceptually What’s Happening
  - What are the real steps
- Demo
  - Setup
  - Deployment Assistance
- Questions, Futures, etc.

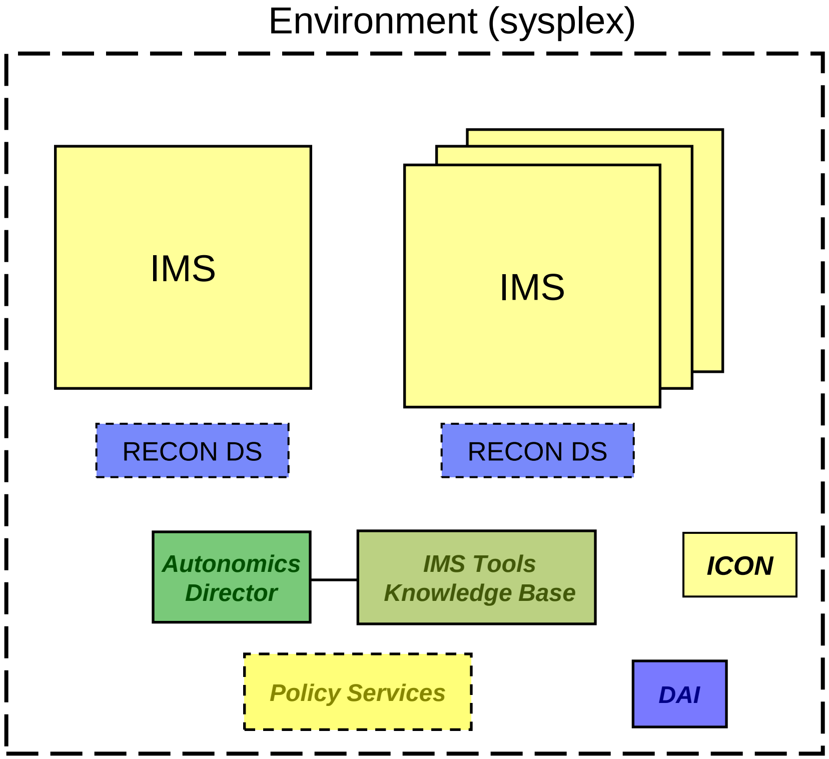
# Traditional Install Order


Environment (sysplex)
IMS
IMS
RECON DS
RECON DS
Autonomics Director
IMS Tools Knowledge Base
Policy Services
DAI

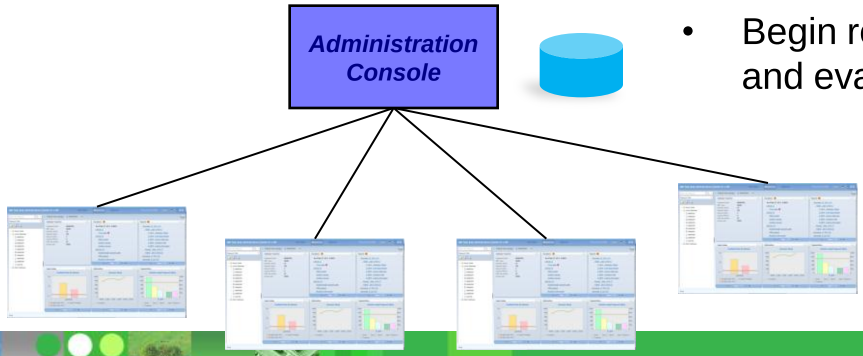
1. Install ITKB
   - Define Locales
   - Store IMS Tools Reports
2. Define Policy Services
   - Start with IBM Default Policies
   - Run Conditional Reorg
3. Install Autonomics Director
   - Define a PEAK schedule
   - Add databases to monitor list
   - Begin regularly collecting sensor data and evaluating policies
4. Install DAI and Administration Console
   - Setup Environments
   - Run AutoDiscovery
   - Work Faster, Work Smarter!


Administration Console

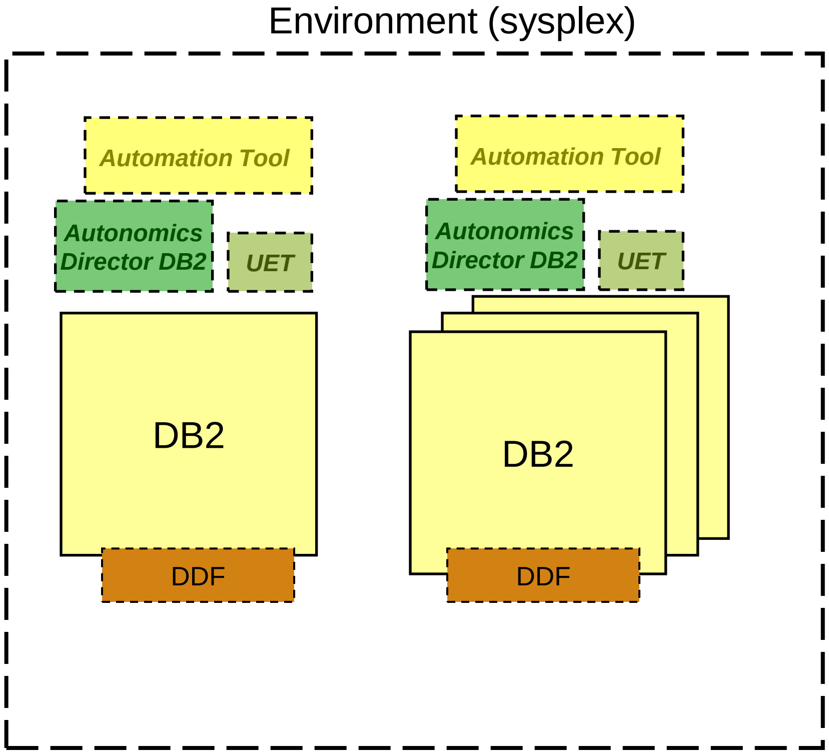
# Management Console First


Environment (sysplex)
IMS
IMS
RECON DS
RECON DS
Autonomics Director
IMS Tools Knowledge Base
ICON
Policy Services
DAI

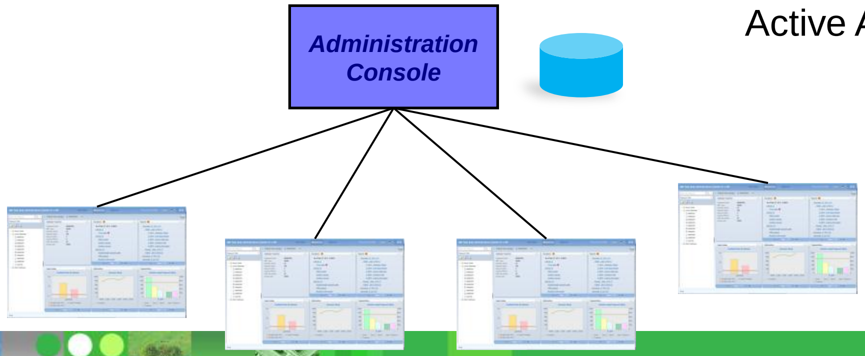
1. **Install Management Console**
   - **Define Sysplex**
   - **Connect to IMS Connect ("E4A")**
   - **Use Deployment Assistance to:**
2. Install DAI
   - Validate Connection
3. Install ITKB
   - Validate ITKB is up
   - Run Auto Discovery
   - View Databases
4. Store Job Reports into ITKB
   - View Reports from GUI
5. Run Sensor Jobs
   - View Sensor Data from GUI
6. Setup Policy Services
   - Run Conditional Reorgs
7. Install Autonomics Director
   - Define a PEAK schedule
   - Add databases to monitor list
   - Begin regularly collecting sensor data and evaluating policies


Administration Console

# Management Console First


Environment (sysplex)
Automation Tool
Autonomics Director DB2
UET
DB2
DDF
Automation Tool
Autonomics Director DB2
UET
DB2
DDF

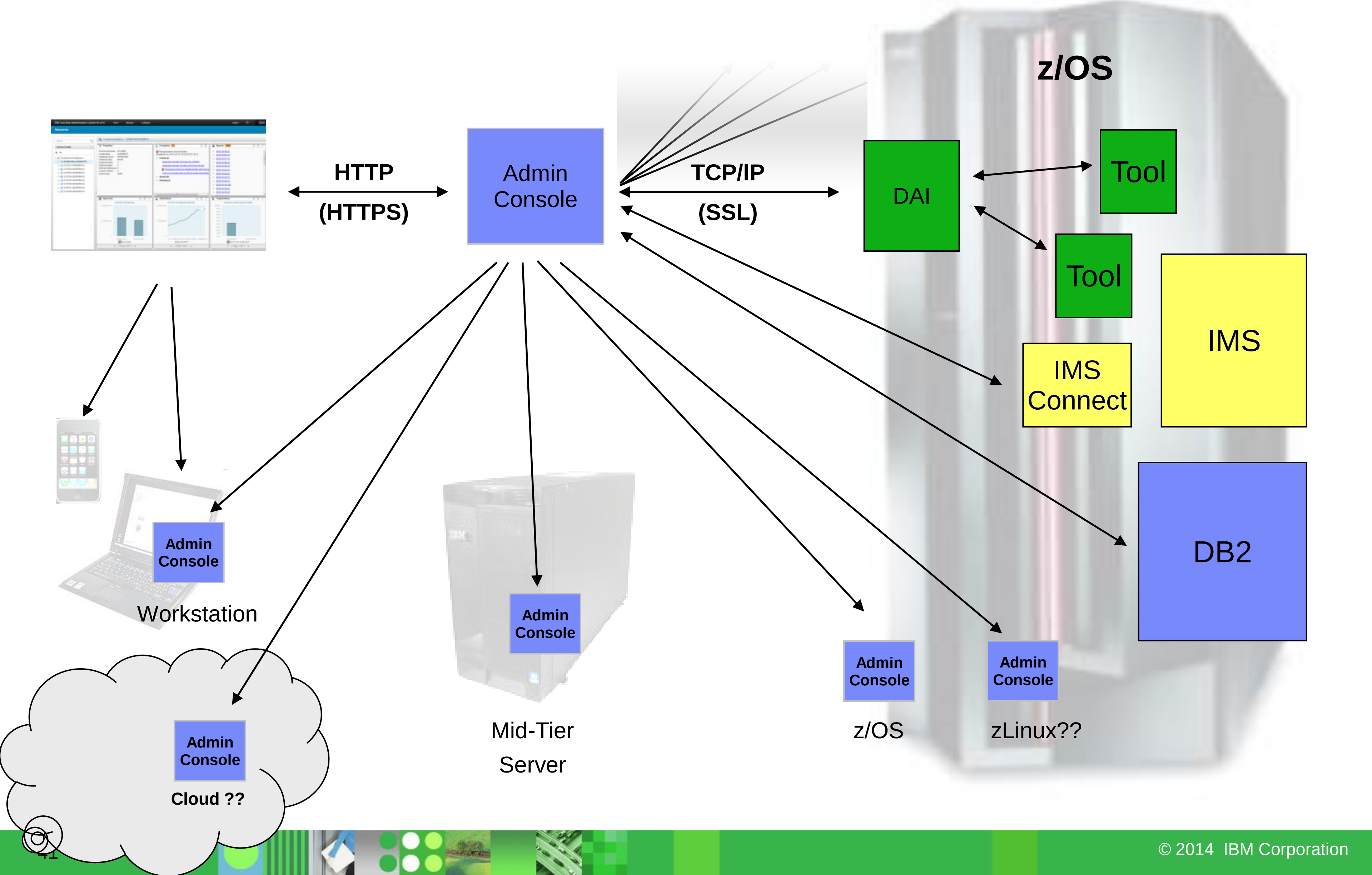
1. **Install Management Console**
   - **Define Sysplex**
   - **Connect to DB2**
   - **Run Auto Discovery**
2. Install Autonomics Director for DB2 for z/OS
   - Automate RTS sensor capture
   - View Sensor Data from GUI
3. Install DB2 UET
   - Capture Historical Jobs
   - View Job reports from GUI
4. Install DB2 Automation Tool
   - Configure Profiles
   - Run Conditional Reorgs
   - View Symptoms / Actions from GUI
5. Leverage Full Autonomics
   - Define Maintenance Windows
   - Schedule Autonomics Director for Active Autonomics


Administration Console

# Installing Management Console

- Choosing where to install
- SMP/E
    - Admin Console vs Management Console
- Installation Manager
- Running Management Console

# Management Console Deployment



z/OS

HTTP (HTTPS)

Admin Console

TCP/IP (SSL)

DAI

Tool

Tool

IMS Connect

IMS

DB2

Admin Console

Workstation

Admin Console

Mid-Tier Server

Admin Console

z/OS

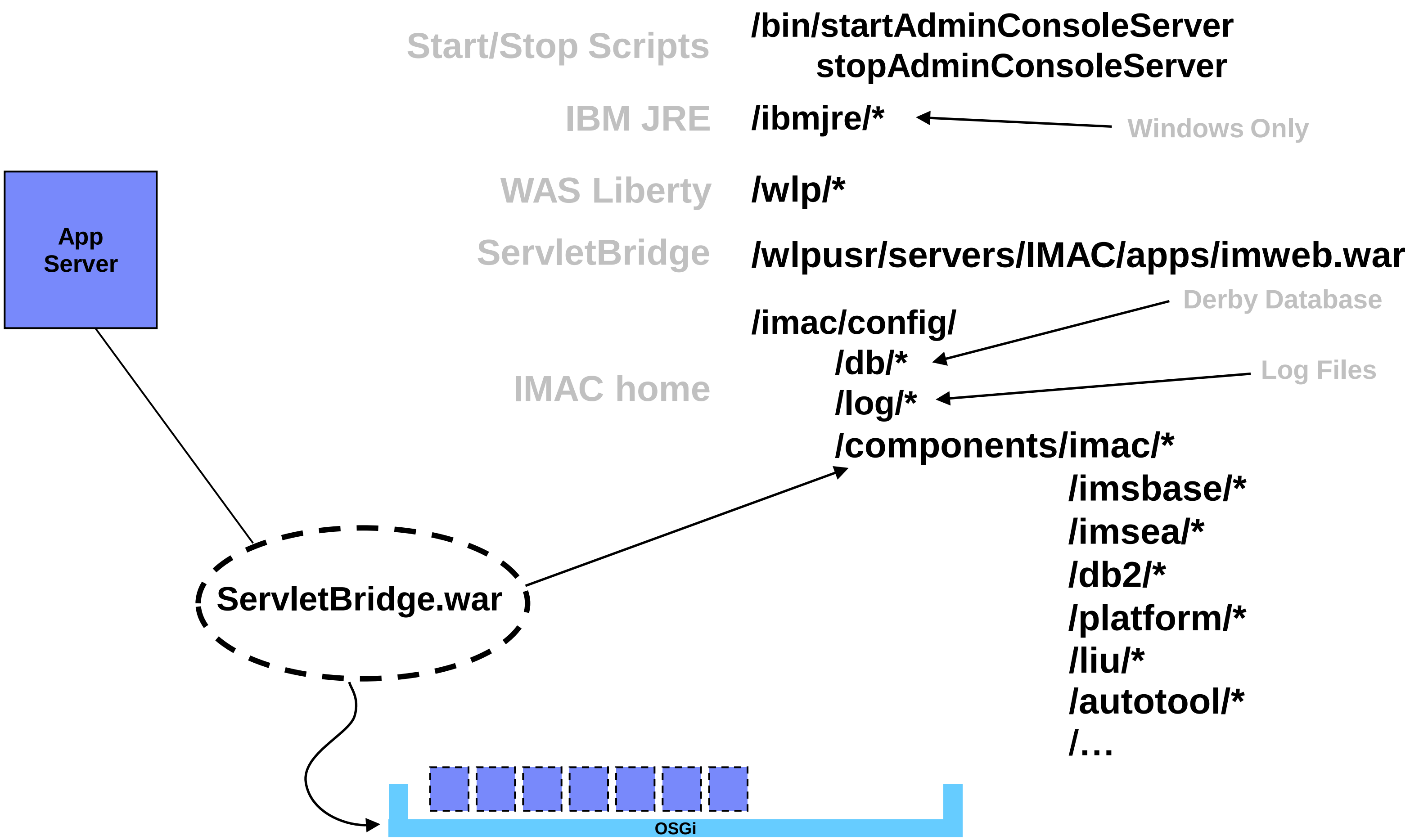
Admin Console

zLinux??

Admin Console

**Cloud ??**

# Installing the Management Console



Start/Stop Scripts **/bin/startAdminConsoleServer**
**stopAdminConsoleServer**

IBM JRE **/ibmjre/*** ← Windows Only

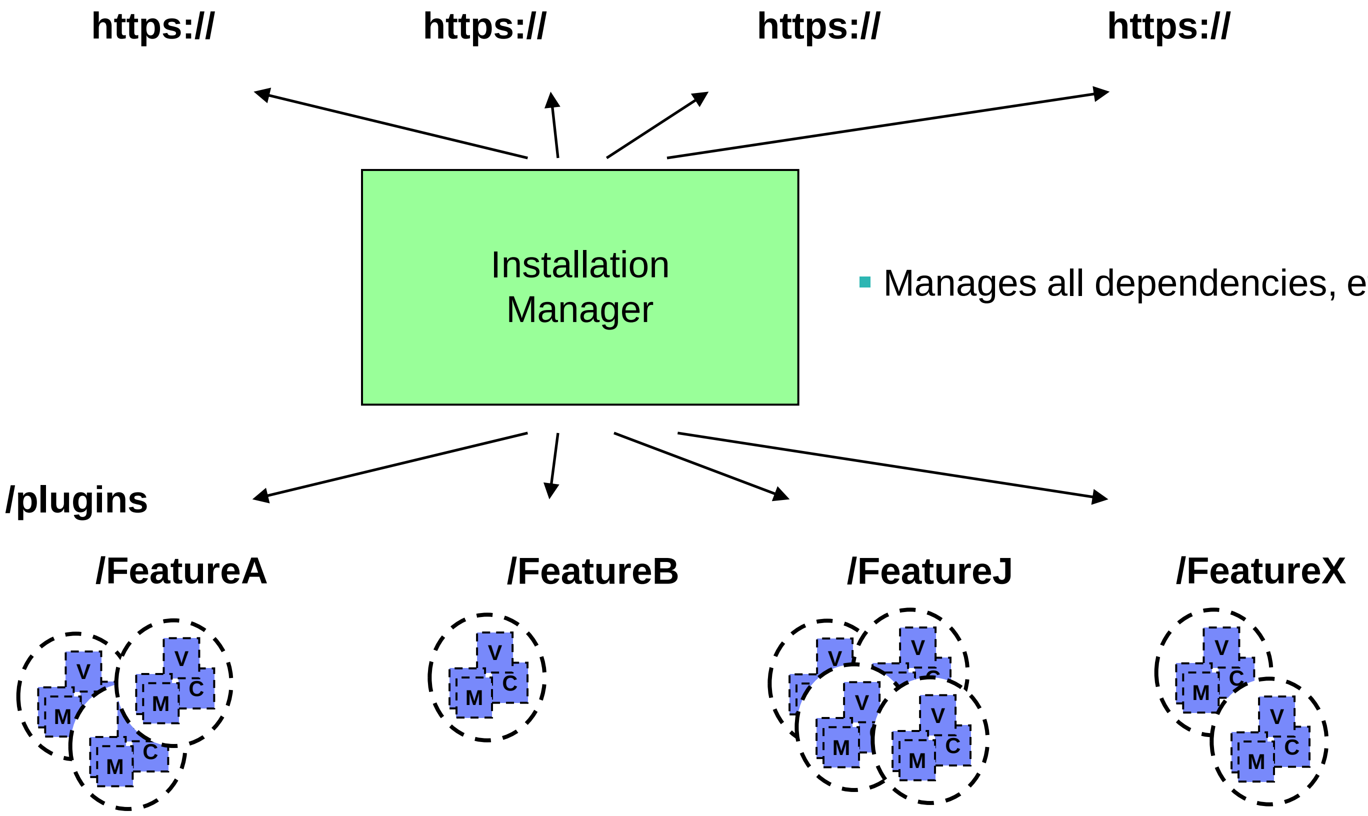
WAS Liberty **/wlp/***

ServletBridge **/wlpusr/servers/IMAC/apps/imweb.war**

IMAC home
**/imac/config/**
**/db/*** ← Derby Database
**/log/*** ← Log Files
**/components/imac/***
**/imsbase/***
**/imseal/***
**/db2/***
**/platform/***
**/liu/***
**/autotool/***
**/…**

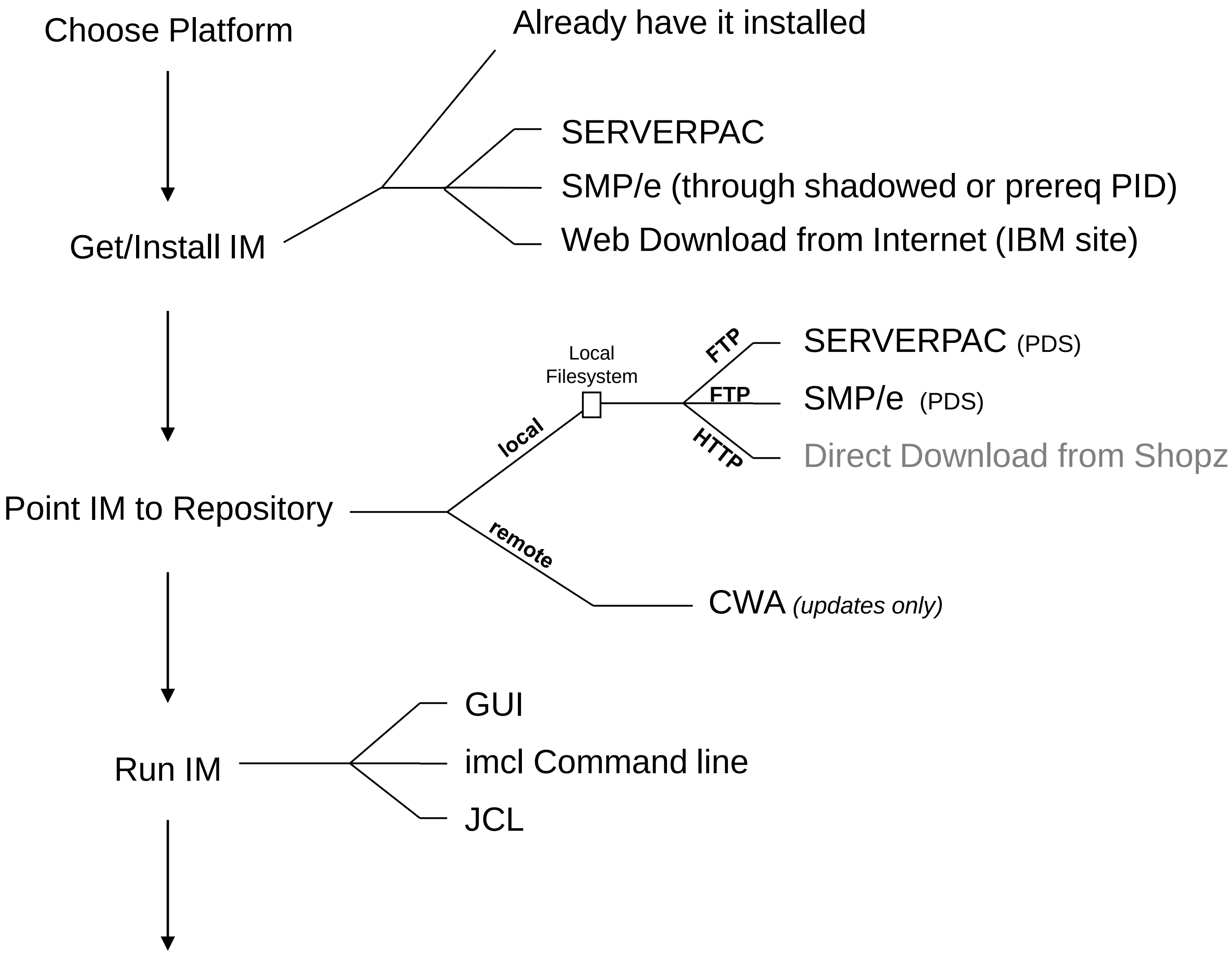
# IBM Installation Manager

## (managing packages and dependencies)


https://
https://
https://
https://
Installation Manager
/plugins
/FeatureA
/FeatureB
/FeatureJ
/FeatureX
V
M
C

- Manages all dependencies, etc

# Packaging and Installation Scenarios



Choose Platform

Get/Install IM

- Already have it installed
- SERVERPAC
- SMP/e (through shadowed or prereq PID)
- Web Download from Internet (IBM site)

Point IM to Repository

- local – Local Filesystem
  - FTP – SERVERPAC (PDS)
  - FTP – SMP/e (PDS)
  - HTTP – Direct Download from Shopz
- remote – CWA *(updates only)*

Run IM

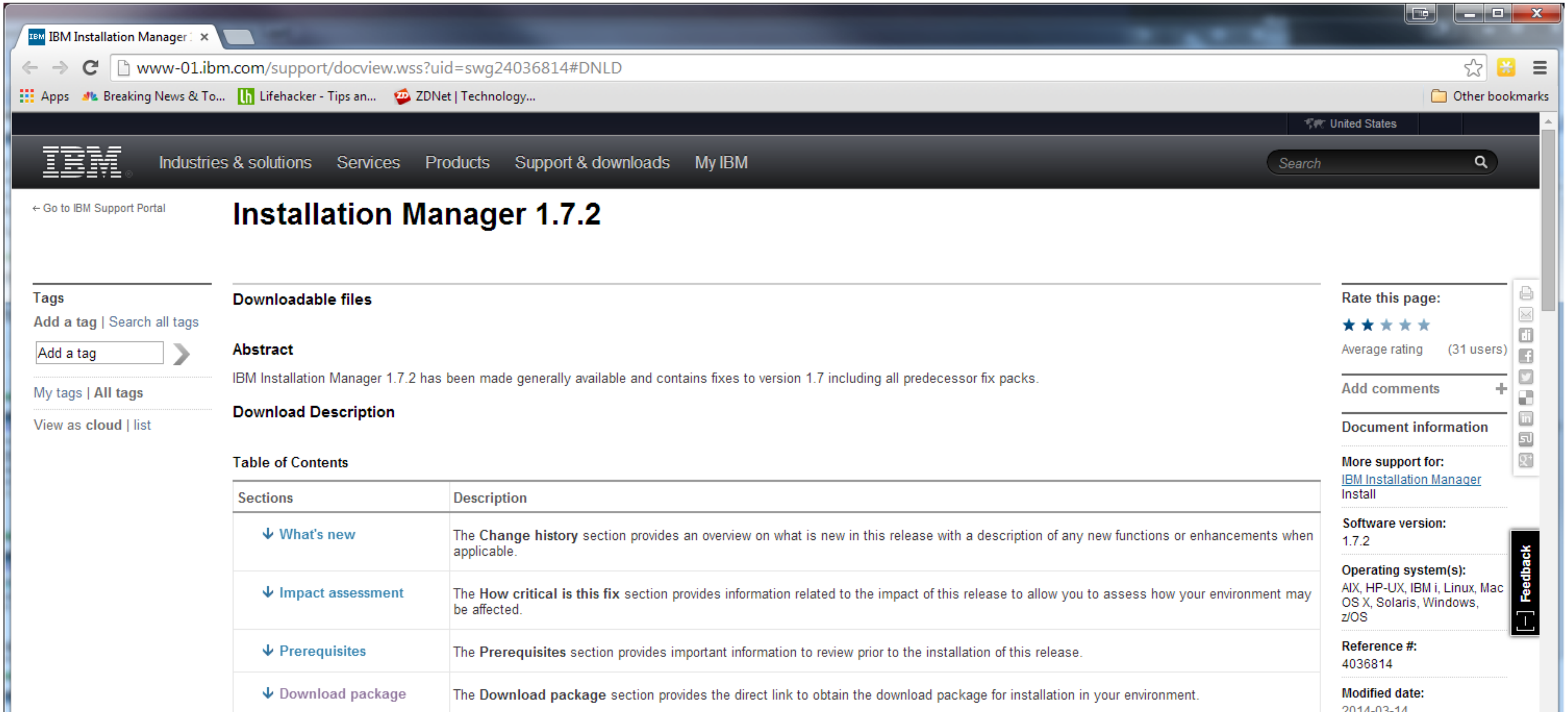
- GUI
- imcl Command line
- JCL

# Installing on Windows

- Download / Install Installation Manager
- Download Management Console Repository
- Set Repository Location in IM Preferences
- Install

# Installation Manager

- Download and Install Installation Manager
  - [http://www-01.ibm.com/support/docview.wss?uid=swg24036814#DNLD](http://www-01.ibm.com/support/docview.wss?uid=swg24036814#DNLD)


IBM Installation Manager
www-01.ibm.com/support/docview.wss?uid=swg24036814#DNLD
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Other bookmarks
United States
IBM
Industries & solutions
Services
Products
Support & downloads
My IBM
Search
← Go to IBM Support Portal
Tags
Add a tag | Search all tags
Add a tag
My tags | All tags
View as cloud | list
Feedback

## Installation Manager 1.7.2

**Downloadable files**

**Abstract**

IBM Installation Manager 1.7.2 has been made generally available and contains fixes to version 1.7 including all predecessor fix packs.

**Download Description**

Table of Contents

| Sections | Description |
|---|---|
| ↓ What's new | The **Change history** section provides an overview on what is new in this release with a description of any new functions or enhancements when applicable. |
| ↓ Impact assessment | The **How critical is this fix** section provides information related to the impact of this release to allow you to assess how your environment may be affected. |
| ↓ Prerequisites | The **Prerequisites** section provides important information to review prior to the installation of this release. |
| ↓ Download package | The **Download package** section provides the direct link to obtain the download package for installation in your environment. |

Rate this page:

★★★★★

Average rating (31 users)

Add comments +

Document information

**More support for:**
IBM Installation Manager
Install

**Software version:**
1.7.2

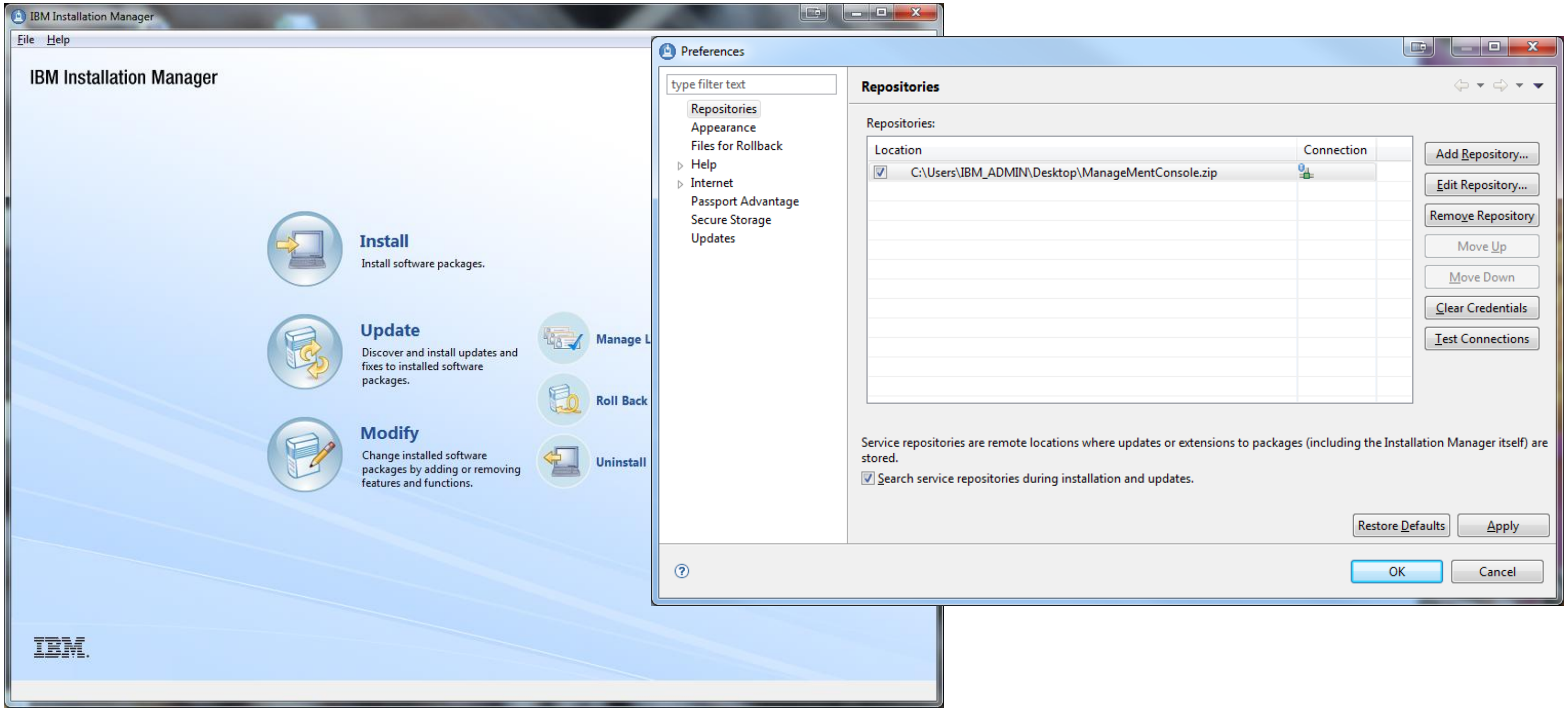
**Operating system(s):**
AIX, HP-UX, IBM i, Linux, Mac OS X, Solaris, Windows, z/OS

**Reference #:**
4036814

**Modified date:**

# Management Console Installation

- Download *ManagementConsole.zip* to local machine
- Define as a Repository
  - File -> Preferences…
- Click Install


IBM Installation Manager
File Help
IBM Installation Manager
Install
Install software packages.
Update
Discover and install updates and fixes to installed software packages.
Modify
Change installed software packages by adding or removing features and functions.
Manage L
Roll Back
Uninstall
IBM.
Preferences
type filter text
Repositories
Appearance
Files for Rollback
Help
Internet
Passport Advantage
Secure Storage
Updates
Repositories
Add Repository...
Edit Repository...
Remove Repository
Move Up
Move Down
Clear Credentials
Test Connections
Restore Defaults
Apply
OK
Cancel

Repositories:

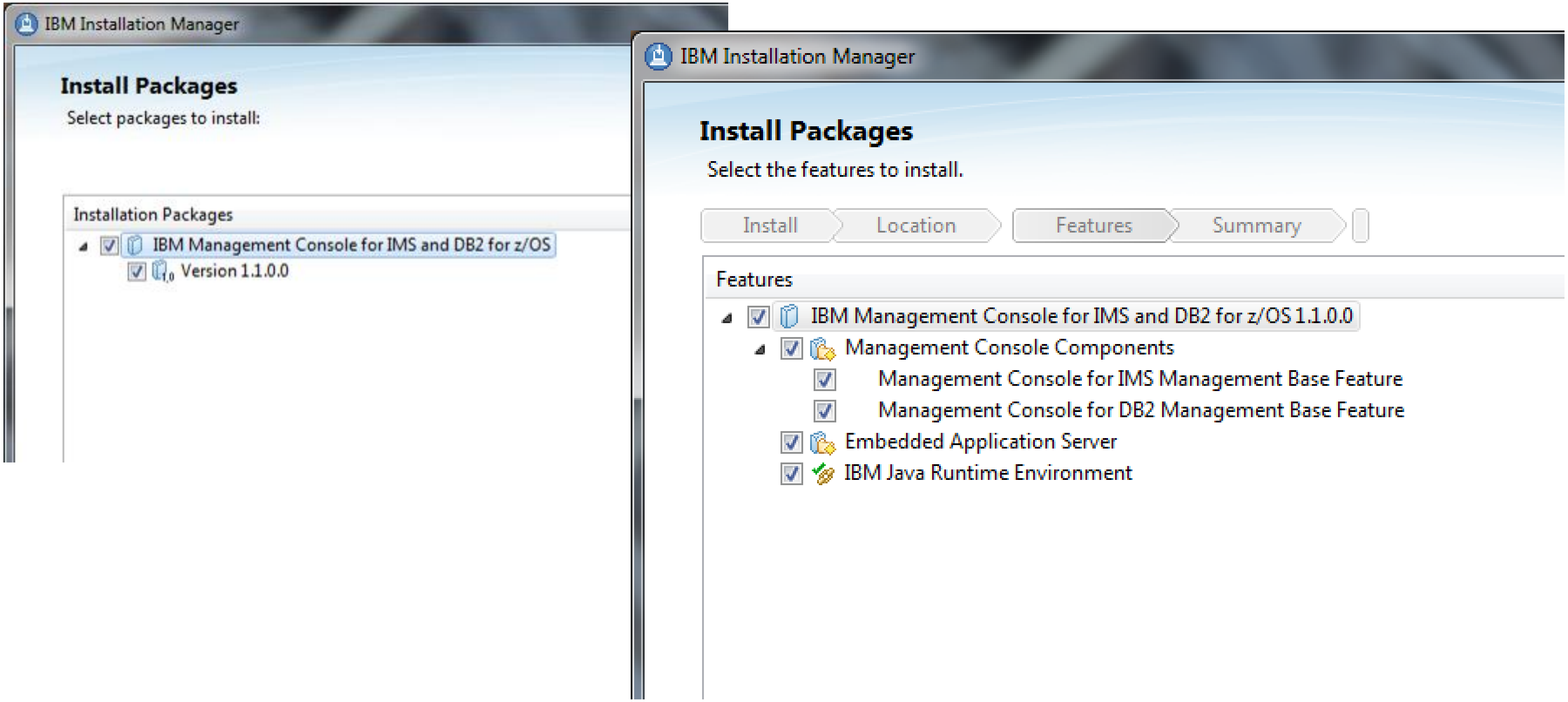
| Location | Connection |
|---|---|
| ☑ C:\Users\IBM_ADMIN\Desktop\ManageMentConsole.zip | |

Service repositories are remote locations where updates or extensions to packages (including the Installation Manager itself) are stored.

☑ Search service repositories during installation and updates.

# Management Console Installation

- Include DB2
- Include IMS



IBM Installation Manager

**Install Packages**

Select packages to install:

Installation Packages

- ☑ IBM Management Console for IMS and DB2 for z/OS
  - ☑ Version 1.1.0.0

IBM Installation Manager

**Install Packages**

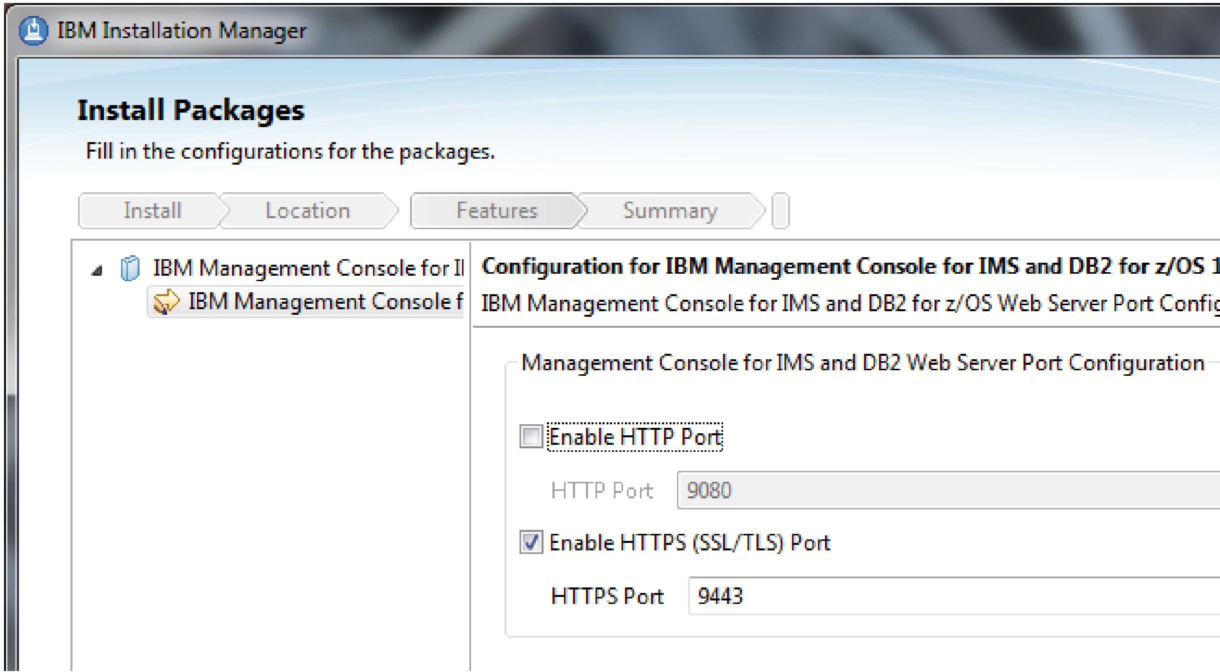
Select the features to install.

Features

- ☑ IBM Management Console for IMS and DB2 for z/OS 1.1.0.0
  - ☑ Management Console Components
    - ☑ Management Console for IMS Management Base Feature
    - ☑ Management Console for DB2 Management Base Feature
  - ☑ Embedded Application Server
  - ☑ IBM Java Runtime Environment

# Management Console Installation

- Run Server on HTTP or HTTPS (HTTPS is default)
  - HTTPS leverages SSL/TLS for secure communication
  - Simply requires the https:// prefix to indicate protocal
  - Starts under a different port


IBM Installation Manager
Install
Location
Features
Summary
IBM Management Console for I
IBM Management Console f

**Install Packages**

Fill in the configurations for the packages.

**Configuration for IBM Management Console for IMS and DB2 for z/OS 1**

IBM Management Console for IMS and DB2 for z/OS Web Server Port Confi

Management Console for IMS and DB2 Web Server Port Configuration

☐ Enable HTTP Port

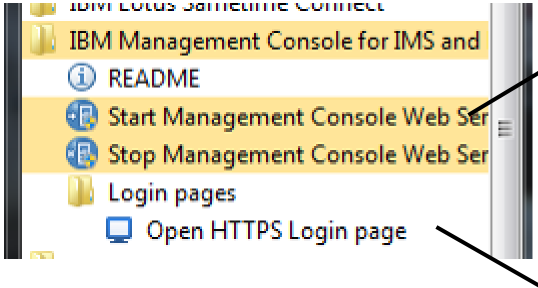
HTTP Port 9080

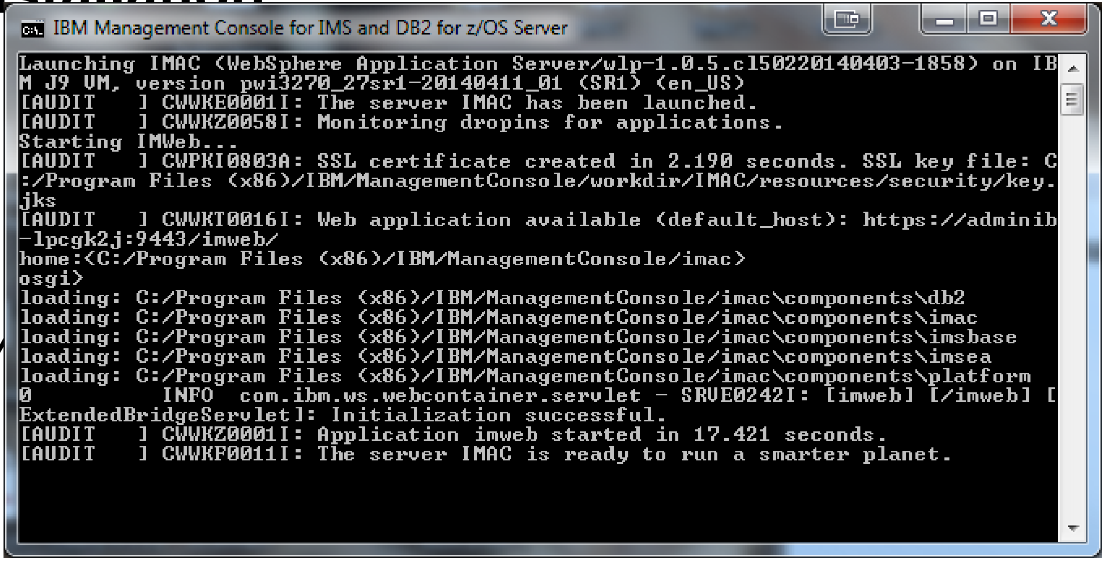
☑ Enable HTTPS (SSL/TLS) Port

HTTPS Port 9443

# Management Console Installation

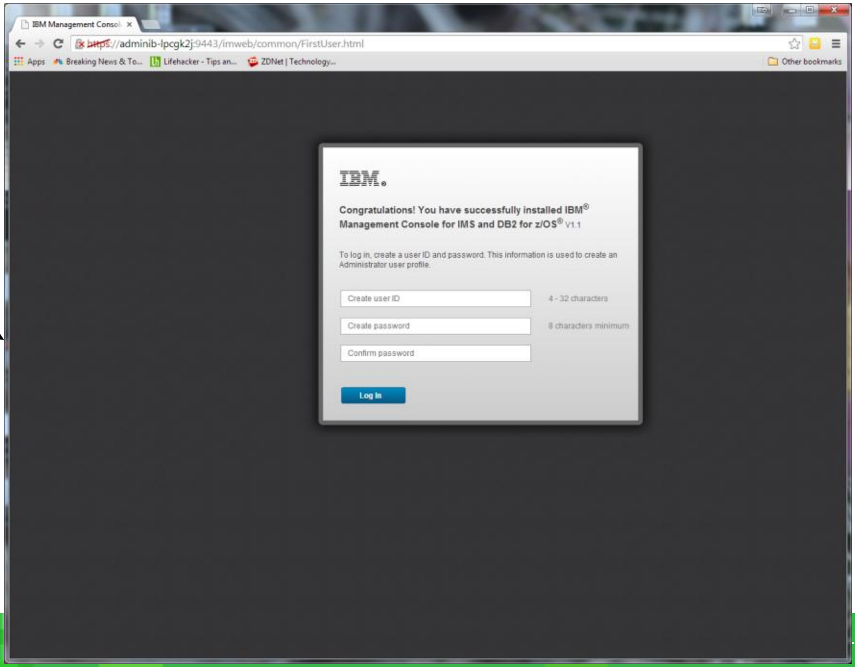
- Start Server…
  - Wait for:
    *server IMAC is ready*


IBM Management Console for IMS and
README
Start Management Console Web Ser
Stop Management Console Web Ser
Login pages
Open HTTPS Login page


IBM Management Console for IMS and DB2 for z/OS Server

```
Launching IMAC (WebSphere Application Server/wlp-1.0.5.cl50220140403-1858) on IB
M J9 VM, version pwi3270_27sr1-20140411_01 (SR1) (en_US)
[AUDIT   ] CWWKE0001I: The server IMAC has been launched.
[AUDIT   ] CWWKZ0058I: Monitoring dropins for applications.
Starting IMWeb...
[AUDIT   ] CWPKI0803A: SSL certificate created in 2.190 seconds. SSL key file: C
:/Program Files (x86)/IBM/ManagementConsole/workdir/IMAC/resources/security/key.
jks
[AUDIT   ] CWWKT0016I: Web application available (default_host): https://adminib
-lpcgk2j:9443/imweb/
home:<C:/Program Files (x86)/IBM/ManagementConsole/imac>
osgi>
loading: C:/Program Files (x86)/IBM/ManagementConsole/imac\components\db2
loading: C:/Program Files (x86)/IBM/ManagementConsole/imac\components\imac
loading: C:/Program Files (x86)/IBM/ManagementConsole/imac\components\imsbase
loading: C:/Program Files (x86)/IBM/ManagementConsole/imac\components\imsea
loading: C:/Program Files (x86)/IBM/ManagementConsole/imac\components\platform
0          INFO  com.ibm.ws.webcontainer.servlet - SRVE0242I: [imweb] [/imweb] [
ExtendedBridgeServlet]: Initialization successful.
[AUDIT   ] CWWKZ0001I: Application imweb started in 17.421 seconds.
[AUDIT   ] CWWKF0011I: The server IMAC is ready to run a smarter planet.
```

- Open Web Page…
  - If you used HTTPS you will get a warning about a self-signed certificate


IBM Management Consol
https://adminib-lpcgk2j:9443/imweb/common/FirstUser.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Other bookmarks
IBM.

Congratulations! You have successfully installed IBM® Management Console for IMS and DB2 for z/OS® V1.1

To log in, create a user ID and password. This information is used to create an Administrator user profile.

Create user ID — 4 - 32 characters
Create password — 8 characters minimum
Confirm password

Log In

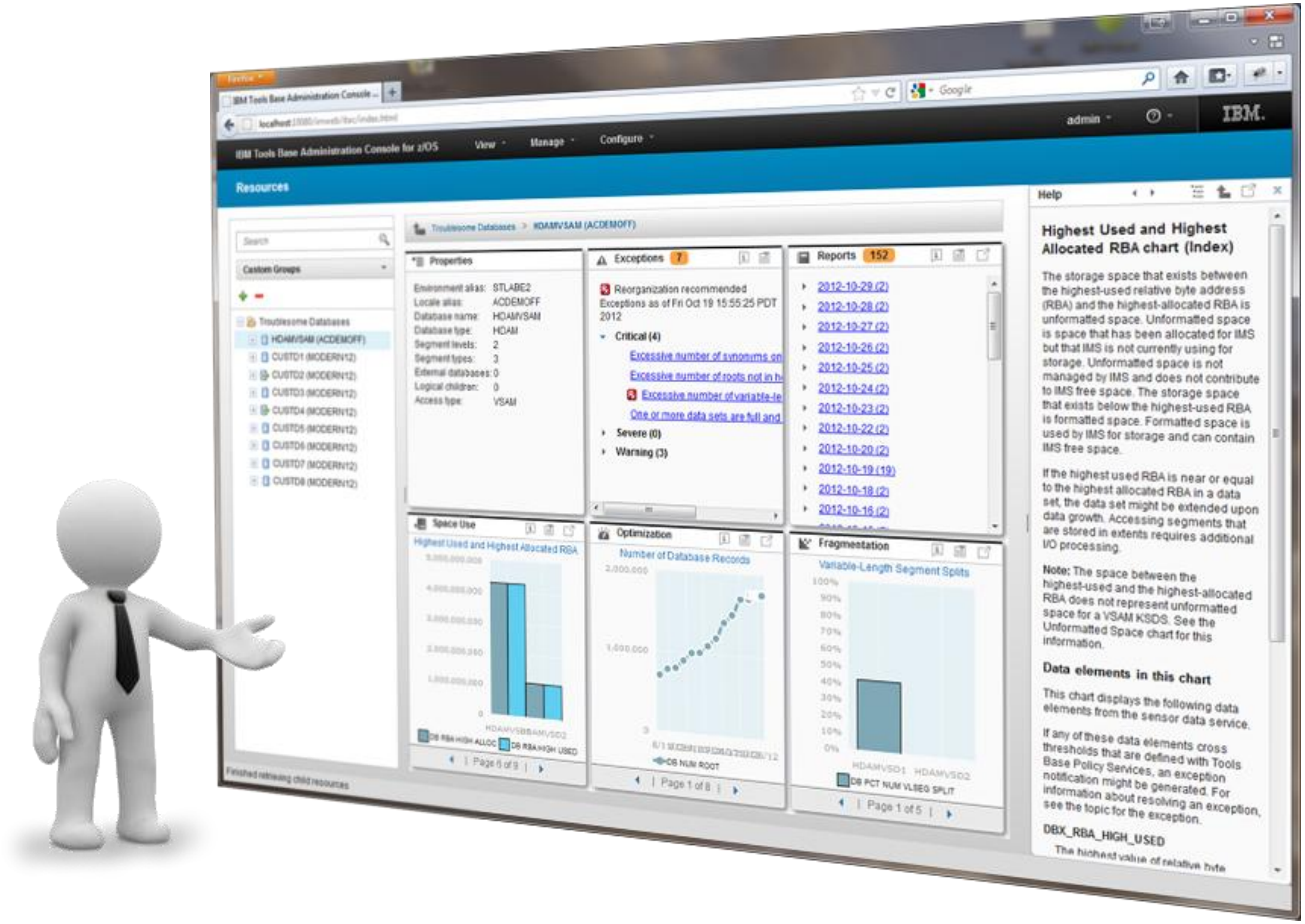
# Management Console URL

- The URL for Management Console is made up of a few combinations depending on what you chose at install.

***https://machine.mycompany.com:port/imweb/common/login.html***

- **http vs https is determined by your choice at install time for SSL/TLS**
- **<machine.mycompany.com> is the name or ip address of your machine**
- **<port> is the port specified at install time**

# Demo of Installation on Windows


IBM Tools Base Administration Console ...
localhost
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
Space Use
Highest Used and Highest Allocated RBA
Optimization
Number of Database Records
Fragmentation
Variable-Length Segment Splits
Help
Finished retrieving child resources

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

- Critical (4)
  - Excessive number of synonyms on
  - Excessive number of roots not in h
  - Excessive number of variable-le
  - One or more data sets are full and
- Severe (0)
- Warning (3)

- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

**Highest Used and Highest Allocated RBA chart (Index)**

The storage space that exists between the highest-used relative byte address (RBA) and the highest-allocated RBA is unformatted space. Unformatted space is space that has been allocated for IMS but that IMS is not currently using for storage. Unformatted space is not managed by IMS and does not contribute to IMS free space. The storage space that exists below the highest-used RBA is formatted space. Formatted space is used by IMS for storage and can contain IMS free space.

If the highest used RBA is near or equal to the highest allocated RBA in a data set, the data set might be extended upon data growth. Accessing segments that are stored in extents requires additional I/O processing.

**Note:** The space between the highest-used and the highest-allocated RBA does not represent unformatted space for a VSAM KSDS. See the Unformatted Space chart for this information.

**Data elements in this chart**

This chart displays the following data elements from the sensor data service.

If any of these data elements cross thresholds that are defined with Tools Base Policy Services, an exception notification might be generated. For information about resolving an exception, see the topic for the exception.

**DBX_RBA_HIGH_USED**

The highest value of relative byte

# Install on z/OS

- Install Installation Manager 1.7.3 or greater
- Point IM to Repository
- Run Install
- Start Server
- Point Browser to Server

# Installation Manager on z/OS

- On z/OS
  - IM is now its own *no-charge* product
  - Requires OMVS / USS
  - Only need a single instance.  Also used by:
    - >= WAS 8.5
    - IMS SOAP Gateway
  - SMP/E Installed as version 1.4
  - PTF updates to latest versions (we require >= 1.7.3)
  - Also available as simple web download (Google it!)

# Supplied Parts

| Part | Description |
|---|---|
| **DYWZREP0** | Management Console IM Repository ~300MB |
| | |
| **DYWZCOPY** | Allocate, Create, Mount HFS or zFS filesystem and copy MC Repository into it. |
| **DYWZCFS** | Allocate, Create, Mount HFS or zFS filesystem for Mngmt Console |
| **DYWZINS** | Call Installation Manager to Install Admin Console |
| **DYWZUNI** | Call Installation Manager to Uninstall Admin Console |
| **DYWZRACF** | Adds AIIGSRV to SAF STARTED class |
| **DYWZSRV** | Starts Admin Console as a started task |

# AC 1.4 Installation Review

(animated)

1. SMP/E RECEIVE
2. Run AIIALLOC (create target/dist libraries)
3. Create new filesystem (4101 tracks)
4. Mount filesystem to IM directory
5. Run AIISMKD (create paths)
6. Run AIIDDDEF (create DDDEF entries)
7. SMP/E APPLY

/usr/lpp/InstallationManagerRepository/HAHN140/ IBM/
adminconsole140.zip

**4101 tracks**

8. Run AIIGCFS
9. Run AIIGINS

/usr/lpp/toolsbase/adminconsole140/ bin/*
wlp/*
wlpusr/*
imac/components/imac
/imsbase
/imsea
/platform

**2472 tracks**

# MC 1.1 Installation Overview

**(animated)**

1. SMP/E RECEIVE
2. SMP/E APPLY
3. Run DYWZCOPY (if running on z)

/usr/lpp/InstallationManagerRepository/HDYW110/ mgmtconsole110.zip

**4101 tracks**

4. Run DYWZCFS
5. Run DYWZINS

/usr/lpp/IBM/mgmtconsole/v110/ bin/*
wlp/*
wlpusr/*
imac/components/imac
/imsbase
/imsea
/platform

**2472 tracks**

# DYWZCOPY

```
//****************************************************************
//*   The following step allocates a new filesystem for the      *
//*   Installation Manager repository for                        *
//*   IBM Management Console for IMS and DB2 for zOS.            *
//****************************************************************
//CREATE   EXEC PGM=IKJEFT01,REGION=0M
//SYSTSPRT DD  SYSOUT=*
//BPXOUT   DD  SYSOUT=*
//STDOUT   DD  SYSOUT=*
//SYSTSIN  DD  *
 BPXBATCH SH +
 /usr/lpp/InstallationManager/bin/eclipse/tools/+
   zCreateFileSystem.sh +
    -name #repdsn +
    -type ZFS +
    -volume #tvolfs +
    -cylinders 1500 250 +
    -mountpoint /usr/lpp/InstallationManagerRepository/HDYW110 +
    -owner #userid +
    -group #groupid +
    -perm 775
/*
```

# DYWZCOPY (cont…)

```
//*********************************************************************
//*  Use OPUT command to copy the Management Console repository from  *
//*  the MVS PDS or PDSE where it was installed by SMP/E to the root  *
//*  of the HFS or ZFS filesystem created in the above step.          *
//*********************************************************************
//COPY     EXEC PGM=IKJEFT01
//SYSTSPRT DD   SYSOUT=*
//SYSPRINT DD   SYSOUT=*
//SYSTSIN  DD   *
  OPUT  'HLQ.SDYWBIN(DYWZREP0)' +
  '/usr/lpp/InstallationManagerRepository/HDYW110/mgmtconsole.zip' +
  binary
/*
```

# DYWZCFS

```
//****************************************************************
//*   The following step allocates a new filesystem for the      *
//*   IBM Management Console for IMS and DB2 for zOS.            *
//****************************************************************
//CREATE   EXEC PGM=IKJEFT01,REGION=0M
//SYSTSPRT DD  SYSOUT=*
//BPXOUT   DD  SYSOUT=*
//STDOUT   DD  SYSOUT=*
//SYSTSIN  DD  *
 BPXBATCH SH +
 /usr/lpp/InstallationManager/bin/eclipse/tools/+
   zCreateFileSystem.sh +
    -name #mcdsn +
    -type ZFS +
    -volume #tvolfs +
    -cylinders 1500 250 +
    -mountpoint /usr/lpp/IBM/mgmtconsole/v110 +
    -owner #userid +
    -group #groupid +
    -perm 775
/*
```

# DYWZINS

```
//****************************************************************
//*   The following step invokes IBM Installation Manager to     *
//*   install the IBM Management Console for IMS and DB2         *
//****************************************************************
//*
//INSTALL  EXEC PGM=IKJEFT01,REGION=0M
//SYSTSPRT DD   SYSOUT=*
//BPXOUT   DD   SYSOUT=*
//STDOUT   DD   SYSOUT=*
//SYSTSIN  DD   *
 BPXBATCH SH +
  usr/lpp/InstallationManager/bin/eclipse/tools/imcl +
    install 'com.ibm.imac',imsbase.feature,db2.feature +
    -installationDirectory /usr/lpp/IBM/mgmtconsole/v110 +
    -sharedResourcesDirectory /usr/lpp/InstallationManager/sharedResources +
    -repositories /usr/lpp/InstallationManagerRepository/HDYW110/+
     mgmtconsole.zip +
    -preferences com.ibm.cic.common.core.preferences.preserveDownlo+
     adedArtifacts=false +
    -properties +
     user.enableHttpPortCheckButtonUserData,,com.ibm.imac=false,+
     user.httpPortPropertyUserData,,com.ibm.imac=9080,+
     user.enableHttpsPortCheckButtonUserData,,com.ibm.imac=true,+
     user.httpsPortPropertyUserData,,com.ibm.imac=9443,+
     user.zosJavaHomeUserData,,com.ibm.imac=/usr/lpp/java170/J7.0_64 +
    -acceptLicense +
    -sVP
/*
```

# MC 1.1 Update Overview

1. SMP/E RECEIVE
2. SMP/E APPLY
3. Run DYWZCOPY

Part is replaced

/usr/lpp/InstallationManagerRepository/HDYW110/ mgmtconsole110.zip

4101 tracks

4. Run DYWZINS

Install is updated

/usr/lpp/IBM/mgmtconsole/v110/ bin/*
wlp/*
wlpusr/*
imac/components/imac
/imsbase
/imsea
/platform

2472 tracks

# MC 1.1 Online Installation Overview

Points to FixCentral URL

1. Run AIIGCFS
2. Run AIIGINS

```
/usr/lpp/IBM/mgmtconsole/v110/ bin/*
                               wlp/*
                               wlpusr/*
                               imac/components/imac
                                              /imsbase
                                              /imsea
                                              /platform
```

**2472 tracks**

# DYWZINS – Online

```
//****************************************************************
//*   The following step invokes IBM Installation Manager to     *
//*   install the IBM Management Console for IMS and DB2         *
//****************************************************************
//*
//INSTALL  EXEC PGM=IKJEFT01,REGION=0M
//SYSTSPRT DD  SYSOUT=*
//BPXOUT   DD  SYSOUT=*
//STDOUT   DD  SYSOUT=*
//SYSTSIN  DD  *
 BPXBATCH SH +
  usr/lpp/InstallationManager/bin/eclipse/tools/imcl +
    install 'com.ibm.imac',imsbase.feature,db2.feature +
    -installationDirectory /usr/lpp/IBM/mgmtconsole/v110 +
    -sharedResourcesDirectory /usr/lpp/InstallationManager/sharedResources +
    -repositories /usr/lpp/InstallationManagerRepository/HDYW110/+
     mgmtconsole.zip +
    -preferences com.ibm.cic.common.core.preferences.preserveDownlo+
     adedArtifacts=false +
    -properties +
     user.enableHttpPortCheckButtonUserData,,com.ibm.imac=false,+
     user.httpPortPropertyUserData,,com.ibm.imac=9080,+
     user.enableHttpsPortCheckButtonUserData,,com.ibm.imac=true,+
     user.httpsPortPropertyUserData,,com.ibm.imac=9443,+
     user.zosJavaHomeUserData,,com.ibm.imac=/usr/lpp/java170/J7.0_64 +
    -acceptLicense +
    -sVP
/*
```

This could be a URL

# Running Management Console

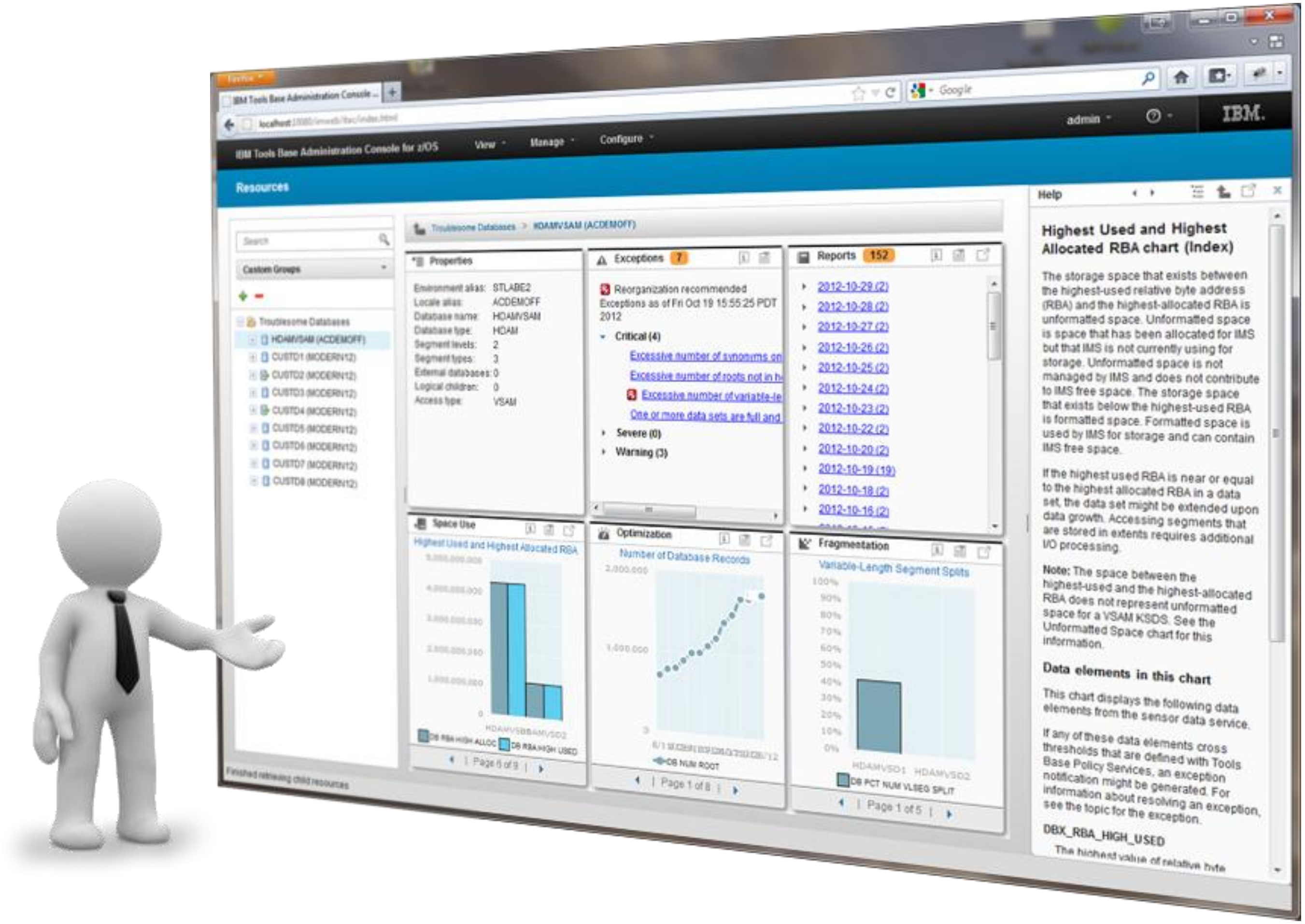
- DYWZRACF
  - Adds AIIGSRV to SAF STARTED class
- DYWZSRV
  - SET INSTDIR=/usr/lpp/IBM/mgmtconsole/v110/wlp
  - SET USERDIR=/usr/lpp/IBM/mgmtconsole/v110/wlpusr
- Point Browser to:
  - https://<address>:9443/imweb/README.html

    **OR**
  - http://<address>:9080/imweb/README.html

# DYWZSRV

```
//*****************************************************************
//* Set the following symbolics:                                  *
//*****************************************************************
//  SET INSTDIR='/usr/lpp/IBM/mgmtconsole/v110/wlp'
//  SET USERDIR='/usr/lpp/IBM/mgmtconsole/v110/wlpusr'
//*
//STEP1   EXEC PGM=BPXBATSL,REGION=0M,
//  PARM='PGM &INSTDIR/lib/native/zos/s390x/bbgzsrv IMAC'
//WLPUDIR  DD PATH='&USERDIR'
//STDOUT   DD SYSOUT=*
//STDERR   DD SYSOUT=*
//*STDENV   DD PATH='/etc/system.env',PATHOPTS=(ORDONLY)
//*STDOUT   DD PATH='&USERDIR/std.out',
//*            PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//*            PATHMODE=SIRWXU
//*STDERR   DD PATH='&USERDIR/std.err',
//*            PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
//*            PATHMODE=SIRWXU
```

# Demo of Installation


IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
Space Use
Highest Used and Highest Allocated RBA
Optimization
Number of Database Records
Fragmentation
Variable-Length Segment Splits
DB RBA HIGH ALLOC
DB RBA HIGH USED
DB NUM ROOT
DB PCT NUM VLSEG SPLIT
Page 6 of 9
Page 1 of 8
Page 1 of 5
Finished retrieving child resources
Help

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

- Critical (4)
  - Excessive number of synonyms on
  - Excessive number of roots not in h
  - Excessive number of variable-le
  - One or more data sets are full and
- Severe (0)
- Warning (3)

- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

**Highest Used and Highest Allocated RBA chart (Index)**

The storage space that exists between the highest-used relative byte address (RBA) and the highest-allocated RBA is unformatted space. Unformatted space is space that has been allocated for IMS but that IMS is not currently using for storage. Unformatted space is not managed by IMS and does not contribute to IMS free space. The storage space that exists below the highest-used RBA is formatted space. Formatted space is used by IMS for storage and can contain IMS free space.

If the highest used RBA is near or equal to the highest allocated RBA in a data set, the data set might be extended upon data growth. Accessing segments that are stored in extents requires additional I/O processing.

**Note:** The space between the highest-used and the highest-allocated RBA does not represent unformatted space for a VSAM KSDS. See the Unformatted Space chart for this information.

**Data elements in this chart**

This chart displays the following data elements from the sensor data service.

If any of these data elements cross thresholds that are defined with Tools Base Policy Services, an exception notification might be generated. For information about resolving an exception, see the topic for the exception.

**DBX_RBA_HIGH_USED**

The highest value of relative byte

Information Management

# Management Console Walkthrough…

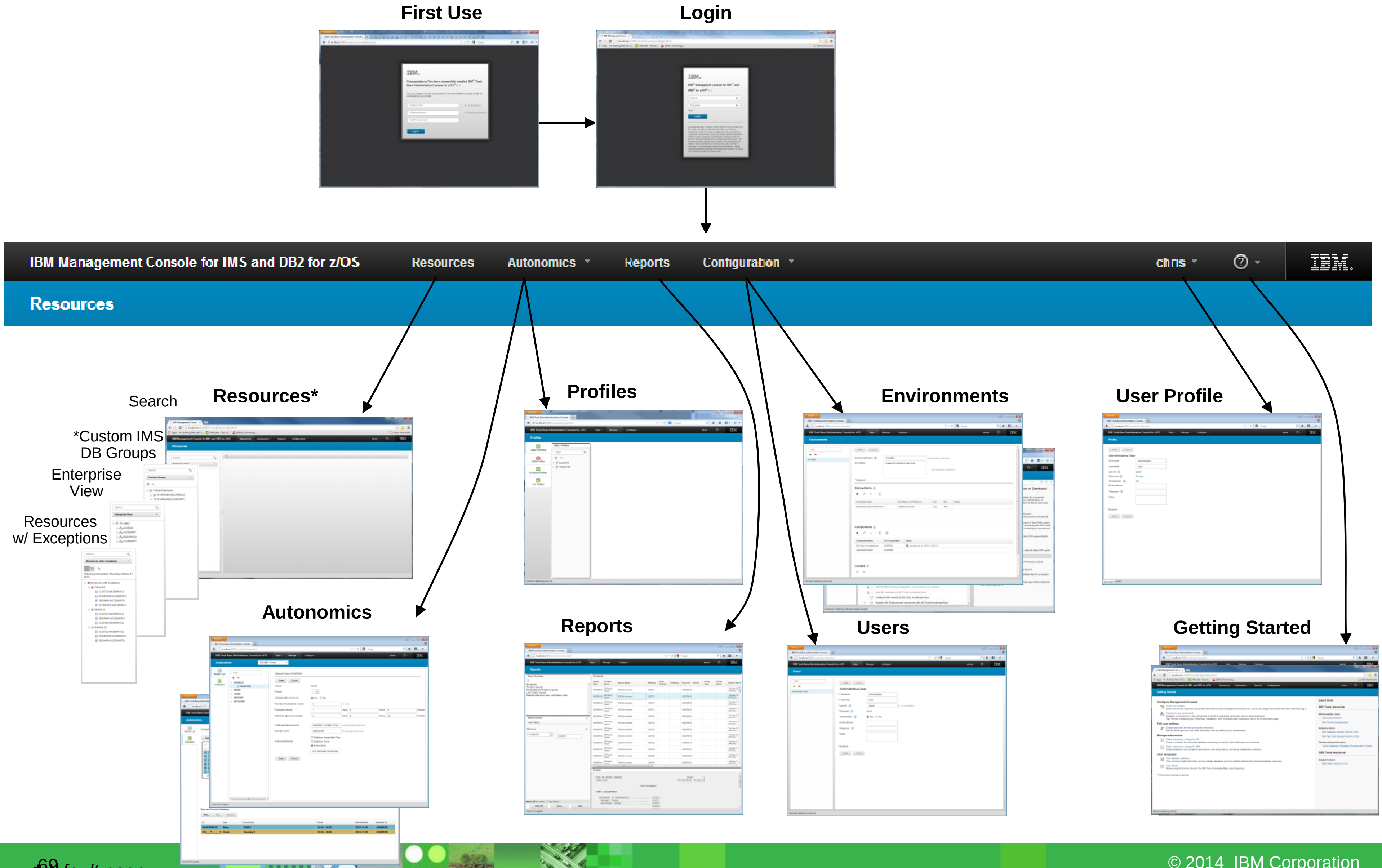
*The future runs on System z*

## IBM Management Console Workshop

**Christopher Holtz**
**IMS and DB2 Modernization Architect**

© 2014 IBM Corporation. IBM Confidential

# Management Console UI Map



First Use

Login

IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
Resources

Search

Resources*

*Custom IMS DB Groups

Enterprise View

Resources w/ Exceptions

Profiles

Environments

User Profile

Autonomics

Reports

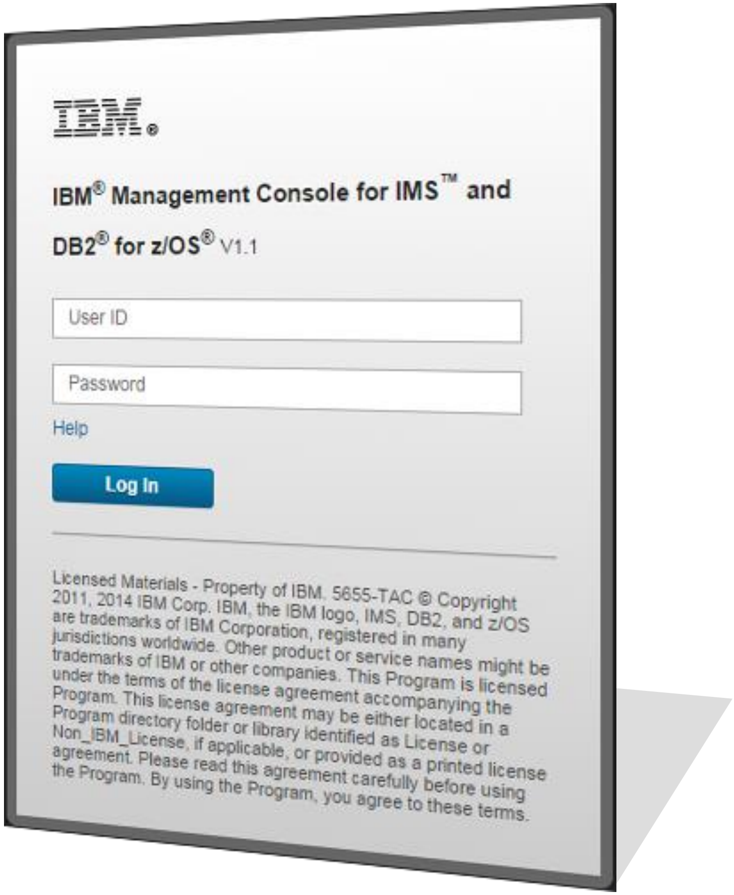
Users

Getting Started

*default page

# Login

- Login
  - First Use
  - Login Authentication (local vs LDAP vs RACF)
- Questions around authentication mechanism
  - Permissions
  - Control
  - Auditing
  - Etc
- Timeout – currently 8 minutes (strong demand for making this configurable?)



IBM® Management Console for IMS™ and DB2® for z/OS® V1.1

Licensed Materials - Property of IBM. 5655-TAC © Copyright 2011, 2014 IBM Corp. IBM, the IBM logo, IMS, DB2, and z/OS are trademarks of IBM Corporation, registered in many jurisdictions worldwide. Other product or service names might be trademarks of IBM or other companies. This Program is licensed under the terms of the license agreement accompanying the Program. This license agreement may be either located in a Program directory folder or library identified as License or Non_IBM_License, if applicable, or provided as a printed license agreement. Please read this agreement carefully before using the Program. By using the Program, you agree to these terms.

# Users

- User Roles
  - User / Administrator
  - What kind of user roles do you want?
    - IMS DBA / IMS Sysprog / DB2 DBA / etc
- Saved Credentials
  - Encrypting credentials
  - Potential options
    - “use my current ID/pass”
    - How to handle password change with external authentication

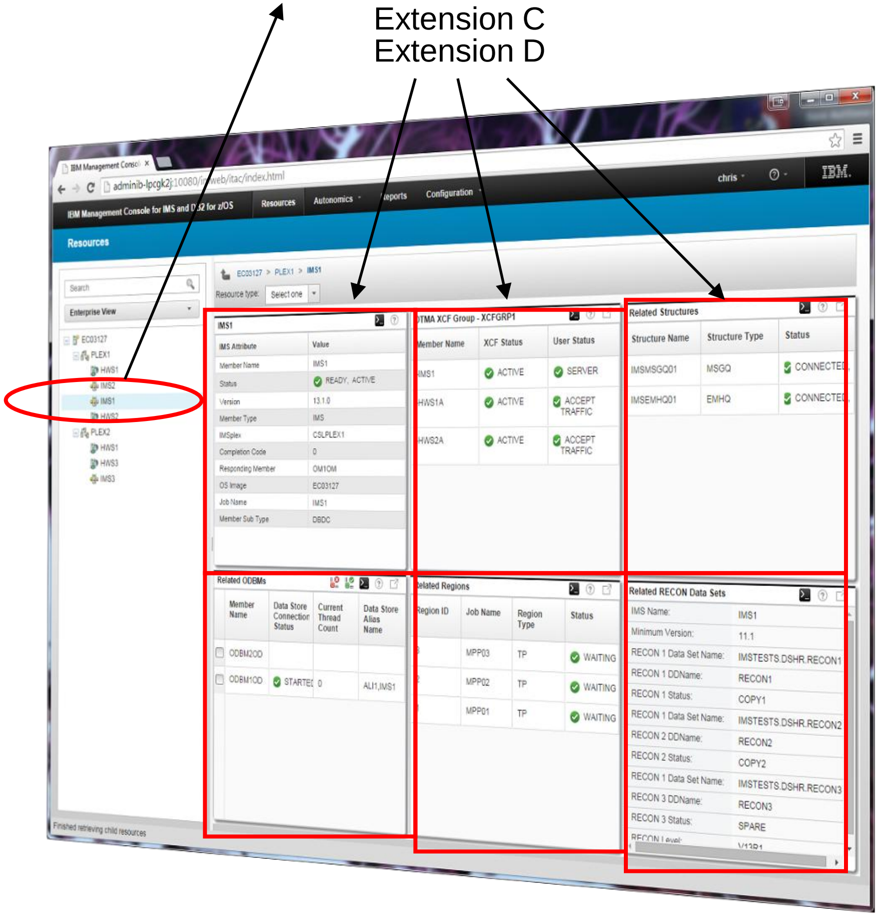
# Configuring Environment

- Modeling the enterprise
  - What is an “environment”
  - What is a “component”
    - Discovery process
- What is a common setup?
  - Production vs test / location environments / per sysplex / IMS vs DB2
- Deployment Assistance
  - Is there value here?

# Resources View

- How it works
    - Dashboards are loaded based on extensions
- Object based
    - What about action based?
- Views
    - Enterprise Hierarchy
    - Custom Groups
    - Resources with Exceptions
    - Search

Registry
Extension A
Extension B
Extension C
Extension D


IBM Management Consol
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
Resources
Search
Enterprise View
EC03127
PLEX1
HWS1
IMS2
IMS1
HWS2
PLEX2
HWS1
HWS3
IMS3
EC03127 > PLEX1 > IMS1
Resource type:
Select one
Finished retrieving child resources

IMS1

| IMS Attribute | Value |
|---|---|
| Member Name | IMS1 |
| Status | ✓ READY, ACTIVE |
| Version | 13.1.0 |
| Member Type | IMS |
| IMSplex | CSLPLEX1 |
| Completion Code | 0 |
| Responding Member | OM1OM |
| OS Image | EC03127 |
| Job Name | IMS1 |
| Member Sub Type | DBDC |

OTMA XCF Group - XCFGRP1

| Member Name | XCF Status | User Status |
|---|---|---|
| IMS1 | ✓ ACTIVE | ✓ SERVER |
| HWS1A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |
| HWS2A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |

Related Structures

| Structure Name | Structure Type | Status |
|---|---|---|
| IMSMSGQ01 | MSGQ | ✓ CONNECTED |
| IMSEMHQ01 | EMHQ | ✓ CONNECTED |

Related ODBMs

| | Member Name | Data Store Connection Status | Current Thread Count | Data Store Alias Name |
|---|---|---|---|---|
| ☐ | ODBM2OD | | | |
| ☐ | ODBM1OD | ✓ STARTED | 0 | ALI1,IMS1 |

Related Regions

| Region ID | Job Name | Region Type | Status |
|---|---|---|---|
| | MPP03 | TP | ✓ WAITING |
| | MPP02 | TP | ✓ WAITING |
| | MPP01 | TP | ✓ WAITING |

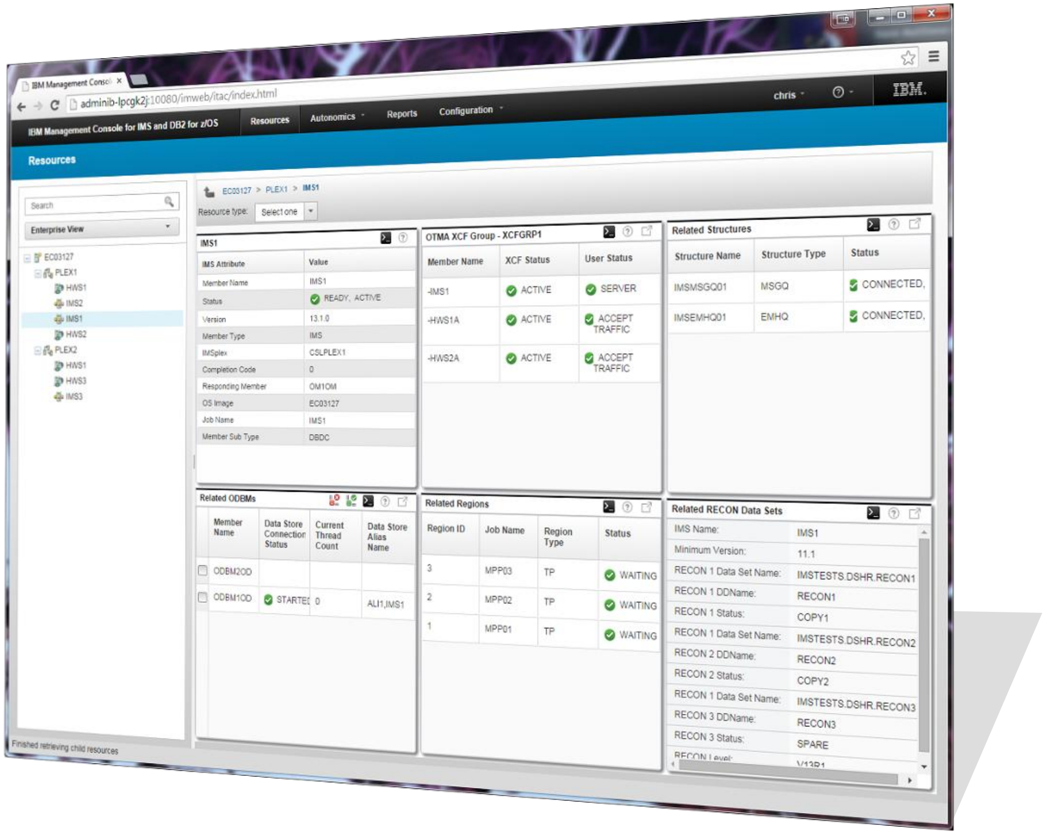
Related RECON Data Sets

| | |
|---|---|
| IMS Name: | IMS1 |
| Minimum Version: | 11.1 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON1 |
| RECON 1 DDName: | RECON1 |
| RECON 1 Status: | COPY1 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON2 |
| RECON 2 DDName: | RECON2 |
| RECON 2 Status: | COPY2 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON3 |
| RECON 3 DDName: | RECON3 |
| RECON 3 Status: | SPARE |
| RECON Level: | V13R1 |

# Included IMS Support

## (*formerly* IMS Explorer for Admin)

- **Requirements**
  - IMS Version 12 or 13
    - IMS Connect
    - IMS SCI
    - IMS OM


IBM Management Conso
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
IBM.
Resources
Search
Enterprise View
EC03127
PLEX1
HWS1
IMS2
IMS1
HWS2
PLEX2
HWS1
HWS3
IMS3
EC03127 > PLEX1 > IMS1
Resource type:
Select one

IMS1

| IMS Attribute | Value |
|---|---|
| Member Name | IMS1 |
| Status | ✓ READY, ACTIVE |
| Version | 13.1.0 |
| Member Type | IMS |
| IMSplex | CSLPLEX1 |
| Completion Code | 0 |
| Responding Member | OM1OM |
| OS Image | EC03127 |
| Job Name | IMS1 |
| Member Sub Type | DBDC |

OTMA XCF Group - XCFGRP1

| Member Name | XCF Status | User Status |
|---|---|---|
| -IMS1 | ✓ ACTIVE | ✓ SERVER |
| -HWS1A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |
| -HWS2A | ✓ ACTIVE | ✓ ACCEPT TRAFFIC |

Related Structures

| Structure Name | Structure Type | Status |
|---|---|---|
| IMSMSGQ01 | MSGQ | ✓ CONNECTED, |
| IMSEMHQ01 | EMHQ | ✓ CONNECTED, |

Related ODBMs

| | Member Name | Data Store Connection Status | Current Thread Count | Data Store Alias Name |
|---|---|---|---|---|
| ☐ | ODBM2OD | | | |
| ☐ | ODBM1OD | ✓ STARTEI | 0 | ALI1,IMS1 |

Related Regions

| Region ID | Job Name | Region Type | Status |
|---|---|---|---|
| 3 | MPP03 | TP | ✓ WAITING |
| 2 | MPP02 | TP | ✓ WAITING |
| 1 | MPP01 | TP | ✓ WAITING |

Related RECON Data Sets

| | |
|---|---|
| IMS Name: | IMS1 |
| Minimum Version: | 11.1 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON1 |
| RECON 1 DDName: | RECON1 |
| RECON 1 Status: | COPY1 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON2 |
| RECON 2 DDName: | RECON2 |
| RECON 2 Status: | COPY2 |
| RECON 1 Data Set Name: | IMSTESTS.DSHR.RECON3 |
| RECON 3 DDName: | RECON3 |
| RECON 3 Status: | SPARE |
| RECON Level: | V13R1 |

Finished retrieving child resources

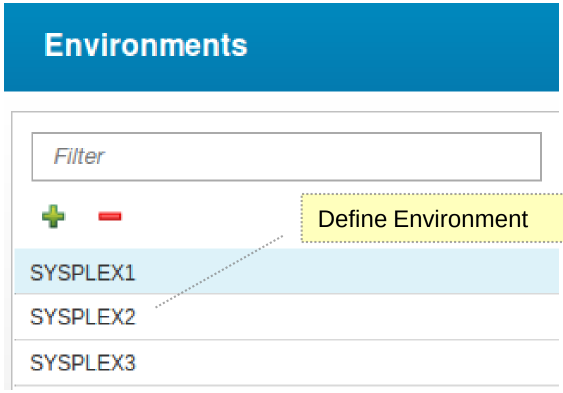
# IBM Tools Management Console (IMS)

- Enterprise System View
  - IMS Resource and IMSPlex discovery
  - Hierarchical representation starting from the SYSPLEX to the IMS Resources
- Enterprise Search
  - Search across the entire enterprise on any type of resource
- Visual Status
  - Quickly see the status of any IMS Resource with colored status icons
  - Hover and click status icons for reason codes and corrective actions
  - Filter IMS Resources
- Manage IMS Resources
  - Start/Stop and update IMS Resource Attributes
  - Multi select IMS Resources to manage and update
- Resource Relationships
  - View relationships between IMS Resources
  - At a glance understand why a transaction is having a problem
- Customize
  - Change the column attribute defaults

# IMS Resource and IMSPlex Discovery

- Define the environment
  - Name the Sysplex
  - Configure the discovery endpoint
    - IMS Connect connections
- Discover IMS Resources
  - IMSPlexes
  - IMS Connect Instances
  - IMS Instances
    - Transactions
    - Databases
    - Programs
    - Routing Codes

# IMS Resource and IMSPlex Discovery



**Environments**

Filter

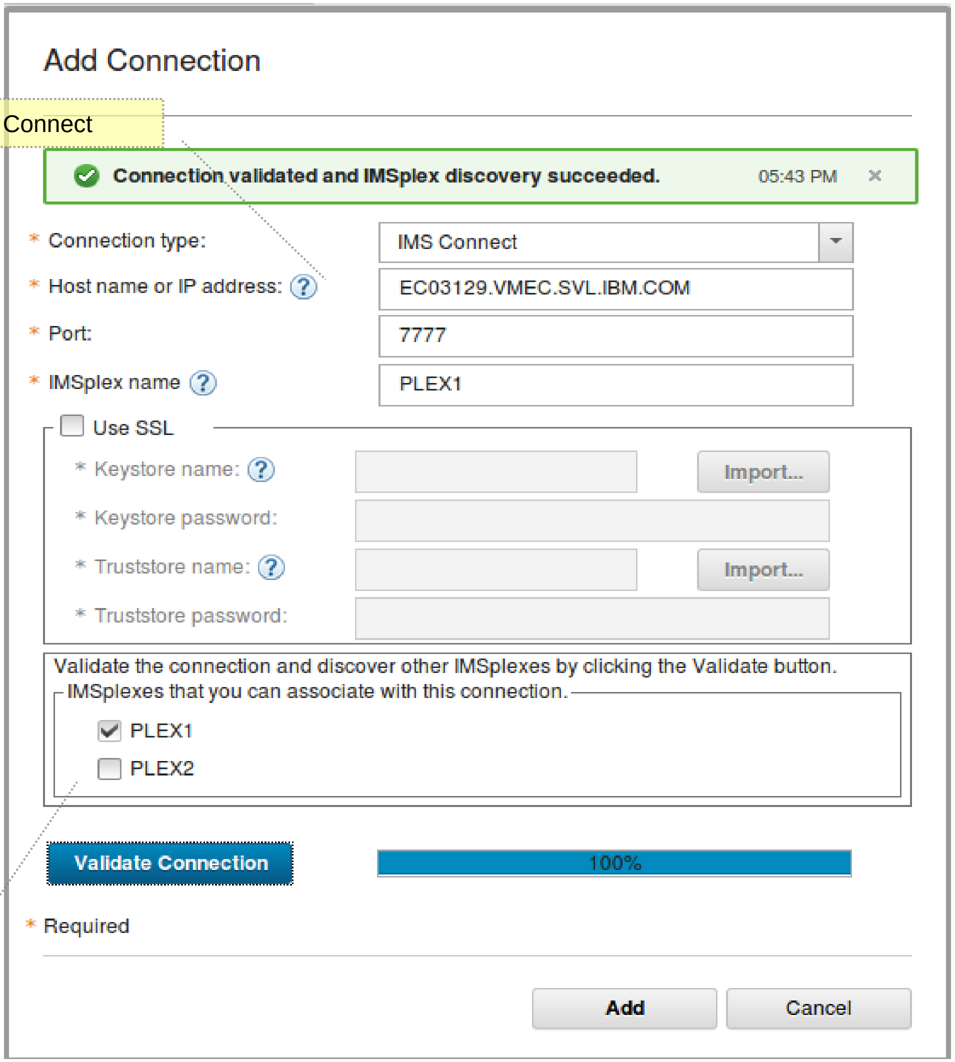
SYSPLEX1

SYSPLEX2

SYSPLEX3

Define Environment

Configure IMS Connect



## Add Connection

✓ **Connection validated and IMSplex discovery succeeded.** 05:43 PM ×

| | |
|---|---|
| * Connection type: | IMS Connect |
| * Host name or IP address: | EC03129.VMEC.SVL.IBM.COM |
| * Port: | 7777 |
| * IMSplex name | PLEX1 |

☐ Use SSL

| | |
|---|---|
| * Keystore name: | |
| * Keystore password: | |
| * Truststore name: | |
| * Truststore password: | |

Validate the connection and discover other IMSplexes by clicking the Validate button.

IMSplexes that you can associate with this connection.

☑ PLEX1

☐ PLEX2

Validate Connection 100%

* Required

Import...
Import...
Add
Cancel

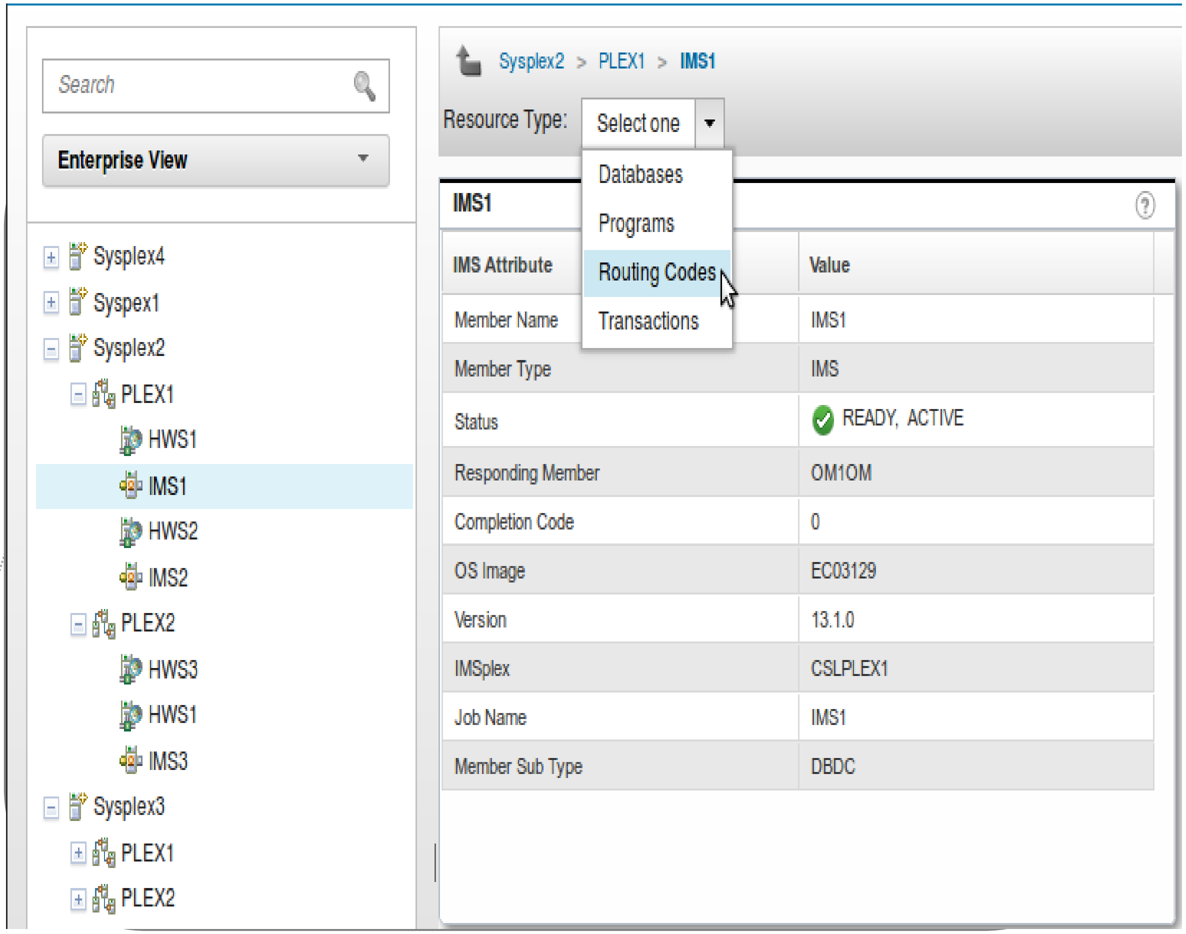
Discovering....
IMS

Discovered PLEX2

# Enterprise View

- Hierarchical view of IMS Resources
- Logically grouped and auto discovered
- Quickly navigate from one resource to another

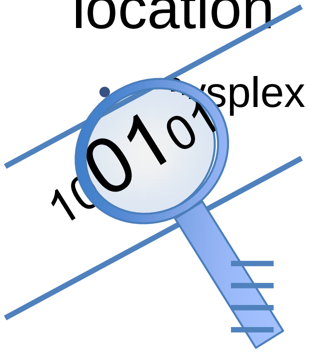
Replaces System Diagram

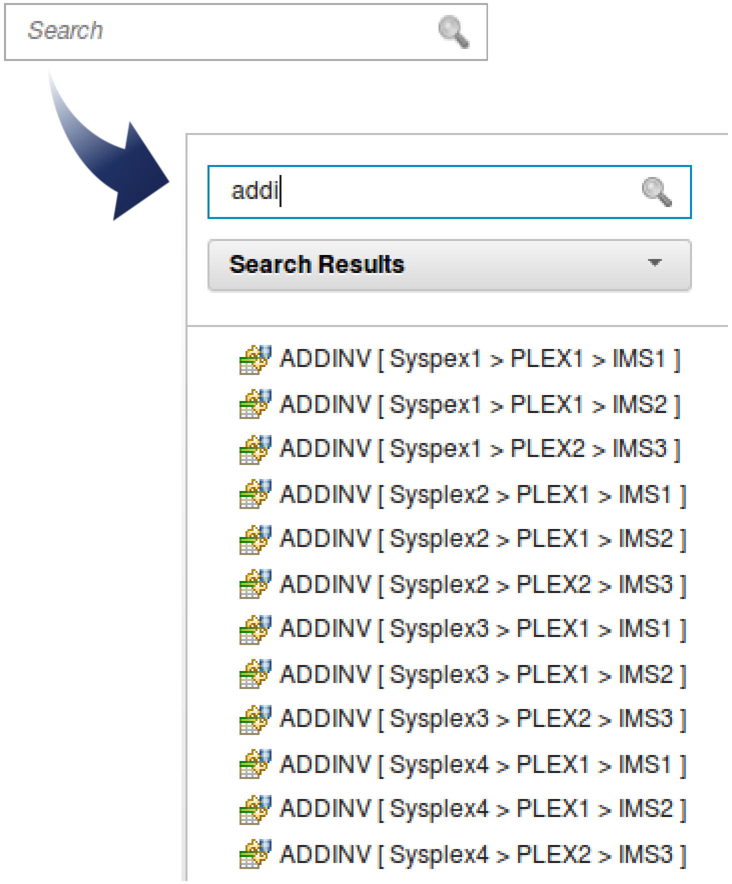

Search
Enterprise View
Sysplex4
Syspex1
Sysplex2
PLEX1
HWS1
IMS1
HWS2
IMS2
PLEX2
HWS3
HWS1
IMS3
Sysplex3
PLEX1
PLEX2
Sysplex2 > PLEX1 > IMS1
Resource Type:
Select one
Databases
Programs
Routing Codes
Transactions
IMS1
?

| IMS Attribute | Value |
|---|---|
| Member Name | IMS1 |
| Member Type | IMS |
| Status | ✓ READY, ACTIVE |
| Responding Member | OM1OM |
| Completion Code | 0 |
| OS Image | EC03129 |
| Version | 13.1.0 |
| IMSplex | CSLPLEX1 |
| Job Name | IMS1 |
| Member Sub Type | DBDC |

# Search the Enterprise

- Search discovered resources by name
  - Transactions, Programs, Routing Codes, Databases
- Context-sensitive search
  - Search by character
- Visually display resource location
  - Sysplex > IMSPlex > IMS



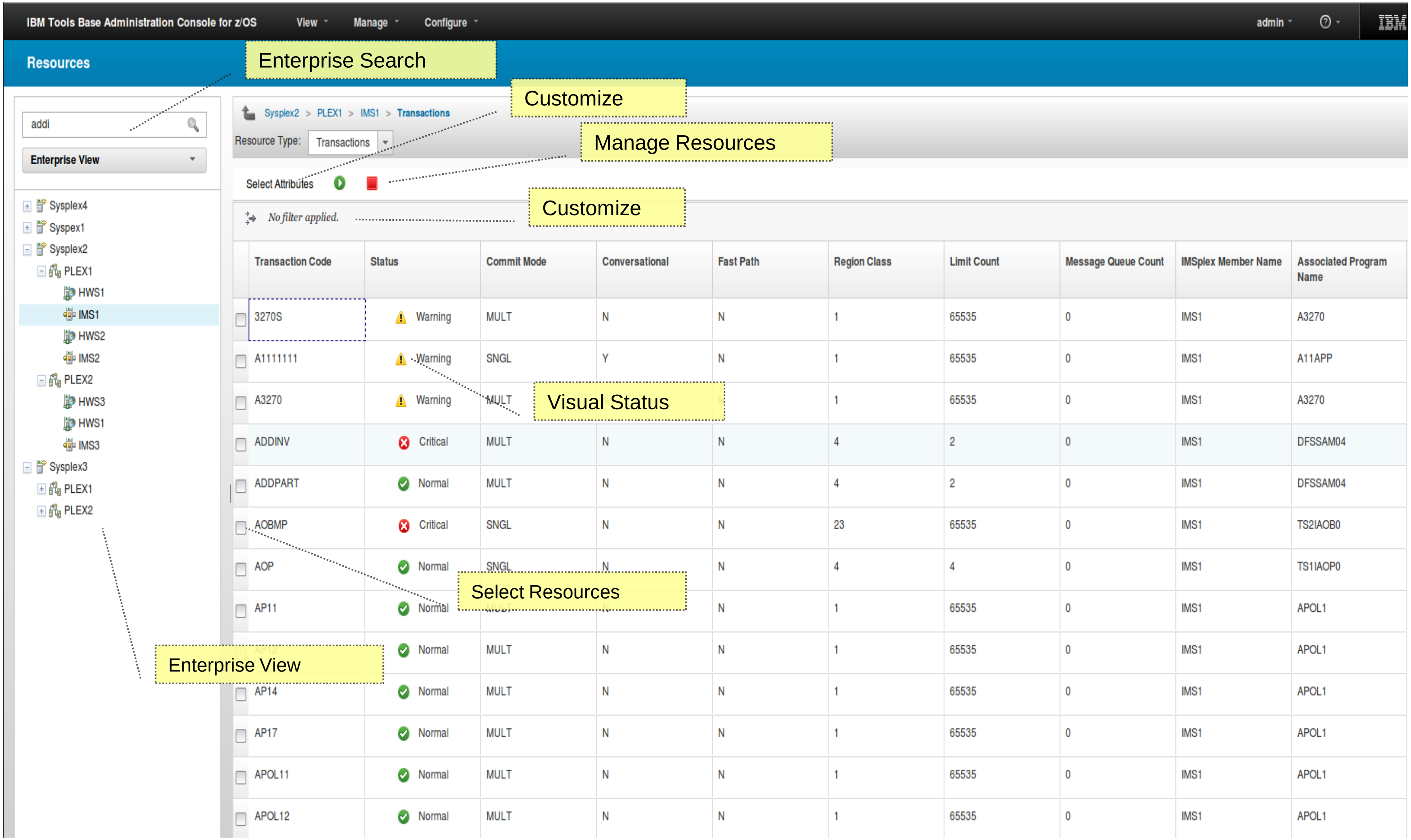


- ADDINV [ Syspex1 > PLEX1 > IMS1 ]
- ADDINV [ Syspex1 > PLEX1 > IMS2 ]
- ADDINV [ Syspex1 > PLEX2 > IMS3 ]
- ADDINV [ Sysplex2 > PLEX1 > IMS1 ]
- ADDINV [ Sysplex2 > PLEX1 > IMS2 ]
- ADDINV [ Sysplex2 > PLEX2 > IMS3 ]
- ADDINV [ Sysplex3 > PLEX1 > IMS1 ]
- ADDINV [ Sysplex3 > PLEX1 > IMS2 ]
- ADDINV [ Sysplex3 > PLEX2 > IMS3 ]
- ADDINV [ Sysplex4 > PLEX1 > IMS1 ]
- ADDINV [ Sysplex4 > PLEX1 > IMS2 ]
- ADDINV [ Sysplex4 > PLEX2 > IMS3 ]

# Manage IMS Visually

- View the enterprise hierarchy
  - Sysplex > IMSPlex > IMSPlex Members
- Start and stop IMS Resources
  - Transactions, Programs, Routing Codes, Databases
  - Multi select resources to command
- At-a-glance view IMS resource status icons
  - Hover icons for reason codes and corrective actions
- Filter displayed results by attributes, name, status

# Manage IMS


IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM
Resources
Enterprise Search
Customize
Manage Resources
Customize
Visual Status
Select Resources
Enterprise View

addi

Enterprise View

- Sysplex4
- Syspex1
- Sysplex2
  - PLEX1
    - HWS1
    - IMS1
    - HWS2
    - IMS2
  - PLEX2
    - HWS3
    - HWS1
    - IMS3
- Sysplex3
  - PLEX1
  - PLEX2

Sysplex2 > PLEX1 > IMS1 > Transactions

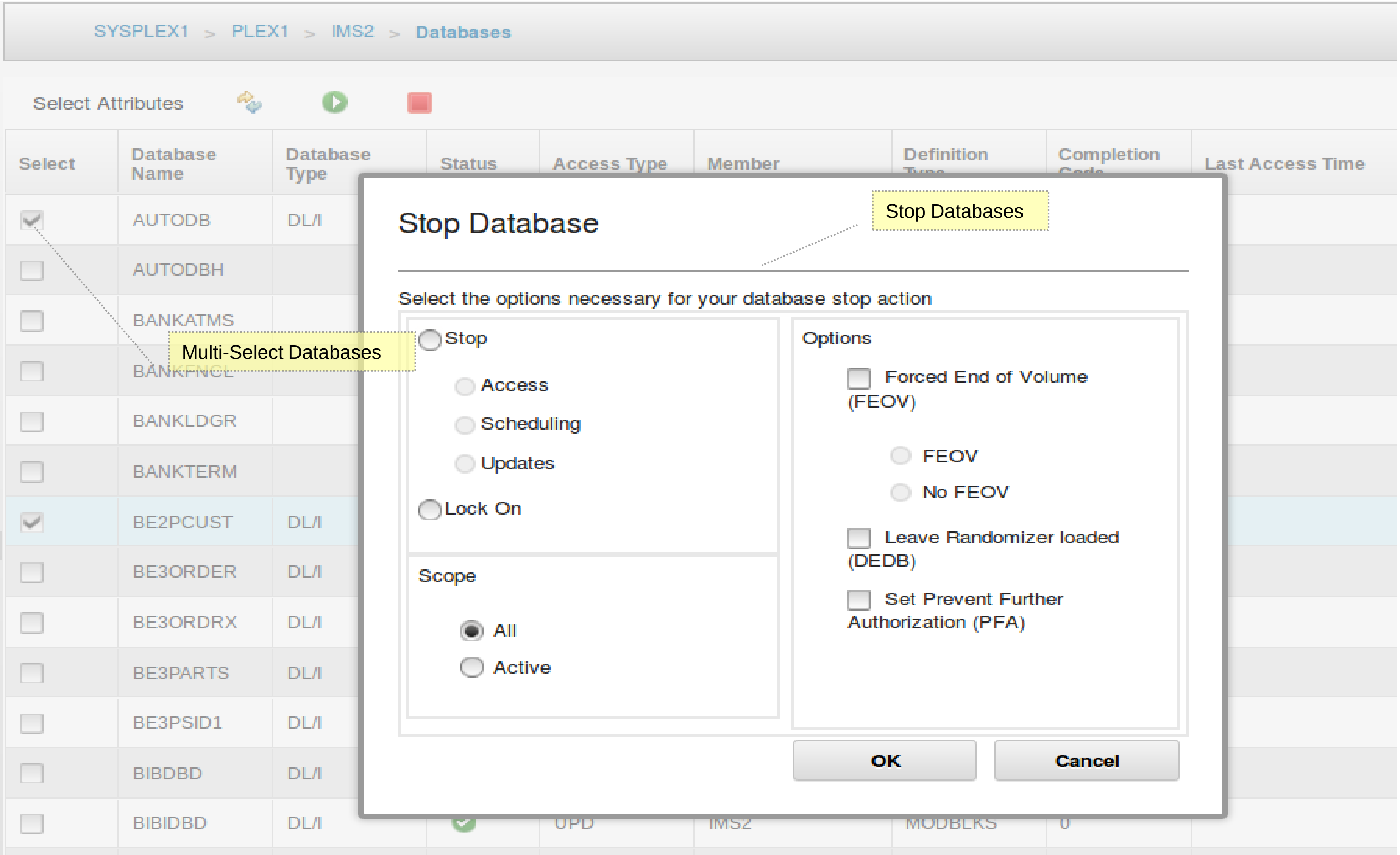
Resource Type: Transactions

Select Attributes

*No filter applied.*

| | Transaction Code | Status | Commit Mode | Conversational | Fast Path | Region Class | Limit Count | Message Queue Count | IMSplex Member Name | Associated Program Name |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | 3270S | ⚠ Warning | MULT | N | N | 1 | 65535 | 0 | IMS1 | A3270 |
| ☐ | A1111111 | ⚠ Warning | SNGL | Y | N | 1 | 65535 | 0 | IMS1 | A11APP |
| ☐ | A3270 | ⚠ Warning | MULT | N | N | 1 | 65535 | 0 | IMS1 | A3270 |
| ☐ | ADDINV | ☒ Critical | MULT | N | N | 4 | 2 | 0 | IMS1 | DFSSAM04 |
| ☐ | ADDPART | ✓ Normal | MULT | N | N | 4 | 2 | 0 | IMS1 | DFSSAM04 |
| ☐ | AOBMP | ☒ Critical | SNGL | N | N | 23 | 65535 | 0 | IMS1 | TS2IAOB0 |
| ☐ | AOP | ✓ Normal | SNGL | N | N | 4 | 4 | 0 | IMS1 | TS1IAOP0 |
| ☐ | AP11 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |
| ☐ | AP12 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |
| ☐ | AP14 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |
| ☐ | AP17 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |
| ☐ | APOL11 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |
| ☐ | APOL12 | ✓ Normal | MULT | N | N | 1 | 65535 | 0 | IMS1 | APOL1 |

# Manage – Start and Stop Resources



SYSPLEX1 > PLEX1 > IMS2 > **Databases**

| Select | Database Name | Database Type | Status | Access Type | Member | Definition Type | Completion Code | Last Access Time |
|---|---|---|---|---|---|---|---|---|
| ☑ | AUTODB | DL/I | | | | | | |
| ☐ | AUTODBH | | | | | | | |
| ☐ | BANKATMS | | | | | | | |
| ☐ | BANKFNCL | | | | | | | |
| ☐ | BANKLDGR | | | | | | | |
| ☐ | BANKTERM | | | | | | | |
| ☑ | BE2PCUST | DL/I | | | | | | |
| ☐ | BE3ORDER | DL/I | | | | | | |
| ☐ | BE3ORDRX | DL/I | | | | | | |
| ☐ | BE3PARTS | DL/I | | | | | | |
| ☐ | BE3PSID1 | DL/I | | | | | | |
| ☐ | BIBDBD | DL/I | | | | | | |
| ☐ | BIBIDBD | DL/I | ✓ | UPD | IMS2 | MODBLKS | 0 | |

Multi-Select Databases

Stop Databases

**Stop Database**

Select the options necessary for your database stop action

○ Stop
- ○ Access
- ○ Scheduling
- ○ Updates

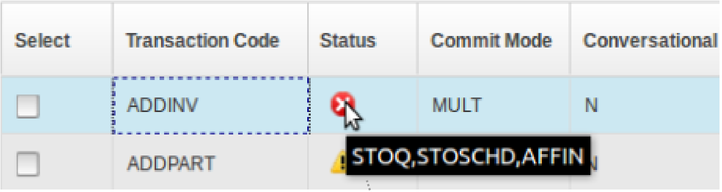
○ Lock On

Scope
- ● All
- ○ Active

Options
- ☐ Forced End of Volume (FEOV)
  - ○ FEOV
  - ○ No FEOV
- ☐ Leave Randomizer loaded (DEDB)
- ☐ Set Prevent Further Authorization (PFA)

# Manage - Statuses

- Hover Help
  - Helpful to new users
- Hover Status Codes
  - Quickly understand a status
- Status Help
  - Help specific to statuses



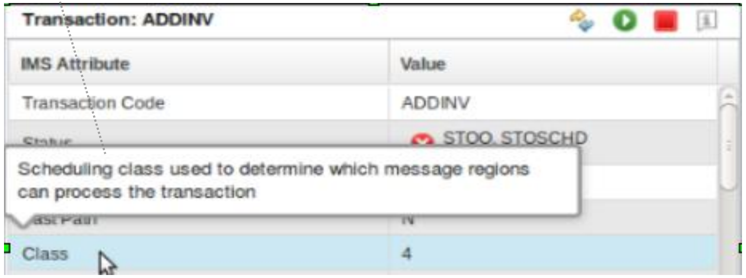
| Select | Transaction Code | Status | Commit Mode | Conversational |
|---|---|---|---|---|
| ☐ | ADDINV | ⊗ | MULT | N |
| ☐ | ADDPART | ⚠ | | N |

STOQ,STOSCHD,AFFIN

Hover Status Codes

Status Help

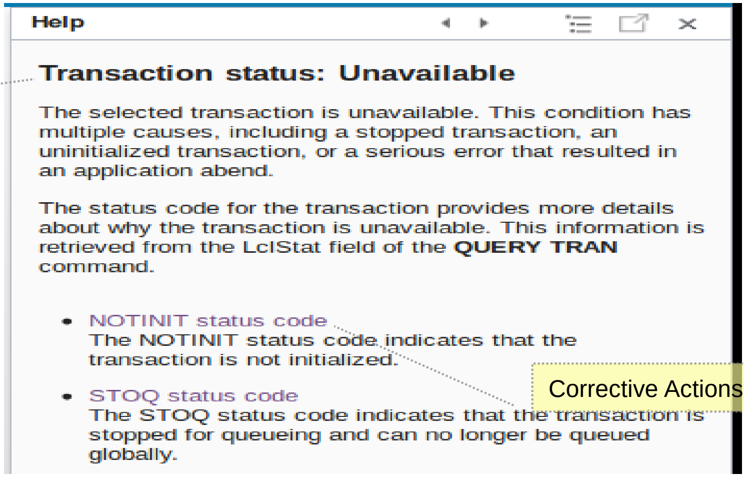
Hover Help



**Transaction: ADDINV**

| IMS Attribute | Value |
|---|---|
| Transaction Code | ADDINV |
| Status | ⊗ STOQ, STOSCHD |
| | |
| ast Path | N |
| Class | 4 |

Scheduling class used to determine which message regions can process the transaction



**Help**

**Transaction status: Unavailable**

The selected transaction is unavailable. This condition has multiple causes, including a stopped transaction, an uninitialized transaction, or a serious error that resulted in an application abend.

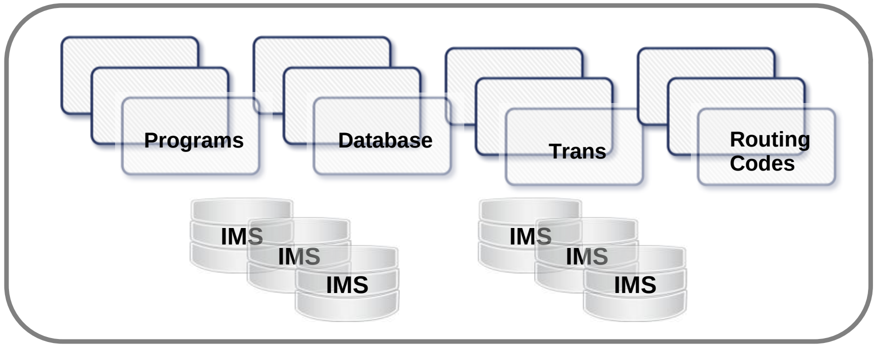
The status code for the transaction provides more details about why the transaction is unavailable. This information is retrieved from the LclStat field of the **QUERY TRAN** command.

- NOTINIT status code
  The NOTINIT status code indicates that the transaction is not initialized.
- STOQ status code
  The STOQ status code indicates that the transaction is stopped for queueing and can no longer be queued globally.

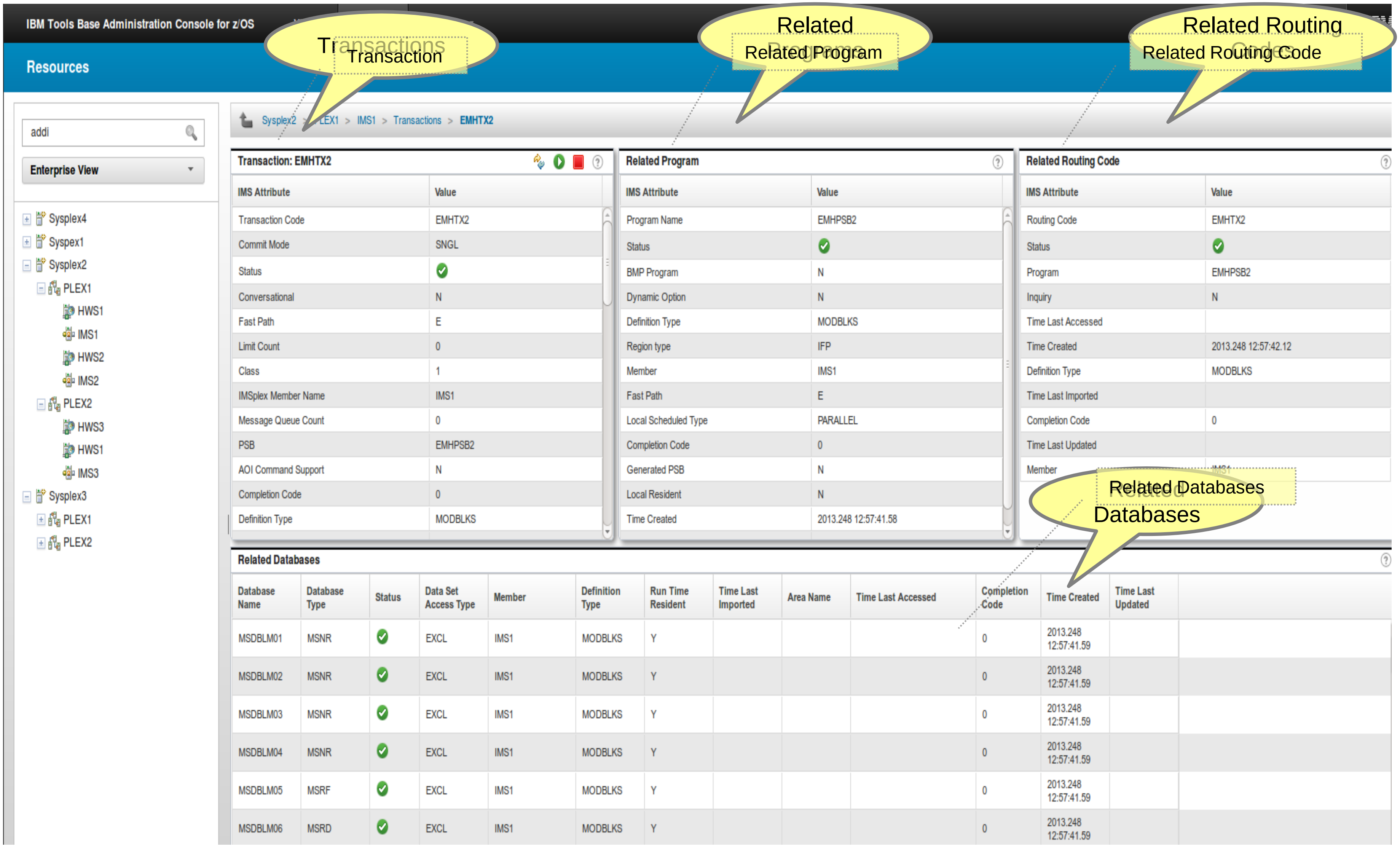
Corrective Actions

# IMS Resource Relationships

- Resource Relationships
  - At a glance see how resources are related
  - Relationships between resources in one view
  - Quickly diagnose problems between resources


Programs
Database
Trans
Routing Codes
IMS
IMS
IMS
IMS
IMS
IMS

# Resource Relationship - Transaction


IBM Tools Base Administration Console for z/OS
Resources
Transactions
Transaction
Related Programs
Related Program
Related Routing Codes
Related Routing Code
Related Databases
Databases
addi
Enterprise View
Sysplex4
Syspex1
Sysplex2
PLEX1
HWS1
IMS1
HWS2
IMS2
PLEX2
HWS3
HWS1
IMS3
Sysplex3
PLEX1
PLEX2
Sysplex2 > PLEX1 > IMS1 > Transactions > EMHTX2

**Transaction: EMHTX2**

| IMS Attribute | Value |
|---|---|
| Transaction Code | EMHTX2 |
| Commit Mode | SNGL |
| Status | ✓ |
| Conversational | N |
| Fast Path | E |
| Limit Count | 0 |
| Class | 1 |
| IMSplex Member Name | IMS1 |
| Message Queue Count | 0 |
| PSB | EMHPSB2 |
| AOI Command Support | N |
| Completion Code | 0 |
| Definition Type | MODBLKS |

**Related Program**

| IMS Attribute | Value |
|---|---|
| Program Name | EMHPSB2 |
| Status | ✓ |
| BMP Program | N |
| Dynamic Option | N |
| Definition Type | MODBLKS |
| Region type | IFP |
| Member | IMS1 |
| Fast Path | E |
| Local Scheduled Type | PARALLEL |
| Completion Code | 0 |
| Generated PSB | N |
| Local Resident | N |
| Time Created | 2013.248 12:57:41.58 |

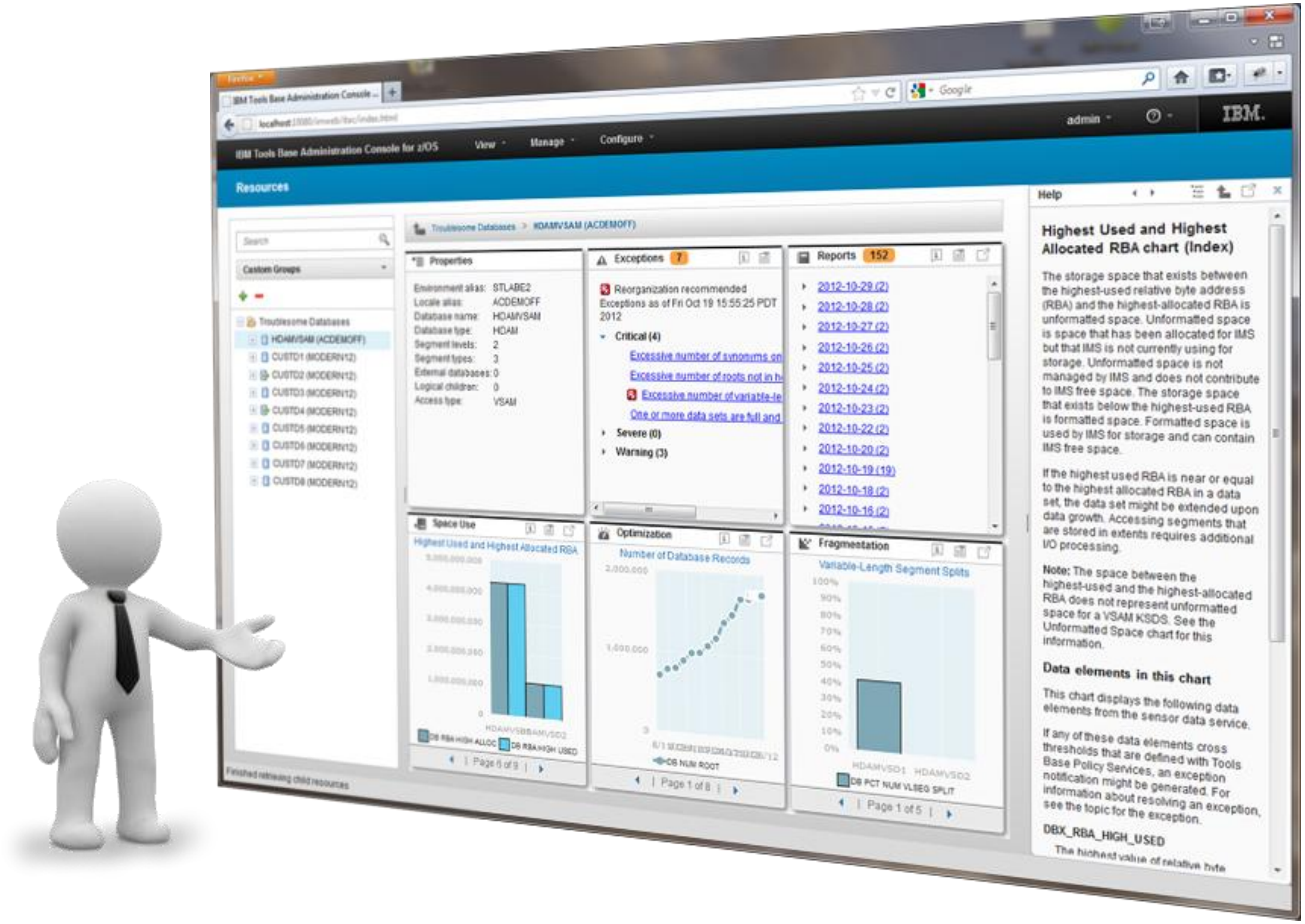
**Related Routing Code**

| IMS Attribute | Value |
|---|---|
| Routing Code | EMHTX2 |
| Status | ✓ |
| Program | EMHPSB2 |
| Inquiry | N |
| Time Last Accessed | |
| Time Created | 2013.248 12:57:42.12 |
| Definition Type | MODBLKS |
| Time Last Imported | |
| Completion Code | 0 |
| Time Last Updated | |
| Member | IMS1 |

**Related Databases**

| Database Name | Database Type | Status | Data Set Access Type | Member | Definition Type | Run Time Resident | Time Last Imported | Area Name | Time Last Accessed | Completion Code | Time Created | Time Last Updated |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSDBLM01 | MSNR | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |
| MSDBLM02 | MSNR | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |
| MSDBLM03 | MSNR | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |
| MSDBLM04 | MSNR | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |
| MSDBLM05 | MSRF | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |
| MSDBLM06 | MSRD | ✓ | EXCL | IMS1 | MODBLKS | Y | | | | 0 | 2013.248 12:57:41.59 | |

# Demo of Base IMS Function


IBM Tools Base Administration Console
localhost:10080/ibm/tbac/index.html
Google
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
IBM.
Resources
Search
Custom Groups
Troublesome Databases
HDAMVSAM (ACDEMOFF)
CUSTD1 (MODERN12)
CUSTD2 (MODERN12)
CUSTD3 (MODERN12)
CUSTD4 (MODERN12)
CUSTD5 (MODERN12)
CUSTD6 (MODERN12)
CUSTD7 (MODERN12)
CUSTD8 (MODERN12)
Troublesome Databases > HDAMVSAM (ACDEMOFF)
Properties
Exceptions 7
Reports 152
Space Use
Highest Used and Highest Allocated RBA
DB RBA HIGH ALLOC
DB RBA HIGH USED
Page 6 of 9
Optimization
Number of Database Records
2,000,000
1,000,000
0
DB NUM ROOT
Page 1 of 8
Fragmentation
Variable-Length Segment Splits
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
HDAMVSD1
HDAMVSD2
DB PCT NUM VLSEG SPLIT
Page 1 of 5
Finished retrieving child resources
Help

Environment alias: STLABE2
Locale alias: ACDEMOFF
Database name: HDAMVSAM
Database type: HDAM
Segment levels: 2
Segment types: 3
External databases: 0
Logical children: 0
Access type: VSAM

Reorganization recommended
Exceptions as of Fri Oct 19 15:55:25 PDT 2012

- Critical (4)
  - Excessive number of synonyms on
  - Excessive number of roots not in h
  - Excessive number of variable-le
  - One or more data sets are full and
- Severe (0)
- Warning (3)

- 2012-10-29 (2)
- 2012-10-28 (2)
- 2012-10-27 (2)
- 2012-10-26 (2)
- 2012-10-25 (2)
- 2012-10-24 (2)
- 2012-10-23 (2)
- 2012-10-22 (2)
- 2012-10-20 (2)
- 2012-10-19 (19)
- 2012-10-18 (2)
- 2012-10-16 (2)

**Highest Used and Highest Allocated RBA chart (Index)**

The storage space that exists between the highest-used relative byte address (RBA) and the highest-allocated RBA is unformatted space. Unformatted space is space that has been allocated for IMS but that IMS is not currently using for storage. Unformatted space is not managed by IMS and does not contribute to IMS free space. The storage space that exists below the highest-used RBA is formatted space. Formatted space is used by IMS for storage and can contain IMS free space.

If the highest used RBA is near or equal to the highest allocated RBA in a data set, the data set might be extended upon data growth. Accessing segments that are stored in extents requires additional I/O processing.

**Note:** The space between the highest-used and the highest-allocated RBA does not represent unformatted space for a VSAM KSDS. See the Unformatted Space chart for this information.

**Data elements in this chart**

This chart displays the following data elements from the sensor data service.

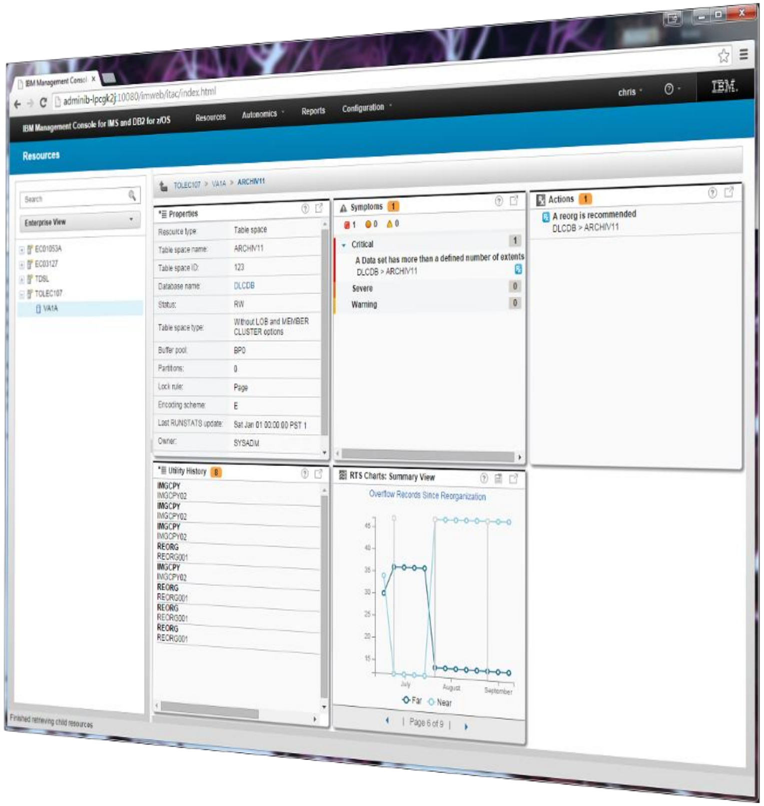
If any of these data elements cross thresholds that are defined with Tools Base Policy Services, an exception notification might be generated. For information about resolving an exception, see the topic for the exception.

**DBX_RBA_HIGH_USED**

The highest value of relative byte

# Base DB2 Support

- Direct Connection to DB2 DDF
  - Discovery walks through DB2 Catalog
- DB2 Object Dashboards
  - Data Sharing Group
  - Subsystem
  - Database
  - Tablespace
  - Tablespace Partition
  - Indexspace
  - Indexspace Partition
- Autonomics Director for DB2 for zOS
  - Provide Object Profiles
  - Provides RTS Snapshot
  - Hooks into DB2 Admin Task Scheduler


IBM Management Consol
adminib-lpcgk2j:10080/imweb/itac/index.html
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
Resources
Search
Enterprise View
EC01053A
EC03127
TDSL
TOLEC107
VA1A
TOLEC107 > VA1A > ARCHIV11
Properties
Symptoms 1
Actions 1
Utility History 8
RTS Charts: Summary View
Overflow Records Since Reorganization
45
40
35
30
25
20
15
July
August
September
Far
Near
Page 6 of 9
Finished retrieving child resources

| | |
|---|---|
| Resource type: | Table space |
| Table space name: | ARCHIV11 |
| Table space ID: | 123 |
| Database name: | DLCDB |
| Status: | RW |
| Table space type: | Without LOB and MEMBER CLUSTER options |
| Buffer pool: | BP0 |
| Partitions: | 0 |
| Lock rule: | Page |
| Encoding scheme: | E |
| Last RUNSTATS update: | Sat Jan 01 00:00:00 PST 1 |
| Owner: | SYSADM |

Critical 1
A Data set has more than a defined number of extents
DLCDB > ARCHIV11
Severe 0
Warning 0

A reorg is recommended
DLCDB > ARCHIV11

IMGCPY IMGCPY02
IMGCPY IMGCPY02
IMGCPY IMGCPY02
REORG REORG001
IMGCPY IMGCPY02
REORG REORG001
REORG REORG001
REORG REORG001

Information Management

*The future runs on System z*

# Autonomics

## IMS & DB2

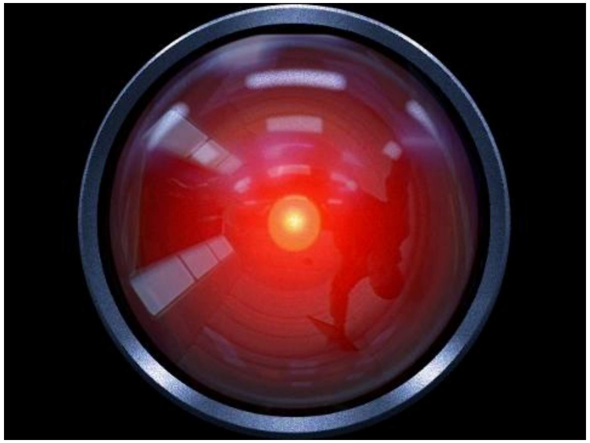
## IBM Management Console Workshop

Christopher Holtz
IMS and DB2 Modernization Architect

© 2014 IBM Corporation. IBM Confidential

# Autonomics

**Autonomic computing** refers to the self-managing characteristics of distributed computing resources, adapting to unpredictable changes while hiding intrinsic complexity to operators and users. Started by IBM in 2001, this initiative ultimately aims to develop computer systems capable of self-management, to overcome the rapidly growing complexity of computing systems management, and to reduce the barrier that complexity poses to further growth.

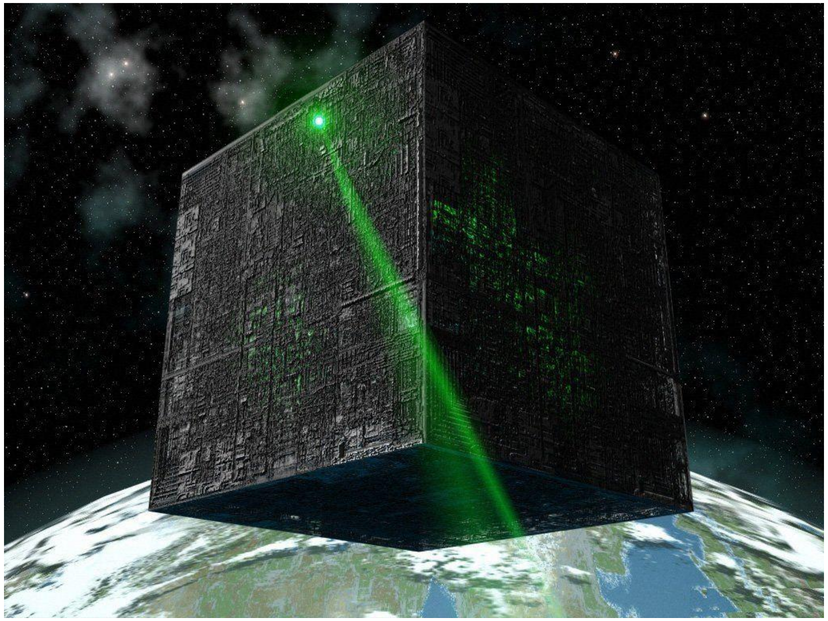


Source: Wikipedia, Oct 2014, http://en.wikipedia.org/wiki/Autonomic_computing

# The Inevitability of Autonomics

Forecasts suggest that the number of computing devices in use will grow at 38% per year [1] and the average complexity of each device is increasing. [1]

Currently, this volume and complexity is managed by highly skilled humans; but the demand for skilled IT personnel is already outstripping supply, with labour costs exceeding equipment costs by a ratio of up to 18:1… [2]



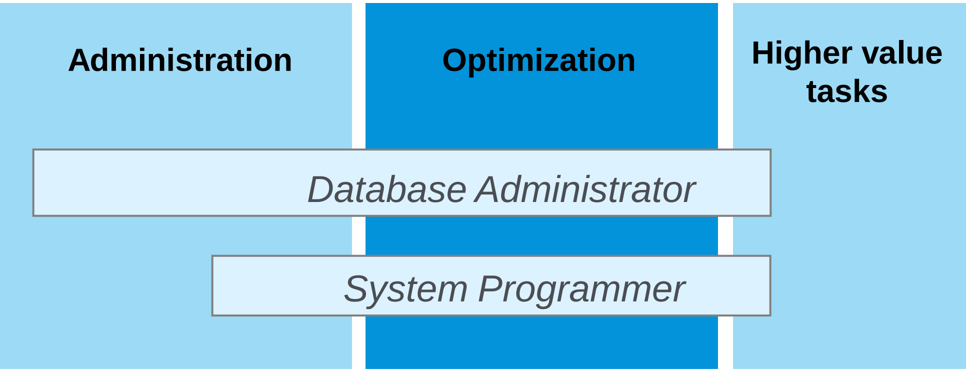
Source: Wikipedia, Oct 2014, http://en.wikipedia.org/wiki/Autonomic_computing

[1] Horn. "Autonomic Computing:IBM's Perspective on the State of Information Technology"

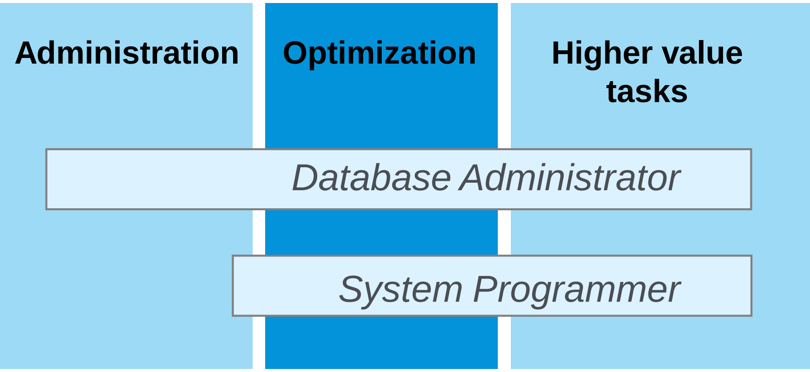
[2] Jump up^ 'Trends in technology', survey, Berkeley University of California, USA, March 2002

# The Value of Autonomics

## Today


Administration
Optimization
Higher value tasks
Database Administrator
System Programmer

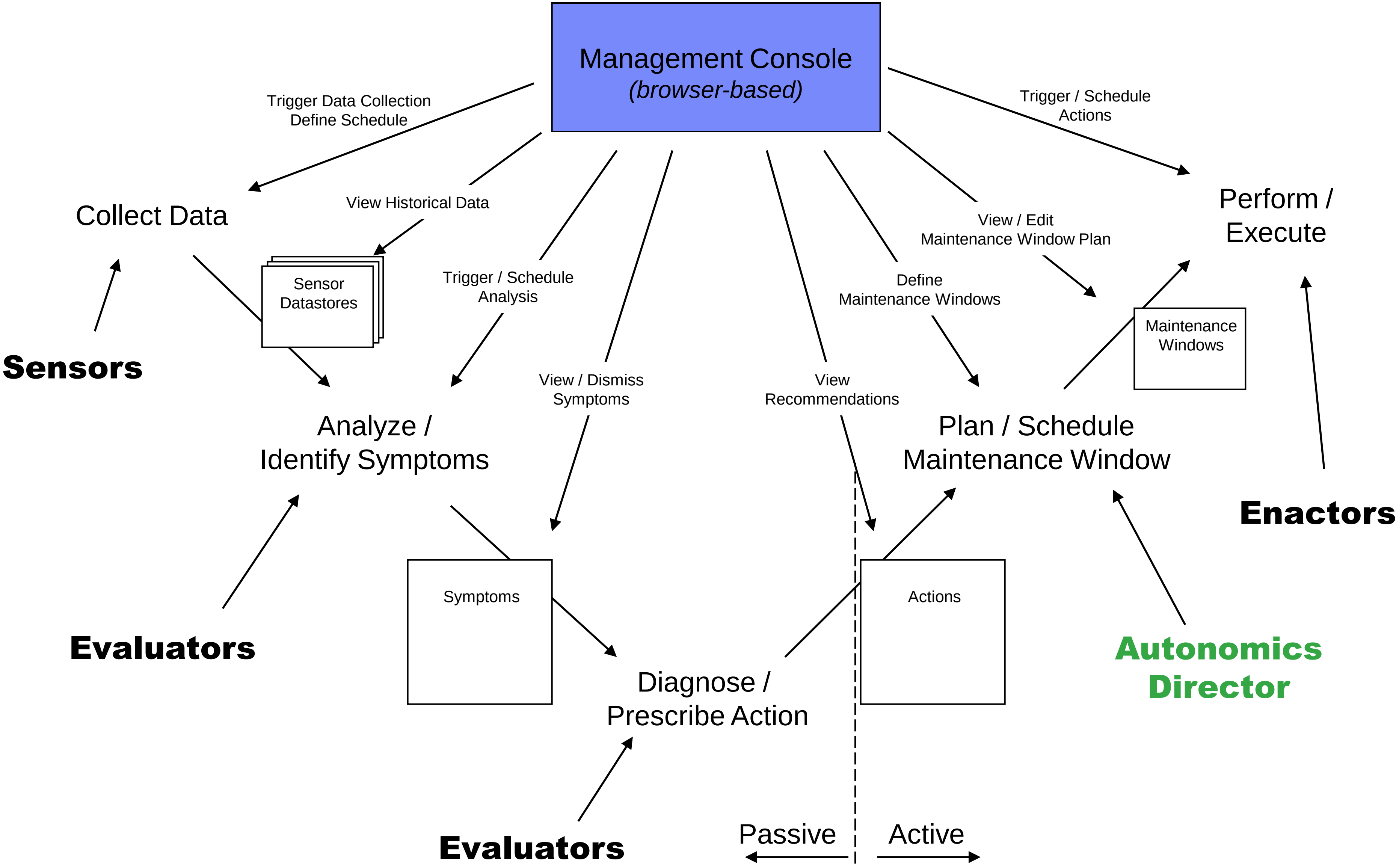
## Target: IMz Tools enables productivity


Administration
Optimization
Higher value tasks
Database Administrator
System Programmer

…the essence of autonomic computing is system self-management, delivering better system behavior and **freeing administrators from low-level task management.**

Source: Wikipedia, Oct 2014, http://en.wikipedia.org/wiki/Autonomic_computing

# Autonomics and Modernization



Management Console
*(browser-based)*

Trigger Data Collection
Define Schedule

Trigger / Schedule
Actions

Collect Data

View Historical Data

Sensor
Datastores

Trigger / Schedule
Analysis

View / Edit
Maintenance Window Plan

Perform /
Execute

Define
Maintenance Windows

Maintenance
Windows

**Sensors**

View / Dismiss
Symptoms

View
Recommendations

Analyze /
Identify Symptoms

Plan / Schedule
Maintenance Window

**Enactors**

Symptoms

Actions

**Evaluators**

Diagnose /
Prescribe Action

**Autonomics
Director**

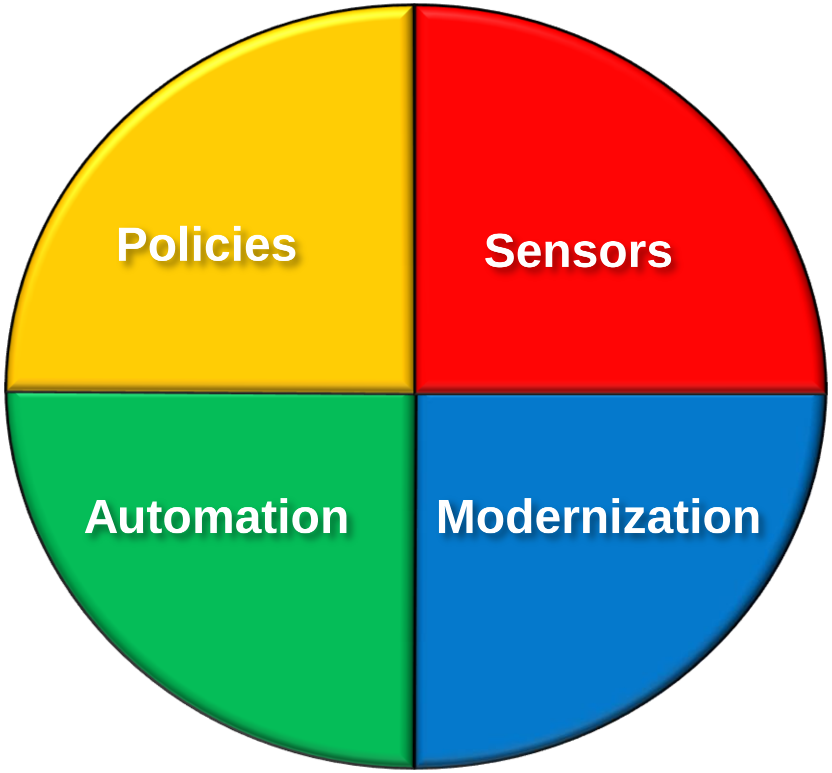
**Evaluators**

Passive

Active

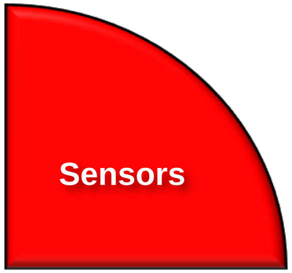
# IMS Tools Autonomics Vision

## Putting information to work


Policies
Sensors
Automation
Modernization

- Sensors collect resource statistics
- Policies evaluate sensor data and identify potential problems
- Automation orchestrates the collection and evaluation of sensor data
- Modernization presents an interactive modern interface for managing the system

# Sensors: Collecting the Basic Information You Need

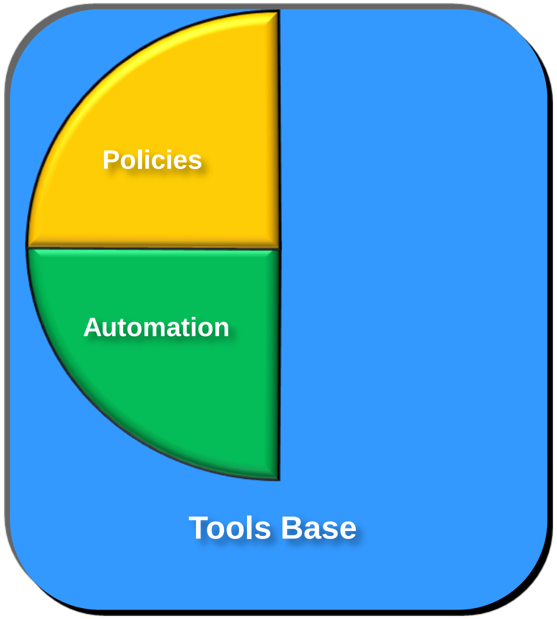


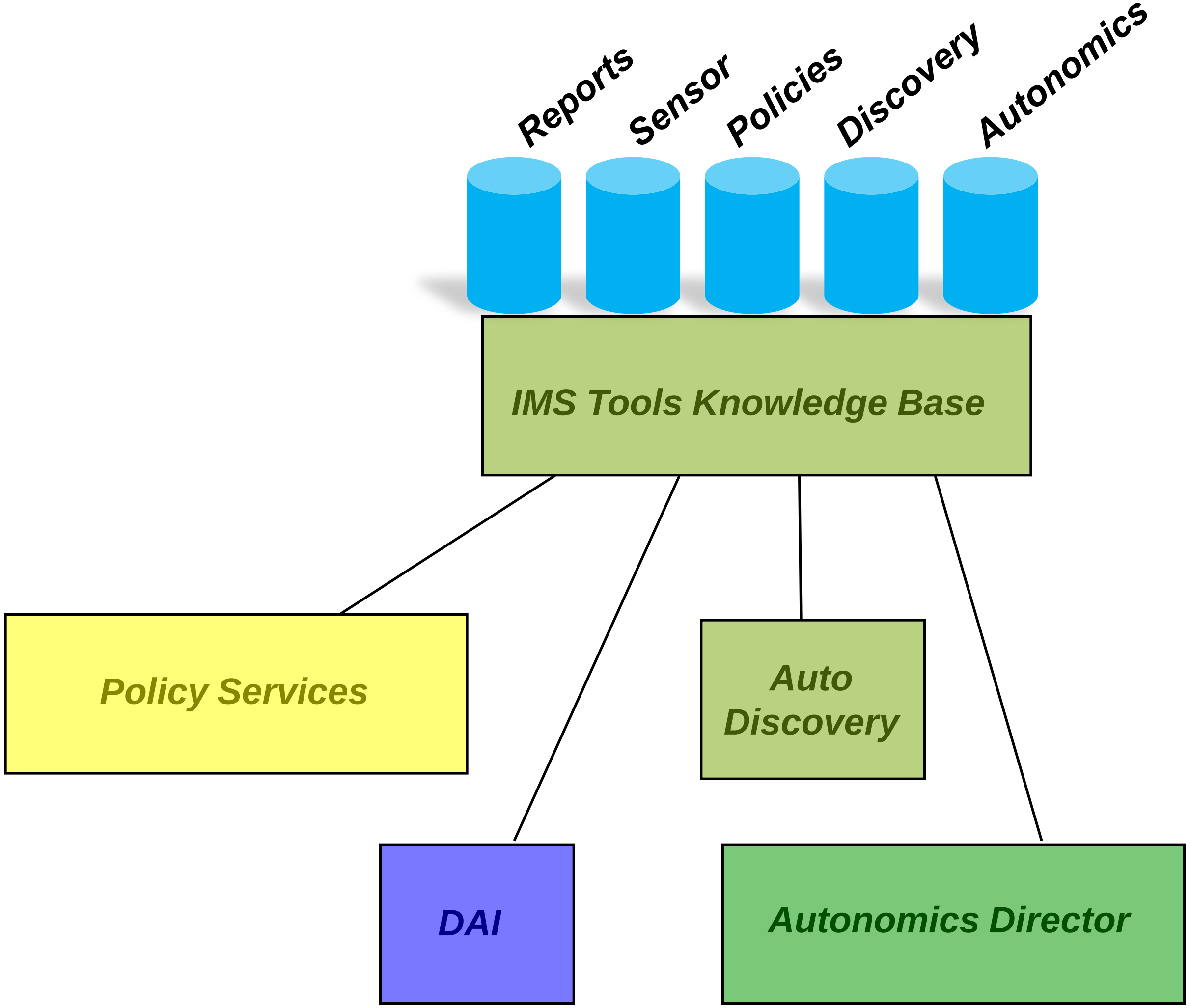
- Statistical point-in-time sensor data on your FF/FP Databases
  - Stored in IMS Tools Knowledge Base repository
  - Historically maintained per user specifications
  - Over 60 separate data elements related to space usage, optimization, and fragmentation
    - data set extents, DASD volume usage, data set free space, roots distribution, RAP usage, CI/CA splits, and IMS free space, etc

- Two methods of collection:
  - Standalone database Sensor utilities for full-function and Fast Path databases
  - Integrated with existing IMS Tools

- Integrated Tools support
  - High Performance Image Copy, High Performance Pointer Checker
  - Fast Path Analyzer, Fast Path Online Pointer Checker

# IBM Tools Base for z/OS
# Autonomic and Modernization Components


Policies
Automation
Tools Base


Reports
Sensor
Policies
Discovery
Autonomics
IMS Tools Knowledge Base
Policy Services
Auto Discovery
DAI
Autonomics Director

# Policies: Using Sensor Data to Make Decisions

Policies

- Policy definitions are used to evaluate specific database states
  - Threshold values are compared against sensor data for a given database or group of databases
  - When thresholds are met or exceeded, exceptions occur

- Works “out of the box”
  - Ships with predefined policies and threshold values
  - Full ISPF interface provided for policy management

- Customizable to fit your shop
  - You can define your own sets of threshold values
  - Customize the messages sent when exceptions do occur
  - Specify who receives which messages and how
    - WTO, e-mail, or text

# Automation: Delivering on our Vision

Automation

- IBM Tools Autonomics Director 1.3 (Passive)
  - Automates collection and analysis of Sensor Data
  - Recommends when databases should be reorganized
    - With email or text notifications
  - Provides a scheduling feature that allows you to control how frequently sensor data is collected and how frequently policies are evaluated
  - Flexible scheduling around pre-defined PEAK times

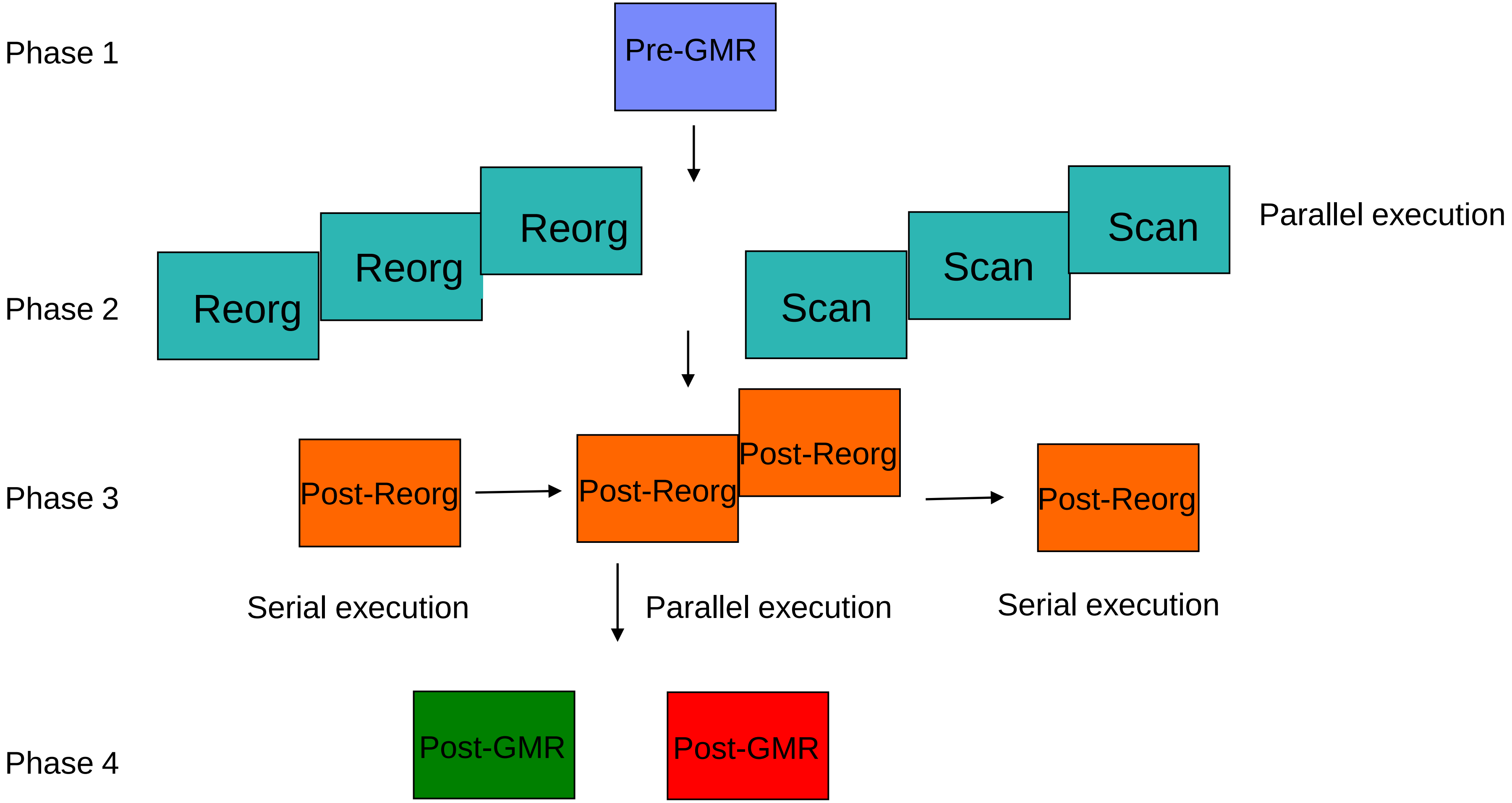
- IBM Tools Autonomic Director 1.4 (Active)
  - Actively initiate recommended actions on user-defined database groups
    - Discovery feature for identifying related database groups
    - Ability to manage and coordinate reorganization of multiple IMS database groups as if reorganizing a single database
    - Flexible scheduling only in pre-defined Maintenance windows

# Group-managed reorganization (GMR)

- Automatically Reorganize DB Groups
  - Reorganize multiple databases in parallel
    - Parallel reorganization for databases with external logical relationships
    - Any group of databases that need parallel reorganization
  - Only reorganizes DBs in group that need it
  - Initiates and controls entire job flow
  - Architected to support distinct phases
  - Parallelism and flexibility are primary driver

- Phases:
  - Pre-GMR phase
  - Reorganization phase
  - Post-reorg phase
  - Post-GMR phase

# Group-managed reorganization plan



Phase 1

Pre-GMR

Phase 2

Reorg

Reorg

Reorg

Scan

Scan

Scan

Parallel execution

Phase 3

Post-Reorg

Post-Reorg

Post-Reorg

Post-Reorg

Serial execution

Parallel execution

Serial execution

Phase 4

Post-GMR

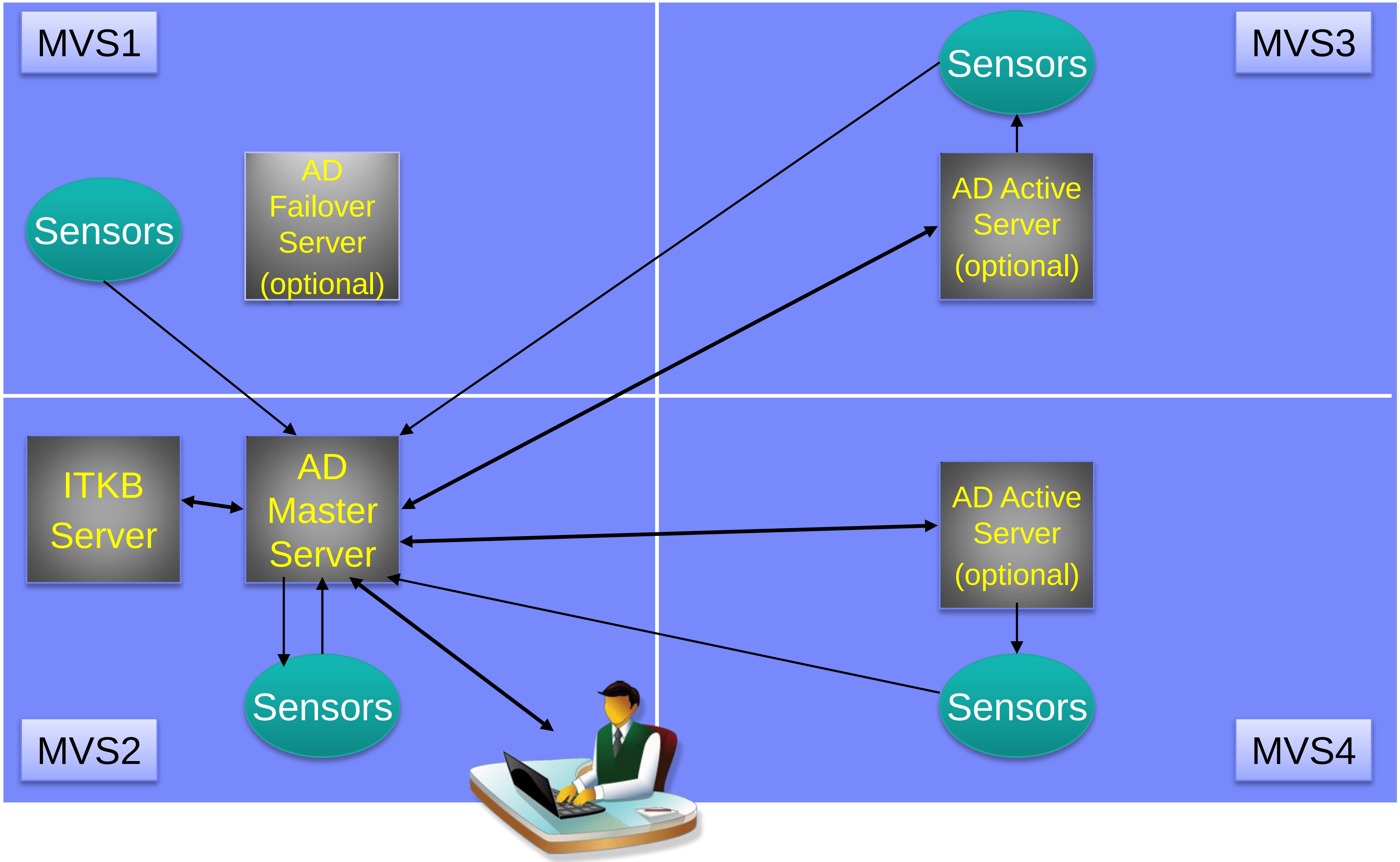
Post-GMR

# Autonomics Director Overview

Autonomic
Computing

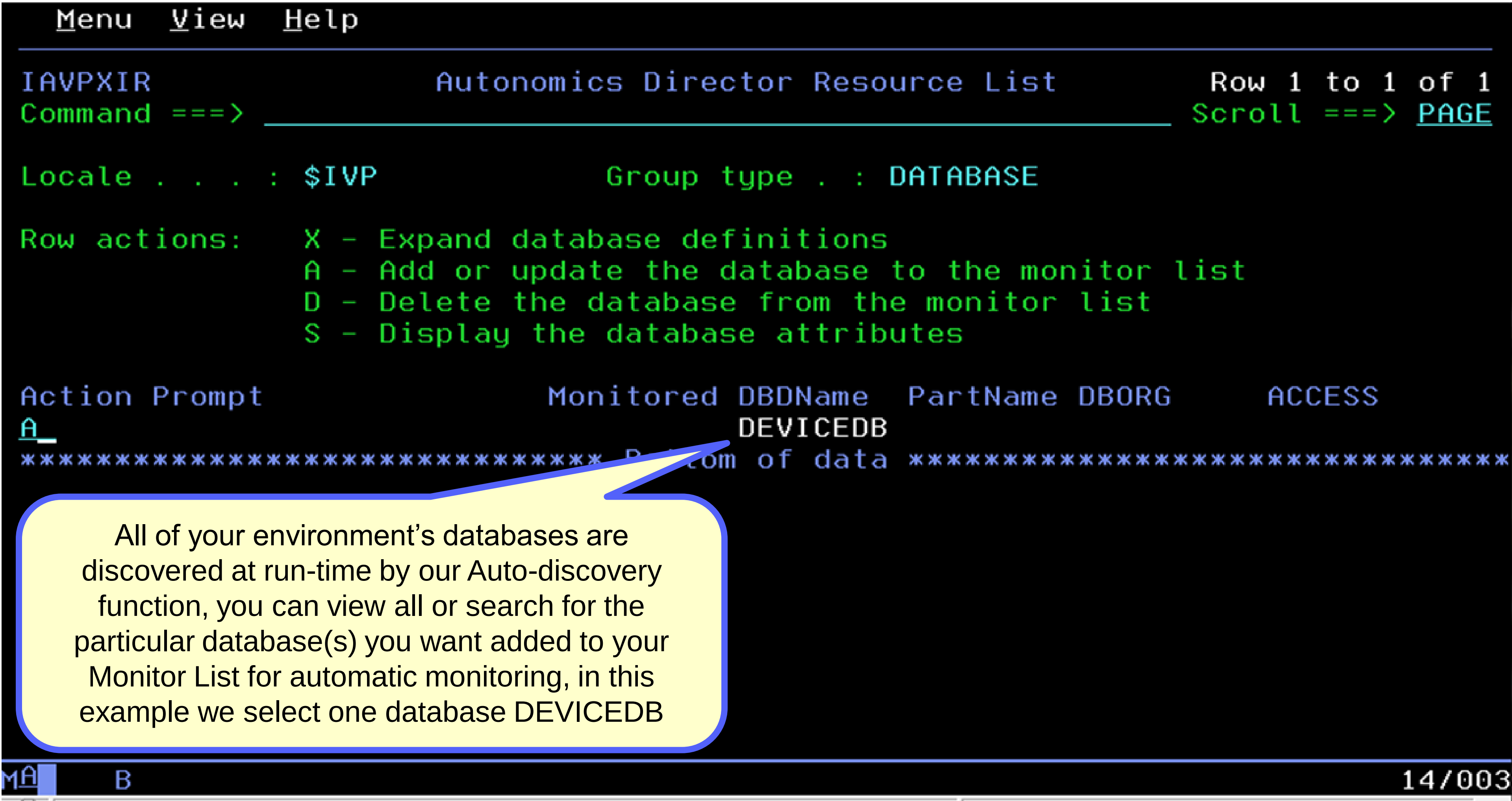
- Automatic collection and evaluation of Sensor data
  - Can integrate with existing IBM Tools image copy and pointer checker processes
  - Based on user-defined policies and thresholds
- Provides recommendations for reorganizations
- E-mail or text notification when a reorganization is recommended
- Flexible scheduling around peak workloads
  - Doesn’t interfere with production throughput or response time
- Works with existing job schedulers
- Exploits the power of IMS sysplex
  - Automatic failover and workload management support
- Easily customized for groups or individual databases
  - Auto-discovery of databases and existing database groups
  - User-defined groupings: “These are the databases that I’m responsible for”
  - Group-assigned defaults propagate to individual databases

# Autonomics Director Configuration


MVS1
MVS3
Sensors
AD Failover Server (optional)
Sensors
AD Active Server (optional)
ITKB Server
AD Master Server
AD Active Server (optional)
Sensors
Sensors
MVS2
MVS4

# Adding database(s) to your monitor list

- Your Monitor List is the custom list of databases you're interested in…

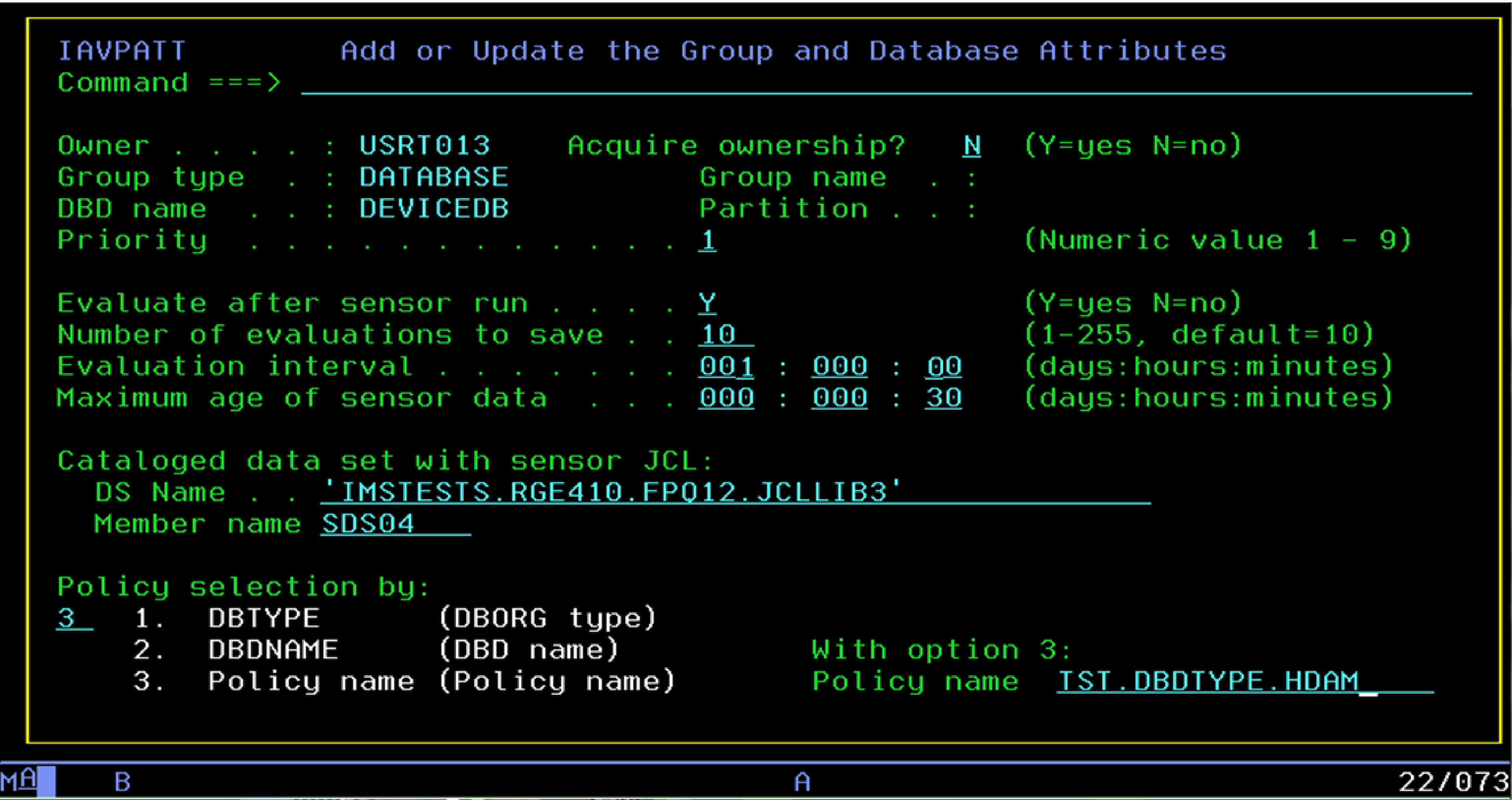


```
   Menu  View  Help
 ------------------------------------------------------------------------------
 IAVPXIR                Autonomics Director Resource List          Row 1 to 1 of 1
 Command ===> ________________________________________________  Scroll ===> PAGE

 Locale . . . : $IVP                Group type . : DATABASE

 Row actions:   X - Expand database definitions
                A - Add or update the database to the monitor list
                D - Delete the database from the monitor list
                S - Display the database attributes

 Action Prompt                Monitored DBDName  PartName DBORG     ACCESS
 A_                                      DEVICEDB
 ******************************* Bottom of data ********************************

 MA     B                                                                 14/003
```

All of your environment's databases are discovered at run-time by our Auto-discovery function, you can view all or search for the particular database(s) you want added to your Monitor List for automatic monitoring, in this example we select one database DEVICEDB

# Setting your monitoring criteria

- You can set how often the database should be evaluated, how many evaluations to save, and which policies to use in the evaluation

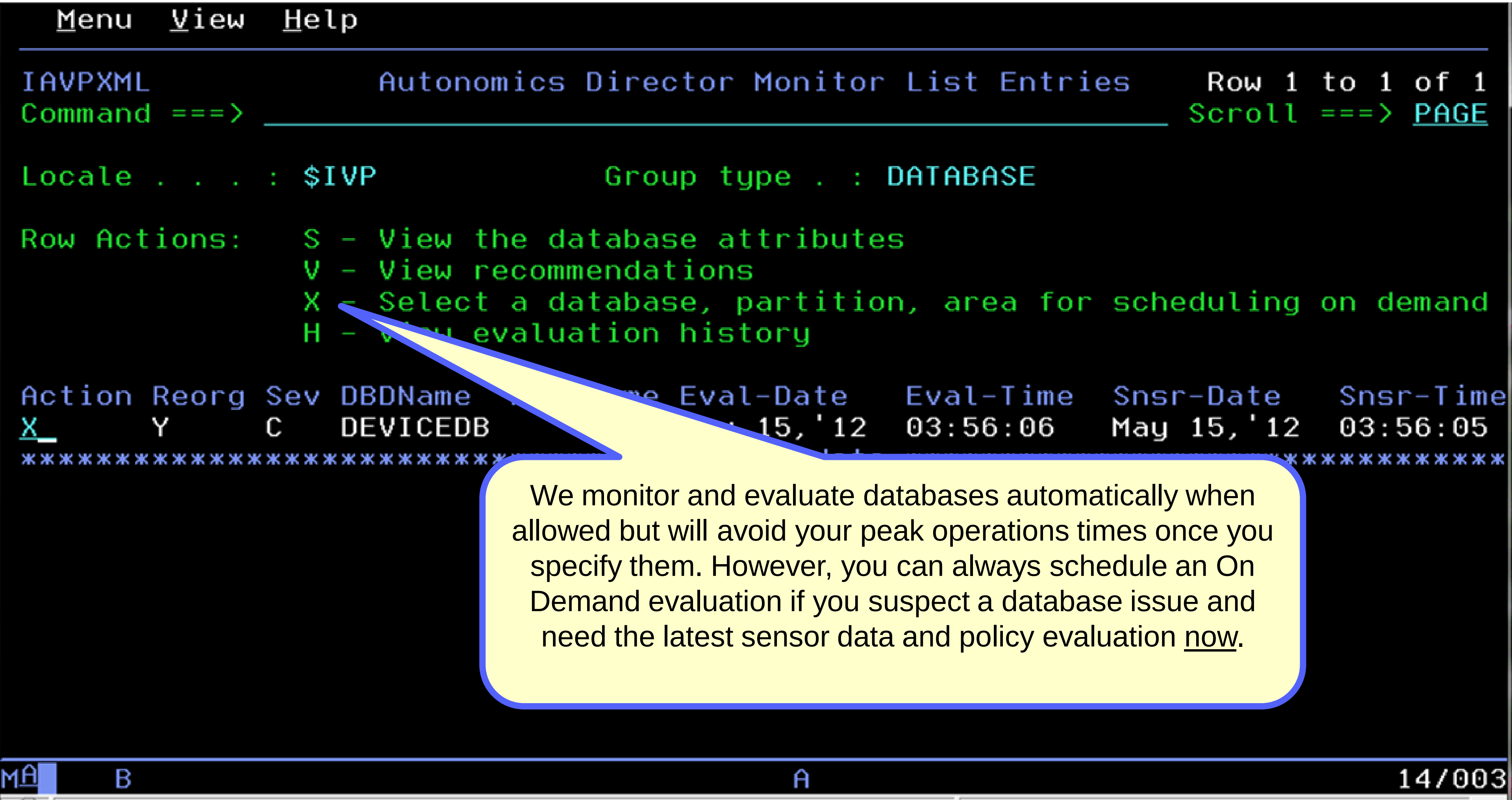


```
IAVPATT        Add or Update the Group and Database Attributes
Command ===> ______________________________________________________________

Owner . . . . . : USRT013    Acquire ownership?   N   (Y=yes N=no)
Group type   . : DATABASE          Group name   . :
DBD name   . . : DEVICEDB          Partition . . :
Priority  . . . . . . . . . . . . 1                   (Numeric value 1 - 9)

Evaluate after sensor run . . . . Y                   (Y=yes N=no)
Number of evaluations to save . . 10_                 (1-255, default=10)
Evaluation interval . . . . . . . 001 : 000 : 00      (days:hours:minutes)
Maximum age of sensor data  . . . 000 : 000 : 30      (days:hours:minutes)

Cataloged data set with sensor JCL:
  DS Name . . 'IMSTESTS.RGE410.FPQ12.JCLLIB3'_____________
  Member name SDS04___

Policy selection by:
3_  1.  DBTYPE      (DBORG type)
    2.  DBDNAME     (DBD name)            With option 3:
    3.  Policy name (Policy name)         Policy name  TST.DBDTYPE.HDAM_____
```

```
MA      B                                     A                              22/073
```

# Scheduling an evaluation On Demand

- Databases will be monitored and evaluated automatically once you specify your peak times (not shown) but you can always schedule an On Demand evaluation

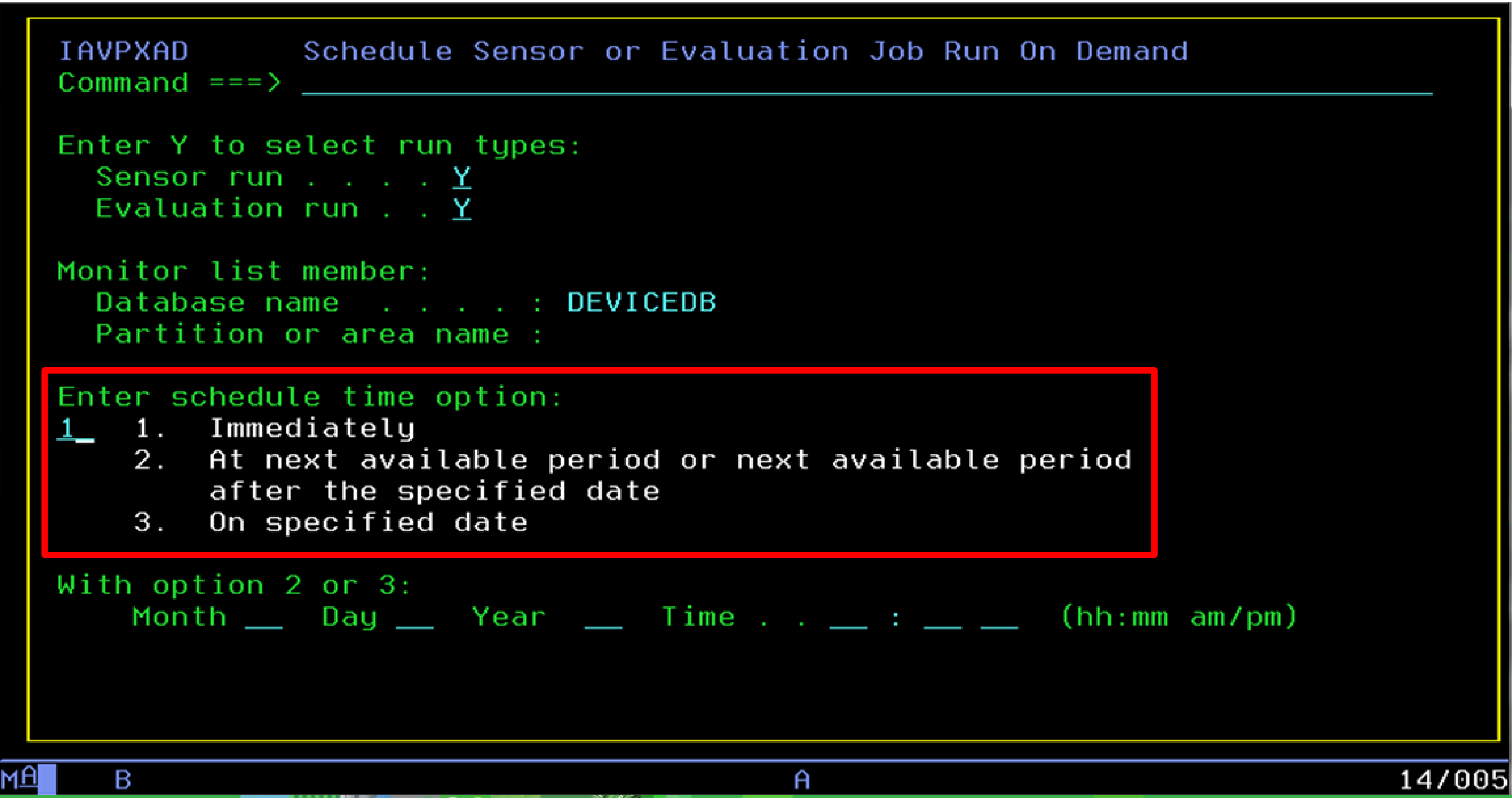


```
  Menu  View  Help
--------------------------------------------------------------------------------
IAVPXML           Autonomics Director Monitor List Entries     Row 1 to 1 of 1
Command ===> ________________________________________________  Scroll ===> PAGE

Locale . . . : $IVP            Group type . : DATABASE

Row Actions:   S - View the database attributes
               V - View recommendations
               X - Select a database, partition, area for scheduling on demand
               H - View evaluation history

Action Reorg Sev DBDName          me Eval-Date   Eval-Time   Snsr-Date   Snsr-Time
X_      Y     C  DEVICEDB            15,'12     03:56:06    May 15,'12  03:56:05
*******************************************************************************

MA      B                                  A                              14/003
```

We monitor and evaluate databases automatically when allowed but will avoid your peak operations times once you specify them. However, you can always schedule an On Demand evaluation if you suspect a database issue and need the latest sensor data and policy evaluation <u>now</u>.

# Immediately…

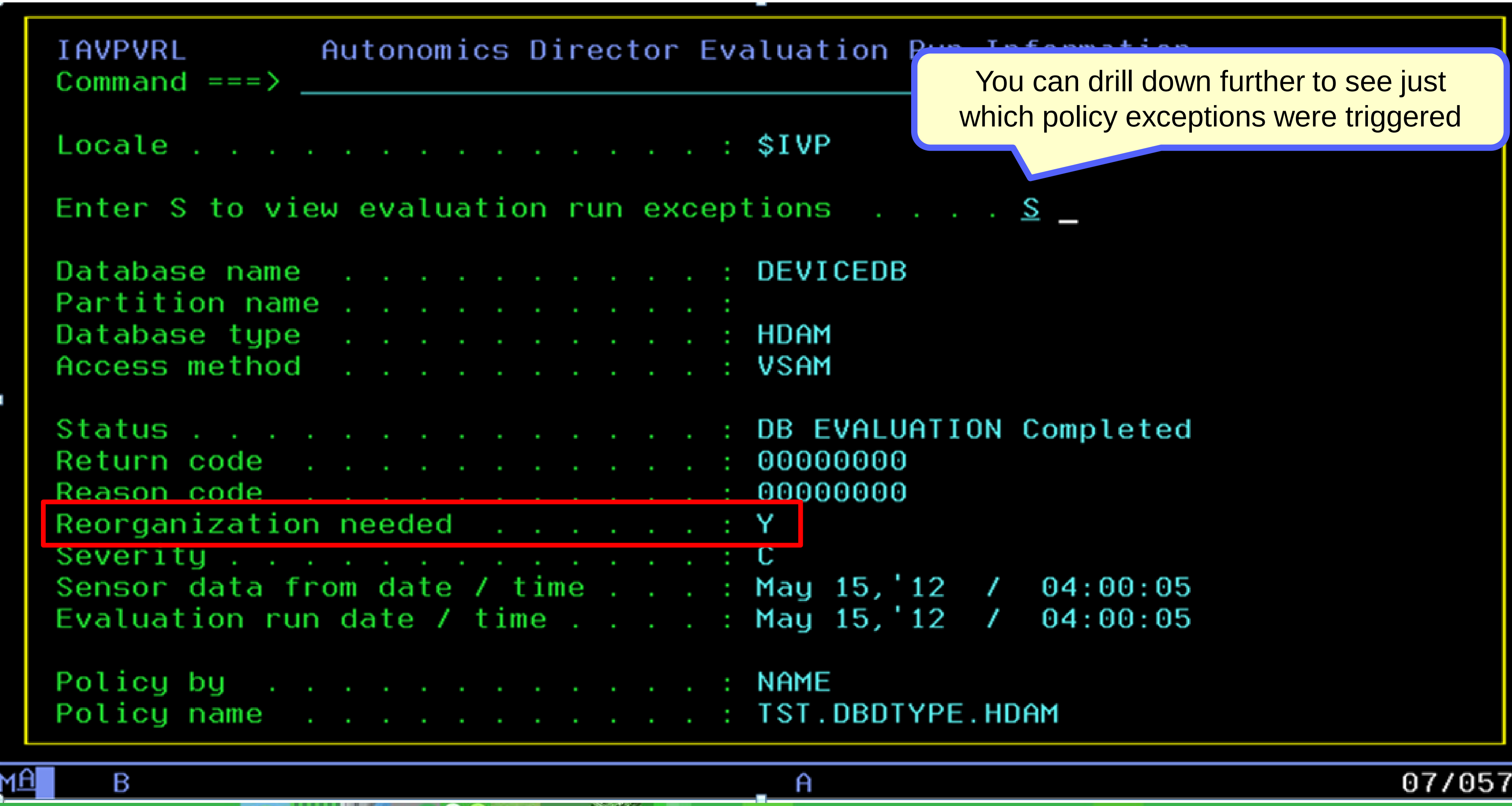
- Maximum flexibility is provided to get you the most current information available when you need it, so decisions are never made using stale data



```
IAVPXAD       Schedule Sensor or Evaluation Job Run On Demand
Command ===> ____________________________________________________________

Enter Y to select run types:
  Sensor run . . . . . Y
  Evaluation run . . Y

Monitor list member:
  Database name  . . . . . : DEVICEDB
  Partition or area name :

Enter schedule time option:
1_   1.   Immediately
     2.   At next available period or next available period
          after the specified date
     3.   On specified date

With option 2 or 3:
     Month __  Day __  Year  __  Time . . __ : __ __  (hh:mm am/pm)

MA    B                                   A                          14/005
```

# View the resulting recommendations

- We keep it simple, if a database reorganization is needed based on the policies you set you’ll see ‘Y’ if not, you’ll see ‘N’ … no guess work here

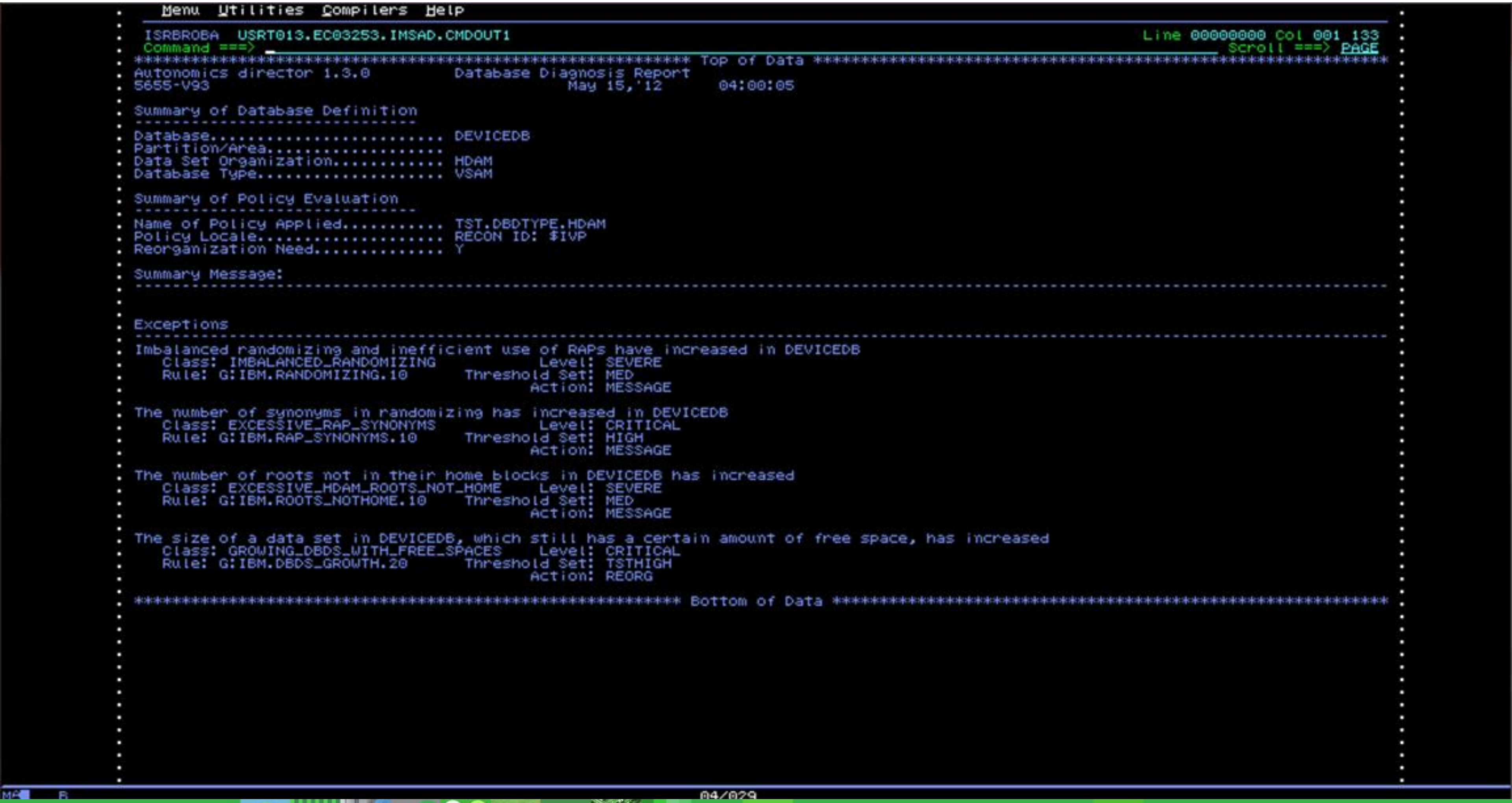


```
IAVPVRL       Autonomics Director Evaluation
Command ===> 

Locale . . . . . . . . . . . . . . . . : $IVP

Enter S to view evaluation run exceptions  . . . . S _

Database name  . . . . . . . . . . . . : DEVICEDB
Partition name . . . . . . . . . . . . :
Database type  . . . . . . . . . . . . : HDAM
Access method  . . . . . . . . . . . . : VSAM

Status . . . . . . . . . . . . . . . . : DB EVALUATION Completed
Return code  . . . . . . . . . . . . . : 00000000
Reason code  . . . . . . . . . . . . . : 00000000
Reorganization needed  . . . . . . . . : Y
Severity . . . . . . . . . . . . . . . : C
Sensor data from date / time . . . . . : May 15,'12  /  04:00:05
Evaluation run date / time . . . . . . : May 15,'12  /  04:00:05

Policy by  . . . . . . . . . . . . . . : NAME
Policy name  . . . . . . . . . . . . . : TST.DBDTYPE.HDAM

MA    B                    A                         07/057
```

You can drill down further to see just which policy exceptions were triggered

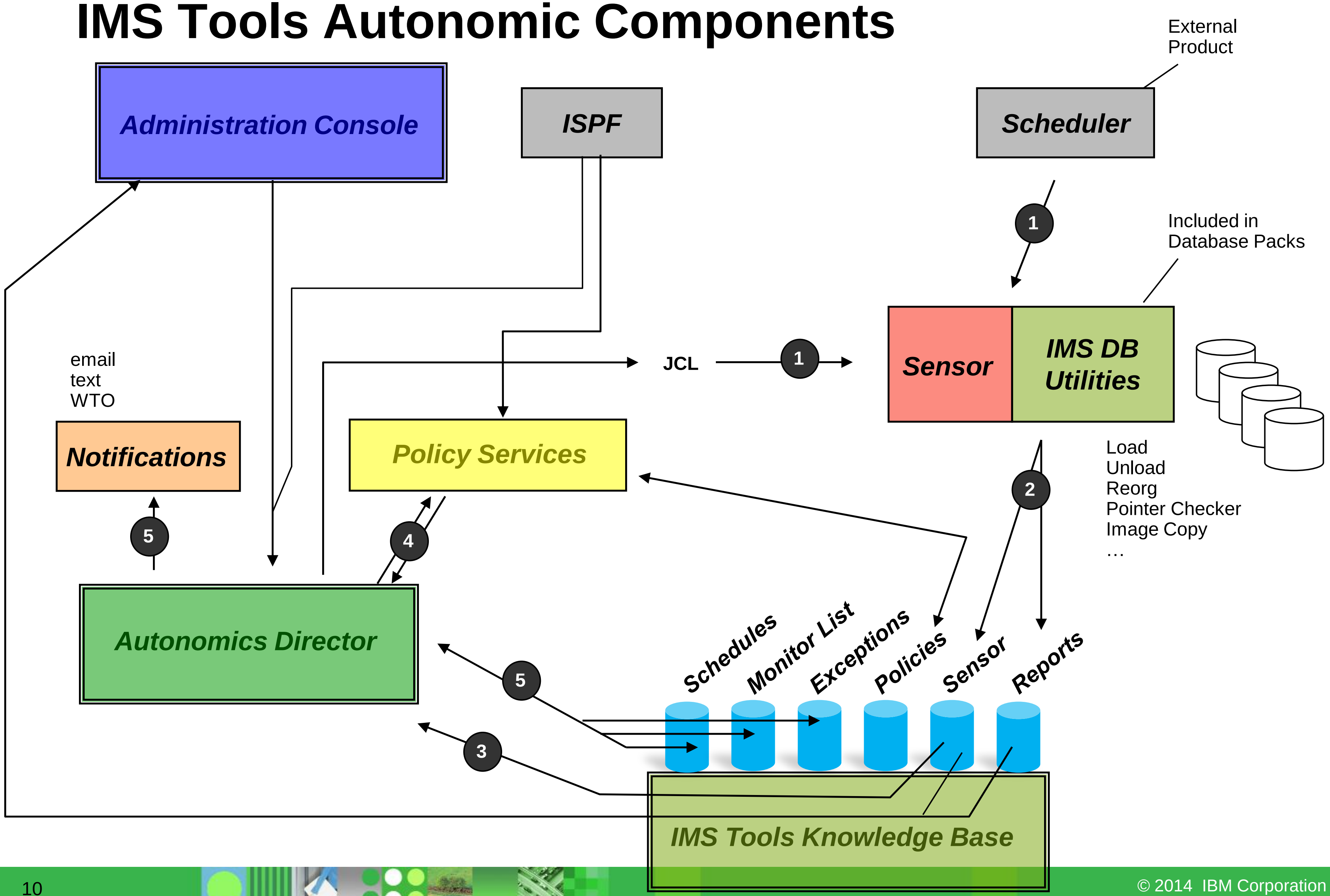
# View the detailed exceptions via ISPF Browse

- Complete transparency so you can see exactly why a reorganization is being recommended, we’ll even send you an e-mail or text message to notify you



```
 ISRBROBA   USRT013.EC03253.IMSAD.CMDOUT1                          Line 00000000 Col 001 133
 Command ===> _                                                          Scroll ===> PAGE
*********************************************************** Top of Data ****************************************************
Autonomics director 1.3.0          Database Diagnosis Report
5655-V93                                        May 15,'12      04:00:05

Summary of Database Definition
------------------------------
Database.......................... DEVICEDB
Partition/Area....................
Data Set Organization............. HDAM
Database Type..................... VSAM

Summary of Policy Evaluation
------------------------------
Name of Policy Applied............ TST.DBDTYPE.HDAM
Policy Locale..................... RECON ID: $IVP
Reorganization Need............... Y

Summary Message:
------------------------------------------------------------------------------------------------------------------------------


Exceptions
------------------------------------------------------------------------------------------------------------------------------
Imbalanced randomizing and inefficient use of RAPs have increased in DEVICEDB
   Class: IMBALANCED_RANDOMIZING           Level: SEVERE
   Rule: G:IBM.RANDOMIZING.10      Threshold Set: MED
                                          Action: MESSAGE

The number of synonyms in randomizing has increased in DEVICEDB
   Class: EXCESSIVE_RAP_SYNONYMS           Level: CRITICAL
   Rule: G:IBM.RAP_SYNONYMS.10     Threshold Set: HIGH
                                          Action: MESSAGE

The number of roots not in their home blocks in DEVICEDB has increased
   Class: EXCESSIVE_HDAM_ROOTS_NOT_HOME    Level: SEVERE
   Rule: G:IBM.ROOTS_NOTHOME.10    Threshold Set: MED
                                          Action: MESSAGE

The size of a data set in DEVICEDB, which still has a certain amount of free space, has increased
   Class: GROWING_DBDS_WITH_FREE_SPACES    Level: CRITICAL
   Rule: G:IBM.DBDS_GROWTH.20      Threshold Set: TSTHIGH
                                          Action: REORG

********************************************************** Bottom of Data **************************************************
```

# IMS Tools Autonomic Components


External
Product
Administration Console
ISPF
Scheduler
1
Included in
Database Packs
email
text
WTO
JCL
1
Sensor
IMS DB
Utilities
Notifications
Policy Services
Load
Unload
Reorg
Pointer Checker
Image Copy
…
2
5
4
Autonomics Director
Schedules
Monitor List
Exceptions
Policies
Sensor
Reports
5
3
IMS Tools Knowledge Base

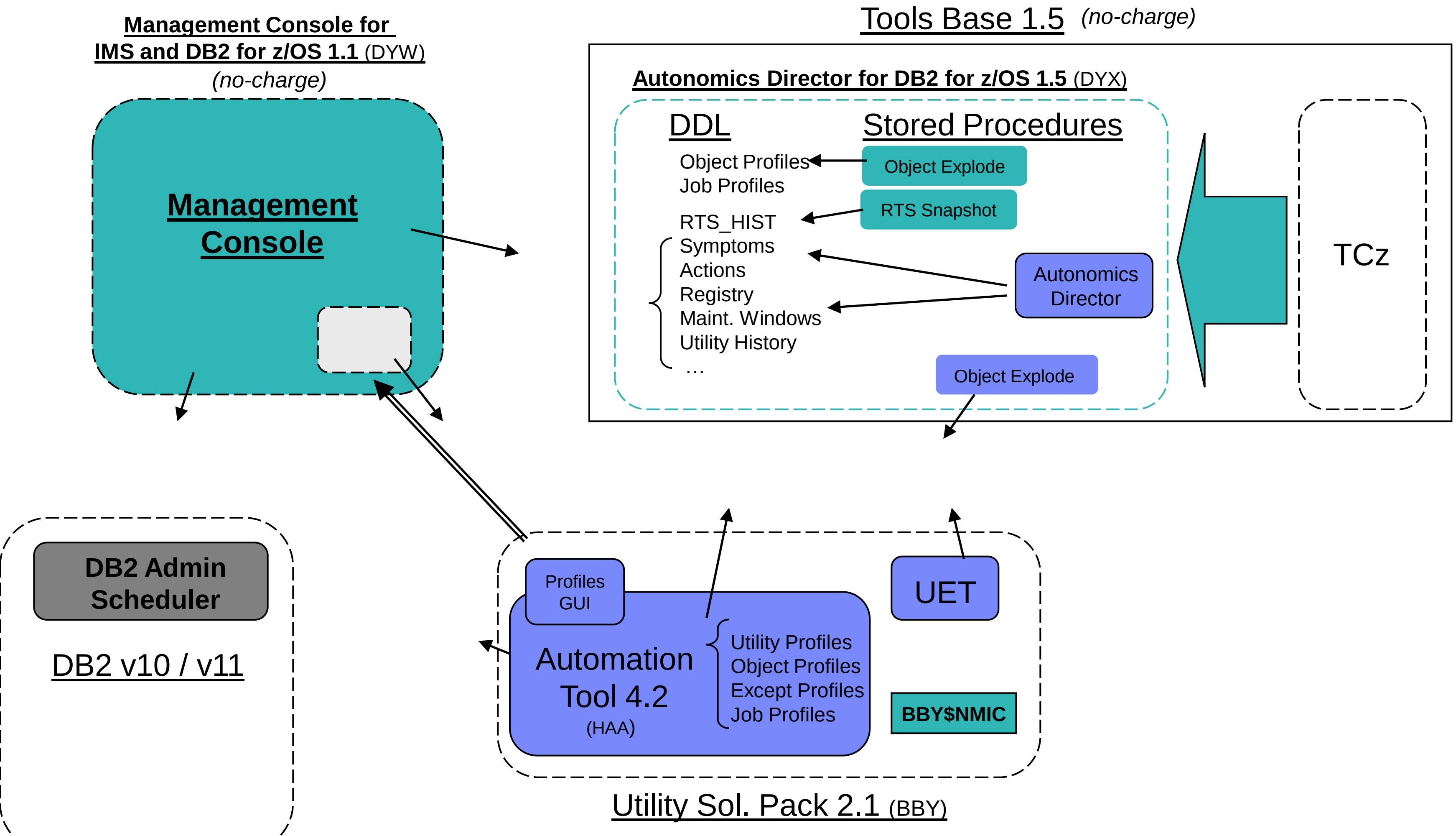
# Library Integrity Utilities

- What is it
- How and when is it useful

# DB2 Utility Autonomics

- Autonomics Director for DB2
- Differences in how Autonomics works between IMS and DB2 and how that impacts the future
- Demo

# DB2 Utility Autonomics Products



**Management Console for IMS and DB2 for z/OS 1.1** (DYW)
*(no-charge)*

**Management Console**

Tools Base 1.5 *(no-charge)*

**Autonomics Director for DB2 for z/OS 1.5** (DYX)

DDL
- Object Profiles
- Job Profiles
- RTS_HIST
- Symptoms
- Actions
- Registry
- Maint. Windows
- Utility History
- …

Stored Procedures
- Object Explode
- RTS Snapshot

Autonomics Director

Object Explode

TCz

**DB2 Admin Scheduler**

DB2 v10 / v11

Profiles GUI

Automation Tool 4.2 (HAA)
- Utility Profiles
- Object Profiles
- Except Profiles
- Job Profiles

UET

**BBY$NMIC**

Utility Sol. Pack 2.1 (BBY)

# Autonomics Director Install and Customization

## TCz Customization Steps

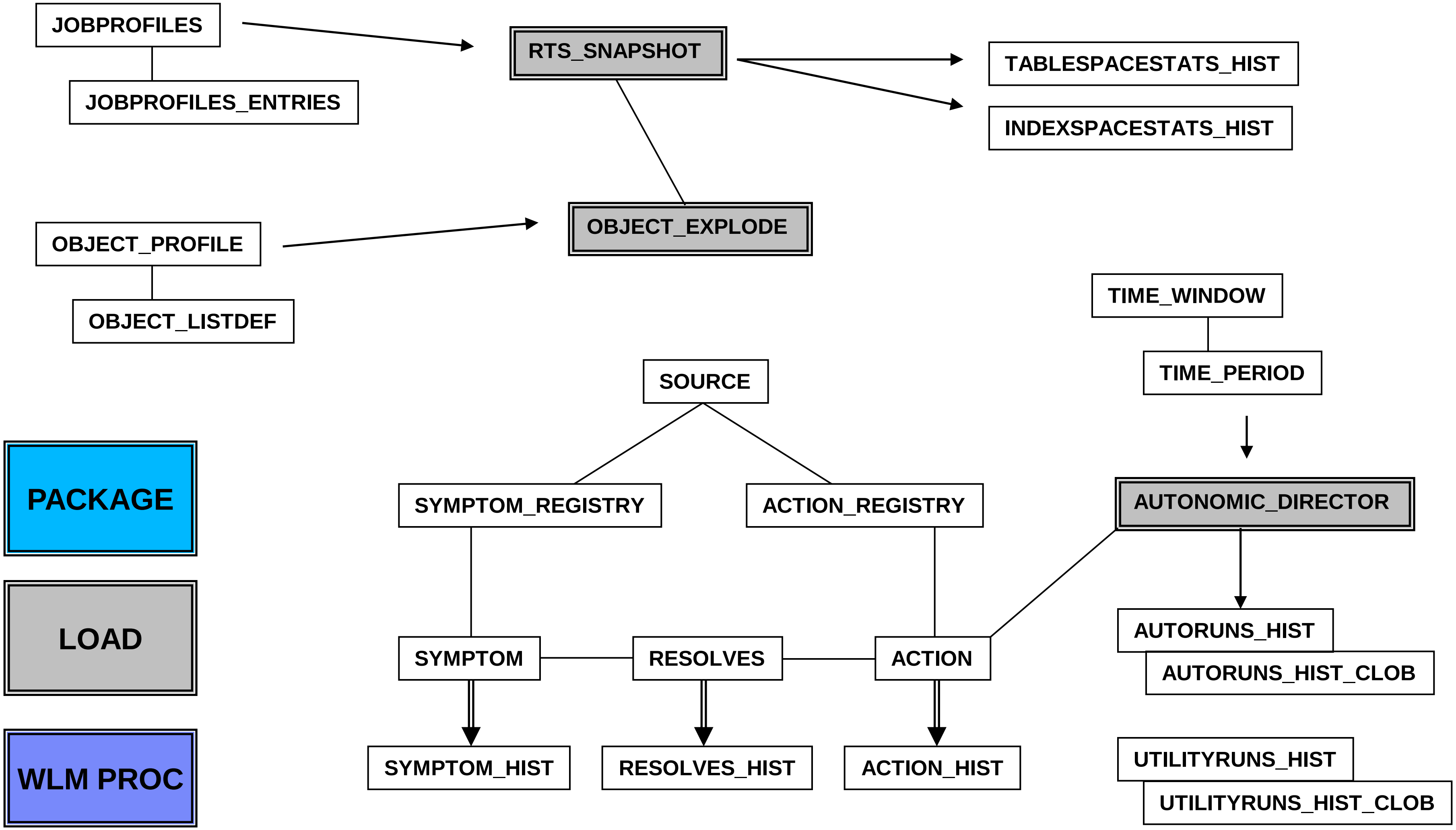
| Parameter Name | Parameter Description |
|---|---|
| DB2 Autonomics HLQ | HLQ where downloaded TERSED files are located |
| TASK - Create or Drop DB2 Autonomics tables | |
| Drop DB2 Autonomics tables | Select this step if you have previous DYX tables and stored procedures you want to clean up. If you run this job without having those tables, you will get a return code 08 |
| Create DB2 Autonomics tables | Pre-selected step. This will generate the job to create the tables and stored procedures |
| TASK - Bind and free packages and plans | |
| Free packages and plans | Select this step only if you have previously ran the bind job for DYX or you will get a return code 08 |
| Bind packages and plans | Pre-selected step. This will generate the job to bind the packages and plans |
| TASK - Grant EXECUTE privilege | |
| Grant EXECUTE privilege on the plans | Pre-selected step. This will generate the job to grant privilege on the plans |
| TASK - Set up WLM Enviroment for DB2 Autonomics Director | |
| Define DB2 Autonomics Director WLM address space | Pre-selected step. This will generate the job to create the WLM proc. It will copy the Proc into the proclib you specify for the Started Task PROCLIB parameter. |
| Started Task PROCLIB | Required parameter. This value is the proclib where you want to store the WLM Proc. E.g. USER.PRIVATE.PROCLIB |
| FEC common code HLQ | Required parameter. This value is the HLQ of the FEC load library. |

# Autonomics Director Install and Customization

- Autonomics Director TCz Parameter Values
  - DB2 Version
  - Library Locations
  - Autonomic Plan Names
  - Autonomic BIND Owners
  - Autonomic Stored Procedures access
  - Autonomic Stored Procedures WLM proc
  - Autonomic Tables CREATOR ID
  - Autonomic Tables Database Name
  - Autonomic Tables Schema
  - Autonomic Tables Storage Group
  - Autonomic Tables Index Storage Group
  - Autonomic Tables Buffer Group

***Fixed at SYSAUTO***

# Autonomics Director for DB2 for z/OS Tables/SP



JOBPROFILES

JOBPROFILES_ENTRIES

RTS_SNAPSHOT

TABLESPACESTATS_HIST

INDEXSPACESTATS_HIST

OBJECT_PROFILE

OBJECT_LISTDEF

OBJECT_EXPLODE

TIME_WINDOW

TIME_PERIOD

SOURCE

SYMPTOM_REGISTRY

ACTION_REGISTRY

AUTONOMIC_DIRECTOR

SYMPTOM

RESOLVES

ACTION

AUTORUNS_HIST

AUTORUNS_HIST_CLOB

SYMPTOM_HIST

RESOLVES_HIST

ACTION_HIST

UTILITYRUNS_HIST

UTILITYRUNS_HIST_CLOB

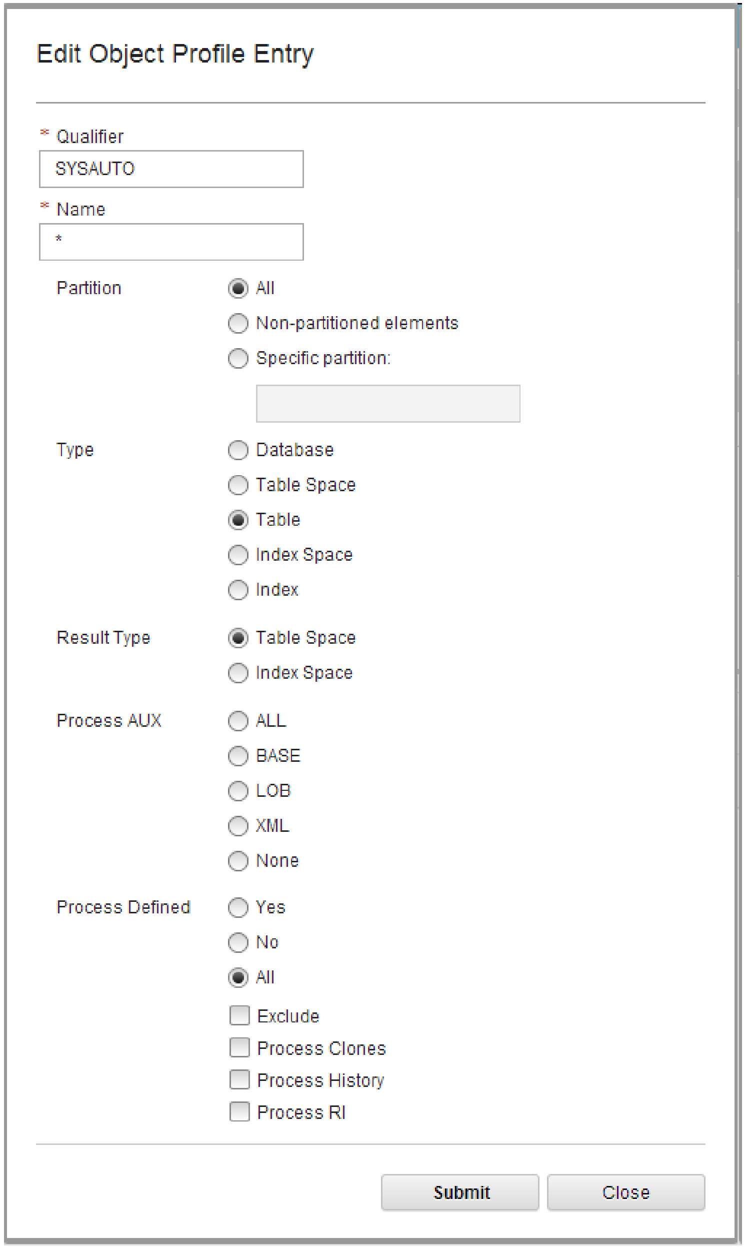
PACKAGE

LOAD

WLM PROC

# LISTDEF Object Profile

- Basic ruleset for defining a collection of DB2 Objects
  - Based entirely on the syntax of DB2 Utilities LISTDEF
  - Works alongside Automation Tool Object Profiles
    - But not as comprehensive
    - Goal is to be interchangable moving forward
  - Provides a means to define Object Profiles inside the Tools Base



Edit Object Profile Entry

* Qualifier: SYSAUTO

* Name: *

Partition
● All
○ Non-partitioned elements
○ Specific partition:

Type
○ Database
○ Table Space
● Table
○ Index Space
○ Index

Result Type
● Table Space
○ Index Space

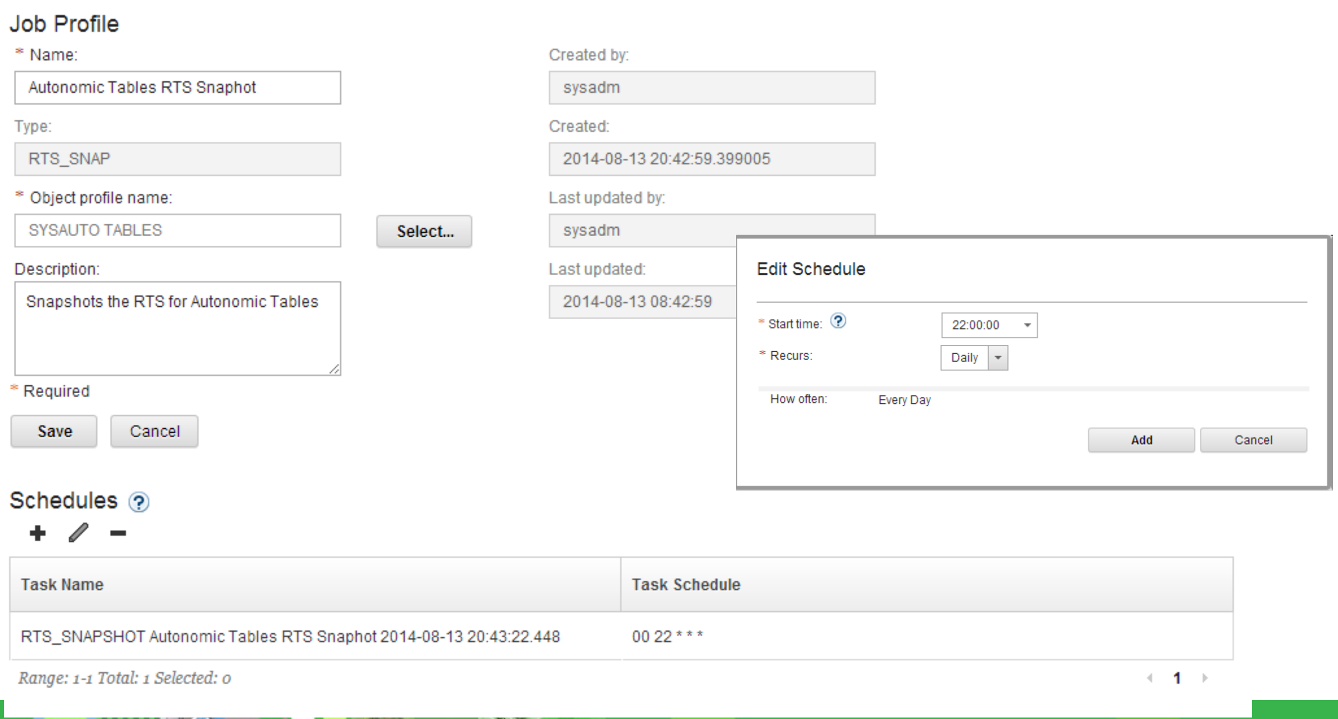
Process AUX
○ ALL
○ BASE
○ LOB
○ XML
○ None

Process Defined
○ Yes
○ No
● All

☐ Exclude
☐ Process Clones
☐ Process History
☐ Process RI

# RTS Snapshot Job Profile

- Job Profile defining a set of DB2 Objects to Snapshot RTS on
  - Includes an Object Profile
    - either LISTDEF or Automation Tool syntax
  - Built in support with DB2 Admin Scheduler for simple setup of recurring runs



Job Profile

* Name: Autonomic Tables RTS Snaphot

Type: RTS_SNAP

* Object profile name: SYSAUTO TABLES

Description: Snapshots the RTS for Autonomic Tables

Created by: sysadm

Created: 2014-08-13 20:42:59.399005

Last updated by: sysadm

Last updated: 2014-08-13 08:42:59

* Required

Edit Schedule

* Start time: 22:00:00

* Recurs: Daily

How often: Every Day

Schedules

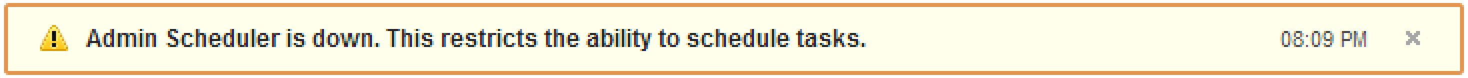
| Task Name | Task Schedule |
|---|---|
| RTS_SNAPSHOT Autonomic Tables RTS Snaphot 2014-08-13 20:43:22.448 | 00 22 * * * |

Range: 1-1 Total: 1 Selected: 0

# DB2 Administrative Task Scheduler

- The DB2 Administrative Task Scheduler has been part of DB2 since V9
  - We leverage the Task Scheduler for simplified driving Evaluations, RTS Snapshots and Active Autonomics Director Maintenance Windows
  - It is entirely optional but strongly encouraged

  - If not setup and installed you will see a message like this:

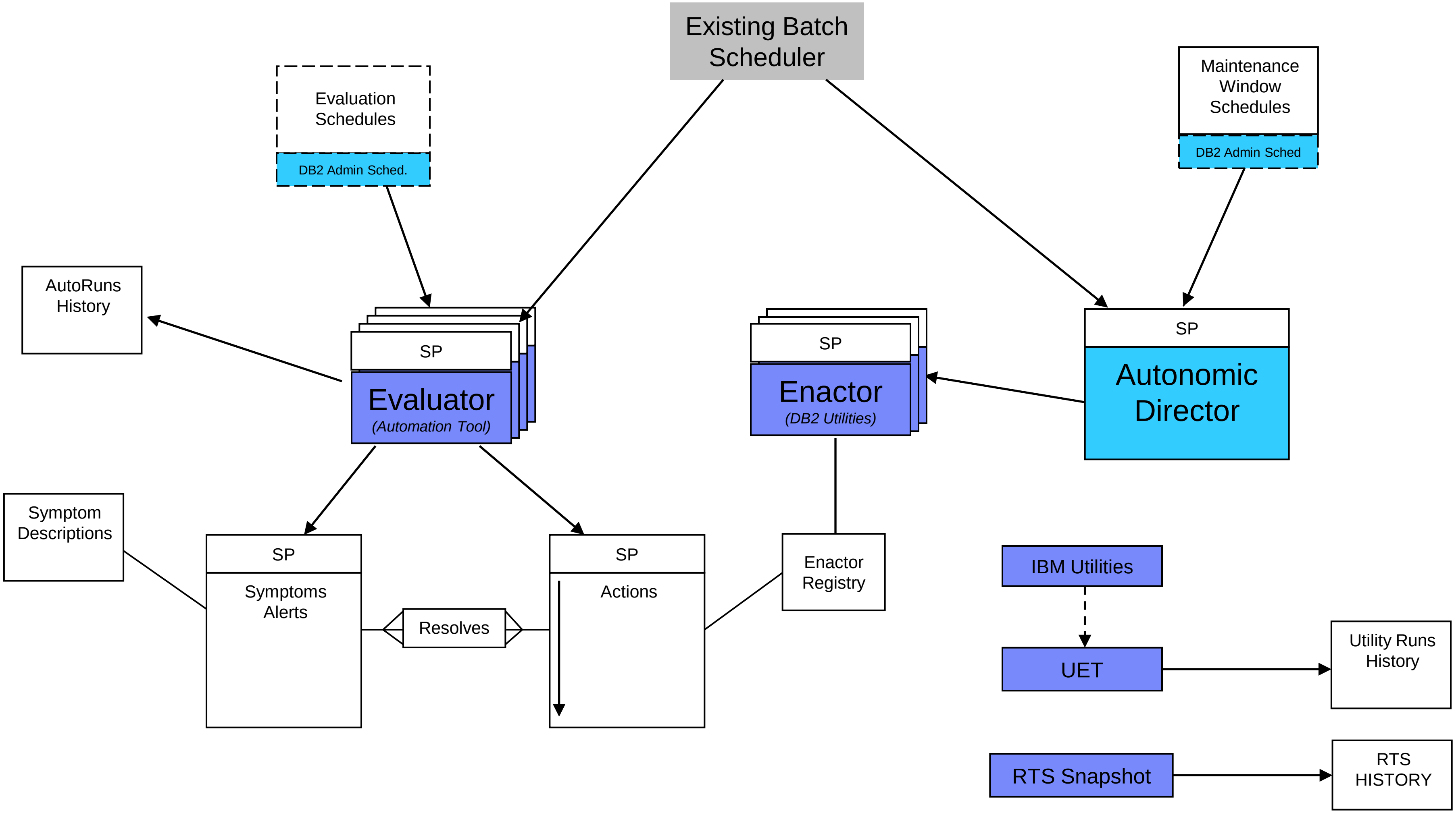


⚠ Admin Scheduler is down. This restricts the ability to schedule tasks. 08:09 PM ✕

# Autonomics Framework

(Passive)

(Active)



Existing Batch Scheduler

Evaluation Schedules

DB2 Admin Sched.

Maintenance Window Schedules

DB2 Admin Sched

AutoRuns History

SP

**Evaluator**

*(Automation Tool)*

SP

**Enactor**

*(DB2 Utilities)*

SP

**Autonomic Director**

Symptom Descriptions

SP

Symptoms Alerts

Resolves

SP

Actions

Enactor Registry

IBM Utilities

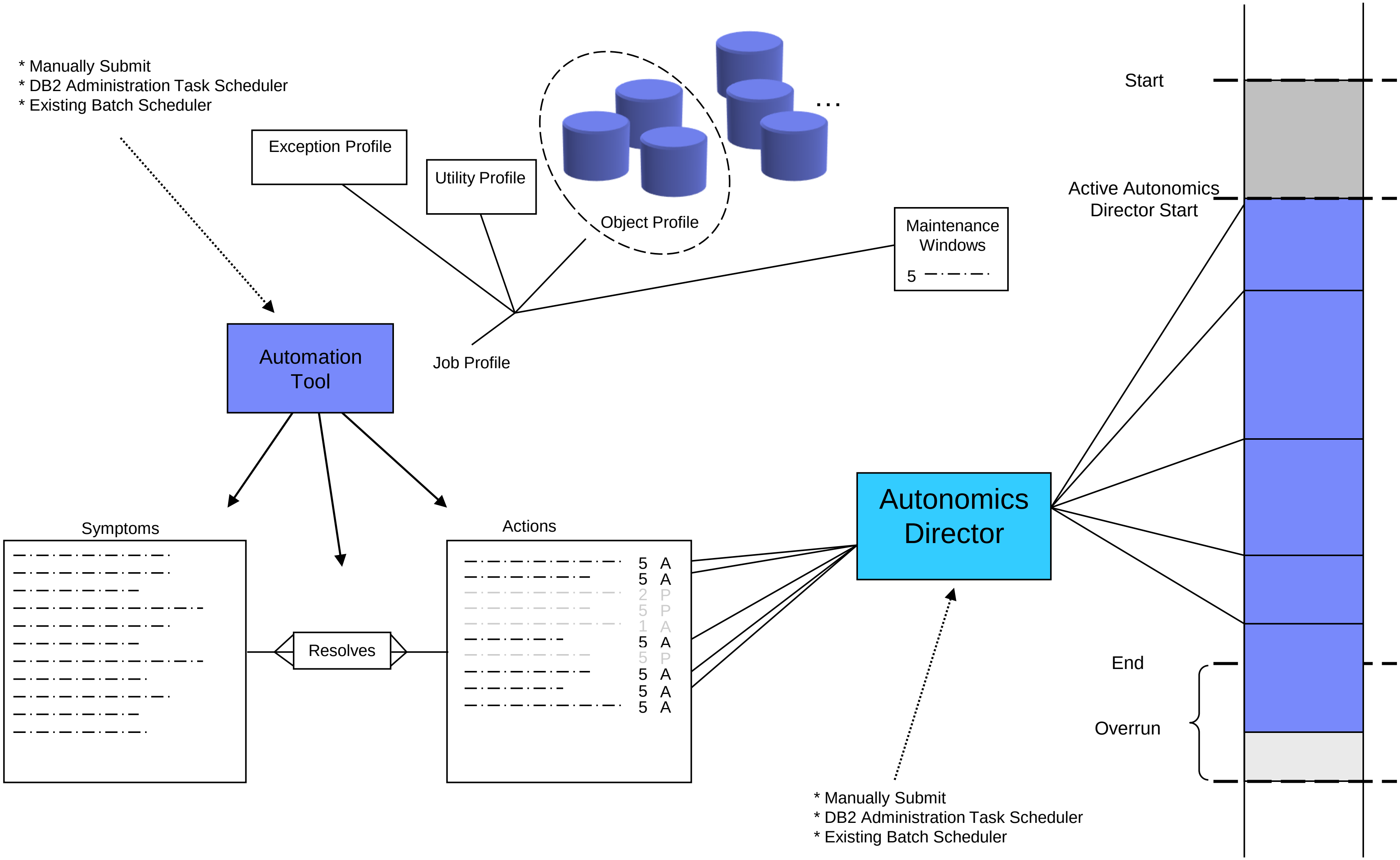
UET

Utility Runs History

RTS Snapshot

RTS HISTORY

# DB2 Utility Autonomics Example



* Manually Submit
* DB2 Administration Task Scheduler
* Existing Batch Scheduler

Exception Profile

Utility Profile

Object Profile

…

Maintenance Windows

5

Job Profile

Automation Tool

Symptoms

Resolves

Actions

5 A
5 A
2 P
5 P
1 A
5 A
5 P
5 A
5 A
5 A

Autonomics Director

Start

Active Autonomics Director Start

End

Overrun

* Manually Submit
* DB2 Administration Task Scheduler
* Existing Batch Scheduler

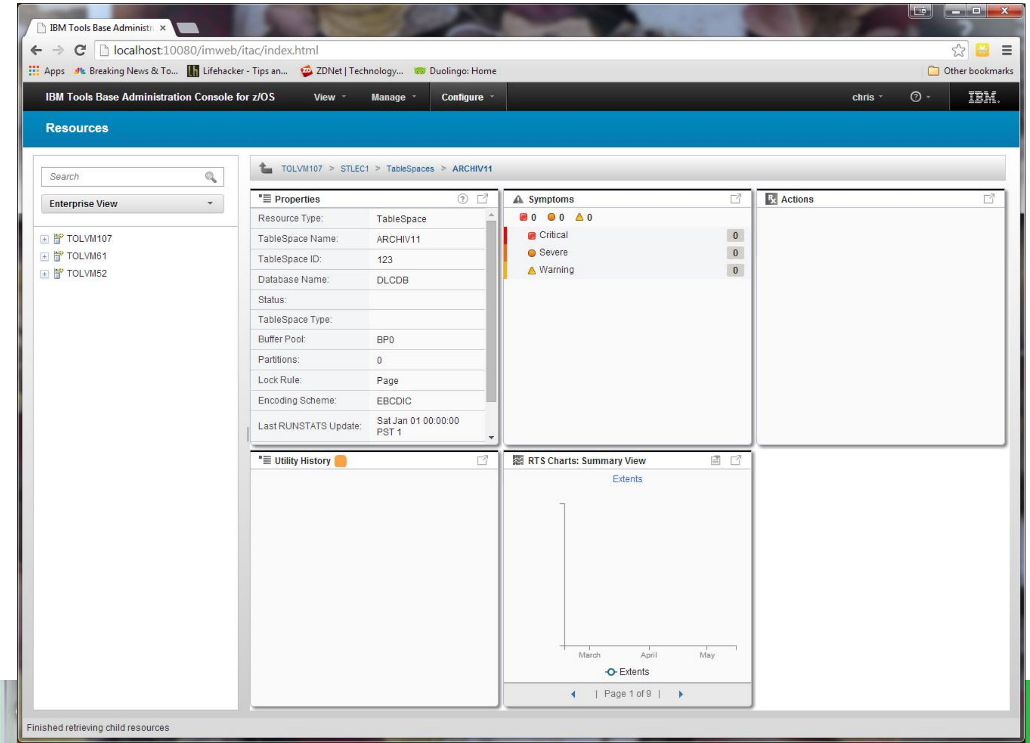
# DB2 Autonomics Deployment

- We recognize the fact that products (and especially Autonomics) require a gentle path into production

- So we propose the following phased approach to rolling out DB2 Autonomics

# Phase 1

- Simply point the Management Console at DB2 systems
- Run Discovery
- Explore DB2 Objects


IBM Tools Base Administr
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Duolingo: Home
Other bookmarks
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
chris
Resources
Search
Enterprise View
TOLVM107
TOLVM61
TOLVM52
TOLVM107 > STLEC1 > TableSpaces > ARCHIV11
Properties
Symptoms
Actions
Utility History
RTS Charts: Summary View
Extents
March
April
May
Extents
Page 1 of 9

| | |
|---|---|
| Resource Type: | TableSpace |
| TableSpace Name: | ARCHIV11 |
| TableSpace ID: | 123 |
| Database Name: | DLCDB |
| Status: | |
| TableSpace Type: | |
| Buffer Pool: | BP0 |
| Partitions: | 0 |
| Lock Rule: | Page |
| Encoding Scheme: | EBCDIC |
| Last RUNSTATS Update: | Sat Jan 01 00:00:00 PST 1 |

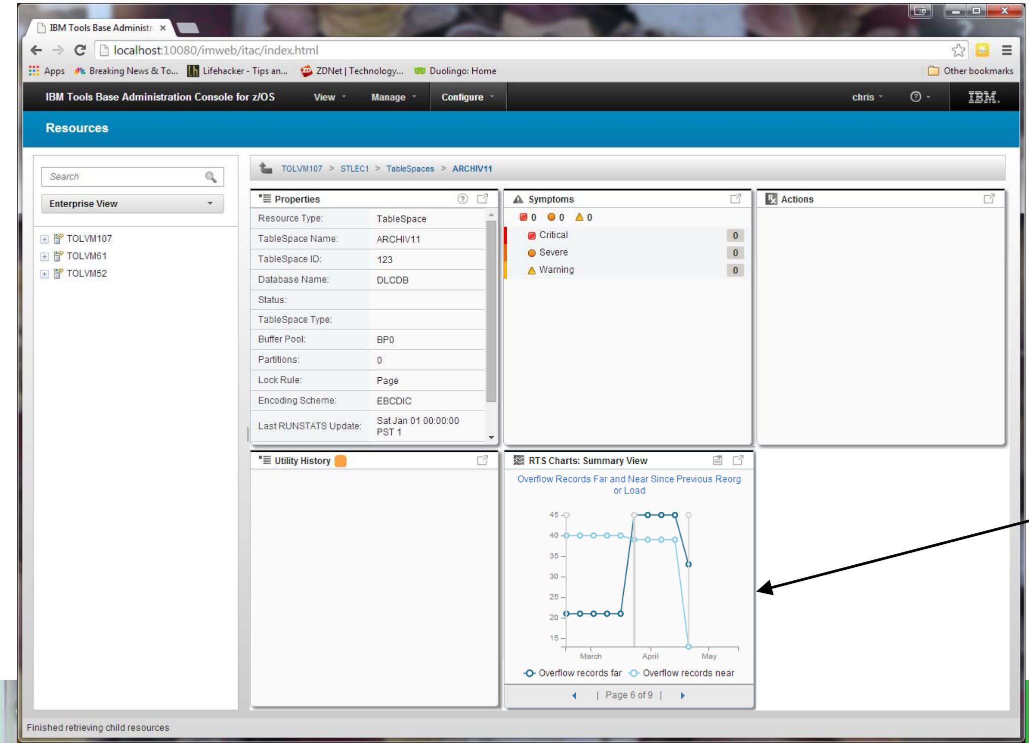
🟥 0 ● 0 ⚠ 0

| | |
|---|---|
| Critical | 0 |
| Severe | 0 |
| Warning | 0 |

Finished retrieving child resources

# Phase 2 (RTS History)

- Install Autonomics User Tables and SPs *(Tools Base)*
- Run RTS_SNAPSHOT SP regularly through DB2 Administrative Task Scheduler (or existing scheduler)


IBM Tools Base Administr
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Duolingo: Home
Other bookmarks
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
chris
IBM.
Resources
Search
Enterprise View
TOLVM107
TOLVM61
TOLVM52
TOLVM107 > STLEC1 > TableSpaces > ARCHIV11
Properties
Symptoms
Actions
Utility History
RTS Charts: Summary View

| | |
|---|---|
| Resource Type: | TableSpace |
| TableSpace Name: | ARCHIV11 |
| TableSpace ID: | 123 |
| Database Name: | DLCDB |
| Status: | |
| TableSpace Type: | |
| Buffer Pool: | BP0 |
| Partitions: | 0 |
| Lock Rule: | Page |
| Encoding Scheme: | EBCDIC |
| Last RUNSTATS Update: | Sat Jan 01 00:00:00 PST 1 |

🟥 0 ● 0 △ 0

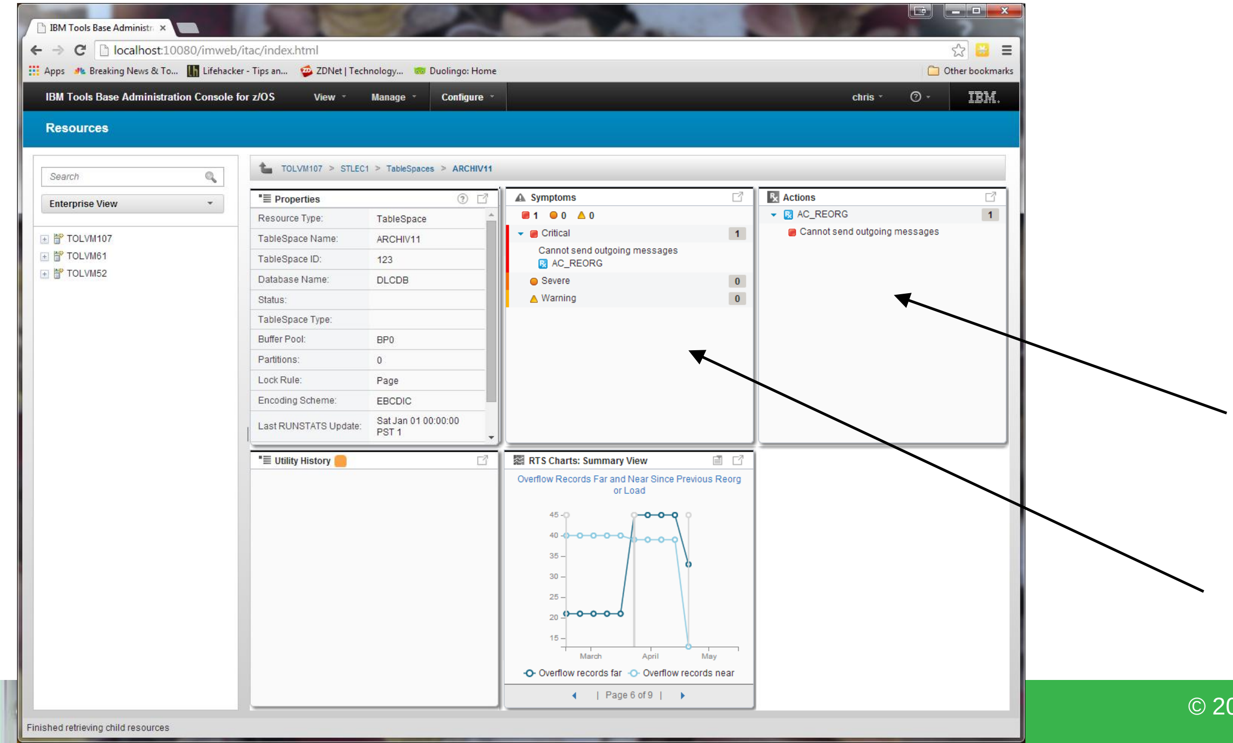
| | |
|---|---|
| 🟥 Critical | 0 |
| ● Severe | 0 |
| △ Warning | 0 |

Overflow Records Far and Near Since Previous Reorg or Load
45
40
35
30
25
20
15
March
April
May
Overflow records far
Overflow records near
| Page 6 of 9 |

Finished retrieving child resources

# Phase 3 (Passive Autonomics)

- Install Automation Tool
- Regularly drive Automation Tool Evaluations through DB2 Administrative Task Scheduler (or existing scheduler)


IBM Tools Base Administr
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Duolingo: Home
Other bookmarks
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
chris
IBM.
Resources
Search
Enterprise View
TOLVM107
TOLVM61
TOLVM52
TOLVM107 > STLEC1 > TableSpaces > ARCHIV11
Properties
Utility History
RTS Charts: Summary View
Overflow Records Far and Near Since Previous Reorg or Load
45
40
35
30
25
20
15
March
April
May
Overflow records far
Overflow records near
Page 6 of 9

| Properties | |
|---|---|
| Resource Type: | TableSpace |
| TableSpace Name: | ARCHIV11 |
| TableSpace ID: | 123 |
| Database Name: | DLCDB |
| Status: | |
| TableSpace Type: | |
| Buffer Pool: | BP0 |
| Partitions: | 0 |
| Lock Rule: | Page |
| Encoding Scheme: | EBCDIC |
| Last RUNSTATS Update: | Sat Jan 01 00:00:00 PST 1 |

**Symptoms**

🟥 1 ● 0 ⚠ 0

| | |
|---|---|
| Critical | 1 |
| Cannot send outgoing messages<br>AC_REORG | |
| Severe | 0 |
| Warning | 0 |

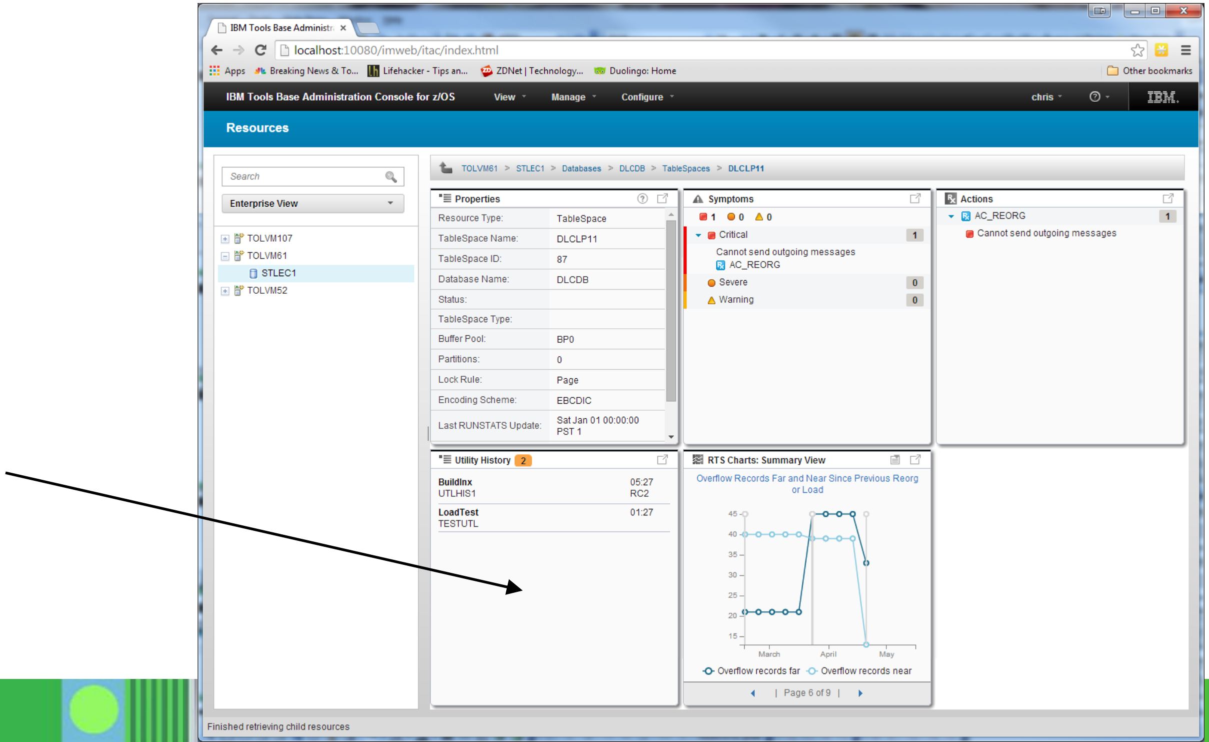
**Actions**

| | |
|---|---|
| AC_REORG | 1 |
| Cannot send outgoing messages | |

Finished retrieving child resources

# Phase 4 (Utility History)

- Install and setup UET
- Allow UET to capture Utility jobs and record to Utility History Table


IBM Tools Base Administr
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Duolingo: Home
Other bookmarks
IBM Tools Base Administration Console for z/OS
View
Manage
Configure
chris
Resources
Search
Enterprise View
TOLVM107
TOLVM61
STLEC1
TOLVM52
TOLVM61 > STLEC1 > Databases > DLCDB > TableSpaces > DLCLP11
Properties
Symptoms
Actions
Utility History 2
RTS Charts: Summary View
45
40
35
30
25
20
15
March
April
May
Overflow records far
Overflow records near
Page 6 of 9

**Properties**

| | |
|---|---|
| Resource Type: | TableSpace |
| TableSpace Name: | DLCLP11 |
| TableSpace ID: | 87 |
| Database Name: | DLCDB |
| Status: | |
| TableSpace Type: | |
| Buffer Pool: | BP0 |
| Partitions: | 0 |
| Lock Rule: | Page |
| Encoding Scheme: | EBCDIC |
| Last RUNSTATS Update: | Sat Jan 01 00:00:00 PST 1 |

**Symptoms**

🟥 1 ● 0 △ 0

Critical 1

Cannot send outgoing messages
AC_REORG

Severe 0

Warning 0

**Actions**

AC_REORG 1

Cannot send outgoing messages

**Utility History** 2

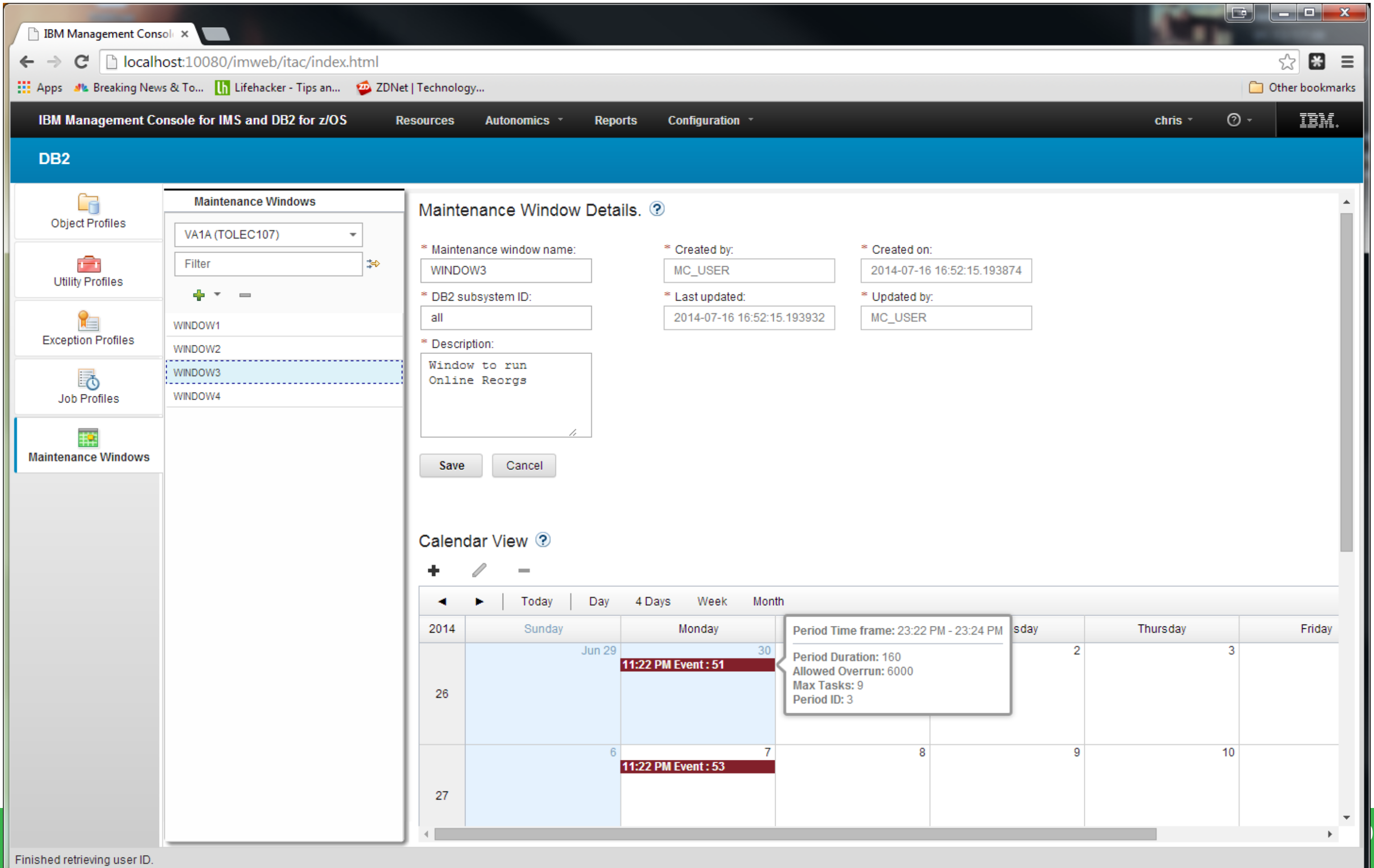
| | |
|---|---|
| **BuildInx**<br>UTLHIS1 | 05:27<br>RC2 |
| **LoadTest**<br>TESTUTL | 01:27 |

Overflow Records Far and Near Since Previous Reorg or Load

Finished retrieving child resources

# Phase 5 (Active Autonomics)

- Define a small Maintenance Window
- Setup Active Autonomics Director to run regularly to drive REORG, IC, Runstats on a small set of objects in that window


IBM Management Consol
localhost:10080/imweb/itac/index.html
Apps
Breaking News & To...
Lifehacker - Tips an...
ZDNet | Technology...
Other bookmarks
IBM Management Console for IMS and DB2 for z/OS
Resources
Autonomics
Reports
Configuration
chris
DB2
Object Profiles
Utility Profiles
Exception Profiles
Job Profiles
Maintenance Windows
Maintenance Windows
VA1A (TOLEC107)
Filter
WINDOW1
WINDOW2
WINDOW3
WINDOW4
Save
Cancel
Today
Day
4 Days
Week
Month

Maintenance Window Details.

* Maintenance window name: WINDOW3
* Created by: MC_USER
* Created on: 2014-07-16 16:52:15.193874
* DB2 subsystem ID: all
* Last updated: 2014-07-16 16:52:15.193932
* Updated by: MC_USER
* Description: Window to run Online Reorgs

Calendar View

| 2014 | Sunday | Monday | | sday | Thursday | Friday |
|---|---|---|---|---|---|---|
| 26 | Jun 29 | 30<br>11:22 PM Event : 51 | | 2 | 3 | |
| 27 | 6 | 7<br>11:22 PM Event : 53 | 8 | 9 | 10 | |

**Period Time frame:** 23:22 PM - 23:24 PM
**Period Duration:** 160
**Allowed Overrun:** 6000
**Max Tasks:** 9
**Period ID:** 3

Finished retrieving user ID.

*The future runs on System z*

# Futures… Roundtable

## IBM Management Console Workshop

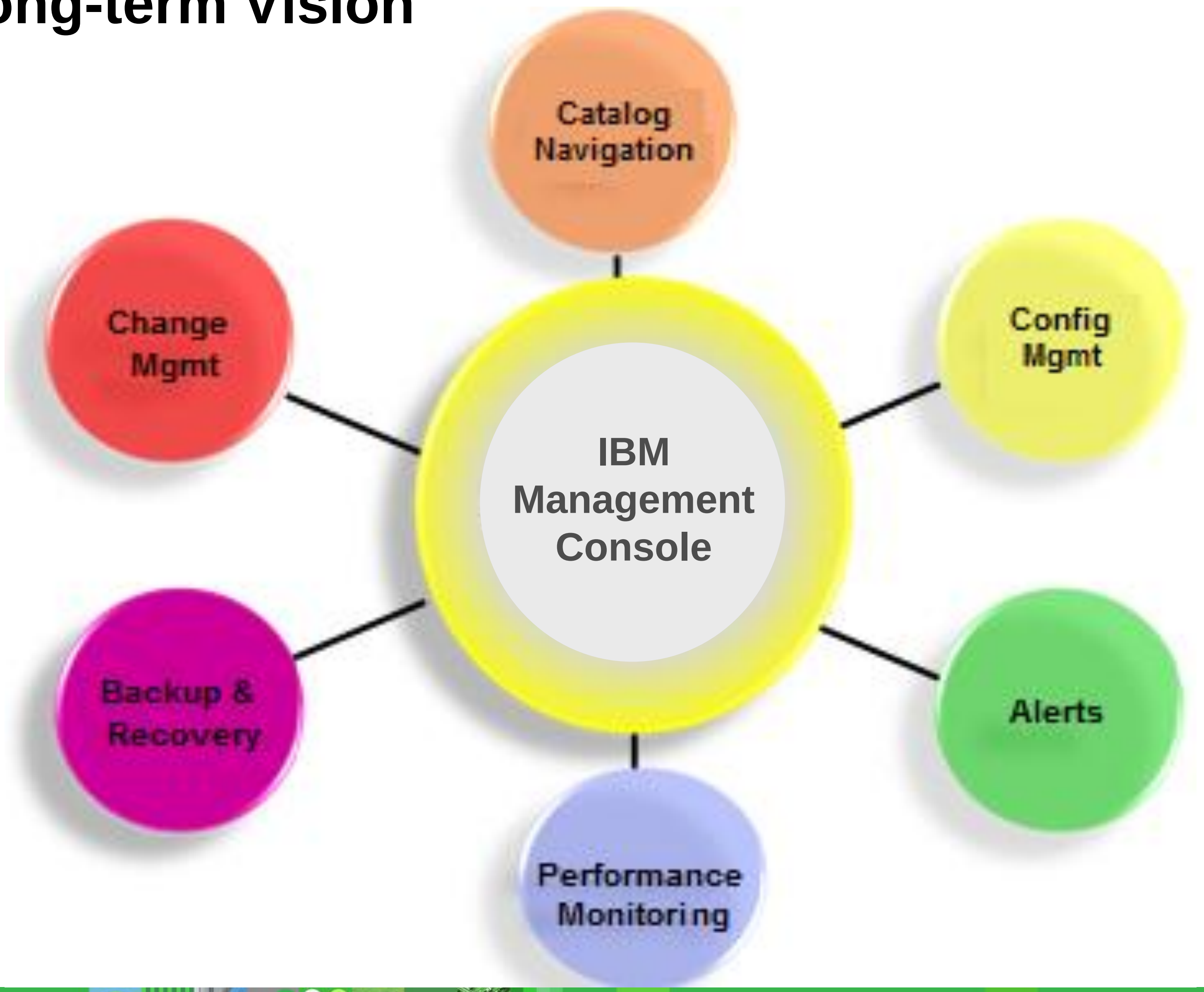
**Christopher Holtz**
**IMS and DB2 Modernization Architect**

© 2014 IBM Corporation. IBM Confidential

# Futures

- Questions
- Comments
- Future Direction

# Long-term Vision



IBM Management Console

Catalog Navigation

Config Mgmt

Alerts

Performance Monitoring

Backup & Recovery

Change Mgmt