Expand your IMS worldview with the **IMS Enterprise Suite**

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100K IMS

IMS 13 celebrating 45 years

Agenda

V13 Integration Enhancements

- Concurrent Application Threads Enhancement
- IMS SQL Support + DRDA DDM Support
- **IMS Enterprise Suite 3.1**
  - IBM IMS Data Provider for Microsoft .NET
  - SOAP Gateway Updates
  - Connect API for Java V2.2 Updates
  - Explorer for Development Updates
  - Java Message Service (JMS) API
    - IMS 13 synchronous program switch support
- IMS Explorer for Administration
  - Extension to the IBM Tools Base v1.4 Administration Console component

How to find Enterprise Suite 3.1

ibm.com/ims → IMS Enterprise Suite

The IMS™ Enterprise Suite is a set of components that support open integration technologies to enable new application development and extend access to IMS transactions and data. The IMS Enterprise Suite provides user-friendly standard interfaces, simplifies IMS metadata generation, and enables IMS business event data and monitoring. The IMS Enterprise Suite simplifies and expands IMS development (including Java™ and XML), administration, and access. Graphical user interfaces and standards-based programming models are provided through tooling support from the WebSphere® and Rational® product families.

The IMS Enterprise Suite includes components that are available for both z/OS® and distributed platforms, and is a no-cost product for unlimited installs. The IMS Enterprise Suite components are designed to complement IMS 13, IMS 12 and IMS 11.

IMS Enterprise Suite Components

IMS Enterprise Suite Data Provider for Microsoft .NET enables you to use standard SQL queries to access IMS data from .NET applications. It delivers high-performing, secure access to IMS data and simplifies the development of Microsoft .NET applications (for example, C# and Visual Basic) that access IMS.

Contact IBM

Considering a purchase?

Email IBM

Request a quote

Or call us at: 1-877-426-3774
Priority code: 109HH03W

Resources

→ IMS Enterprise Suite download

→ Release Notes

→ IMS Enterprise Suite information center

Highlights

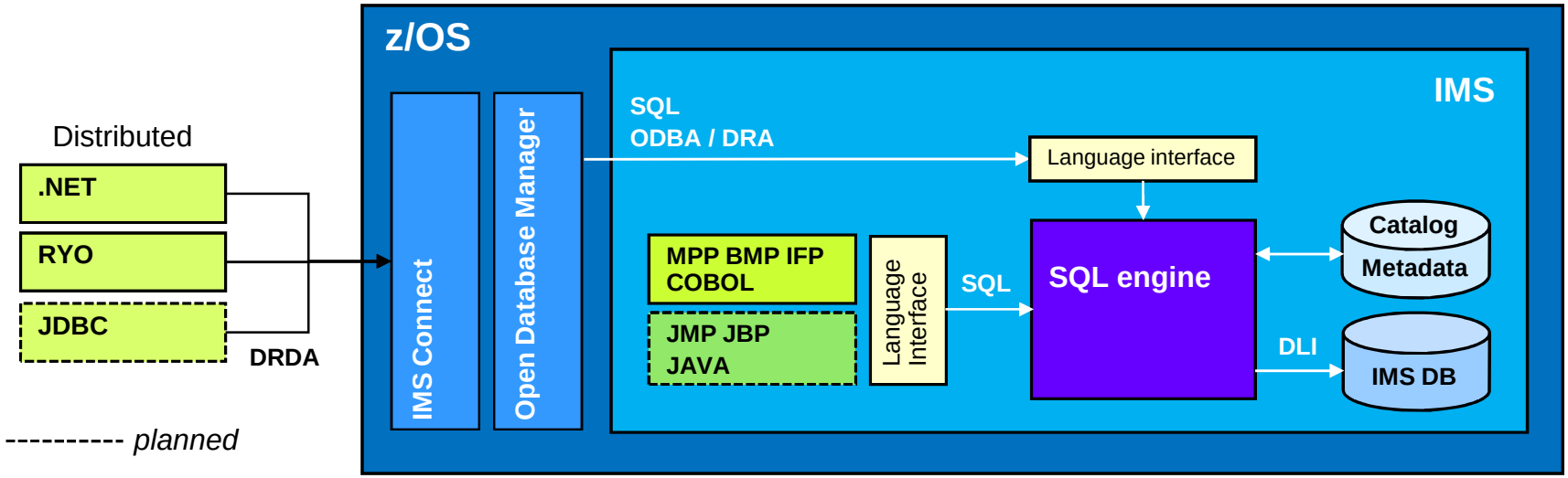
Brochure: IMS Explorer (273KB)

→ IMS Newsletter

→ IBM Redbook: IMS Version 12 Technical

IMS V13 SQL Support

- SQL Engine for COBOL and distributed applications (.NET/JDBC)
- Provides standard SQL keywords to easily access IMS data
  - ✓ SELECT, INSERT, UPDATE, DELETE
  - ✓ Uses Dynamic SQL programming model
  - ✓ Converts SQL statements to DLI calls
  - ✓ Supports a subset of SQL keywords that are currently supported by IMS Universal JDBC driver
- Uses database metadata in IMS Catalog
  - ✓ No need to generate metadata for use in applications



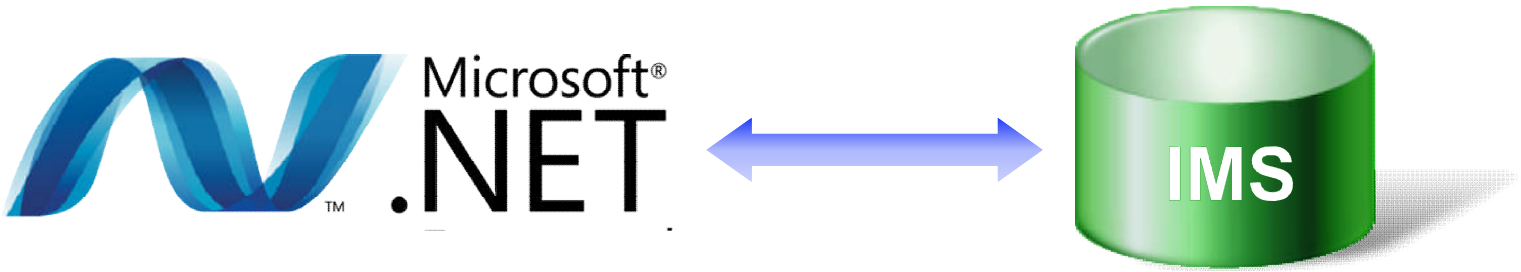
IMS DRDA DDM command support for SQL enhancement

- The DRDA DDM command support for native SQL requires the Open Database Manager (ODBM) component of the IMS Common Service Layer (CSL).
  - ODBM translates the DDM commands into SQL and then routes the SQL calls to the appropriate IMS system.
  - The receiving IMS system's native SQL translates the SQL into DL/I.
- IMS Data Provider for Microsoft .NET uses this support
- IMS Universal Drivers to be updated via service process
  - Enables SQL processing to be handled directly by IMS instead of on the client side
  - Results in increased performance for the IMS Open Database solution.

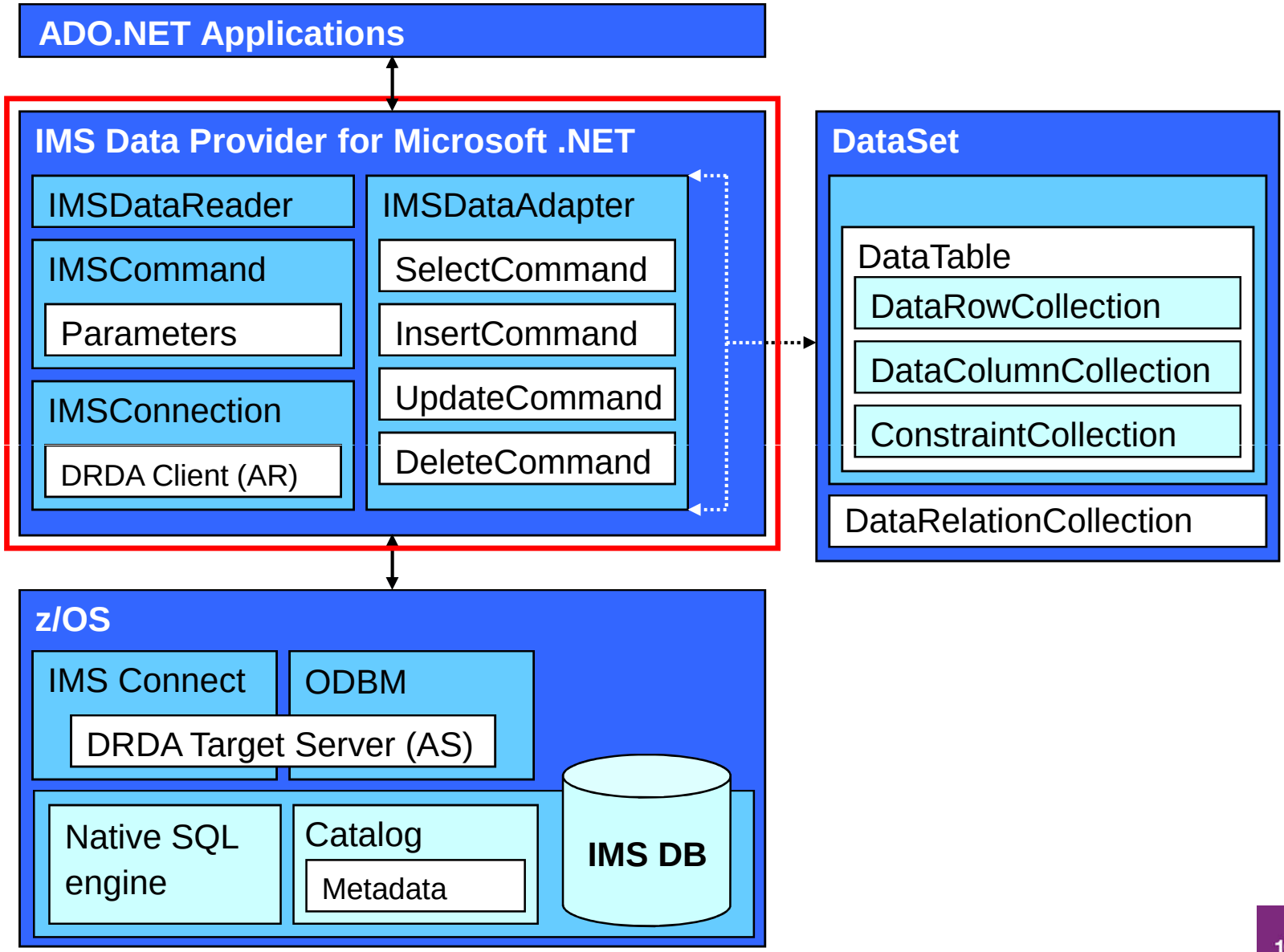
IMS Data Provider for Microsoft .NET

IBM IMS Data Provider for Microsoft .NET

- **IBM IMS Data Provider for Microsoft .NET**
  - a component of IMS Enterprise Suite
- This product enables standard ADO.NET SQL access to IMS data from .NET applications in a simple, fast, well proven way
  - Develop and reuse .NET applications (written in any .NET language, e.g. C#, VB, VC++) to access IMS data
  - Perform CRUD operations via SQL directly against IMS data
  - No need for intermediate steps/tools (such as DB2 stored procedures, web services, or 3rd party products) to access IMS databases from .NET



IMS Data Provider Architecture



C# Application Example (SELECT)

Example.cs

```
using IBM.Data.IMS;

static void IMSReader()
{
        // Use connection string to configure connection properties
        IMSConnection connection = new IMSConnection("Data source = MyIMS,5555;
           Database = Insurance");
        // Establish connection to IMS database
        connection.Open();

        // Specify SQL query in the IMSCommand object
        IMSCommand command = new IMSCommand("SELECT * FROM PCB01.CUSTOMERS",
                    connection);

        // Execute query and return a DataReader object
        IMSDataReader reader = command.ExecuteReader();

        // Iterate through results and output on the screen
        while (reader.Read())
           Console.WriteLine(reader.GetString(0));

        // Close the reader
        reader.Close();

        // Close the connection
        connection.Close();
}
```

C# Application Example (INSERT)

Example.cs

```
using IBM.Data.IMS;

static void IMSWriter()
{
        // Use connection string to configure connection properties
        IMSConnection connection = new IMSConnection("Data source = MyIMS,5555;
           Database=Insurance");
        // Establish connection to IMS database
        connection.Open();

        // Specify SQL command in the IMSCommand object
        IMSCommand command = new IMSCommand("INSERT INTO PCB01.CUSTOMERS (NAME,
      POLICY) VALUES ('EVGENI', 1210050000)", connection);

        // Execute command, return number of affected rows
        int i = command.ExecuteNonQuery();

        // Close the connection
        connection.Close();
}
```

- INSERT, UPDATE and DELETE commands are used identically

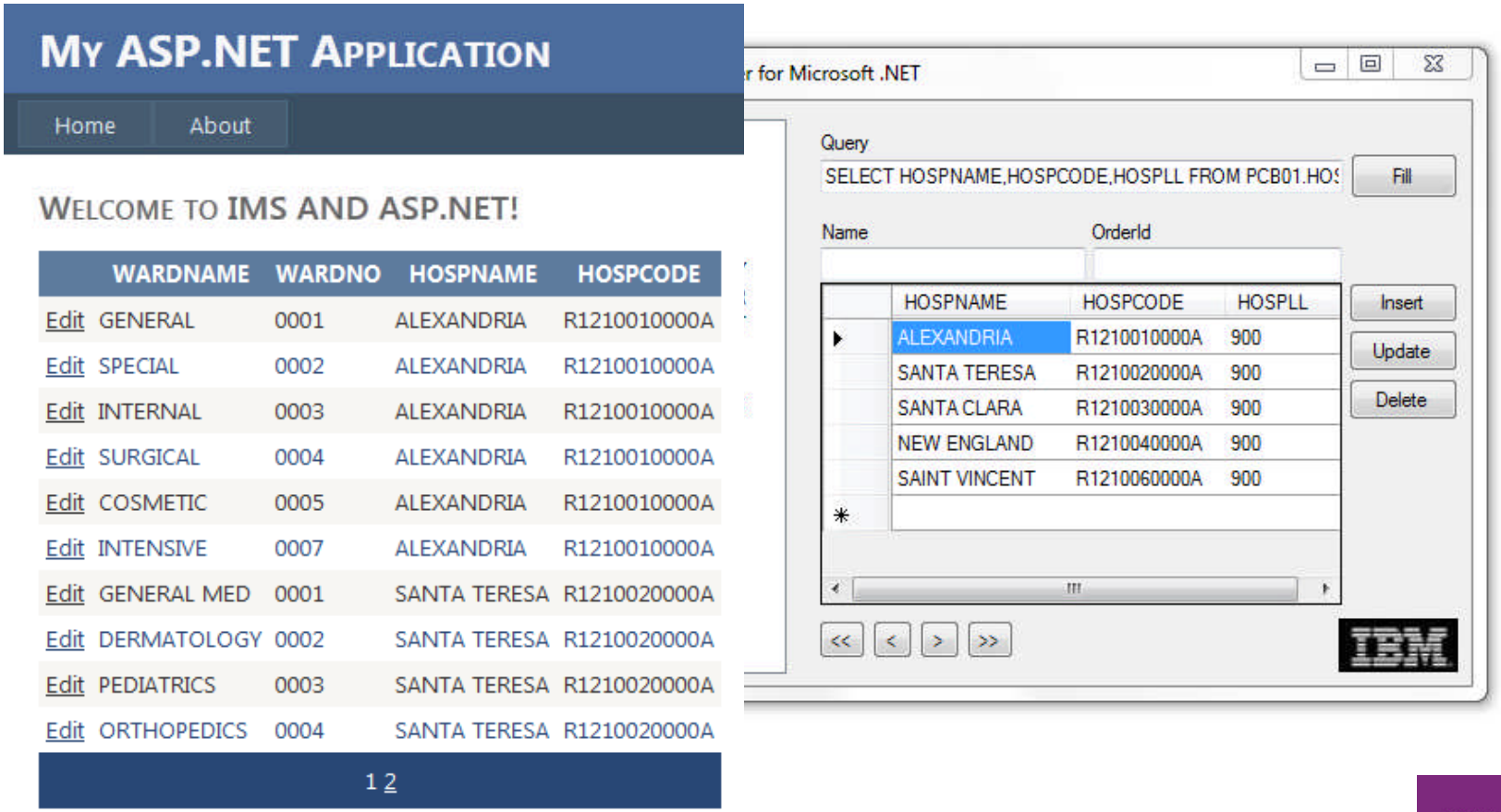
More features

- Dynamic **Parameters**
- **Local Transactions**
- **Connected** and **disconnected** modes
- **Generic coding** (factory based) interface
- **Connection pooling** for improved performance
- Access to **Metadata** (result set or entire database)
- RACF **authentication** and AT-TLS **encryption** supported

IBM IMS Data Provider for Microsoft .NET

GUI / Web Development

- Visual Studio is a powerful environment for developing GUI and web applications
  - Interactive applications that work with IMS data are easy to develop



Getting Started

- Documentation:

  http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/topic/com.ibm.ims.net31.doc/net_intro.htm

  - "Verifying installation" page is a good place to start

- Look for getting_started.txt and a sample project in the installation directory after installing the .NET Data Provider

- Video tutorials and demos on YouTube:

  - http://bit.ly/IMS_YouTube

System Requirements

- Software requirements
  - IMS DB v13, APARs PM96324 and PI05437
    - IMS Connect, ODBM
    - Catalog
  - .NET Framework 4.0
  - Windows XP, Windows 7
- Hardware requirements
  - For IMS DB - same as IMS v13
  - For .NET Data Provider and Visual Studio
    - Computer that has a 1.6GHz or faster processor
    - 1 GB (32 Bit) or 2 GB (64 Bit) RAM (Add 512 MB if running in a virtual machine)
    - 3GB of available hard disk space
- Tooling
  - Microsoft Visual Studio

IMS ES SOAP Gateway

ES 3.1 - SOAP Gateway

- **64-bit support for z/OS**
  - SOAP Gateway now runs on the z/OS platform in 64-bit mode, allowing organizations to take advantage of their 64-bit operating environment for extended memory usage.
- **Send-only with ACK support for synchronous callout**
  - Send-only with acknowledgement protocol support for synchronous callout allows SOAP Gateway to receive a final confirmation that the response message was delivered to the original IMS application that issued the callout request. This confirmation provides SOAP Gateway users additional information about whether a callout response message was sent to IMS and whether IMS received the message.

ES 3.1 - SOAP Gateway

- **SOAP Gateway management utility batch mode support**
  - Administrators can now use the batch mode of the management utility to facilitate web service deployment and server management for better performance and manageability
  - iogmgmt -batch command read file for execution as a batch in one JVM instance.

- **Enhanced security cipher suite support**
  - SOAP Gateway is enhanced to use the FIPS 140-2 approved cryptographic provider(s); IBMJCEFIPS (certificate 376) and/or IBMJSSEFIPS (certificate 409) for cryptography.
  - SOAP Gateway also adds the support for Transport Layer Security (TLS) V1.2 and for cipher suites with key length of 2048 and key strength of 112 bit, as required by NIST SP800-131A.

Transaction tracking

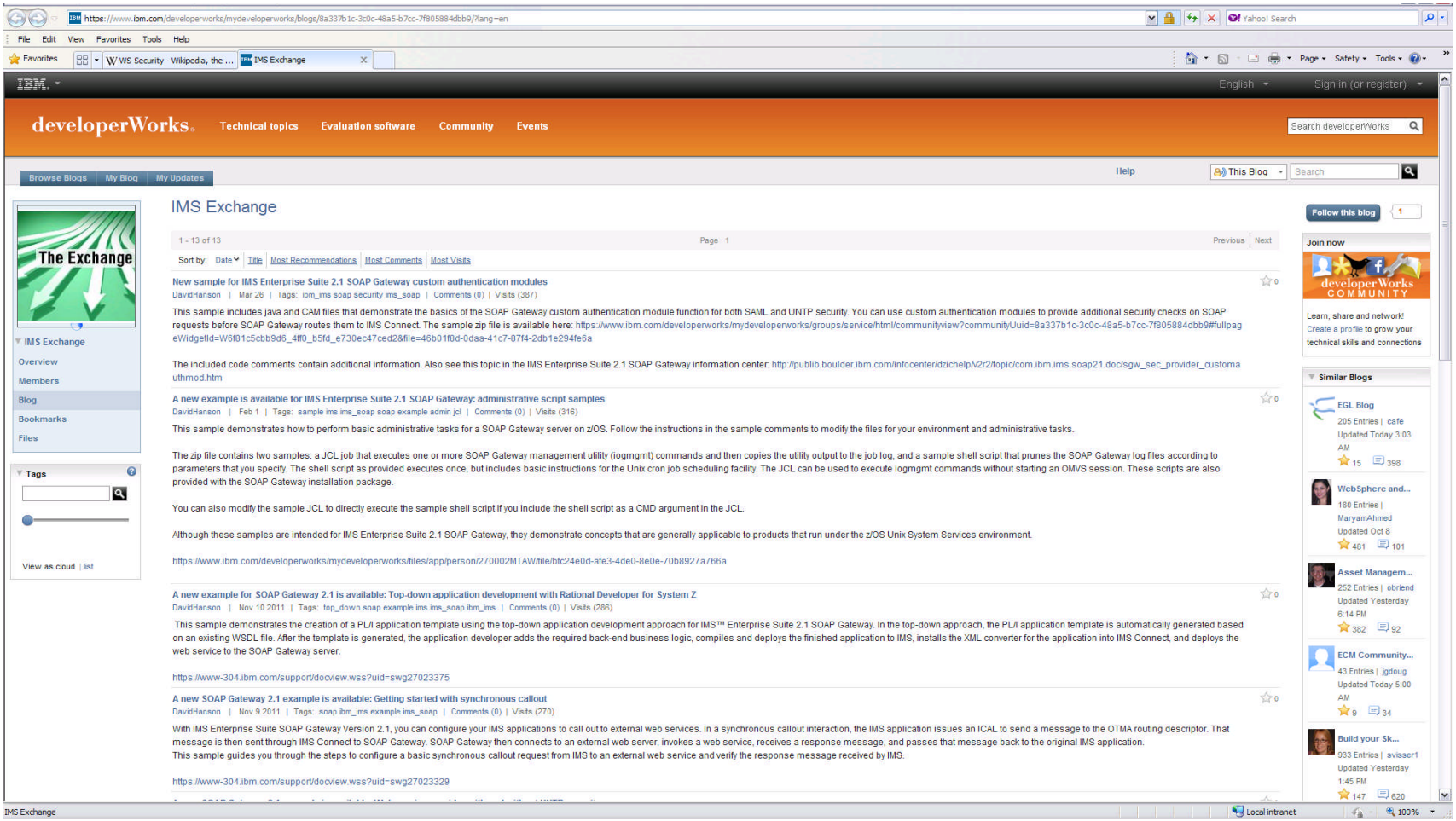
- SOAP Gateway transaction tracking IDs and logging
  - SOAP Gateway can attach 40 byte *horizontal* tracking ID to inbound web service request
    - ID is sent with the inbound request through IMS Connect to the target IMS application and returned with the response message to SOAP Gateway
  - IMS Connect tracking ID captured by the IMS Connect Event Recorder exit routine (HWSTECL0).
    - This information can be consumed by the IBM IMS Connect Extensions for z/OS and equivalent tools.
    - For IMS 12 requires APAR PM69983 applied to IMS Connect
  - IMS log records for transactions include the tracking ID
    - IBM IMS Performance Analyzer for z/OS and IBM IMS Problem Investigator for z/OS, or equivalent tools, to inspect IMS log records.
  - Benefits
    - Correlates transactions between SOAP Gateway, IMS Connect, and IMS
    - Provides information for diagnostic purposes

WS-Security

- WS-Security SAML unsigned tokens for synchronous callout applications
  - Originating Userid (PSTUSID) for the IMS synchronous callout application is passed to the external web service for further authentication and authorization
  - Benefit
    - Provides message-level security for synchronous callout
- WS-Security enhancement for provider web services
  - Support for Security Assertion Markup Language (SAML) 2.0 sender-vouches signed tokens
  - Benefit
    - Provides additional message integrity for service provider processing
    - Extends SOAP Gateway support of WS-Security standards

IMS ES 2.2 SOAP Gateway New Samples

- IMS Exchange web site updated
- Link on IMS Enterprise Suite SOAP Gateway web page



IMS ES Connect API for Java

IMS ES Connect API for Java

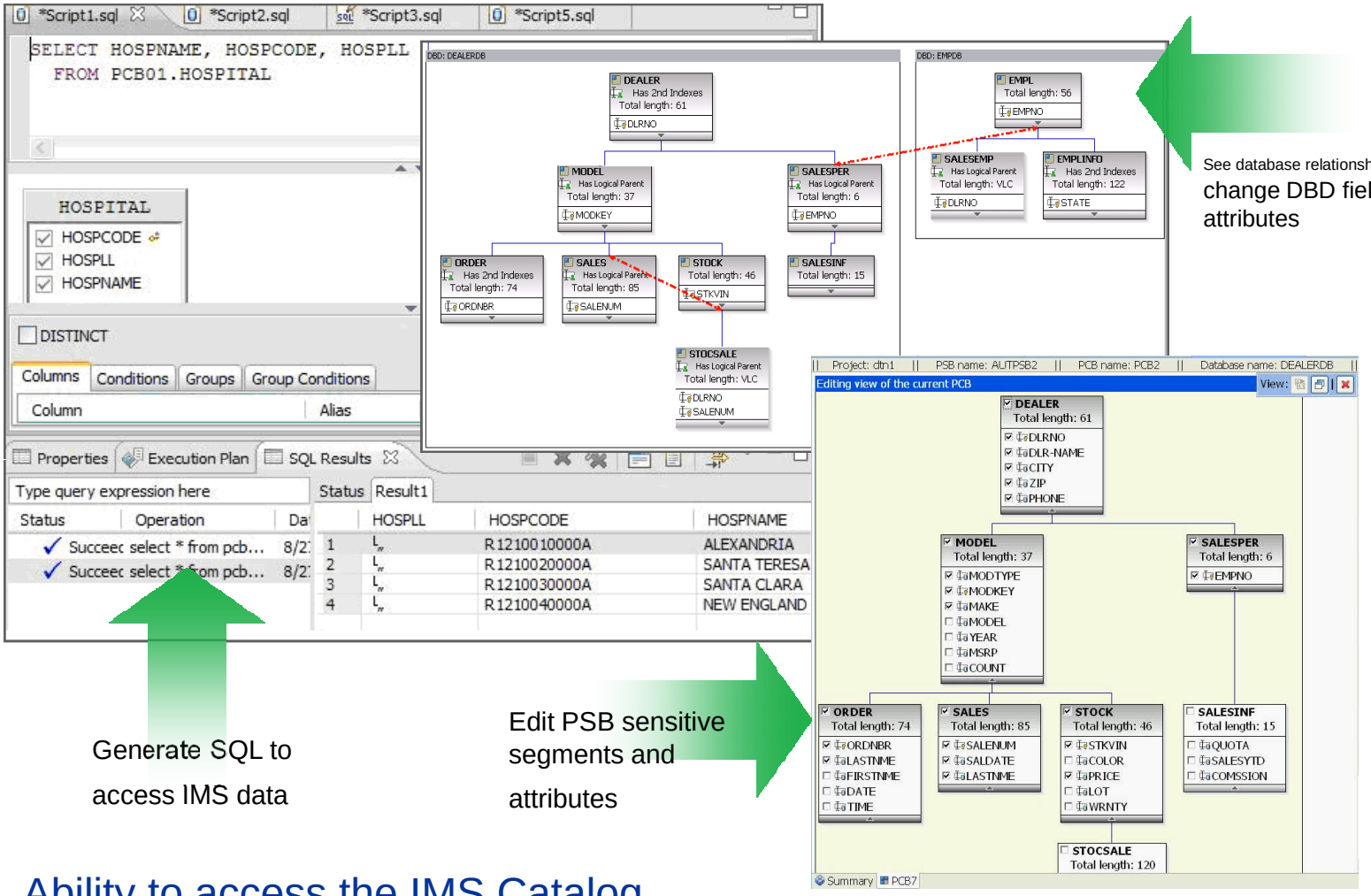
- IMS and IMS Connect type-2 commands
- Performance Enhancements
- Support for SendOnly synchronous callout response messages with acknowledgement
  - Function requires that both the following APAR/PTFs are applied
    - IMS Connect 12: PM39569/UK74666
    - IMS OTMA 12: PM39562/UK74653
- Benefits
  - Custom written IMS Connect TCP/IP Java client applications
    - Can send and receive commands to IMS and IMS Connect
    - Can request and receive an indication of response delivery to IMS for synchronous callout processing

V2.2 Performance data

- For inbound, 16,000 transactions per second using V2R2 which is a 3% improvement over V2R1
- For callout, 11,000 transactions per second using V2R2 which is a 56% improvement over V2R1

IMS ES Explorer for Development

IMS Enterprise Suite V3.1 Explorer for Development



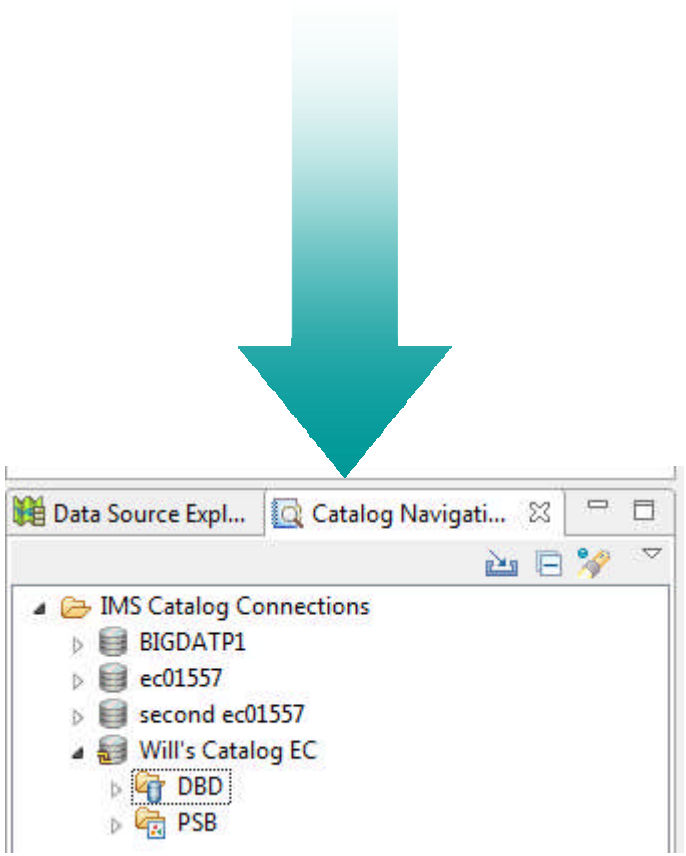
Ability to access the IMS Catalog

IMS Enterprise Suite Explorer for Development

- Enhancements for V3.1 include:
  - Ability to import large numbers of DBDs and PSBs.
  - Automatic imports of referenced DBDs when DBDs and PSBs from the IMS catalog or the host are imported.
  - Ability to import COBOL and PL/I data structures from the host.
  - Support for transaction unit testing.
    - Uses IMS Connect API for Java
    - Can be used in addition to IBM IMS Batch Terminal Simulator
  - Support for IMS catalog navigation.
    - View IMS resources in an IMS catalog-enabled system
    - Import IMS resources into IMS Explorer projects from the view.
    - Show all instances of a given resource or find referenced DBDs or PSBs
  - A Problems View for troubleshooting information
    - Shows resource problems and missing files

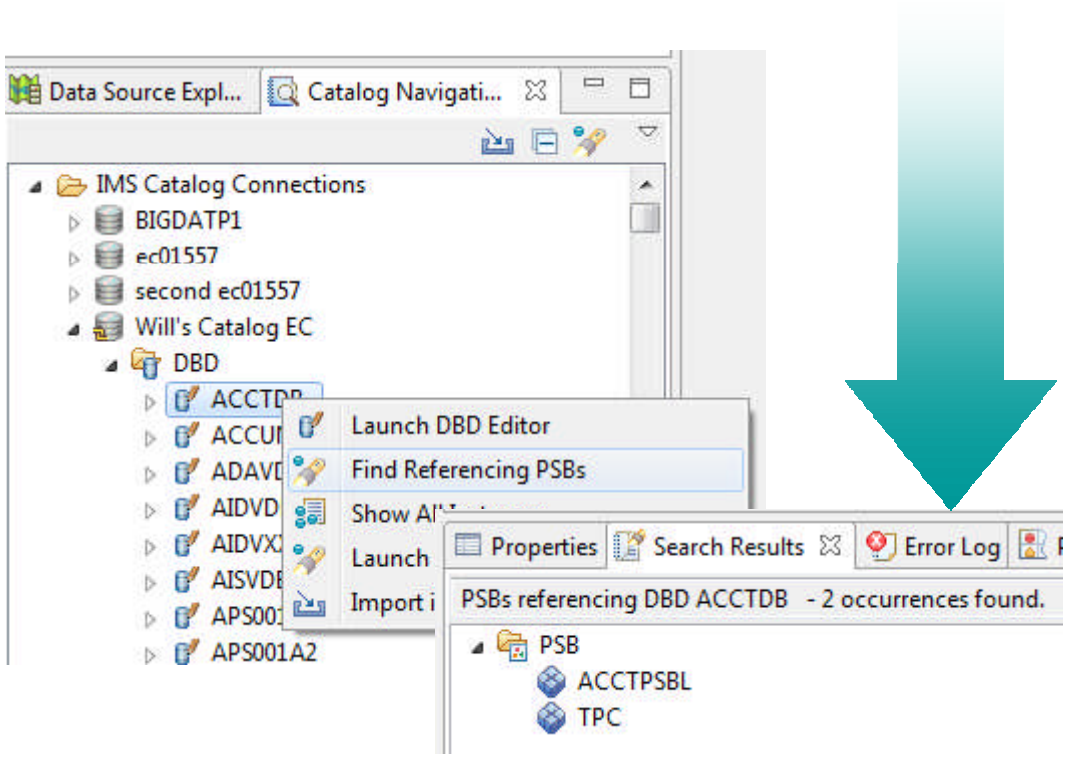
IMS Catalog Navigation View

- Get a list of all the PSBs/DBDs in the system.



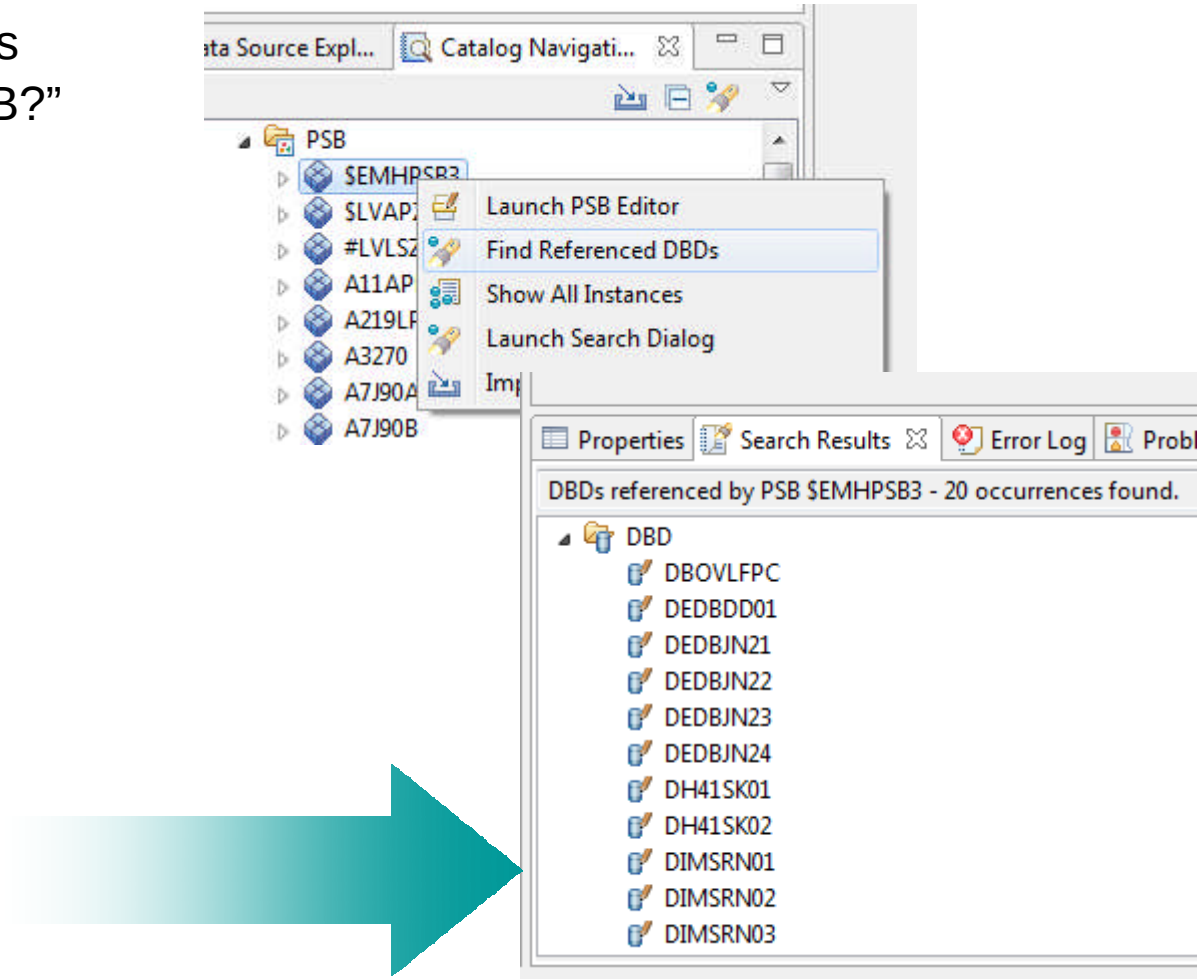
Built-in queries

- Several built-in queries have been added to assist with resource and relationship discovery
  - "What are all the PSBs that reference this DBD?"

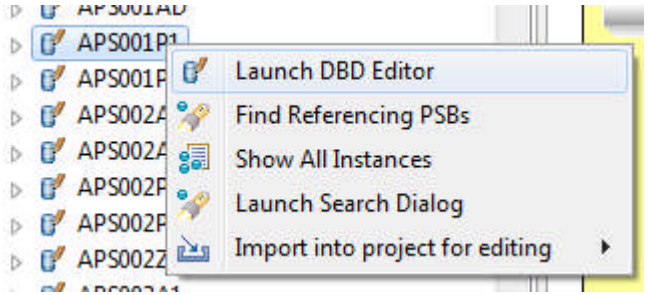


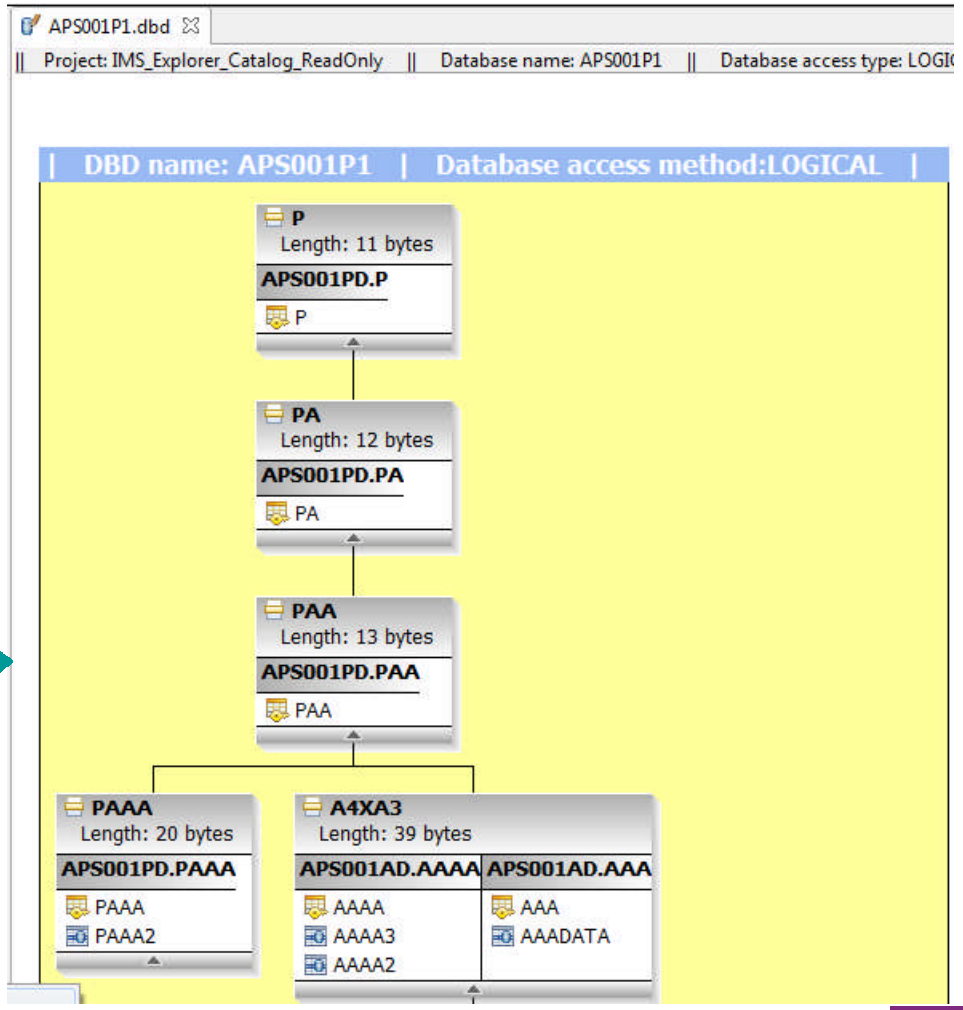
Built-in queries continued

- "What are all the DBDs referenced by this PSB?"



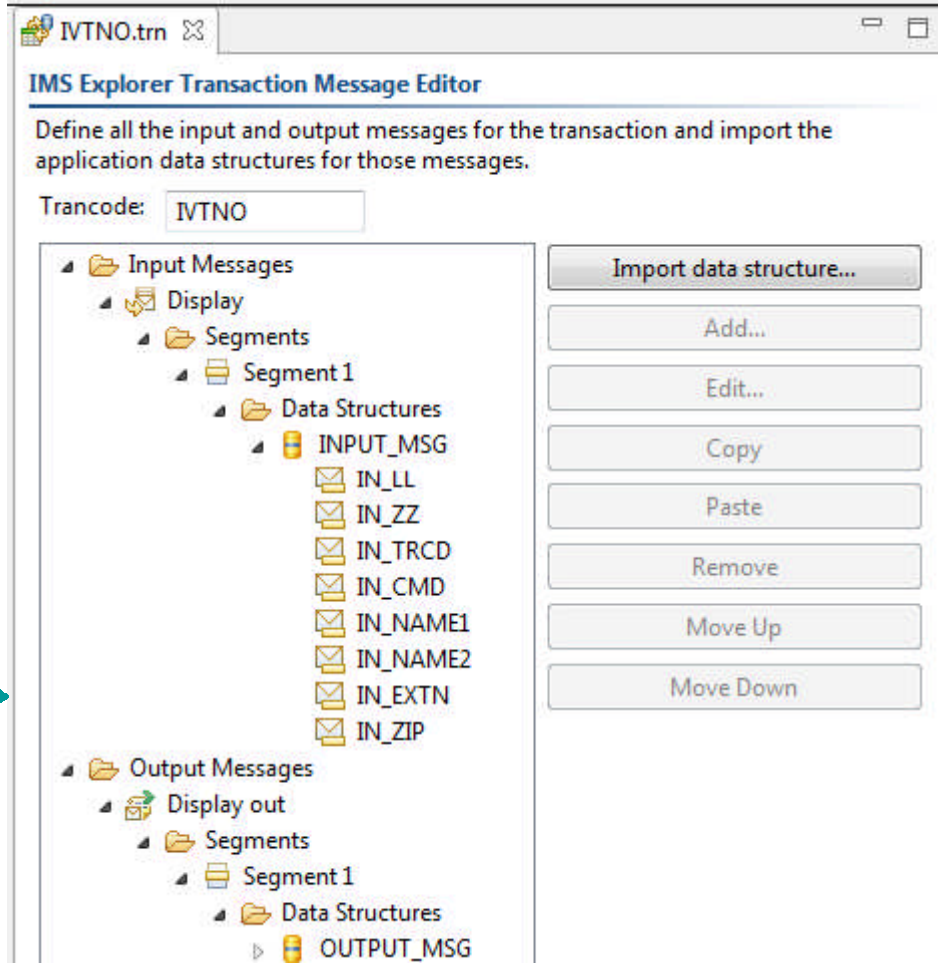
Graphically view resources directly from the IMS catalog





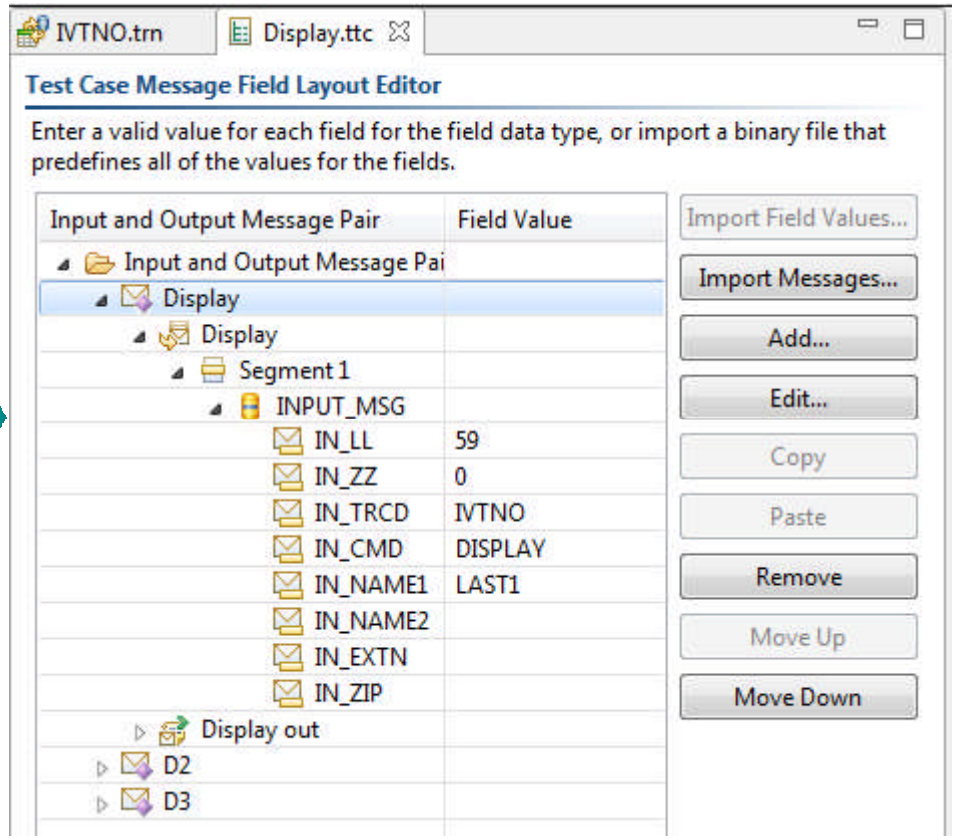
IMS Transaction Unit Test Support

- In a Transaction test project you can define a transaction and import application data structures to specify the layout of the input messages it consumes and output messages it returns.



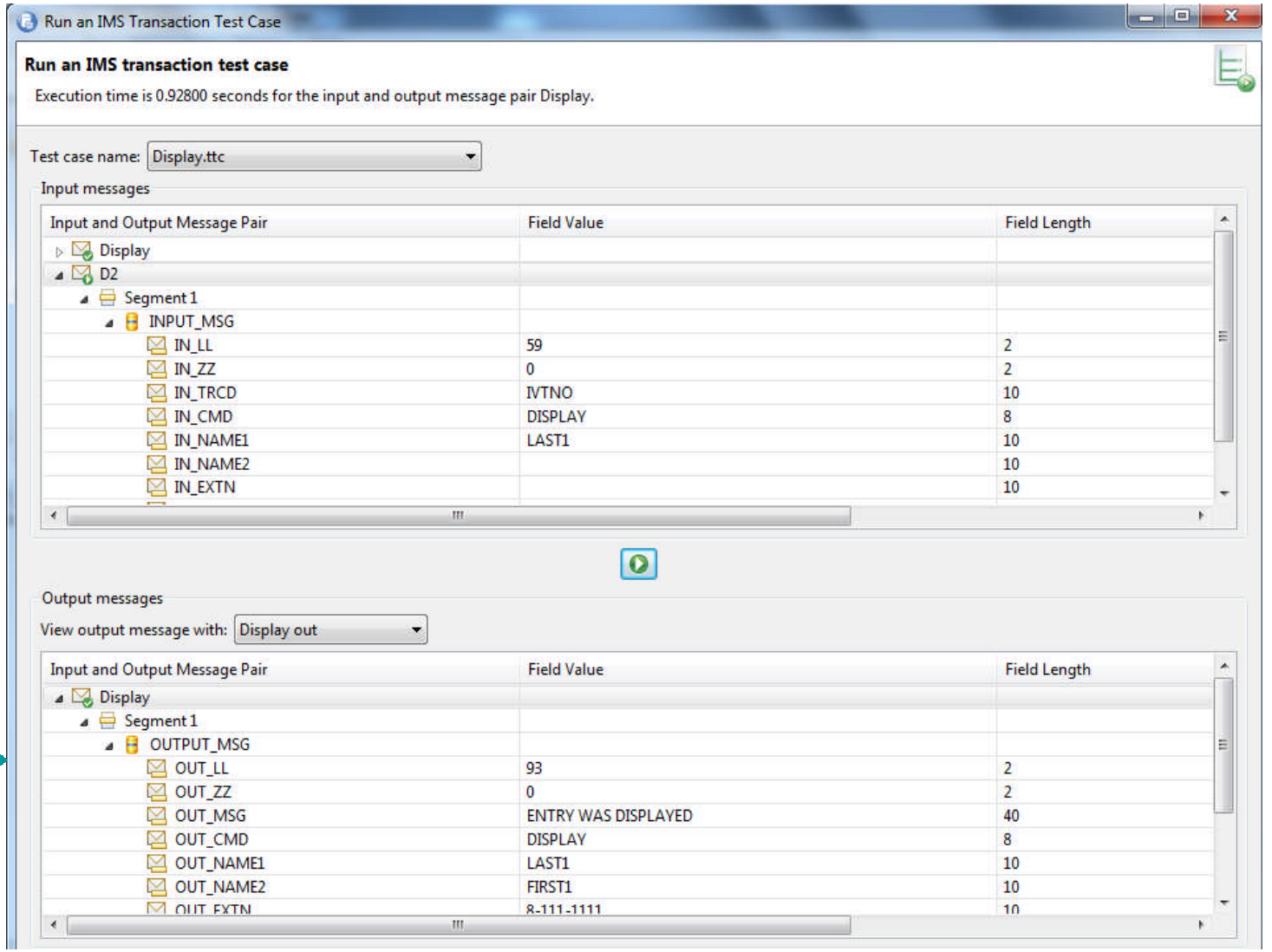
IMS Transaction Unit Test Support

- You can then create a test case to script a dialog between a virtual client application and the transaction.
- You can specify the input message payload with human readable values at the field level. Explorer does the data conversion at invocation time.
- Test cases can be duplicated and changed in order to build up a test bucket to drive different code paths in the transaction.



IMS Transaction Unit Test Support

Use the runtime console to tweak input message field values, invoke the transaction, and inspect the output message.



IBM IMS Explorer for Administration

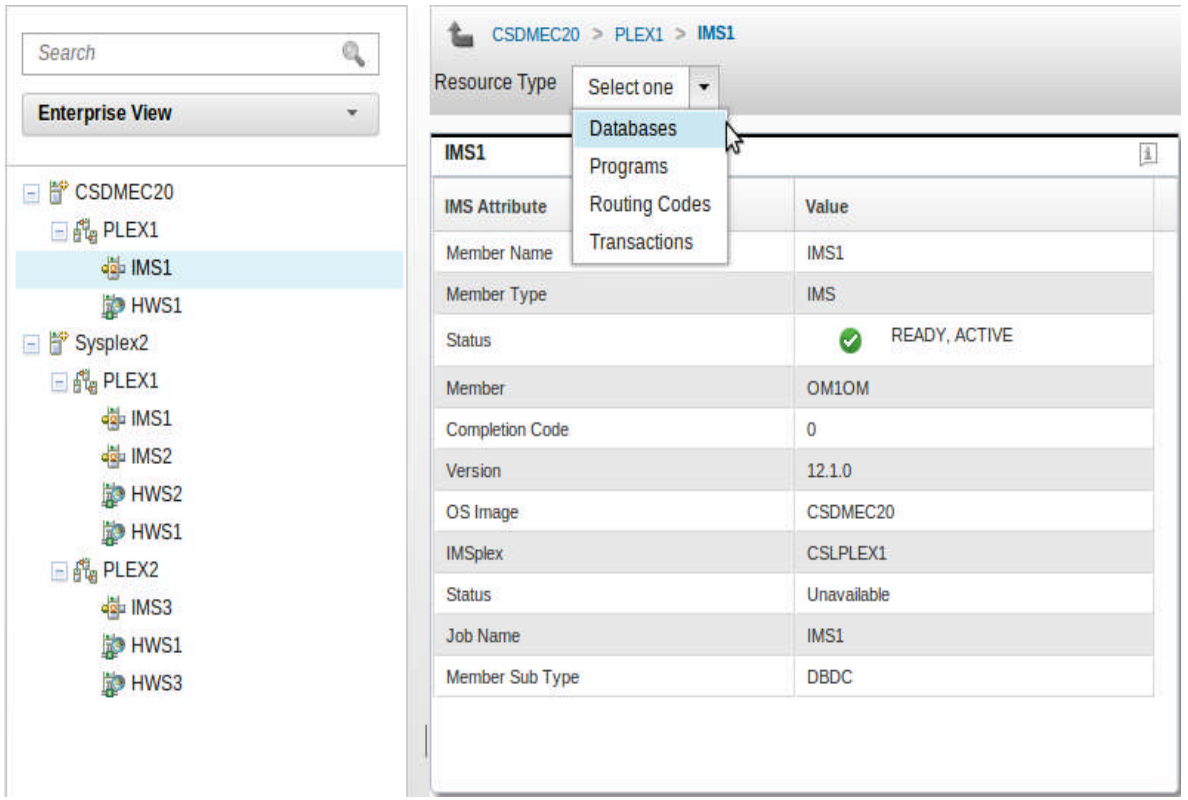
IBM IMS Explorer for Administration

IMS Explorer for Administration is an extension to the IBM Tools Base v1.4 Administration Console for System z

- 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

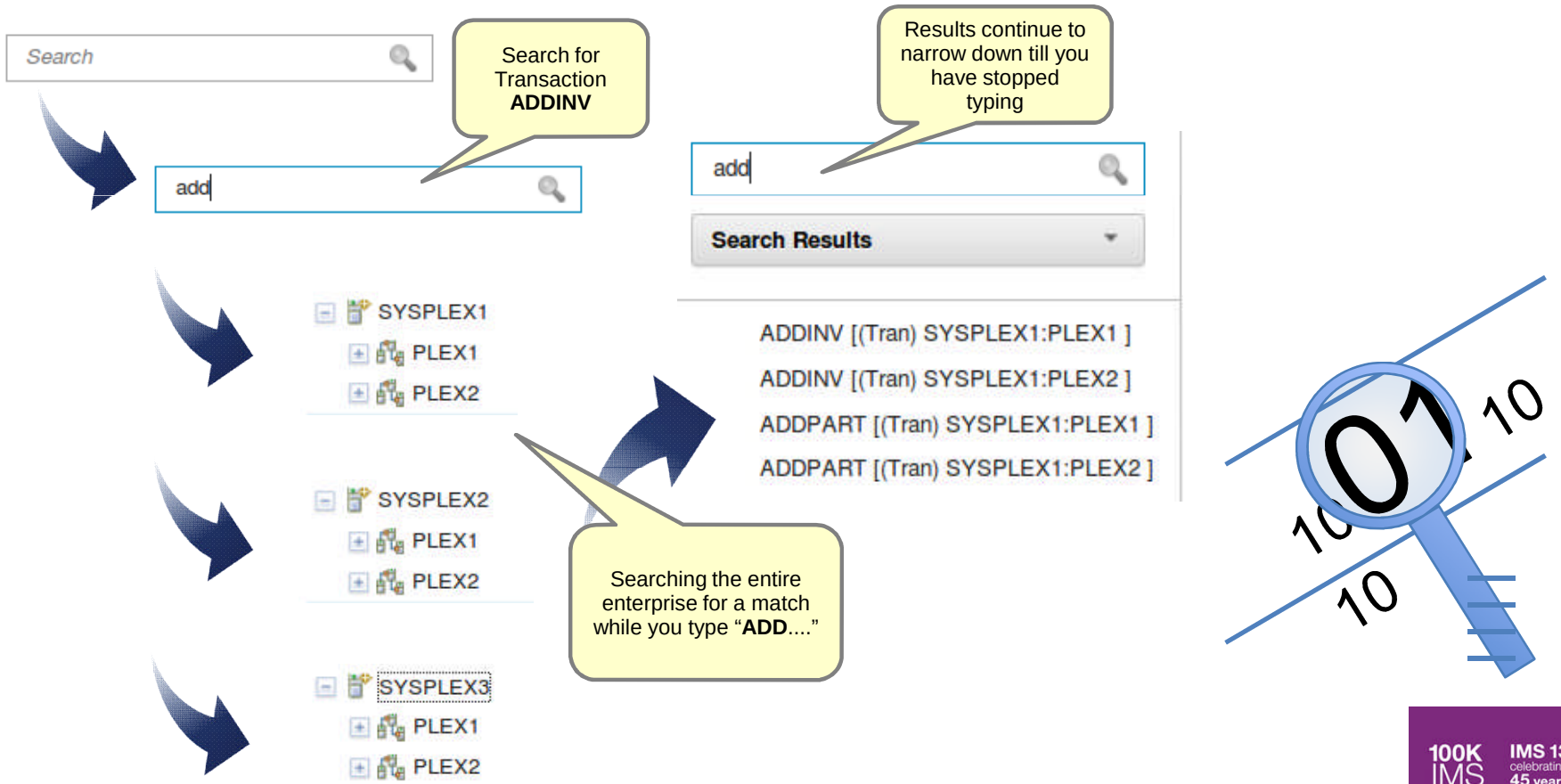
Enterprise System View

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



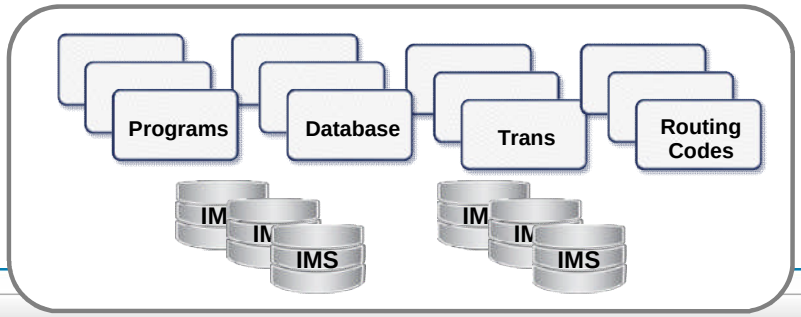
Search the enterprise

- Search for any resource that has been configured or discovered
  - Resources include IMS Transactions, Databases, Programs and Routing Codes
    - Search result types are identified by keyword
    - Instantly view the found resource and drill further into the resource



Resource relationship

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



Search

Enterprise View

- SYSPLEX1
  - PLEX1
    - HWS1
    - IMS2
      - Transactions
      - Programs
      - Routing Codes
      - Databases
    - HWS2
    - IMS1
      - Transactions
      - Programs
      - Routing Codes
      - Databases
  - PLEX2
    - HWS1
    - HWS3
    - IMS3
      - Transactions
      - Programs
      - Routing Codes
      - Databases

SYSPLEX1 > PLEX1 > IMS1 > Transactions > EMHTX2

Transaction: EMHTX2

IMS Attribute	Value
Transaction Code	EMHTX2
Status	✓
Commit Mode	SNGL
Fast Path	E
Class	1
Conversational	N
Message Queue Count	0
Limit Count	0
PSB	EMHPSB2
Member	IMS1
AOI Command Support	N

Related Program

IMS Attribute	Value
PGM Name	EMHPSB2
Status	✓
BMP Type	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

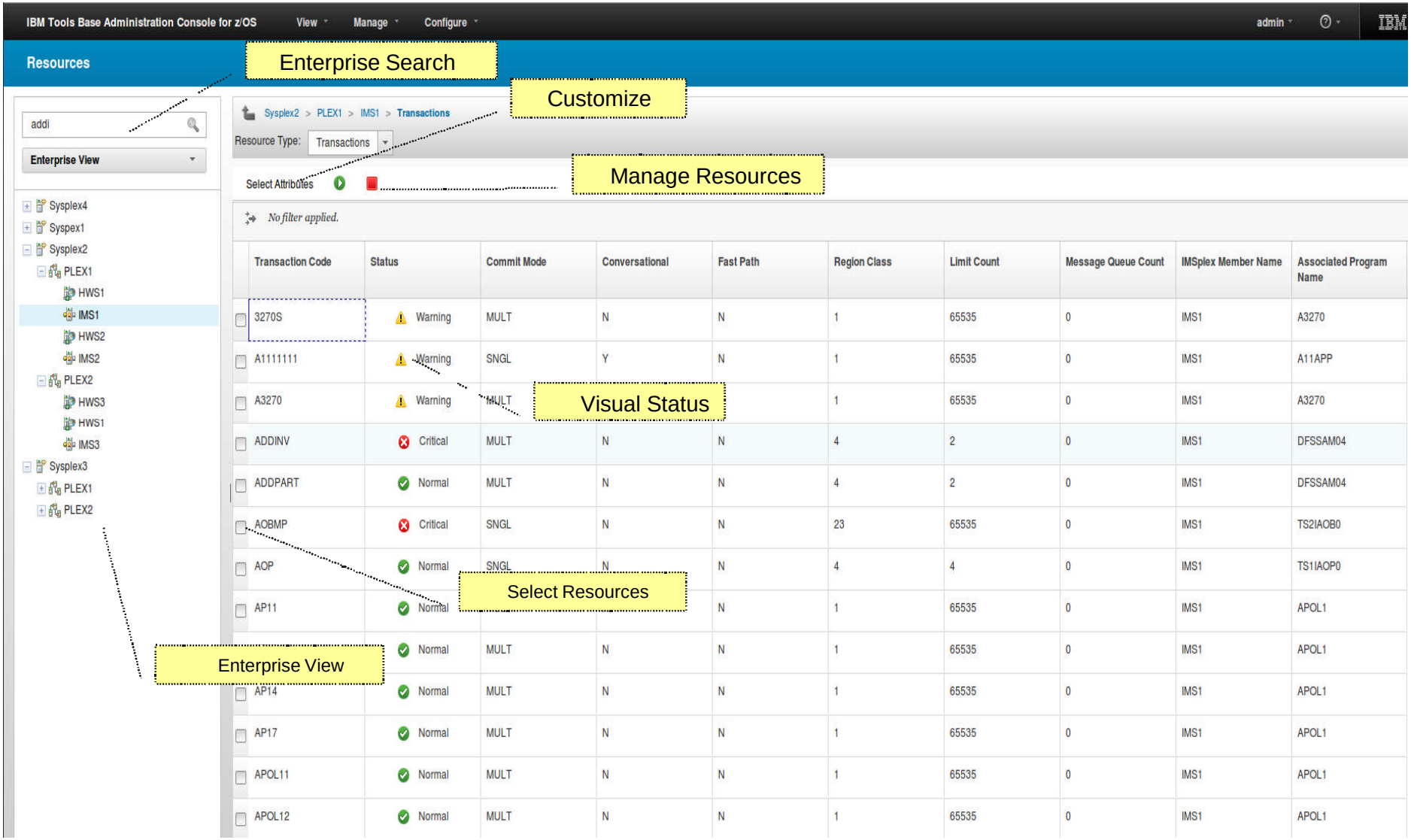
Related Routing Code

IMS Attribute	Value
Routing Code	EMHTX2
Status	...
Program	EMHPSB2
Inquiry	N
Last Access Time	
Time Created	2013.105 10:31:46.86
Definition Type	MODBLKS
Last Import Time	
Completion Code	0
Last Update Time	
Member	IMS1

Related Databases

Database Name	Database Type	Status	Access Type	Resident	Member	Definition Type	Last Access Time	Area Name	Last Imported Time	Completion Code	Time Created	Last Updated Time
MSDBLM01	MSNR	✓	EXCL	Y	IMS1	MODBLKS				0	2013.105 10:31:45.67	
MSDBLM02	MSNR	✓	EXCL	Y	IMS1	MODBLKS				0	2013.105 10:31:45.67	
MSDBLM03	MSNR	✓	EXCL	Y	IMS1	MODBLKS				0	2013.105 10:31:45.67	
MSDBLM04	MSNR	✓	EXCL	Y	IMS1	MODBLKS				0	2013.105 10:31:45.67	

Manage IMS


IBM Tools Base Administration Console for z/OS
View
Manage
Configure
admin
Resources
Enterprise Search
Customize
Manage Resources
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 | | | 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 | | | N | 1 | 65535 | 0 | IMS1 | APOL1
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

IBM IMS Explorer for Administration

- Software requirements
  - IMS Tools Admin Console (no-charge)
  - IBM IMS Explorer for Administration is available through APAR PM94292 as an extension of the Administration Console component of IBM Tools Base for z/OS, V1.4
  - IMS Version 12
  - IMS Connect
    - Common Service Layer OM and SCI
  - Supported web browser
  - Firefox, Internet Explorer, Safari

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