



Welcome to the Virtual IMS *CONNECTION* newsletter. Virtual IMS *CONNECTION* at [www.virtualims.com](http://www.virtualims.com) is an independently-operated vendor-neutral site run by and for the IMS user community.

## Virtual IMS *CONNECTION* IMS presentation

The latest webinar from Virtual IMS *CONNECTION* was entitled, “IMS Open DB functionality in IMS V11”, and was presented by Kevin Hite, an IMS lead tester with IBM. Kevin is a software engineer originally from Rochester, NY, and has worked in IBM for both WebSphere for z/OS and IMS. He is the test lead for IMS V11 Open Database and is the team lead for a new test area, IMS Solution Test. Solution Test is responsible for integrating new IMS function to customer-like applications in a customer-like environment.

Kevin started by looking at IBM’s IMS SOA (Service-Oriented Architecture) strategy, which aims to:

- Protect customer investments by making it easy, flexible, and cost-efficient to reuse and modernize IMS applications and data.
- Fully integrate with WebSphere/Rational servers and tooling in an SOA environment.
- Encourage new application development by supporting standards – eg XML, SOAP, Java, JDBC, etc.
- Partner with ISVs to facilitate IMS SOA.

Moving on to IMS Open Database, which is new in V11, Kevin informed the user group that it offers scalable, distributed, and high-speed local access to IMS database resources. The product allows business growth, and allows more flexibility in accessing IMS data to meet growth challenges, while at the same time allowing IMS databases to be processed as a standards-based data server.

What makes IMS Open Database different is its standards-based approach, using Java Connector Architecture 1.5 (Java EE), JDBC, SQL, and DRDA. It enables new application design frameworks and patterns.

Figures 1 and 2 shows diagrammatically how IMS Open Database works.

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## IMS Open Database

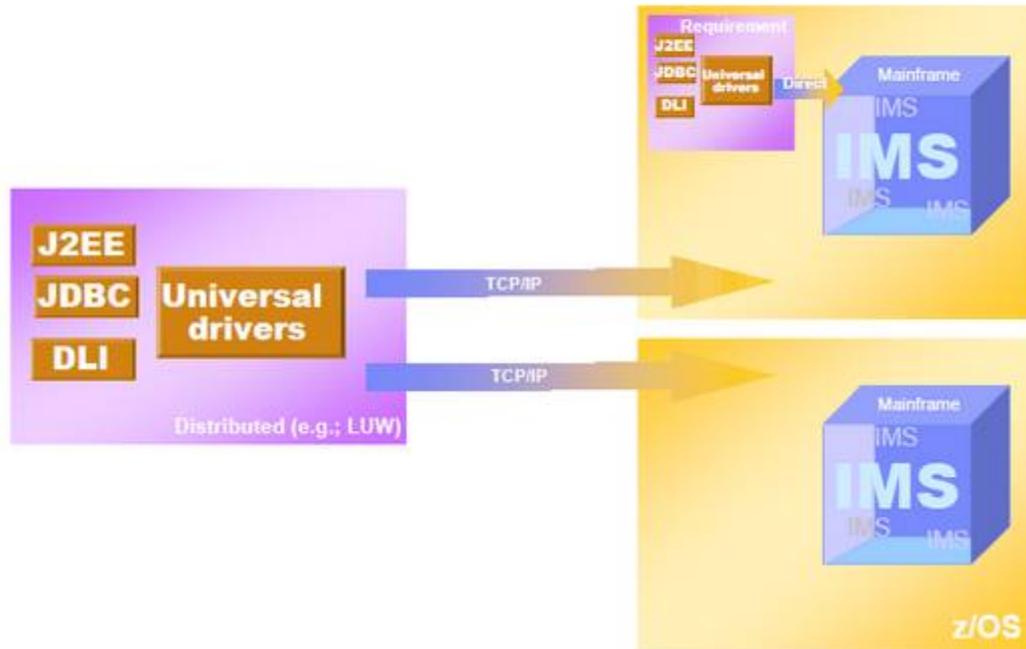


Figure 1: IMS Open Database

## Open Database Environment

Innovative Improved Usability Open Standards

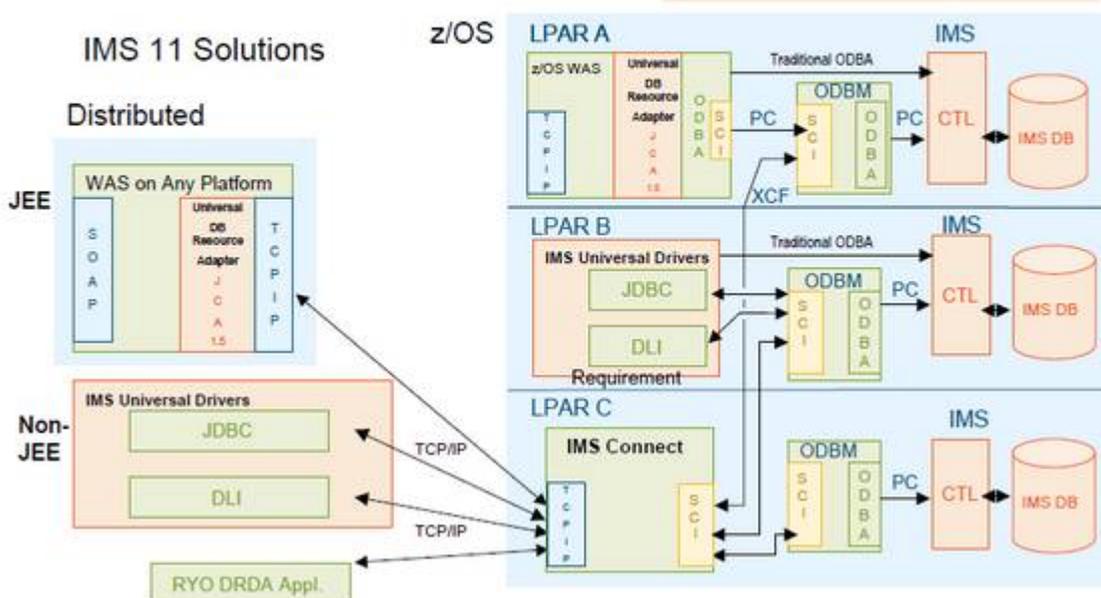


Figure 2: Open Database environment

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One particular highlight Kevin identified with the new solution are three universal drivers. These include:

- Universal DB resource adapter
  - JCA 1.5, which provides: XA transaction support and local transaction support; connection pooling; connection sharing; and the availability of multiple programming models (JDBC, CCI with SQL interactions, and CCI with DLI interactions).
- Universal JDBC driver
- Universal DLI driver

With distributed access:

- All Universal drivers support type 4 connectivity to IMS databases from TCP/IP-enabled platforms and runtimes, including:
  - Windows
  - zLinux
  - z/OS
  - WebSphere Application Server
  - Stand-alone Java SE
- Resource Recovery Services (RRS) is *not* required if applications do not require distributed two-phase commit.

For local connectivity, Kevin informed us that the Universal driver support for type 2 connectivity to IMS databases from z/OS runtimes includes WebSphere Application Server for z/OS, IMS Java dependent regions, CICS z/OS, and DB2 z/OS stored procedures.

The two Universal drivers for JDBC – IMS Universal DB Resource Adapter and IMS Universal JDBC Driver – offer a greatly-enhanced JDBC implementation including:

- JDBC 3.0
- Local commit/rollback support
- Standard SQL implementation for the SQL subset supported
  - Keys of parent segments are included in table as foreign keys, and allows standard SQL implementation
- Updatable result sets
- Metadata discovery API implementation
  - Uses metadata generated by DLIModel Utility as “catalog data”

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- Enables JDBC tooling to work with IMS DBs just as they do with DB2 DBs.

In terms of foreign keys:

- Referential constraint between two tables
  - Used to link information together and have linkage managed by the DBMS.
- Identifies a column (or set of columns) in one referencing table that refers to a column (or set of columns) in another referenced table.
- Columns in referencing table must be the primary key in the referenced table.
- Row in the referencing table cannot contain values that don't exist in the referenced table.
- Cannot insert a row in a referencing table unless the column identified as the foreign key exists in the referenced table
  - Establishes a hierarchy in a relational database.

With IMS, it cannot insert a dependent segment unless the parent segment exists

- Virtually represent foreign keys in each segment that comprise keys of each parent segment.
- Fully integrate this into the metadata exposed via JDBC for tooling to consume
- These fields actually do exist –in the key feedback area
- Can be queried as part of an SQL query
- Universal drivers don't have to do anything additional to return them
- For INSERT operations the VFKs are used to establish the correct position
- Values aren't actually inserted because they already exist in the database

Kevin told the group that IMS Connect has the following enhancements to support IMS Open Database:

- IMS Connect Configuration member HWSCFGxx
  - New ODACCESS statement
  - DRDA ports, timeout value, IMSplex name etc.
- Changes to existing commands:
  - VIEWHWS, VIEWDS, VIEWPORT.
- New commands:

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- STARTOD, STOPOD, STARTIA, STOPIA, VIEWIA, SETOAUTO.
- New user exits:
  - HWSROUT0 – Routing Exit for ODBM – can override the IMS alias and/or select the ODBM target.
  - HWSAUTH0 – Security Exit for ODBM – can perform the authentication of the userid.

With IMS Open Database, there's Open Database Manager (ODBM), which is a new Common Service Layer component. It:

- Receives database connection requests from IMS Connect
- Translates incoming database requests from the DDM protocol into DLI calls expected by IMS
- Translates responses to the client into the DDM protocol
- Manages connections to ODBA.

There are new type-2 commands:

```
QUERY ODBM TYPE(option),  
UPDATE ODBM START|STOP(TRACE)  
UPDATE ODBM  
START|STOP(CONNECTION)  
UPDATE ODBM TYPE(CONFIG)
```

There are also four new ODBM Exit Routines.

DLIModel Utility is an IMS database visualization tool that can:

- Visualize an entire IMS PSB
- View each PCB individually, including the hierarchy, segments, fields, and types, etc.

It is also an IMS database metadata generation tool that generates the necessary metadata that is consumed at runtime by IMS DB Resource Adapter, XML-DB support – including database metadata and XML schema.

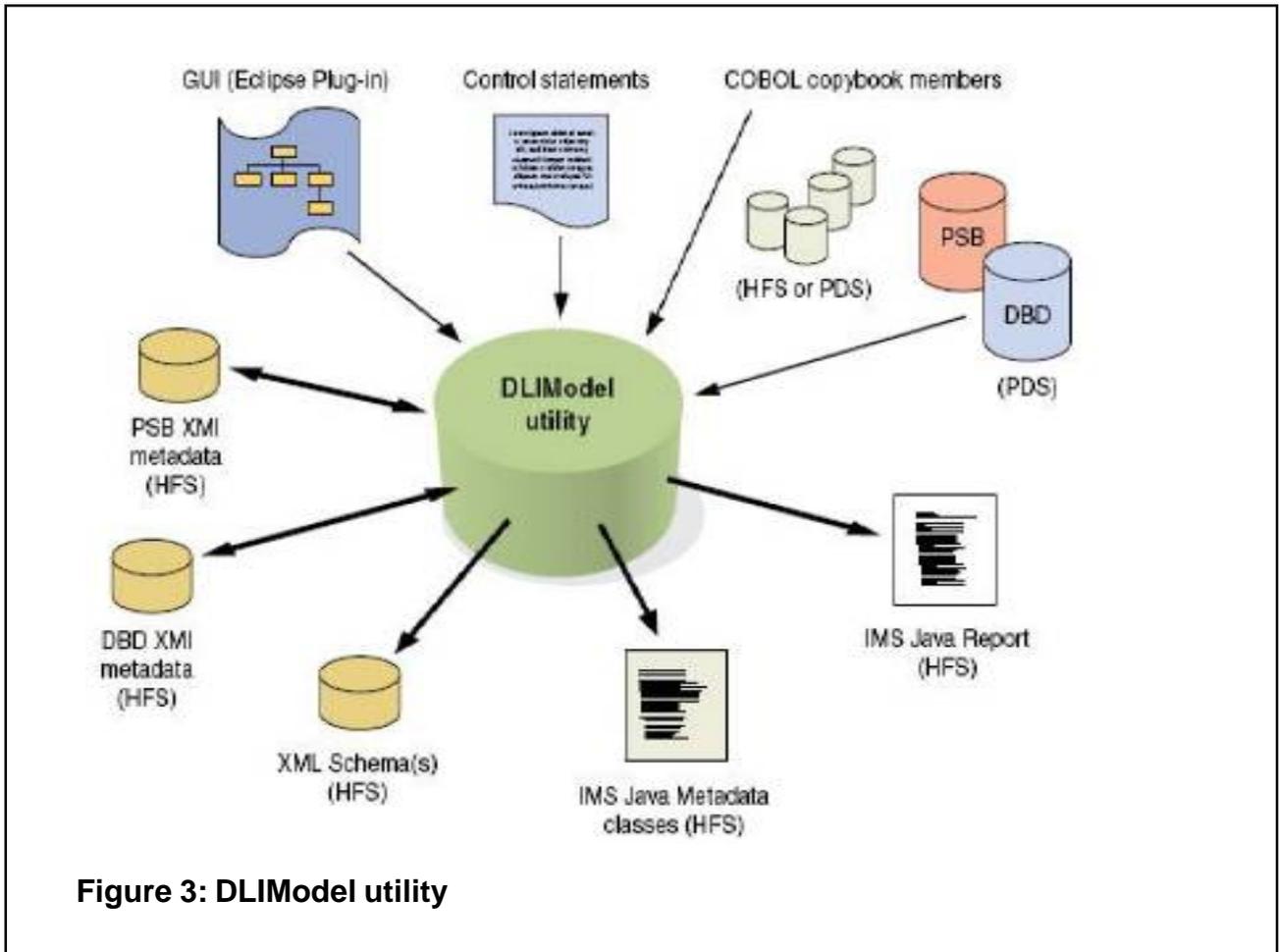
DLIModel Utility has a bottom-up tooling approach:

- Parses PSB and DBD source
- Optional COBOL copybook definitions of segments

Importantly, it is also an Eclipse 3.x plug-in.

Open Database satisfies a number of requirements, including:

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- Universal drivers – with Type 2 Connectivity and XML-DB/XQuery support.
- IMS simplification initiative – with Query assist and Application generation assist.
- Web 2.0 support – with the generation of IMS database feeds and RESTful services, and allowing IMS database information to participate in a Web 2.0 mash-up.
- Explore integration opportunities with other IBM offerings.

This is illustrated in Figure 3.

A copy of Kevin's presentation is available for download from the Virtual IMS CONNECTION Web site at [http://www.virtualims.com/presentations/Open\\_DB.pdf](http://www.virtualims.com/presentations/Open_DB.pdf).

### Recent IMS articles

*Initial Project Analysis: An IMS to DB2 Conversion Example* by Shirley Huhtanen in the August/September issue of *zJournal*. You can find the article at [zjournal.com/index.cfm?section=article&aid=1207](http://zjournal.com/index.cfm?section=article&aid=1207).

### Virtual IMS CONNECTION meeting dates

The following meeting dates have been arranged for the Virtual IMS CONNECTION user group:

- October 6, 2009 – Rob Morris, Chief Strategy Officer, GT Software.  
“Mainframe integration is not a strategy – get your MIPS back while delivering value today”  
How you can integrate with the mainframe, project by project, without major licensing requirements or MIPS concerns.
- December 8, 2009 – Gregg Willhoit, Chief Architect, Progress DataDirect.  
“Bringing zIIP offload to the IMS platform”
- February 9, 2010 – CA.
- April 6, 2010 – Tony Lubrano, NEON Data Systems.  
“zPrime and IMS”

All meetings start at 10:30 Central Time (4:30 GMT in the winter and 3:30 GMT during daylight saving time). All members will be e-mailed the WebEx URL, access code, and password for each meeting. Members need to log in about five minutes before the meetings starts in order for the WebEx connection to complete, and to phone into the freephone number provided so they can join in with the audio component of the meeting.

### News Update

Mainstar, part of Rocket Software, has announced Database Backup and Recovery for IMS (DBR for IMS) on z/OS, its storage-aware backup and recovery solution that integrates storage processor fast-replication facilities with IMS backup and recovery operations to allow instantaneous backups with no downtime, reduce recovery time, and simplify disaster recovery procedures while using less CPU, I/O, and storage resources. DBR for IMS provides backup and recovery techniques to address the high-availability and integrity needed by organizations. DBR for IMS complements Database Backup and Recovery for DB2 (DBR for DB2) to provide a consistent methodology for both DB2 and IMS database management systems. Further information is available from <http://www.mainstar.com/pdf/dbr-for-ims.pdf>.

### About Virtual IMS CONNECTION

Virtual IMS CONNECTION is a user group established as a way for individuals using IBM's IMS hierarchical database and transaction processing systems to exchange information, learn new techniques, and advance their skills with the product.

The Web site at [www.virtualims.com](http://www.virtualims.com) provides a central point for coordinating periodic meetings (which are technically-oriented topics presented in a webinar format), and will provide articles, discussions, links, and other resources of interest to IBM IMS practitioners. Anyone with an interest in IMS is welcome to join Virtual IMS CONNECTION and share in the knowledge exchange.

To share ideas, and for further information, contact [trevor@itech-ed.com](mailto:trevor@itech-ed.com).

The Virtual IMS CONNECTION user group is free to its members. Various sponsorship opportunities are available to vendors of IMS-related products. Full details of these opportunities and can be found [here](#).