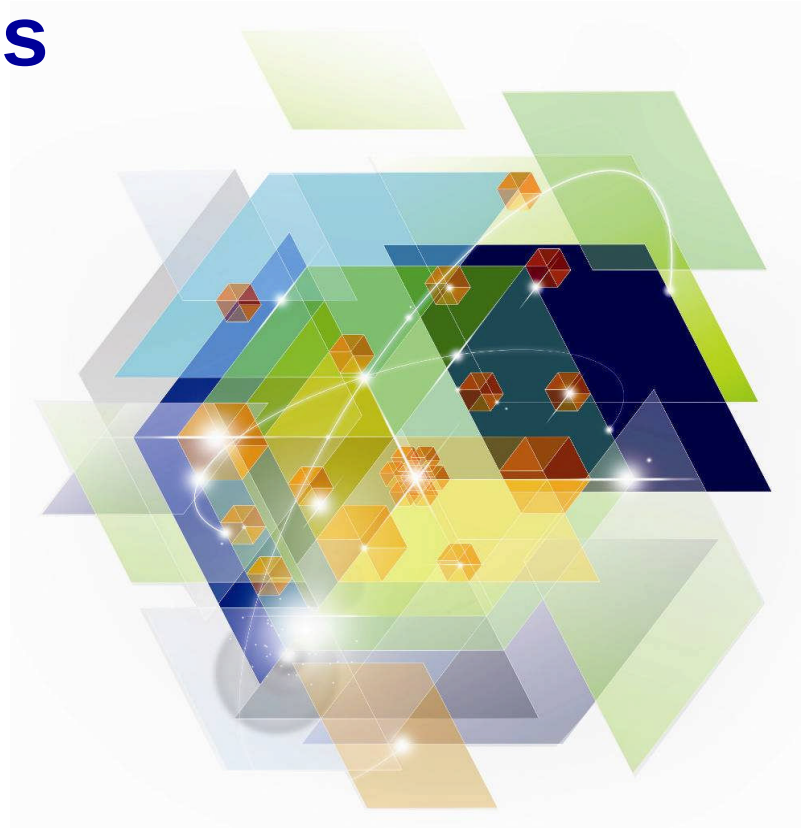
IMS Trends and Directions



Dinesh Nirmal – Director, IMS

Betty Patterson – Distinguished Engineer

June 5, 2012

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Agenda

- IMS is Essential to your Business
- Lab Outreach and Opportunities
- IMS 12
- IMS Explorer for Development
- Looking Ahead

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IMS is Essential to Your Business

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15 million gigabytes of production data managed by IMS

$3.0 trillion ($US) per day is transferred through IMS.....by one customer

200+ million users served every day

375 million accounts…..for one customer

46,000 transactions per second…..on a single IMS system

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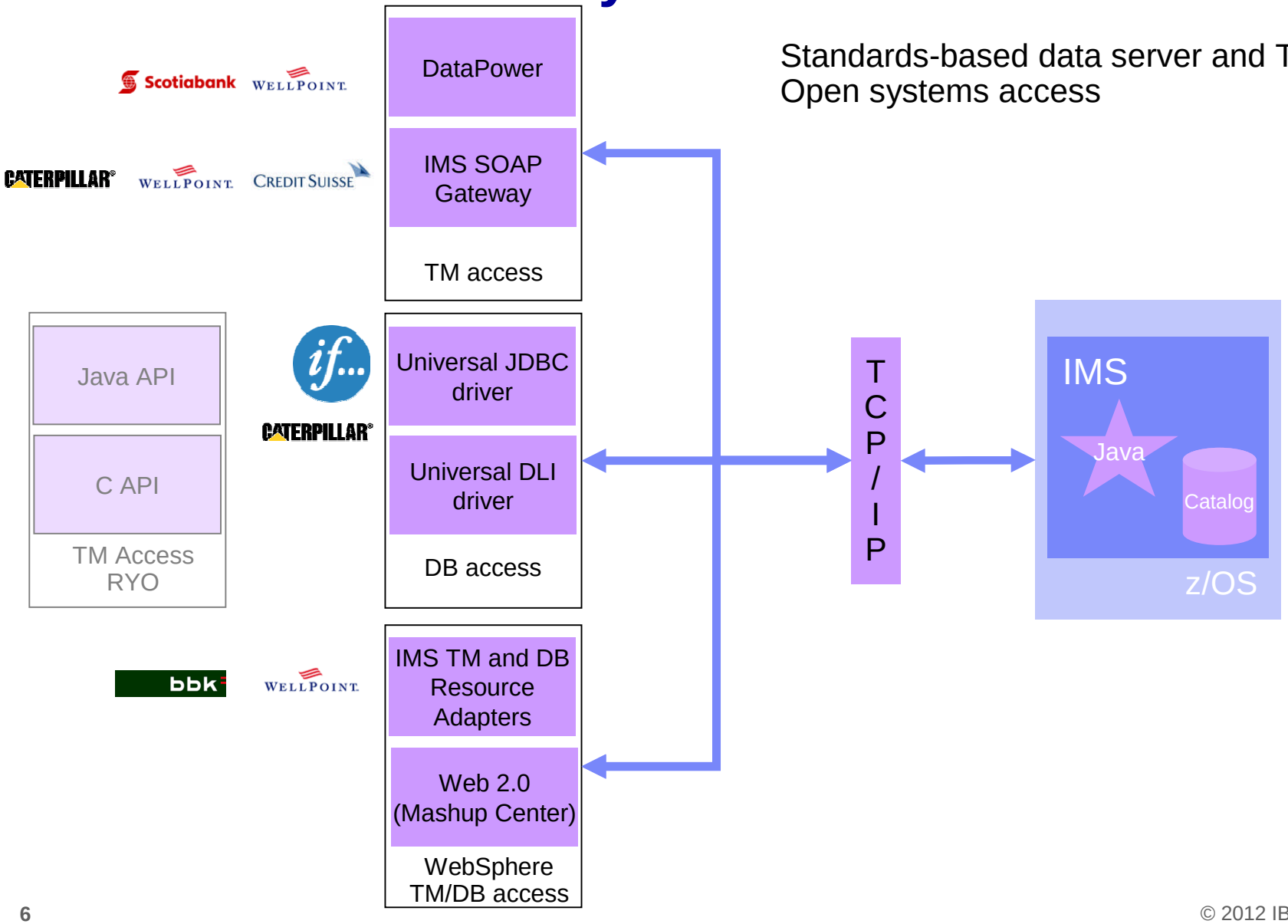
Access IMS from Anywhere

Standards-based data server and TM
Open systems access



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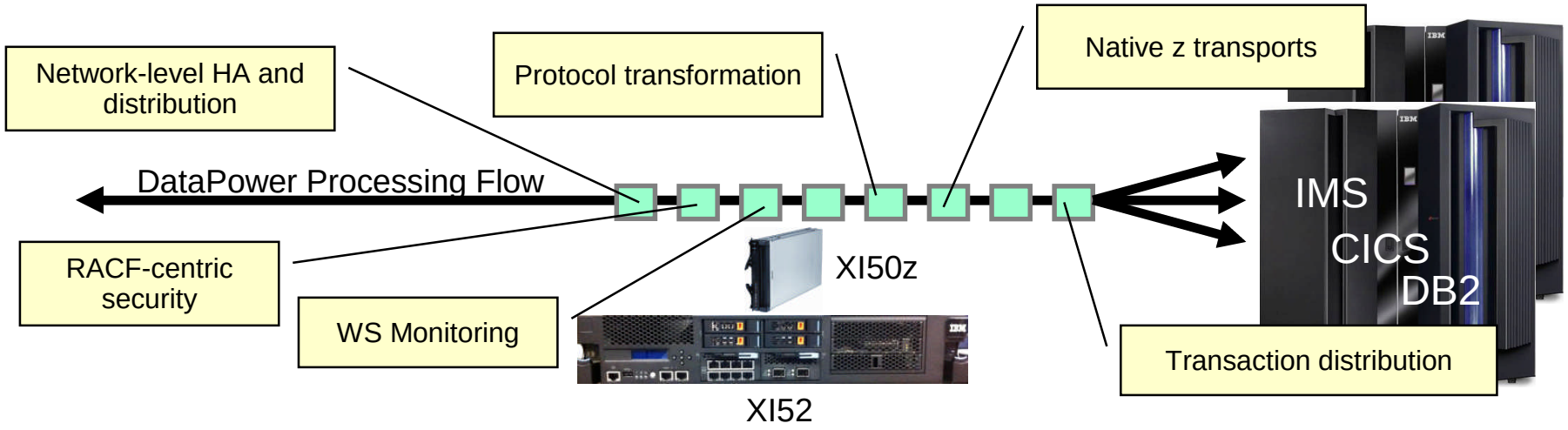
Web service enablement through DataPower

IBM cross-brand initiative

- **Deep synergy between DataPower, System z, Rational and Common Transformation tooling to support DataPower as the premier System z gateway for IMS, CICS and DB2**
- **Plans to further extend the integration capabilities of Data Power and IMS**



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IMS Roadmap

IMS 11

Access to IMS database resources anywhere in the IMSplex *directly* from z/OS and distributed environments

CPU Reduction

Java Support

Easier Operations

IBM IMS Tools Day 1 Support

Free RDz Licenses

IMS 12

Double-digit gains in performance, throughput, and simplification

CPU savings and increased throughput for IMS DBCTL clients

Single centralized store for dynamic resource definitions

Integration with Cognos and Guardium

IBM IMS Tools Day 1 Support

Free RDz Licenses

IMS 12+

Huge emphasis on cost savings

IMS Database Revitalization

Eliminate sysgens and planned outages

Direct access from .NET, other distributed platforms

Expanded SQL support – COBOL, PL/I

Web-based operational access

Catalog for storing IMS DB metadata and artifacts

And much more…

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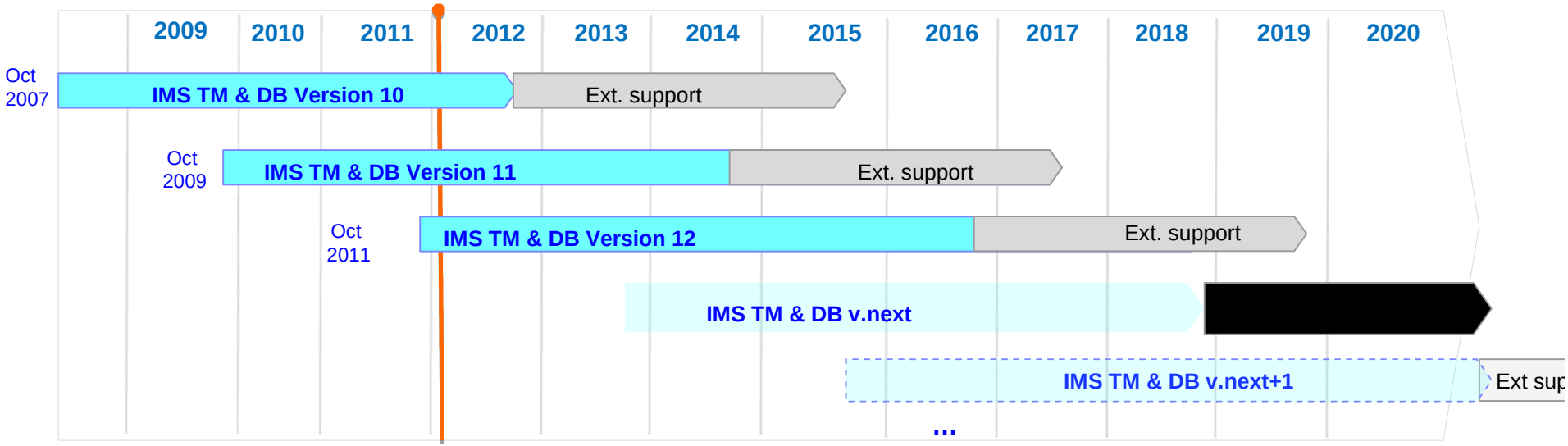
IMS Transaction Manager and Database Manager for z/OS



- **New major version every 2-3 years**
  - IMS 12 GA October 2011
  - **IMS 10 goes out of service November 12, 2012**

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IMS Transaction Manager and Database Manager for z/OS

- **IMS 12 became generally available on October 28, 2011**
  - IMS Enterprise Suite 2.1
- **Quality Partnership Program highly successful**
  - 14 external clients, 26 vendors
  - 5 clients were in production before GA; one was in production more than 100 days before GA
- **Tremendous interest and adoption with IMS On Demand SOA solutions for revitalization and integration**

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IMS Tools – our current direction
Why Autonomics and Modernization?

Now more than ever, business challenges demand it

- **Unanticipated problems can result in downtime and loss of revenue**
- **Increased burden of system management and maintenance**
- **Problem determination is time and resource intensive**
- **DBA resources are dwindling**

"The information technology industry is obliterating barriers and setting records with astonishing regularity, but now we face a problem springing from the very core of our success....More than any other IT problem, this one, if it remains unsolved, will actually prevent us from moving to the next era of computing. The obstacle is complexity."

— Paul Horn, Senior Vice President, Research, IBM

What our clients tell us about IMS 12

Running 60 million transactions per day on IMS 12

In production on IMS 12 over 100 days before General Availability

GAD IT für Banken

FIDUCIA Ihr IT-Partner

“The IMS Repository and the MSC TCP/IP features in IMS V12 allow us easier maintenance; The IMS Repository will bring us more simplicity, security, and reliability, as we can share it between the systems.”

SIGNAL IDUNA

"With the IMS Repository and RDDS feature of DRD, we can manage our system resources much more easily; change management is more efficient and faster."

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CREDIT SUISSE

Business Challenge

❖ *Credit Suisse needs to flexibly and cost efficiently implement new and changed business requirements to isolate the effects of changes and prevent ripple effects of changes. They need services with a business semantic that is unrelated to the current implementation or database schema.*

Solutions

❖*Credit Suisse's Strategic core banking applications are built and evolved with PL/I as the preferred language on IMS*

❖*Start with Web services description files (WSDL) that represent the interface contract to develop new and evolve existing IMS applications*

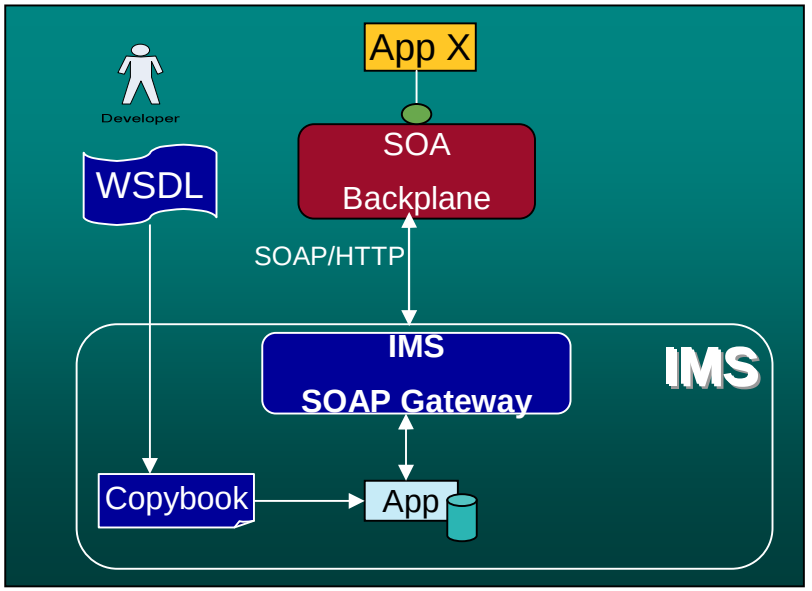
❖*A top-down approach is required to map complex XML data structures, including unbounded arrays and strings to PL/I*

❖*Using IMS SOAP Gateway for both inbound and outbound requests, with RDz as the development tooling.*

❖*First Web Services now successfully in production!*

Benefits

❖ *Integrate IMS systems into overall enterprise SOA infrastructure and maintain high availability and throughput in the new IMS profile*



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WELLPOINT.

Wellpoint is the largest health benefits company in the United States by membership. In 2010, they embarked on a proof-of-concept to modernize a proprietary connectivity solution used to access claims data residing in IMS.

Solution

The new solution, using IMS Connect, WAS, and DataPower, enabled them to implement a solution that was better aligned to their overall SOA strategy and that provided them with a web services interface.

Benefit

As a result of implementing these new technologies, Wellpoint now has a new architecture that is faster, uses less mainframe CPU and enables mainframe transaction avoidance through configuration-based side caching. These changes enabled them to meet their overall objectives of improving performance and lower costs.

Results

- ***Java media performance was 17% faster round trip***
- ***.NET median performance was 60% faster round trip***
- ***Mainframe connectivity related CPU was reduced 20-59%***
- ***RPC calls were processed 200% faster***

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Lab Outreach & Opportunities

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Free IMS Lab-driven Customer Workshops

- IMS Business Value Assessment
  - Business and architectural review of IMS subsystem and applications with the goal of helping customers get more value out of their IMS investment
- IMS Database Workshop
  - Hands-on workshop for application developers to learn about and test drive the latest advances in IMS database technology
- IMS SOA Workshop
  - Hands-on workshop for application developers to learn about IMS SOA capabilities that help you service-enable and reuse IMS assets (data and business logic), and save money!
- IMS Cobol, JAVA, and PLI Application Development Workshops
  - Hands-on workshop for application developers to test drive the latest tools that accelerate and simplify IMS application development; available for COBOL, PLI, and JAVA developers

Want to know more? Ask Sofilina Wilhite sofilina@us.ibm.com

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New IMS Customer Internship Program

- **Located at IBM Silicon Valley Lab in San Jose, California – home of IMS Development**
- **Help you to quickly grow IMS skills**
- **First class is scheduled for 2Q 2012**
- **Class is limited to <10 participants for focused attention**
- **2-month minimum duration, possibility to extend**
- **Customers will work on real projects tailored to their job responsibilities: Application Development, DBA, System Programmer**
- **Formal and informal classes will be taught by IMS engineers**

Interested?

Contact Steve Zozaya - zozaya@us.ibm.com

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IMS Laboratory Technical Specialist Group

- Our scope is world wide:
  - Our highly skilled team members have over 20+ years of IMS experience each. The team can assist you in planning for and implementing IMS versions and deploying features
  - Examples of assistance are Shared Queues, Data Sharing, Sysplex, Migration, Health Checks, rent-a-SYSPROG/DBA, SOA pilots, capacity planning plus others
  - We can be called up to provide remote or on-site critical situation management and assistance
  - With our unique position within the IMS development organization we have direct access to both IMS development and change team groups to obtain the answers and direction you require
  - We offer a wide variety of 15 IMS Service offerings. Please visit our website or contact Jeff Hook (jhook@us.ibm.com) directly for more information.

http://www-01.ibm.com/software/data/services/imsofferings.html

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European IMS Architecture Team

- **Specialized team that focuses on IMS as part of our European Clients' overall System z architecture plans**
- **Region includes Europe, Middle East and Africa**
- **Team's Mission:**
  - Confirm and secure existing IMS workload and seek opportunities to derive new benefit and workload on existing systems
- **They represent net new investment in IMS**
- **Team members located in France, UK, Spain, Germany, Denmark and Switzerland**

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IMS China Development Lab - CDL

- We initially built a small team focused on IMS technical support for IBM China and Taiwan clients
- New development and QA projects were then started at CDL
- The team is now integrated to support both IMS and IMS tools
- We will continue to expand this team

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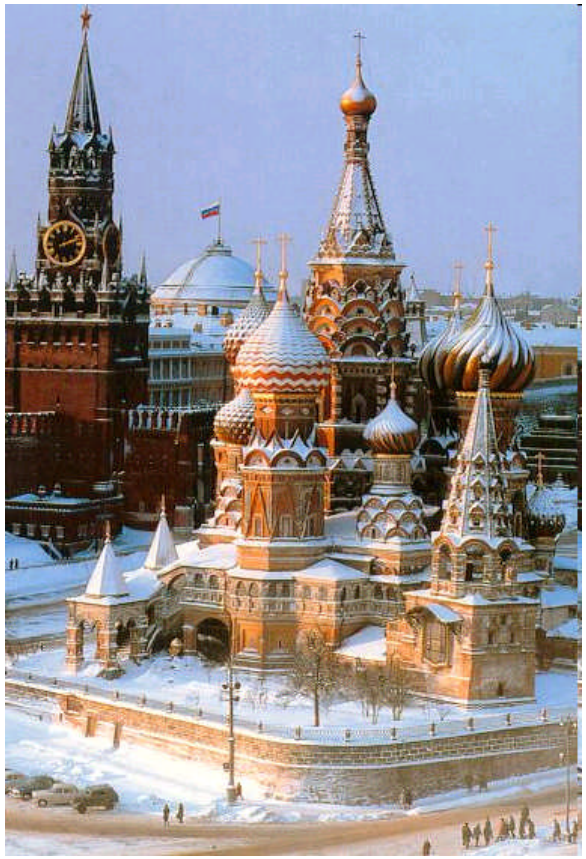
IMS Business Opportunities in Russia

- Russian companies are starting to centralize and look for automated enterprise systems.
- IBM Sales and Business Partners are actively working with 2 new clients for and IMS Installation Proof Of Concept.
- An IMS Lab team was built in Moscow – Development and QA
- We are working with Bauman University to teach IMS
- Several multi-customer IMS awareness events have been held in Russia



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IMS 12 Highlights

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Database Management

IMS Database
- CICS Open Thread TCB support (Threadsafe)
- IMS Catalog

Full Function Database
- FF Dynamic DB Buffers
- DB Storage Enhancement
- Additional FF Enhancements

Fast Path Database
- FP Buffer Manager 64 bit Enhancements
- FP DEDB Secondary Index Enablement
- Additional FP Enhancements

DBRC
- DBRC Enhancements
- Migration/Coexistence

Systems Management

- Scheduling Pool Stg Enh
- Extended Address Volume Support for non-VSAM
- IMS Repository and Usage for DRD Resources
- IMPORT Command Enhancement
- Member OLC Enhancement
- Logger Enhancements
- Syntax Checker Enhancements
- Diagnose Command Enhancements

Transaction Management and Connectivity

- IMS to IMS TCP/IP Communications
- MSC TCP/IP Support
- OTMA TCP/IP Support
- IMS Connect Type-2 Commands Support
- Additional Connect Enhancements
- CM0 Message Enhancement
- Send Only w/ACK for Callout
- OTMA Security Enhancements
- APPC/OTMA Sync SQ
- Enhanced CQS Traceability

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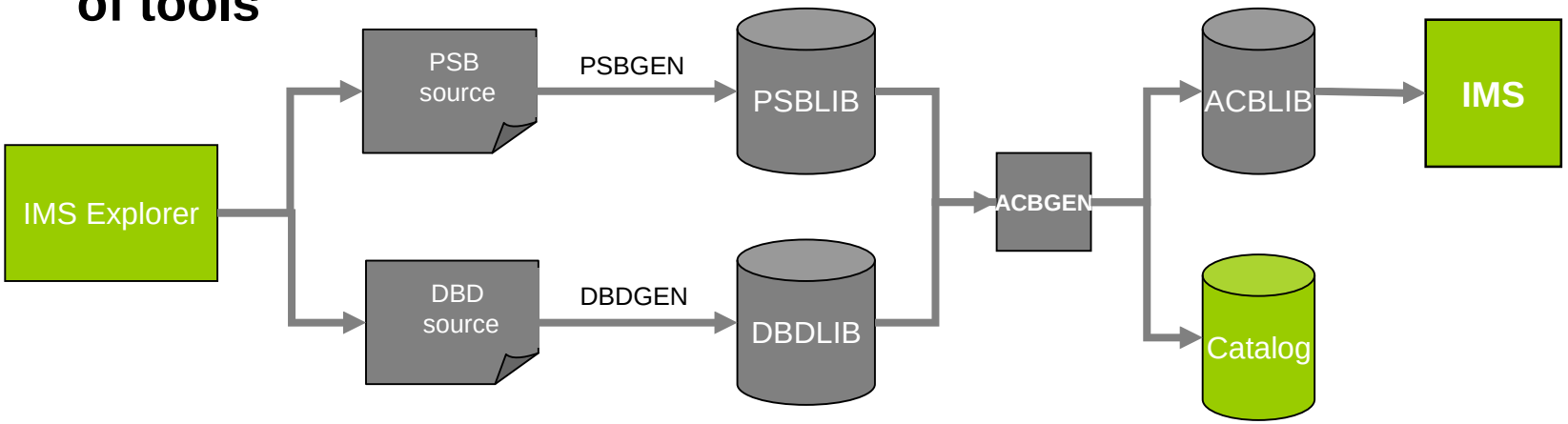
IMS Catalog

- **Trusted IMS metadata information**
- **Comprehensive view of IMS database metadata (including application metadata) managed by IMS with standard access patterns (JDBC/SQL)**
- **Offers metadata discovery and exchange via IMS Open Database and the IMS Explorer for Application Development**
- **Scalable Open Database solution – large scale deployment into virtualized production and test environments**
- **Enables broad IMS integration into the IBM and non-IBM portfolio of tools**



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Full Function Dynamic Database Buffer Pools

Solution

- Provide for dynamic change to an OSAM or VSAM buffer pool without recycling IMS systems to pick up the change
- Commands are used to add, change, or delete Full Function Database Buffer Pools
- Increase VSAM buffer pool limit (from 16 to 255)

Value

- Improves buffer pool management
- Eliminates system down time for modifications
- Flexibility with the ability to adjust DB buffers to business needs to improve application performance

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Additional Full Function Database Enhancements

Solution

- **General Enhancements**
  - Optional DFS2291I diagnostic messages for U3310 for lock timeouts
  - Eliminates IMS U0080 abends for OSAM Open, Close, and EOV processing - DFS0730I issued
  - Reuse of local DMB numbers
- **High Availability Large Database (HALDB)**
  - Display status of randomizers and partition selection exit routines
  - OLR Ownership released from terminated IMS to resume on another IMS without restarting the terminated IMS
  - HALDB Partition name reuse after structure change
- **Batch**
  - Batch Data Sharing jobs survive CF cache structure access failures
  - RACF userid in Data Capture batch log records (9904)
- **DBCTL**
  - Support for CICS Open Transaction Environment TCBs (Threadsafe)
  - Message DFS993I sent to system console

Value

- Scalability by reusing unused local DMB numbers
- Serviceability by providing additional information
- Availability by reuse of DMB numbers and eliminating of some hangs
- Enhance the availability and usability for HALDB, OLR and batch users of IMS

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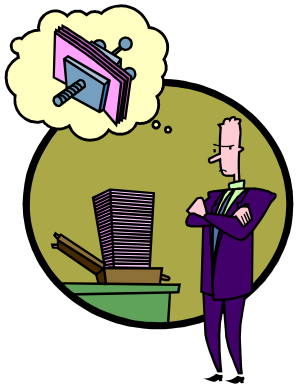
Fast Path 64-bit Enhancements

Solution

- Extends 64-bit support added with IMS 11
- FP subpools made more dynamic
  - Compression and pre-expansion
  - Resizing and cleanup
- Additional FP buffers are moved from ECSA to 64-bit storage
  - FLD calls
  - SDEP calls during /ERE and XRF tracking
- Query Pool Type command enhancements
  - SHOW(STATISTICS) added
  - SHOW(ALL) now displays subpool status

Value

- Reduce ECSA usage
- Smarter usage of subpools



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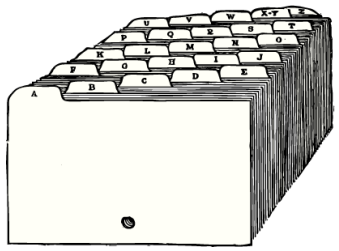
Fast Path Data Entry Database (DEDB) Secondary Index Enablement

Solution

- Provide secondary indexing infrastructure for Fast Path DEDBs
  - Secondary indexes are full function databases (HISAM or SHISAM)
  - Support for maintenance of secondary indexes
  - No support for the creation of secondary indexes
- Tools or utilities to build a secondary index database for DEDB databases exploiting this function could be separately offered by IBM or other vendors
  - IMS Tools Fast Path Solution Pack provides this support

Value

- Enhance usability by providing Fast Path DEDB secondary indexing infrastructure in IMS to access a DEDB database using a secondary key sequence
  - Access via an alternate key



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Extended Address Volume (EAV) Support

Solution

- Non-VSAM data sets can reside in Extended Address Space (EAS) on EAV volumes to satisfy growing DASD storage requirements.
  - Requires z/OS 1.12 and above
- EAV supported for most non-VSAM data sets including:
  - Overflow Sequential Access Method (OSAM) data sets
  - Restart data set
  - Message Queue data sets
  - Log data sets

Value

- Provide relief for systems running out of z/OS addressable disk storage
- Allows more data sets on a single larger volume
- Less need for multi-volume OSAM
- Alleviate disk storage constraints providing greater scalability to grow business solutions

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IMS Repository and Usage for Dynamic Resource Definition (DRD) Resources

Solution

- Provides an optional single centralized store for the DRD resource definitions
- Enables IMS systems to manage, store, share, and retrieve resource definitions
  - Database, Program, Transaction, Routing Code and related descriptors
- Allows resource definition changes to be made in repository and rolled to one or more active IMS systems
- DRD UI supports new options for Query, Import and Export commands
- Syntax Checker and Installation Verification Program support for repository

Value

- Simplifies management of IMS resource definitions
- Eliminates the need for managing multiple RDDS for each IMS

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Member Online Change Enhancement

Solution

– New option to allow Member Online Change to only bring in PSB members and new DBD members

Value

– Could provide significant performance enhancement when there are huge number of ACB members in ACBLIB

  - Eliminates the process of determining the associated ACB members for the PSB and DBD members affected by the OLC, when the user knows it is not needed

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Logger Enhancements

Solution

- Optional Extended Format Support for OLDS and SLDS
  - Allows OLDS and SLDS to be striped
- Optional IMS log buffer storage moved above the 2 gigabyte boundary
- WADS management changed to be more efficient
  - Track groups no longer used
  - WADS written in wrap around fashion

Value

- Increased OLDS write capability
- Increases logging speed
- Improves logging bandwidth
- Reduced 31-bit ECSA usage

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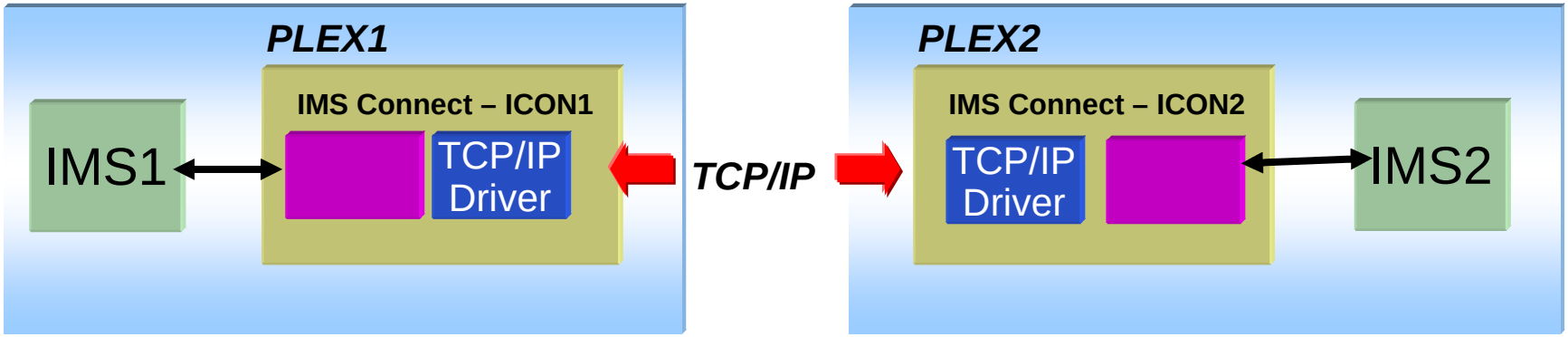
IMS to IMS TCP/IP Communications

Solution

- Provide communications between IMS systems using TCP/IP via two IMS Connect instances

Value

- Enhances connectivity
- Supports TCPIP communications to invoke transactions between IMS systems without having to create or maintain a separate gateway solution
- Reduces the maintenance cost by eliminating the need to maintain a RYO IMS Connect gateway application solution



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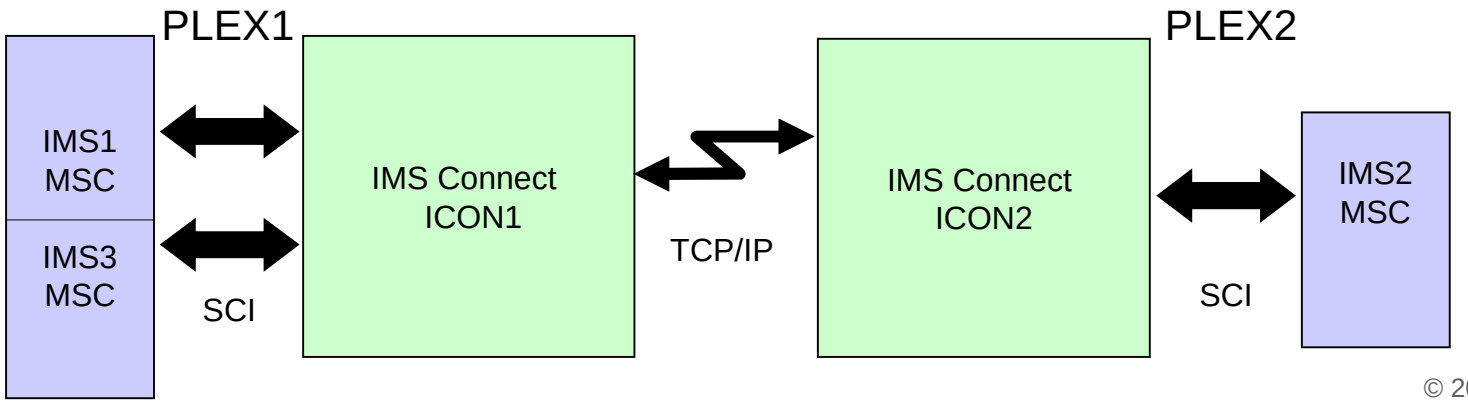
Multiple Systems Coupling (MSC) TCP/IP Link

Solution

- Connects two IMS systems using MSC across a TCP/IP network
- MSC communicates with IMS Connect within a IMSPlex to send/receive messages via the TCP/IP network
  - IMS Connect manages the TCP/IP communications
  - MSC manages the message processing
  - Structured Call Interface (SCI) used for communication

Value

- Increased usability by allowing migration of links from SNA to TCP/IP
- Increased availability if VTAM/SNA and TCP/IP are used together for redundancy
- Potential increased MSC bandwidth



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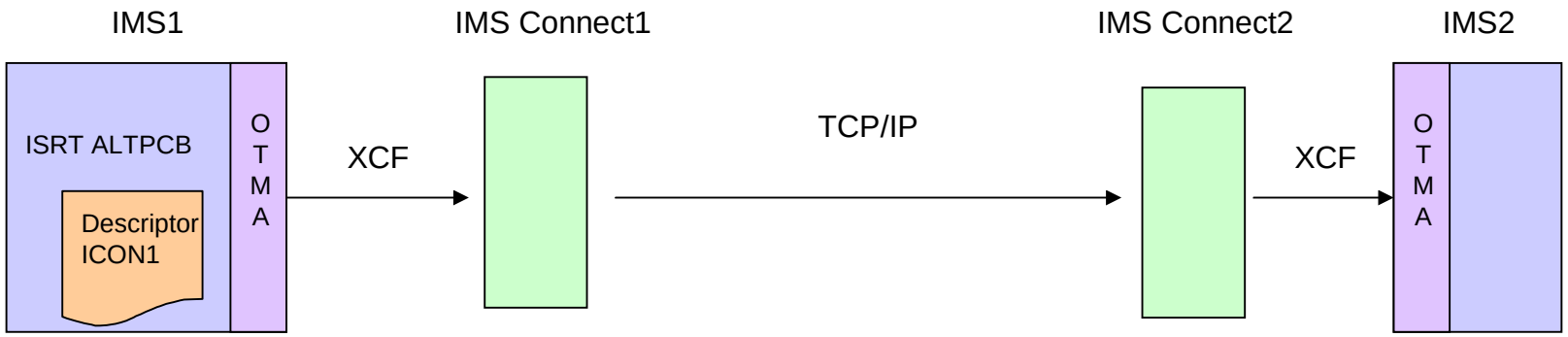
Open Transaction Manager Access (OTMA) TCP/IP Connection Enhancement

Solution

- OTMA can now send transaction messages from applications running in a dependent region across a one-way TCP/IP connection to another IMS system for processing
- OTMA destination descriptor has new parameters specified when a remote IMS is the TCP/IP destination for transaction messages

Value

- Enhances connectivity
- Removes need for an intermediate gateway between IMS systems
- Simplifies definition of remote IMS system as TCP/IP destination for OTMA transaction messages



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IMS Connect Enhancements

Solution

- QUERY and UPDATE command support for IMS Connect resources
- Ability to refresh XML converters for IMS SOAP Gateway without restarting IMS Connect
- Provide RACF Userid caching – reduces MIPS
- Return actual RACF return codes – more info for security errors
- Recorder Trace data capture – new trace points
- Commit Mode 0 (CM0) NoWait for ACK/NAK for RYO clients
- New READ client connection status
- Load modules for IMS-provided exits – no need to assemble/bind

Value

- Improve usability and availability for IMS Connect while providing better performance and diagnostics

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Enhanced APPC/OTMA Synchronous Shared Queues

Solution

- New capability removes the dependency on Resource Recovery Service (RRS) in a Shared Queues environment for
  - APPC synchronous conversations and OTMA CM1 (send-then-commit)
    - Applies only to SYNCLVL = NONE | CONFIRM
      - > SYNCLVL = SYNCPT still requires RRS
- Communications uses XCF services

Value

- Improve performance and simplify the syncpoint process
  - Due to IMS being the sync point manager rather than RRS

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IMS 12 Performance Highlights

- **Migration of existing workloads from IMS 11 to IMS 12**
  - Expect equivalent performance and CPU efficiency in some cases, and significant improvements in others, depending on the environment.
- **Single image Fast Path environment benchmark**
  - Over 46,000 transactions per second
- **APPC/OTMA Synchronous Shared Queues environments using XCF**
  - 40-50% ITR improvements (CPU efficiency) were observed compared with the same environments using Resource Recovery Services (RRS).
- **IMS Logger**
  - Logging rates over 350 MB/sec were achieved with 64-bit virtual buffering and Sequential Access Method (SAM) striping
  - Extended common service area (ECSA) savings with the use of 64-bit log buffers.
  - Workloads that are logging bandwidth constrained can significantly improve transaction throughput rates – IBM SVL testing observed gains of twice the throughput
  - Device response time reduced by up to 10% with the enhanced channel program for the IMS 12 WADS devices in comparison to IMS 11 WADS response time rates.
- **MSC TCP/IP**
  - Transaction rates over 10,500 transactions per second.

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IMS Explorer for Development

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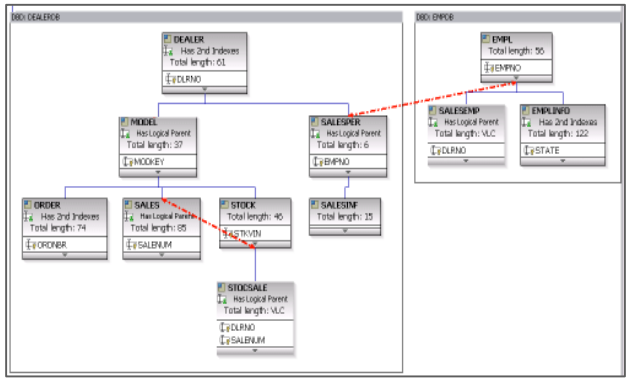
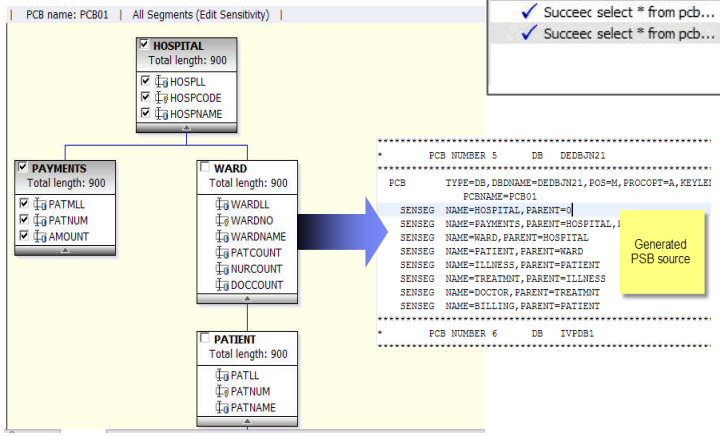
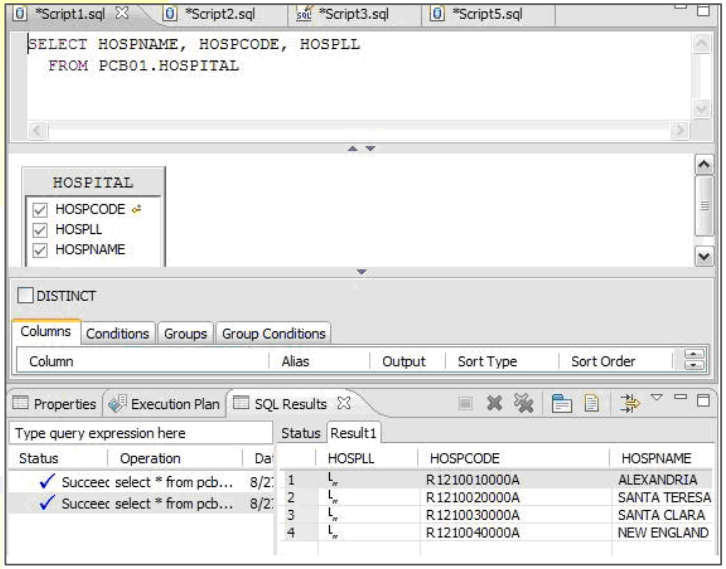
IMS Explorer for Development

IMS Enterprise Suite 2.1

- **Visualize IMS database structure as defined by DBD source**
- **Graphically-driven editors to display and update IMS program and database definitions**
- **Graphical interface to easily access and manipulate IMS data using standard SQL**
- **View your mainframe datasets**
- **Submit JCL and inspect output**







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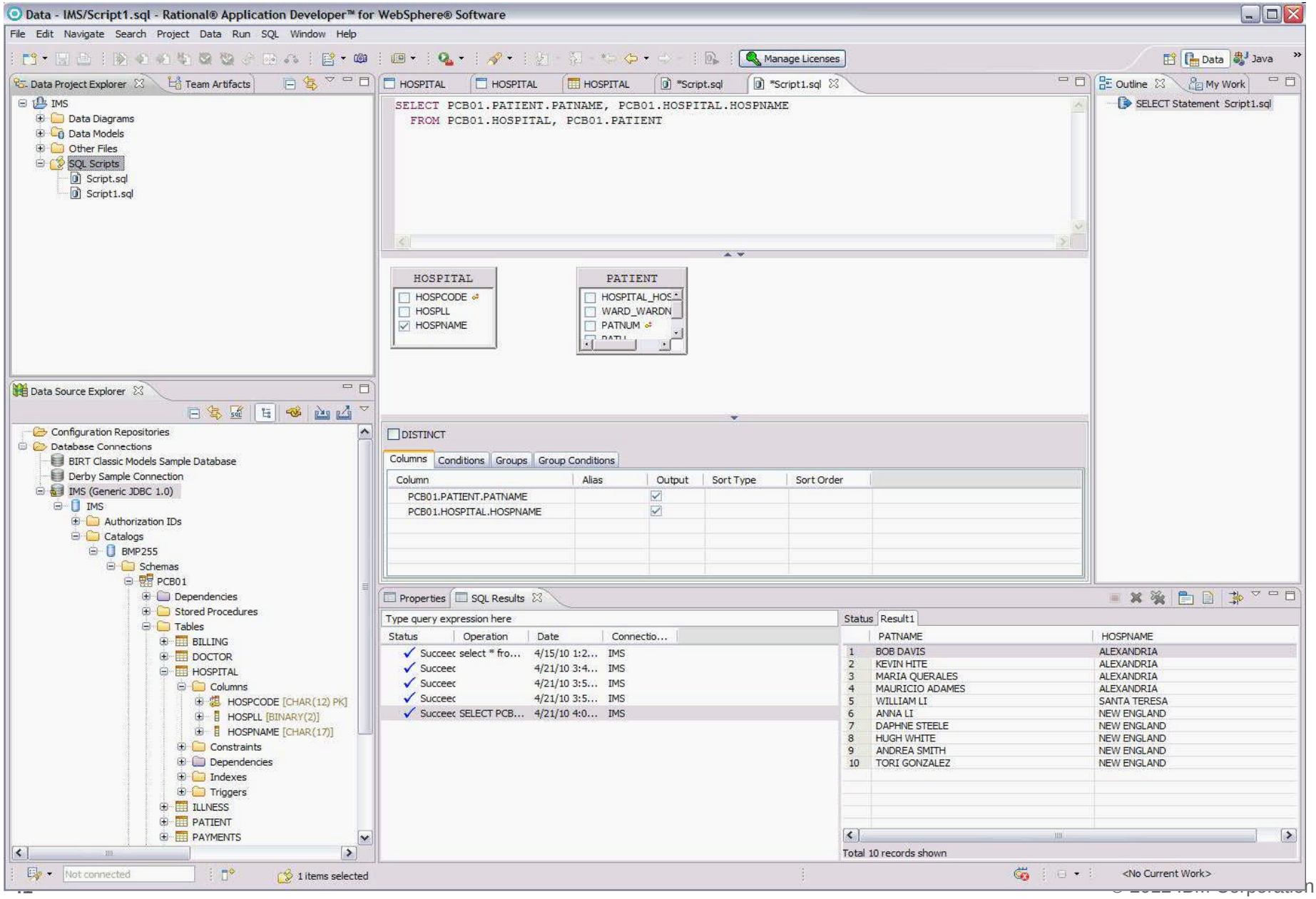

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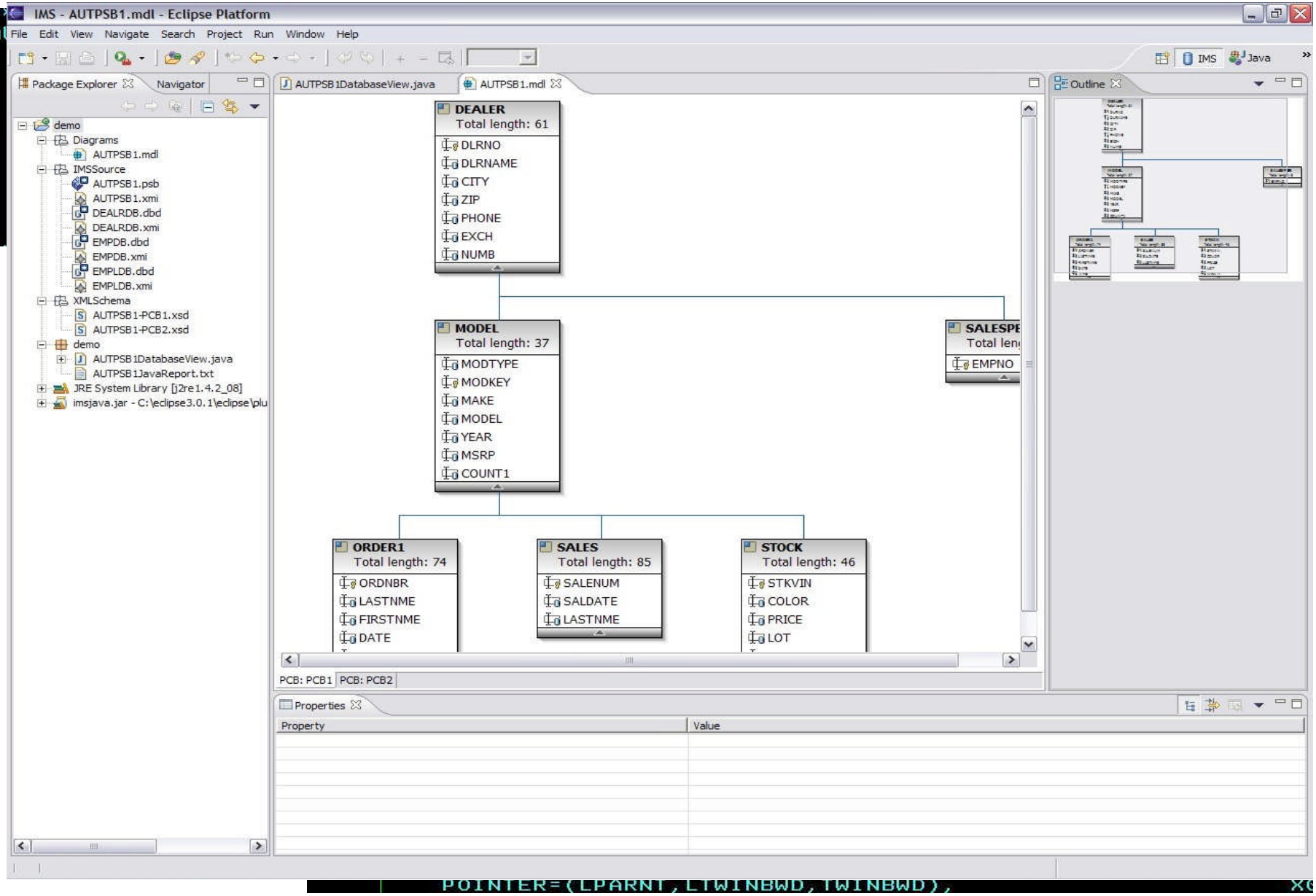

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Looking Ahead

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Continuing Areas of Focus

- Reduce Total Cost of Ownership
  - Reduce MIPS usage
  - Advance autonomics to make the system more self-managing and self-tuning
  - Simplify all aspects of using IMS to do more with less staff
- Extend the lead in availability, scalability and performance
  - Ensure IMS capacity limits are well beyond customer needs
  - Evolve dynamic definition for IMS to eliminate the need for IMS system generation
  - Expand Active-Active Environment and IMS Replication capabilities
- Application simplification and enablement
  - Increase support for application and database access to IMS through standard APIs: SQL, Web Services, JEE, Java, .NET
  - Improve ease of use for application development with graphical assist and centralized IMS metadata support
  - Enhance and simplify integration of IMS with other Web solutions, decision support solutions and other IBM products
- Enable high-volume transaction processing for next wave of applications
  - Enhance TCP/IP support
  - Continue investment in IMS Connect and IMS On Demand SOA solutions
    - IMS TM Resource Adapter (RA), IMS Universal Drivers, SOAP Gateway, etc.

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Summary

- **IMS continues to be a premier server with architected standard interfaces**
  - A messaging & transaction manager
  - A batch manager
  - A database manager
- **New products and tools from a variety of vendors provide access to IMS transactions and data**
- **Our goal is to position IMS as an integral part of the enterprise in the evolving business world through**
  - Addition of support for complementary standards surrounding IMS connectivity, data representation, and application development
  - Simplification of integration layers for transactional workload, batch workload and database access.

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Thank You

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