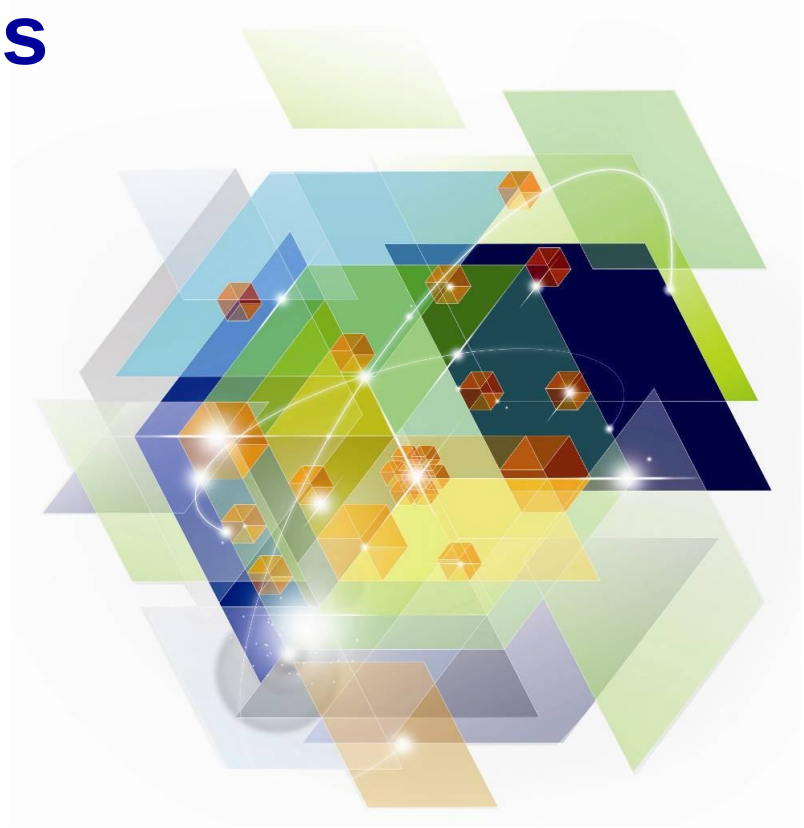
IMS Trends and Directions



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AGENDA

- What's New
- Trends and Focus Areas
- What Customers are doing with IMS now
- What's Next?

What's New

European IMS Architecture Team

- New team to focus on IMS as part of our customers' overall z architecture plans
- Similar to Americas ATS team
- Net new investment in IMS.
- France, UK, Spain, Germany, Nordics, Alps.
- Mission is to support IMS strategically as part of overall system z architecture

IMS China Lab Team Expanded

- Initial small team focused on technical support for IBM China and Taiwan IMS clients
- Some new development and QA projects started at CDL.
- Integrated team for IMS and IMS tools.
- Continuing to expand this team in 2011 with additional QA resource.

IMS Strengths

- ***Quality***
  - IMS has best customer sat in IBM SWG
  - PE (PTF in Error) rate halved over past 5 years.
  - Field Apar Rate improved consistently Version to Version
  - 6 customers in production on IMS 11 prior to GA, 4 of them full enterprise
  - 2 customers in production on IMS 12 now, several more targeting production prior to GA.

- ***Reliability***
  - IMS is running core business apps in most large global financial, insurance, manufacturing and telecommunications companies.
  - Many customers go years without an unplanned outage
  - In cases of hard downs (power outages etc) IMS recovers gracefully
  - High availability features (sysplex, Shared Message Queues, Data Sharing etc) tend to work as designed.
  - Data integrity problems very rare.

IMS Strengths

- ***Performance/Scalability***
  - Lab benchmark with single system IMS 12, z196 - **37,000 trans/sec Fastpath** application with database update and 30,000 simulated network clients!
  - With 3 IMS images, above benchmark achieved **61,000 trans/sec**!
  - Customers running >7500 trans/sec, 200M+ trans/day
  - DL/1 database extremely efficient, uses less DASD space and faster access than relational.
  - Continuous improvements in MIPS consumption, offload capabilities

- ***Modern***
  - IMS today is “open”, through industry standard interfaces.
  - Direct access to IMS transactions and data from distributed systems
  - Integrated with standard tooling, BI solutions, Web 2.0
  - Rich support for Java, SQL, .net
  - Sophisticated Web Services implementation with support for top down WSDL definition, Callout and advanced security.

Growth of the IMS Business

- **IMS runs CORE business apps**
  - ATM networks, core banking, bill of materials applications, auto/airline maintenance, insurance policy/claims.
  - Most companies already run IMS (or an alternative) for these applications!
- **New Customers**
  - Mergers and Acquisitions
  - New applications built on IMS – eg. T2S Securities project for EU
  - Consolidations of Transaction Managers
  - Upgrade from DL1/VSAM
  - Strong potential in emerging GEOs
    - 2 POCs being driven now in Russia for IMS TM/DB
- **Most growth is additional workload from existing customers**
  - IMS MIPS have doubled over last 5 years.
  - Over 50% of IMS customers grew transaction workload in 2010.
  - New applications and workloads onto IMS

永 亨 銀 行
WING HANG BANK

Stock Code 股份代號: 302

- 6th largest Bank in Hong Kong
- New IMS DB customer 2009
  - IMS DBCTL and CICS to manage transactions
- Over 50 branches and representative offices throughout Hong Kong, Macau and mainland China.
- The principal banking activities of the group in Hong Kong and Macau are retail banking, corporate banking, and foreign exchange and treasury services.
- Very happy with IMS!

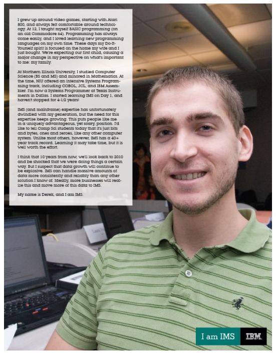
Target2 Securities

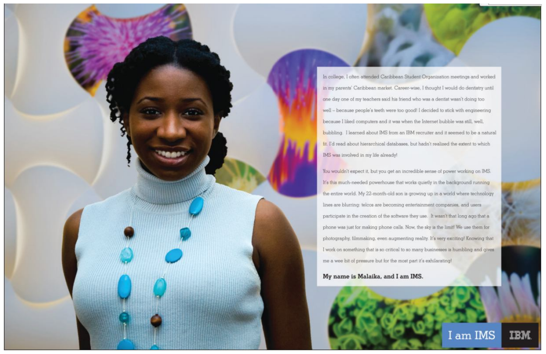
- Owned by Eurosystem
- State-of-the-art securities settlement platform for the European Union
- Will be a service offered to European central securities depositories (CSD)
- Standardized process for settling almost all heavily traded securities against the Euro
- Scheduled to be tested with CSDs January 2014, and available in Sept 2014.
- Development and future operation of T2S has been assigned to 4 National CSDs:
  - Deutsche Bundesbank, Banque de France, Banca d'Italia and Banco de España
- IMS has been selected as part of the platform on which T2S will be built.

New IMS Business Opportunities in Russia

- Russian companies just starting to centralize and look for automated enterprise systems.
- IBM Sales and BP actively working with 2 new clients for IMS POC.
- IMS Lab team in Moscow – Dev & QA
- Working with Bauman University to teach IMS
- Run several multi-customer IMS awareness events in Russia

Promoting the IMS Community





Il mio nome è Luigi, e io sono IMS. ***My name is Lars, and I am IMS.*** ***Mein Name ist Annedore, und ich bin IMS.***

YouTube

My developerWorks

I am IMS IBM

THINK IMS Facebook Community

IMS Newsletter

twitter
twitter.com/imsinfo

Free IMS Lab-Driven Offerings

- IMS Regional User Group Meetings
- IMS SOA Workshop
- IMS Database Workshop
- IMS AD COBOL Workshop
- IMS Business Value Assessment

2011 IMS Technical Conferences

Information OnDemand **2011**

The Premier Forum for Information & Analytics

October 23-27, 2011
Mandalay Bay, Las Vegas

Trends and Focus Areas

Cost Savings – “do more with less”

- **IMS – lowest cost per transaction DBMS**
- **IMS DB – less disk space and CPU**
- **25% CPU Reduction IMS Connect – V10**
- **FP 64 bit buffers – V11**
- **Transaction Expiration – V11**
- **Up to 25% CPU Reduction for OLR – V11**
- **zAAP offload for:**
  - Java Application Code in any dependent region
  - Java Dependent Region Resource Adapter
  - IMS Universal Drivers
  - IMS TM Resource Adapter
  - IMS DB Resource Adapter
  - IMS SOAP Gateway
  - XML Converter (some processing is offloadable)
- **zAAP on zIIP with z/OS 1.11**
- **Bucket for each new release with MIPS reduction items**

V12 MIPS Reduction Items

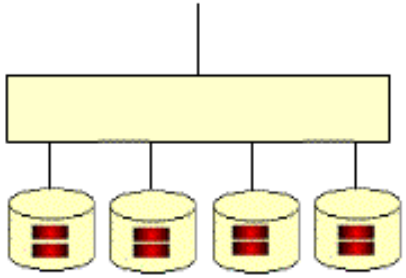
- RACF Userid Caching enhances performance and significantly reduces MIPs for RACF users
- Commit Mode 0 ACK NoWait for roll your own users eliminates need for receiving a timeout after the ACK, increasing throughput and reducing MIPs
- OTMA Access Control Environment Element enhancements provide a better security environment and reduce the ACEE storage needed to run IMS
- Shared queues users should see increased benefit by the elimination of RRS overhead for many OTMA and APPC transactions processed on a back end IMS.
- Storage for FF Database pools is now obtained in 31 bit virtual backed by 64-bit real storage, reducing the overhead MIPS for short term z/OS page fix and free.
- Full Function dynamic database buffer pools management would reduce the number of required I/Os and the system outage for change, thus reducing the mips required for this.
- Fast Path users can take advantage of additional 64-bit storage exploitation to reduce ECSA demand and reduce MIPS.
- Fast Path option to reduce type 99 logging, decreasing logging overhead, which reduces the MIPS required for logging.
- IMS 12 is also planning to provide a number of additional enhanced efficiency items across the product which would reduce internal IMS path length and reduce overhead and thus cost per transaction.

IMS 12 Logger Enhancements

IMS logger enhanced to support Extended Format Data Sets

- Online Log Data Set
- System Log Data Set

Allows use of Striping to dramatically increase bandwidth and improve volume of logging



Could DOUBLE online throughput and reduce batch window

64-bit log buffers

- ECSA Virtual Storage Constraint Relief
- Improved performance for DEDB
- Requires Extended Format Data Sets

Write Ahead Data Set (WADS)

- WADS Channel Program rewritten
- Increased efficiency
- Simplifies WADS Data Set Size calculation
- 11% improvement on WADS device response time vs V11

Improved Resiliency

Increased ability to absorb spikes in workload with existing hardware

Application Modernization

- **Outdated “green screen” applications written in 1970-1980’s**
  - Impossible to maintain
  - Heavily batch oriented
- **Many customers looking at how to modernize these applications**
  - Renovate vs replace
  - Many large IMS customers have application modernization projects ongoing

- **Today’s IMS technology makes a compelling case for modernization with IMS**
  - Web based access, Web services, re-use of existing, working assets
  - Open technology, connectivity to distributed systems
  - Support of industry standard interfaces, JDBC, XML, J2EE, SQL, Java
  - High performance, availability

Business Challenge

Scotiabank

❖ *Scotiabank had several objectives focused on enterprise modernization: eliminate costs associated with IBM Communication Servers and SNA LUs; significantly reduce proprietary transaction chaining; improve business function response times and transaction performance; and position IMS applications as first-class players in enterprise SOA solutions.*

Solutions

❖*IMS Connect and IMS commit processing (CM1)*

❖*WebSphere Java applications access IMS using the IMS TM Resource Adapter*

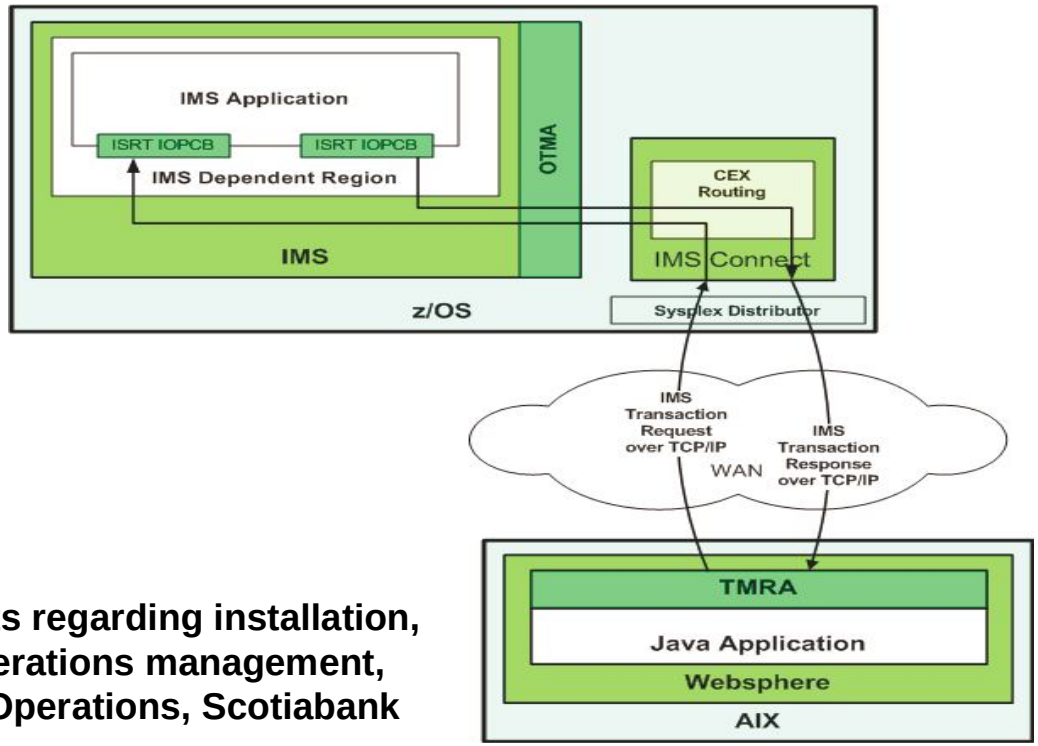
❖*IMS TM Resource Adapter implements sophisticated connection pooling for support of persistent socket connections*

❖*IMS Connect and TM Resource Adapter support SSL, allowing for Client and Server-side certificate-based SSL connections.*

❖*Execute various operational scenarios including planned and unplanned "downs" for the network, IMS, IMS Connect, and IMS dependent regions*

Benefits

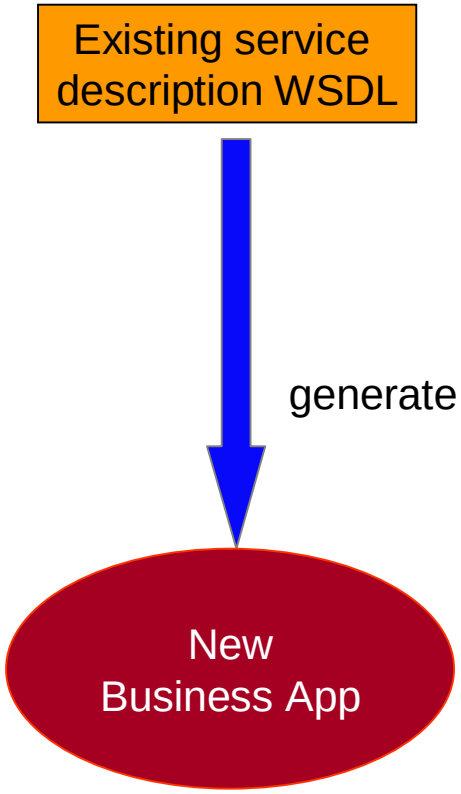
❖ *MIPS utilization, response times, switchover/failover and recovery, and mid-tier metrics all tested to expectations.*



"We are extremely pleased with the results regarding installation, configuration, tuning, new processes, operations management, and security management." Craig Oddy, Operations, Scotiabank

Top Down Web Services

- **“WSDL first” approach**
  - Implies new application workload
  - Tooling to generate PL/1 or COBOL code
- **A top-down approach is required to map complex XML data structures, including unbounded arrays and strings to PL/I and COBOL**
- **Both inbound and outbound requests**
- **SOAP Gateway**
  - Orders of magnitude improvements in performance, security
  - Lightweight SOAP connectivity with no need for Java EE server
- **TM Resource Adapter with WebSphere**
- **Becoming increasingly popular with large IMS customers**
  - Several joint development/POC projects underway



Enable New workloads.

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*

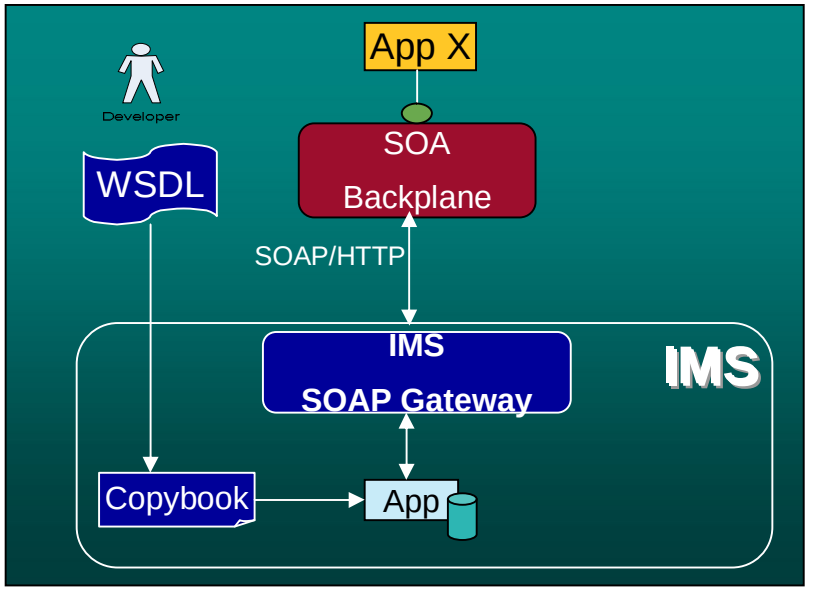
❖*A top-down approach is required to map complex XML data structures, including unbounded arrays and strings to PL/I*

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

❖*First Wed Services now successfully in production!*

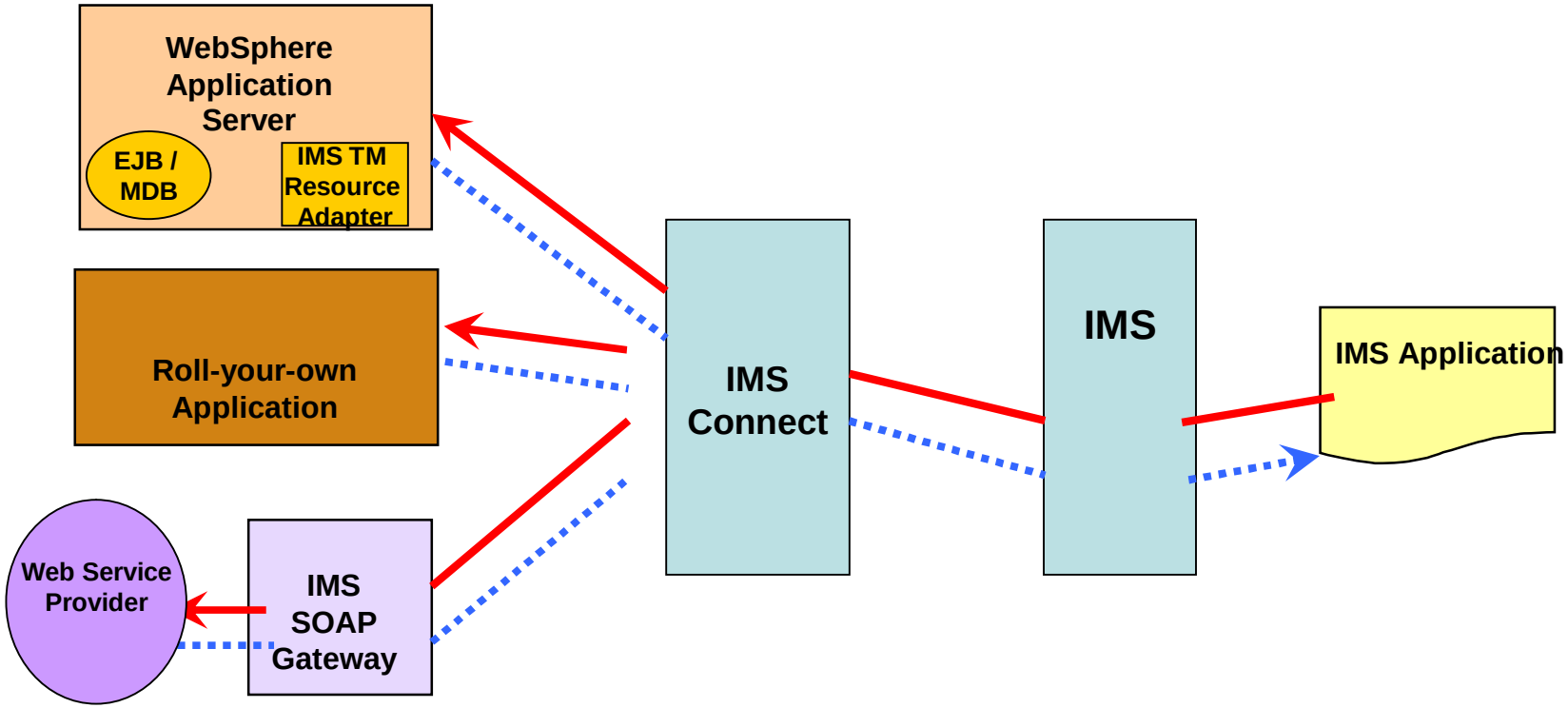
Benefits

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



Synchronous Callout

- **Ability to go outbound from an IMS application program to retrieve data from another program or platform, then resume processing**
  - Eg. Sales tax, stock price, interest rate….
- **Tremendous customer interest and demand for Callout specific workshops.**



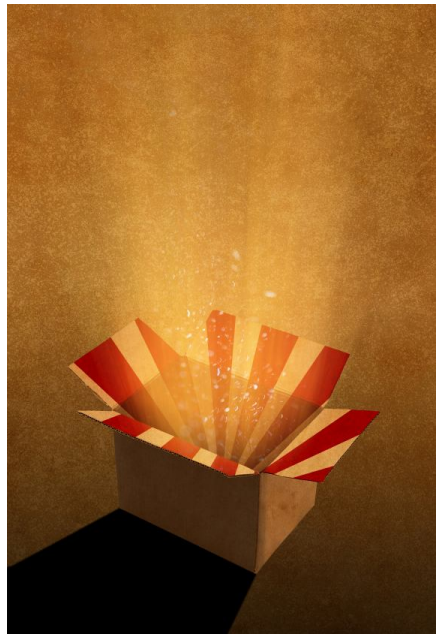
IMS Callout

- **Enable IMS applications as clients or Web Service requesters**
  - Interoperate with business logic outside the IMS environment
  - Callout to Java EE apps and Web Services using WebSphere Application Server and IMS TM Resource Adapter
  - Callout to Web services providers (e.g. Microsoft .NET) using IMS SOAP Gateway
- **IMS 10: Asynchronous Callout**
  - IMS application invokes external applications without waiting for response Response can be received by another IMS application
- **IMS 10 SPE: Synchronous Callout**
  - IMS application invokes external application and synchronously waits for the response – new DL/1 call ICAL.
- **IMS 11: Dynamic Change for OTMA Descriptors**
  - Can roll out new application changes without an IMS outage

Distributed Access to IMS Data

- IMS Open Database offers access to IMS database resources anywhere in the IMSplex *directly* from z/OS and distributed environments
  - Using *industry standard* Distributed Relational Database Architecture (DRDA) to communicate with IMS Connect

    IMS Universal DB Resource Adapter - to take advantage of Java Platform, Enterprise Edition (J2EE) platform services, JCA 1.5
    IMS Universal JDBC driver - to make SQL calls that directly access your IMS data
    IMS Universal DL/I driver - to issue calls that are similar to DL/I directly to IMS from Java
    RYO - Use a programming language of your choice to issue DRDA commands directly to IMS Connect



  - IMS Connect becomes the gateway to IMS Transactions ***and*** IMS Data
- *Makes Application development and Connectivity much simpler!*

CATERPILLAR®

Business Challenge

❖ *Connect IMS applications with distributed applications tracking manufacturing materials across the enterprise, to maintain the currency of data in both systems.*

Solutions

❖*Implement the IMS SOAP Gateway on z/OS.*

❖*Implement both asynchronous and synchronous Callout from IMS programs.*

❖*Implement IMS V11 With ODBM*

Benefits

❖ *Data for tracking materials is updated between systems allowing better control of inventory and eliminating waste.*

- ***"IMS "Callout", ODBM, and the SOAP Gateway allow us to keep data in distributed systems in "sync" with that in the legacy IMS systems, helping maintain inventory control."***

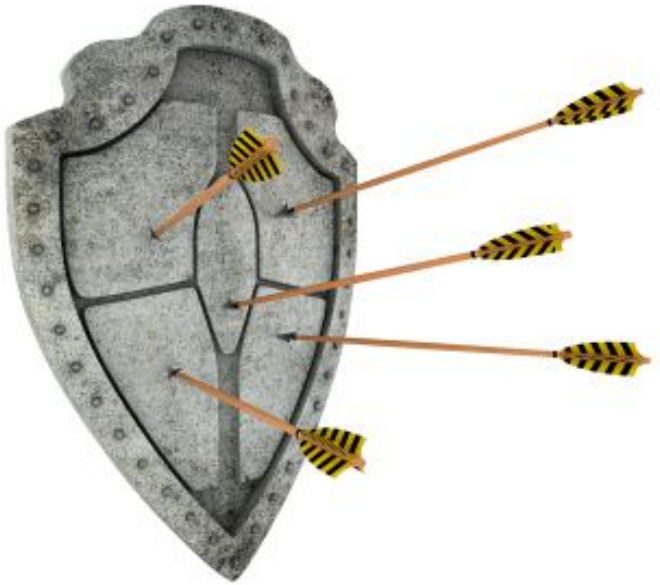
  Steve Clanton
  IT Transactional Services, Caterpillar Inc.

Consolidation

- **Mergers and Acquisitions**
  - Run workloads side by side or
  - Integrate workloads
- **Datacenter consolidations**
  - Double throughput requirements

- **Result: higher workload on existing machines**
- **IMS is “gold standard” for high performance, scalability**
  - 29,000 trans/sec lab benchmark on IMS 11/z10 with DB update
- **MSC Bandwidth Improvements – IMS 10**
- **FastPath 64 bit buffering – IMS 11**
  - 80% of FP buffers can be moved to 64 bit
- **Extended Address Volumes for non-VSAM data sets – IMS 12**

Resiliency

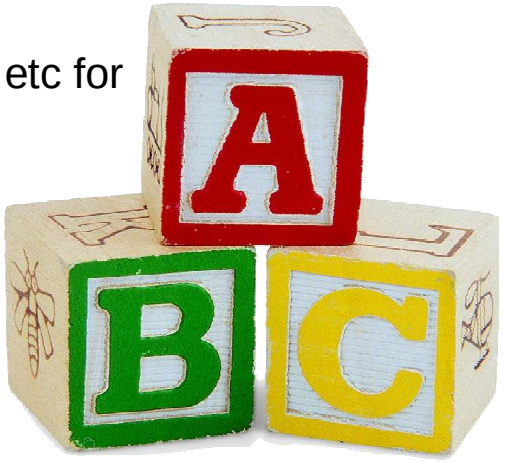


- **Prevent IMS outages due to external factors**
  - Failures of other system components
  - Environmental impacts
- **“Bulletproof” System Recoverability**
  - Smooth restarts with no data loss
  - Successful failover options
- **Focus on outage prevention**
  - Synchronization with hardware, microcode, middleware
  - Improved end-to-end testing
- **Dedicated IMS RAS team focusing on IMS “self healing” and recoverability**
- **Recent experiences – hundreds of distributed servers vs IMS**

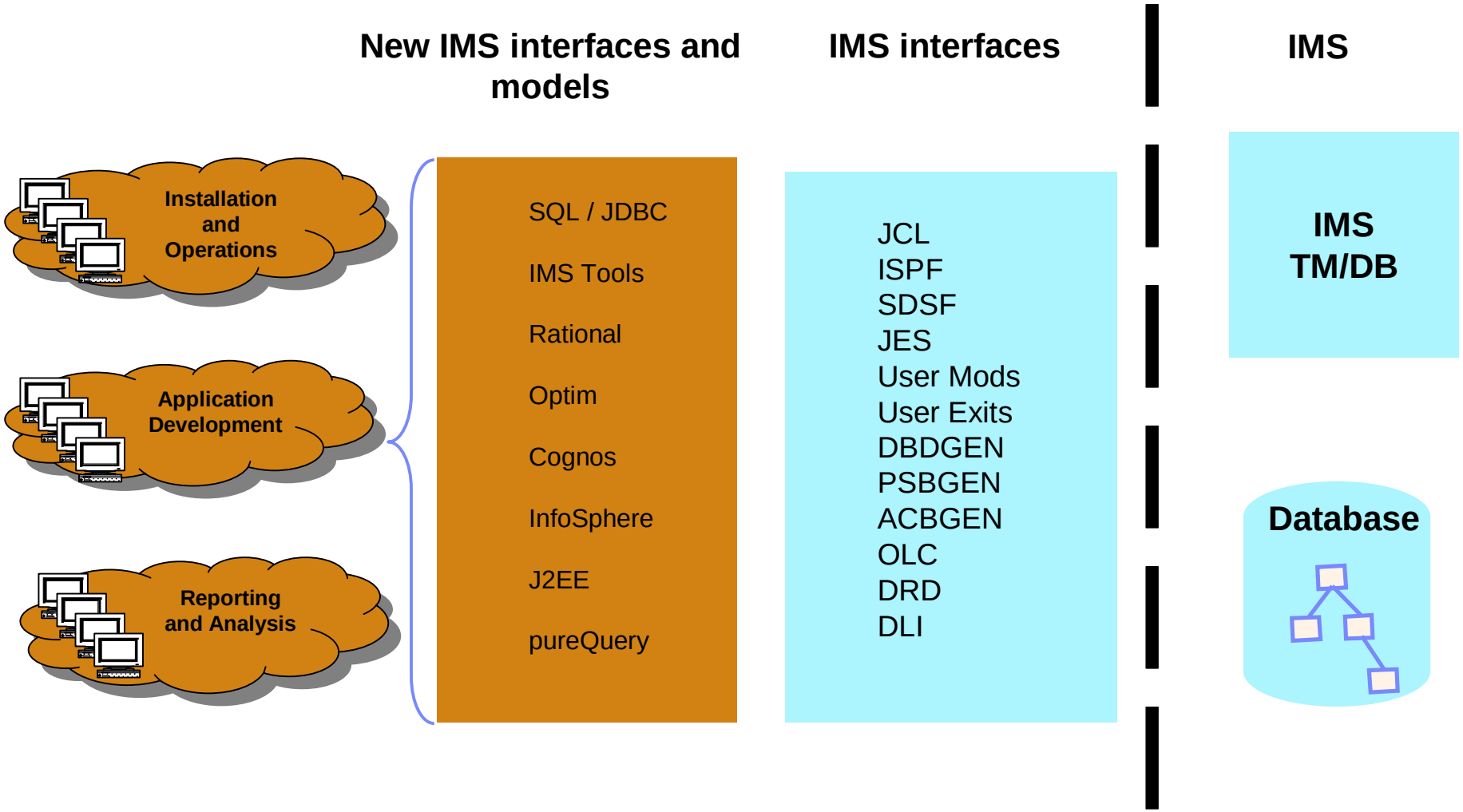
Resilience: the ability to bounce back from and successfully adapt to adversity

IMS Simplification

- **More intuitive UIs and interfaces to talk to IMS**
  - Eclipse based tooling for Application Development
  - SQL support from Java with Open Database – IMS 11
  - More consistency with z/OS, CICS, DB2, Omegamon for IMS etc for Operational Interfaces
- **Reduction of planned outages and manual tuning**
  - Online Reorganization – IMS 9
  - Dynamic Resource Definition – IMS 10
  - Database Quiesce – IMS 11
  - Dynamic allocation of ACBLIB data sets – IMS 11
  - Dynamic Database Buffer Pools – IMS 12
- **Help address the IMS skills availability issues**
  - Use industry available Systems Admin and AD skills



IMS Simplification Strategy

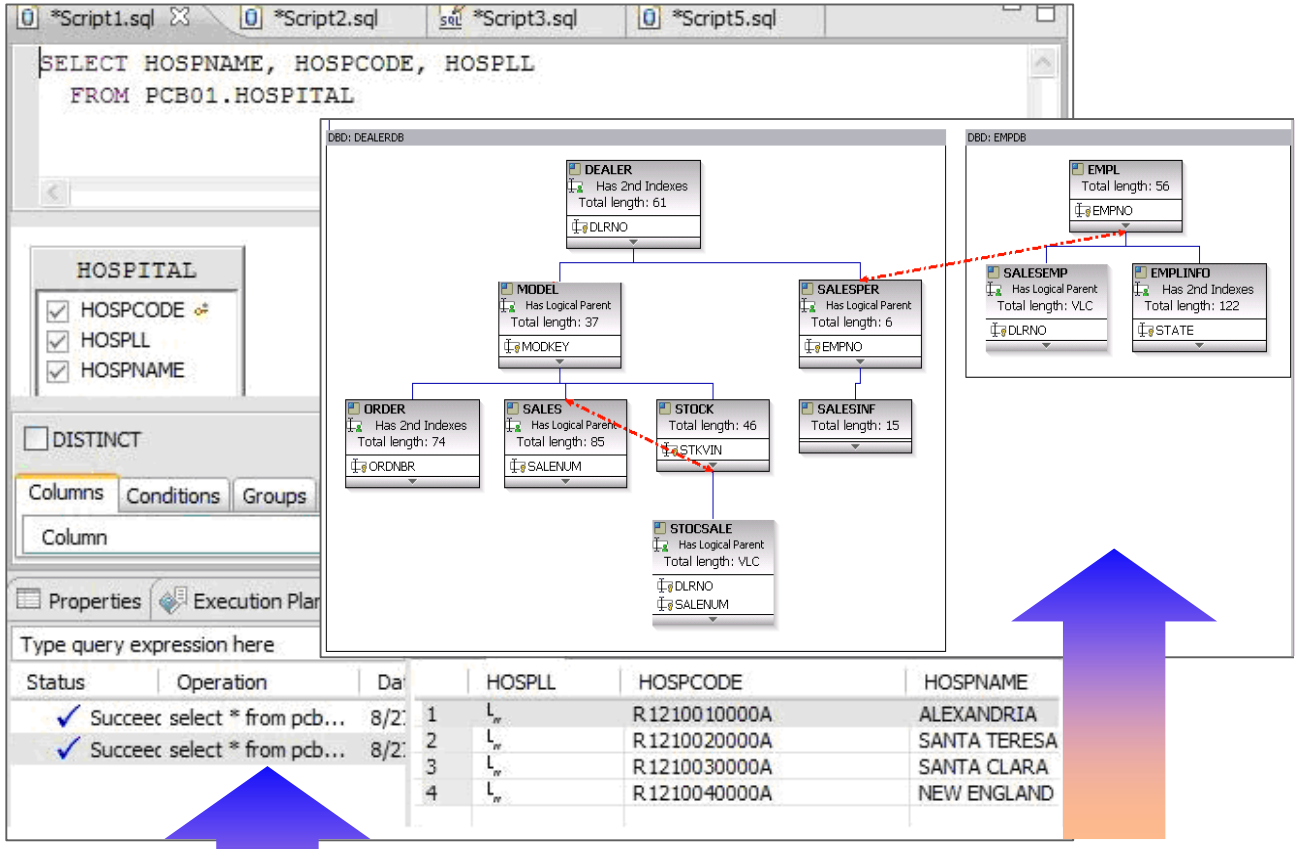


Reduce the need for special, in-depth IMS skills

IMS Explorer…Simplifying IMS application development !

Graphically-driven editors to display and update IMS program and database definitions

Graphical interface to easily access and manipulate IMS data using standard SQL



Generate SQL to access IMS data

See database relationships Change DBD and PSB definitions

Rapid IMS Application Development

- **Extending IMS Application Development to Business Analysts**
  - Make decisions based on up-to-the-minute data
- **Business Rules**
  - ILOG BRMS support – code generation
- **Mashups**
  - IMS Web 2.0 Solutions for Mashup Center
  - Available in V10 for IMS TM feeds, IMS 11 for IMS Data feeds
  - Ability to easily integrate multiple RESTful services, widgets, data
- **COGNOS**
  - Real time query of IMS data
  - Business analyst with no IMS skill can make decisions based on data supplied by IMS

Infrastructure Investment for the Future

- **Parallel RECON access – IMS 10**
- **VSCR – items in each version**
  - 24 bit to 31 bit CSA/private
  - CSA to private
  - 31 bit ECSA to 64 bit
- **Repository – IMS 12**
- **WADS/logger re-write – IMS 12**
  - More efficient, better performance
- **MSC over TCP/IP – IMS 12**
  - New kind of MSC link, measured nearly 11K trans/sec!
- **Connect to Connect – IMS 12**
  - Next extension of connectivity between IMS systems

What's Next

Future Considerations

- **IMS Database revitalization**
  - Dynamic sizing of DB fields
  - Eliminate unload/reload
  - Store new types of data
- **Elimination of gens and planned outages**
- **Continue focus on Usability & Simplification**
  - Expanded SQL support – COBOL, PL1
  - Web based GUI for operational access
- **Catalog for storing IMS DB metadata and artifacts**
- **Direct access from .NET, other distributed platforms**
- **Huge emphasis on cost savings – lower CPU, offload**