

Extending Your Mainframe for More Business Value

Deliver Business Insight with a Data Warehouse on System z

Get More Business Results Out of Your Data

Our branch offices have separate databases.
Each branch is analyzing customers and sales on their own.



**Service Oriented Finance
Marketing**

Looking at data in isolation can miss larger trends and opportunities



IBM

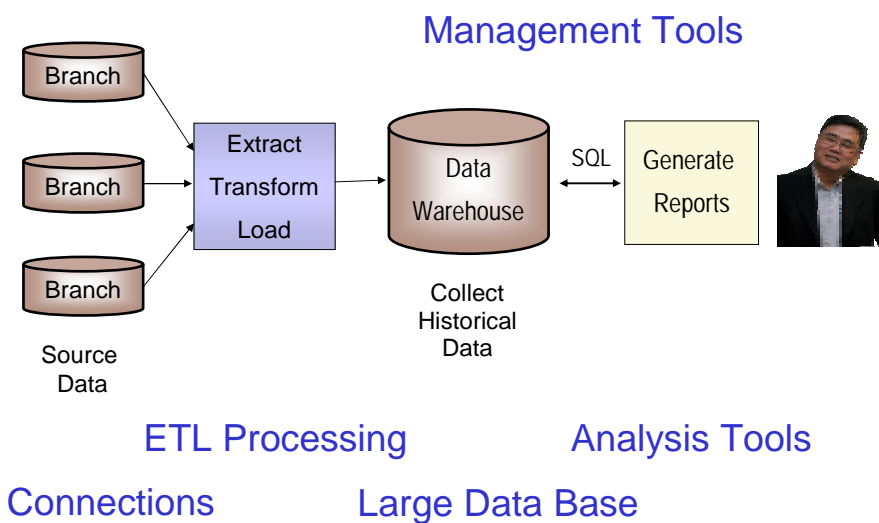
Service Oriented Finance Needs a Data Warehouse to Make Optimal Business Decisions

- Each branch is responsible for its own marketing campaign
- Corporate marketing gets reports from each of the branches based on local results
- Corporate marketing needs to spot trends to know what campaigns are most effective region-wide
- A corporate data warehouse would give marketing the data to easily do comparisons between the branches and promote best practices

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Mainframe Extension Solution – Deliver Business Insight with a Data Warehouse



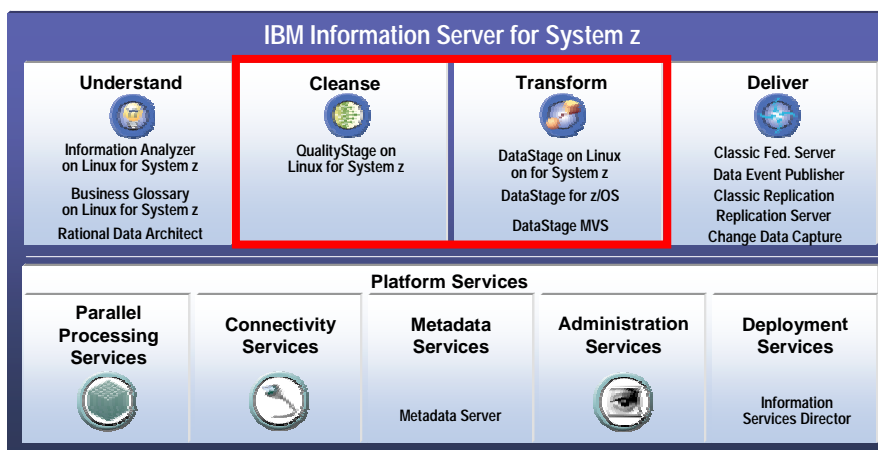
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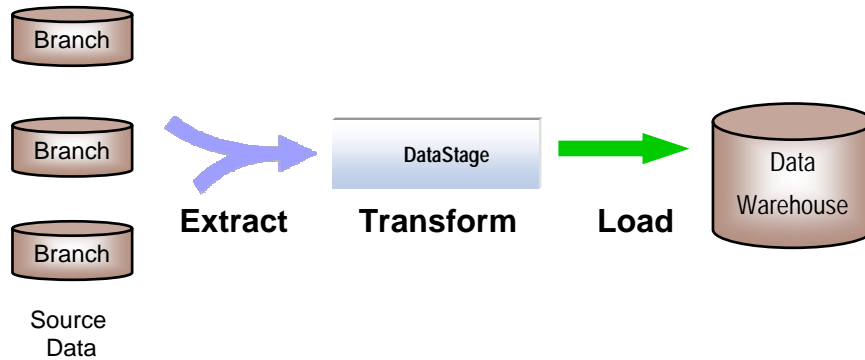
Data Warehouse Capabilities on System z

- Large Capacity Data Base
 - ▶ **DB2 for z/OS**
 - ▶ Parallel queries, Materialized Query Table, Star Join Enhancements
- Connect, Extract, Transform and Load
 - ▶ **IBM Information Server For System z**
 - ▶ Runs on zLinux (DataStage also runs on z/OS)
- Analysis Tools
 - ▶ **DataQuant**
 - ▶ Other tools (QMF, Alphablox, Hyperion, Business Objects, SAS, IBI)
- Performance Monitoring
 - ▶ IBM Tivoli Omegamon XE for DB2 Performance Expert on z/OS
- Security and Compliance
 - ▶ DB2 Data Archive Expert, DB2 Test Database Generator, DB2 Audit Manager Expert, IBM Encryption for DB2 and IMS Databases

IBM Information Server for System z Can Load Your Data Warehouse



Load Your Data Warehouse with DataStage



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Data Stage Transforms Data on the Fly

Different field names
 Different field order
 Add Branch Identifier
 Different currency format



PROD ID	CUST ID	BRANCH ID	QTY	AMT	SALEDATE
000 101	100	01	01	10,000.00	2007-02-28
000 121	100	01	03	500.50	2007-02-28
000 101	101	01	01	20,000.00	2007-03-01

Data Warehouse



Transform

PRODUCT	QTY	CUSTNO	AMOUNT	DATE

Branch Data

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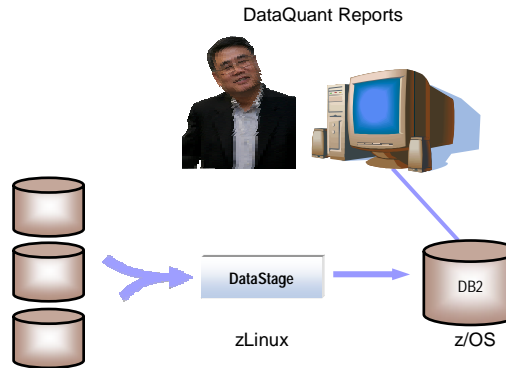
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DEMO: Extract, Transform, Load

Use DataStage to load sales and customer data from a branch into your data warehouse

- ▶ ODBC (Input) – Branch Sales info from SQL Server
- ▶ DB2 (Update) – Corporate Sales Warehouse

Show how built-in stages make it easy to handle transformation and aggregations



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BlueCross BlueShield of Tennessee

Challenge

- In order to compete effectively for new business in the complex healthcare market, BCBST needed to differentiate itself from competitors with targeted offerings
- They needed a single view of information across their multiple LOBs with business intelligence capabilities

Solution

- BCBST is using **IBM Information Server** with **IBM DB2** to profile, transform, and load data to their enterprise data warehouse
- The solution also provides intelligent search capabilities for unstructured data using IBM OmniFind and IBM DB2 Content Manager



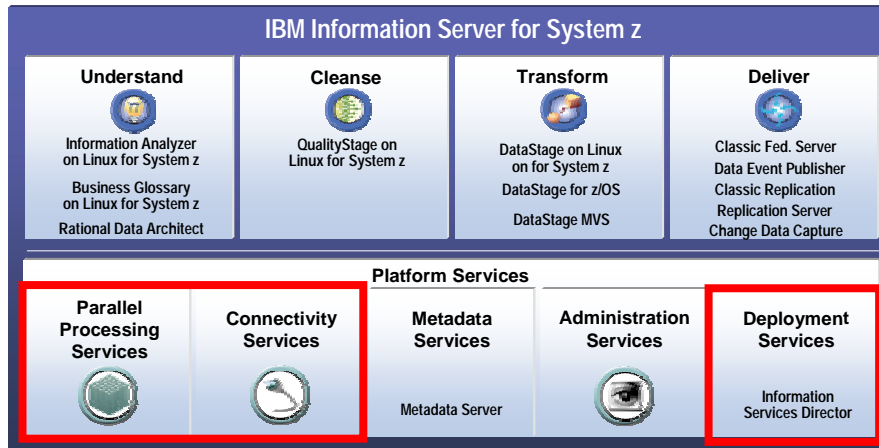
Business Benefits

- Improved customer and provider satisfaction by enabling them to run their own analytics and better manage their healthcare costs.

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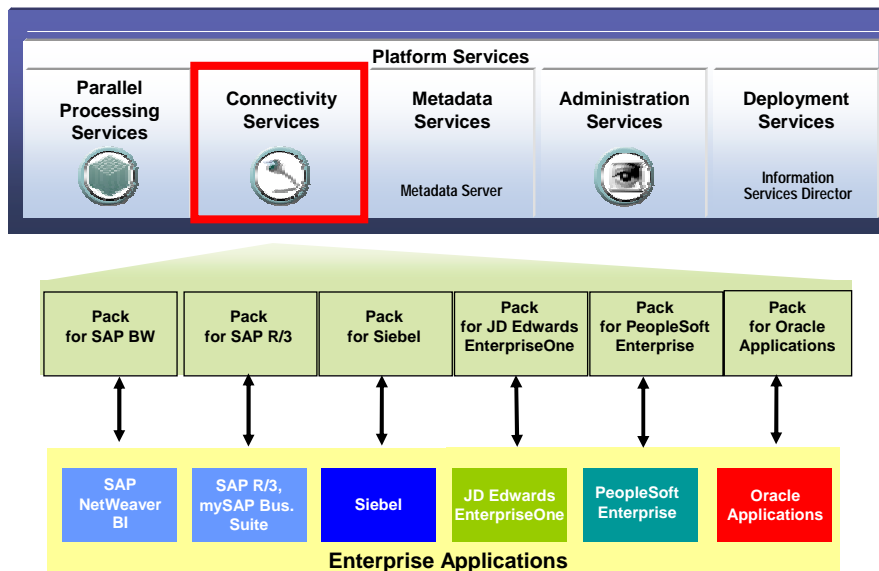
IBM Information Server for System z Has Connectivity and Scalability Suitable for the Large Enterprise



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Data From 3rd Party Systems Can Be Integrated Using Connectivity Services



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IBM Information Server Connects to Almost All Sources of Data

RDBMS

DB2 (on Z, I, P or X series)
 Oracle
 Informix (IDS and XPS)
 Ingres
 MySQL
 Netezza
 Progress
 RDB
 RedBrick
 SQL/DS
 SQL Server
 Sybase (ASE and IQ)
 Teradata
 Universe
 UniData
 NonStopSQL
 And more.....



General Access

Sequential File
 Complex Flat File
 File / Data Sets
 Named Pipe
 FTP
 Compressed / Encoded Data
 External Command Call
 Parallel/wrapped 3rd party apps
 EMC InfoMover
 Web logs
 Unstructured: e-mail, docs, etc.
 Content Management Systems
 Life Sciences



Standards and Real Time

WebSphere MQ
 Java Messaging Services (JMS)
 Java
 XML and XSL-T
 EBXML
 Web Services (SOAP)
 Enterprise Java Beans (EJB)
 EDI
 FIX
 SWIFT
 HIPAA



Enterprise Applications

JDE/PeopleSoft EnterpriseOne
 Oracle Applications
 PeopleSoft Enterprise
 SAS
 SAP R/3 and BI
 SAP XI
 Siebel
 JDA
 Ariba
 Manugistics
 I2
 And more...



CDC / Replication

DB2 (on Z, I, P, X series)
 Oracle
 SQL Server
 Sybase
 Informix
 IMS
 VSAM
 ADABAS
 IDMS
 NonStopSQL
 Enscribe

Legacy

Allbase/SQL
 C-ISAM
 D-ISAM
 Datacom/DB
 DS Mumps
 Enscribe
 Essbase
 FOCUS
 IDMS/SQL
 ImageSQL
 Infoman
 KSAM
 M204
 MS Analysis
 Nomad
 Nucleus
 RMS S2000
 Supra
 TOTAL
 TurboImage
 Unify
 And many more....



Remove Erroneous Data Before It Gets Into the Warehouse

DataStage can Extract, Transform, and Load data into your data warehouse.

But we need to make sure the data is clean.



IBM

Why Should I Care About Cleansing Information?

- **Lack of data standards**
 - ▶ Different formats and structures across different systems
- **Data surprises in individual fields**
 - ▶ Data misplaced in the data base
- **Information buried in free-form fields**
- **Data myopia**
 - ▶ Lack of consistent identifiers inhibit a single view
- **The redundancy nightmare**
 - ▶ Duplicate records with a lack of standards

```
Kate A. Roberts 416 Columbus Ave #2, Boston, Mass 02116
```

```
Catherine Roberts Four sixteen Columbus APT2, Boston, MA 02116
```

```
Mrs. K. Roberts 416 Columbus Suite #2, Suffolk County 02116
```

Name	Tax ID	Telephone
J. Smith DBA Lime Cons.	228-02-1975	6173380300
Williams & Co. C/O Bill	025-37-1888	415-392-2000
1st Natl Provident	34-2671434	3380321
HP 15 State St.	508-466-1200	Orlando

```
WING ASSY DRILL 4 HOLE USE 5J868A HEXBOLT 1/4 INCH
WING ASSEMBY, USE 5J868-A HEX BOLT .25" - DRILL FOUR HOLES
USE 4 5J868A BOLTS (HEX .25) - DRILL HOLES FOR HA ON WING ASSEM
RUDDER, TAP 6 WHOLES, SECURE W/KL2301 RIVETS (10 CM)
```

```
19-84-103 RS232 Cable 6' M-F Cands
```

```
CS-89641 6 ft. Cable Male-F, RS232 #87951
```

```
C&SUCH6 Male/Female 25 PIN 6 Foot Cable
```

90328574	IBM	187 N.PK. Str. Salem NH 04156
90328575	I.B.M. Inc.	187 N.PK. St. Salem NH 04156
90238495	Int. Bus. Machines	187 No. Park St Salem NH 04156
90233479	International Bus. M.	187 Park Ave Salem NH 04156
90233489	Inter-Nation Consults	15 Main Street Andover MA 02341
90345672	I.B. Manufacturing	Park Blvd. Boston MA 04106

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QualityStage Fixes Data Quality and Consistency

- Ensures clean, standardized information
 - ▶ Eliminates duplications
 - ▶ Matches against reference data
- Supports global postal address verification
- Provides visual tools for designing quality rules and matching logic
- Integrated with DataStage (one platform, one user interface)
- Data quality processes can be deployed within extract, transform, and load (ETL) jobs logic or separately as shared data quality services (SOA)



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Two Methods to Decide a Match

Are these two records a match?

WILLIAM J	HOLDEN	128	MAIN	ST	02111	12/8/62		
WILLIAM JOHN	HOLDEN	128	MAINE	AVE	02110	12/8/62		
B	B	A	A	B	D	B	A	= BBAABDBA
+5	+2	+20	+3	+4	-1	+7	+9	= +49

Deterministic Decisions Tables:

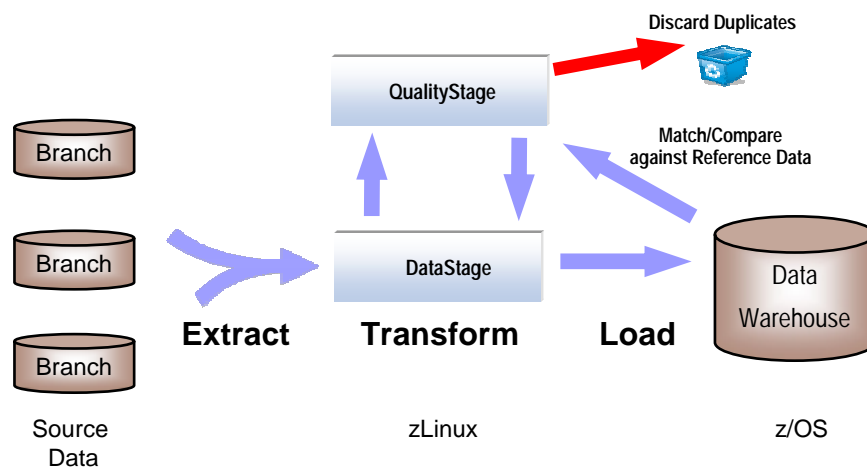
- ▶ Fields are compared
- ▶ Letter grade assigned
- ▶ Combined letter grades are compared to a vendor delivered file
- ▶ Result: Match; Fail; Suspect

Probabilistic Record Linkage:

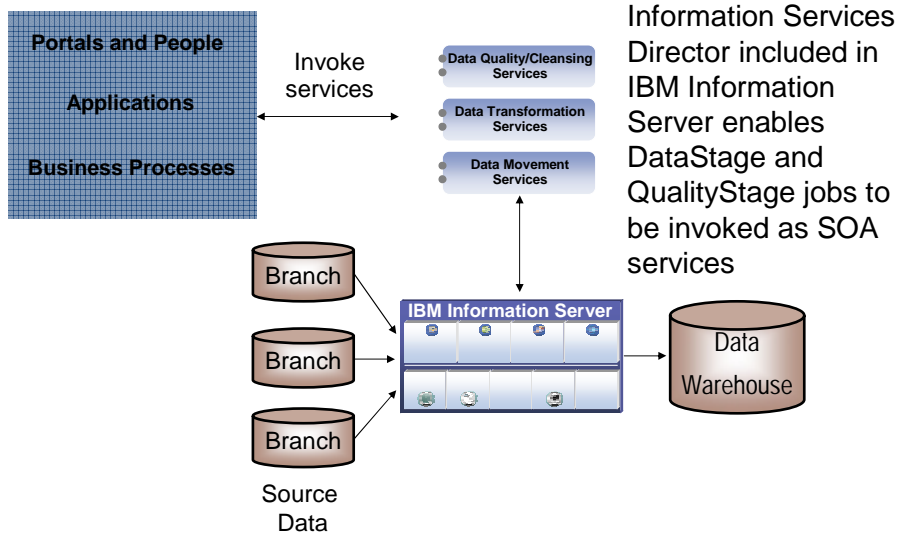
- ▶ Fields are evaluated for degree-of-match
- ▶ Weight assigned: represents the "information content" by value
- ▶ Weights are summed to derived a total score
- ▶ Result: Statistical probability of a match

Better Accuracy

Add QualityStage to Cleanse the Data



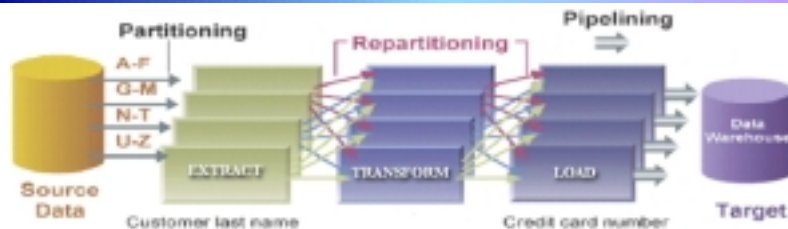
IBM Information Server Exposes Jobs as SOA Services



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DataStage and QualityStage Utilize Parallel Processing Services for Extreme Scalability



- Provides automatic dynamic data partitioning, repartitioning, and pipelining for optimal parallel performance
- Design integration processes without concern about underlying hardware architecture or number of processors
 - ▶ Resources defined in a separate configuration file
 - ▶ Allows easy expansion to new hardware
- Benefits from processing capacity, I/O capacity, and Hipersockets on System z

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IBM Beats the Competition in Data Warehouse Solutions

IBM



- Integrated data services platform
- Extensive connectivity
- Enterprise scalability
- Easily expose jobs as services

Oracle



- Two separate un-integrated products
- Warehouse Builder can only load Oracle databases
- Oracle Data Integrator (used to be Sunopsis) has no data quality capabilities
- Coding required to expose jobs as services

Microsoft



- Data quality limited to "Fuzzy Search" and MS SQL only
- Limited connectivity and limited support for non-Microsoft
- Lacks enterprise scalability
- Coding required to expose jobs as services

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Service Oriented Finance Wants a *Dynamic* Data Warehouse

Our data is updated frequently,
We need the data in our data warehouse to be more current

Data Event Publisher together with Information Server can "trickle feed" data into your data warehouse as it changes

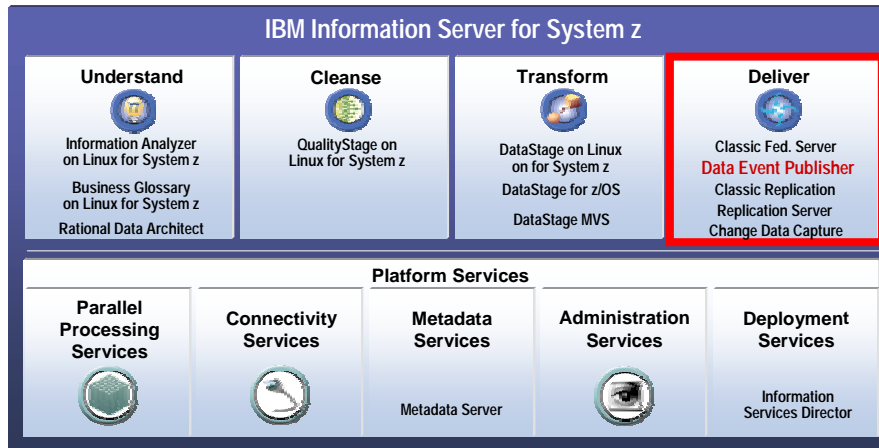


IBM

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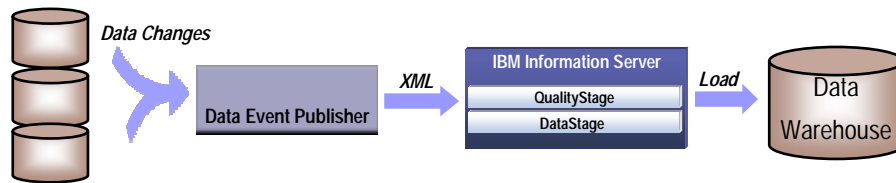
IBM Information Server for System z Can Provide Near Real-Time Data Movement



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Data Event Publisher



- Event is triggered automatically by a change in the data
 - ▶ Monitors DB2 log file for data changes
 - ▶ Sends XML message with data changes
- XML message can initiate a business process
 - ▶ Example: After \$10,000 in sales, a service request is sent to WebSphere Information Services Director, invoking a DataStage job to load sales data for analysis
- Automates the process of loading the data warehouse
 - ▶ Improves the currency of data in the data warehouse
 - ▶ Alternative to statically scheduled updates - which can lead to stale data and lost opportunities

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Where Should We Deploy This Solution?

Capability is important, but cost is a big concern for us



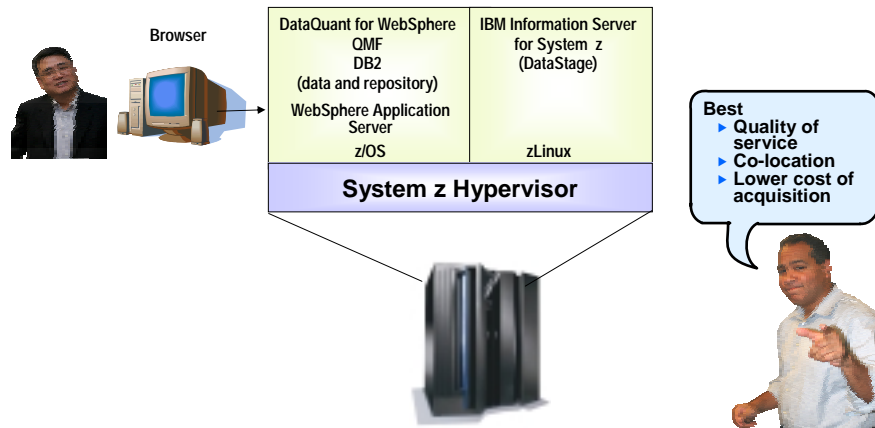
CIO

Deploying this solution on your System z will cost less than Oracle on distributed



IBM

Mainframe Extension Solution – Deliver Business Insight with a Data Warehouse



Storage Costs: DB2 Provides More Storage Savings than Oracle

- DB2 for z/OS lowers TCO by reducing storage needed
 - ▶ TPC-H Benchmark: DB2 compression of 59% vs 29% for Oracle RAC
- Storage savings with DB2 vs. Oracle for a 10 TB data base

	Oracle	DB2 for z/OS*
Storage System	HP Enterprise Virtual Array 8100 Storage	IBM System Storage DS6800
Overall database compression ratio (using TPC-H benchmark results)	29%	59%
For 10 TB uncompressed data storage needed	7.5 TB of HP Storage	4.2 TB of IBM Storage
Cost of storage (3 year TCA)	\$319,270 + \$15,113 x 3 = \$364,609	\$234,101 + \$13,164 x 2** = \$260,429
With compression, storage for DB2 costs <u>29% less</u> than for Oracle		

*DB2 for z/OS achieves similar compression ratios to those of DB2 for LUW

**IBM storage maintenance fee for the first year is included in the warranty

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US Retailer Improves Response Time by Co-locating Data Warehouse and Operational Data

- A major US retailer moved their 5.5TB data warehouse from distributed servers to System z
 - ▶ Operational data bases were already located on System z
- On average they reduced query processing times by 80% due to better query parallelism in DB2 for z/OS
 - ▶ (17 minutes to 3 minutes)
- They saved CPU cycles to load the data warehouse
 - ▶ Avoided network processing

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The Value of Business Insight

We learned the best promotion to maximize our business profits



Marketing VP

And I saved money by deploying our data warehouse solution on System z



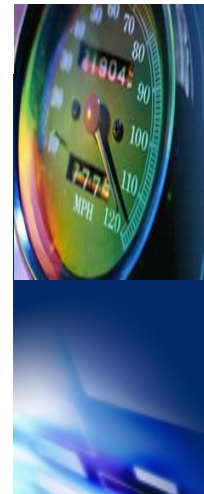
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Accelerate Development with Pre-Built Data Models for Industry Data Warehouses

- Quick start your data warehouse design with pre-built **IBM Industry Data Models**
- Use **Enterprise Model Extender** to customize the data model
 - ▶ Eclipse plug-in for Rational Data Architect
- Models capture the best practices of over 400 IBM customers
 - ▶ Banking, finance, health, insurance, retail and Telco



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