Leveraging Data To Optimize Business

zEnterprise – The Ideal Platform For Smarter Computing

Leveraging Data To Optimize Business
Business Analytics Are A Source Of New Business Intelligence

Data is aggregated from all sources and optimized for fast access, to support sophisticated analysis on massive amounts of historical data.

Data Warehouse
DB2 z/OS

Business Analytics
Smarter Business

Smart retail
Smart supply chains
Smart healthcare
Smart food systems
Smart countries
**Typical Business Analytics Data Flow**

**Operational Data Sources**
- Savings
- Credit Cards
- Checking
- Mortgages
- Loans

**Extract Transform Load**

**Data Warehouse**

**Business Analytics**
- Reports
- Dashboards
- Cubes
- Analytics

**Distributed Data Mart**

**DB2**
- ORC
- SQL
- z/OS
- AIX
- Win
System z Is The Foundation For Data

- 60-70% of corporate information resides on System z*

- Copying data from System z to another platform for data warehouses or data marts
  - Is costly
  - Can be inefficient
  - Takes longer to update
  - May create data disparities
  - Introduces security concerns

- System z offers a fully integrated, holistic solution from operational data to business analytics

IBM InfoSphere Information Server

Operational Data Sources
- Savings
- Credit Cards
- Checking
- Mortgages
- Loans

IBM InfoSphere Warehouse

Extract Transform Load

Data Warehouse

Cognos 10 SPSS
New Intelligence
- Reports
- Dashboards
- Cubes
- Analytics

Operational Data Sources
- DB2
- ORC
- SQL

Platforms
- Linux
- z/VM
- AIX
- Win
- z/OS
Duplicating Data Off The Mainframe Is Costly

The Cost Of Duplicating A 2TB Data Mart

<table>
<thead>
<tr>
<th>Cost of storage - send file</th>
<th>$25,252</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of storage - receive file</td>
<td>$36,864</td>
</tr>
<tr>
<td>Cost of storage - data mart</td>
<td>$184,320</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System z Storage Admin</th>
<th>$12,042</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Premises Network</td>
<td>$20</td>
</tr>
<tr>
<td>Off Premises Network</td>
<td>$1,188</td>
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<table>
<thead>
<tr>
<th>System z CPU extract</th>
<th>$2,826</th>
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<tbody>
<tr>
<td>System z CPU cost FTP</td>
<td>$1,188</td>
</tr>
<tr>
<td>System z extract labor</td>
<td>$9</td>
</tr>
<tr>
<td>System z FTP labor</td>
<td>$6</td>
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<table>
<thead>
<tr>
<th>Distributed CPU cost load</th>
<th>$799</th>
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<tbody>
<tr>
<td>Distributed CPU cost FTP</td>
<td>$96</td>
</tr>
<tr>
<td>Distributed load labor</td>
<td>$14</td>
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</tbody>
</table>

Data Mart analysis costs not included
Based on IBM internal study

Cost per Transfer
$6,146
Transfer Costs Add Up Over One Year

The Cost Of Duplicating A 2TB Data Mart

Cost of storage - send file: $12.33/GB x 2048 GB = $25,252

Cost of storage - receive file: $18/GB x 2048 GB = $36,864

Storage acquisition cost: $246,436

Cost of storage - data mart: $18/GB x 10,240 GB = $184,320

System z CPU extract: $1.38/GB x 2048 GB x 365 = $1.03M

System z CPU cost FTP: $0.58/GB x 2048 GB x 365 = $434K

System z extract labor: $9.33/job x 365 = $3.3K

System z FTP labor: $5.88/job x 365 = $2.2K

On Premises Network: $0.0024/GB x 2048 GB x 4 hops x 365 = $7.1K

Off Premises Network: $0.29/GB x 2048 GB x 2 hops x 365 = $434K

Annual Transfer Costs: $2,243,290

Distributed CPU cost load: $0.39/GB x 2048 GB x 365 = $292K

Distributed CPU cost FTP: $0.05/GB x 2048 GB x 365 = $35K

Distributed load labor: $14.00/job x 365 = $5.1K

Annual storage admin cost: $122,511

Distributed Storage Admin: $8.99/GB/yr x 12,288 GB = $110,469

Cost of storage - send file: $12.33/GB x 2048 GB = $25,252

Cost of storage - receive file: $18/GB x 2048 GB = $36,864

Data Mart analysis costs not included

Based on IBM internal study
Co-locating Data Mart On z196 Is A More Cost Effective Solution

Sun M9000 Oracle RAC

M9000-32 SPARC64 VII+ 3.0GHz (8ch/32co)

- 2TB Receive file
- 10TB provisioned

2TB Send file

Equivalent Performance = 59,782 QpH
Source: IBM Internal Study. Results may vary based on customer workload profiles/characteristics.

Total (3yr TCA) $11.65M

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
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</thead>
<tbody>
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<td>Hardware</td>
<td>$1,784,776</td>
</tr>
<tr>
<td>Software</td>
<td>$2,522,720</td>
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<tr>
<td>Storage</td>
<td>$184,320</td>
</tr>
<tr>
<td>FTP File Storage</td>
<td>$62,116</td>
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<tr>
<td>Storage Admin</td>
<td>$367,533</td>
</tr>
<tr>
<td>Transfer Cost</td>
<td>$6,729,870</td>
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</table>

zEnterprise z196 DB2 on z/OS

z196-703 + Incremental 2GP+ 2zIIP 2,643 MIPS

10TB provisioned

Total (3yr TCA) $1.98M

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
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</thead>
<tbody>
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<td>Hardware</td>
<td>$352,405</td>
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<tr>
<td>Software</td>
<td>$1,325,713</td>
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<tr>
<td>Storage</td>
<td>$117,505</td>
</tr>
<tr>
<td>Storage Admin</td>
<td>$180,630</td>
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</tbody>
</table>

Equivalent Performance = 59,782 QpH
Source: IBM Internal Study. Results may vary based on customer workload profiles/characteristics.
IBM Cognos Is An Integrated Platform For Smart Analytics

- **People-centric**
  - Server based business analytics accessed via browser
  - Consistent user interface for different analytic activities
  - Reuse new intelligence assets
  - Built-in collaboration and social networking
  - Threaded discussions, activities, and notifications

- **Easy to deploy and manage**
  - Implemented in Java, runs on WebSphere
  - Scales up and out across heterogeneous hardware and operating systems
  - Runs on Linux on System z
IBM Cognos Provides A Unified Workspace

- All activities from one place, without jumping to different interfaces
  - Dashboards for summary overview
  - Reports for tracking progress
  - Ad hoc queries and drill down for analysis and what if scenarios
  - Statistics and predictive analysis
- Progressive interaction – Interact and analyze information based on role
- Form decision networks for collaborative business analytics
Author once, consume anywhere

All analytic assets share a common metadata model and a common multilingual report specification

Ensures consistent information and enables reuse across platform functions
DEMO: Use Cognos To Identify New Business Insights From The Data Warehouse

1. Show report generated in Cognos Report Studio in PDF format

2. Report identifies high-risk mortgages by looking at negative credit events in other customer accounts (CC, Checking, etc…)

3. Report uses both structured and unstructured data (link to mortgage data stored in FileNet)

4. Use Go! Dashboard to monitor the business operations

At risk customers are identified
Capture
Data Collection delivers an accurate view of customer attitudes and opinions

IBM SPSS Data Collection

Predict
Predictive capabilities bring repeatability to ongoing decision making, and drive confidence in your results and decisions

IBM SPSS Statistics*/Modeler*/Text Analytics

Act
Unique deployment technologies and methodologies maximize the impact of analytics in your operation

IBM SPSS Decision Management Collaboration & Deployment *

SPSS Enables Customers To Predict Future Events And Drive Better Business Outcomes

Pre-built Content

Text Analytics  Data Mining  Statistics

Attract  Up-sell  Retain

* Runs on Linux on System z
DEMO: Discover Rules For Identifying Risky Customers Using SPSS Statistics

1. Load data from Data Warehouse on DB2 for z/OS into SPSS Statistics

2. Pre-process the data to create new attributes for quantifying negative credit events across different product lines and create a risk flag for mortgage

3. Run Comparison of Means and Decision Tree to discover rules for characterizing risky customers

- Credit Limits identified for characterizing risky customers
- Use these credit limits for automated loan approval process
IBM Smart Analytics System 9600 – A Complete Package With A Discounted Price

- Extend the qualities of service, inherent in the z/OS environment to ensure the availability and security of data

- **Hardware/OS**
  - IBM zEnterprise technology
  - IBM System Storage DS8700 Intelligent Disk controller
    - Large controller cache and 3 Tier disk offering
  - z/OS 1.12

- **Unique Software**
  - DB2 for z/OS
  - Cognos included in base offering (Linux on System z)
  - InfoSphere Warehouse (Linux on System z)

- **Optional Components**
  - Solid State drives, integrated within DS8700
    - Easy Tier to identify and migrate “hot data” to SSD
  - SPSS For Linux on z
IBM Smart Analytics Optimizer Accelerates Complex Queries

IBM Smart Analytics Optimizer

- Special purpose query accelerator
- Implemented on Intel blades in zBX
- DB2 for z/OS automatically routes appropriate queries to optimizer

Operational System (OLTP)
- DB2 for z/OS
- Data Sharing Group

Enterprise Data Warehouse
- ETL
- DB2 for z/OS

Copy of data mart in memories compressed and organized by column

load snapshot

query results

InfoSphere Information Server 8.1
- Linux

Cognos 10
- BI and Analytics
- Linux

InfoSphere Warehouse 9.5.2
- Cubing Services
- Linux

z/OS
A Longer List Of Business Analytic Software Available On z196

**Information Management**
- DB2
- Informix
- FileNet Business Process Manager
- FileNet Content Manager
- FileNet Records Manager
- FileNet Rendition Engine
- InfoSphere – totally 30 products, incl:
  - InfoSphere DataStage
  - InfoSphere Federation Server
  - InfoSphere Information Analyzer
  - InfoSphere Information Server
  - InfoSphere Master Data Mgmt Server
  - InfoSphere Warehouse for DB2 for z/OS
  - InfoSphere FastTrack
  - ... many more

**Business Analytics**
- Cognos Business Intelligence
- SPSS Collaboration and Deployment Services
- SPSS Modeler
- SPSS Statistics
zEnterprise Is An Excellent Base For Your Data Warehouse And Business Analytics

- Operational and warehouse data co-located on z196 for optimal performance
- Exploits System z Parallel Sysplex for availability and scale
- Cognos supports a common metadata model and report specification, and provides 100% browser-based access
- SPSS predictive analytics provides actionable insights versus hindsight
- Systematic disaster recovery and backup strategies
- Qualities of Service
- Competitive Price