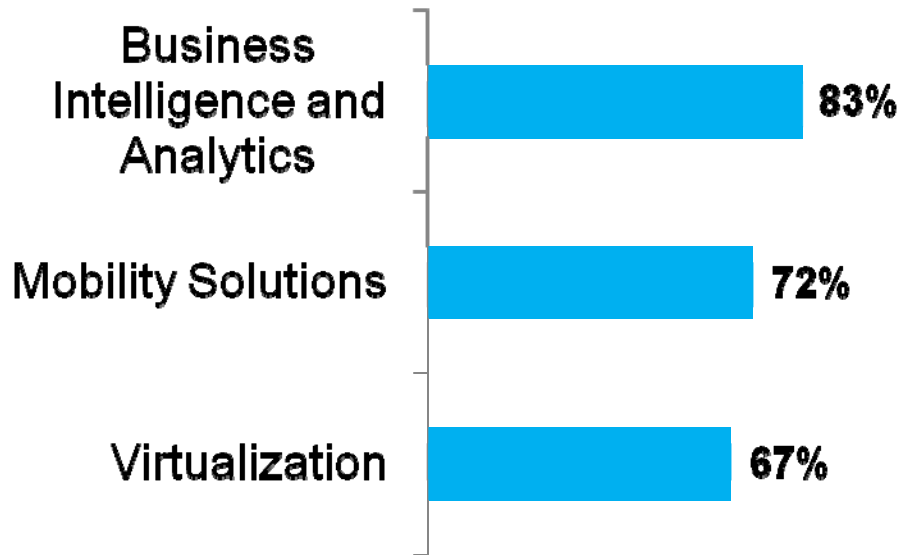




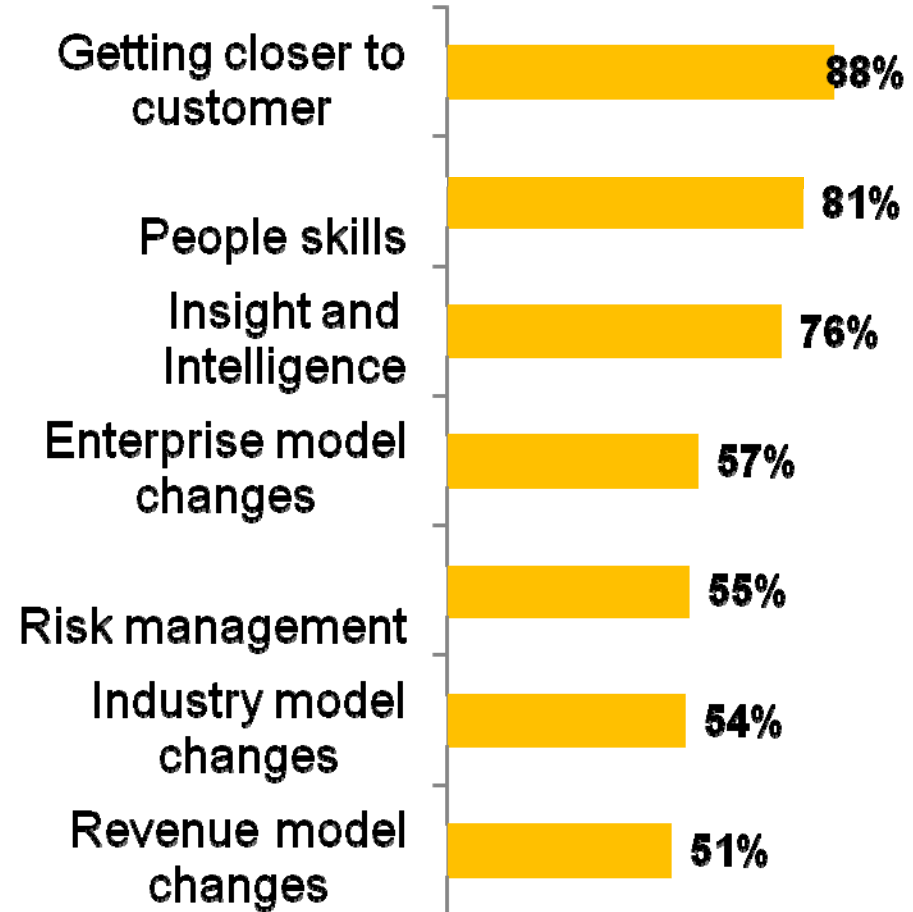
zEnterprise – The Ideal Platform For Smarter Computing

**System z – Best Place For Business
Analytics**

Business Analytics Is Hot And Getting Closer To The Customer Is Top Priority



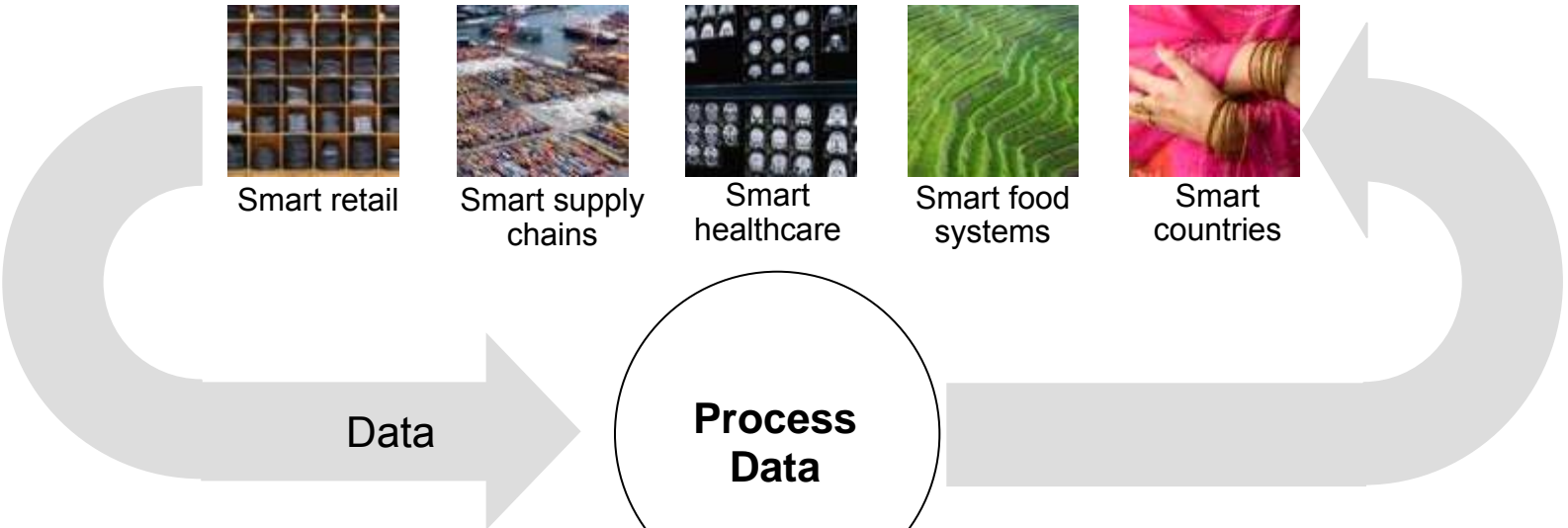
Source: [2011 Global Midmarket CIO Study](#)



Source: [2010 Global CEO Study](#)

“Our customers want personalization of services and products. It is all about the market of one” – Tony Tyler, CEO, Cathay Pacific Airways

Business Analytics Are A Source Of New Business Intelligence In A Smarter Planet

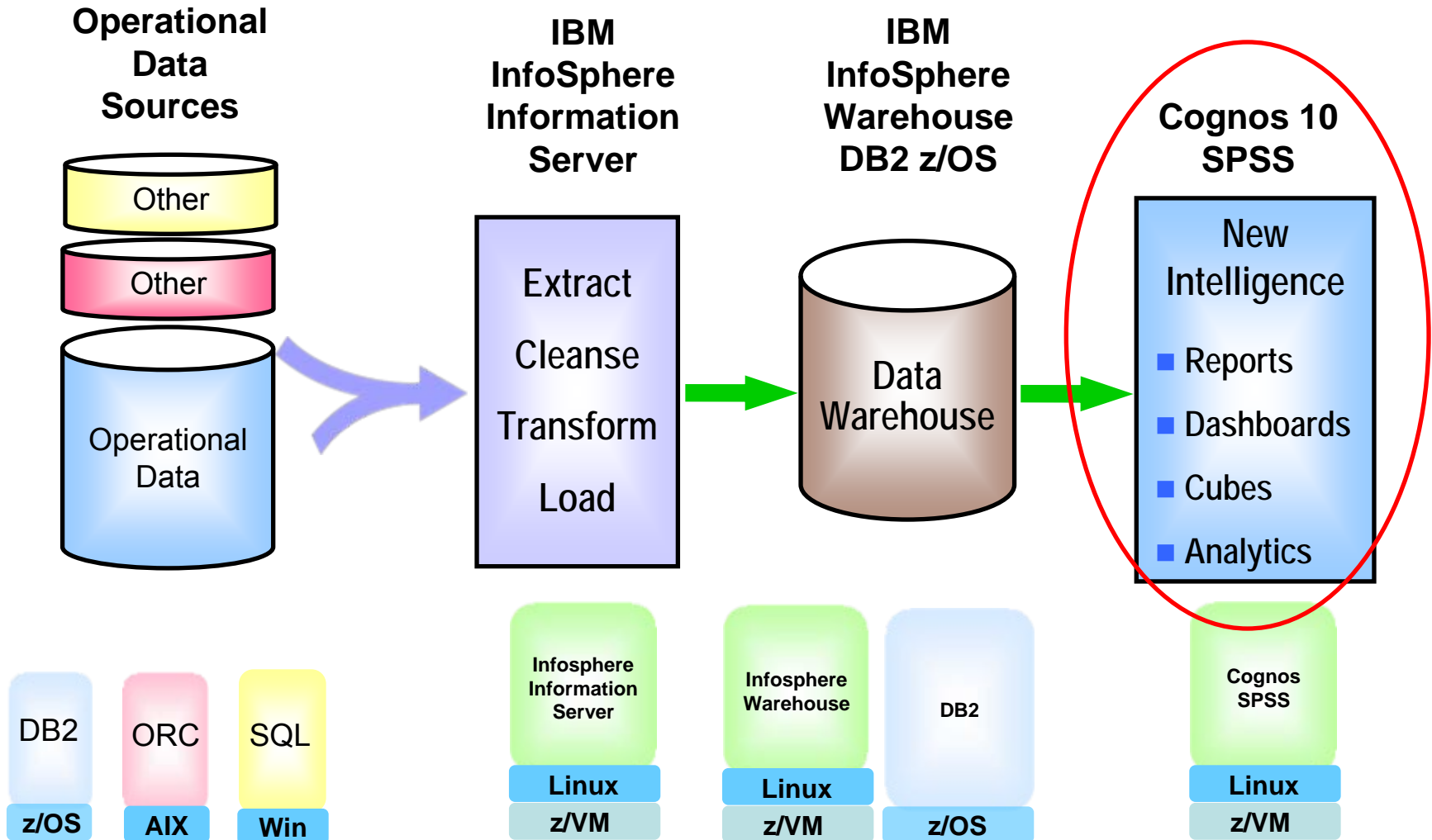


Data is aggregated from all sources and optimized for fast access, to support sophisticated analysis on massive amounts of historical data

Implementing A Business Analytics Solution Involves 3 Primary Steps

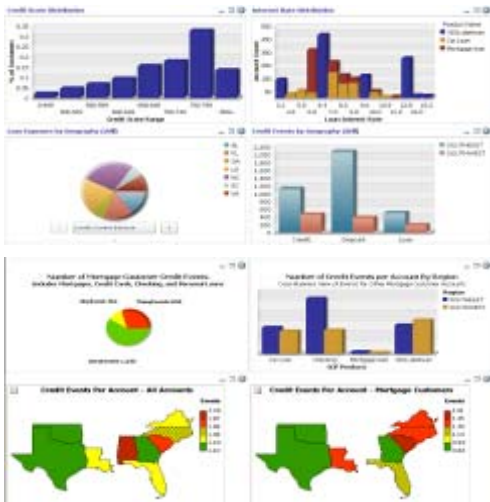
- Load data from Operational data stores in frequent intervals into a large unified historical data repository known as a Data Warehouse
 - ▶ Apply Extract, Cleanse, Transform, Load processes
- Create Reports and Dashboards to answer a variety of what-if questions
 - ▶ Run simple, intermediate or complex queries that can take a few seconds, minutes, to several hours to run
- Use Predictive Analytics to gain insights and convert them to actions
 - ▶ Using data from past, score the likelihood of outcomes for future events

zEnterprise Now Provides All Of The Components You Need For A Complete Analytic Solution



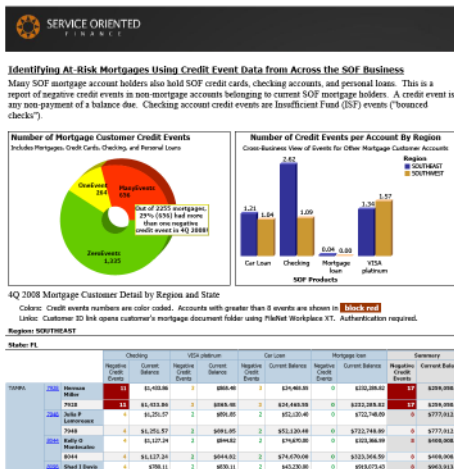
Businesses Intelligence Answers Key Questions That Drive A Competitive Edge

How are we doing?



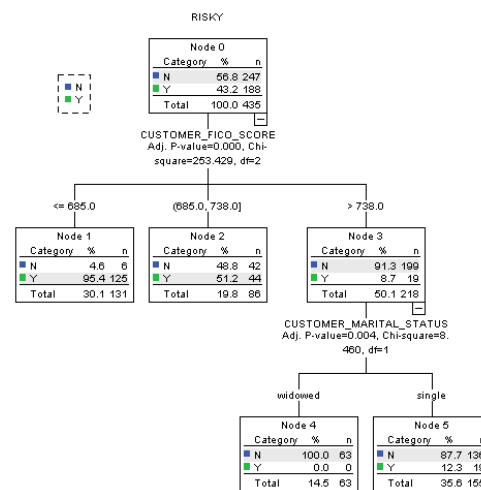
Dashboard
Operational or Strategic

Why are we on/off track?



Query and Reporting
Exploratory Analysis

What should we do next?



Analytics
Statistics and Predictive Analytics



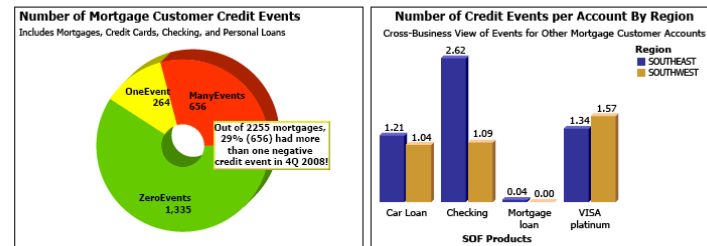
DEMO: Use Cognos to Identify New Business Insights from the Data Warehouse

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 Dashboard to monitor the business operations



Identifying At-Risk Mortgages Using Credit Event Data from Across the SOF Business

Many SOF mortgage account holders also hold SOF credit cards, checking accounts, and personal loans. This is a report of negative credit events in non-mortgage accounts belonging to current SOF mortgage holders. A credit event is any non-payment of a balance due. Checking account credit events are Insufficient Fund (ISF) events ("bounced checks").



4Q 2008 Mortgage Customer Detail by Region and State

Colors: Credit events numbers are color coded. Accounts with greater than 8 events are shown in **block red**.
Links: Customer ID link opens customer's mortgage document folder using FileNet Workplace XT. Authentication required.

Region: SOUTHEAST

State: FL

		Checking		VISA platinum		Car Loan		Mortgage loan		Summary	
		Negative Credit Events	Current Balance	Negative Credit Events	Current Balance	Negative Credit Events	Current Balance	Negative Credit Events	Current Balance	Negative Credit Events	Current Balance
TAMPA	7228 Herman Miller	11	\$1,433.86	3	\$865.46	3	\$24,465.55	0	\$232,285.82	17	\$259,050.71
	7928	11	\$1,433.86	3	\$865.46	3	\$24,465.55	0	\$232,285.82	17	\$259,050.71
	7248 Julia P Lamoreaux	4	\$1,251.57	2	\$891.85	2	\$52,120.40	0	\$722,748.89	8	\$777,012.71
	7948	4	\$1,251.57	2	\$891.85	2	\$52,120.40	0	\$722,748.89	8	\$777,012.71
	8044 Kelly O Montecalvo	4	\$1,127.24	2	\$844.82	2	\$74,670.00	0	\$323,366.59	8	\$400,008.65
	8044	4	\$1,127.24	2	\$844.82	2	\$74,670.00	0	\$323,366.59	8	\$400,008.65
	8028 Shad I Davis	4	\$780.11	2	\$830.11	2	\$43,230.00	0	\$919,073.43	8	\$963,913.65

At risk customers are identified

Businesses Benefit By Using An Analytic Approach Over Intuition



40% decline
in homicide rates



600% increase
in cross-sell
campaign



\$13.8 Million
in cost savings



PRIMERICA
1000's of Reps
run their daily business using
IBM Business Analytics



80% decrease
in reporting time on top of
Oracle e-business suite

OmnicomGroup



\$200 Million
increase in cash flow

The more analytics a business uses, the better it performs

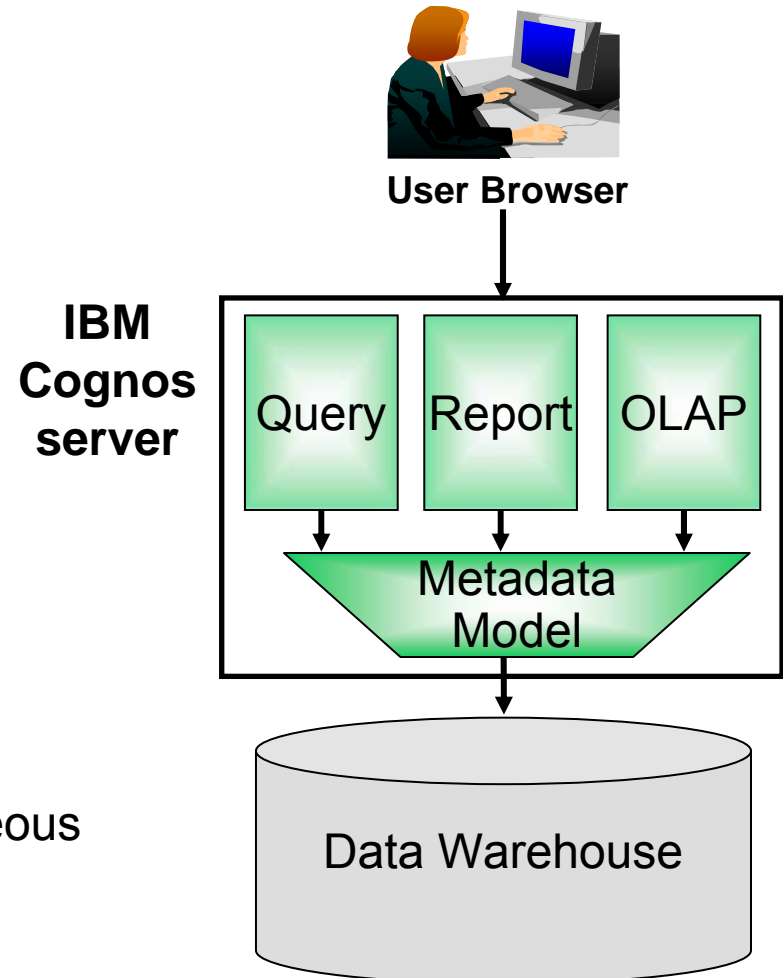
Create Reports And Dashboards Using IBM Cognos

■ 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

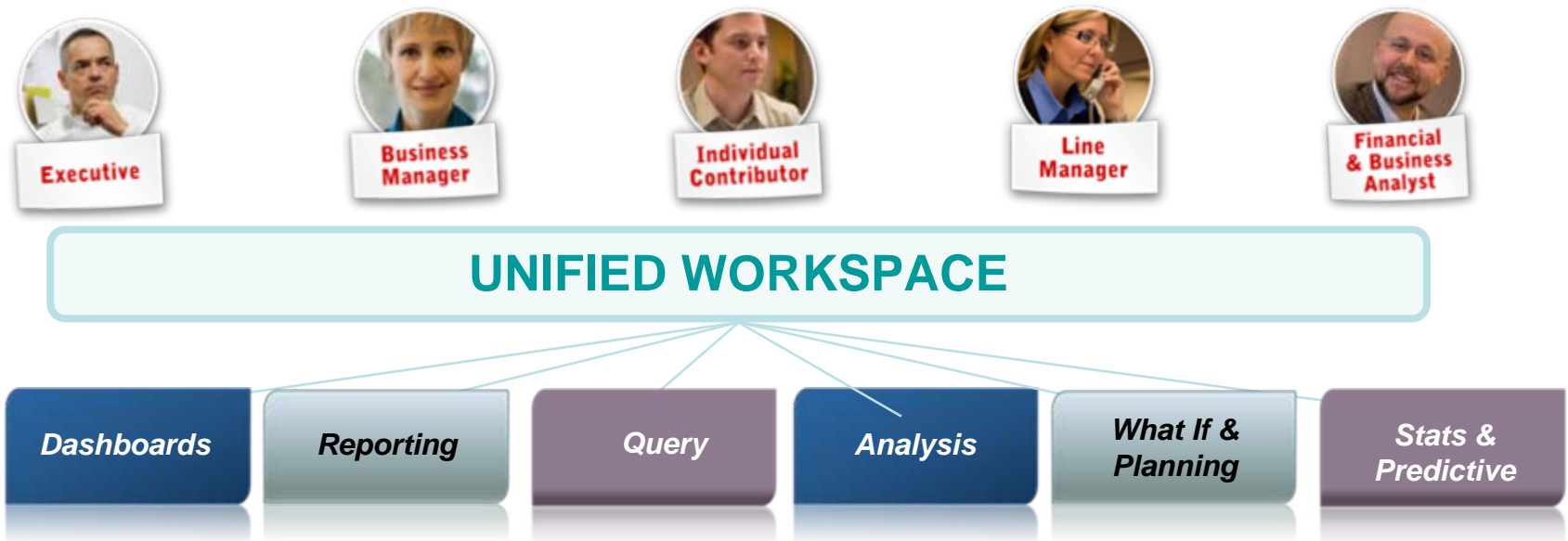
■ Easy to deploy and manage

- ▶ Implemented in Java, runs on WebSphere
- ▶ Scales up and out across heterogeneous hardware and operating systems
- ▶ Runs on Linux on System z

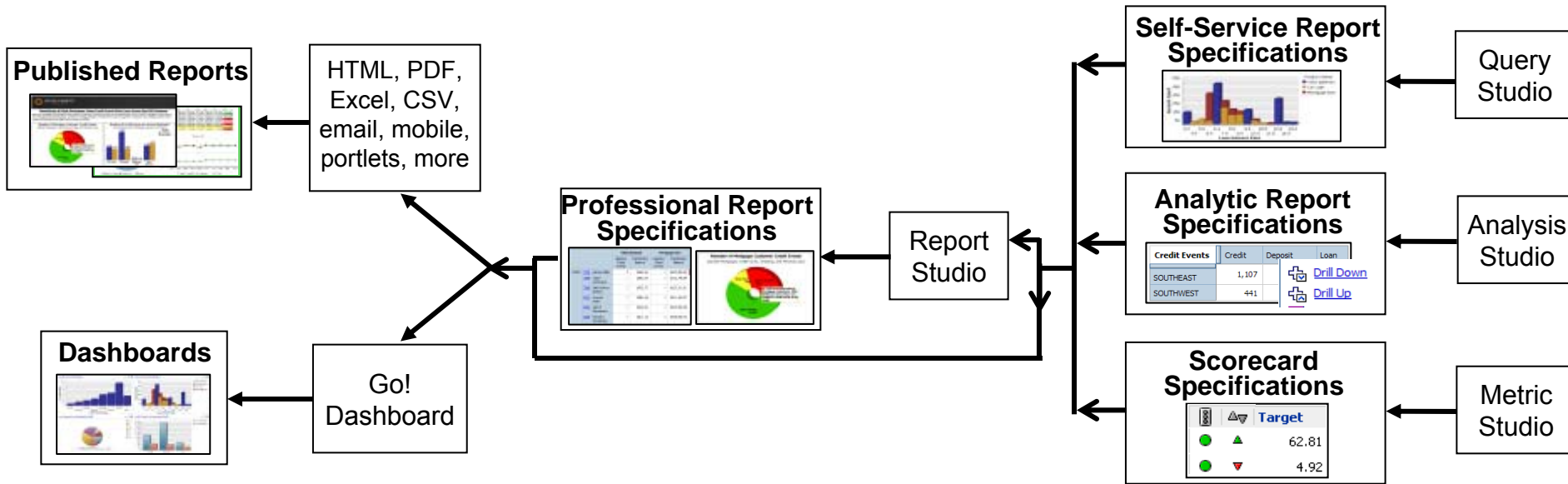


IBM Cognos Provides a Unified Workspace

- 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



Reuse Prior Assets In New Deliverables



- 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

Miami Dade County Runs Cognos On Linux On System z

Requirements:

- Demand for BI has really taken off
 - ▶ New Federal reporting requirements
 - ▶ Every new system, every new solution, every new application is having a business intelligence component
- Multiple Cognos 8 BI deployments
- Wanted an enterprise BI standardized solution, but
 - ▶ Needed higher capacity – grow from approx 400 to 1000 users
 - ▶ Do more with less - less researchers, less software, less hardware, same staff
 - ▶ Had available IFL's on System z

Results:

- 11 days to move from distributed to System z deployment model for Cognos 8 BI
 - ▶ Quickly and easily meet new requirements
- Consolidate multiple BI deployments on to a single platform
- Single point for BI administration
- Consolidate multiple disparate data sources
- Ensure 99.999% availability
- Offer a complete disaster recovery plan
- Additional green savings



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

Capture

Data Collection delivers an accurate view of customer attitudes and opinions

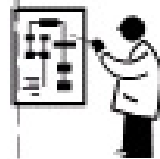
IBMSPSS Data Collection



Predict

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

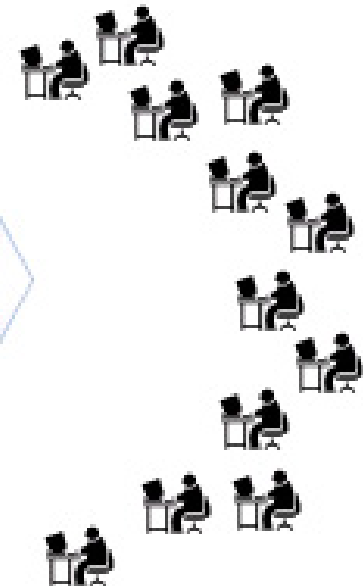
IBM SPSS Statistics*/Modeler*/Text Analytics



Act

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

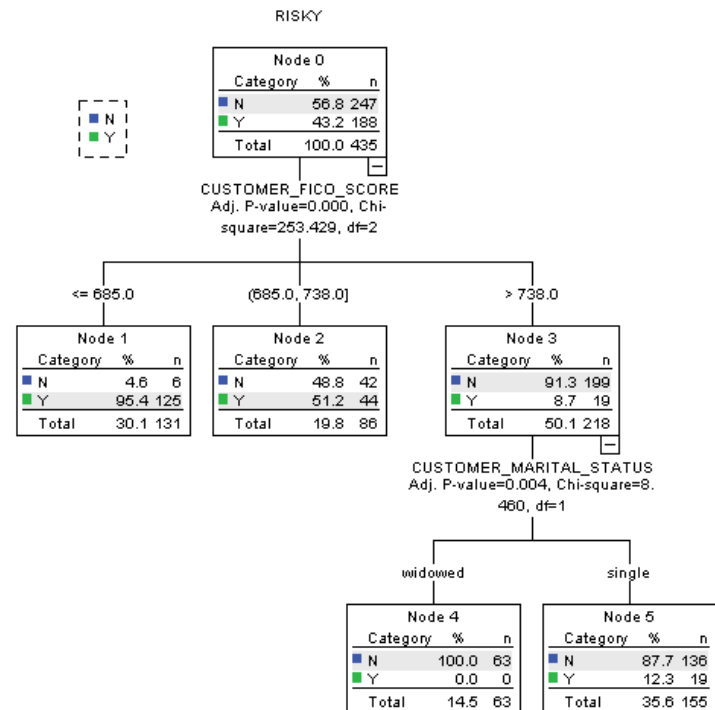
IBM SPSS Decision Management Collaboration & Deployment *



* Runs on Linux on System z

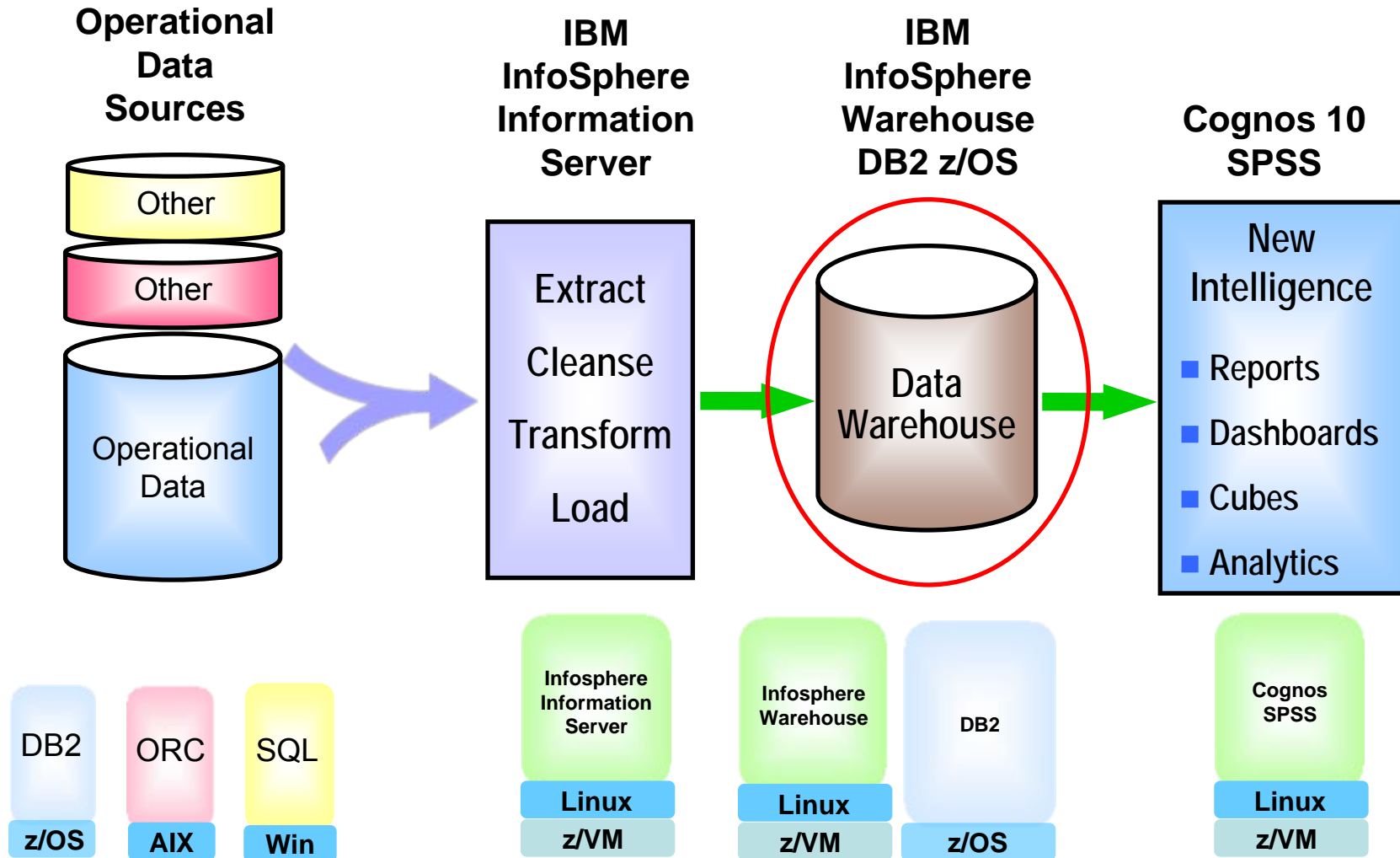
DEMO: Discover Rules For Identifying Risky Customers Using SPSS Statistics

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

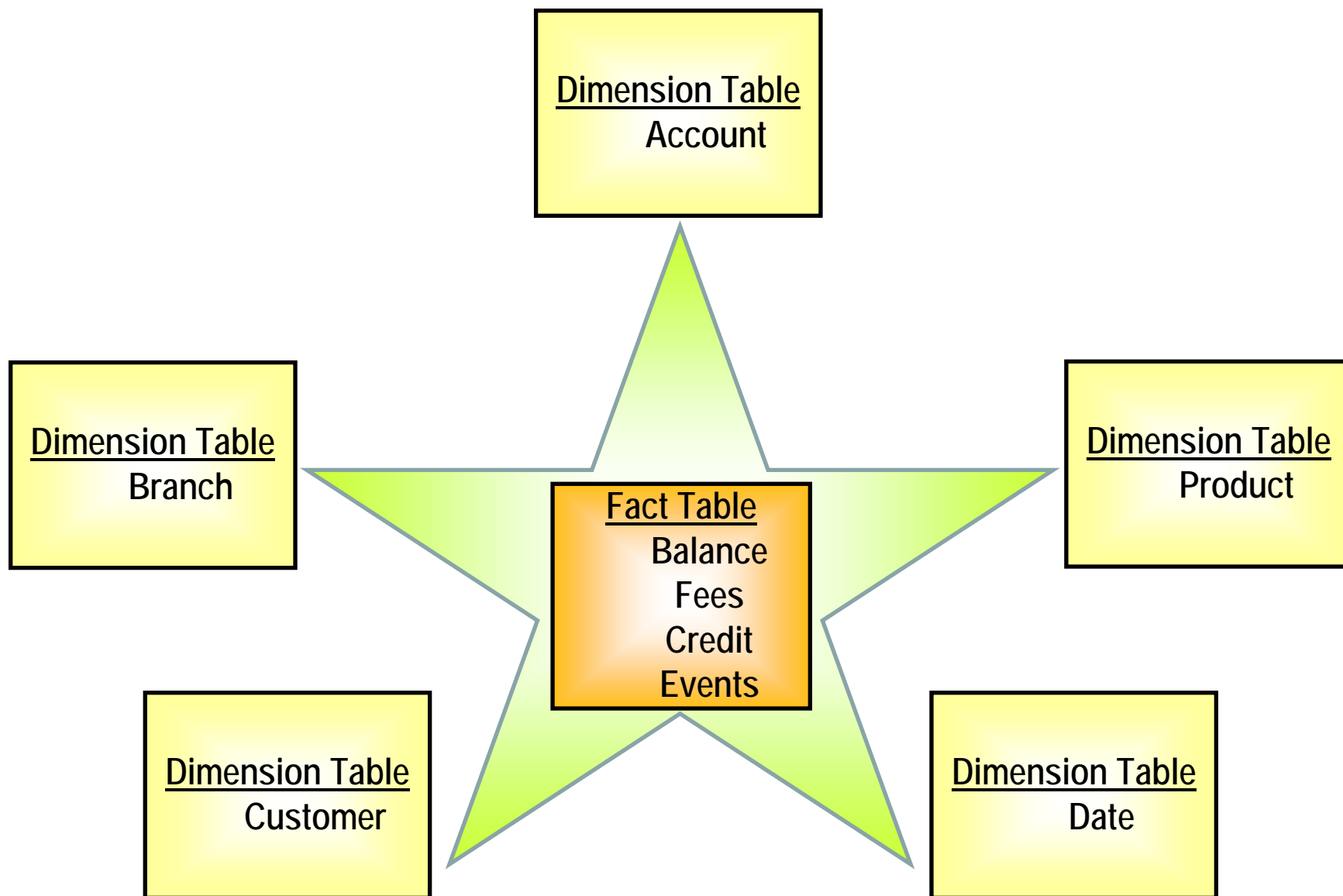


- Credit Limits identified for characterizing risky customers
- Use these credit limits for automated loan approval process

The Data Warehouse Is At The Heart Of A Business Analytics Solution



Data Warehouses Typically Organize Data In A Star Schema Format



DB2 For z/OS Is Optimized For Data Warehouse Workloads

- Data Warehouse Workloads typically include a mix of simple, intermediate and complex queries
- Data is partitioned to increase parallelism and compressed to increase I/O performance
- DB2 for z/OS Cost Based Optimizer decides best execution plan for each query
 - ▶ Simple queries typically assigned to a single processing thread
 - ▶ Complex queries may be decomposed into operations that execute in parallel
 - ▶ Queries may be automatically rewritten to take advantage of pre-computed partial results in materialized query tables (MQT)
- Result: Optimum Throughput

z/OS Is Optimized For Data Warehouse Workloads

- More processors, memory and cache than other enterprise servers provides high concurrency
- I/O offloaded to the Dedicated I/O Sub-system
- Parallel Sysplex clustering designed for near linear scaling
- Hardware compression
- Optimized resource sharing for mixed queries with WLM
- DS8000 delivers high storage bandwidth with caching
- Unmatched scalability
- Systematic Disaster Recovery
- Attractive pricing with IBM Smart Analytics Solution 9700

Add IBM DB2 Analytics Accelerator For Even More Optimization

What is a IDAA?

A workload-optimized, blade-based appliance add-on

Deeply integrated with DB2 for z/OS and transparent to applications

Significantly speeds up the response time for a wide variety of complex queries

Drives down the costs of data warehousing and business analytics



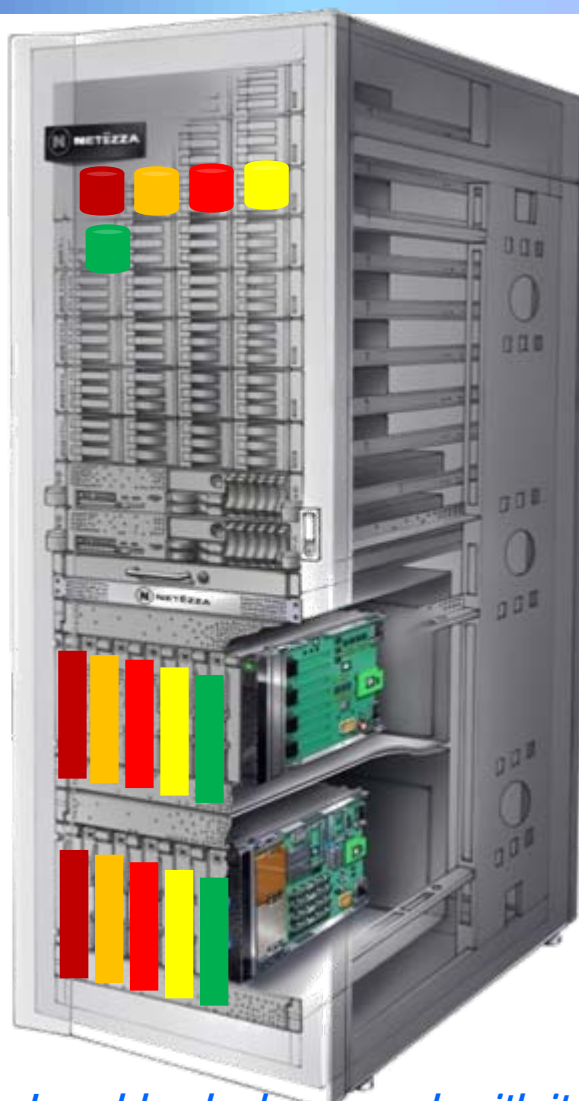
What's new?

- System x blade customized with Netezza Technology
- Massively Parallel Processing Architecture with data partitioned across multiple disks, each matched with a CPU
- Incorporates streaming architecture based on Netezza's patented data filtering using Field Programmable Gate Arrays (FPGAs)
- Tuned for delivering fast query response times for a wide variety of decision workloads
- Uses efficient data filtering by early SQL projections
- Storage integrated into the hardware rack
- Supported on DB2 for z/OS v9 or DB2 for z/OS v10 running on a z114 /z196

Breakthrough Technology Enabling New Opportunities

IDAA Leverages Massively Parallel Processing To Speed Up Complex Queries

Fact Table



Storage

SMP Hosts

Data Filtering Processors

CPU

Partitioning data into physical disks and assigning dedicated processors to each disk – throughput scales linearly with partitions

"...when something took 24 hours I could only do so much with it, but when something takes 10 seconds, I may be able to completely rethink the business...", SVP, Nielsen

Outstanding Customer Results With IDAA

			DB2 Only		DB2 with IDAA		Times Faster
Query	Total Rows Reviewed	Total Rows Returned	Hours	Sec(s)	Hours	Sec(s)	
Query 1	2,813,571	853,320	2:39	9,540	0.0	5	1,908
Query 2	2,813,571	585,780	2:16	8,220	0.0	5	1,644
Query 3	8,260,214	274	1:16	4,560	0.0	6	760
Query 4	2,813,571	601,197	1:08	4,080	0.0	5	816
Query 5	3,422,765	508	0:57	4,080	0.0	70	58
Query 6	4,290,648	165	0:53	3,180	0.0	6	530
Query 7	361,521	58,236	0:51	3,120	0.0	4	780
Query 8	3,425,29	724	0:44	2,640	0.0	2	1,320
Query 9	4,130,107	137	0:42	2,520	0.1	193	13

Actual customer results, October 2011

Customers Are Excited About Business Analytics On zEnterprise



DB2 Analytics Accelerator: “we had this up and running in days with queries that ran over 1000 times faster”



DB2 Analytics Accelerator: “we expect ROI in less than 4 months”

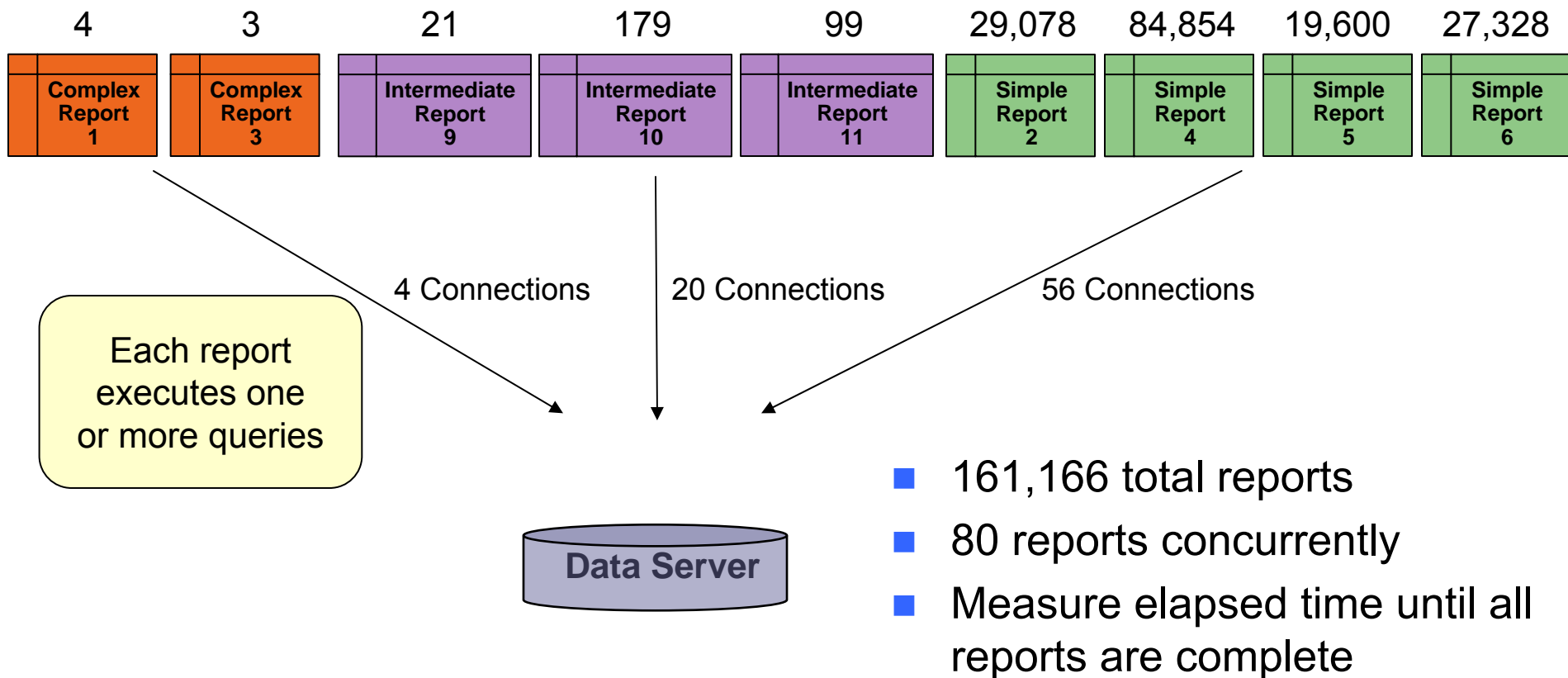


Cognos BI for System z “We didn’t have to justify a higher cost for putting this on the mainframe, *it was cheaper!*”

Intelligent Solutions, Inc.

Analyst Claudia Imhoff “the industry pendulum in swinging towards centralization and there is no better platform than the mainframe”

Example: BI Day Fixed-Set Operational Reports Run Concurrently On A Periodic Schedule



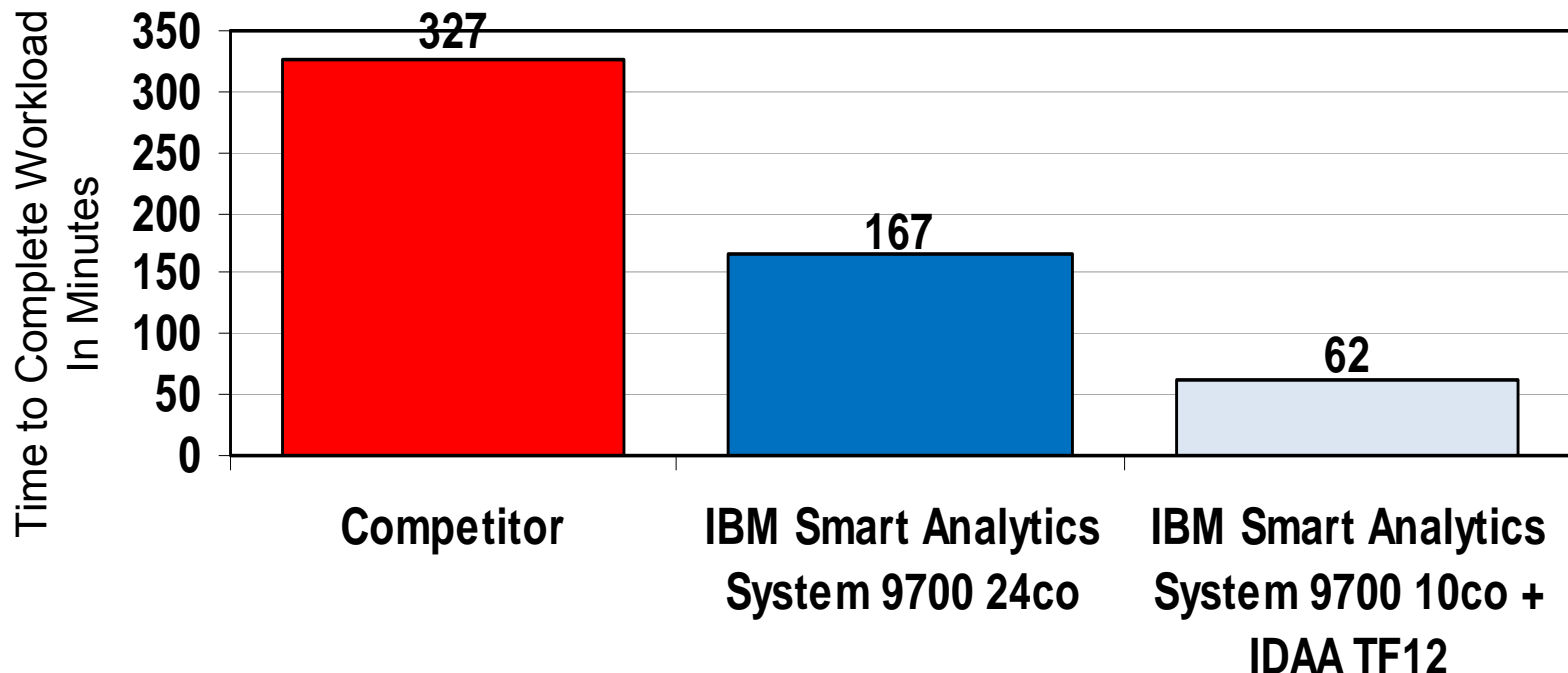
Note: Distribution of complex, intermediate, and simple workloads based on Forrester Research, Profiling the Analytic End User for Business Intelligence, 2004

BI Day Fixed-Set Operational Reports Run Concurrently On A Periodic Schedule

- CASE 1:
Run concurrently 160,860 simple reports and 306 intermediate and complex reports on Competitor 1/4 Rack
- CASE 2:
Run concurrently 160,860 simple reports and 306 intermediate and complex reports on IBM Smart Analytics System 9700 with dedicated 24-cores
- CASE 3:
Run concurrently 160,860 simple reports on IBM Smart Analytics System 9700 10-cores and in parallel offload 306 intermediate and complex reports serially to IDAA (Twinfin 12)

IBM DB2 Analytics Accelerator Makes A Great Analytics Solution Even Better

Time To Completion For Fixed Size Concurrent Workload – 1 TB



Lower is better

Test measures time to complete a fixed number of 161,166 concurrently executing reports

Based on BI Day Tests. Performance numbers may vary based on workload profiles. IBM Smart Analytics System + IDAA performance estimated from IBM Smart Analytics System running simple reports and NZ TF12 running intermediate + complex reports

Running Analytics On Optimized zEnterprise Platform Saves 75% Over Competition

Competitor

Quarter Rack



IBM Smart Analytics System 9700

DB2
(IBM Smart Analytics System 9700)
z/OS
12 GP+12 zIIP



IBM Smart Analytics System 9700 + IDAA

DB2
(IBM Smart Analytics System 9700)
z/OS
5 GP+5 zIIP



Netezza TwinFin 12



Unit Cost (3yr TCA) **\$97/RpH**

Unit Cost (3yr TCA) **\$62/RpH**

Unit Cost (3yr TCA) **\$24/RpH**

RpH (Reports/Hour)	29,572
Competitor ¼ Rack (HW+SW+Storage)	\$2,857,500

RpH (Reports/Hour)	57,904
IBM Smart Analytics System 9700 24-co (HW+SW+Storage)	\$3,600,000

RpH (Reports/Hour)	154,893
IBM Smart Analytics System 9700 10-co (HW+SW+Storage)	\$1,500,000
NZ TF12 (HW+SW+Storage)	\$2,140,600

Source: Customer Study running 161,166 concurrent operational reports. Intermediate/Complex Reports offloaded to IDAA for serial execution. Results may vary based on customer workload profiles/characteristics.

5X performance
4X price performance

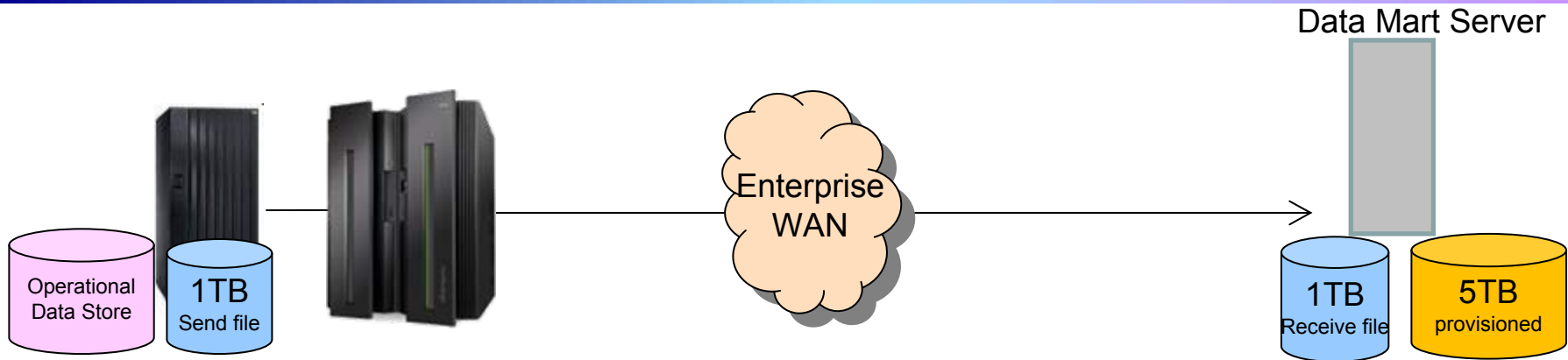
System z Is The Foundation For Business Analytics

- 60-70% of operational data 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



* Source <http://www.ibmssystemsmag.com/mainframe/trends/whatsnew/The-Mainframe-at-a-Crossroads/>

Duplicating Very Large Data Off The Mainframe To A Data Mart Is Costly



Cost of storage - send file \$12.33/GB x 1,024 GB	\$13K
--	-------

Storage acquisition cost
\$123K

Cost of storage - receive file \$18/GB x 1,024 GB	\$18K
Cost of storage - data mart \$18/GB x 5,120 GB	\$92K

System z Storage Admin \$5.88/GB/yr x 1,024 GB	\$6K
---	------

Annual storage admin cost
\$61K

Distributed Storage Admin \$8.99/GB/yr x 6,144 GB	\$55K
--	-------

System z CPU extract \$1.38/GB x 1,024 GB x 365	\$515K
System z CPU cost FTP \$0.58/GB x 1,024 GB x 365	\$217K
System z extract labor \$4.67/job x 365	\$1.7K
System z FTP labor \$2.94/job x 365	\$1.1K

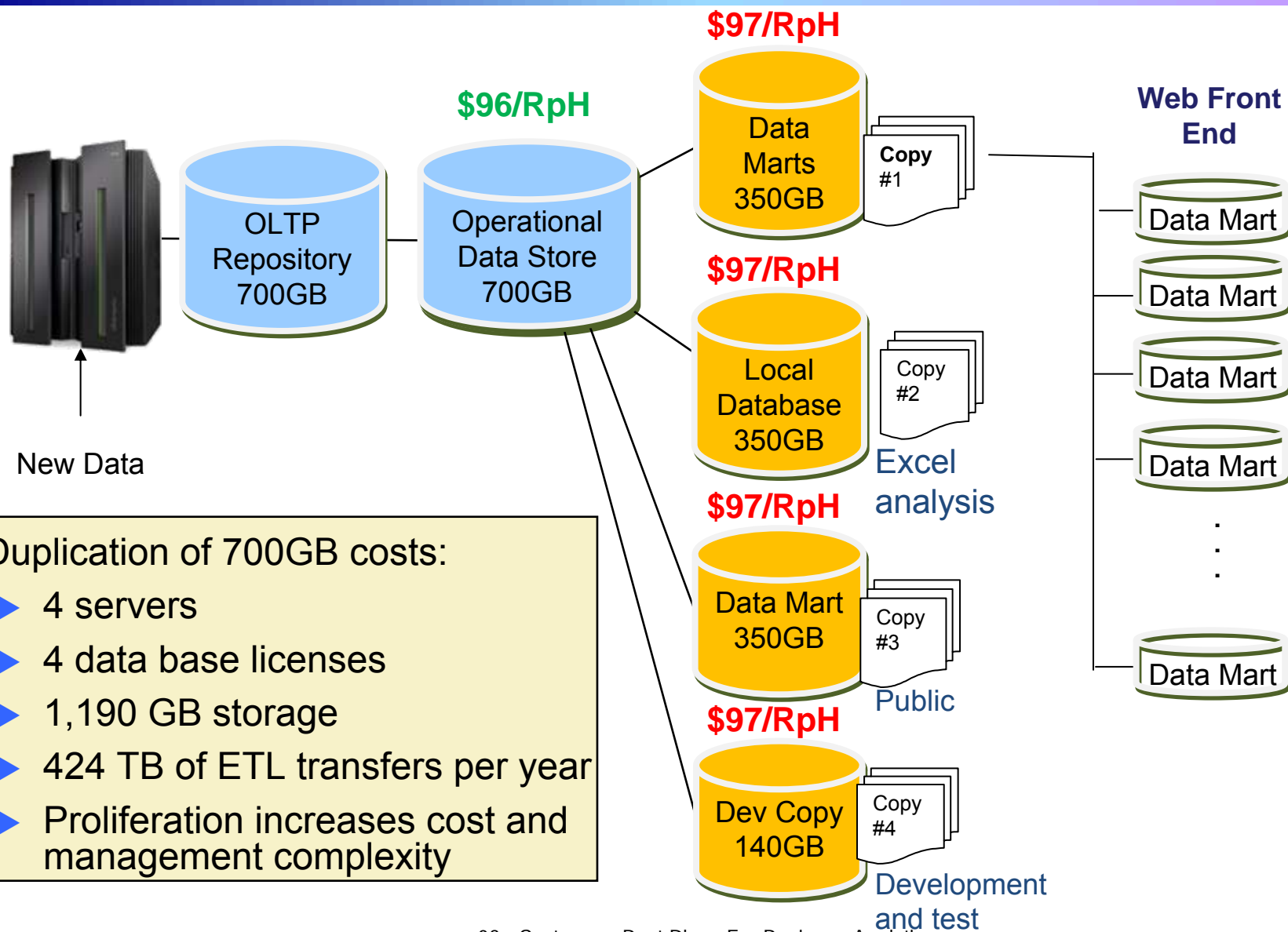
On Premises Network \$0.0024/GB x 1,024 GB x 4 hops x 365	\$3.6K
Off Premises Network \$0.29/GB x 1,024 GB x 2 hops x 365	\$217K

Annual Transfer Costs
\$1.1M

Distributed CPU cost load \$0.39/GB x 1,024 GB x 365	\$146K
Distributed CPU cost FTP \$0.05/GB x 1,024 GB x 365	\$17.5K
Distributed load labor \$14.00/job x 365	\$2.55K

Data Mart analysis costs not included
Based on IBM internal study

Save 75% By Consolidating Proliferating Data Marts On zEnterprise

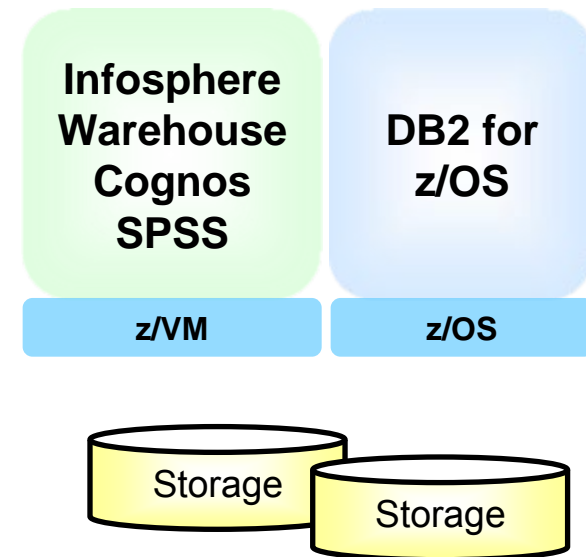


Duplication of 700GB costs:

- ▶ 4 servers
- ▶ 4 data base licenses
- ▶ 1,190 GB storage
- ▶ 424 TB of ETL transfers per year
- ▶ Proliferation increases cost and management complexity

IBM Smart Analytics System 9700 – A Comprehensive Package For Business Analytics

- Extend the qualities of service, inherent in the z/OS environment to ensure the availability and security of data
- Hardware/OS
 - ▶ IBM zEnterprise z196 technology
 - ▶ IBM System Storage DS8800 Intelligent Disk controller
 - Large controller cache and 3 Tier disk offering
 - ▶ z/OS 1.12
- Unique Software
 - ▶ **DB2 10 for z/OS**
 - ▶ Cognos 10 BI (Linux on System z)
 - ▶ InfoSphere Warehouse (Linux on System z)
 - ▶ SPSS Modeler (Linux on System z)
- Optional Components
 - ▶ IBM DB2 Analytics Accelerator
 - ▶ Solid State drives, integrated within DS8800
 - Easy Tier to identify and migrate “hot data” to SSD



zEnterprise Provides An Excellent Base For All Data Needs

- Operational and warehouse data co-located on z196 for optimal performance
- Exploits IBM DB2 Analytics Accelerator optimized for complex queries
- 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