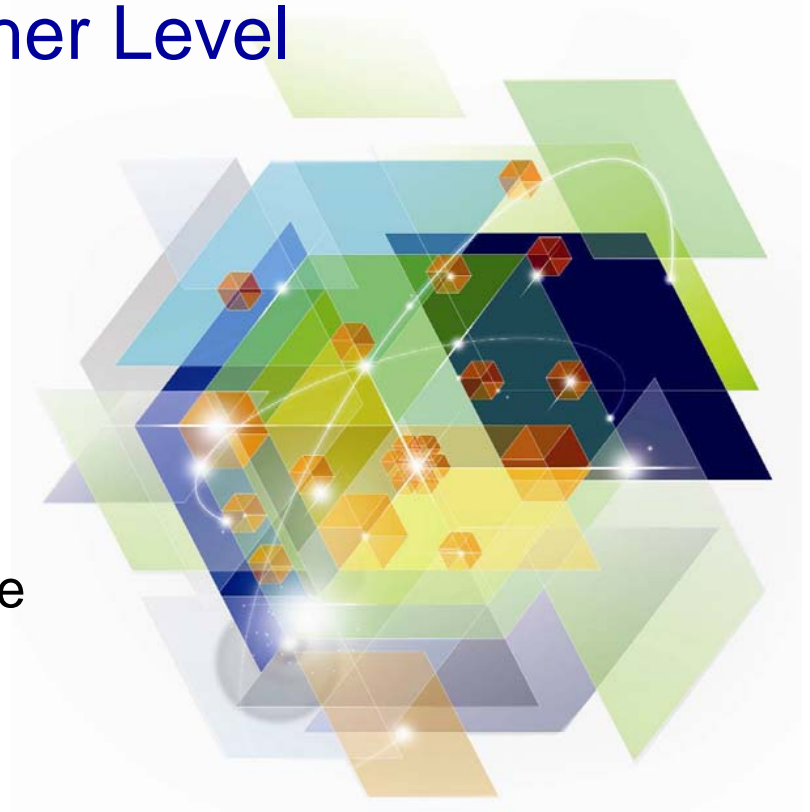





IBM DB2 Analytics Accelerator – Delivering Faster Complex Business Analysis: Taking Your Business Decisions to Another Level

Dan Wardman,
Vice President,
Information Management Mainframe Software

August 2012





Knowing what happened is no longer adequate.

Business leaders need to know

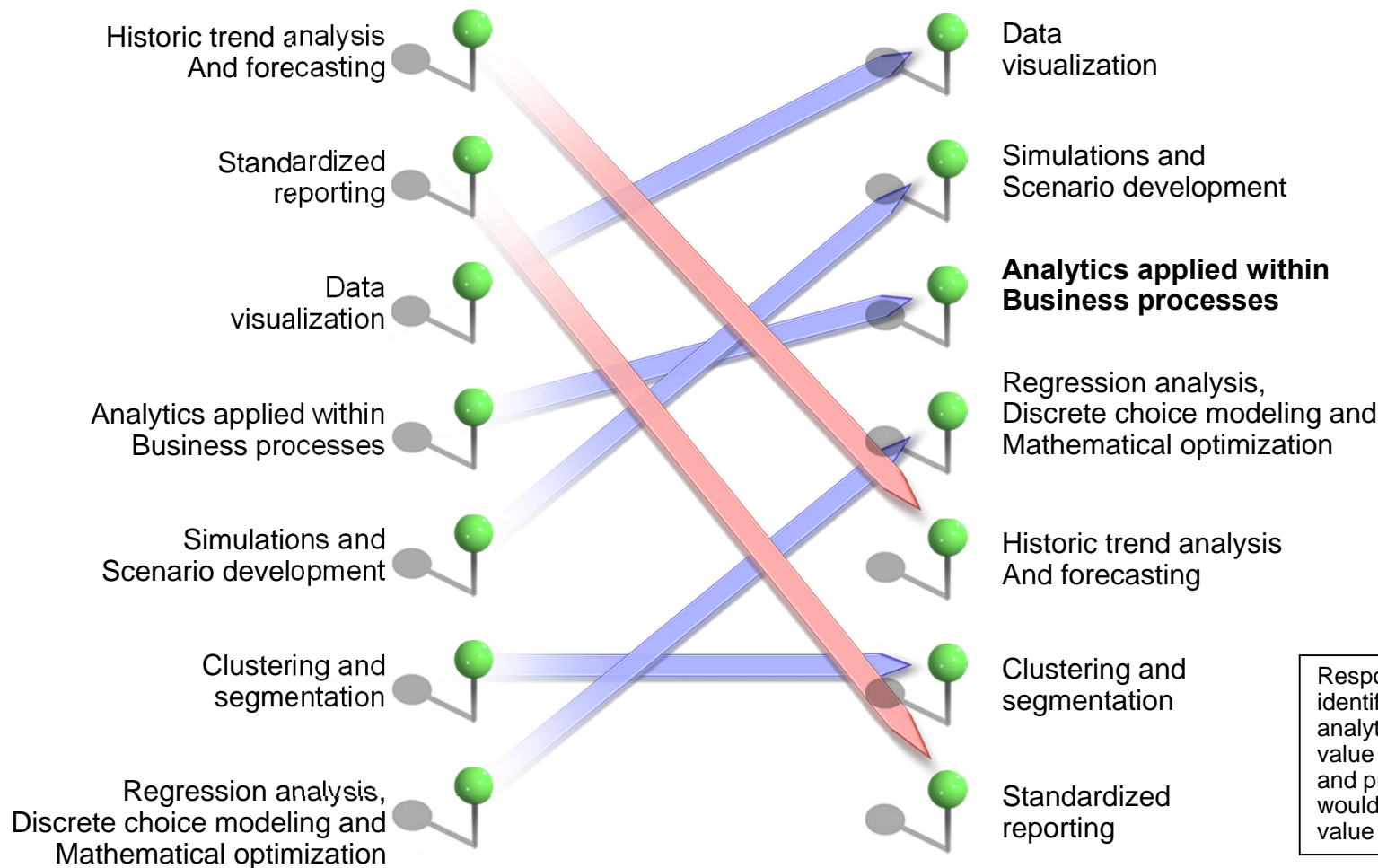
what is happening now,

what is likely to happen next and

what actions they should take.

What matters is changing

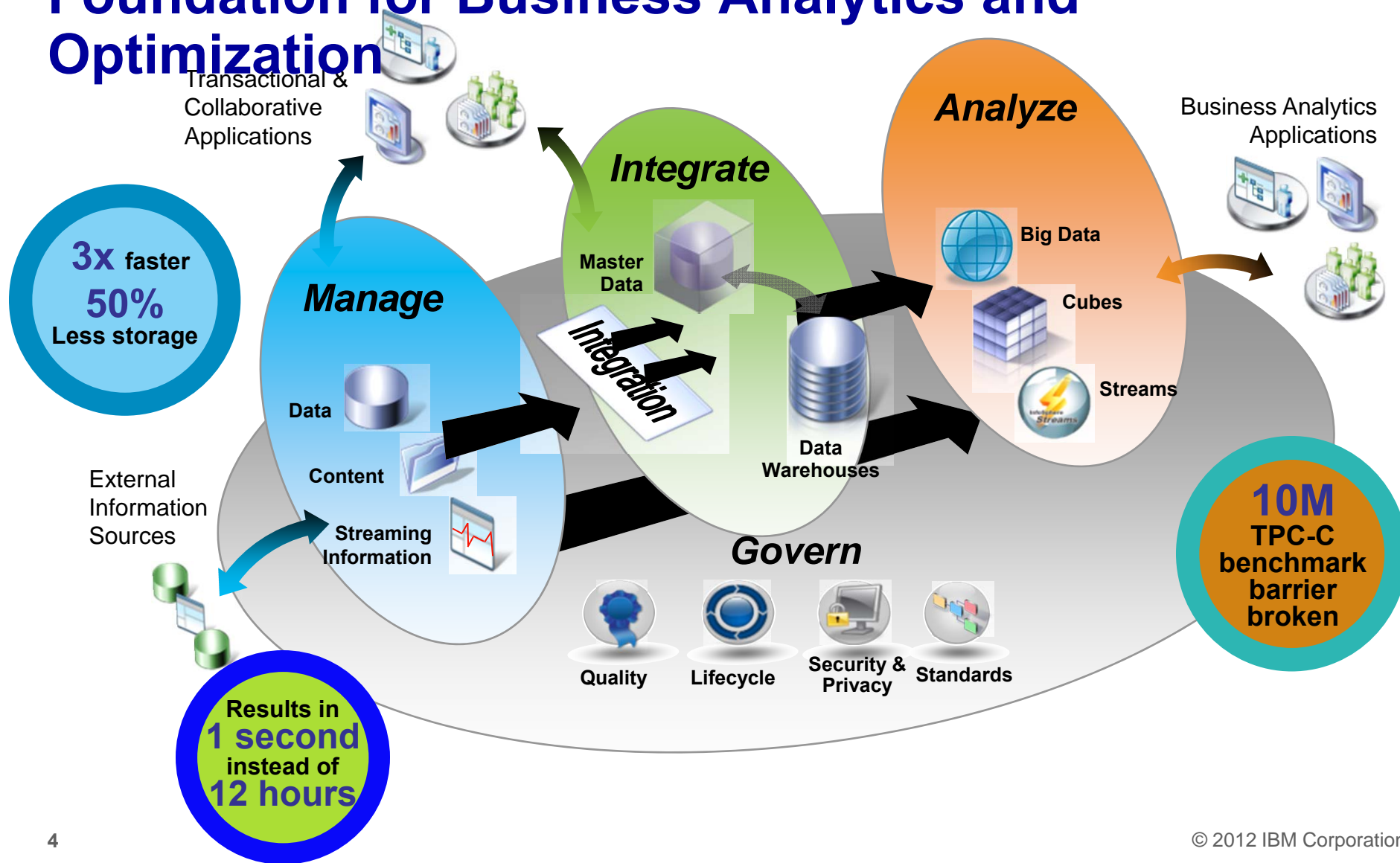
Results of New Intelligence Enterprise Survey of nearly 3,000 executives



Respondents were asked to identify the top three analytic techniques creating value for the organization and predict which three would be creating the most value in 24 months.

Source: MIT Sloan Management Review, 10 Data Points: Information and Analytics at Work, N Kruschwitz and R Shockley, Fall 2010

Foundation for Business Analytics and Optimization

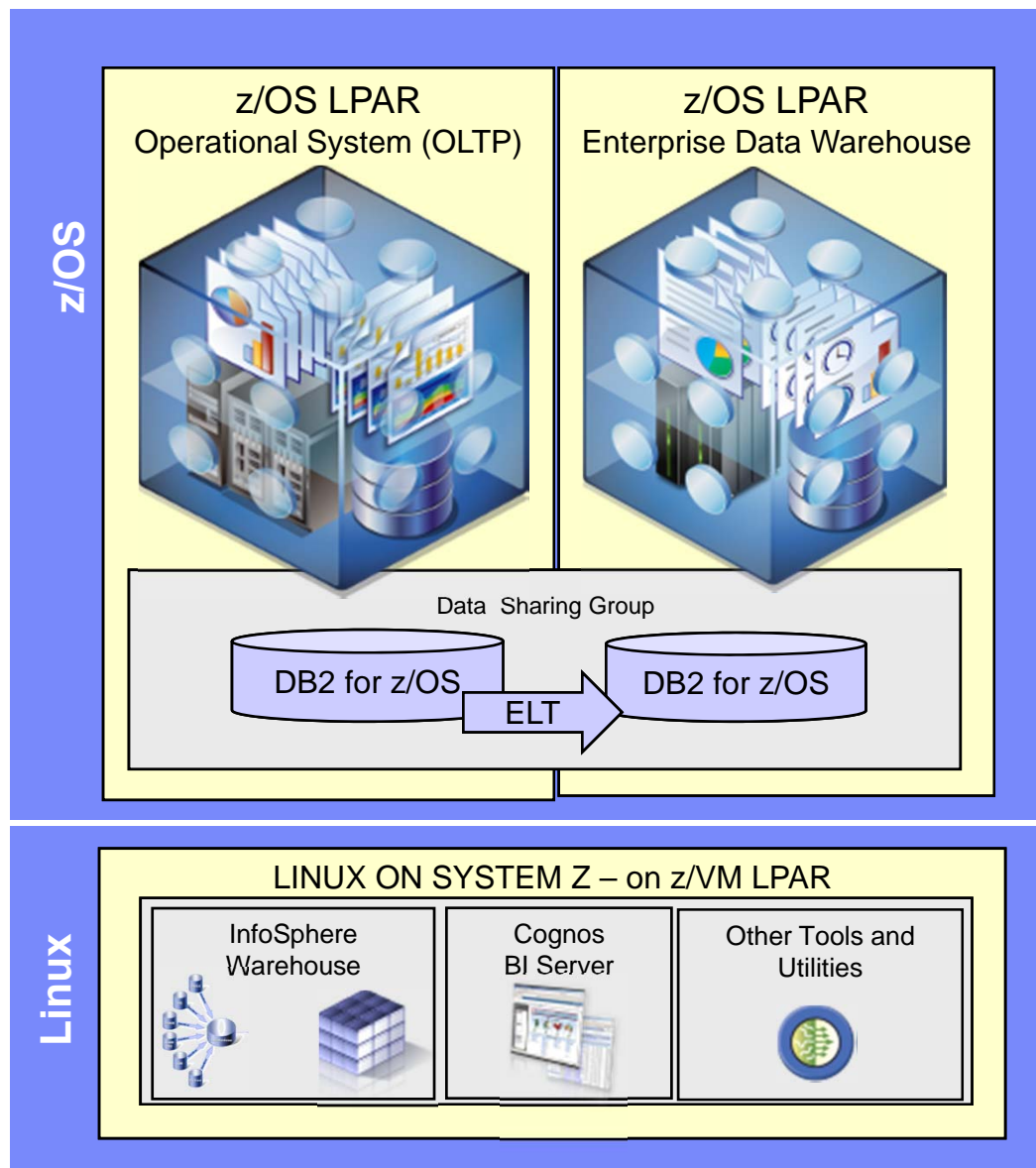


The market is moving to the strengths of System z

- **Enterprises are expanding the role of analytics**
 - Better decisions from the right information
 - Informed decisions at the point of contact
 - Consistency of information across organizations
- **Which is driving operational characteristics requirements**
 - Cost of downtime is escalating
 - The impact of unauthorized intrusion and publishing of private information is overwhelming
 - Stringent Service Level Agreements must be met
- **Newer applications demand lower latency of the data**
 - Businesses want the most up-to-date information they can get
 - Yesterday's information was good yesterday
- **All while focusing on reducing costs/ consolidating**
 - Lower costs through reduced complexity
 - Simplified environment with easier administration
 - Lower SW costs
 - Reduced costs through elimination of redundant servers and resources
 - Reduced footprint, environmental, and administrative costs



A data warehouse solution on a System z foundation



- Minimizes data movement between operational system and data warehouse
- Lowers data latency for time sensitive decisions
- Enables consolidation and simplification of data warehouse and data marts
- Leverages existing high availability, backup, disaster recovery, and security environments
- Provides greater scalability of multidimensional analysis through cubing services (data marts) and DB2 enhancements

DB2 10 for z/OS

CPU reductions for transactions, queries, and batch

- Out-of-the-box CPU reductions of 5-10% for traditional workloads
- Up to additional 10% CPU savings using new functions or avoiding constraints
- Out-of-the box CPU reductions of up to 20% for new workloads

Scales with less complexity and cost

- 5-10x more concurrent users – up to 20,000 per subsystem
- Significant scale-up capabilities in addition to existing scale-out support
- Consolidate to fewer LPARs and subsystems

Improved operational efficiencies and lower administration cost

- Automatic diagnostics, tuning, and compression

Even better performance

- Elapsed time improvement for small LOBS and Complex Queries

64 bit Evolution
Virtual Storage
Relief

Temporal Data

Integrated XML
Support

Query Processing
Enhancements

Business Security &
Compliance

Better Productivity

Standardized Cognos Business Intelligence tools delivering information when, where, and how each user needs it



- **Delivers information where, when and how it is needed**
 - Self-service reporting and analysis
 - Individualized by user
 - Automated delivery of information in context
 - Author once, consume anywhere
- **Full range of BI capabilities**
 - Query, reporting, analysis, dashboarding, realtime monitoring
- **Purpose-built SOA platform**
that fits client environments and scales easily

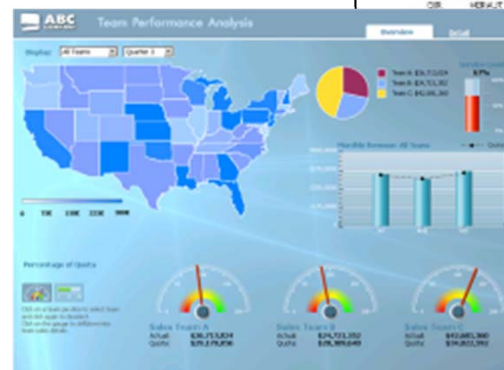
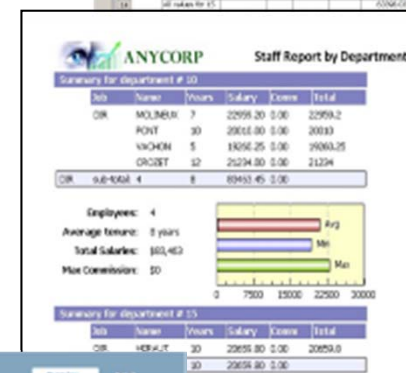
The New Query Management Facility (QMF) 10

Meeting the challenges of today's Business Analytics requirements

Today's functionality with support for yesterday's applications

- Executive dashboards & significantly enhanced visual reports
- New QMF content remains fully compatible with existing QMF objects
- Rapid development and deployment enterprise-wide solutions
- Lightweight installation and administration
- Minimal learning curve - zero coding, drag-drop authoring model
- Embeddable BI – can be integrated into web and Java apps
- Database-based licensing model – not user or application server-based
- 150 new BI and analytic functions

ID	Name	Salary	Expense	Total
01	COLE	21234.00	8.00	\$21,242.00
02	MOLBLS	22995.20	8.00	\$23,003.20
03	FOUNT	20615.00	8.00	\$20,623.00
04	VOCHON	18262.25	8.00	\$18,270.25
05	CRDST	21234.00	8.00	\$21,242.00



SPSS Modeler with InfoSphere Warehouse



Full breadth of predictive analytics

Data collection, statistics, data mining, predictive modeling, deployment services...

Putting prediction in hands of the business

Decision Management

Driving better business outcomes

- Attract and retain profitable customers
- Detect and prevent fraud
- Improve resource allocation

IBM Smart Analytics System 9700

Mixed Workloads for Next Generation Business Analytics



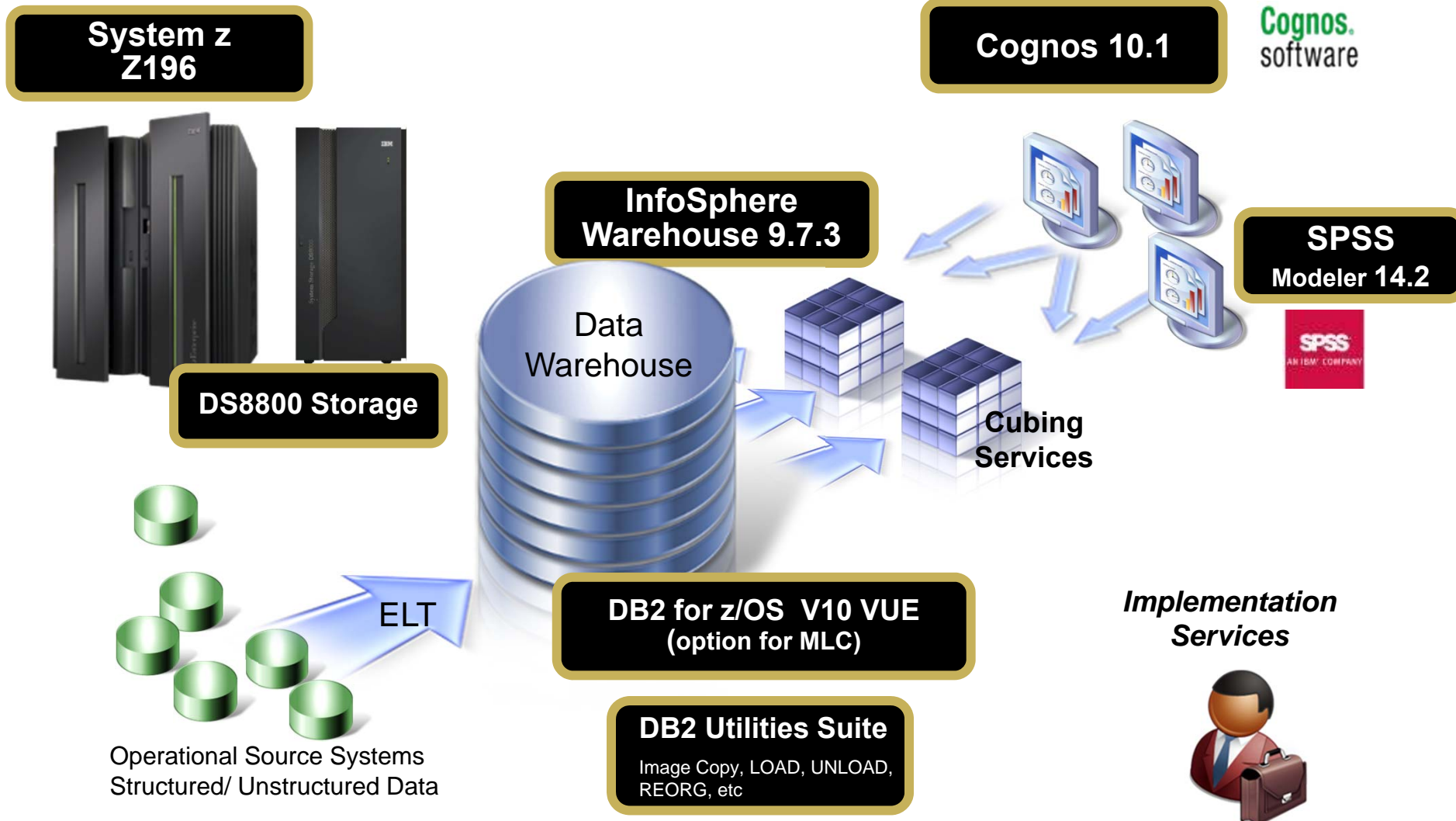
The next generation of System z analytics; an integrated solution of hardware, software and services that enables customers to rapidly deploy cost effective game changing analytics across their business.

- ***Secure, Available Business Analytics***
- ***Simplified administration***
- ***Proven Operational Characteristics***
- ***High Value Operational BI***

Making every decision on facts, at the point of impact

IBM Smart Analytics System 9700

High Value Data Warehousing – Standard Configuration



DB2 Analytics Accelerator

Accelerating decisions to the speed of business

Blending System z and Netezza technologies to deliver unparalleled, mixed workload performance for complex analytic business needs.



Get more insight from your data

- Fast, predictable response times for “right-time” analysis
- Accelerate analytic query response times
- Improve price/performance for analytic workloads
- Minimize the need to create data marts for performance
- Highly secure environment for sensitive data analysis
- Transparent to the application

Fast Time to Value

- **IBM DB2 Analytics Accelerator (Netezza 1000-12)**

➔ Production ready - 1 person, 2 days

- **Table Acceleration Setup ... 2 Hours**

- DB2 “Add Accelerator”
- Choose a Table for “Acceleration”
- Load the Table (DB2 copy to Netezza)
- Knowledge Transfer
- Query Comparisons



Performance & Savings

Query	Total Rows Reviewed	Total Rows Returned	DB2 Only		DB2 with IDAA		Times Faster
			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

Queries run faster

- Save CPU resources
- People time
- Business opportunities

Actual customer results, October 2011

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”



http://www.livestream.com/ibmsoftware/video?clipId=pla_1bc6db16-ac1a-48c2-b50d-2ad13c6ba7ec

Advance to 31 minute mark for DB2 Analytics Accelerator section of keynote

Accelerating decisions to the speed of business

Performance & Savings

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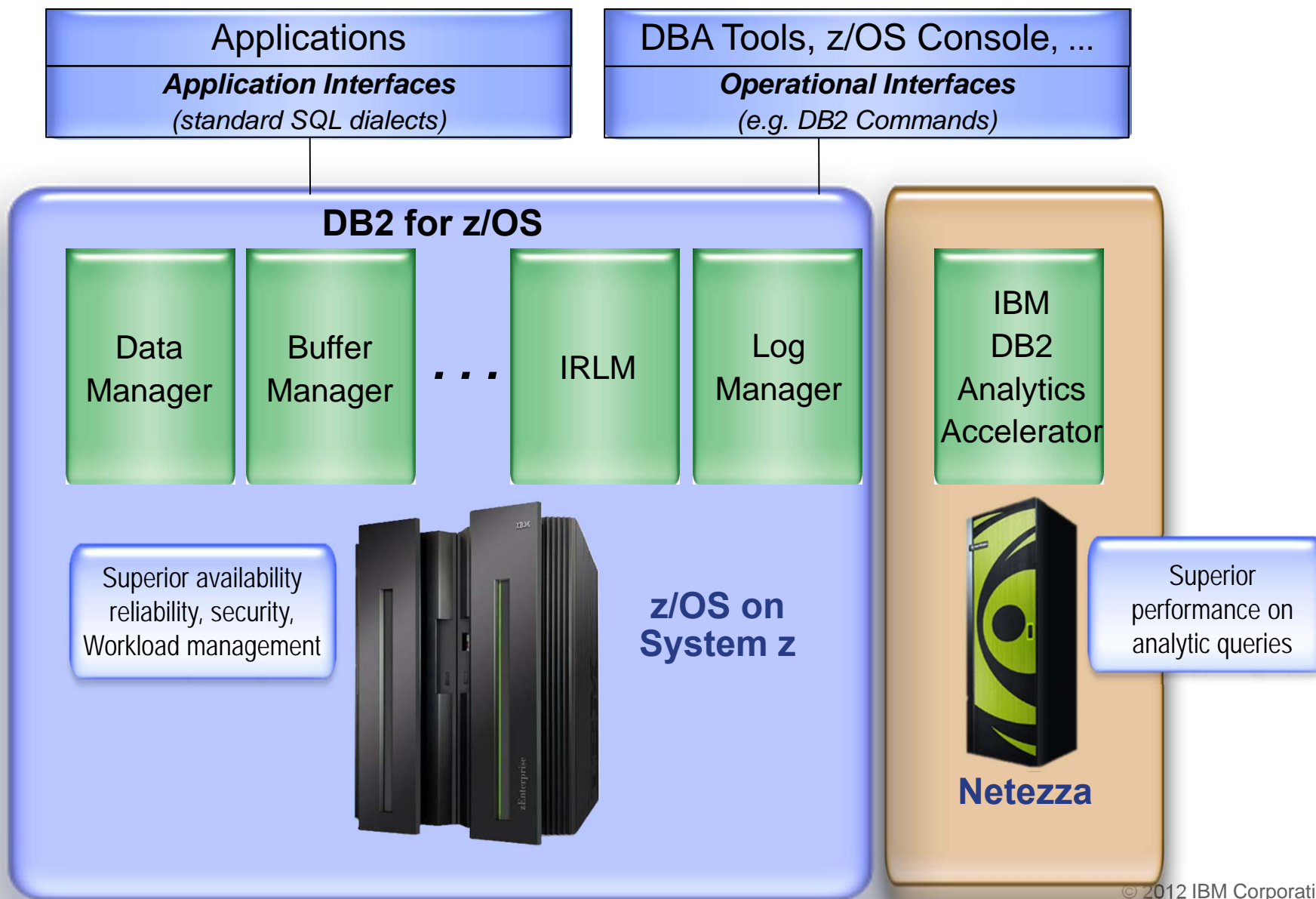
Actual customer results, October 2011

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

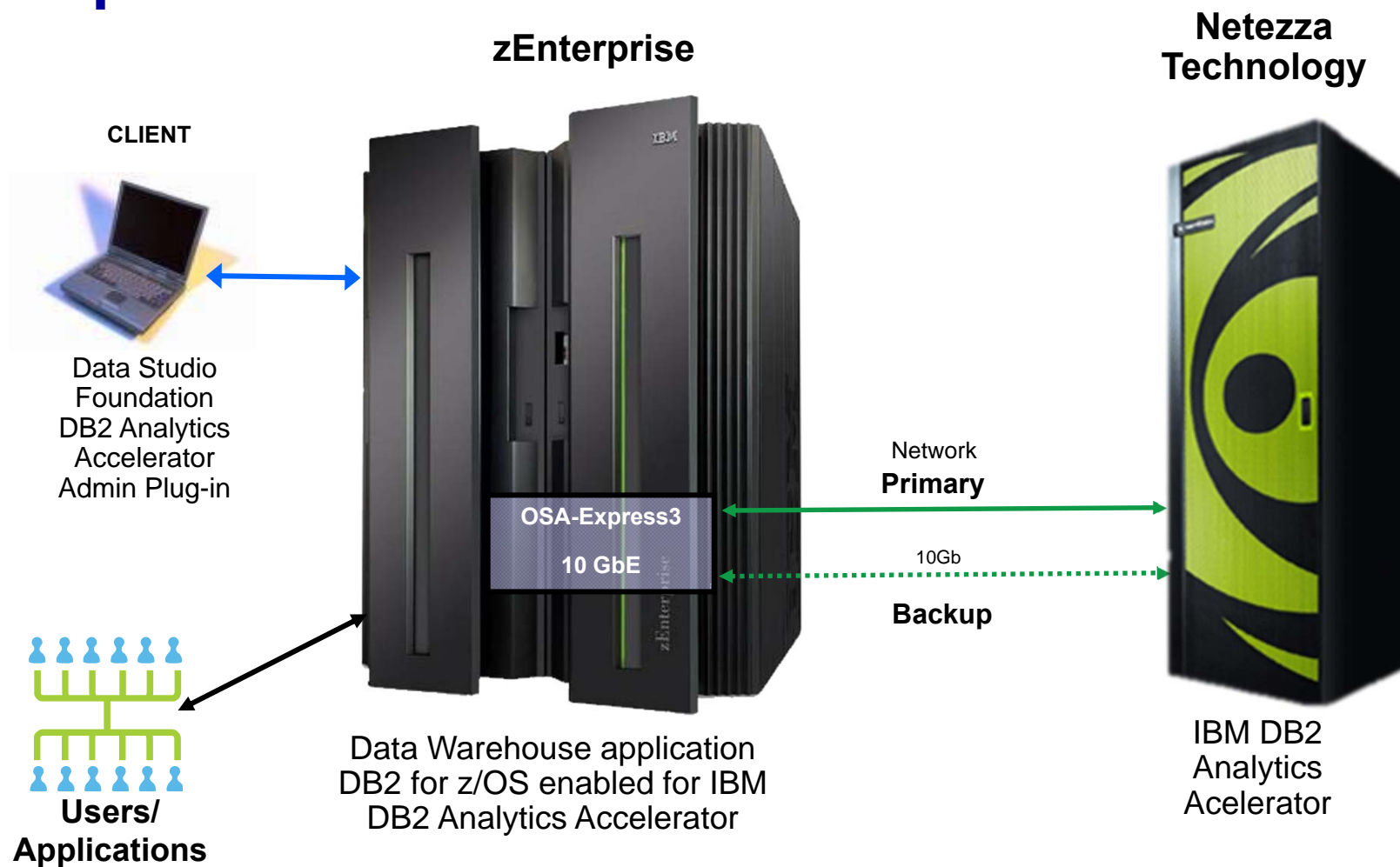
DB2 Analytics Accelerator: “we expect ROI in less than 4 months”

Accelerating decisions to the speed of business

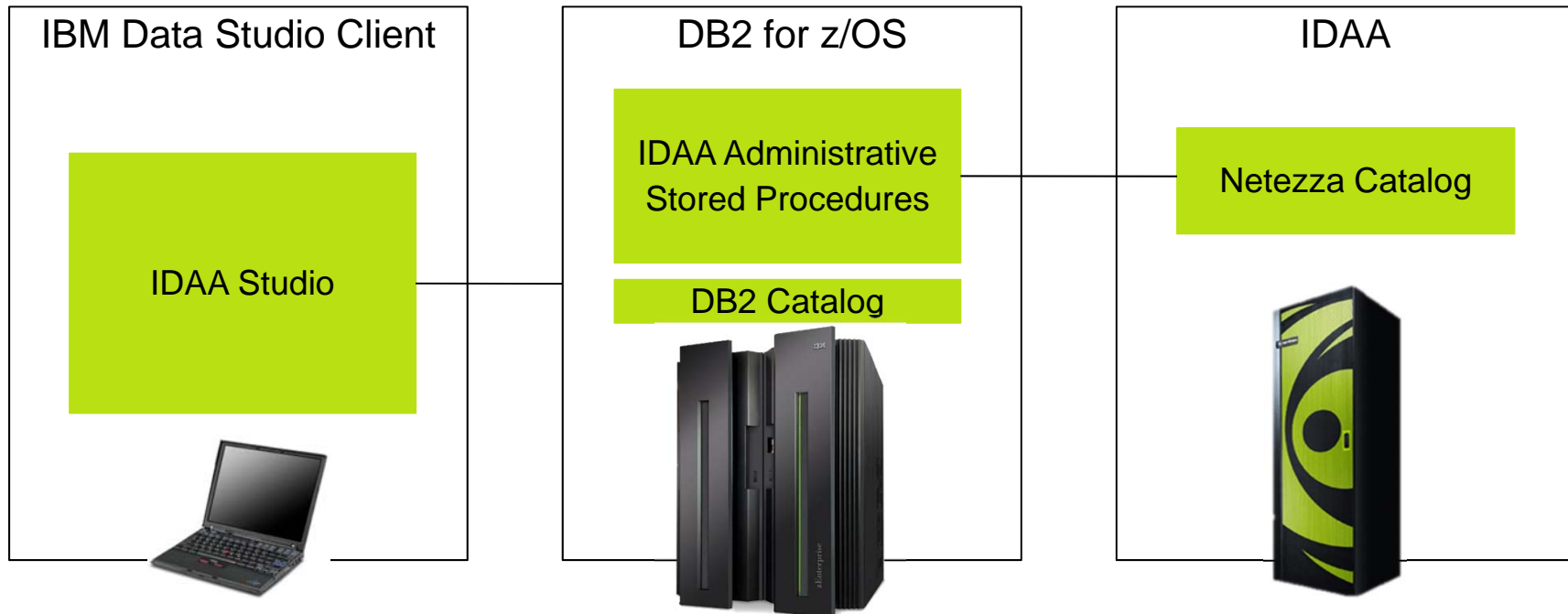
Deep DB2 Integration within zEnterprise



IBM DB2 Analytics Accelerator V2 Product Components



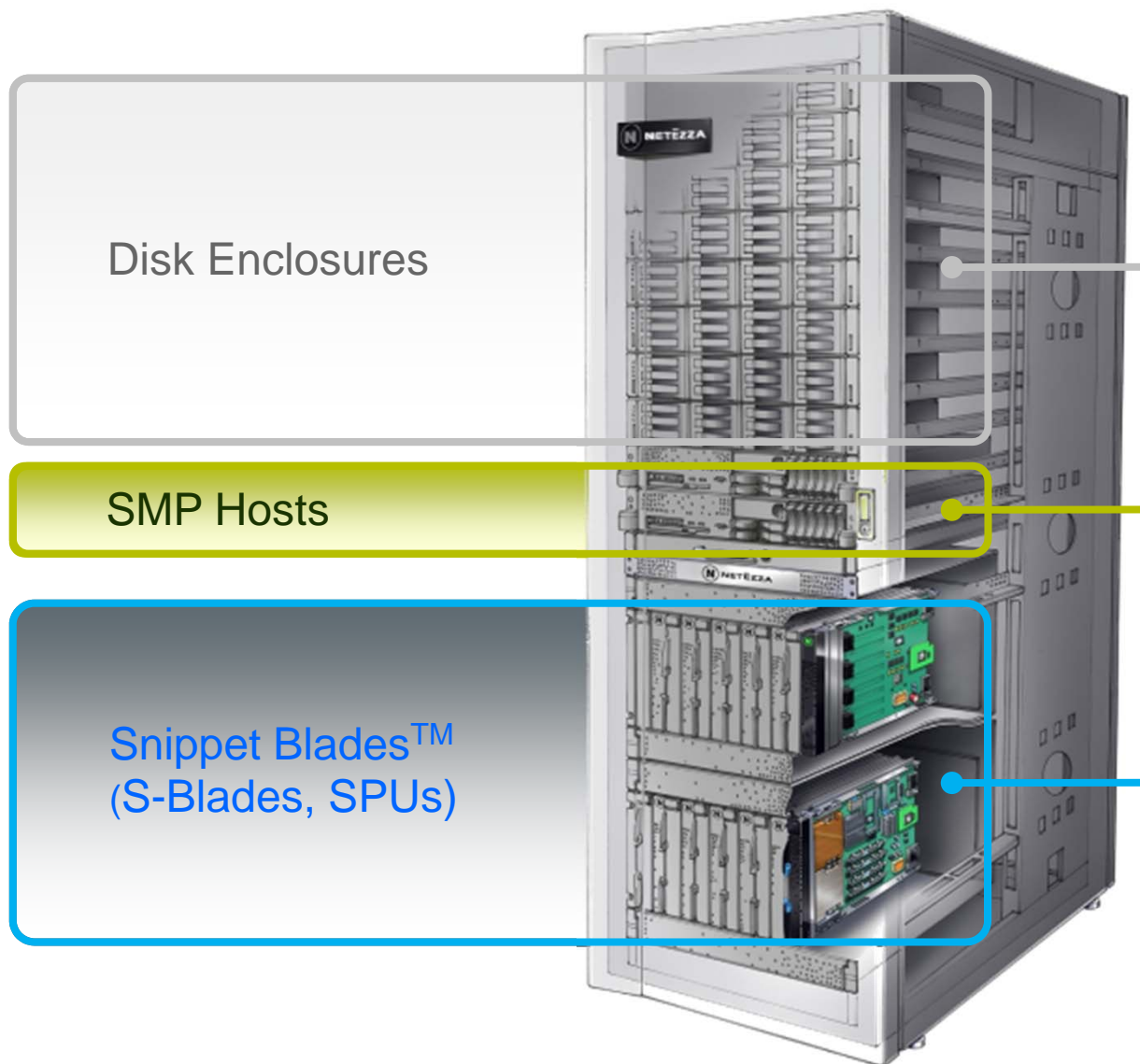
Analytics Accelerator Table Definition and Deployment



- The tables need to be defined and deployed to IDAA before data is loaded and queries sent to it for processing.
 - Definition: identifying tables for which queries need to be accelerated
 - Deployment: making tables known to DB2, i.e. storing table meta data in the DB2 and Netezza catalog.
- IBM DB2 Analytics Accelerator Studio guides you through the process of defining and deploying tables, as well as invoking other administrative tasks.
- IBM DB2 Analytics Accelerator Stored Procedures implement and execute various administrative operations such as table deployment, load and update, and serve as the primary administrative interface to IDAA from the outside world including IDAA Studio.

DB2 Analytics Accelerator V2

Powered by Netezza 1000 Appliance



Disk Enclosures

SMP Hosts

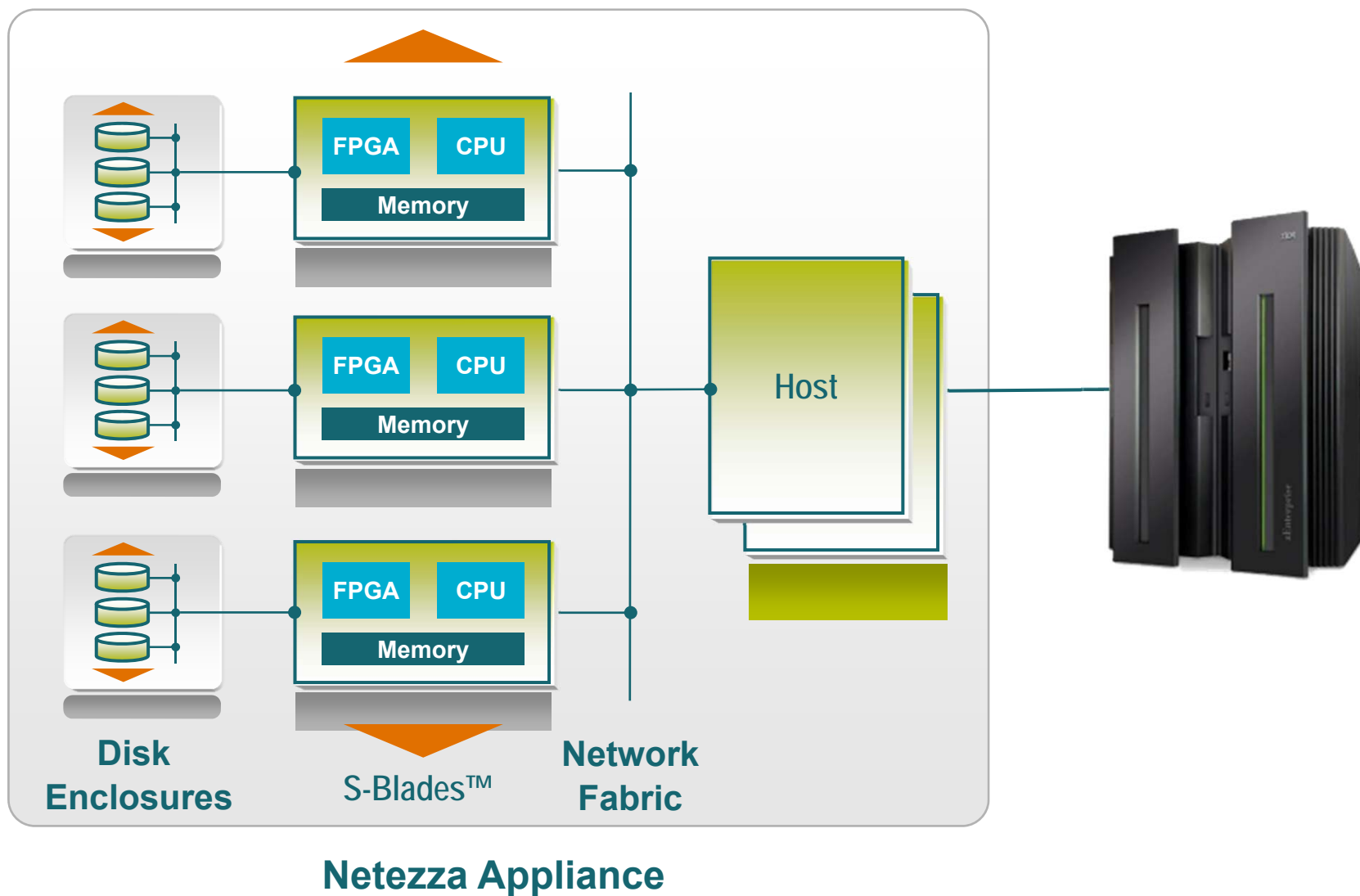
Snippet Blades™
(S-Blades, SPUs)

Slice of User Data
Swap and Mirror partitions
High speed data streaming
High compression rate
EXP3000 JBOD Enclosures
12 x 3.5" 1TB, 7200RPM, SAS (3Gb/s)
max 116MB/s (200-500MB/s compressed data)
e.g. TF12:
8 enclosures → 96 HDDs
32TB uncompressed user data (→ 128TB)

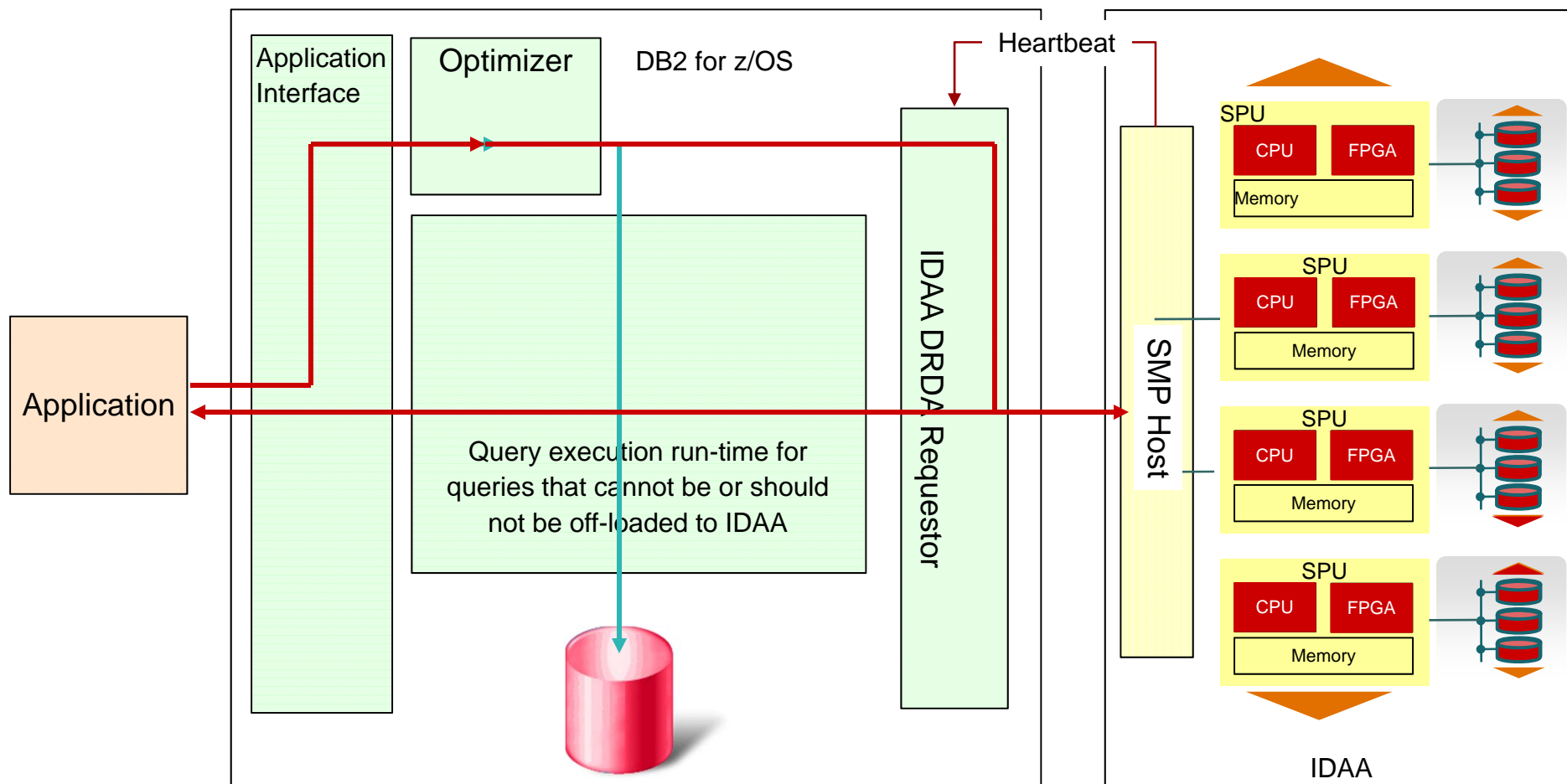
IDAA Server
SQL Compiler, Query Plan, Optimize
Administration
2 front/end hosts, IBM 3650M3
clustered active-passive
2 Nehalem-EP Quad-core 2.4GHz per host

Processor &
streaming DB logic
High-performance database
engine streaming joins,
aggregations, sorts, etc.
e.g. TF12: 12 back/end SPUs
(more details on following charts)

The Appliance Connected to a System z



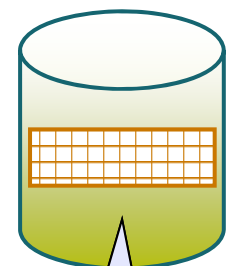
Query Execution Process Flow



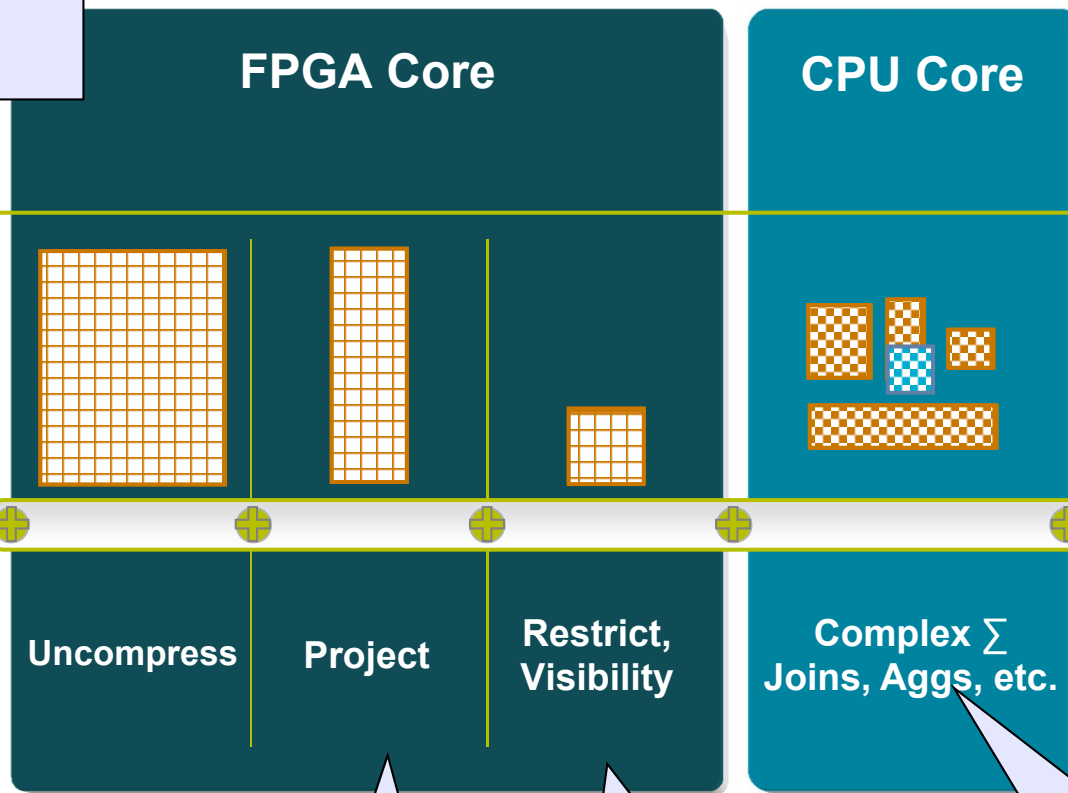
- Queries executed without IDAA
- Queries executed with IDAA
- Heartbeat (IDAA availability and performance indicators)

The Key to the Speed

```
select DISTRICT,
       PRODUCTGRP,
       sum(NRX)
from   MTHLY_RX_TERR_DATA
where  MONTH = '20091201'
and    MARKET = 509123
and    SPECIALTY = 'GASTRO'
```



Slice of table
MTHLY_RX_TERR_DATA
(compressed)

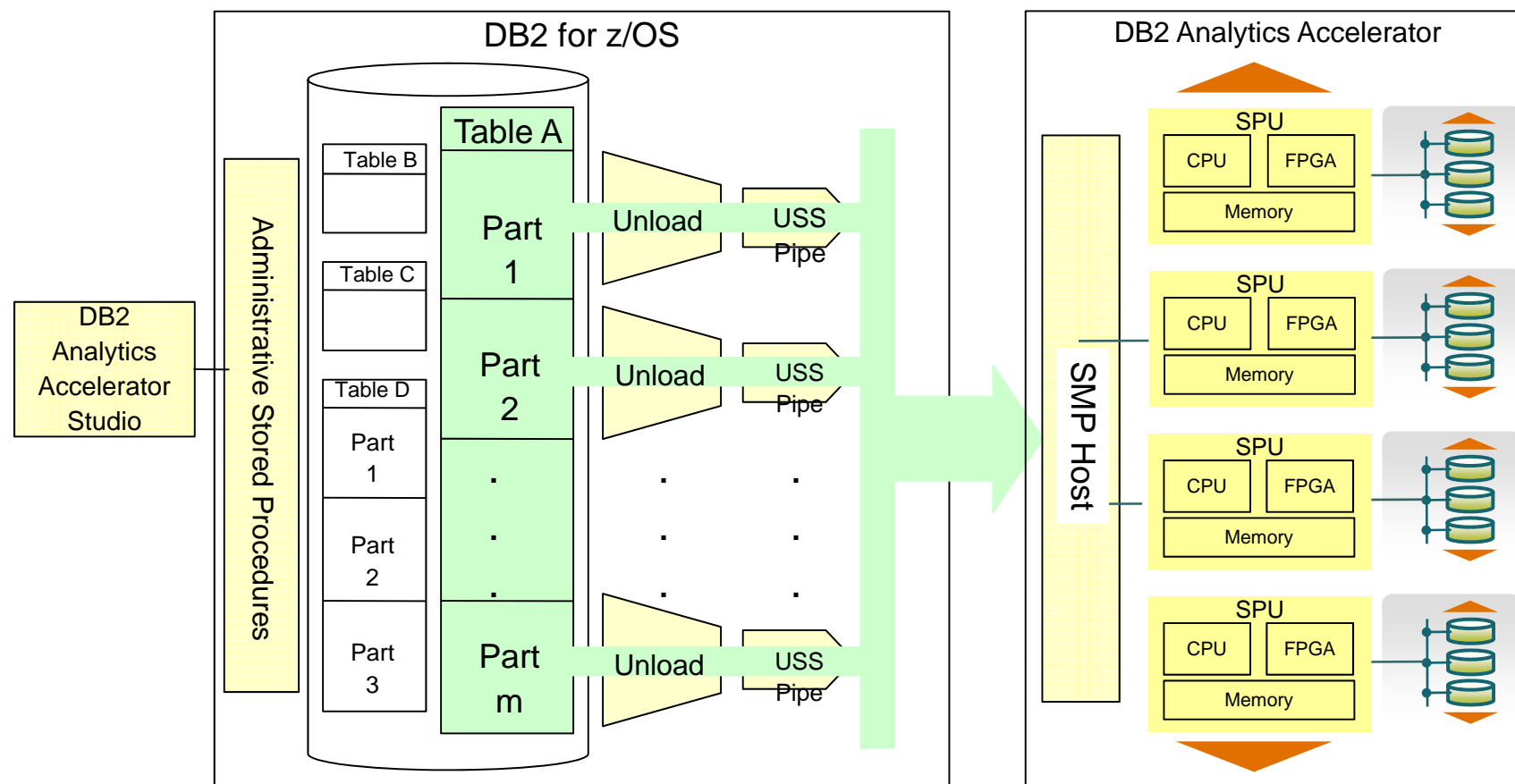


```
select DISTRICT,
       PRODUCTGRP,
       sum(NRX)
```

```
where MONTH = '20091201'
and    MARKET = 509123
and    SPECIALTY = 'GASTRO'
```

sum(NRX)

DB2 Analytics Accelerator Content Maintenance



- Partitions belonging to the same table can be loaded in parallel
 - User-defined degree of parallelism
- Updates are done on a per-table or per-partition level

Connectivity Options

Multiple DB2 systems can connect to a single IDAA



A single DB2 system can connect to multiple IDAAs



Multiple DB2 systems can connect to multiple IDAAs



Better utilization of IDAA resources
Scalability
High availability

Full flexibility for DB2 systems:

- residing in the same LPAR
- residing in different LPARs
- residing in different CECs
- being independent (non-data sharing)
- belonging to the same data sharing group
- belonging to different data sharing groups

Why Both?

Marrying the best of both worlds

IBM System z



Mixed Workload System

IBM Netezza



Focused Appliance

Capitalizing on the strengths of both platforms while driving to the most cost effective, centralized solution - destroying the myth that transaction and decision systems had to be on separate platforms

Very diverse workload

Very focused workload

Tailored to your needs

A Hybrid Solution

IBM System z with IBM DB2 Analytics Accelerator

Mixed Workload System

- Mixed workload system z with operational transaction systems, data warehouse, operational data store, and consolidated data marts.
- Unmatched availability, security and recoverability
- Natural extension to System z to enable pervasive analytics across the organization.
- Speed and ease of deployment and administration

IBM Netezza

Focused Appliance

- Appliance with a streamlined database and HW acceleration for performance critical functionality
- Price/performance leader
- Speed and ease of deployment and administration
- Optimized performance for deep analytics, multifaceted, reporting and complex queries

Flexibility

The right mix of simplicity and flexibility

Simplicity

What is the value?

- **Quickly delivers analytics to operational applications**
- **High speed analytics where the data is generated**
- **Enables train-of-thought analysis with high speed complex queries**
- **Substantially reduces operational costs by removing the need for complex query tuning**
- **Creates a highly secure environment for highly sensitive analysis (EAL5)**

“Back of the Envelope” ROI

Consider the MIPs of your z196 / z114

Consider software MLC reduction: z/OS, CICS, DB2...

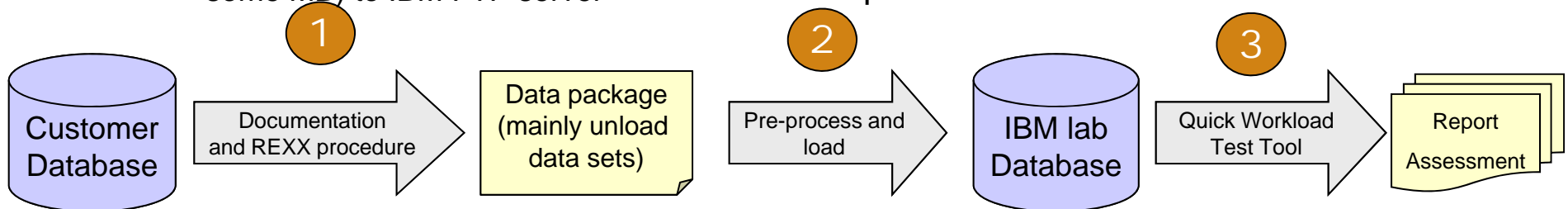
Consider hardware value of MIPs redeployed

Examples of 6 month ROI:

- Avoiding 400 MIPs is roughly the cost of an IDAA Netezza 1000-3
- Avoiding 800 MIPs is roughly the cost of an IDAA Netezza 1000-6
- Avoiding 1600 MIPs is roughly the cost of an IDAA Netezza 1000-12

Next step: Quick Workload Test

- Customer
 - Collecting information from dynamic statement cache, supported by step-by-step instruction and REXX script (small effort for customer)
 - Uploading compressed file (up to some MB) to IBM FTP server
- IBM / Center of Excellence
 - Importing data into local database
 - Quick analysis based on known DB2 Analytics Accelerator capabilities



IDAA 2012 Roadmap

IBM DB2 Analytics Accelerator Vnext - Highlights

Further strengthen DB2 for z/OS competitive position to host mission critical operational BI workloads

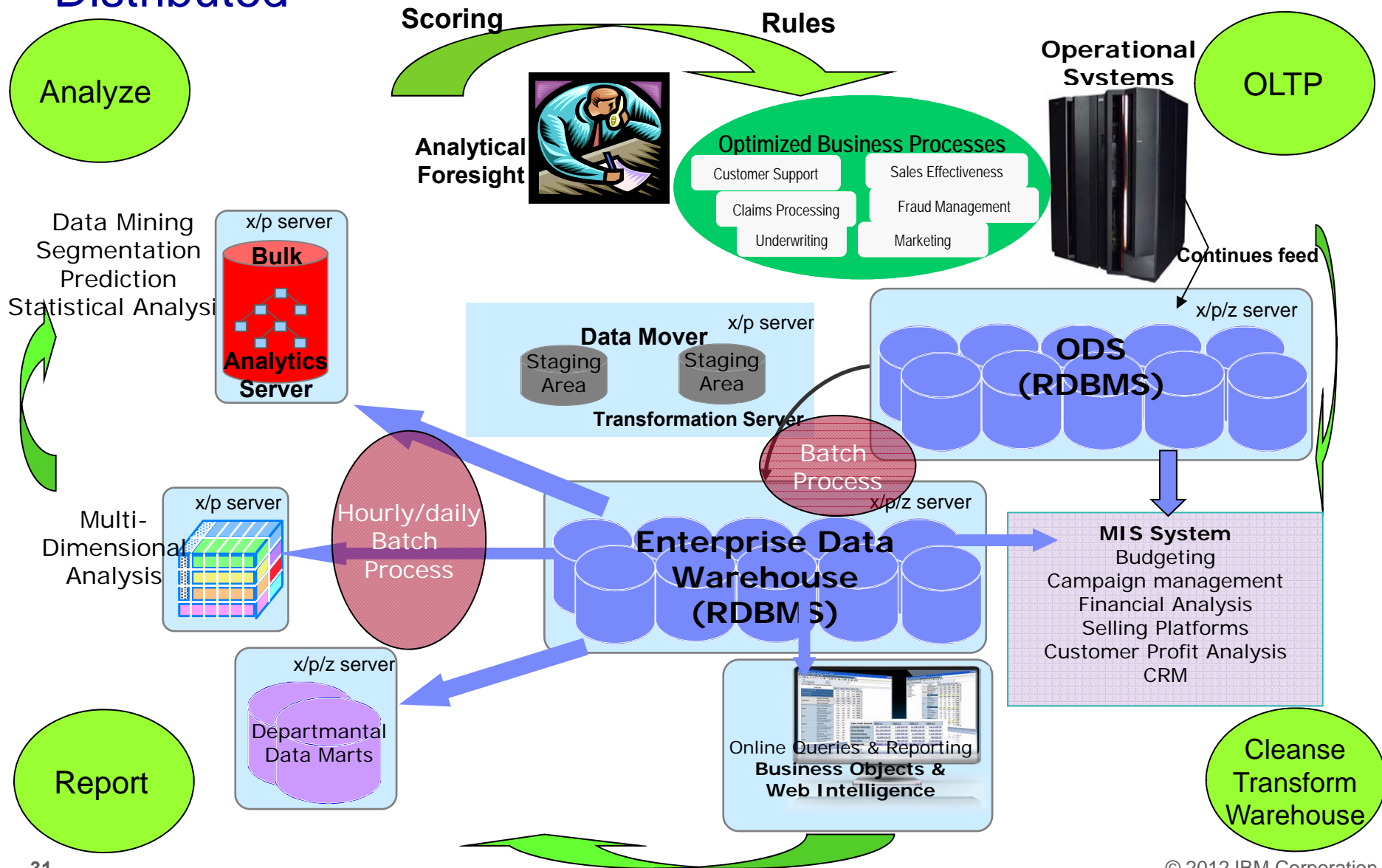
- **New capability: Online Storage Server**
 - Exploit the storage capacity of the Netezza appliance for a true “multi-temperature” data solution controlled by DB2 for z/OS.
 - Less Cost for DataMarts on System z through reduced data duplication.
- **Significantly enhanced Data Currency**
 - Advanced asynchronous data propagation with change data capture technology
- **Improved Performance**
 - Faster data load process with reduced CPU requirements
- **Enhanced Query Support**
- **Platform Support**
 - More IBM Netezza systems



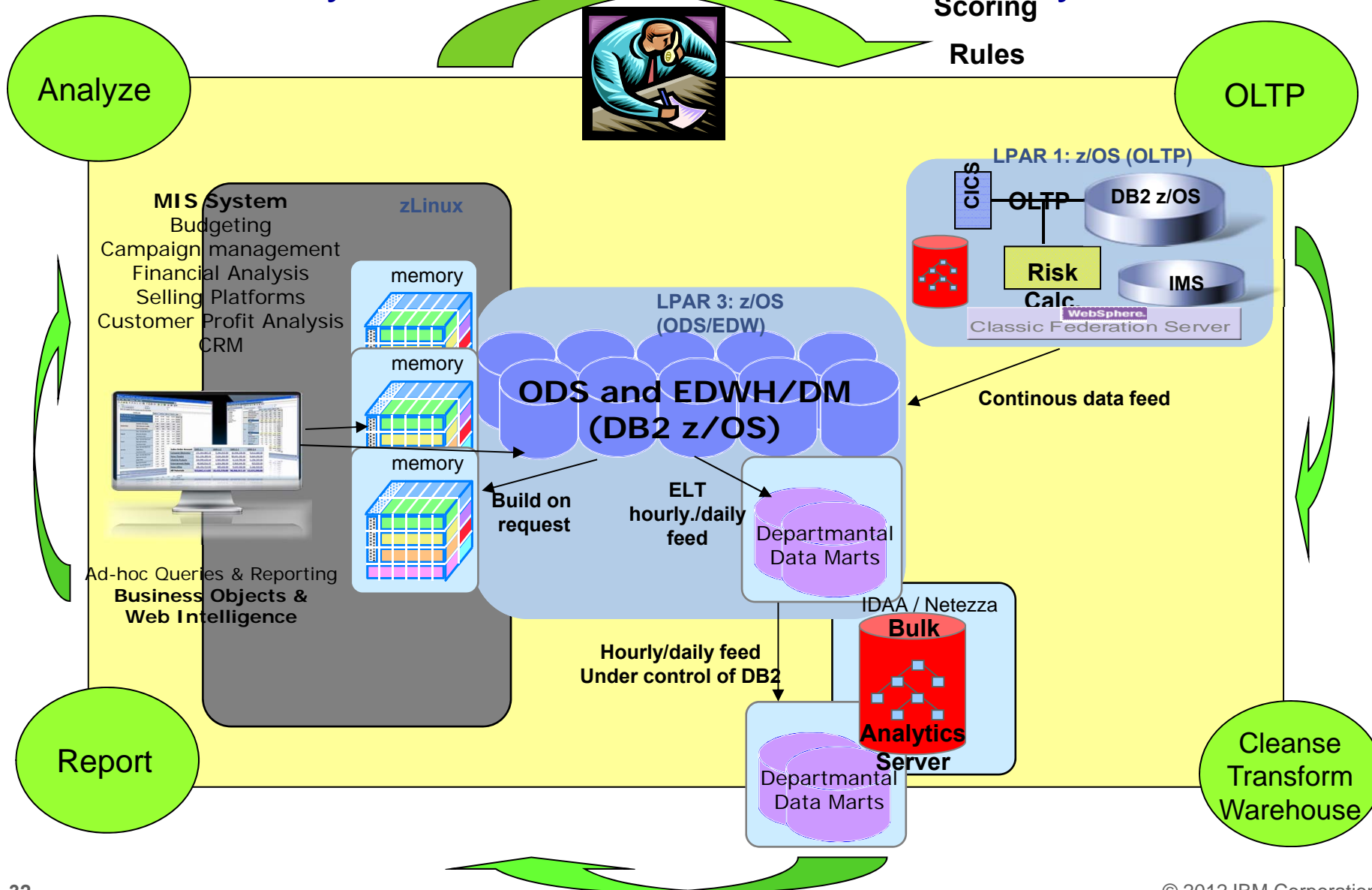
Beta program starting in July 2012

Prerequisites: zEnterprise (z196, z114) - DB2 10

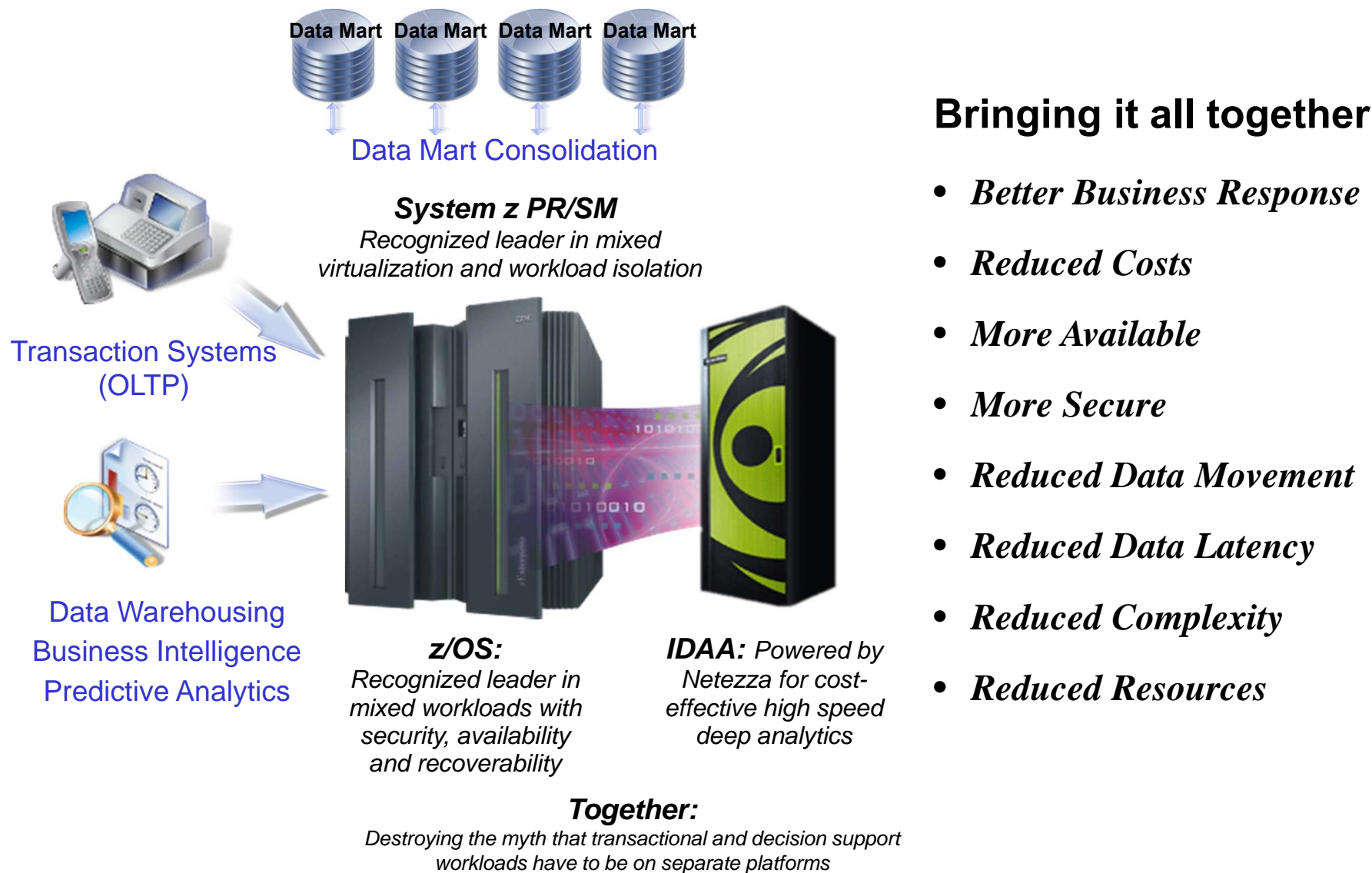
Today's Data Life Cycle "Architecture" - Async and Distributed



Business Analytics Life Cycle Architecture on System z



The Ultimate Consolidation Platform



Bringing it all together

- *Better Business Response*
- *Reduced Costs*
- *More Available*
- *More Secure*
- *Reduced Data Movement*
- *Reduced Data Latency*
- *Reduced Complexity*
- *Reduced Resources*

Thank You