





System z Data Warehousing and Business Intelligence ... the right time, right platform



Business Intelligence ...



- 
- IBM has a long history in the BI space beginning in 1981 with the emergence of the Information Center
 - The misconception about BI is that it is trivial in nature and typically just involves some simple query & reporting
 - The reality about BI is that it is often VERY complex and requires very sophisticated analytics and logic
 - The best way to describe BI is as a “word problem”
- 



Business Intelligence tools ...

- Provide a core set of functionality
 - Query
 - Reporting
 - Dashboards
 - Analytics
 - ... and more
- All tout ease of use ... but then we have those “word problems”
- Do not always meet end user profiles or skills thus may be under-deployed
- Are changing today with more and more function pushed back to the server for processing
- ‘Modern’ initiatives like SOA are driving a more modular approach and a BI ‘platform’ agenda rather than ‘fat’ suites

Some of the things customers tell us today ...

- 
- We started with arcane tools, proprietary data sources, and isolated usage of BI processes
 - We ‘evolved’ into a series of BI tools with each mapping to a specific application area or user set
 - Our early attempts to pull application data together from our BI tools required “home grown” federation
 - This often resulted in inappropriate use of several of our BI providers and a ‘closed’ society within the enterprise
- 



... and they tell us

- Some of the tools we have acquired have proven to be of more use than others though we have not standardized on one particular tool or vendor
- Our deployment of our BI tools is far less than what we had hoped
- Our costs of BI growth are too high .. We have to constantly add new servers and associated software as our usage increases
- **We are looking for leadership in this area and direction from IBM in two key areas on System z**
 - **Data Warehouse enabling technology**
 - **Business Intelligence solutions**

Data Warehouse and BI factors on System z

- The bulk of enterprise data is captured and stored on a System z platform
- The rate and volume of captured data increasing exponentially
- Data collected on System z is often replicated to a distributed platform creating lag time and substantial additional processing
- Real-time and operational uses of data (e.g. customer service) are becoming increasingly more prevalent and mission-critical
- 24x7 operation and system security/regulatory compliance are high priority within the enterprise
- Cost factors
 - Server consolidations
 - SW and hardware costs of distributed systems
 - BI Tools consolidation and standardization
 - Power consumption
 - Time to increase server processing and acquisition versus starting a new Linux image

Data Warehouse Solutions



Cost of Ownership is King

The 'Hidden' Operational Costs of Computing

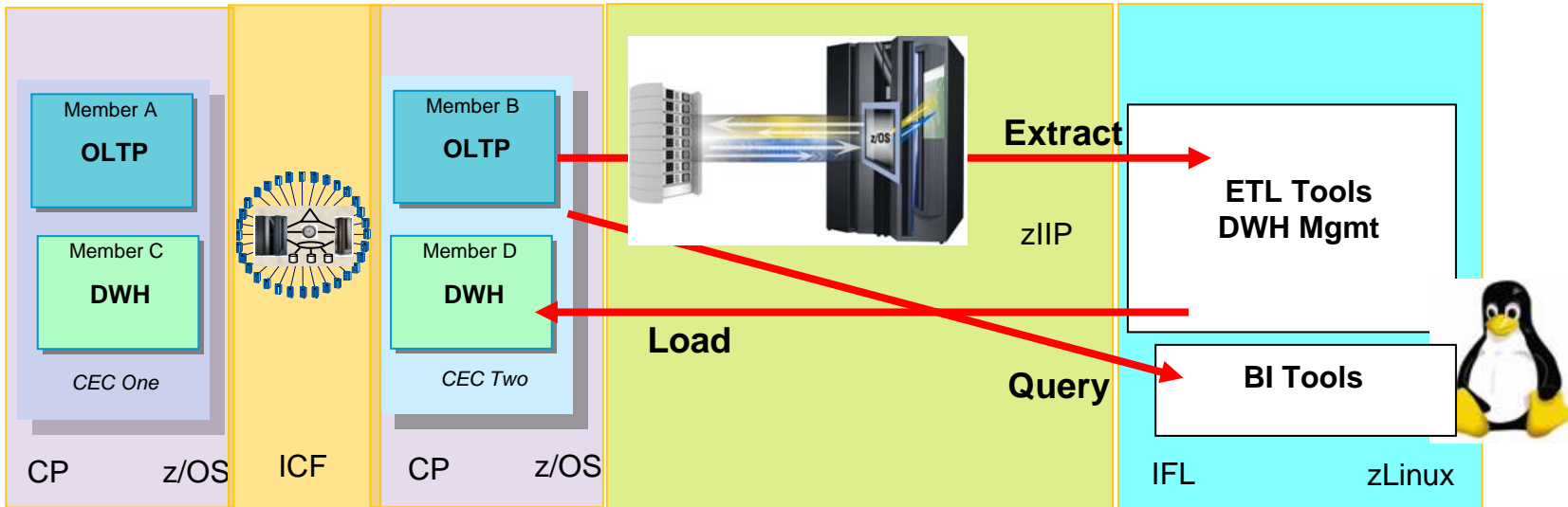


- Management and administration
 - ***'However, the costs of supporting and managing these complex environments and infrastructures have soared, and now far outweigh the customer's expenditure on new systems themselves'***
© Software Strategies 2005 11
- Security breaches
 - ***More Than 90% Of Companies Expose Sensitive Data***
Reconnex Insider Threat Index August 2005
 - ***Businesses Reluctant To Report Cyber Attacks***
2005 CSI/FBI Computer Crime and Security Survey
 - ***One In Four Identity-Theft Victims Never Fully Recover***
Nationwide Mutual Insurance Co. Survey July 2005
 - ***Card Associations Unite Setting Standards to Fight Fraud***
Green Sheet Inc. August 2005 Issue 2
- Downtime
 - ***Cost of downtime can vary by industry and can range from hundreds of thousands to millions of dollars per hour***
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IBM Mainframe solutions are highly available, highly secure and highly managed to help lower TCO



Specialty Processors in a DB2 for z/OS Warehouse Solution

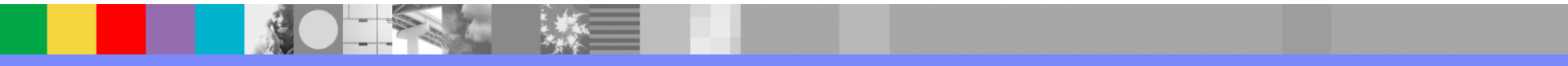


ICF – Uniquely allows a Data Warehouse database to share data with an OLTP database.

IFL – Enables efficient data movement (secure, high-speed hypersockets)

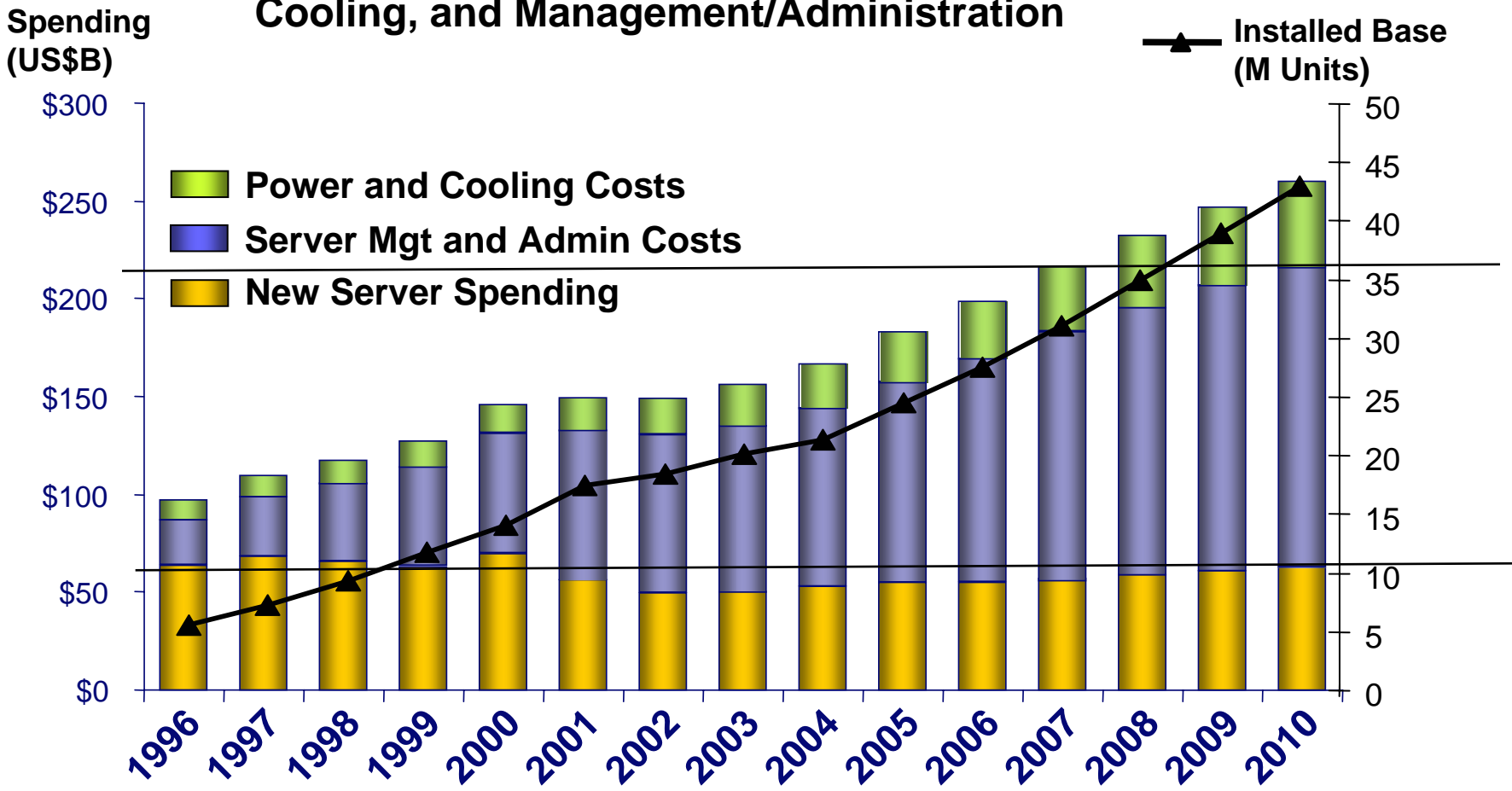
- Lowers TCO through reduced hardware and software costs
- Enables use of zIIPs during extract and further reduces costs

zIIP – Further enables lower cost of Business Intelligence queries

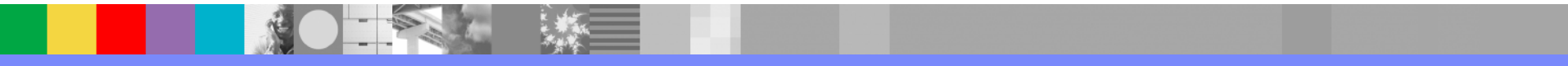
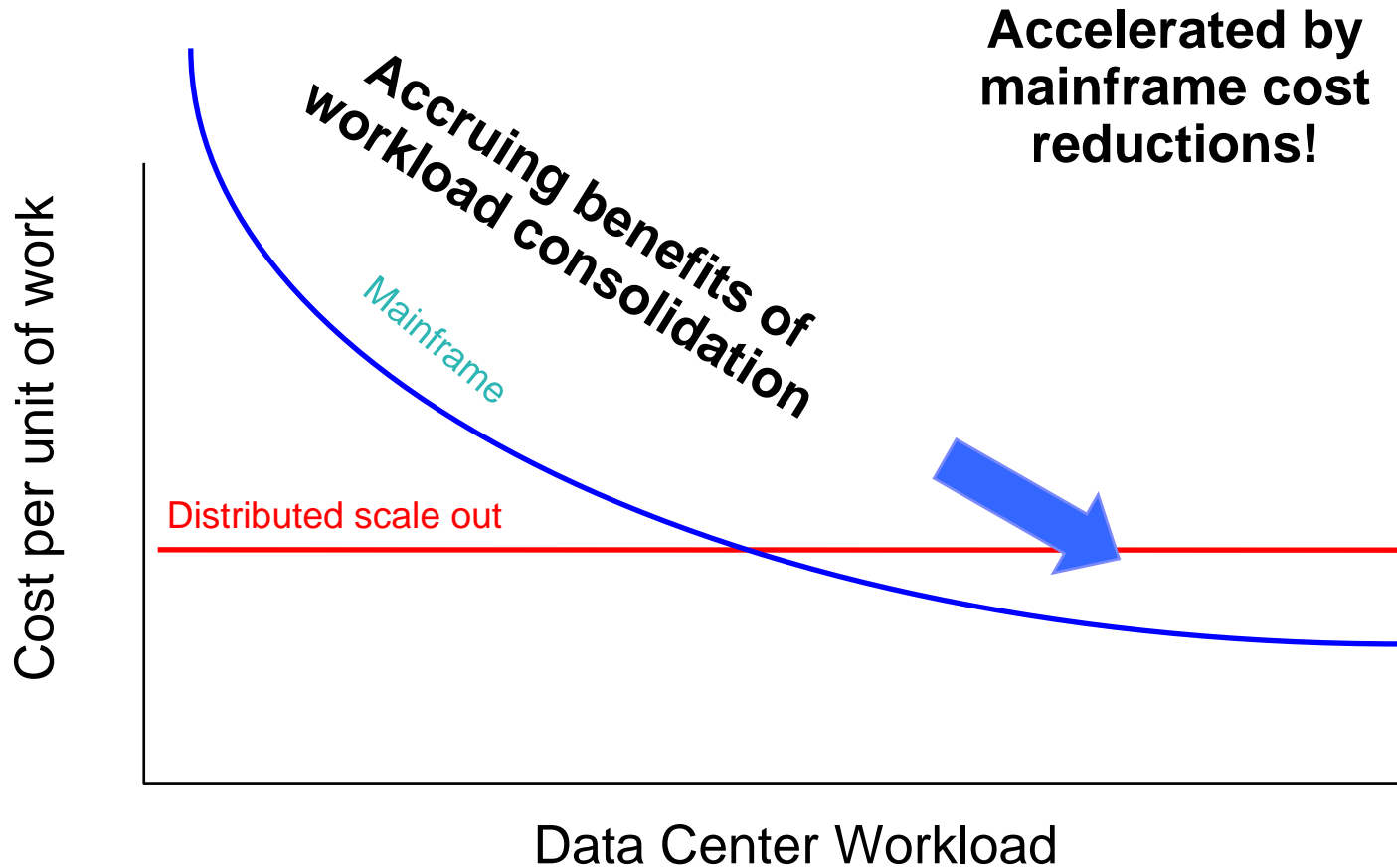


Relative Contributions to TCO

Worldwide IT Spending on Servers, Power and Cooling, and Management/Administration

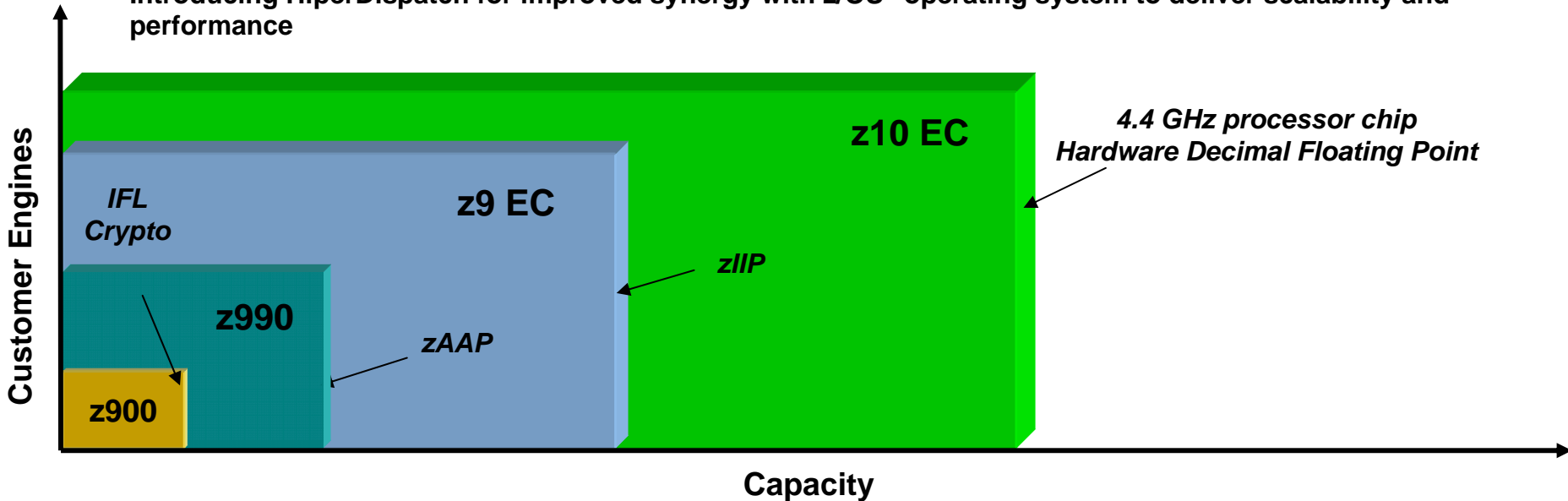


System z: Cost Per Unit of Work Goes Down as Workload Increases



Improved server performance and scalability with faster and more processors and improved dispatching synergy

- The z10 EC delivers on average 50% more performance in a n-way configuration
 - The uniprocessor is expected to deliver 62% more performance than z9™ EC uniprocessor*
- The z10 EC 64-way offers 70% more server capacity than the largest z9 EC**
- Introducing HiperDispatch for improved synergy with z/OS® operating system to deliver scalability and performance



Significant capacity for traditional growth and consolidation

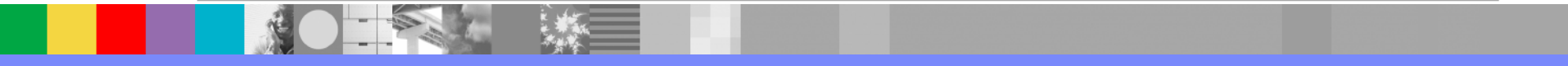
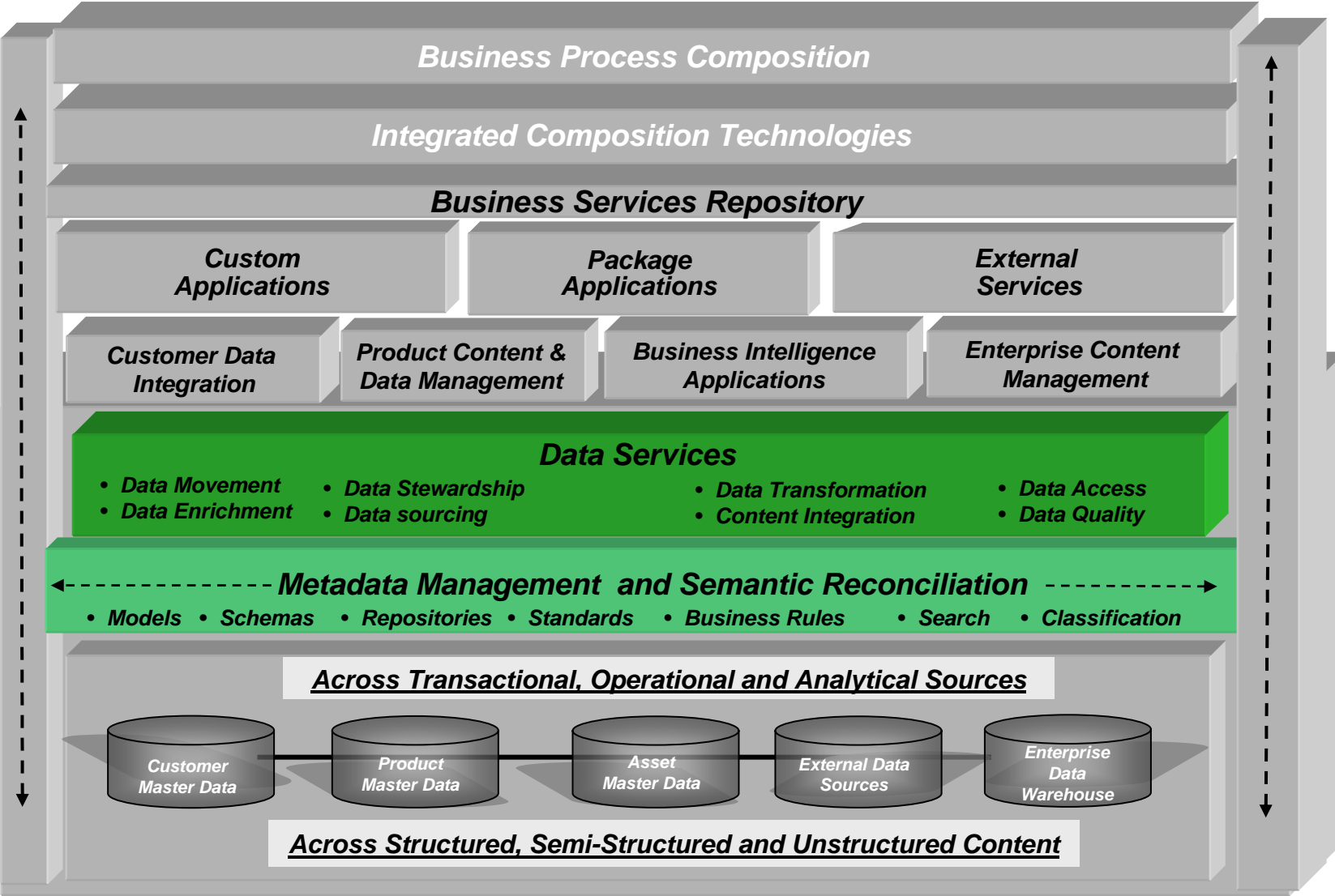
* LSPR mixed workload average running z/OS 1.8 - z10 EC 701 versus z9 EC 701

** This is a comparison of the z10 EC 64-way and the z9 EC S54 and is based on LSPR mixed workload average running z/OS 1.8



How Gartner Defines the Requirement

Enterprise Information Management: Getting Value From Information Assets Gartner Business Intelligence Summit 2006 David Newman 6-8 March 2006



The IBM Solution: IBM Information Server

Delivering information you can trust

IBM Information Server

Unified Deployment

Understand



Discover, model, and govern information structure and content

Cleanse



Standardize, merge, and correct information

Transform



Combine and restructure information for new uses

Deliver

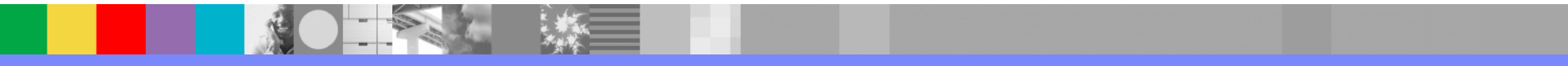


Synchronize, virtualize and move information for in-line delivery

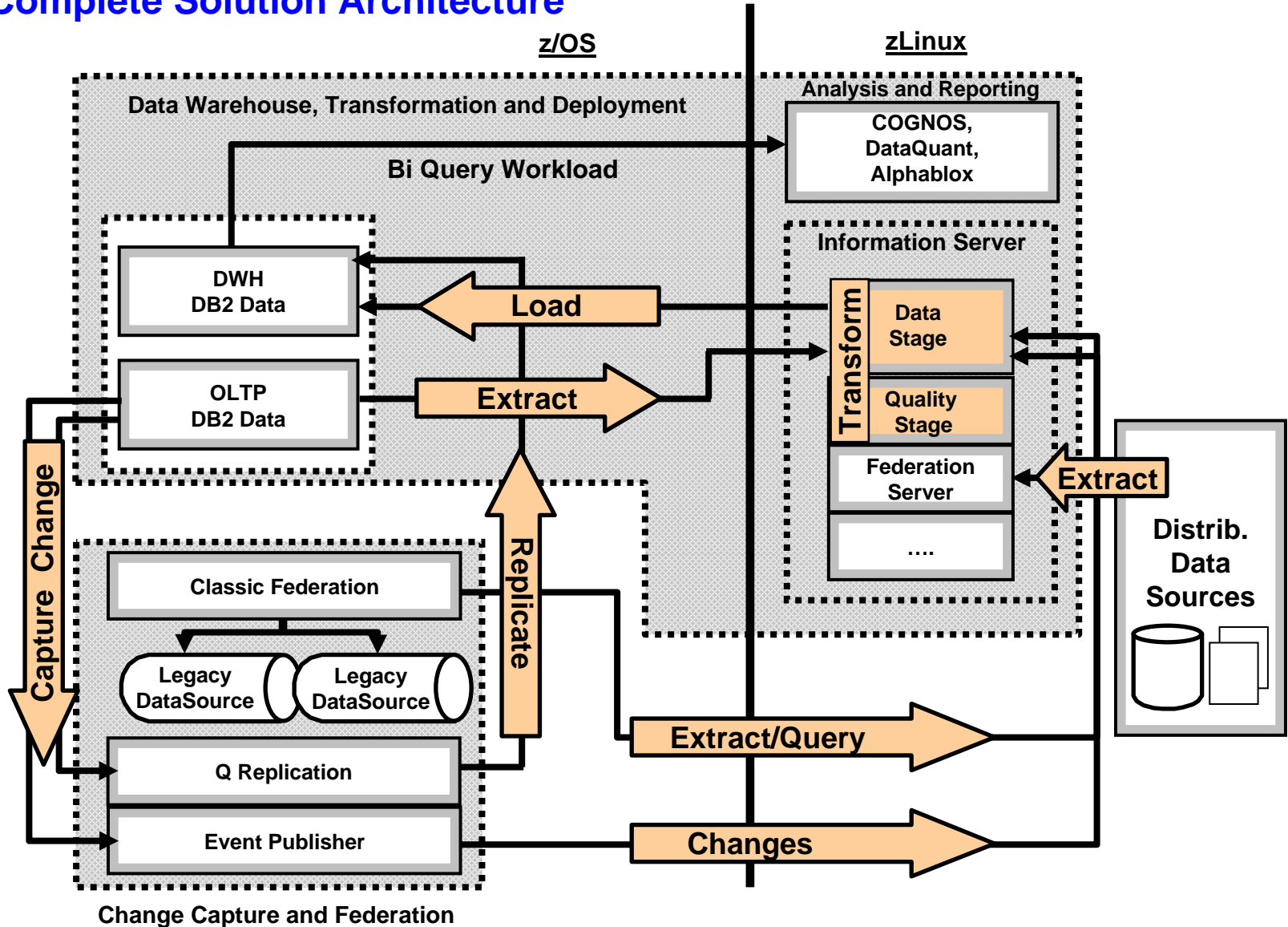
Unified Metadata Management

Parallel Processing

Rich Connectivity to Applications, Data, and Content



Enterprise Data Warehouse on System z The Complete Solution Architecture



DB2 9: Rich Release for BI

Performance

- New row internal structure for faster VARCHAR processing
- **Fast delete of all the rows in a partition**
- Numerous enhancements in 'smaller' LOB performance
- Fast LOB streaming
- Reducing log latch contention
- Deleting first n rows
- Skipping uncommitted inserted/updated qualifying rows
- Faster release of LOB locks
- Reducing data sharing overhead for global indexes
- **Functional indexes**

Business warehouse

- Dynamic index ANDing
- Reduce temporary tables materialization
- Generalizing sparse index/in-memory data caching

Continuous Availability

- **Partition-by-growth as a means to remove non-partitioned tablespace size limit**
- Full support for system-level backup and recover (automatic offload to tapes and individual objects recovery)
- Renaming SCHEMA and VCAT to facilitate fast database provisioning
- Rename index
- Reorganization of LOBs to reclaim space
- **Online REORG enhancements**
- **Online REBUILD index**

Architecture/SQL

- Thin DB2 Connect Client
- FOR BIT DATA collating sequence (VARBINARY)
- Full JDBC compliance
- Enable Decimal Float data type (pre-conditioning)
- BIGINT data type
- **Index compression**

Architecture/SQL (con't)

- Provide more VS relief for thread related storage (partially)
- Unicode support for all CLI functions
- MERGE statement
- SET operations

Ease of Use

- Implicit objects creation
- Enhancing real time statistics (Optimization Service Center)
- Autonomic reoptimization
- Integration of Real Time Statistics tables into the catalog
- Simulating indexes in EXPLAIN (Optimization Service Center)
- More autonomic bufferpools tuning (WLM synergy)
- RLF support for end-user correlation
- TRACE support for end-user correlation
- Enhance tracing in DB2 Connect
- Identifying unused indexes
- Enhancing IFC for IRLM diagnostics
- DSNACCOR enhancements



Business Intelligence Solutions



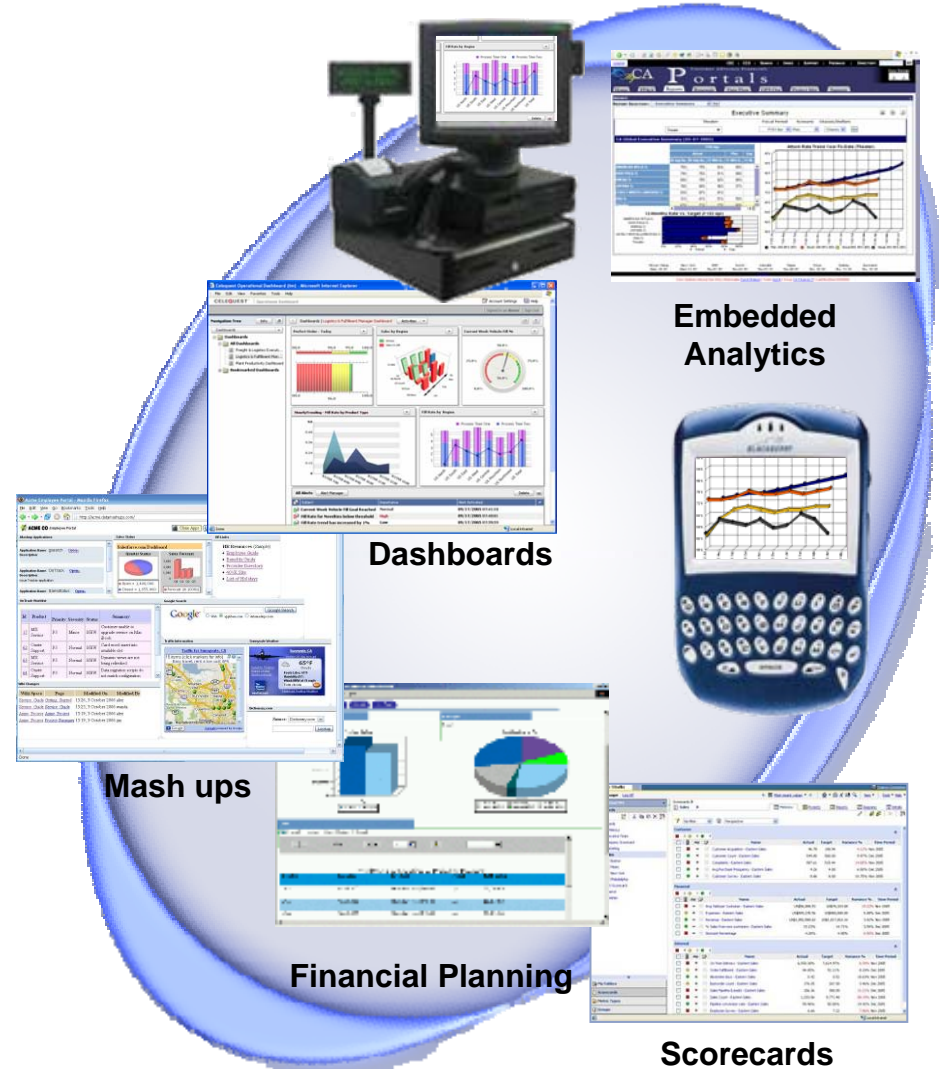
Analysts Predict Move to Right-Time BI

By 2012, BI Platform capabilities will be **embedded** as a service within **75% of new business applications**.

By 2012, emerging technologies will significantly drive adoption of **BI to 50% of business users**

(e.g. interactive visualization, in-memory analytics, search, SaaS and SOA)

Source : Gartner BI Summit 2008, 4/2008



Gartner BI 2009 Quadrant

- BI platform architecture.
 - IBM Cognos 8's Web services-based SOA is much better integrated than some competing offerings
 - shared metadata across the platform enabling ease of transfer from report to query to analysis.
- IBM's commitment to BI is evident
 - in significant staff expansion
 - growth in the overall "Cognos" workforce
 - assisted by much greater focus from the IBM GBS consulting arm.
- IBM Cognos has a high proportion of enterprise-standard BI platform deployments
 - more than three-quarters of the customers Gartner contacted as part of this research consider IBM Cognos a BI standard in their organization.
- The IBM Cognos customers that Gartner contacted as part of this research rated its BI platform functionality very highly, above the mean in all 11 areas

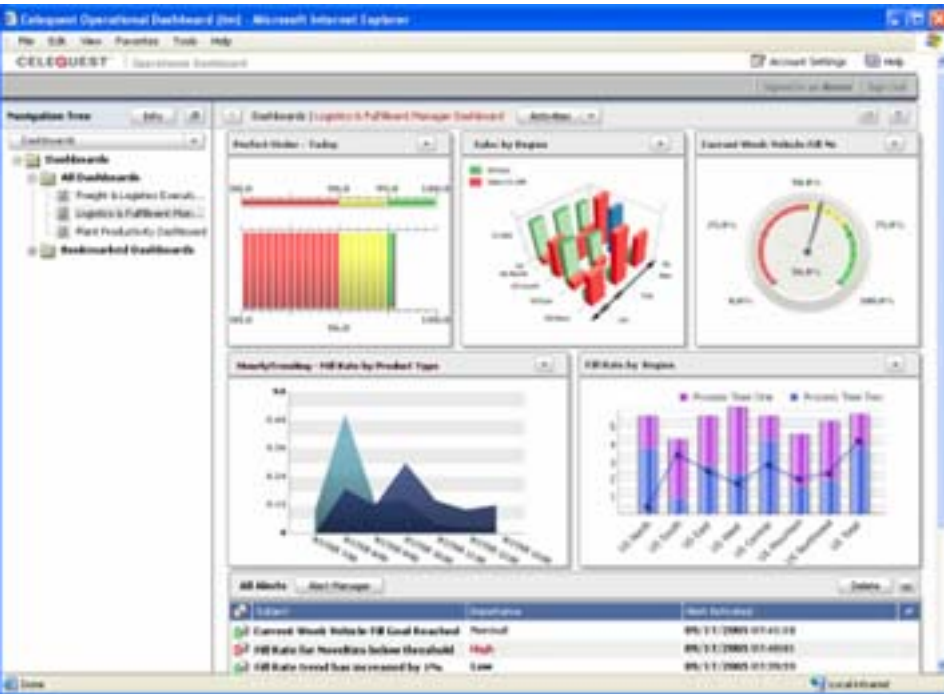


IBM Cognos 8 BI for Linux on System z ... a unique offering

- Cognos' first venture on System z – previously only LUW platforms were supported
- Customer-driven initiative – “Add value to my System z investment!”
- Provides a total System z solution from data to analysis
- Complements IBM's Data Warehousing for System z offerings
- Utilizes System z specialty engines (IFLs, zIIPs)
- BI processes and enterprise data co-resident on System z



How Are We Doing?



■ Dashboards

- Translate complex information into high-impact presentations
- Allow you to spot changes
- Are highly intuitive
- Align decision makers



Why?



■ Enterprise Reporting

- Supports multiple report types: Production, Managed, Ad-hoc, Financial, etc
- Is adaptable to any data source
- Operates from a single metadata layer
- Can be personalized and targeted
- Can be distributed via email, portal, MS-Office, search application and mobile device

■ Analysis

- Enables the guided exploration of information that pertains to all dimensions of your business
- Performs complex analysis and scenario modeling easily and quickly
- Gets to the “why” behind an event or action to improve business performance.
- Moves from summary level to detail levels of information effortlessly



Cognos 8 BI for Linux on System z

"Written off by many industry pundits five years ago, IBM has reinvented the mainframe. The pursuit of new workloads has been a critical aspect of the resurgence, while at the same time protecting and nurturing the installed base. The introduction of specialty engines has been a catalyst to the growth but represents only the first step toward a significant change in architecture during the next five years. The IBM mainframe remains a critical component in the large mission-critical environment, and it will be no less critical in three years."

Source: The IBM Mainframe Platform Ongoing Challenges, New Opportunities. PDF; Gartner Data Center Conf, Dec. 2008



Introducing the Cognos 8 platform

PRESENTATION TIER

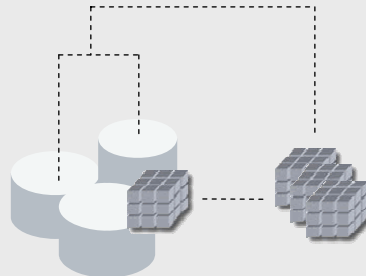


APPLICATION TIER



Metadata layer

DATA TIER



**Capabilities
Delivered Anywhere**

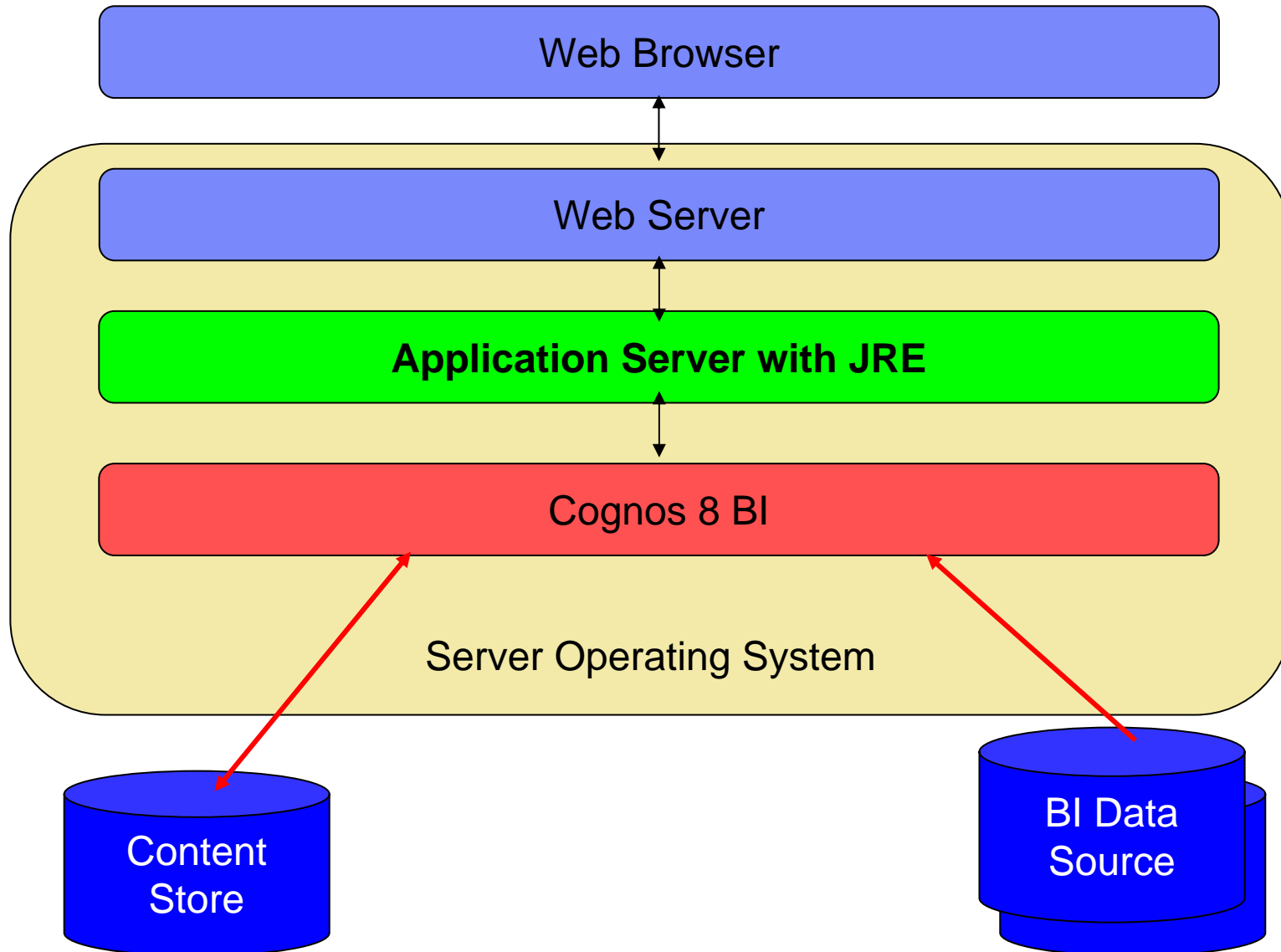
(Web, Mobile, Search Office)

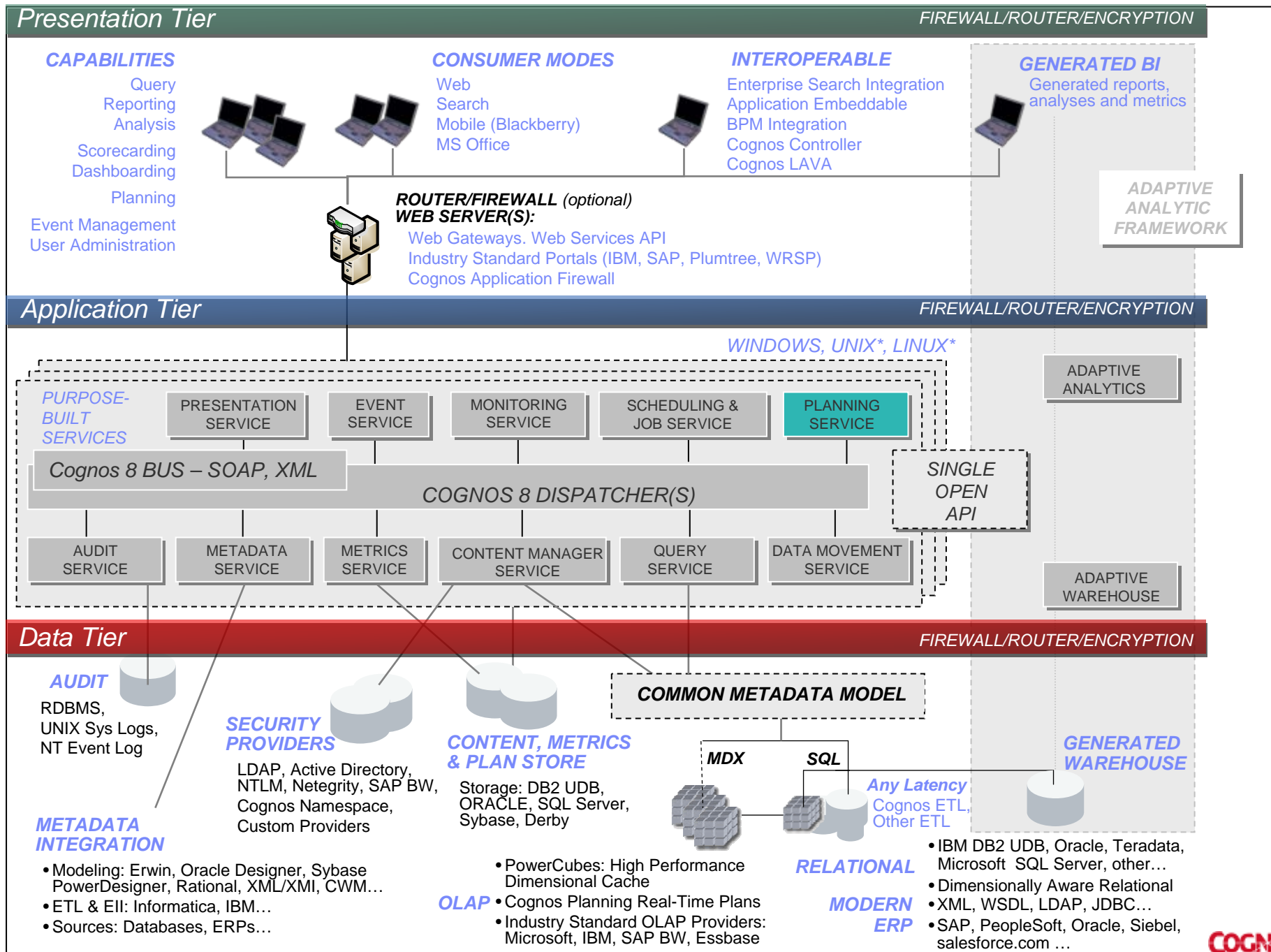
**Common Set of
Services (query,
reports, analytics,
etc.)**

**Access
to All Data**
(SQL, ERP, Cubes etc.)



What do you need to run Cognos 8 BI?





What is IBM Cognos 8 BI for Linux on System z?



IBM System z

Product Capabilities

- Adhoc query, reporting and analysis (Query Studio, Report Studio & Analysis Studio)
- Dashboards and charting (Cognos Connection & Report Viewer)
- Event management (Event Studio)
- Integration with Microsoft Office (Go! Office and CAFÉ)
- Cube building (Transformer)
 - Lineage
 - InfoSphere Business Glossary Integration
 - Cognos 8 Go! Dashboard
 - Cognos 8 Go! Mobile
 - SDK/LDK

8v4 Conformance

- | | |
|---------------------|--|
| Operating System: | •Suse 10 Linux Sp1
•Redhat |
| Database Support: | •DB2 z/OS 8 and 9
•DB2 LUW 9.5
•Oracle 10R2, 11 |
| Application Server: | •Apache Tomcat
•WebSphere 6.1.0.17 |
| Content Store: | •Derby on Linux for System z
•DB2 9.5 LUW
•Oracle 10g, Oracle 11
•DB2 zOS 8 & 9 |
| Directory Server: | •IBM Tivoli Directory Server 6.0
•LDAP version 3 compliant server |
| Web Server: | •IBM HTTP server 6.1 |

Metrics Studio & Cognos 8 Go! Search is not currently support on System z but Metrics Studio can be run on a parallel distributed platform if so desired..

For latest updates at GA, please see supported environment on Cognos Support (support.cognos.com)



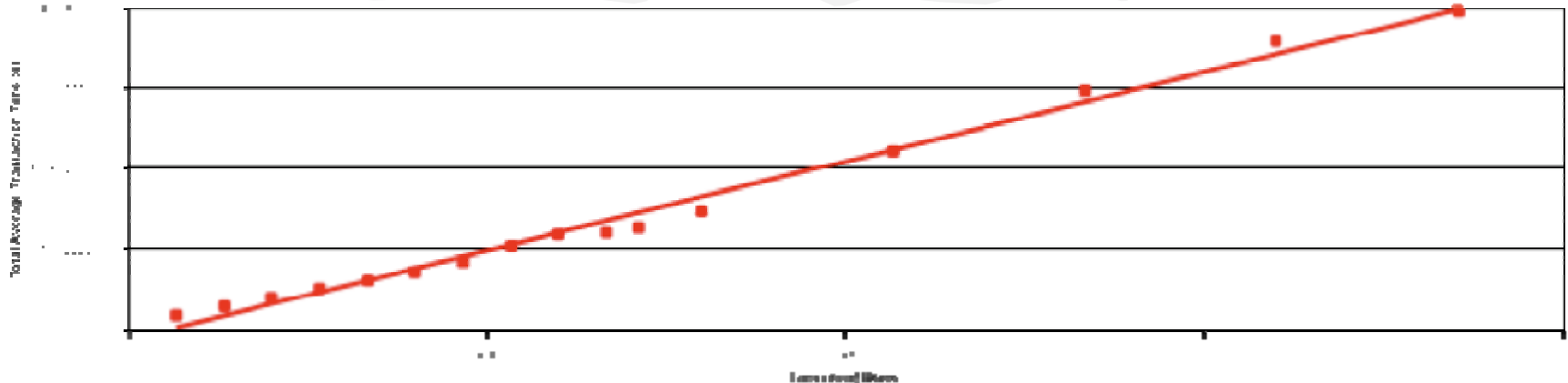
Proven To Scale Across the Enterprise.



- Testing demonstrated IBM Cognos 8 BI for Linux on System z **scales linearly** to large user groups

“**Cognos, ...makes it easy for companies to deploy BI and PM to a broader user population, while minimizing the resulting workload for IT departments.**”

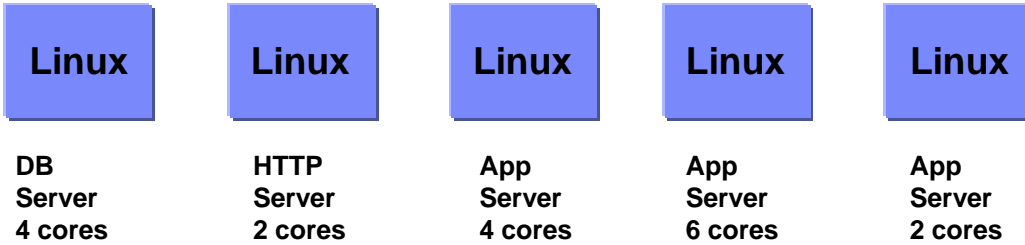
- Nucleus Research, *Cognos Takes on the Rest of the Enterprise*, November, 2007



- Testing was conducted on up to **90,000 named users**

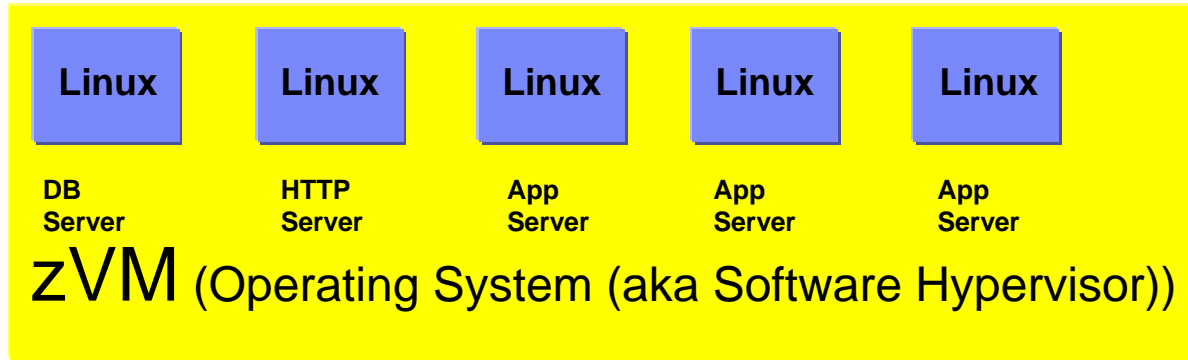
50TB Summary

- System z and Cognos BI can respond to operational BI requirements
 - Successfully ran **400 active users** simulating call center agents accessing a prompted operational BI report
 - Average **1.75 seconds** response time for query and report creation per user over a 15 min run (steady state), at **56% Linux CPU** utilization
 - DB2 for z/OS provides **very efficient access** to operational BI data
- Cognos configuration options for Linux on System z
 - Multiple 31Bit WebSphere Application Servers on a single system
 - Varied resources assigned to Linux on System z and Cognos
- Load testing techniques using Rational Performance Tester
 - Strategic IBM tool for performance/load tests also recommended for customer tests
- Collateral
 - Best practices and results in Redbook
 - Collected detailed performance measurement data



Processors and % utilization typically 20% (for actual work) ←

Number of virtual machines = 1 to Infinity!*



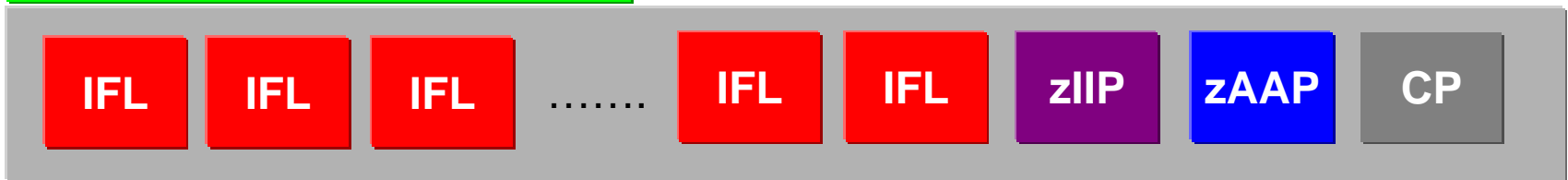
- Each virtual machine has RAM, Disk, NICs, processors, and HBAs (FCs) assigned to it
- Each copy of Linux sees an entire system z Server with the virtual machine's resources
- Intercommunication (TCP/IP) is facilitated by the hypervisor

LPAR = logical partition of the system hardware



z10 machines can have up to 60 LPARs (depending upon the processor class)

* Customers regularly run z10s at or near 100% utilization (that's efficiency!!!)



Operational Business Intelligence



Claudia Imhoff - noted BI Analyst * highlights Operational Intelligence

Claudia outlines 3 kinds of Business Intelligence in her 2007 BI Trend spotting Presentation

Strategic Intelligence –

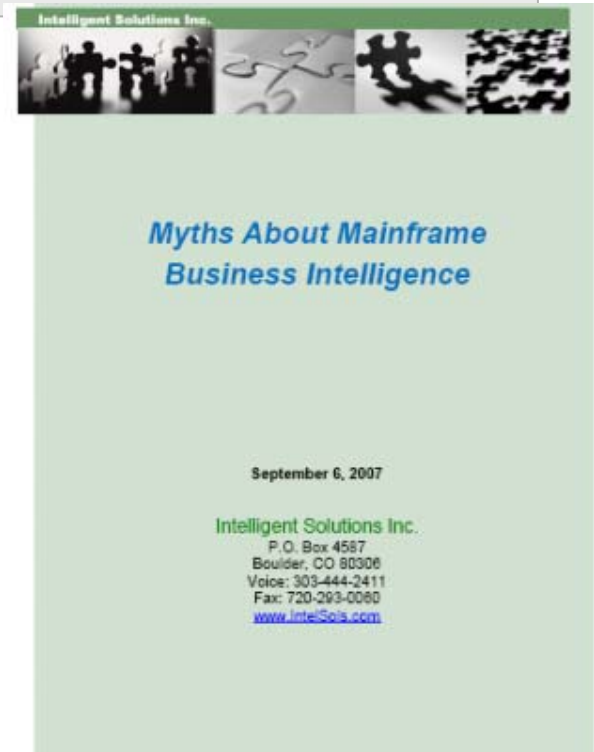
- reports tell you what is occurring over time, create longer term business strategy

Tactical Intelligence –

- analytics help you formulate short term business objectives such as marketing campaigns

Operational Intelligence –

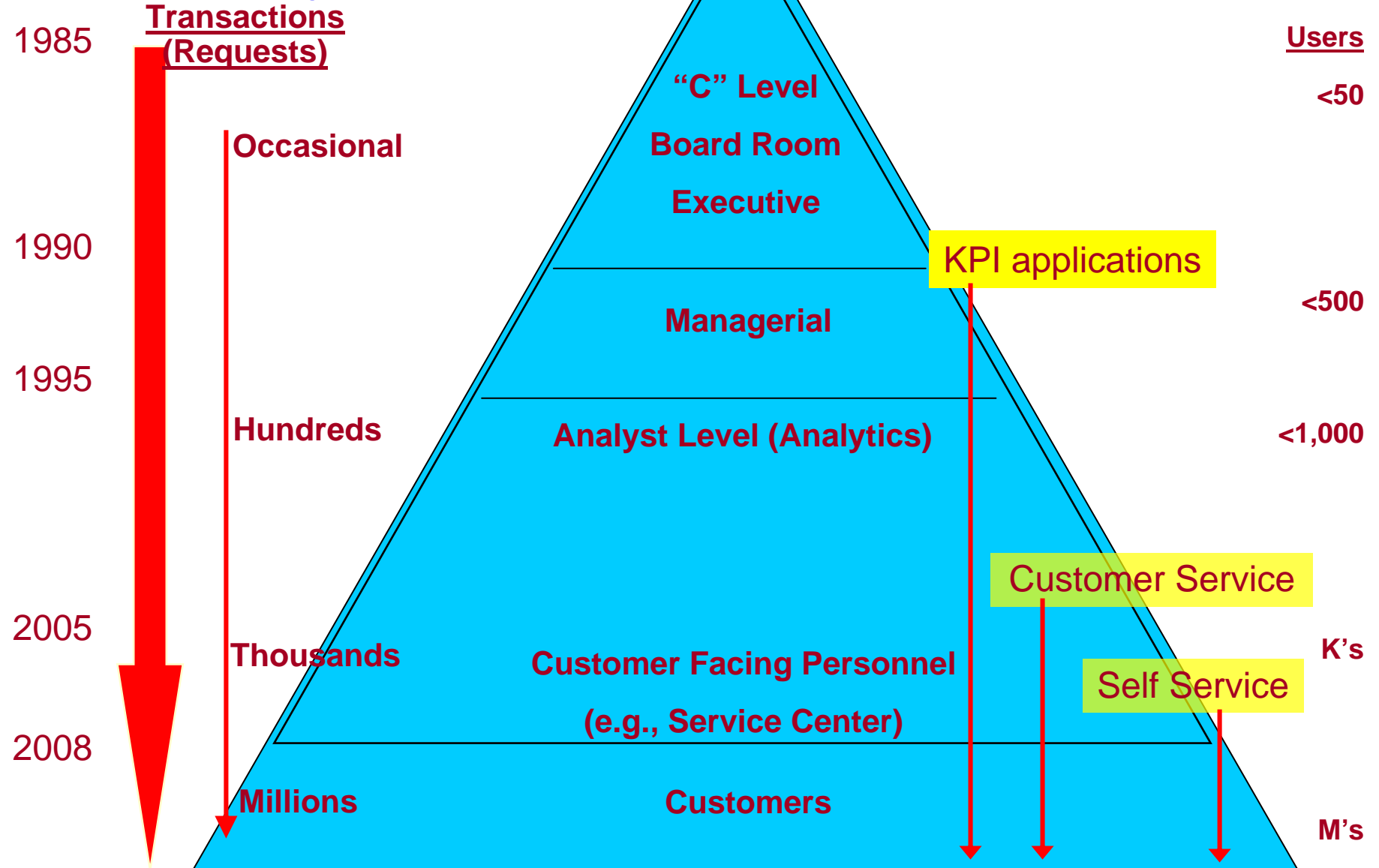
- **allows you to manage and optimize business operations and practices**



**Author: Myths about Mainframe Business Intelligence - whitepaper on web: [LINK](#)
Author: Operational Business Intelligence – whitepaper on web: [LINK](#)*



BI Capability

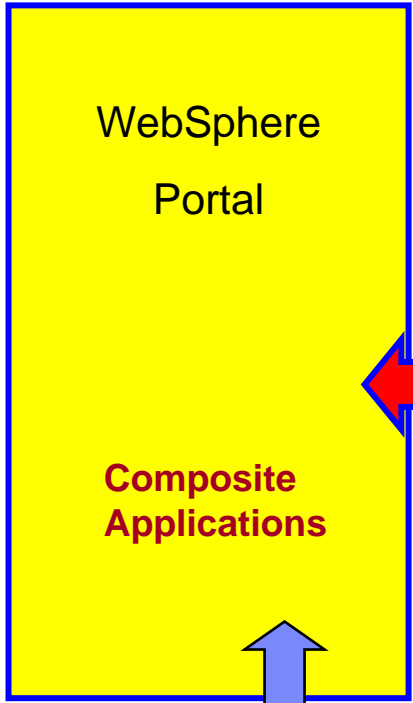
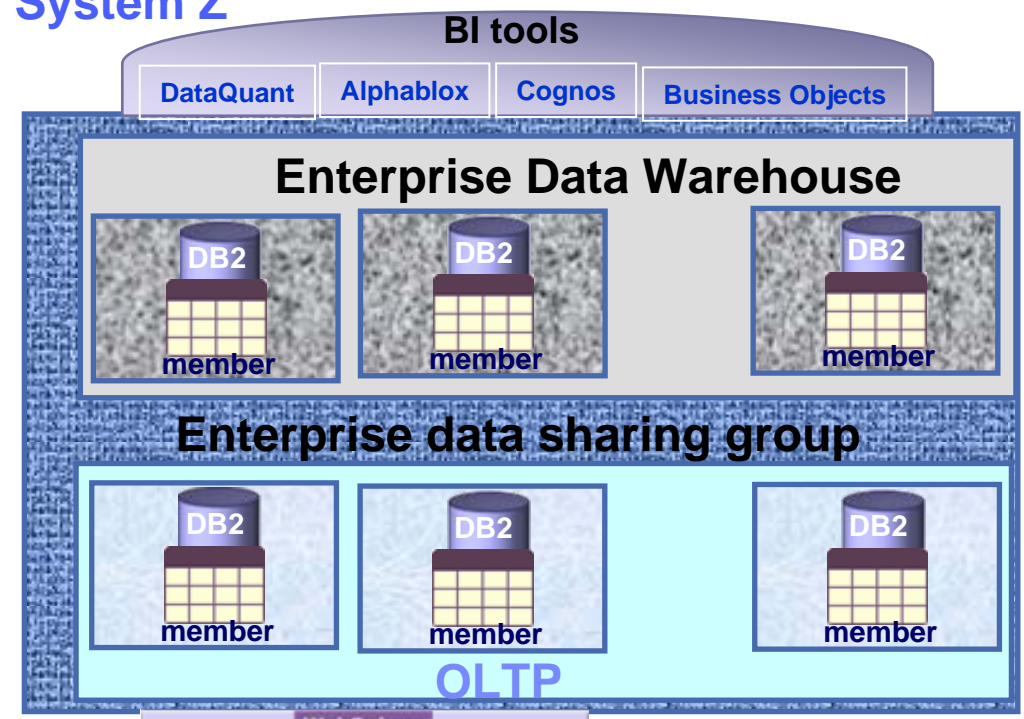


Integration of Cognos 8 BI and Lotus Notes



Enterprise Composite Application Architecture

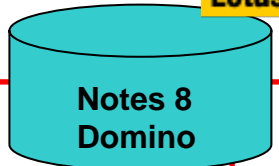
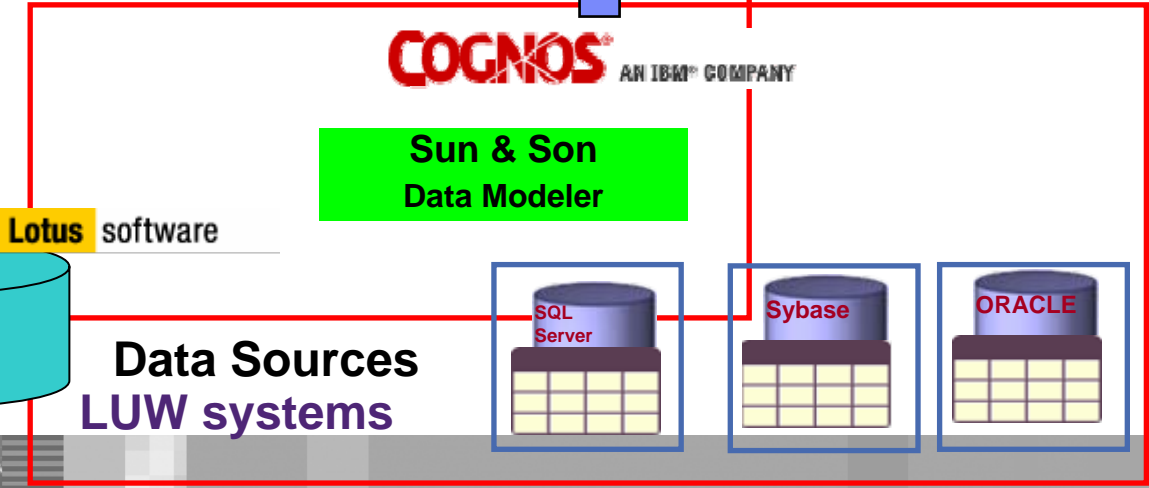
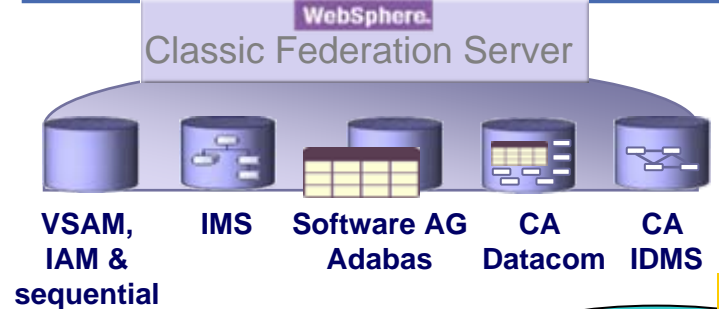
System Z



- ### Types of Services
- Data access
 - Business Intelligence
 - Real-time BI
 - Transaction processing
 - Office services
 - Email
 - Messaging
 - Workflow



Rich Client
Thin Client



Lotus software



■ Cognos 8 BI

- our stated BI strategic product suite
- a BI ‘platform’ with integrated, extensible features and Performance Management capabilities
- has many years of known industry credibility and a large organization to back it up and assist
- extraordinary functional capabilities

■ DataQuant

- a BI ‘tool’ that has ease of use out of the box but all extensions must be created
- best suited to extending the QMF install base
- can interoperate with Cognos 8 at the portal layer to enhance System z Cognos accounts with their QMF investment



Summary

- The industry is changing with new technologies, new customer demands, and new pressures (cost, compliance, etc.)
- The BI tools market is taking on a more integrated, platform-based approach
- SOA initiatives are driving a more modular and web-enabled approach
- Data Warehousing has taken on a more federated and global data access approach
- System z is beginning to emerge as the platform most adaptable to these trends and requirements
- IBM has invested in System z HW and SW to enable customers to take advantage of this emerging global infrastructure

