IBM Infrastructure
for Smarter Analytics

Smarter**Analytics** Live

Quando la conoscenza trasforma il business

Milano, 5 giugno 2012 (ore: 9.00-17.30)
Sede Gruppo 24 ORE, Via Monte Rosa 91

Analytics has evolved from business initiative to business imperative

Analytically sophisticated companies outperform their competition

2.2x
more likely to outperform industry peers

260%
more likely to be top performers

Analytics is expanding from enterprise data to big data

Volume

12 terabytes

of Tweets create daily

Velocity

5 million

trade events per second

Variety

100's video feeds

from surveillance cameras

350 billion

meter readings per annum

500 million

call detail records per day

80% data growth

are images, video, documents…

Organizations drive transformation by starting with one of these four high-value initiatives

Examples:

1 Grow, retain and satisfy customers ▶
- Churn management
- Social media sentiment analysis
- Propensity to buy/Next best action

2 Increase operational efficiency ▶
- Predictive maintenance
- Supply chain optimization
- Claims optimization

3 Transform financial processes ▶
- Rolling plan, forecast and budget
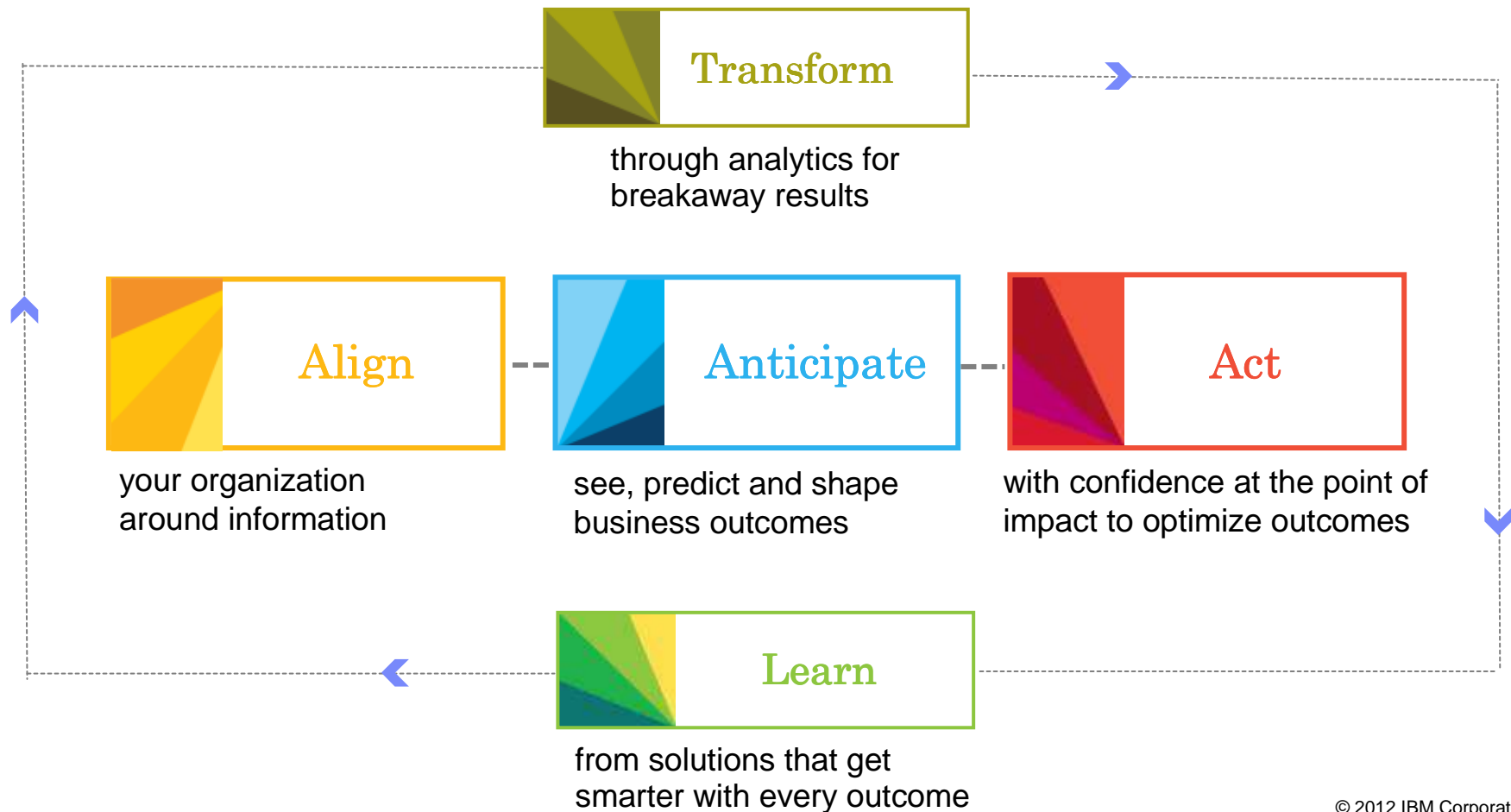- Financial close process automation
- Real-time dashboards

4 Manage risk, fraud & regulatory compliance ▶
- Operational and financial risk visibility
- Policy and compliance simplification
- Real-time Fraud identification

IBM Smarter Analytics is a holistic approach that turns information into insight and insight into business outcomes.

Transform

through analytics for breakaway results

Align

your organization around information

Anticipate

see, predict and shape business outcomes

Act

with confidence at the point of impact to optimize outcomes

Learn

from solutions that get smarter with every outcome

The Smarter Analytics approach embodies several key IT Infrastructure tenets

Align

Deploy an information and big data strategy that flows from your business architecture.

Creating a **scalable**, trusted information and systems foundation that improves IT economics and optimizes analytic workload performance using all available data and information.

Anticipate

Leveraging and Integrating Business Analytics to deliver actionable insights

~

Optimizing high performance parallel technologies to support complex decision making, spotting trends and anomalies, predicting business outcomes.

Act

Embed analytics into your processes and empower a culture of data-driven decision making

Deploying analytics throughout the organization, it's customers and suppliers using **resilient** architectures either on premise or in the cloud.

The trend in the system landscape

Scale In

Analytics and Big Data Workloads, MultiCore Chip, integrated Systems
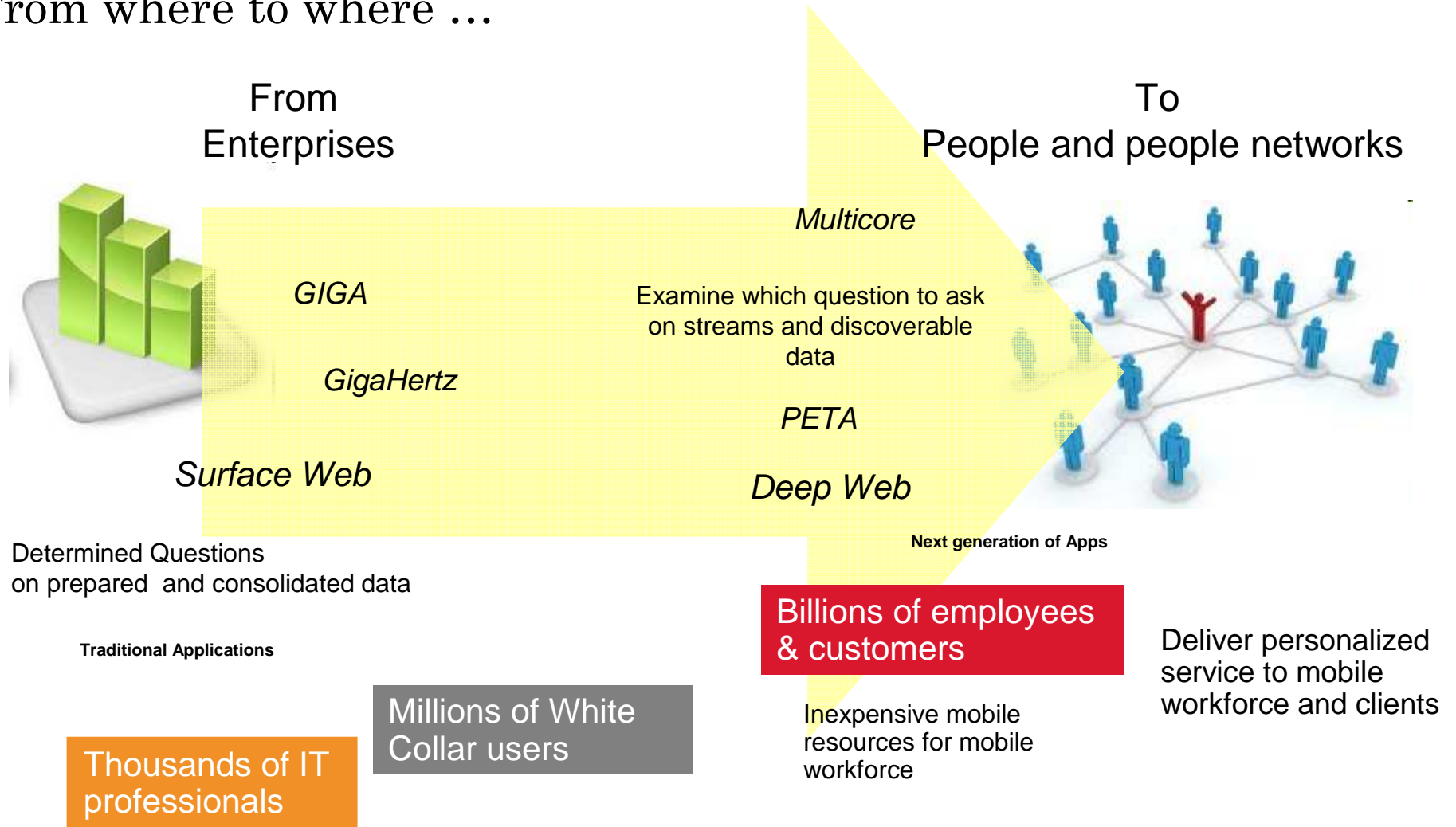
Information-Centric era

- Real-time pattern based action
- Focused on top-line growth through revenue acquisition
- Reactive for shorter product cycles
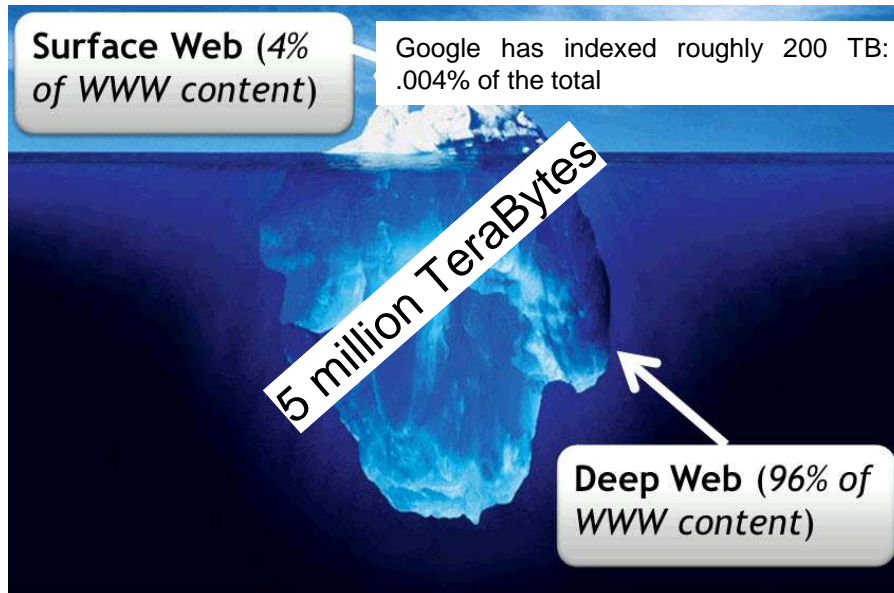- Zettabytes of largely unstructured data

Scale Out

Web Application

Process-Centric era

- Business processes automation
- Focused on bottom-line improvement through SG&A reduction
- Typically long business cycle
- Terabytes of largely structured data

Scale Up

Large OLTP Database and ERP.

$77,147

From where to where …

From
Enterprises

Multicore

GIGA

Examine which question to ask on streams and discoverable data

GigaHertz

PETA

Surface Web

Deep Web

Determined Questions
on prepared and consolidated data

Next generation of Apps

To
People and people networks

Traditional Applications

Billions of employees & customers

Deliver personalized service to mobile workforce and clients

Millions of White Collar users

Inexpensive mobile resources for mobile workforce

Thousands of IT professionals

New advances in technology enable new questions

- New technology capabilities

- New Source of Data

Surface Web (4% of WWW content)

Google has indexed roughly 200 TB: .004% of the total

5 million TeraBytes

Deep Web (96% of WWW content)

InfoSphere BigInights
InfoSphere Streams
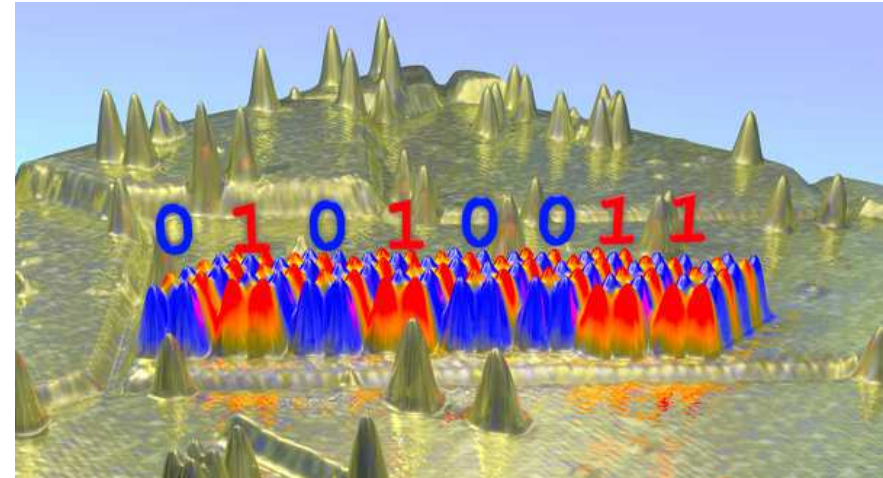
January 12, 2012 SAN JOSE, Calif. — Researchers at I.B.M. have stored and retrieved digital 1s and 0s from an array of just 12 atoms, pushing the boundaries of the magnetic storage of information to the edge of what is possible. Until now, the most advanced magnetic storage systems have needed about one million atoms to store a digital 1 or 0.

The group at I.B.M.'s Almaden Research Center here, led by Andreas Heinrich, has now created the smallest possible unit of magnetic storage by painstakingly arranging two rows of six iron atoms on a surface of copper nitride.

Scalable: Different types of analytics require a scalable IT infrastructure

Different types of analytics (OLTP, Data warehouse, Streaming Data, OLAP, Operational Analytics, Ad-hoc reporting, time series, deep analytics)…
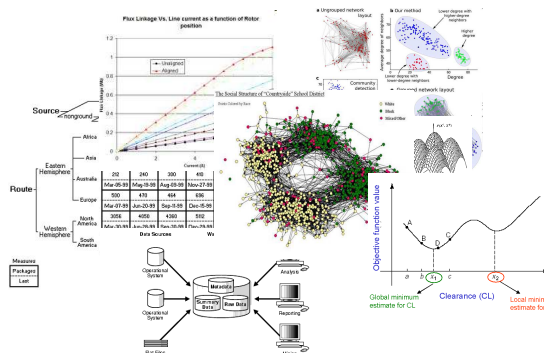
…need to access data differently and require compute *and* storage resources that are distinctly different and often highly scalable.

Optimized: Enabling analytics anytime and anywhere requires an optimized system "tuned for the task"

Turning information into insight requires information as it happens and analysis as needed….

…thru flexible systems designed to access the latest information regardless of type or location; allocating the right resource at the right time; providing new resources as needed for optimal analysis on-demand.

Resilient: Empowering a culture of data-driven decision making requires a resilient IT infrastructure

As a business imperative, Smarter Analytics is about pushing analytics to the edge of the organization and beyond….to employees, customers, and suppliers…

…thru mission critical, reliable systems and design, a responsive infrastructure that can handle large numbers of users, secure systems that work seamlessly.

…in 2011 IBM showed to the world an example on how an IT Infrastructure can be designed to achieve superior outcomes…


A System Designed For Answers:

- Designed to answer the questions of today and tomorrow using deep QA Architecture

- Addresses natural language questions with accuracy and confidence in seconds not hours or days

- Processes massive array of information including unstructured "Big Data"

- Built on a cluster of commercially available Power 7 servers, optimized for complex analytic workloads and used by thousands today.

Workload Optimized Systems (WOS)

Workload Optimized Systems are

- An approach to maximized the overall potential of each components of an IT solution related to a specific client's business workload

- Easy to manage and to fit in the current IT environment

- Drive Innovation and new business capabilities

- An IBM 360° approach
  – IBM Systems,
  – IBM Software
  – IBM Research
  – Workload specialists involvement
  – Best Practices

IT Stack Optimization Gain
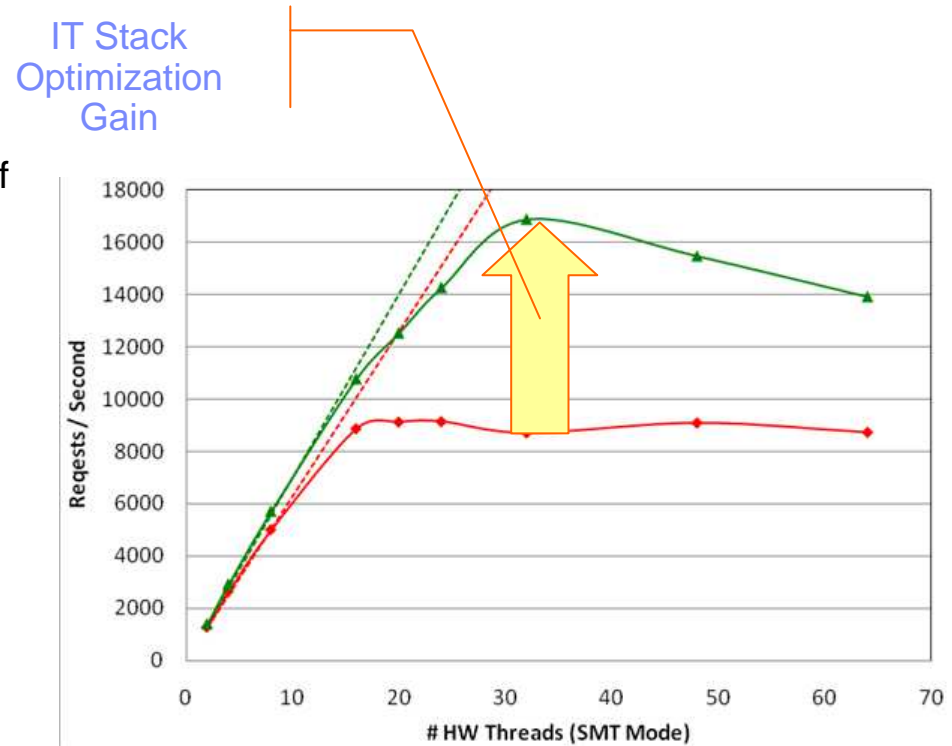
Clients require a range of workload optimized systems

Client-built with optimized components

Integrated, Optimized Systems

Appliances

Need flexibility to deploy multiple workloads of different types—e.g., data management, messaging, web facing etc.

Requires moderate flexibility to tune small number of workloads—e.g., information management and analytics

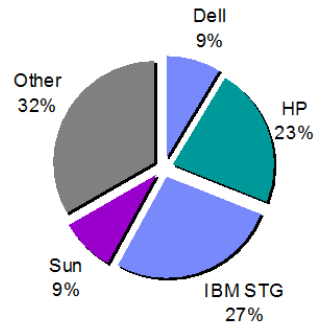Flexibility not required— need high performance at low cost for a specific workload

IBM Systems for Smarter Analytics

IBM Systems is the market leader in support of analytical workloads

Pie chart:
- Dell 9%
- HP 23%
- IBM STG 27%
- Sun 9%
- Other 32%

Workloads:
Data Analysis/Data Mining
Data Warehousing/Data Mart
Scientific/Engineering/Industrial R&D

IDC Server Workload study 2011

What the Analysts are saying

*"...at the Smarter Analytics Leadership Summit, it was clear that the **company's hardware, software, and services** people are all working closely together to build integrated business analytics and optimization solutions tuned to perform extremely well — and designed around achieving the outcomes required by IBM customers (on an industry-by-industry basis)."* Clabby Analytics

*"When we commenced this exercise we expected to find that there were some areas in which IBM excelled and others in which Oracle did so. We have been surprised to find that that is not the case and that the **IBM Smart Analytics System out-competes Oracle Exadata in almost every area we have examined**"* Philip Howard, Bloor Research

*"**IBM has the deepest Hadoop platform and application portfolio**. IBM … has its own Hadoop distribution; an extensive professional services force working on Hadoop projects; extensive R&D programs developing Hadoop technologies … and software, appliance, and cloud offerings."* Source: The Forrester Wave™: Enterprise Hadoop Solutions

*Three-year costs for Smart Analytics System 7700 are **43 and 40 percent less than those for Oracle and Teradata systems** respectively.* Source: Cost/Benefit Case for Enterprise Warehouse Solutions, International Technology Group

IBM and Analytics at a glance:

- More than **$14B** in Acquisitions Since 2005

- More than **10,000** Technical Professionals

- More than **7,700** Dedicated Consultants

- **Largest** Math Department in Private Industry

- More than **27,000** Business Partner Certifications

Industry leading portfolio for Smarter Analytics...

Manages the data explosion to spot trends, predict outcomes, and take meaningful actions

Align

Netezza
(x, Storage)

Smart Analytics System
(x, Power, z, Storage)

Custom Data Warehouse
(x, Power, z, Storage)

DS8000
DS5000
DS3000

XIV   **SONAS**

StorWize V7000   **SVC**

Anticipate

DB2 Analytics Accelerator
(z, x, Storage)

SAP HANA Appliance
(x, Storage)

Cognos
SPSS
Optimized for IBM systems
(x, Power, z, Storage)
SAS
(x, Power, z, Storage)

Systems for InfoSphere BigInsights
(x, Power, Storage)

Act

Cognos
ILOG SPSS
Optimized for IBM systems
(x, Power, z, Storage)

SAS SAP
Systems for ISV BAO
(x, Power, z, Storage)

IBM Watson
(Power, Storage)

Systems for InfoSphere Streams
(x, Power, Storage)

- **Cost effective Big Data storage**
- **Integrate and govern data**
- **Single, trusted information source**

- **Address scale and complexity**
- **Model trends and scenarios**
- **Predict business outcomes**

- **Embed analytics across enterprise**
- **Accelerate real-time decision making**
- **Systems that reason and learn**

Customers want larger integrated systems

Integrated System buying

Rack

Blade

Box buying
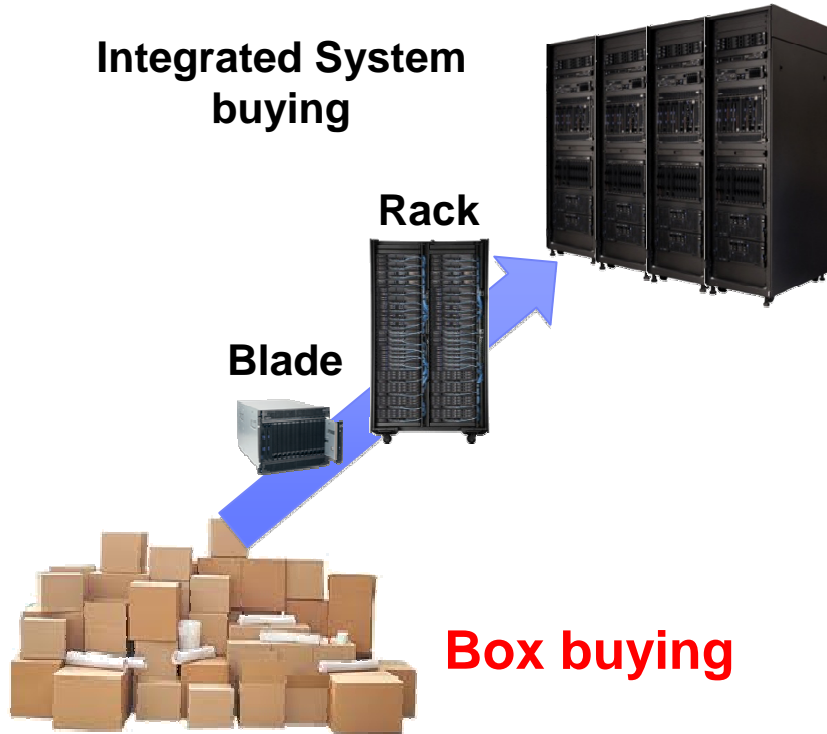
Priority Investment Trends in next 18 months

Not an Investment Area (0-3)	Somewhat of an Investment Area (4-7)	High Investment Area (8-10)

Virtual Machine Mobility | 8% | 36% | 56%

Integrated Compute Platform | 11% | 44% | 45%

Integrated Management | 9% | 47% | 44%

Converged Fabrics | 13% | 47% | 40%
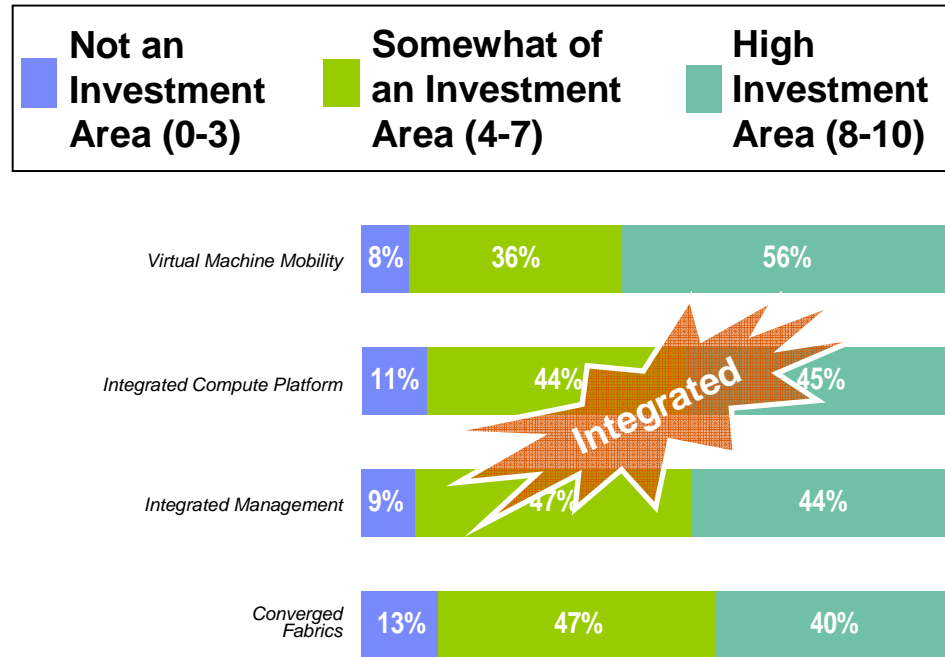
Integrated

Clients are seeking solutions to the complexities associated with inefficient networking, server sprawl and manual virtualization management.

Integrated system pre-packages
server, storage, network, virtualization and management and
provides an automated, converged & virtualized solution
with fast time to value & simple maintenance

The Time has come for a new breed of Expert Integrated Systems
Announcing the first two members of the IBM PureSystems family

PureFlex · New

Infrastructure System:
Expert at sensing and anticipating resource needs to optimize your infrastructure

PureApplication · New

Platform System:
Expert at optimally deploying and running applications for rapid time-to-value

Built-in expertise ▪ Integration by design ▪ Simplified experience

IBM PureSystems... "integration by design"

Deployment

Middleware

Applications

Development

Management

Virtualization

Storage

Networking

Servers

Optimizes the complete solution stack

- All hardware and software components factory integrated and optimized
- Single point of unified lifecycle management
- Integrated monitoring & maintenance
- Integrated and elastic application and data runtimes
- Application patterns allocate system resources for optimal performance, security and reliability
- Fully virtualized and built for cloud
- Storage tuned to data needs
- Integrated Security

IBM's Systems and Storage provide an ideal foundation for Workload Optimized Systems and Appliances

Power Systems

- IBM Smart Analytics Systems (7700/7710)
  - *11 percent less TCA*
  - *43 percent less TCO than Oracle Exadata**
  - *16 percent less TCA*
  - *40 percent less TCO than Teradata**
- Optimization of Cognos & SPSS analytics on AIX
- Power i BI Bundle
  - DB2 WebQuery for IBM i
  - Analytics packaged solution for midmarket
- IBM Watson

System x

- IBM Smart Analytics Systems (5600/5710)
  - *80 percent reduction in data storage space*
- IBM SAP Hana Appliance
  - Scales to the largest SAP BW installations
  - Real time analytic for SAP operational data
  - "Accelerates analytics as much as 10,000x…" **
- IBM System x and Informix Warehouse Accelerator
- IBM System x and Cognos TM1
- IBM Netezza

System z

- IBM Smart Analytics Systems (9700/9710)
  - *Secure, available business analytics*
  - *70 percent less TCO* compared to distributed platforms
  - Up to 52% lower security admin costs
  - *E*ach processor uses less energy than a 40 Watt light bulb
- IBM DB2 Analytics Accelerator (IDAA)
  - Combining the best of System z and Netezza
  - Queries run up to 1000x faster (hrs to seconds)
  - *Operational in 3 days, ROI in 4 months*

Storage

- IBM Real-Time Compression Appliance
  - *Shrink active data up to 80%*
  - Keeps more data on-line for improved analytics and decision making
- IBM ProtecTIER
  - Optimized backups & restores
- IBM Easy Tier
  - *Self-tuning storage* by moving data to the right place
- IBM Disk Systems
  - XIV, DS8000, Storwize V7000, DS3000, SVC
- IBM NAS Systems
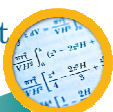 - SONAS, N Series, Storwize V7000U

Optimizing for Different Analytic Workloads

Deep Analytics

Operational Analytics

Business Analytics

Time Series Data Analytics

IBM Systems for Smarter Analytics

Workload Optimized Systems

Pre-Integrated Smart Analytics Systems

Systems Hardware for Watson

Custom InfoSphere Warehouse Solutions

IBM Systems BAO Portfolio Segments

Systems Hardware for Big Data

Systems Hardware for IBM BAO Software

STG Hardware for ISV Software

20
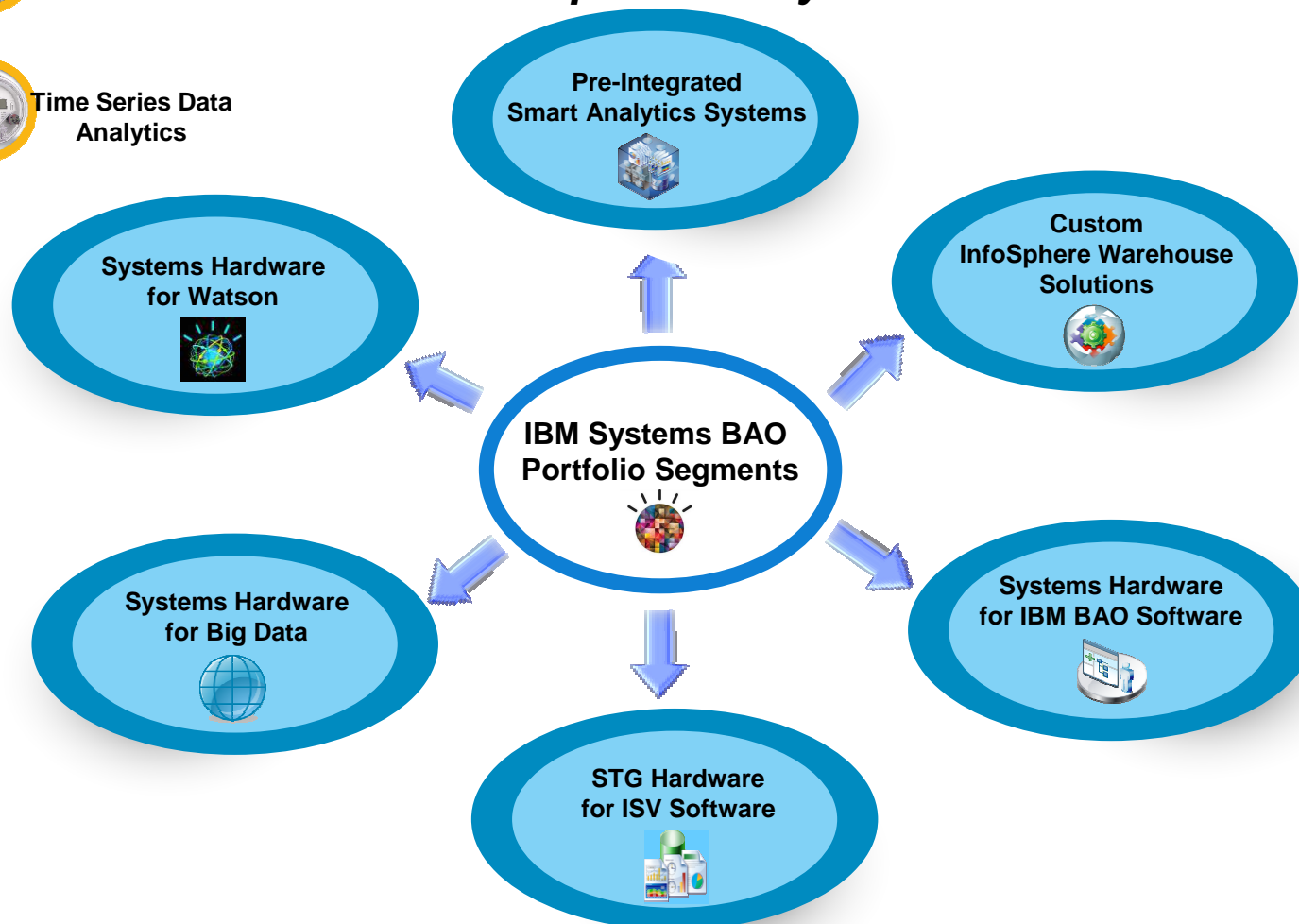
IBM System Storage for Big Data

Align	System Storage Designed to Support Big Data

Self-tuning storage systems
Stop storing so much
Move data to the right place
Store more with what's on the floor

Managing unstructured data growth
Big File Systems with Big Files
Global Name Space
Data when you need it, where you need it

SONAS

XIV

DS8000

SVC

DS3000   **StorWize V7000**

Data Protection and Retention
Perfect balance of performance and cost
Continuous data availability
Smart Archive

IBM Power Systems for SPSS & Cognos
Optimized for maximum performance

Anticipate	Your complete solution for Business Analytics

Cognos BI optimized for maximum performance on POWER7
- **40% better** performance with Cognos Business Intelligence V10.1.1 on POWER7/AIX 7.1, over Windows 2008 on x86

SPSS optimized for maximum performance on POWER7
- **22% better** performance for real-time scoring with SPSS Collaboration and Deployment Services V4.2 on POWER7/AIX 7.1, over Windows 2008 on x86
- **38 times better** performance for real-time scoring with IBM SPSS Collaboration and Deployment Services V4.2 optimized for POWER7 over default POWER7 environment configuration settings.

Sources: Best Practices and Advantages for Cognos BI on POWER7 (IBM, BP); Best Practices for SPSS on POWER7 (IBM, BP); Power Systems Analytics with Cognos and SPSS (IBM, BP)

IBM DB2 Analytics Accelerator for System z
Best of both worlds – for the next generation Analytics workload

Anticipate

Extreme performance for complex business analytics

Workload-optimized appliance add-on for System z based on Netezza

- Deeply integrated with DB2 for z/OS
- Completely transparent to applications and end users

Fast, predictable response times for "right time" analysis

Improves price/performance for analytics workloads

Minimize the need to create data marts for performance

Highly secure environment for sensitive data analysis

Unprecedented Speed, Reliability and Security

Exploits hardware accelerators

Response times to enable "train of thought" analyses

IBM Systems solution for SAP HANA™
Simple, Seamless, & Scalable

Anticipate | Your complete solution for Business Analytics

Real time analytics for SAP operational data
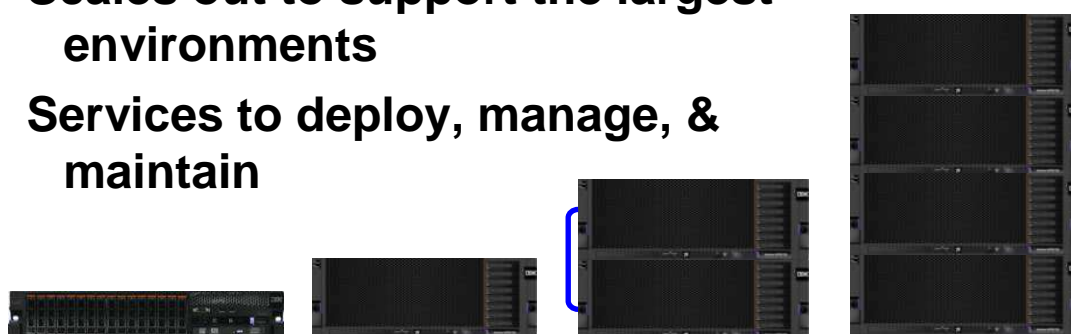
Certified eX5 workload optimized models

preconfigured with software preload

Accelerates analytics on SAP operational data for ERP data marts and Business Warehouse

Scales out to support the largest environments

Services to deploy, manage, & maintain

Speed

Accelerates analytics as much as 10,000x

Solution

The fastest growing product in SAP history

SAP®

IBM Netezza Appliance
The Simple Data Warehouse Appliance for Serious Analytics

Anticipate | *Industry's fastest TTV and lowest TCO*

Purpose-built analytics engine

- Runs analytic computations directly in the appliance, thereby accelerating analytic queries and shortening query times

Integrated database, server & storage

- Maximizes performance by running parallelized, in-database advanced analytics algorithms

Low total cost of ownership

- Reduces the cost and expands the available disaster recovery options, serving as a consolidated hot-standby platform during an outage
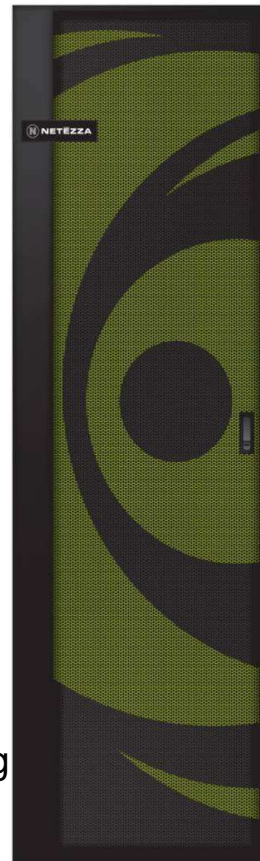
Transforming information into business insight

Speed

10-100x faster than traditional systems

Simplicity

Minimal administration and tuning

Scalability

Peta-scale user data capacity

Smart

High-performance advanced analytics

IBM Watson: A Workload Optimized System
integrated optimized system for business analytics

Act	Watson will transform how technology is applied

A System Designed For Answers:

- Designed to answer the questions of today and tomorrow using deep QA Architecture

- Addresses natural language questions with accuracy and confidence in seconds not hours or days

- Processes massive array of information including unstructured "Big Data"

- Built on a cluster of commercially available Power 7 servers, optimized for complex analytic workloads and used by thousands today.

Speed

Operates at up to 80 Teraflops

Scalability

Scales out with and searches vast amounts of unstructured information with UIMA & Hadoop open source components

Watson: A Workload Optimized System

- 90 x IBM Power 750 servers

- 2,880 POWER7 cores

- POWER7 3.55GHz chip

- 500GB per sec on-chip bandwidth

- 10Gb Ethernet network

- 15 Terabytes of memory

- 20 Terabytes of disk, clustered

- Operates at up to 80 Teraflops

- Runs IBM DeepQA software stack

- Scales out with and searches vast amounts of unstructured information with UIMA & Hadoop open source components

- SUSE Linux provides a cost-effective open platform which is performance-optimized to exploit POWER 7 systems

- 10 racks include servers, networking, shared disk system, cluster controllers

Summary and
Thank You

Smarter**Analytics** Live

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