Francesco Silveri *Director of STG Technical Sales*

Guido Schiaffino *Service Management Solution Architect*

Smarter Computing

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Why Smarter Computing?

Three years ago we started describing the Smarter Planet we saw emerging, **fueling innovation across industries.**

Neonatal Care

Law Enforcement

Telecom

Fraud Prevention

Resource Management

Traffic Control

Manufacturing

Trading

On a Smarter Planet, successful enterprises are taking a new approach to designing their IT infrastructure to create **new opportunities**.

Create new markets in a fraction of time

Universita' di Bari

Reduced time to market for fishermen and farmers with cloud-based solution for real-time trading.

Deliver new services more quickly

Citigroup

Reduced provisioning times from 45 days to 20 minutes, improving ability to deploy new banking services to clients.

Identify new trends before competition

Acxiom

Improved capacity five-fold with no new floor space with cloud-based model improving customer retention and capturing new business.

Utilize IT resources more efficiently

City of Norfolk

Improved storage performance by 40% and cut power consumption in half, enabling it to deploy automated parking systems and police in-car video surveillance.

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These enterprises are addressing the challenges that emerged during the last era of computing…

- **32.6 million servers worldwide**
- **85% idle** computer capacity
- **15%** of servers run 24/7 without being actively used on a daily basis

1.2 Zetabytes (1.2 trillion gigabytes) exist in the "digital universe"
- **50%** YTY growth
- **25%** of data is unique; **75%** is a copy

Between 2000 and 2010
- servers grew **6x** ('00-'10)
- storage grew **69x** ('00-'10)
- virtual machines grew **51% CAGR** ('04-'10)

Data centers have **doubled** their energy use in the past five years
- **18%** increase in data center energy costs projected

Internet connected devices **growing 42% per year**

Since 2000 security vulnerabilities grew **eightfold**

…while IT budgets are growing less than 1% per year.

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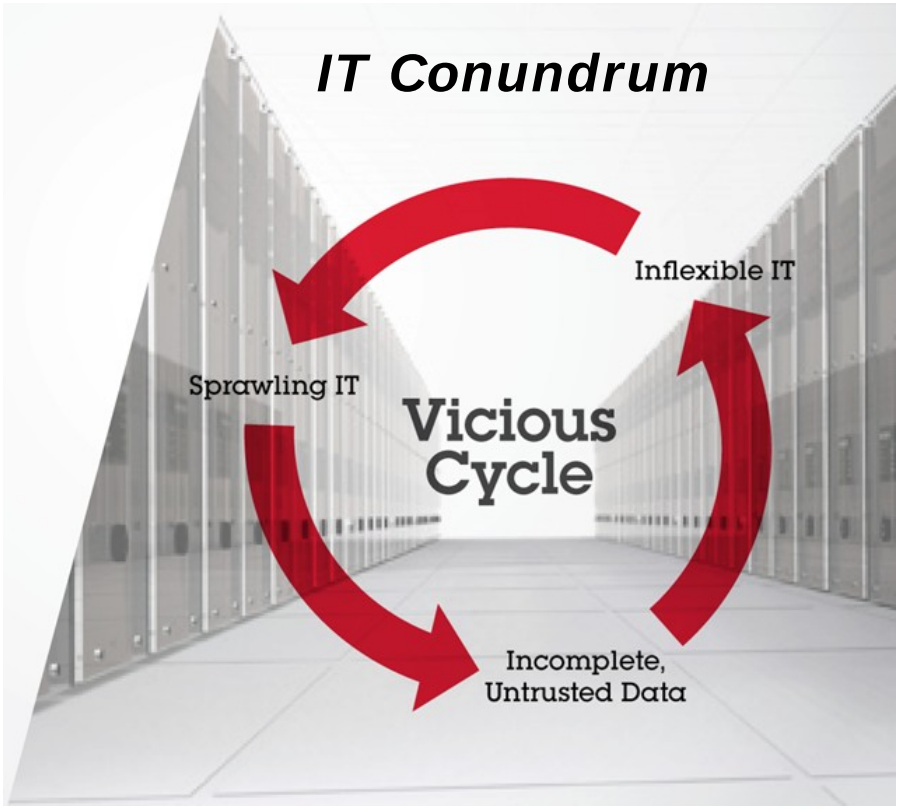
In doing so, they've addressed the IT conundrum meeting exploding demand for service on a flat budget.

Incomplete, Untrusted Data: Always Guessing
Decisions are made on incomplete data, big ideas are seen as risky, and small decisions aren't optimized.

Sprawling IT: More Cost
Every IT investment leads to more sprawl which drives up infrastructure and management costs.

Inflexible IT: Reactive
Inflexibility of infrastructure limits integration across silos and responsiveness to customer demands.

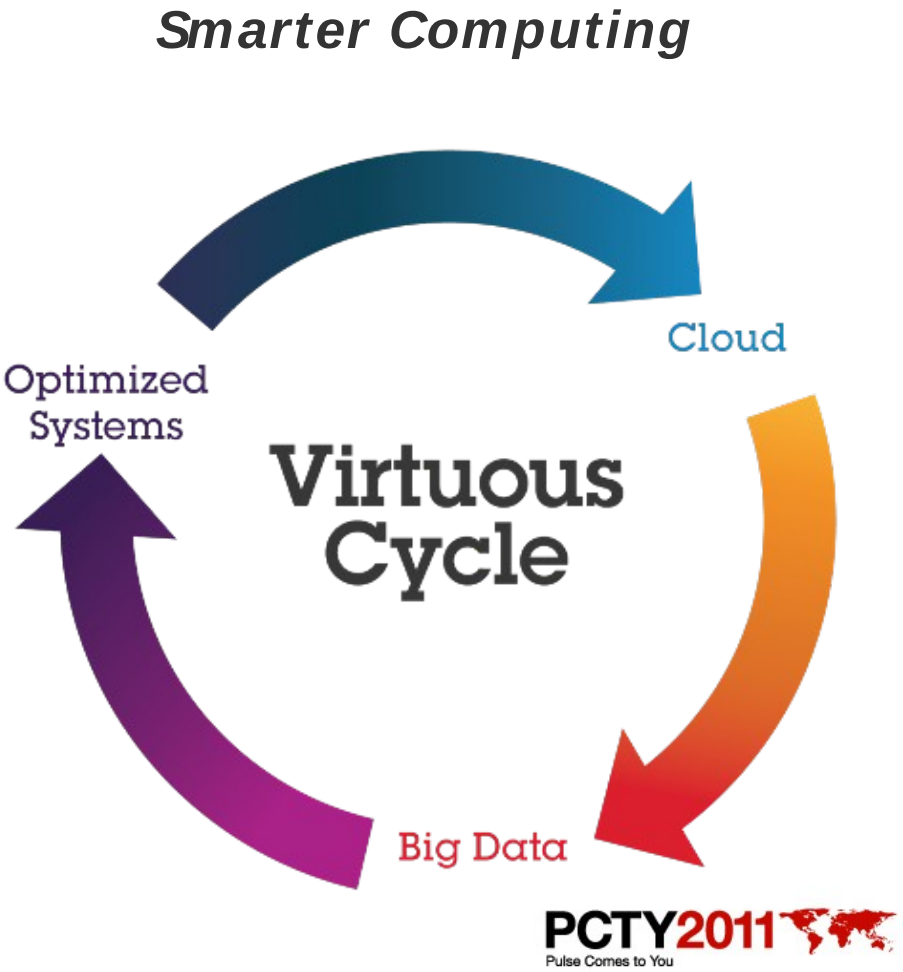


Smarter Computing is defined by three critical technologies

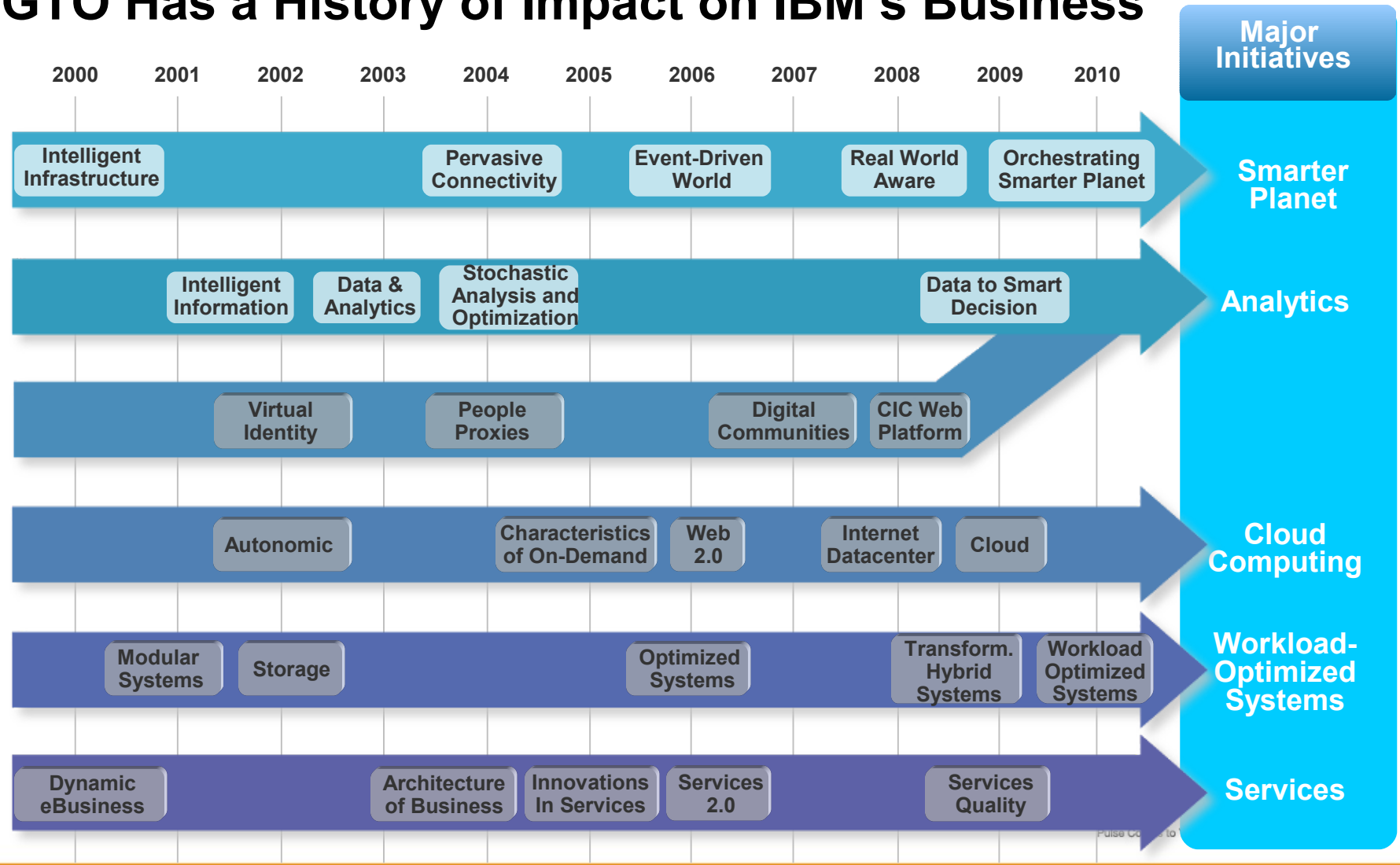
Big Data: Designed for data
Remove barriers to harnessing all available information and unlock insights to make informed choices.

Optimized Systems: Tuned to the task
Remove financial barriers by driving greater performance and efficiency for each workload.

Cloud: Managed through the cloud
Remove barriers to rapid delivery of new services and reinvent business processes to drive innovation.



GTO Has a History of Impact on IBM's Business



Tuned to the Task

Optimized Systems for superior economics

Different workloads have different characteristics

Transaction Processing and Database

- Thousands of online users
- Large transactional databases
- 24x7 operation

Business Intelligence and Analytics

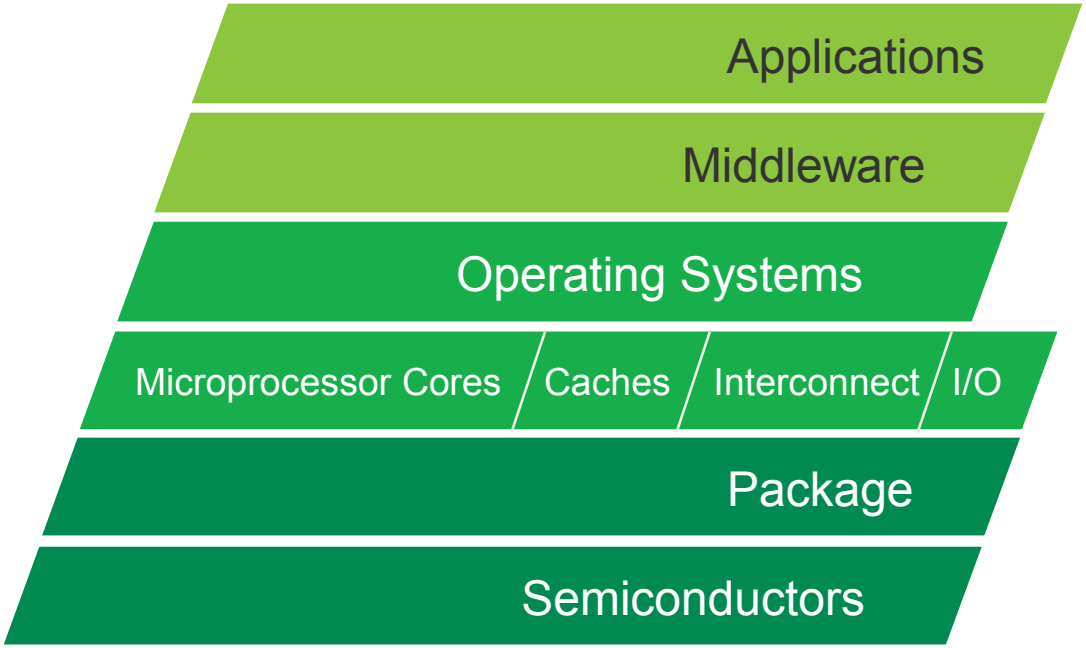
- Fewer users
- Complex queries
- Multiple data sources
- Large data warehouse

Business Process Management

- Unite content, people and process flows
- Orchestrate multiple services
- Empower business users

Optimized Systems are tuned to help address the unique needs of any workload.

Domain Knowledge / Workload characteristics options / Interdependencies / Architecture



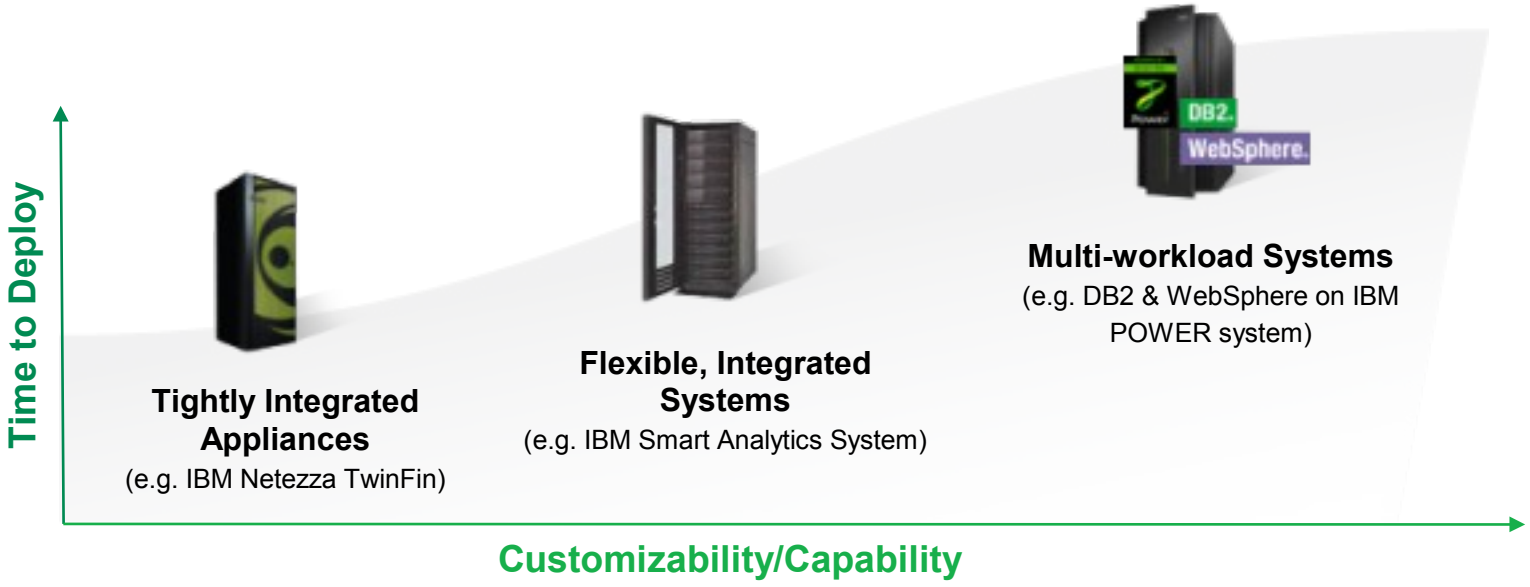
Software

- Stack integration
- Middleware tuned for hardware
- Integrated management across architectures

Hardware

- Multi-core architectures
- Advanced threading
- Low latency

IBM offers different approaches to optimize workloads from multi-workload to single workload systems



	Tightly Integrated Appliances	Flexible, Integrated Systems	Multi-workload Systems
Customizability/ Capability	Pre-configured for single workload	Flexible for specific workloads	Tuned to support multiple workloads
Time to Deploy	Low	Medium	High

IBM's Optimized Systems can help drive down cost per workload and improve time to value.

System z

Freedom by Design

Achieve up to 55% lower TCO per workload

Power

Performance Redefined

Power Systems running DB2 as low as 1/3 the cost of Oracle Database*

System x

Defining the Next Generation of x86 Servers

Industry-leading Intel performance and lower management cost by 50%

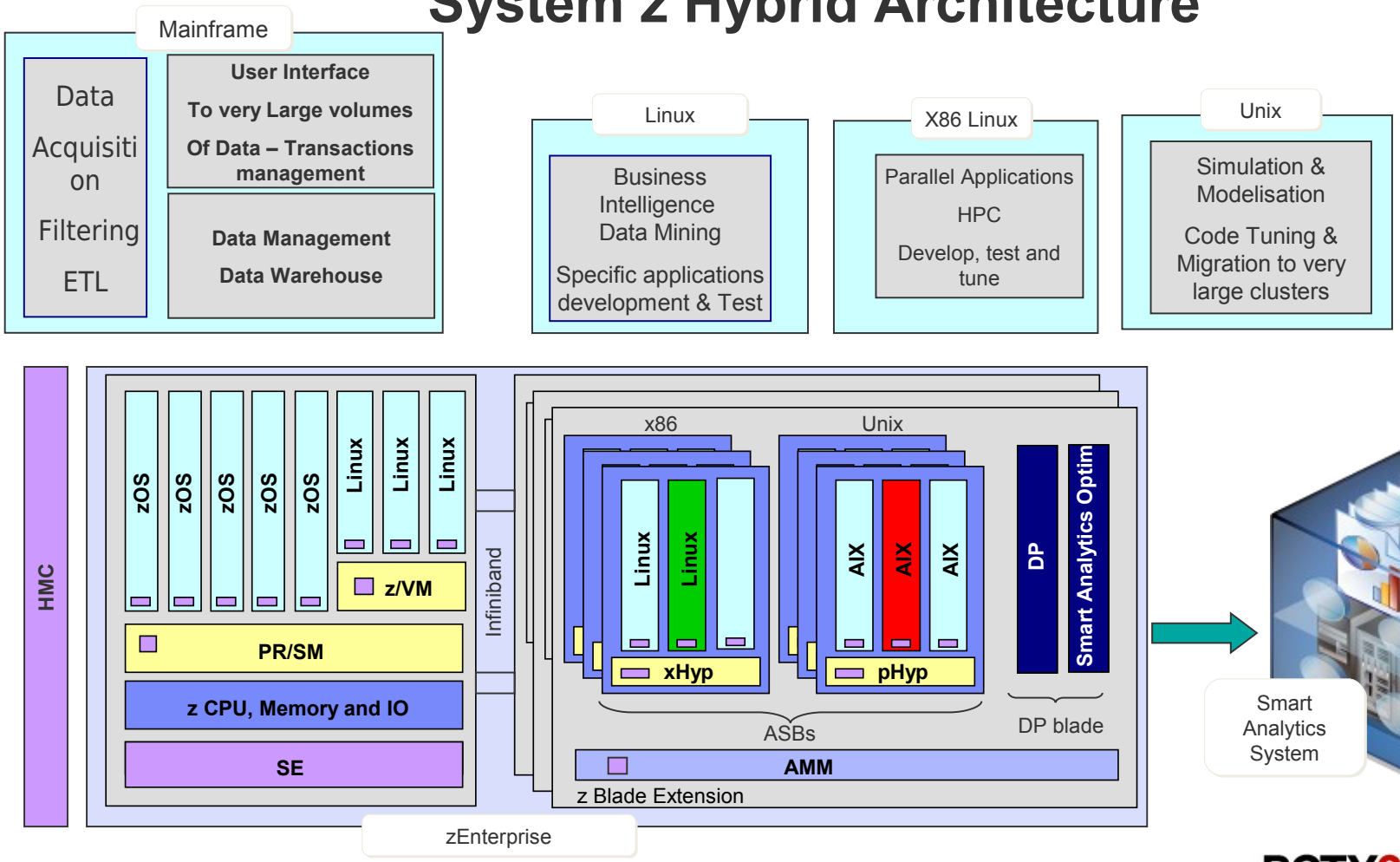
Storage

Storage Reinvented

Reduce power, operating and cooling costs by up to 60%

Source: Based on IBM internal studies
*Pricing comparison based on US list prices of IBM DB2 Advanced Enterprise Edition and the Oracle software with analogous capabilities: Oracle Database Enterprise Edition, Advanced Compression, Active Data Guard, Label Security, Partitioning, Oracle Enterprise Manager, Internet Developer Suite, Diagnostics Pack, Oracle-to-Oracle Federation, Golden Gate. All list prices based on US and valid as of 01/26/2011.

System z Hybrid Architecture



Shift in Innovation for Storage Systems

Two Major Product Categories

- ***Operational Storage***
- ***Retention and Archive***

Key Differentiators

- *Compression*
- *De-duplication*
- *Thin provisioning*
- *Storage virtualization*
- *Tiered storage with SSDs*
- *Power and space minimization*

Our integrated offerings can accelerate the path to Smarter Computing.

Flexible Integrated Systems

- Deploy systems in days vs. months
- Reduce storage costs by 40%
- Lower energy consumption by 70-90%

IBM Smart Analytics System

IBM CloudBurst

Tightly Integrated Appliances

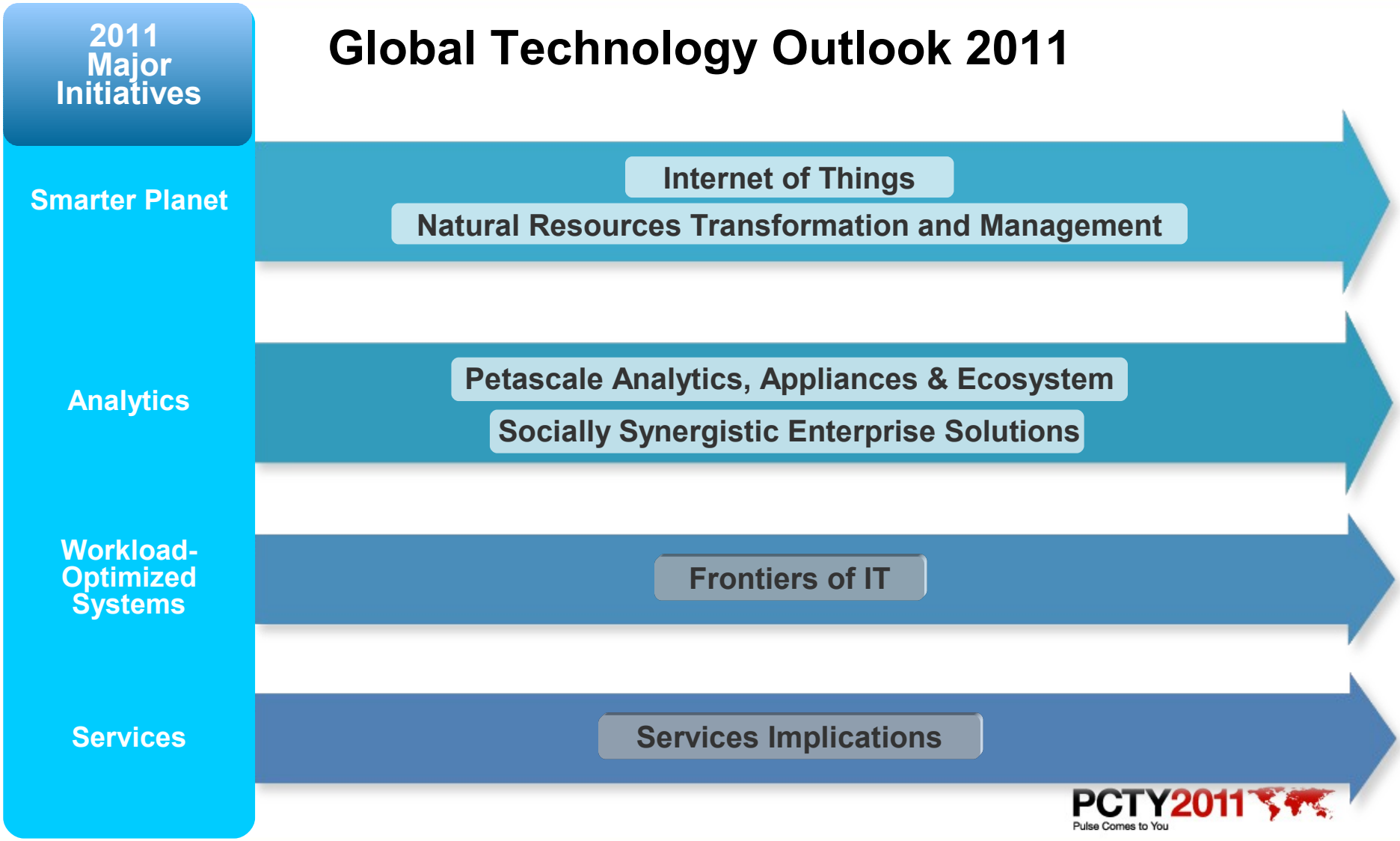
- Up in 24 hours or less
- Wire speed processing
- Data security, 5X less time

IBM WebSphere Data Power

IBM InfoSphere Guardium

IBM Netezza

Global Technology Outlook 2011



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Watson showcased the potential capabilities of IBM's workload optimized systems.

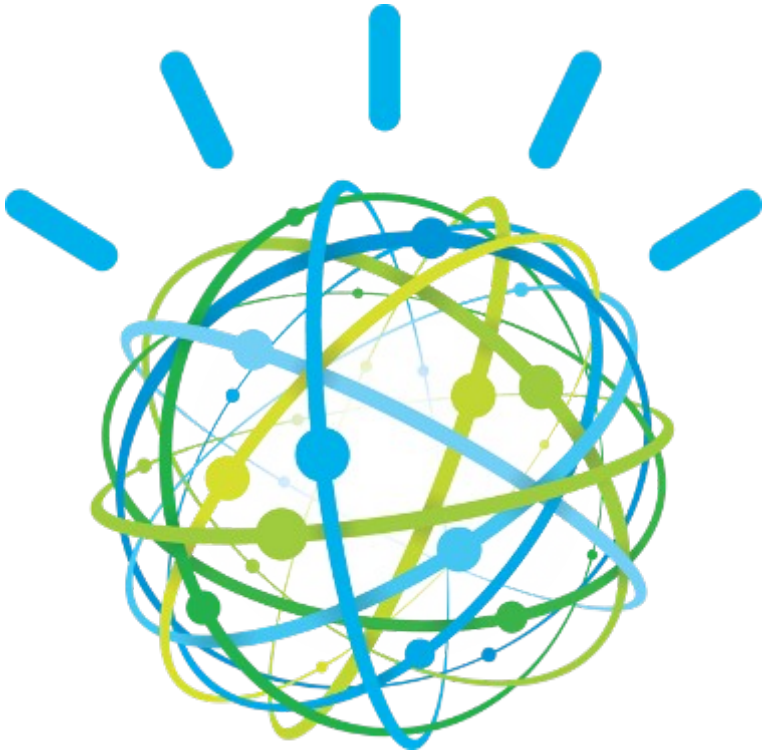
A System Designed for Answers

Built on a cluster of commercially available Power 750 servers

Runs thousands of simultaneous tasks
- 4 threads per core
- 2880 cores

Leverages IBM Content Analytics and InfoSphere BigInsights Software for "Big Data" analysis

Optimized to leverage 15 terabytes of RAM to deliver answers in seconds



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Designed for Data

Big Data for better decision making

Imagine the possibilities when all available information is harnessed to unlock insights.

Information from Everywhere

Extreme Scalability

Radical Flexibility

An extremely huge quantity of unstructured data is available today.
This is a tremendous opportunity in decision making

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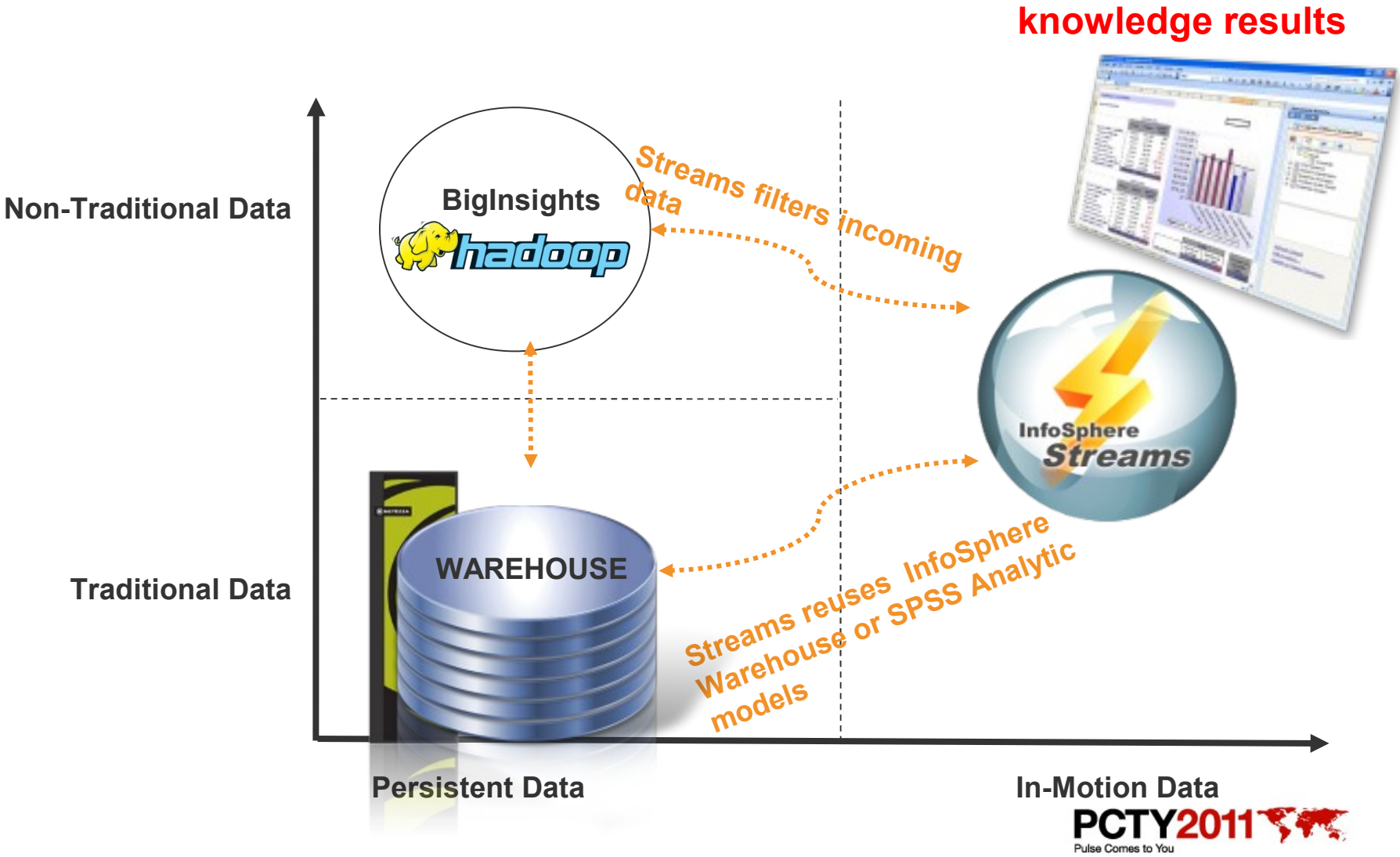
IBM offers a comprehensive and integrated set of solutions for many types of BIG Data processing needs



BIG Data: 2 examples

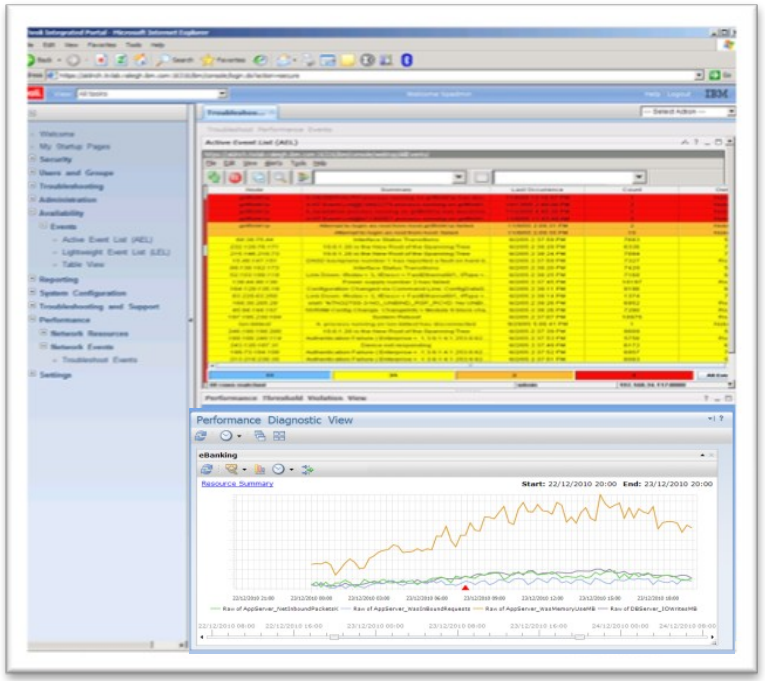
hundreds of traffic sensors, hundreds of CCTV cameras, thousands of GPS devices from taxicabs and a real-time weather data feed. Those are the non-traditional data sources that the city of Stockholm has integrated with their existing traditional data, which enabled them to provide **travel time forecasts**, reduce gridlock by 20%, and dramatically increase public transportation use

Consider **credit card fraud detection**. Companies used to pour 30 days of transactions data, for tens of millions of cardholders into data warehouses. They were using overnight batch jobs and consolidating the data by client segment in order to be able to fit in the data warehouse. In order to reduce fraud expenses they need to do the scoring by individual, based on the latest transactions, and in real time, as the new transactions come in. They also need to factor in 7 years worth of data, no just 30 days. IBM BigInsights, based on Hadoop, enables them to achieve that by analyzing data chunks in parallel where they already are, without overwhelming the data warehouse and making it prohibitively expensive.

Coming Soon: Tivoli Service Assurance Analytics

Proactive and self-learning performance and bsm intelligence

- Real-time analytics for detecting and avoiding service disruption.
- Uses advanced multivariate analytic algorithms; providing all the advantages mentioned previously.
- Correlates metric across multiple domains and heterogeneous data sources.
- Ultra scalable; analyzing massive volumes of metrics in a single multivariate instance.
- Leverages key IBM analytic engines and mediation
- Works in non-Tivoli environments, as well as integrating tightly with Tivoli suite.



Early Access Trials Underway; Looking For Additional Volunteers!

Managed through the Cloud
Cloud to reinvent business processes
and drive innovation

How will you manage cloud computing?
Virtualized is not Cloud

- Do you have a service management strategy across your data center, public cloud services, and private cloud?
- What type of SLA does your provider offer? Read the fine print
- What is your governance model?
- What type of quality of service do your customers, suppliers, and customers expect and demand?

Reduce cost of service delivery

Deliver higher quality services

Accelerate business agility

"Our efforts to develop services with IBM ... will ultimately enhance our customers' experience... our aim is to create new business opportunities by rapidly commercializing the ideas of content developers...."

Senior VP of large Telecom

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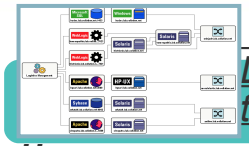
Source: McKinsey & Company., 2010 McKinsey Global Survey results: How IT is managing new demands (October 2010)

Infrastructure needs to become more dynamic …

VIRTUALIZATION + STANDARDIZATION + AUTOMATION = Cost / Flexibility

… to free budget for new investment and speed deployment of new capabilities.

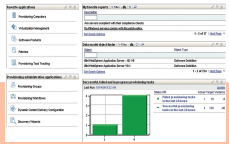
Service Management Capabilities



Map Service Dependencies to Infrastructure

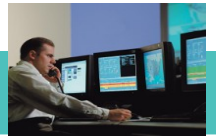
How are resources connected to provide business services?

Automate Service Operations



Are activities efficiently executed when delivering business services?

***Visibility* across Applications, Data and Underlying Infrastructure**



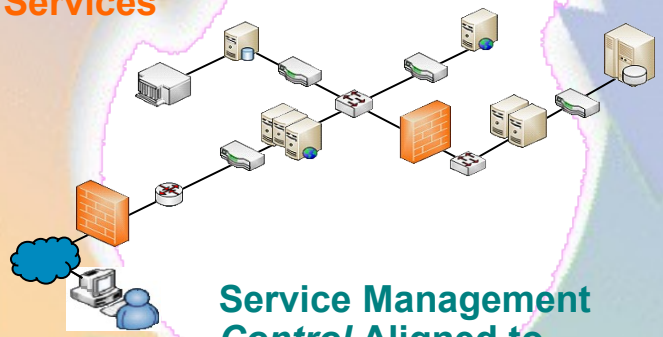
Monitor Infrastructure Resources

How are infrastructure events affecting services?

Process and Technology *Automation* across Business Services

Understand User Service Experience

How are services meeting business user needs?



Align Assets and Resources to Business Priorities

How are resources being deployed to meet business demand?

Asset
Contracts
Financial

Service Management *Control* Aligned to Business Priorities

Provide Business Aligned Dashboards

What is the health of my business and the services that support it?

Incident
Problem
Change

Fulfill Service Requests

How effectively are requests for services being managed?

Provide Security and Compliance Solutions

How secure and compliant are my business services?

Integrated Service Management provides the *Visibility, Control, & Automation* needed to unlock the value of these delivery models…

On average, 81%* of Cloud payback is driven by labor savings enabled by service management

- **Simplify user interaction with IT**
  - User friendly self-service interface accelerates time to value
  - Service catalog enables standards which drive consistent service delivery
- **Provisioning enables policies to lower cost**
  - Automated provisioning and de-provisioning speeds service delivery
  - Provisioning policies allow release and reuse of assets
- **Increase productivity**
  - Move from management silos to a service management system

*Average of the three studies based on IBM Research study 2009

VISIBILITY

See your business services

CONTROL

Manage your service risk & compliance

AUTOMATION

Optimize your service delivery processes

ISM is the “bones & muscles” of Cloud Infrastructure

Orange, a major global telecommunications company, is using the IBM Cloud Service Provider Platform in a pilot project to create new infrastructure-as-a-service offerings for their customers.

Didier Jaubert, senior vice president Global Services of Orange Business Services. "This integrated platform provided by IBM is an important step for us to expand our capabilities faster and beyond those of other carriers."

GREAT RIVER ENERGY®
A Touchstone Energy® Cooperative

The Need

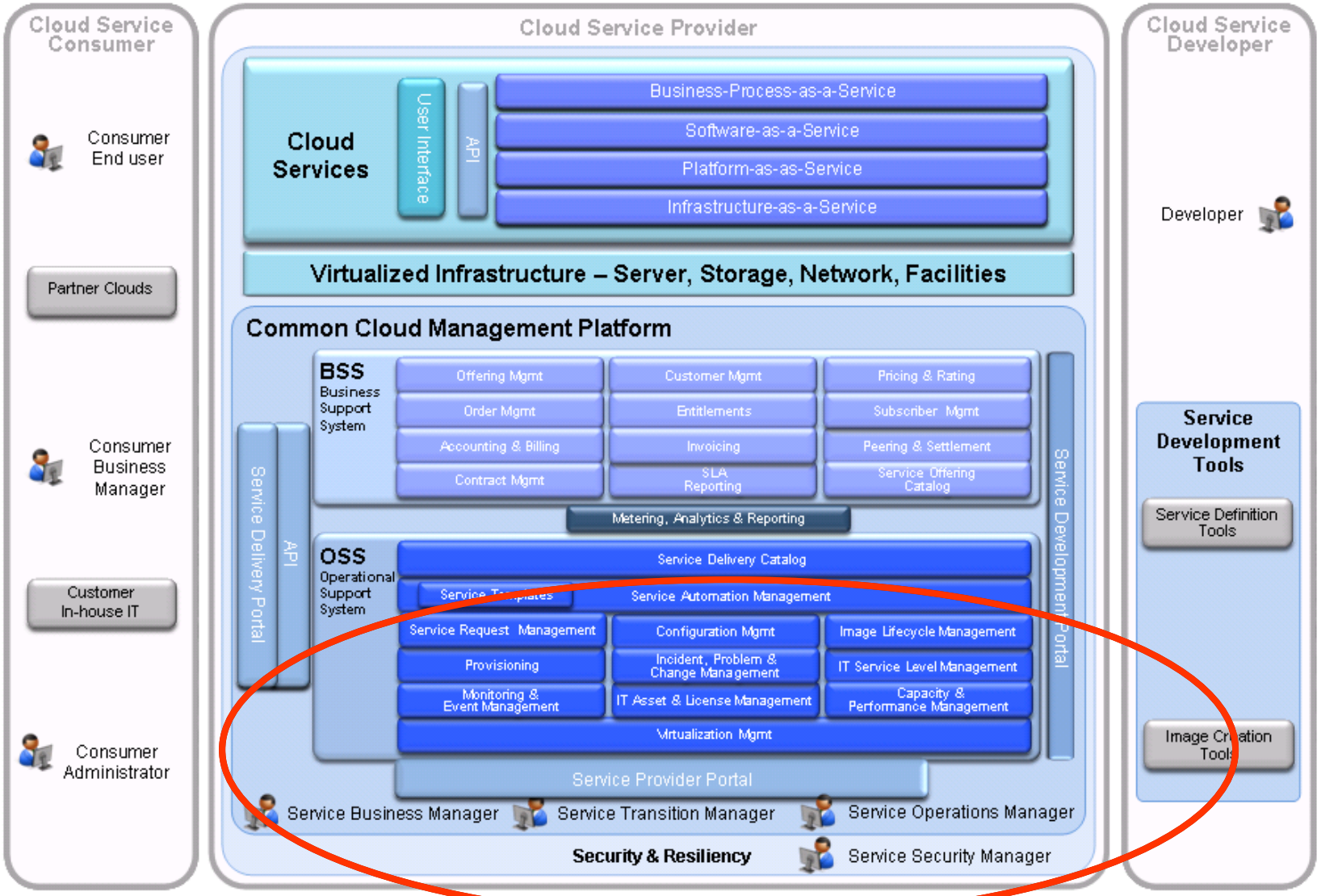
- Work teams process both requests and incidents
- Work transfer without losing ownership
- Requests for change
- Organizational ticketing (an extensible process)

The Solution

- Use a single application for…
  - Incidents
  - Service requests
  - Internal work requests
  - Requests for change
- Add a Ticket Type field
- Rely upon activities

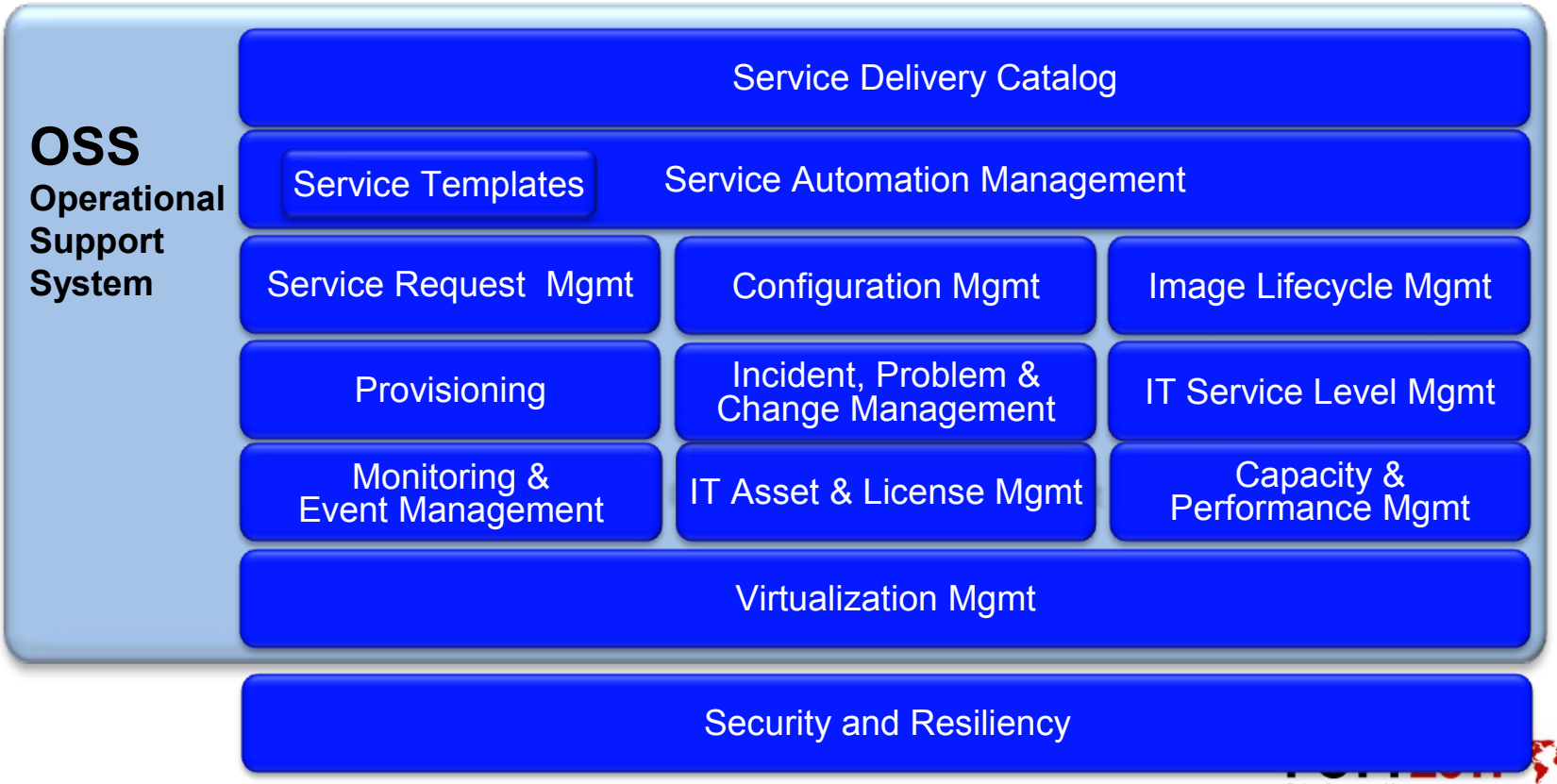
“The convergence of IT and business asset management provides a means for integrating service orientation and service management focused on business goals across all types of assets within the organization.”

Common Cloud Management Platform Reference Architecture

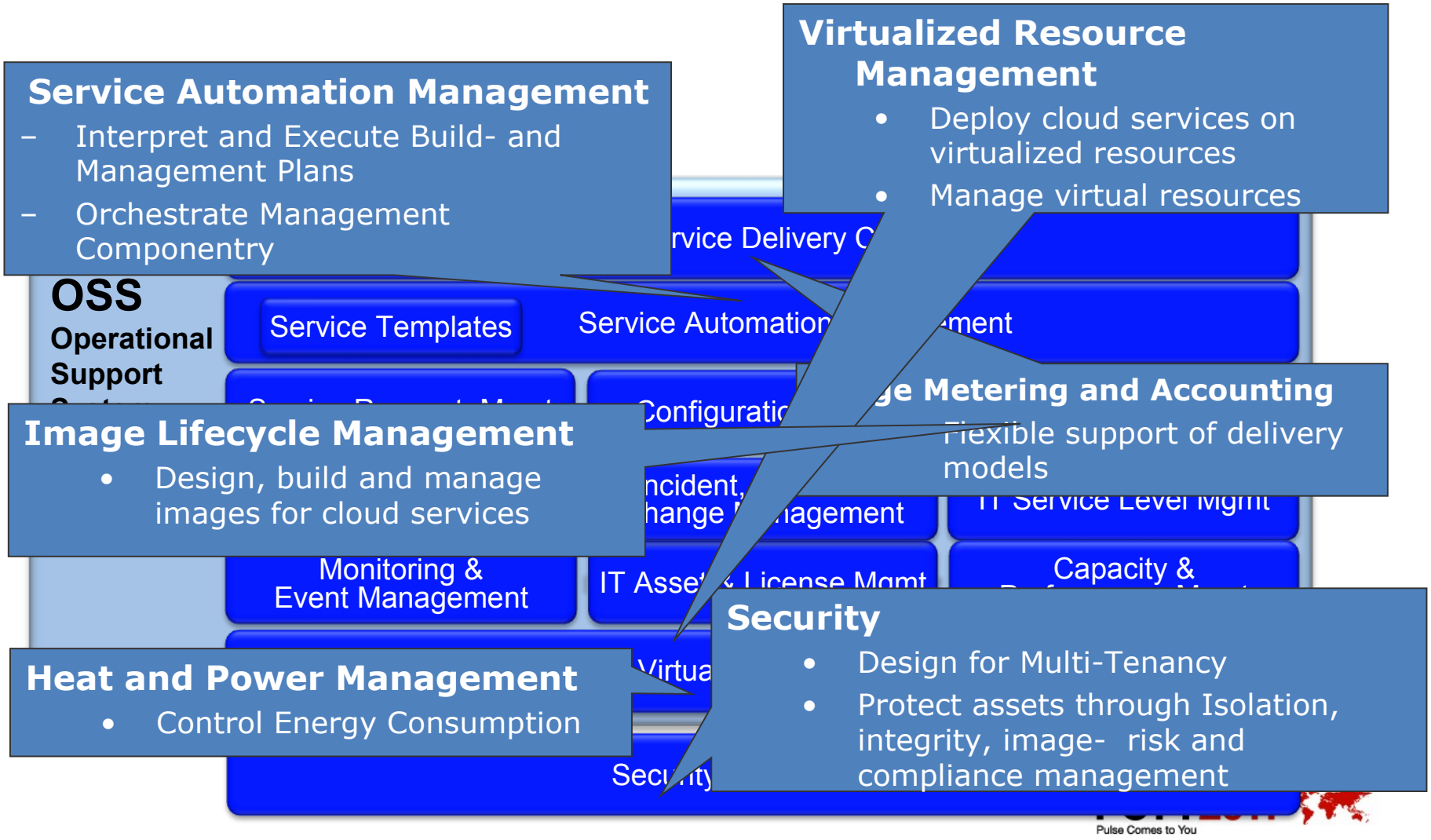


Core operational support capabilities required Cloud platforms

- **An operational support system is required to deliver cloud services**
- Key capabilities are provided below and **need to work together** as a basis for customer cloud service delivery



Service Management Concerns in Cloud Computing



We have it! Tivoli Service Automation Manager and Tivoli Provisioning Manager

Service Automation Management
- Interpret and Execute Build- and Management Plans
- Orchestrate Management Componentry

Service Designers, Service Operators, Administrators

End Users

Web2.0 GUI

MEA / REST APIs

Admin GUI

Tivoli Service Request Manager

Tivoli Service Automation Manager

Tivoli Provisioning Manager

Tivoli Process Automation Engine

IBM Tivoli Monitoring

Tivoli Usage and Accounting Manager

Virtualized Resource Management
- Deploy cloud services on virtualized resources
- Manage virtual resources

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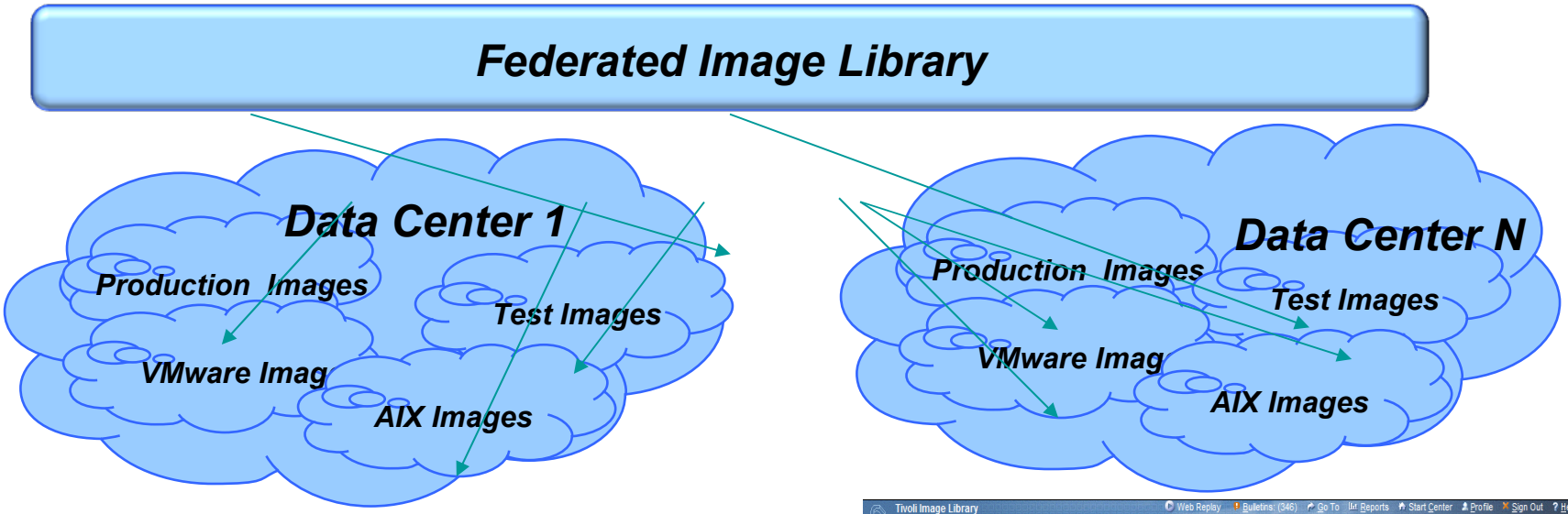
We have it! Tivoli Provisioning Manager for Images



- *Federates Master and Instance images wherever they are in the datacenter*
- *Tracks versions, owners, deployments*
- *Tracks content of images using OVF*
- *Tracks provenance (Parent/child)*
- *Manages replication*
- *Federates IBM and non-IBM platform repositories (e.g. IBM Systems Director VMControl)*

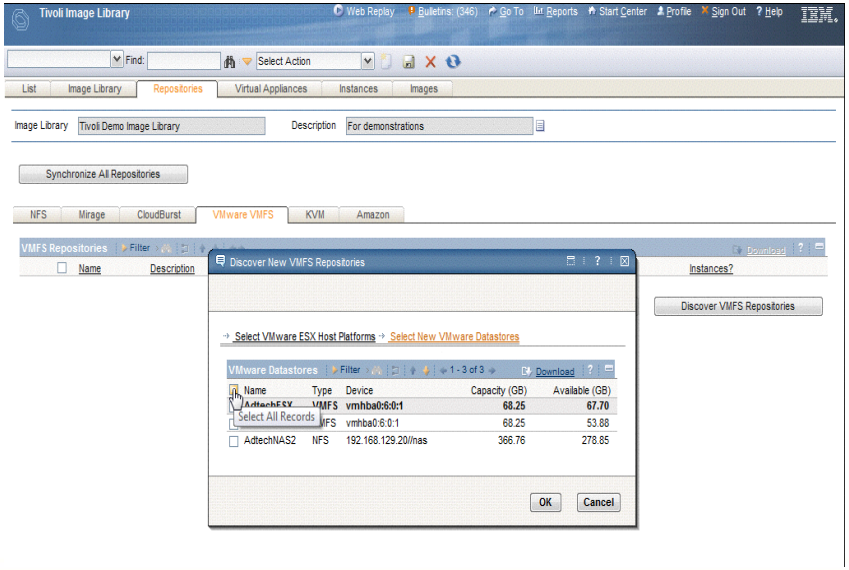


Image Lifecycle Management

- Design, build and manage images for cloud services

We have it! IBM Security Framework

Authentication and role-based access control

- Federated Identity including single sign-on

Isolation Management

- Server, Storage and Network

Security for Image Management

- Security Metadata, Access Control, Authorization

Integrity management

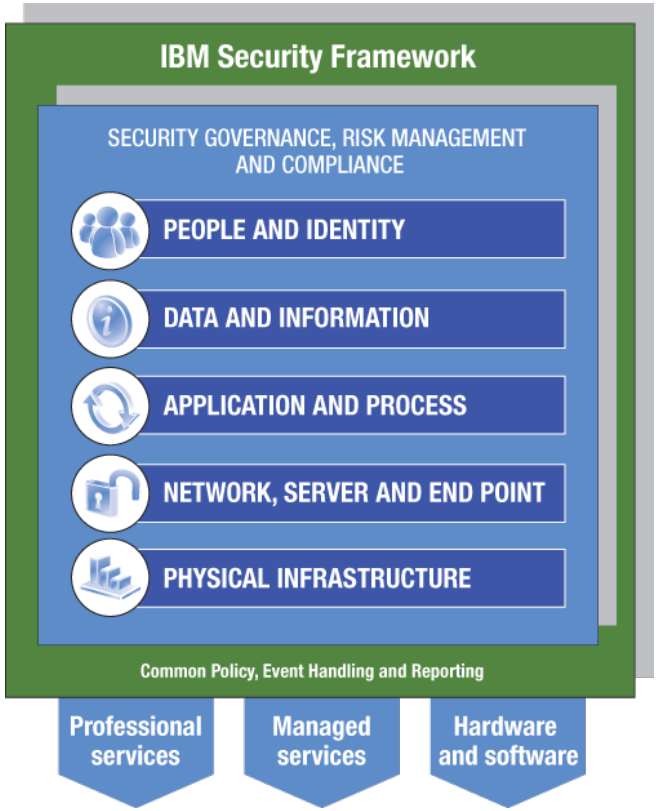
- Virtual Image integrity

Risk and Compliance

- Auditing and Configuration Management
- Enterprise-level Regulatory Compliance

Policy Management

Threat Management



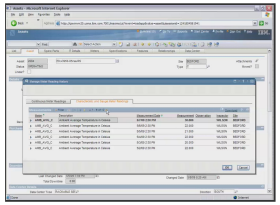
Security

- Design for Multi-Tenancy
- Protect assets through Isolation, integrity, image- risk and compliance management

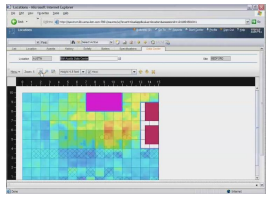
We have it ! Tivoli Monitoring for Energy Mgmt & Maximo for Energy Optimization

IBM

Integration of Energy and Asset Data



Thermal Visualization of Data Center



Maximo for Energy Optimization

Information Technology

IT Operator/ Manager

Tivoli Monitoring for Energy Mgmt

TDW

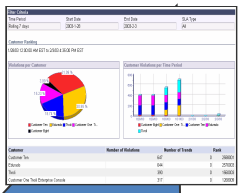
TRIRIGA® An IBM Company

Facility Manager / Engineer

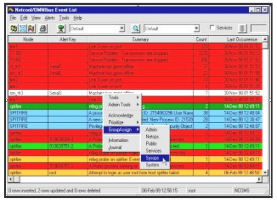
Data Center Administrator

Private Cloud

Centralized Energy Views & Reporting



Integrated IT and Facilities Alerts



Building Infrastructure

Data Center Infrastructure

Heat and Power Management

- Control Energy Consumption

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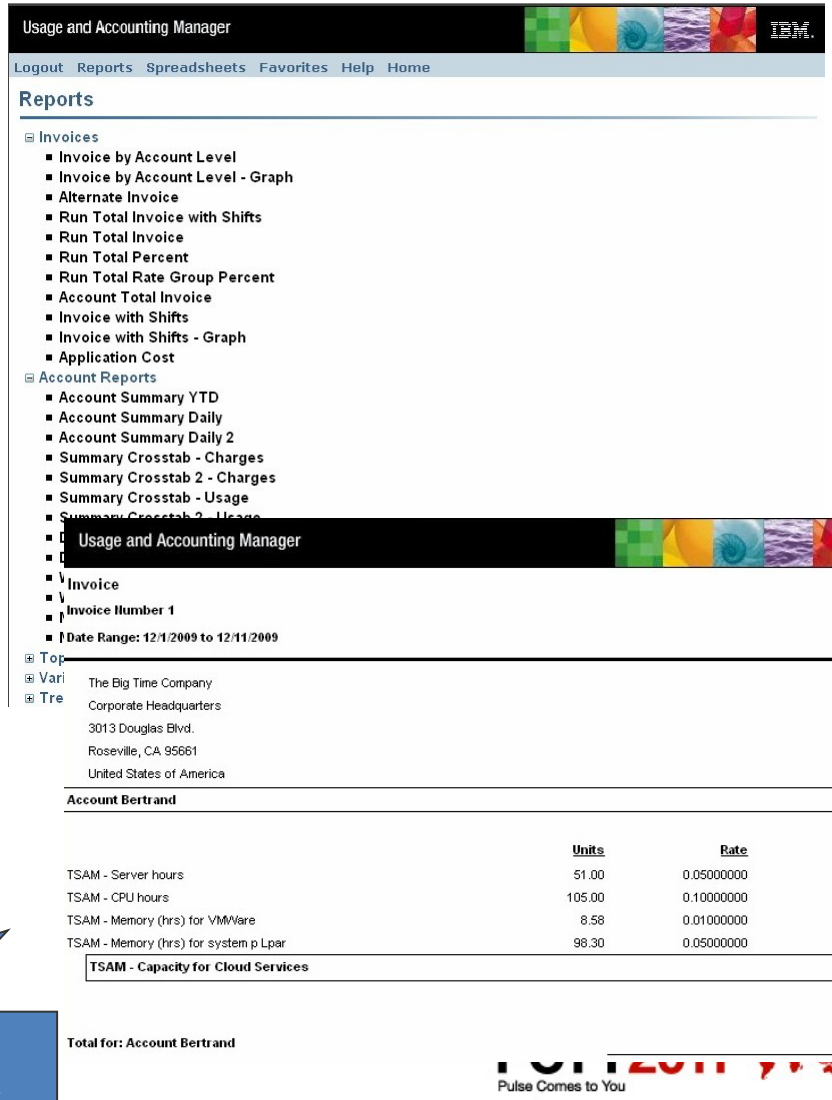
We have it! IBM Tivoli Usage and Accounting Manager

- Automated tracking of CPU, memory and storage resource allocation within TSAM.
- Inbuilt integration in TSAM to automatically interface transactions to TUAM.
- Definition of rates and costs of resources allowing full cost reporting of resources used.
- Flexible reporting engine with 40 template reports.
- Granular reporting allowing drill down, and detailed data filtering.
- Usage reporting driving change in behaviour to match resources to business needs (and release unused systems back into the resource pool).
- Providing the basis for chargeback implementation or invoicing in the future.

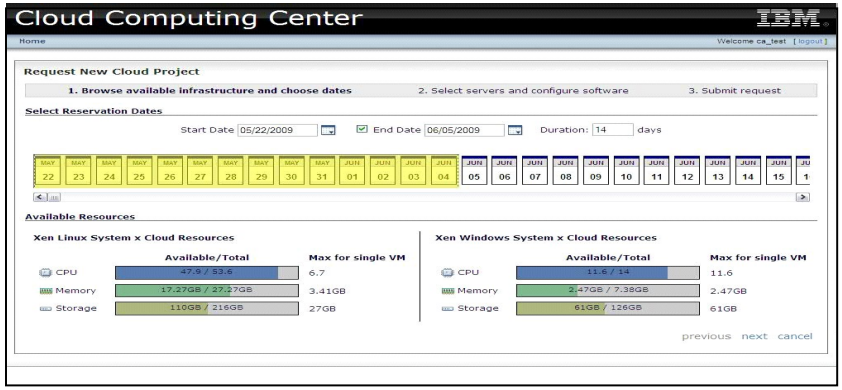


Usage Metering and Accounting

- Flexible support of delivery models

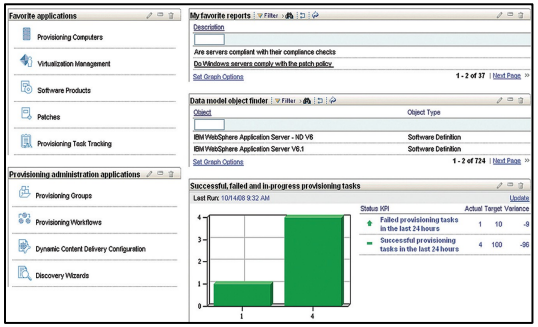
Core Components of Service Managed Clouds

For Locating and Requesting Services



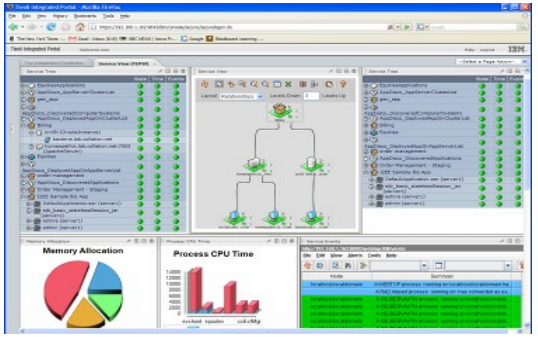
Secure User Centric Self-Service Portal, Automation engine and Catalog

Deploying Cloud Services



Automated Provisioning and Image Management

Managing Cloud Services



Monitoring, Security and Metering

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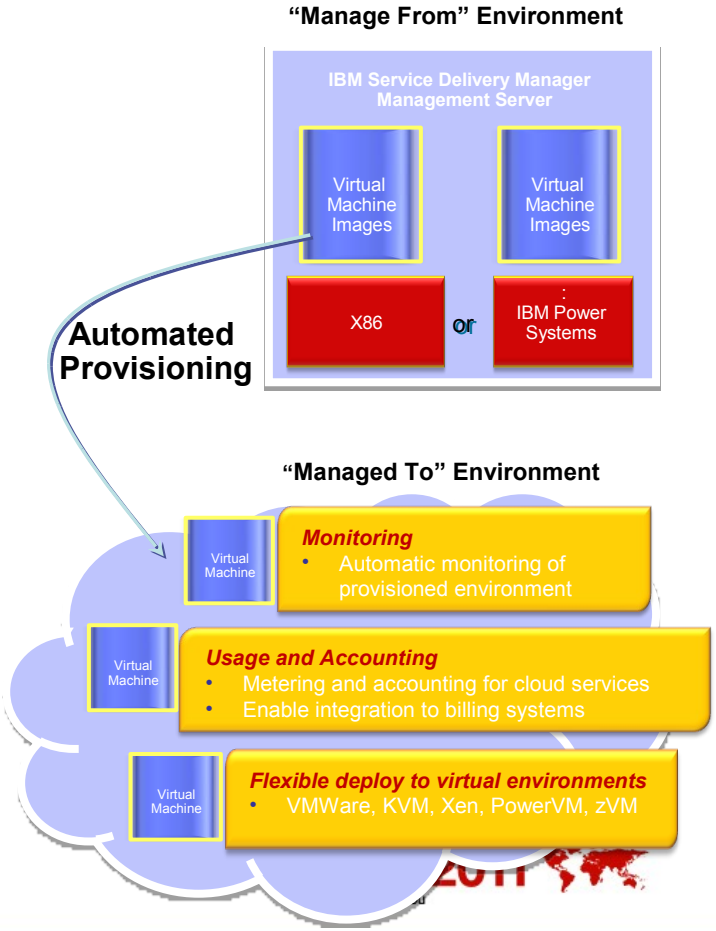
Putting all together: IBM Service Delivery Manager

A pre-integrated software stack, deployed as a set of virtual images, **that automate IT service deployment and provide resource monitoring, cost management**, and high availability of services in a cloud

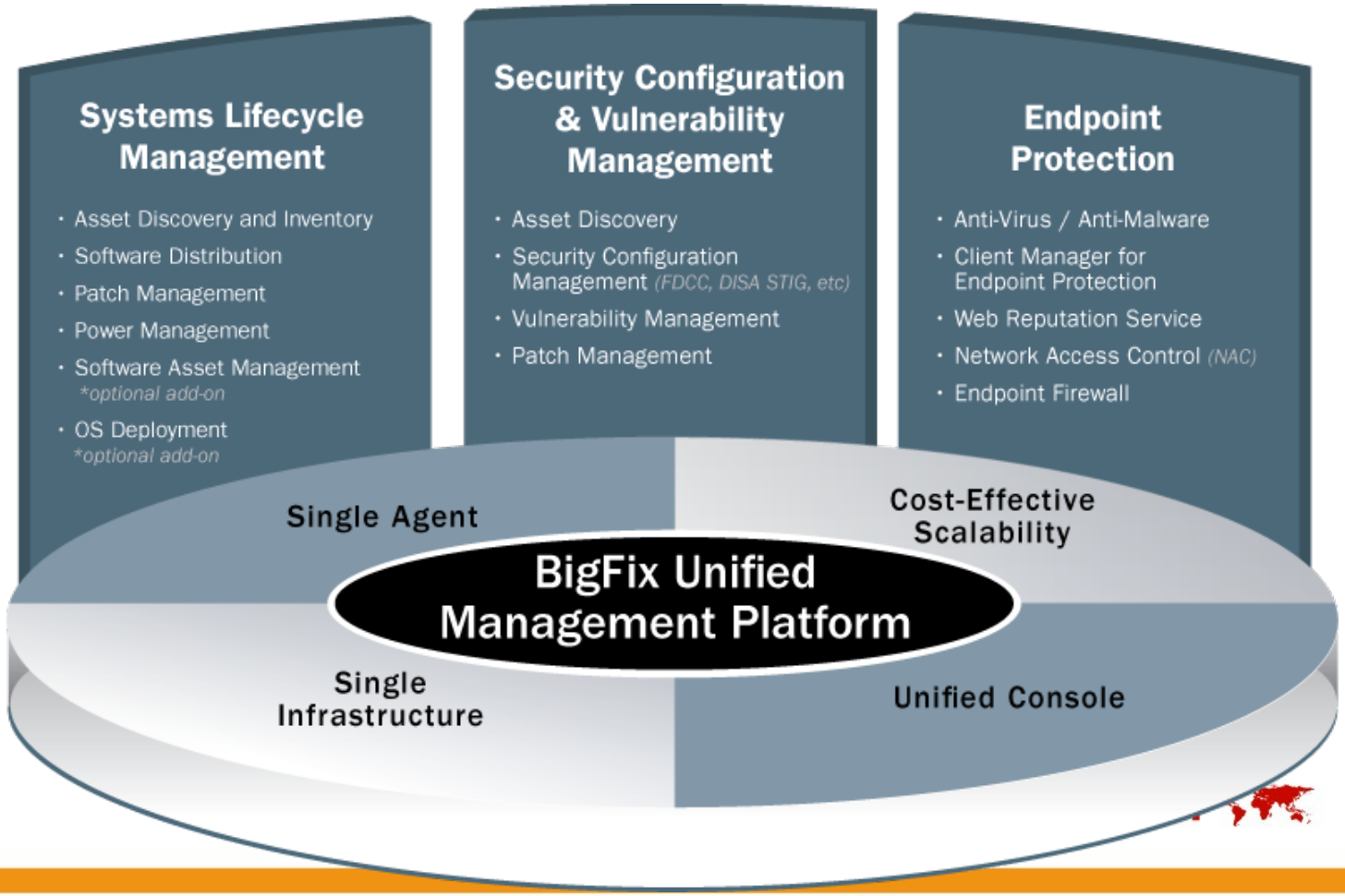
China unicom中国联通

The second-largest mobile telephony operator in China boosts CPU usage rate from 15 percent to 60 percent while reducing provision time from two weeks to 20 minutes when it works with IBM to implement an IBM Service Delivery Manager solution with a suite of IBM Tivoli software



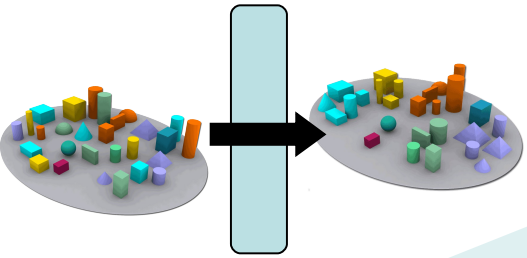
EndPoint Management

- *Business Services are accessed by users, so don't forget about the EndPoints*



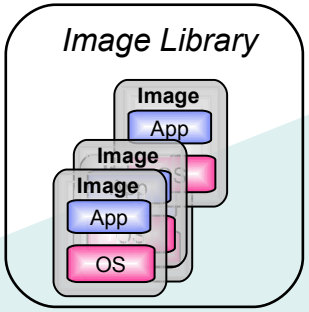
BigFix Aligns with IBM Service Management Solutions

Consolidate and Virtualize



- Automatic discovery of virtualized resources (server, storage and network)
- Dependency and change tracking
- Monitor virtualized environment
- Perform problem identification and isolation of virtualized environment

Automate and Optimize



- Automated provisioning / de-provisioning
- Pool standardized virtualized building blocks
- Plug-and-play capacity across HW generations
- Capture and catalog virtual images used in the data center
- Management of the virtualized environment

Business Centric, Enterprise Transformation

- Dynamic delivery of service
- Integrated virtualization management with IT service delivery processes
- Elastic scaling
- Pay for use
- Self-service provisioning
- Simplified deployment with virtual appliances

Successful transformation to virtualization and cloud computing requires a Secure, Consistent and Integrated Service Management platform as the foundation. Provisioning of devices and services plays key roles in business transformation.

Moving Automation, Compliance, Inventory and Policy Based Mgmt from DataCenter to the EndPoints

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Customers on BigFix

Flexibility

"It's not a fair fight [between BigFix and the competition]". The ability to solve multiple challenges by leveraging a multi-purpose agent, residing in a single console was ultimately the compelling reason for BGC to choose BigFix. Additionally, BigFix's speed was another big consideration."

--Chris Marino, SVP of Global IT Procurement

Ease Of Use

"We've been impressed with how BigFix has helped meet our goals and we're finding new uses for it all the time."

--Mark Starry, Manager of IT Infrastructure & Security

Customers on BigFix: Miami Dade

Customer Overview

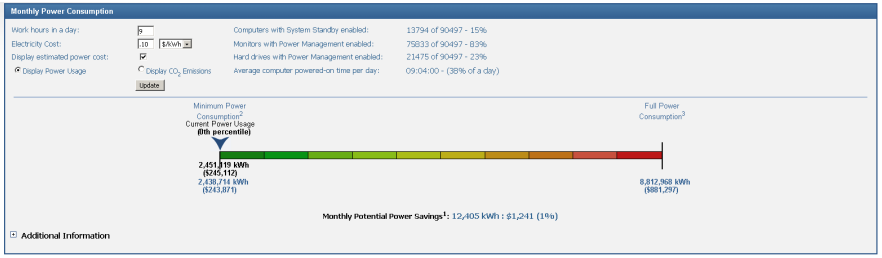
- 345,000 pupils, 22,000 teachers and over 400 schools and administrative sites
- over 100k computers supporting classroom instruction and administration

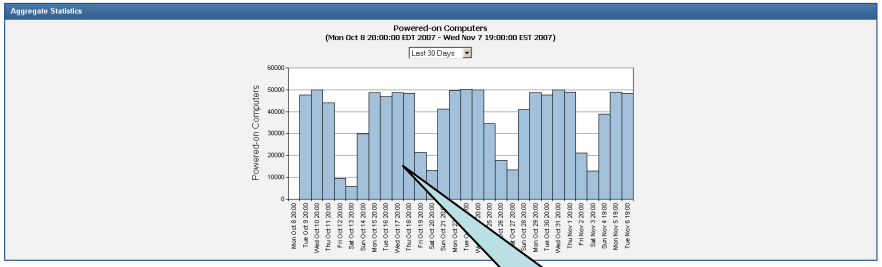
Challenges

- Reduce electricity bills for the USA's 4th largest public school district
- Implement a PC power conservation program with flexibility to accommodate a diverse set of needs, hours and end-user requirements
- Maximize conservation without impeding systems maintenance

Value Provided by BigFix

- Over $4.2M in total savings from reduced energy costs, with documented savings of $100,000 • per week
- Per-user group-based policy settings to ensure maximum energy conservation with no impact to • end-user productivity
- Integrated systems and power management with distributed Wake-on-LAN functionality overcomes • systems maintenance obstacles





Computers powered-off at night and on weekends

Energy Mamagement

"These $4.2M savings [from BigFix Power Management] are impressive, but they are just the beginning."

--

Tom Sims, Director of Network Systems

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How can you proceed to realize Smarter Computing?

IBM can help any enterprise proceed with a strategic, staged approach.

Each step leads to an IT infrastructure that is integrated, automated and secured.

To create advantage by serving customers in new ways, start with **Big Data** and information integration.

To create advantage by transforming the economics of your IT, start with workload **Optimized Systems.**

To create advantage by reinventing your business processes and improving the speed of your service delivery, start with **Cloud.**

To get real business advantage, do all three things together and design your IT as **a holistic system.**

University of Pittsburgh Medical Center achieved Smarter Computing.

$8 billion global healthcare enterprise with more than 50,000 employees challenged to lower cost of IT infrastructure to enable investment in next-generation clinical systems

UPMC
LIFECHANGINGMEDICINE

Transform to deliver:

- Doubled IT capacity and held costs flat
- Eliminated need for $80 million data center
- Enabled investment in next-generation clinical technology—“smart” hospital room and paperless hospital

ibm.com/smartercomputing