L'infrastruttura applicativa WebSphere, 15 anni al servizio delle aziende IT
Agenda:

- Introduction
  - IBM

- The Evolution
  - The IT Evolution
  - From traditional computing to the Cloud

- WebSphere Application Server
  - Application Infrastructure for Web Applications
  - What’s new in WAS

- Expert Integrated System
  - IBM PureApplication System
Over the past 100 years, hundreds of millions of IBMers, clients, customers and business partners all over the globe have helped IBM make the world work better.

To every single individual, thank you.

We pledge boldness in IBM’s second century to create a company that never stops moving toward the future. *Ever onward.*
In 2012 IBM was awarded the most U.S. patents for the 20th year in a row

- In the last 20 years, IBM inventors received nearly 67,000 U.S. patents
  - IBM’s 2012 patent count exceeded the combined totals of Accenture, Amazon, Apple, EMC, HP, Intel, Oracle/Sun, and Symantec

- 6478 patents issued to IBM in 2012 will enable advancements in established and emerging areas, such as analytics, Big Data, cloud and mobile computing, as well as industry solutions for retail, banking healthcare, and more
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The Evolution
The IT Evolution
Pressures like workforce mobility and increasing productivity are placing greater demands on IT systems.

**Increased expectations**

52% CAGR growth in self-service channels

**Increased demands**

10x growth in digital data from 2007 to 2011.

**Increased competition**

2/10 of the world’s largest companies in 2000 remain on that list today.

54% of surveyed enterprise IT budgets in 2010 were spent on ongoing operations and maintenance costs.*

As a result, cloud is an increasingly attractive means of creating and delivering IT services.

Value delivered

- Change management
- Test provisioning
- Install database
- Install of operating system
- Provisioning environment
- Design and deploy business applications

<table>
<thead>
<tr>
<th>From traditional</th>
<th>To cloud</th>
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<tbody>
<tr>
<td>Months</td>
<td>Days or hours</td>
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<tr>
<td>Weeks</td>
<td>20 minutes</td>
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<tr>
<td>1 day</td>
<td>12 minutes</td>
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<tr>
<td>1 day</td>
<td>30–60 minutes</td>
</tr>
<tr>
<td>51% cost savings</td>
<td>Days/Weeks</td>
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Cloud helps business and IT create and deliver value in fundamentally new ways

**Deliver IT without boundaries**
Enable new IT and business processes that break down traditional silos and simplify access to information in order to deliver better business outcomes.

**Improve speed and dexterity**
Speed the delivery of new offerings and services by creating new models of self-service and deployment.

**Create new business value**
Empower internal and external communities to define and create new offerings and services.
Businesses are choosing a variety of cloud models to meet their unique needs and priorities.

**Private cloud**
On or off premises cloud infrastructure operated solely for an organization and managed by the organization or a third party.

**Public cloud**
Available to the general public or a large industry group and owned by an organization selling cloud services.

**Hybrid IT**
Traditional IT and clouds (public and/or private) that remain separate but are bound together by technology that enables data and application portability.

**Traditional IT**
Appliances, pre-integrated systems and standard hardware, software and networking.
Adoption patterns are emerging for successfully beginning and progressing cloud initiatives

**IaaS**: Cut IT expense and complexity through a cloud enabled data center

**PaaS**: Accelerate time to market with cloud platform services

**BPaaS**: Innovate business models by becoming a cloud service provider

**SaaS**: Gain immediate access to business solutions on cloud
Easily build and rapidly scale private cloud environments with unparalleled time-to-market, integration and management

Platform as a Service Technologies

- Application Lifecycle
- Application Resources
- Application Environments
- Application Management
- Integration

Infrastructure as a Service Technologies

- Infrastructure Platform
- Management and Administration
- Availability and Performance
- Security and Compliance
- Usage and Accounting

Virtualization, Standardization, Automation

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Application architecture is changing
Application architecture is changing

Back-end Services

RDBMS

TPM

Elastic Caching Tier
(In-Memory Data Grid)

Application Server Tier

Web Server Tier

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**WAS V8.5 Delivers**

*Unparalleled Application Development and Management Environment, Rich User Experiences...Faster*

### Developer Experience

- Liberty Profile
- Expanded Tooling and WAS Tooling Bundles
- OSGi programming model enhancements
- EJB support in OSGi apps
- JDK7 Support
- Migration toolkit
- Web 2.0 & Mobile Toolkit; IBM Worklight Integration
- SCA OASIS programming model

### Application Resiliency

- Application Edition Management
- Application Server Health Management
- Dynamic Clustering
- New Intelligent Routing capabilities
- Messaging infrastructure resiliency
- Memory leak detection & protection in WAS

### Operations and Control

- Selectable JDK
- WebSphere Batch enhancements
- Admin Security Audit
- OSGi Blueprint security improvements
- Cross Component Trace (XCT)
- Enhanced IBM Support Assistant
- Better log and trace filtering

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WAS V8.5 introduces the lightweight Liberty profile –
For web, OSGi, and mobile apps

A highly composable, dynamic server profile

Dynamic Server Profile
Not static like Web Profile – determines by app at a fine-grained level

Developer First Focus
Simplified, shareable server config (like a dev. artifact). One XML file or several to simplify sharing & reuse of config

Incredibly fast:
start times: < 5 secs

Lightweight runtime
Small memory footprint: (60MB for TradeLite)

Integrated Tooling
Powerful tools. Simple Eclipse feature

Small Download:
< 50MB

Dynamic Runtime
Adding features & updating configs does not require server restart

Integration with ND Job Mgr
Optionally manage server lifecycle through ND Job Mgr

Unzip Install & Deploy
IM or unzip to install. Unzip deploy of server + app + config

Popular Platforms
Adds MAC OS for development

Fidelity to full profile WAS
Same reliable containers & QOS (easy migration from dev to ops)
Highly composable feature-based runtime

Example:

- WAS Extensions
- Java EE support
- Runtime services
- config model

Full WAS Profile

WAS V8.5
Liberty Profile
Intelligent Management

*Extending QoS through autonomic computing*

**Application Edition Management**
- Self-Managing
  - StockTrading 1.0
  - StockTrading 2.0
  - StockTrading 3.0
  - Finance 3.0
  - Finance 4.0

**Health Management**
- Self-Protecting Self-Healing

**Dynamic Clustering**
- Self-Optimizing

**Intelligent Routing**

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Applications can be upgraded without incurring outages

- Upgrade Applications without interruption to end users
- Concurrently run multiple editions of an applications
  - Automatically route users to a specific application
- Multiple editions can be activated for extended periods of time
- Rollout policies to switch from one edition to another without service loss
- Easily update OS or WebSphere without incurring down time
- Easy-to-use edition control center in admin console, plus full scripting support
Health Management

Sense and respond to problems before end users suffer an outage

- Automatically detect and handle application health problems
  - Without requiring administrator time, expertise, or intervention
- Intelligently handle health issues in a way that will maintain continuous availability
- Each health policy consists of a condition, one or more actions, and a target set of processes
- Includes health policies for common application problems
- Customizable health conditions and health actions

Comprehensive Health Policies

Customizable Health Conditions

Customizable Health Actions
Health Management – Health Policies

**Helps mitigate common health problems before outages occur**

- Health policies can be defined for common server health conditions
- When a health policy's condition is true, corrective action execute automatically or require approval
  - Notify administrator (send email or SNMP trap)
  - Capture diagnostics (generate heap dump, java core)
  - Restart server
- Excessive response time means you are monitoring what matters most: your customer's experience!
- Application server restarts are done in a way that prevent outages and service policy violations
- Each health policy can be in supervise or automatic mode. Supervise mode is like training wheels to allow you to verify that a health policy does what you want before making it automatic.

**Health Conditions**

- **Excessive request timeouts**: % of timed out requests
- **Excessive response time**: average response time
- **Excessive garbage collection**: % of time spent in GCs
- **Excessive memory**: % of maximum JVM heap size
- **Age-based**: amount of time server has been running
- **Memory leak**: JVM heap size after garbage collection
- **Storm drain**: significant drop in response time
- **Workload**: total number of requests
Dynamic Clustering

Proactively provision and start or stop application servers based on workload demands to meet Service Level Agreements

- Associate service policies with your applications
  - Let WebSphere manage to the service goals
- Programmatically respond to spikes in demand
  - Add or reduce application server instances as appropriate
- Automatically recover from infrastructure problems
- Includes automatic start and stop of cluster members based on load for MQ-driven applications
- Decrease administrative overhead required to monitor and diagnose performance issues
Intelligent Routing

- Requests are prioritized and routed based upon administrator defined rules
  - Flexible policy-based routing and control
- On Demand Router (ODR) is the focal point for Intelligent Routing
- A routing tier that’s aware of what’s happening on the application server tier
  - Application server utilization, request performance, etc…
- Route work to the application server that can do it best
- Provide preference for higher priority requests
- Integrates with Health Management and Dynamic Clustering

Improves business results by ensuring priority is given to business critical applications
WebSphere Batch

Quickly develop and deploy batch applications and dramatically reduce infrastructure and operational costs

- **Lower TCO**: Concurrent execution of batch & online transaction processing (OLTP) workloads using shared business logic on a shared infrastructure; Higher throughput and lower resource consumption on z/OS when collocated with data subsystems

- **Enhanced Developer Productivity**: Pre-integrated application framework, Java batch programming model and tools

- **Automation & Admin**: Container managed services for checkpoint and restart capabilities. Integrated administration of OLTP applications and batch jobs

- **Packaging utility**: Utility to package batch application that can be deployed using JEE runtime
Cross-Component Trace (XCT) for Problem Determination

Improve your ability to diagnose & debug SW problems in order to minimize and eliminate application downtime

- **XCT log viewer** - available for the IBM Support Assistant, can render log and trace content from multiple log / trace files grouped by request
  - View that detailed information on HTTP and JMS requests and responses to easily debug complicated application problems.
- **High Performance Extensible Logging (HPEL)** now has log / trace entry extensions
  - Filter entries by application name, by request ID or by other custom fields
Cross-Component Trace (XCT)

- XCT enables correlation of log and trace entries created by multiple threads and/or processes on behalf of the same request
  - XCT can augment log / trace entries with a requestID which you can view and filter using HPEL

- XCT can add records to your log / trace files so you can see how work related to each request branched between all involved threads / processes.

- XCT can store data snapshots, for example the complete text of a JMS/HTTP request, to facilitate in-depth problem determination
Cross-Component Trace (XCT)

- XCT log viewer, available for the IBM Support Assistant, can render log and trace content from multiple log / trace files grouped by request.
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The time has come for a new breed of systems
Systems with integrated expertise and built for cloud

**Built-in Expertise**
*Capturing and automating what experts do* – from the infrastructure patterns to the application patterns

**Integration by Design**
*Deeply integrating and tuning hardware and software* – in a ready-to-go workload optimized system

**Simplified Experience**
*Making every part of the IT lifecycle easier - with integrated management of the entire system and a broad open ecosystem of optimized solutions*
# IBM PureApplication System

## Built-in Expertise

*Capture and automate what experts do* – infrastructure and application expertise enhance application time to value

- ‘Patterns of Expertise’ pre-integrated, out-of-the box IBM and Partner patterns for deploying application workloads based on proven best practices and expertise

- Open and extensible with tools to capture your own patterns of expertise, designed to deploy new applications 20-30X faster* than traditional approaches

- Application patterns can encapsulate failover, load balancing, and security features, reducing security management by 51% and change management by 53%*

## Integration by Design

*Deeply integrate and tune hardware and software* – a secure, built for cloud, ready-to-go workload optimized platform system

- ‘Scale in’ integrated provisioning, elasticity and virtualization reduces cost and required management time by up to 55%

- Zero system downtime for capacity upgrades, system maintenance, software updates can result in 98% fewer unplanned outages*

- Integrated analytics to optimize database query performance and adaptive database compression that can provide 7x or greater overall space savings*

## Simplified Experience

*Make every part of the IT lifecycle easier* - integrated management and an open solution ecosystem broadens choice

- ‘Single pane of glass’ view from the infrastructure up through the application platform – designed to be up & running in 4 hours*, not 4 months

- Online catalog with 80+ certified, optimized pattern solutions from a broad, open ecosystem

- Built-in workload management, integrated system monitoring and maintenance can drive up to 55% reduction in operation costs*

- Application patterns can encapsulate failover, load balancing, and security features, reducing security management by 51% and change management by 53%*

* Based on internal test and client experiences of existing IBM capabilities leveraged in PureApplication Systems. Results may not be typical and will vary based on actual configuration, applications, and other variables in a production environment.

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Faster Set Up and Deployment

Includes (at no additional cost):
✓ Hardware set-up and configuration
✓ Software set-up and configuration
✓ First workload deployment

Hardware Set-Up and Configuration (2 days*)
Software Set-Up and Configuration (2 days*)
First Workload Deployment (1 day*)

*Actual times reported by customer working with competitor setup team
IBM PureApplication System integration by design

Optimizes the complete solution stack:

• All hardware and software components factory integrated and optimized
• Virtualized across the stack for efficiency
• Unified management, monitoring & maintenance
• Integrated and elastic application and data runtimes
• Application patterns allocate system and application resources for optimal performance, security and reliability
Multiple pattern types to enable open ecosystem

**Virtual Appliances**
- Standard software installation and configuration on OS
- Images created through extend/capture
- Traditional administration and management model
- Infrastructure driven elasticity

**Virtual System Patterns**
- Automated deployment of middleware topologies
- Traditional administration and management model
- Application and infrastructure driven elasticity

**Virtual Application Patterns**
- Highly automated deployments using expert patterns
- Business policy driven elasticity
- Built for the cloud environment
- Leverages elastic workload management services

Standard TCO existing applications

Improved TCO virtualized applications

Best TCO cloud applications
Virtual System Pattern
Default constraints (startup order)

Constraints define the order in which the parts will be started and are defined in terms of X starts before Y.

Default constraints cannot be deleted.

Highlighting a constraint highlights the parts involved in the constraint.
Virtual system pattern deployment steps

From the pattern attribute window, click on the “Cloud” button to deploy the Virtual System pattern

Virtual system pattern deployment steps

1. Specify a unique name for the virtual system to be created
2. Choose an existing cloud group or environment profile to deploy your pattern into
3. Schedule a deployment time – now or at a future time
4. Configure virtual image parts and script packages (if not already configured during pattern creation)

Check mark indicate configuration is complete unless you need to modify

No check mark indicate more configuration needed
Schedule a virtual system pattern deployment

- Deploy immediately
- Deploy at some later date and time
- Run forever or until some later date and time
- Default option is to start now and run indefinitely

Start deployment now or later

Click to schedule deployment
Configure a virtual system pattern deployment

Configuration updates are specific to this deployment (virtual system)
Values for “root” and “virtuser” passwords are required by the user
Virtual Application Pattern
Virtual Application Builder - graphically assemble your virtual application

- Virtual Application Builder: Graphically assemble your virtual application.
Drag and drop components

- Drag and drop the components
- The palette consists of component templates and predefined components
Add and configure policies

- Configure application components with different policies to add or enhance functionality
  - Policies can be applied to Enterprise, Web or OSGI applications only
- Policies can be attached at the virtual application level
  - Applies to all relevant components in the pattern
  - Component level policy takes precedence over virtual application level policy
Extensibility from the broadest ecosystem is made easy

New IBM PureSystems Centre:

- Gain access to a broad community of IBM and certified partner expertise
- Download optimized, deployable application patterns from 100+ leading ISV partners
- Search by solution area, industry or system
- Download fixes and patches
- Access to developer community

Also run your existing applications today*

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