



# IBM System z Technology Summit

Moving to cloud? Integrated service management on System z will be a critical success factor



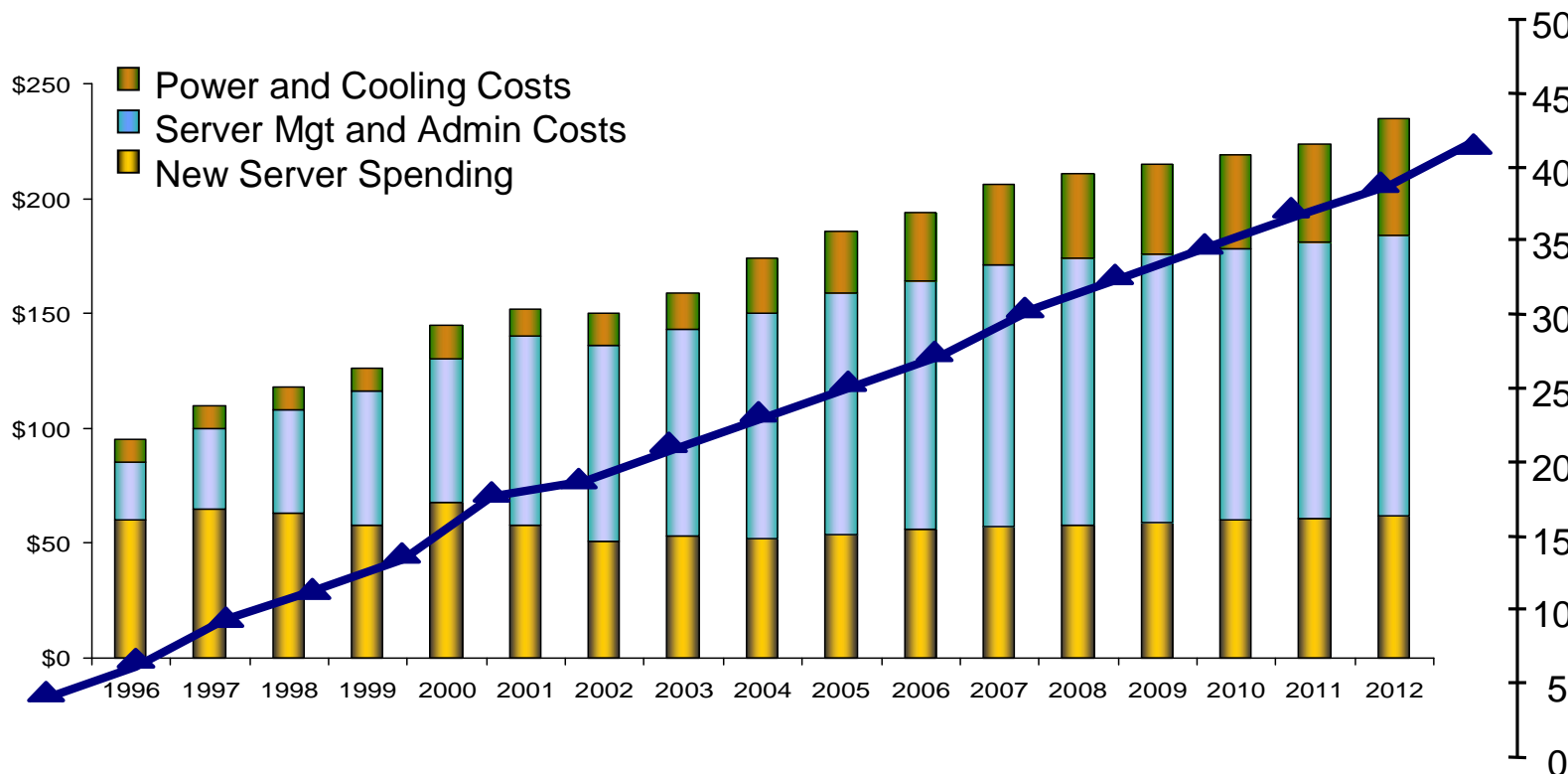
# Annual Operating Costs Are Out Of Control

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

Spending  
US\$(B)

Physical  
Server Installed  
Base (Millions)

- Power and Cooling Costs
- Server Mgt and Admin Costs
- New Server Spending

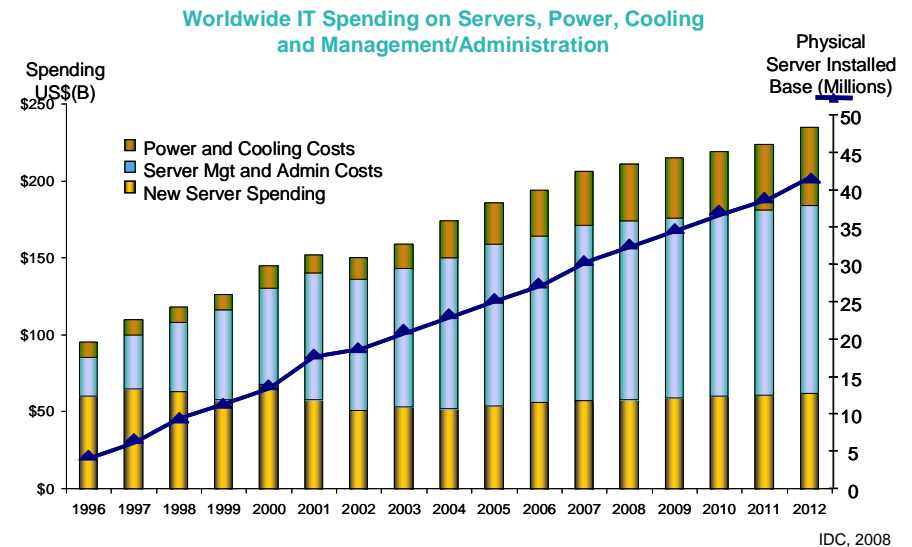


IDC, 2008

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# Businesses face challenges today

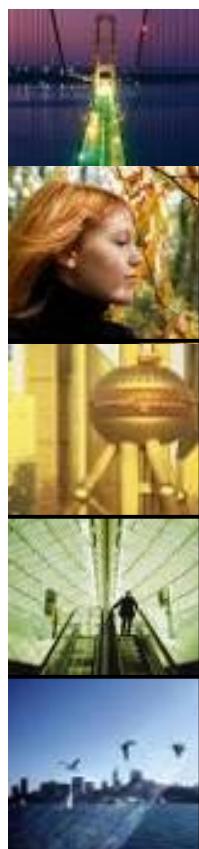
- Lost business opportunity because IT too slow to react. Lack of agility
- Long deployment timelines for new systems (weeks/months+)
- Many people involved in the process, high cost & complexity
- Many steps are manual and prone to error
- Huge up front investment for new infrastructure
- Server sprawl
- Low utilization
- Costly compliance, auditing, and security patching



## What Is The Solution?

- **Reinvent the data center to build a more dynamic infrastructure**
  - Take Cost Out
    - Virtualization and consolidation
  - Reduce Energy Consumption
    - Green Data Center
  - Simplified Administration - Request Driven Provisioning
    - Automatic self service

Provide private cloud services to the enterprise



	<i>2008 CEO Directions</i>	<i>CIO Implications</i>
<b>HUNGRY FOR CHANGE</b>	<i>83% expect substantial change in the next three years</i>	<b>Flexible, adaptable, extendible systems to support business model changes</b>
<b>INNOVATIVE BEYOND CUSTOMER IMAGINATION</b>	<i>76% see opportunity in more informed and collaborative customers</i>	<b>Collaboration &amp; social networking to improve idea/information sharing</b>
<b>GLOBALLY INTEGRATED</b>	<i>75% are actively entering new markets</i>	<b>Embrace emerging technologies</b>
<b>DISRUPTIVE BY NATURE</b>	<i>69% are planning some type of business model innovation over the next three years</i>	<b>Manage increasing risk</b>
<b>GENUINE, NOT JUST GENEROUS</b>	<i>69% believe rising customer expectations of corporate social responsibility will positively impact their business</i>	<b>Deliver on Green IT</b>

Cloud computing can be a critical part of the enterprise transformation

# Cloud computing is about enabling the end user to help themselves

## A user experience and a business model

- Standardized offerings
- Rapidly provisioned
- Flexibly priced
- Ease of access

## An infrastructure management and services delivery method

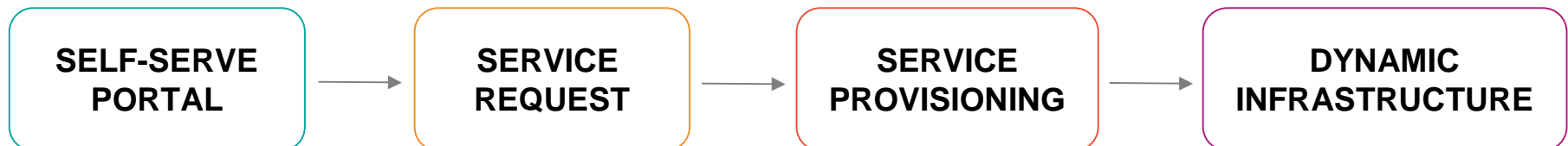
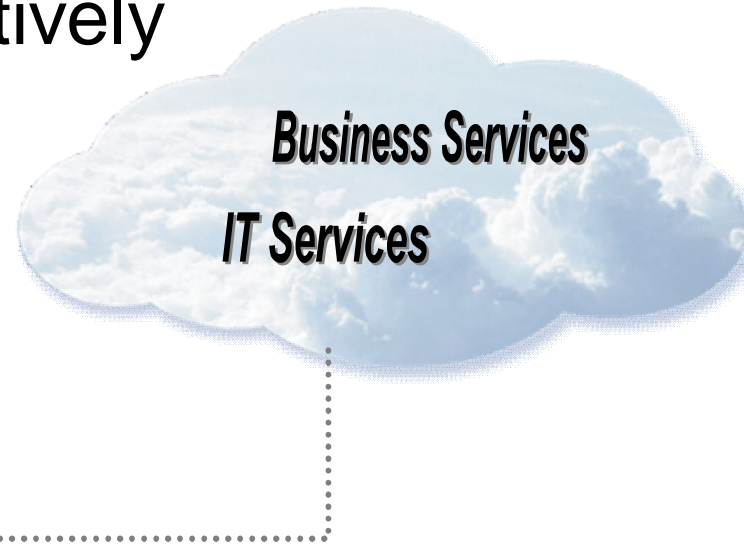
- Virtualized resources
- Managed as a single large resource
- Delivering services with elastic scaling

## Similar to Banking ATMs and Retail Point of Sale, Cloud is Driven by:

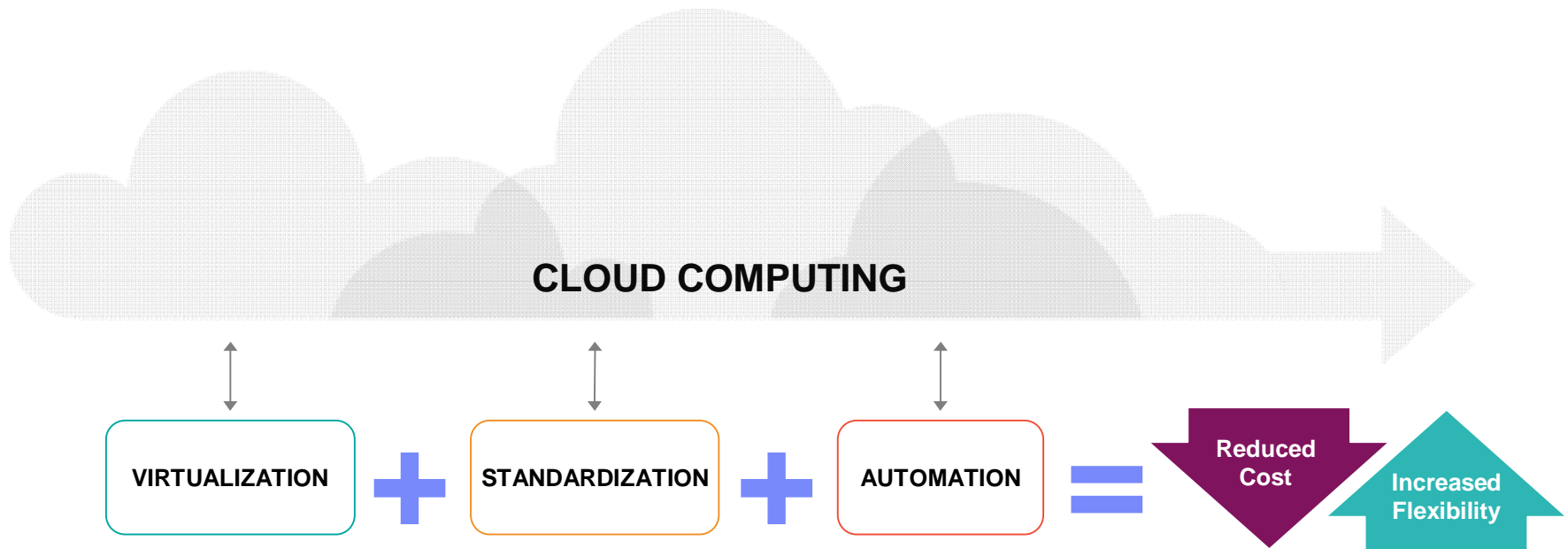
- Self-Service (*consumer behavior*)
- Economies of scale
- Technology advancement



“Self-service” plus standardization drives lower costs and unlocks productivity for delivering workloads more effectively



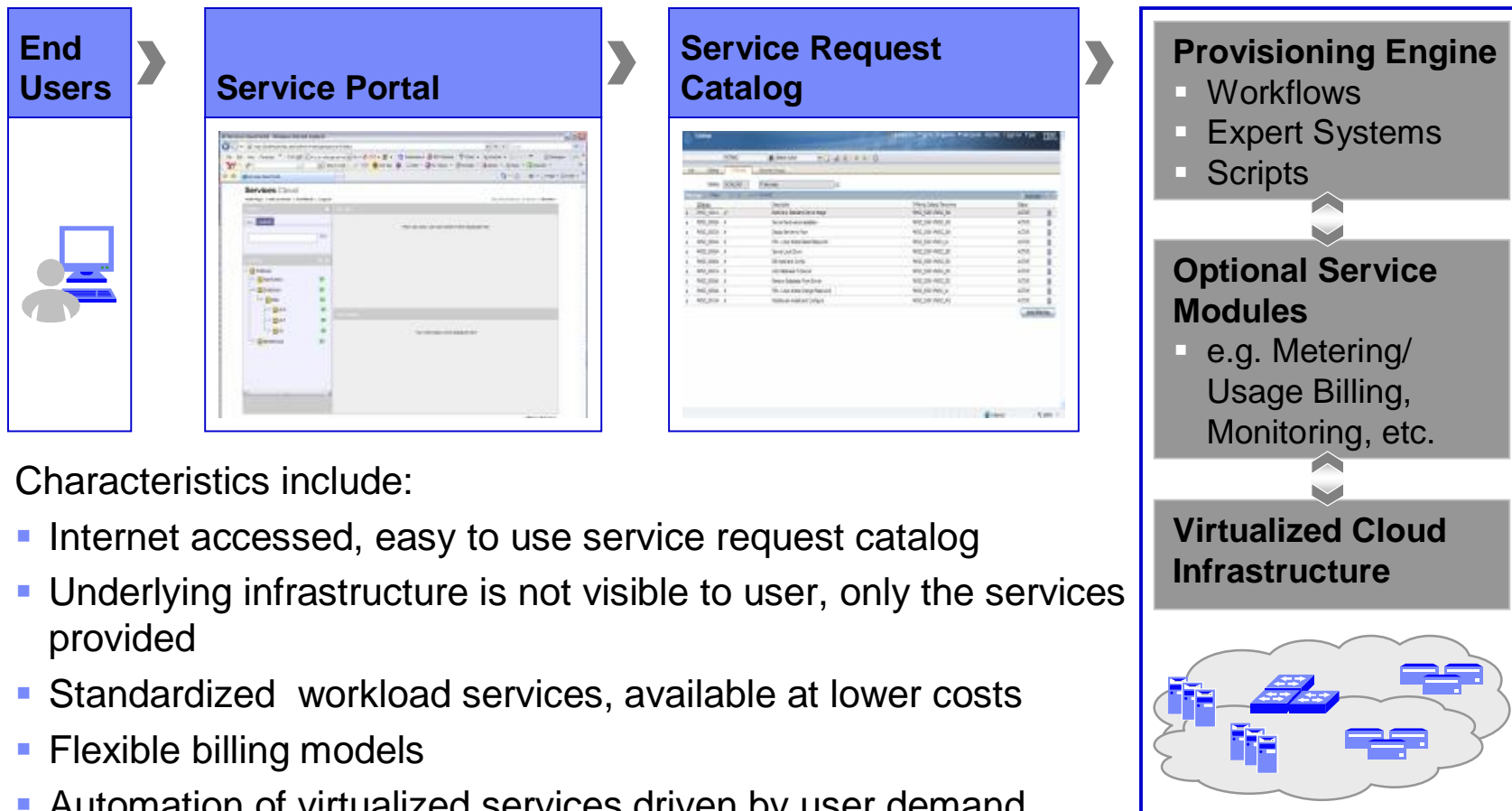
An effective cloud computing deployment is highly optimized to achieve more with less....



...leveraging **virtualization**, **standardization** and **automation** to free up operational budget for new investment.



# How does cloud computing work?



Characteristics include:

- Internet accessed, easy to use service request catalog
- Underlying infrastructure is not visible to user, only the services provided
- Standardized workload services, available at lower costs
- Flexible billing models
- Automation of virtualized services driven by user demand
- Seemingly endless resources

# There are multiple delivery models for cloud

## Flexible Delivery Models

### Private ...

- Privately owned and managed
- Access limited to client and its partner network
- Drives efficiency, standardization & best practices, while retaining control

### Value drivers ...

.... Customization, efficiency, availability, resiliency, security and privacy

## Cloud Services

## Cloud Computing Model

### Hybrid ...

- Access to client, partner network, and third party resources
- Industrialization

### Public ...

- Owned and managed by service provider
- Subscription based offering
- Offers standardized business process, application and/or infrastructure services
- Flexible price on utility basis

### Value drivers ...

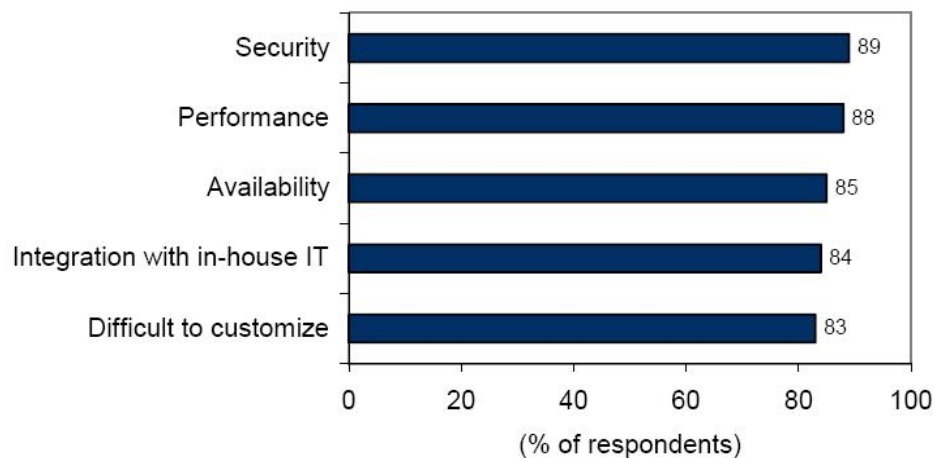
....Standardization, capital preservation, flexibility and time to deploy

# System z and private cloud computing

## *The right answer for the large enterprise*

Enterprises must overcome obstacles to adopt cloud computing ...

Cloud Computing Implementation Challenges Described as "Significant"



Note: Multiple responses were allowed.

Source: IDC's Enterprise Panel, 2008

...and System z can help.



**Virtual** – a “share all” approach to system resources for efficiency



**Secure** - a multi-tenant design point with EAL 5 certification



**Available** - 24x7x365 operations with zero data loss recovery



**Efficient** - consuming 80% less energy than distributed solutions



**Scale** - ability to meet massive demands from users and data

# Cloud computing is based on operational efficiency

## *System z brings differentiated value to the cloud*

Economies of scale achieved with less resources, moving parts, and money, while delivering more compute capacity from system resources

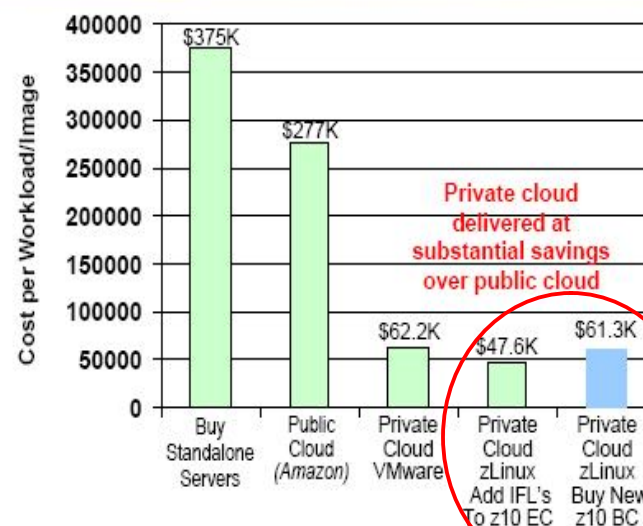
### Dramatic Simplification through Virtualization

IBM's Project Big Green System z consolidation results in 60-75% gross cost savings (5 yr TCO)

### TCO Reductions with Cloud Computing

IBM found cost comparisons for 100 virtual Linux servers to be cheaper with Private Clouds on z

**Cost Per Image for Linux Workloads (5 Yr TCO)**



Unit	Distributed	System z Linux	% Reduction
Software Licenses	26,700	1,800	93%
Ports	31,300	960	97%
Cables	19,500	700	96%
Physical Network Connections	15,700	7,000	55%

## Do more work with your cloud - use System z

▪ Near-linear scalability	up to 900,000+ concurrent users; TBs of data
▪ “Mean Time Between Failure”	measured in decades versus months
▪ ¼ network equipment costs	virtual and physical connectivity
▪ 1/25th floor space	400 sq. ft. versus 10,000 sq. ft
▪ 1/20 energy requirement	\$32/day versus \$600/day
▪ 1/5 the administration	< 5 people versus > 25 people
▪ Highest average resource utilization	Up to 100% versus < 15%
▪ Capacity Management & upgrades	On demand; in hours, not weeks/months
▪ Security intrusion points	Reduced by z architecture and # of access pts.
▪ Higher concurrent workload	hundreds of applications versus few



# Case Study

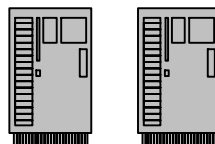
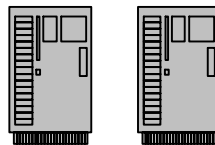
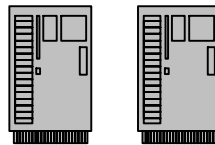
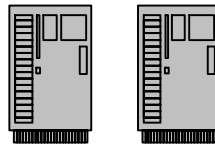


# A Benchmark Comparison

We ran a benchmark to compare how many images can be consolidated in practice

**Friendly Bank online banking benchmark  
(WebSphere Application Server)**

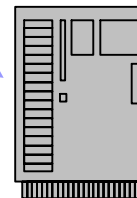
**Intel servers x366**  
4 cores @ 3.66 GHz  
12 GB memory



**Workload on each one**  
5% utilization  
40 ms response time  
4.5 tps



**Linux on System z z10-EC**  
8 IFL cores @ 4.4 GHz  
64 GB physical memory



**Intel server x3950**  
8 cores @ 3.5 GHz  
64 GB physical memory

**Consolidate VM  
images on two  
different platforms**

**Each VM image**  
4 virtual cores  
1 GB virtual memory

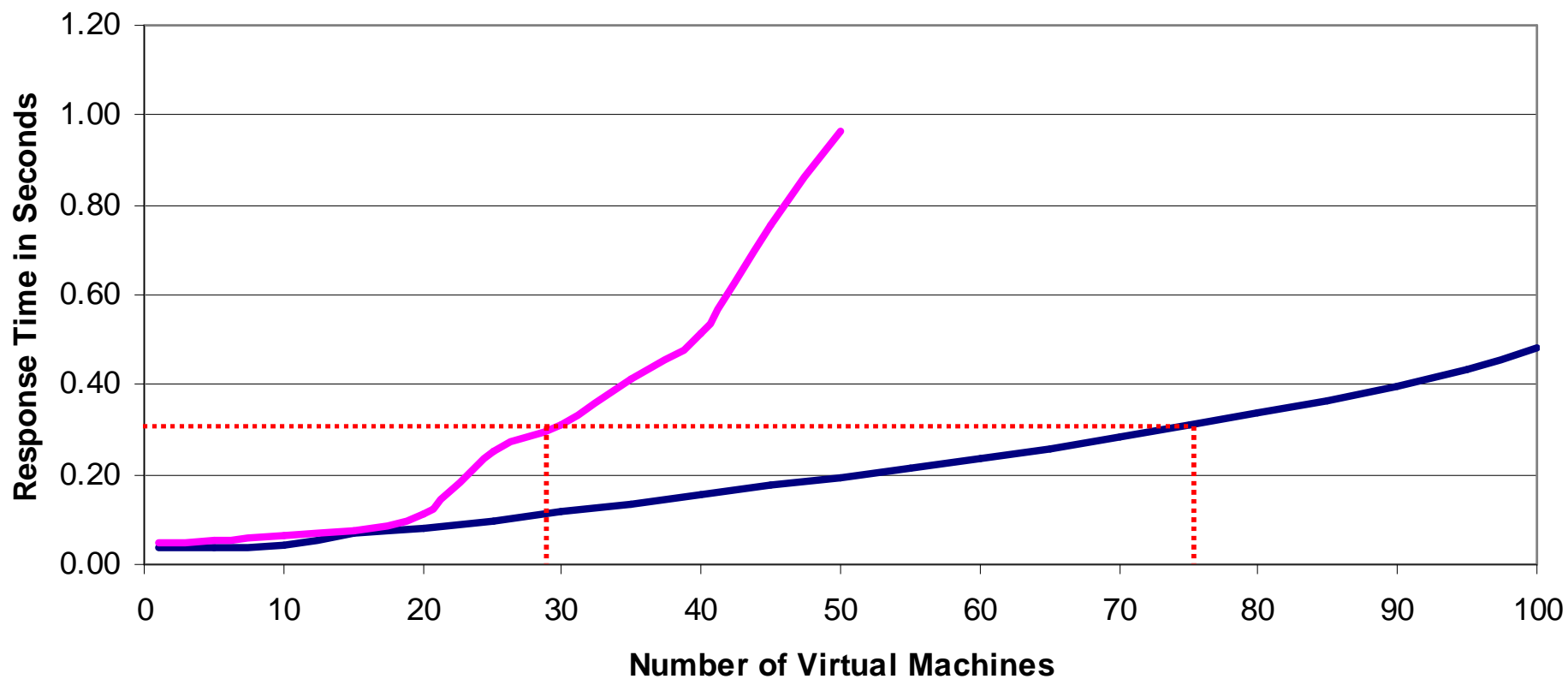
# Response Time Comparison

## Standalone Server

CPU: 5%  
 TP: 4.53 trans/sec  
 RT: .04 sec  
 TT: .18 sec

## Response Time Comparison

— z/VM — x86 Hypervisor





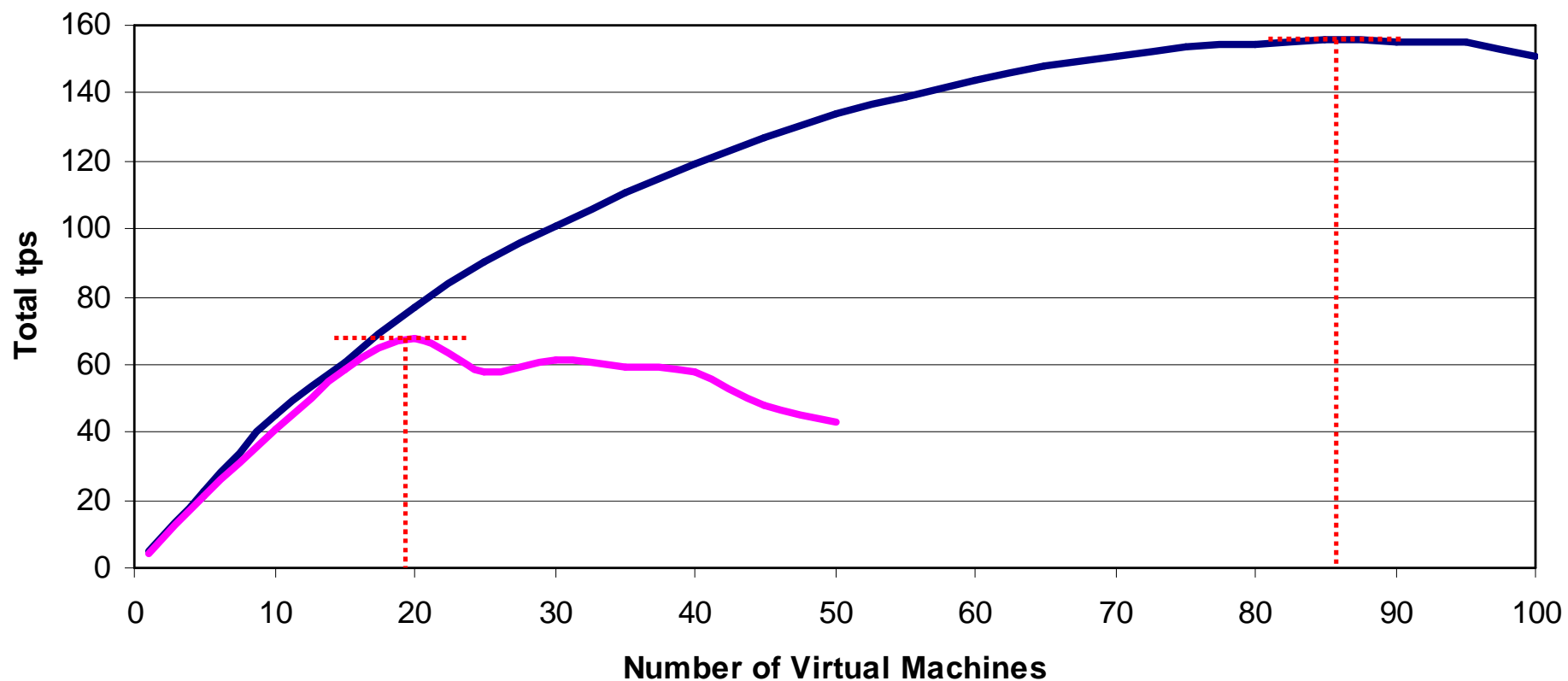
# Throughput Comparison

**Standalone Server**

CPU: 5%  
 TP: 4.53 trans/sec  
 RT: .22 sec  
 TT: .18 sec

## Throughput Comparison

— z/VM — x86 Hypervisor



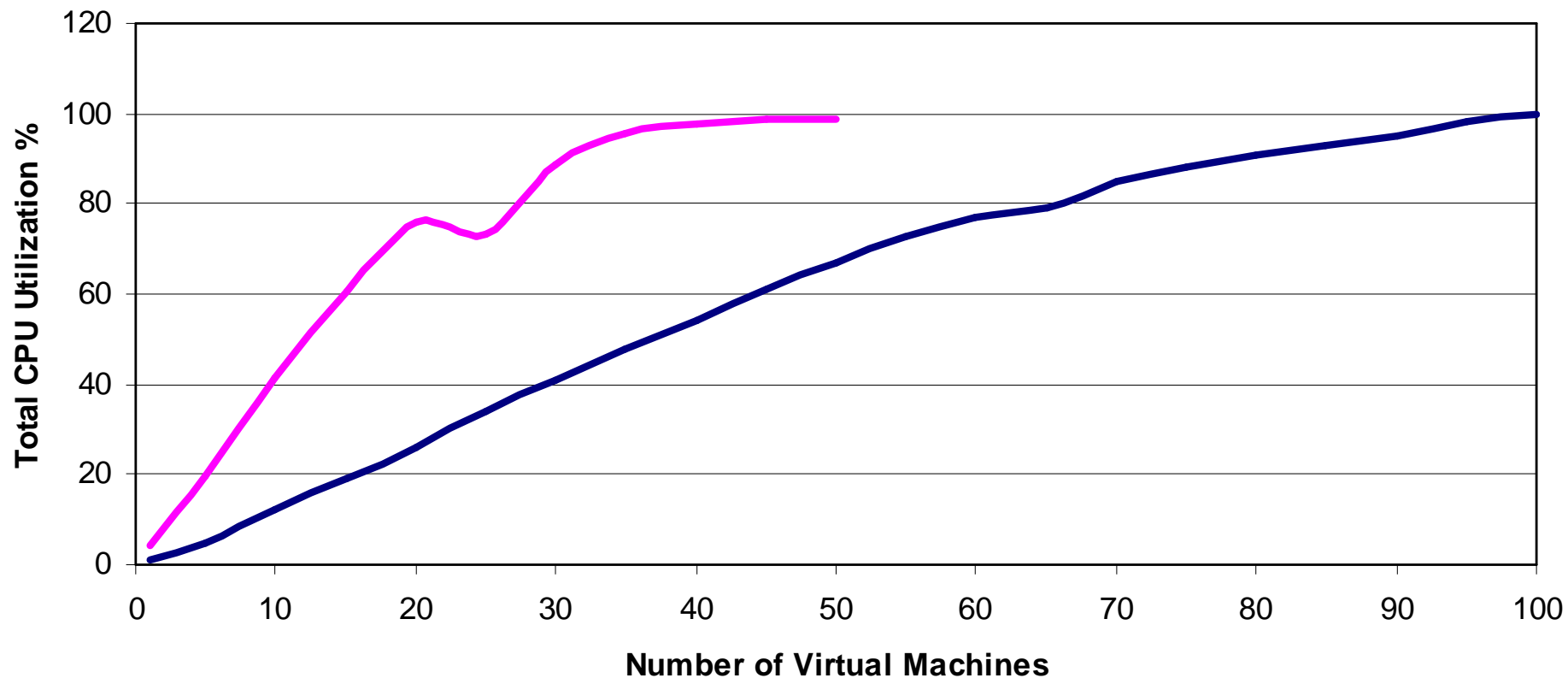
# Utilization Comparison

**Standalone Server**

CPU: 5%  
 TP: 4.53 trans/sec  
 RT: .22 sec  
 TT: .18 sec

## Utilization Comparison

— z/VM — x86 Hypervisor



# Service management in the enterprise

*Enabling quality service delivery and business innovation*



**Visibility:**  
*See your  
Business*

***Respond faster and  
make better decisions***



**Control:**  
*Manage your  
Business*

***Manage risk and  
compliance***

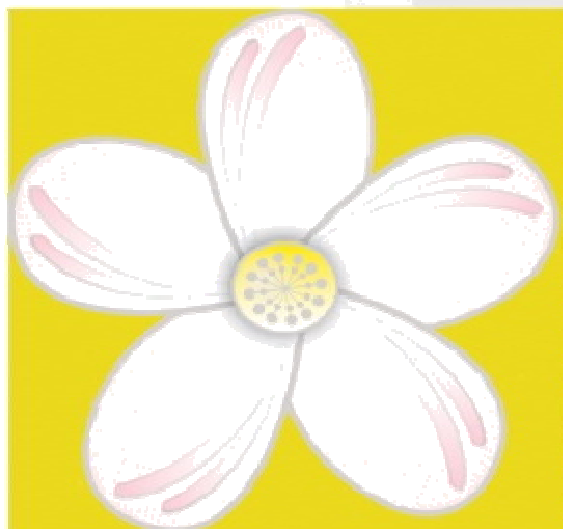


**Automation:**  
*Improve your  
Business*

***Lower costs and  
build agility***

# Success Story at

DI COMPETENZA



DAISY-NET

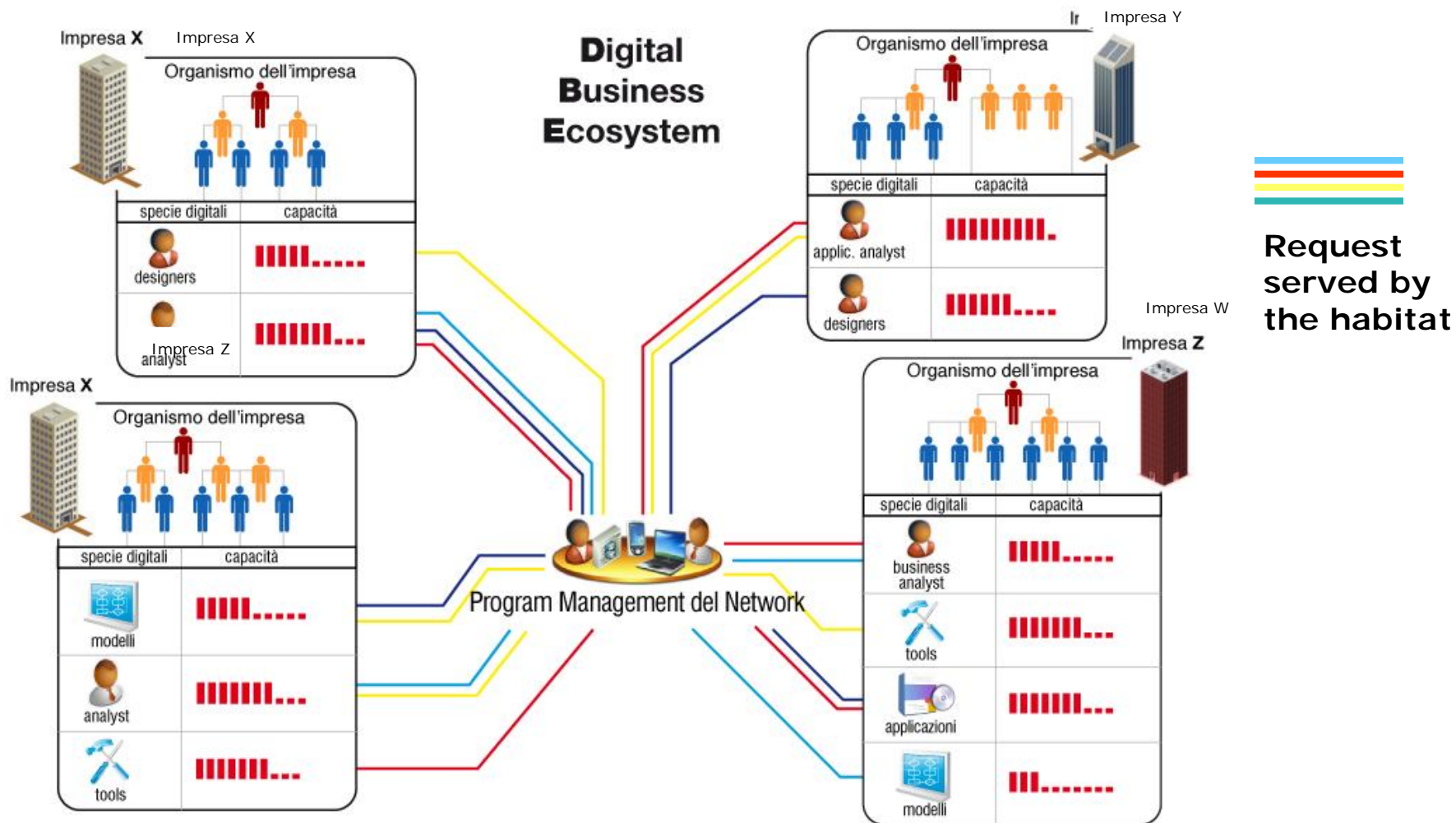
## Who is the customer: Status and Company structure

- **Status: cooperative no profit association**
- **Apulian Node of the competency center ICT-SUD, launched with a government funding**
- **Members:**
  - All public universities of Apulia
  - About 40 private companies ICT services provider or ICT services consumer

### Industry Development goal

- Innovative organizational paradigm: **Digital Business Ecosystem** (DBE)

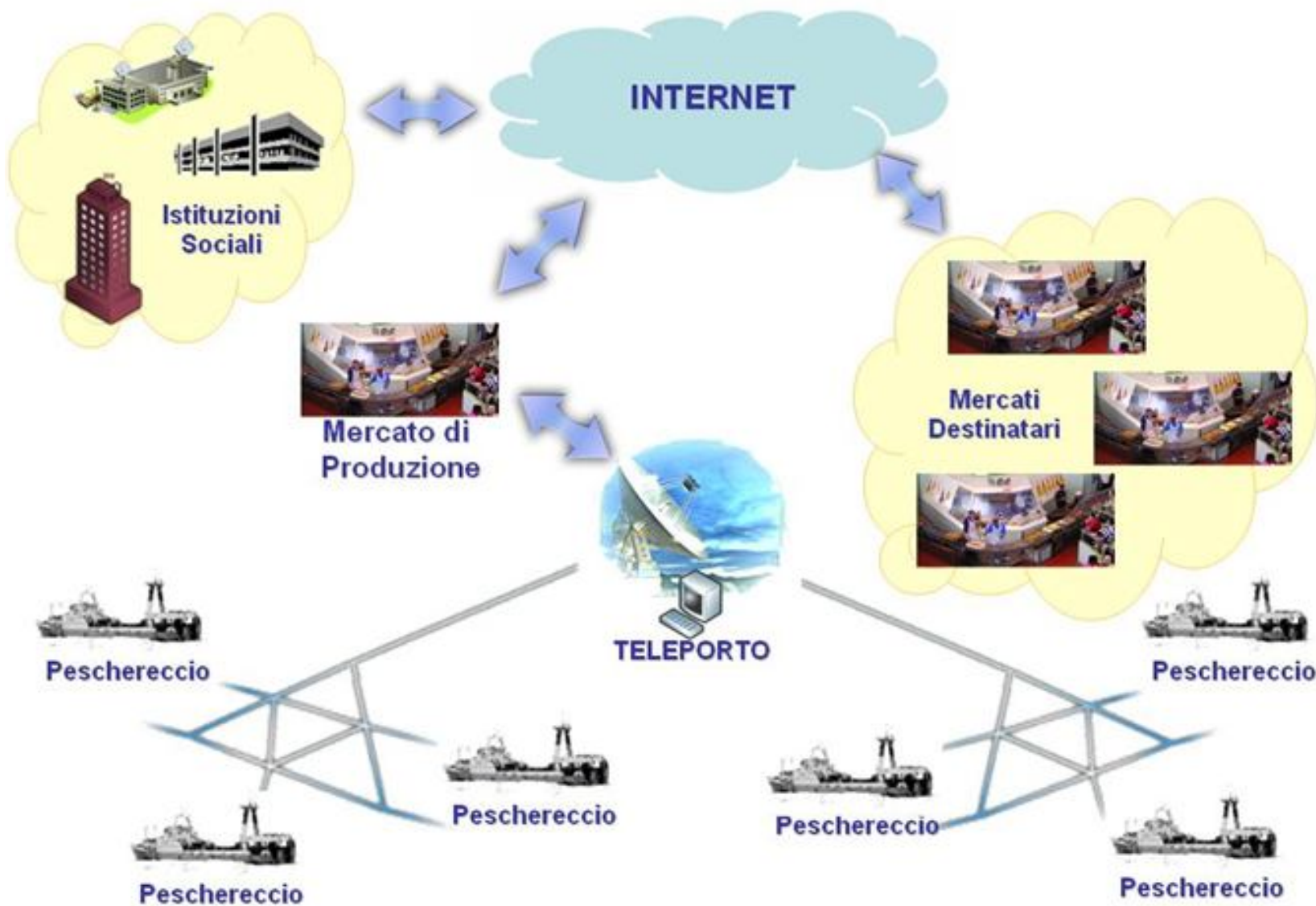
# Digital Business Ecosystem



## DBE in the Production System ...

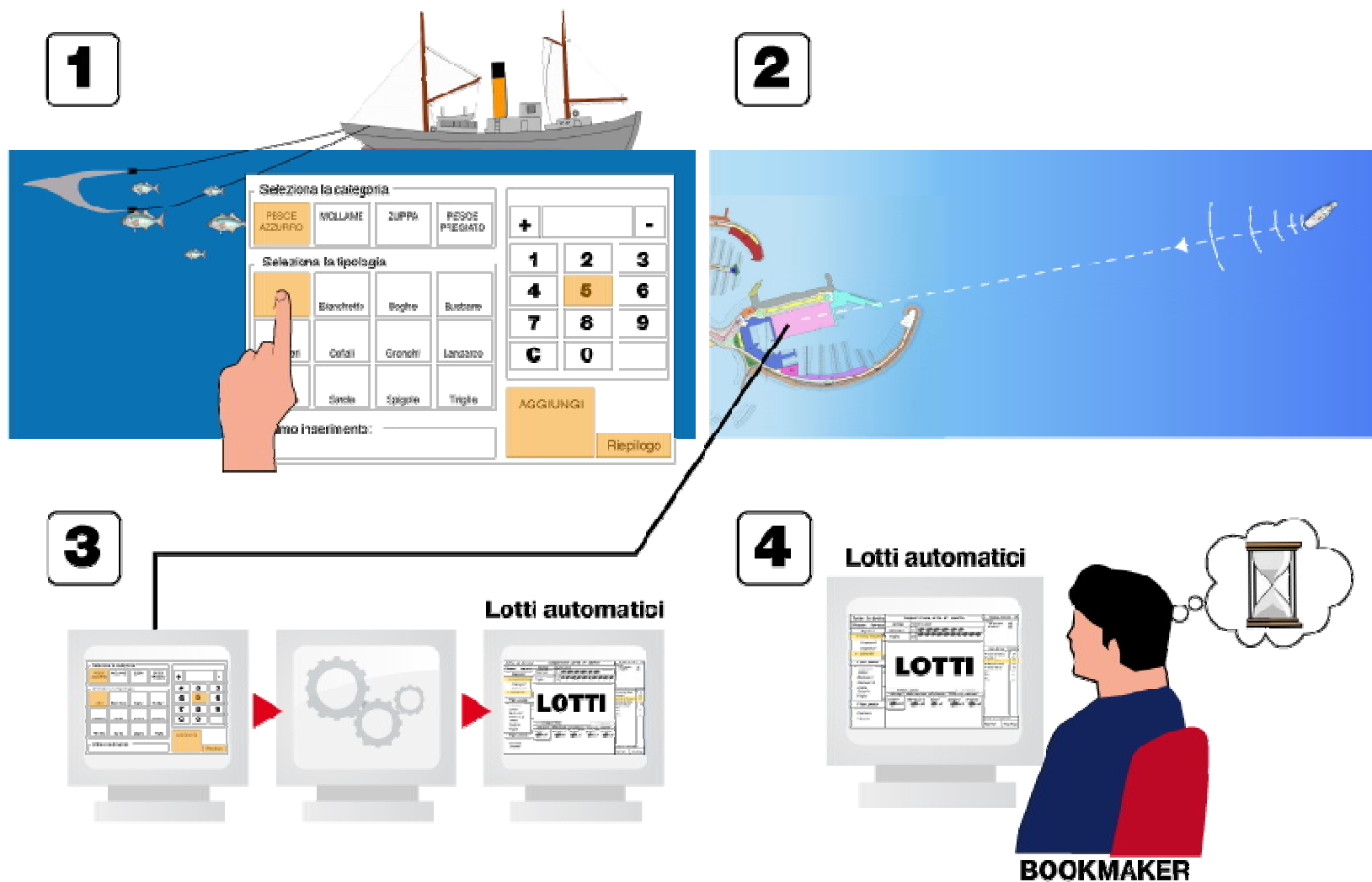
- **Digital Business Ecosystem** is the group of organizations belonging to a community
  
- **The digital species are:**
  - Software components
  - Software applications
  - Telco device
  - Business process
  - Educations courses
  - Skills

# “Smart Fish project” General Overview

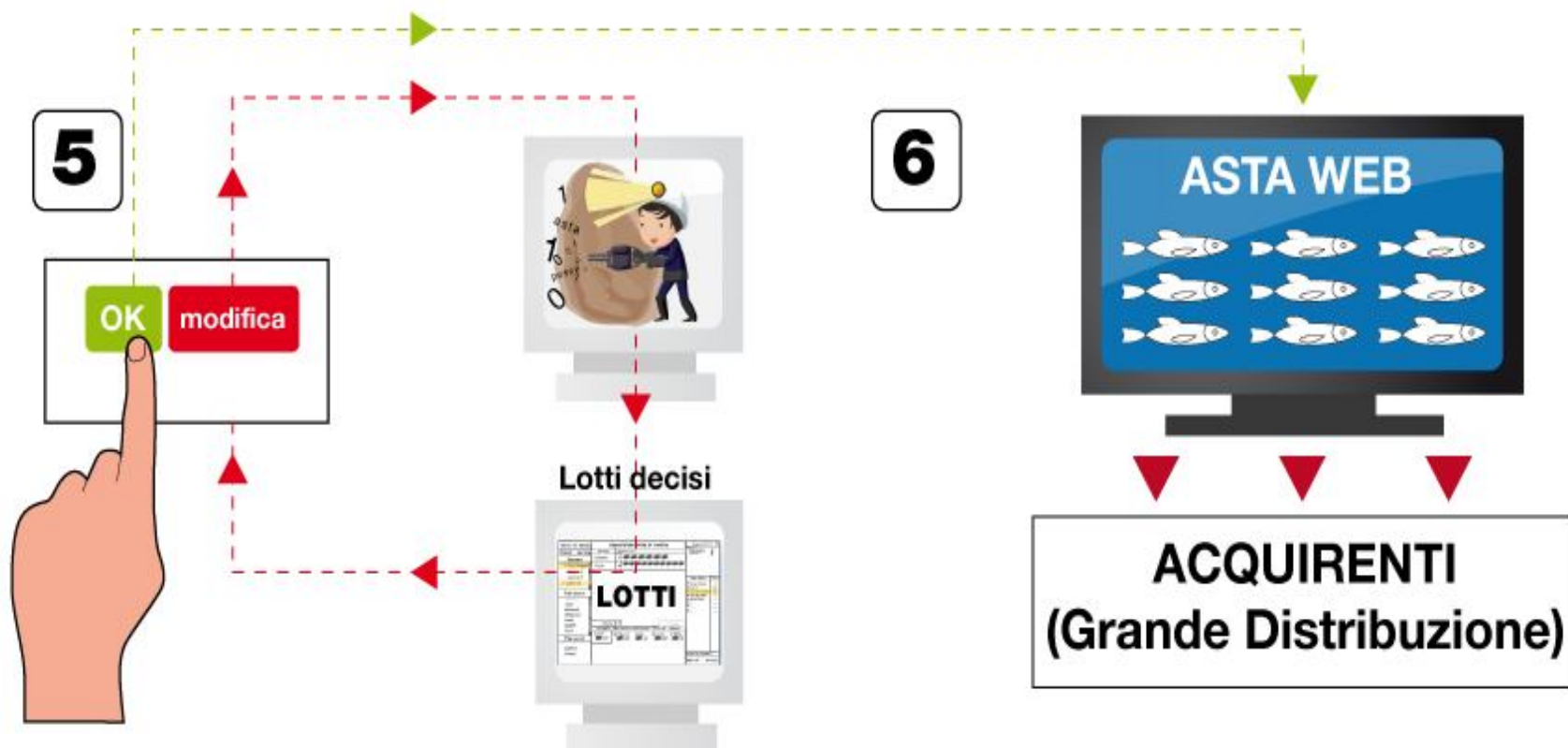




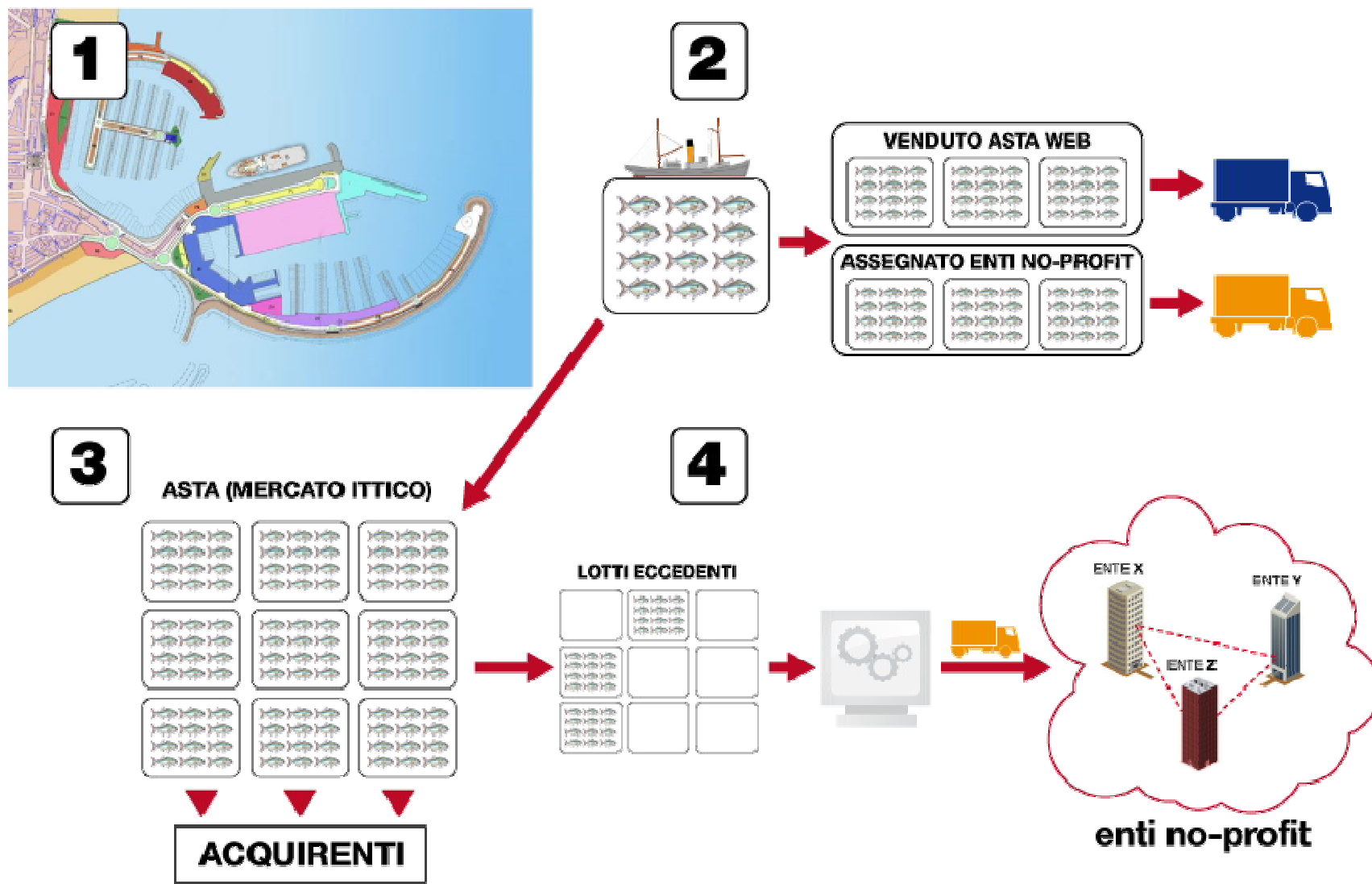
# Scenario #1: virtual auction



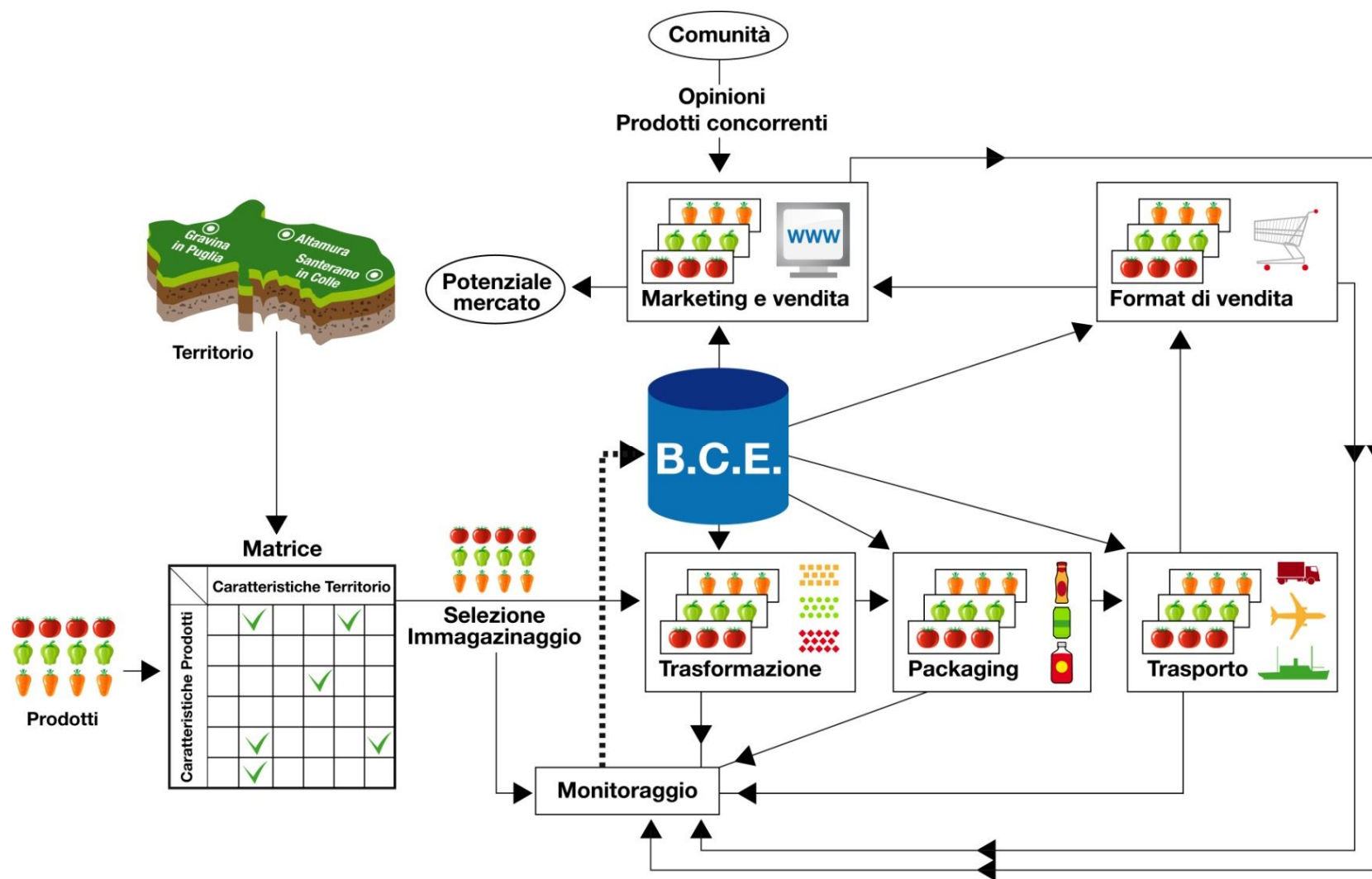
# Scenario #1: virtual auction



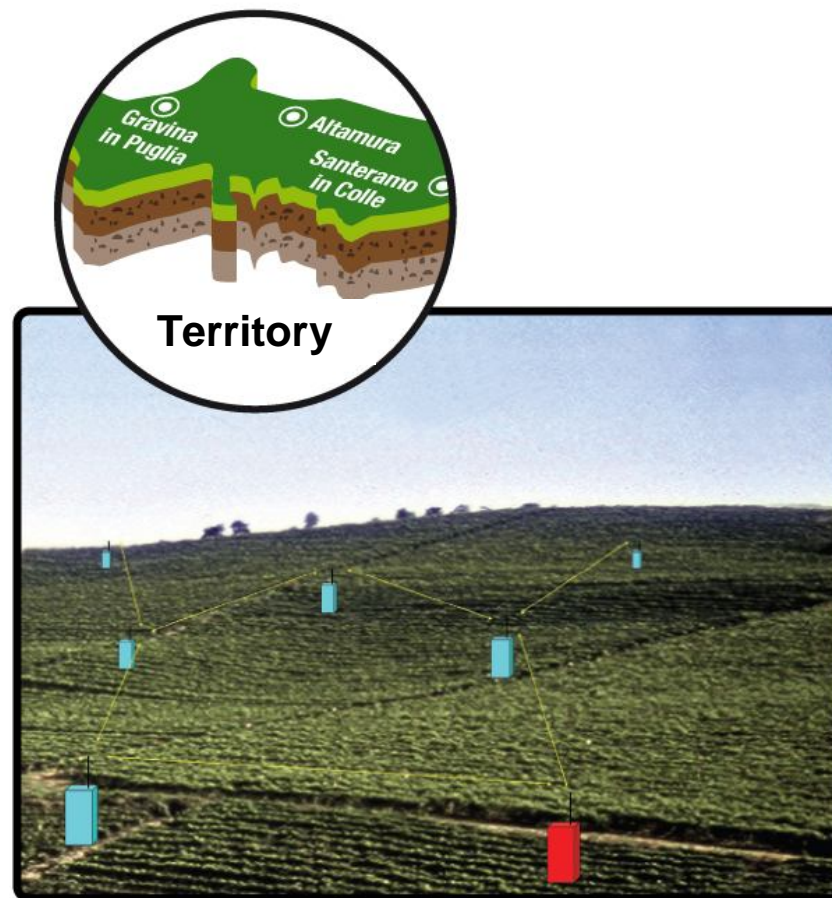
# Scenario #2: real auction



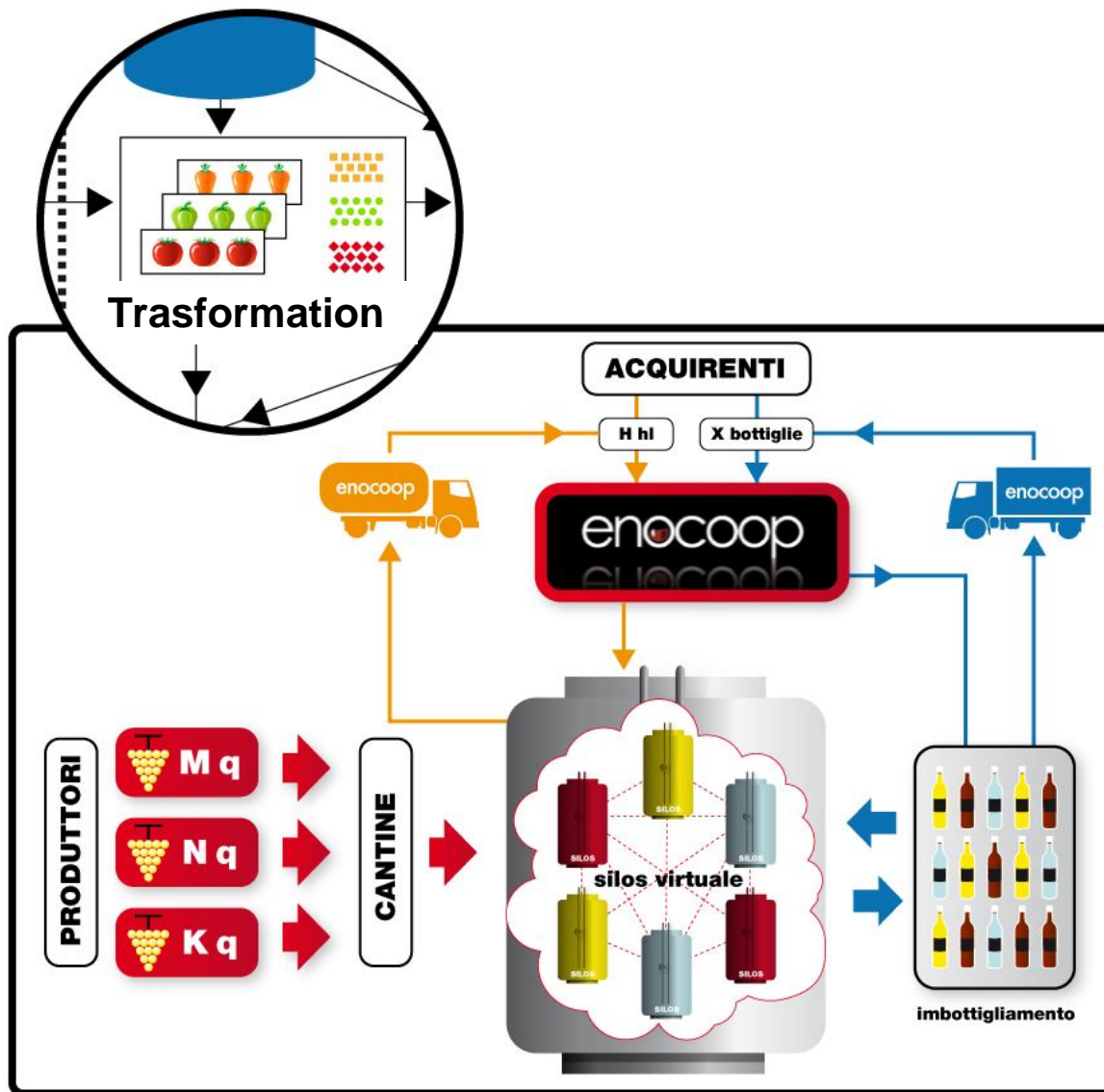
# “Monica project” General Overview



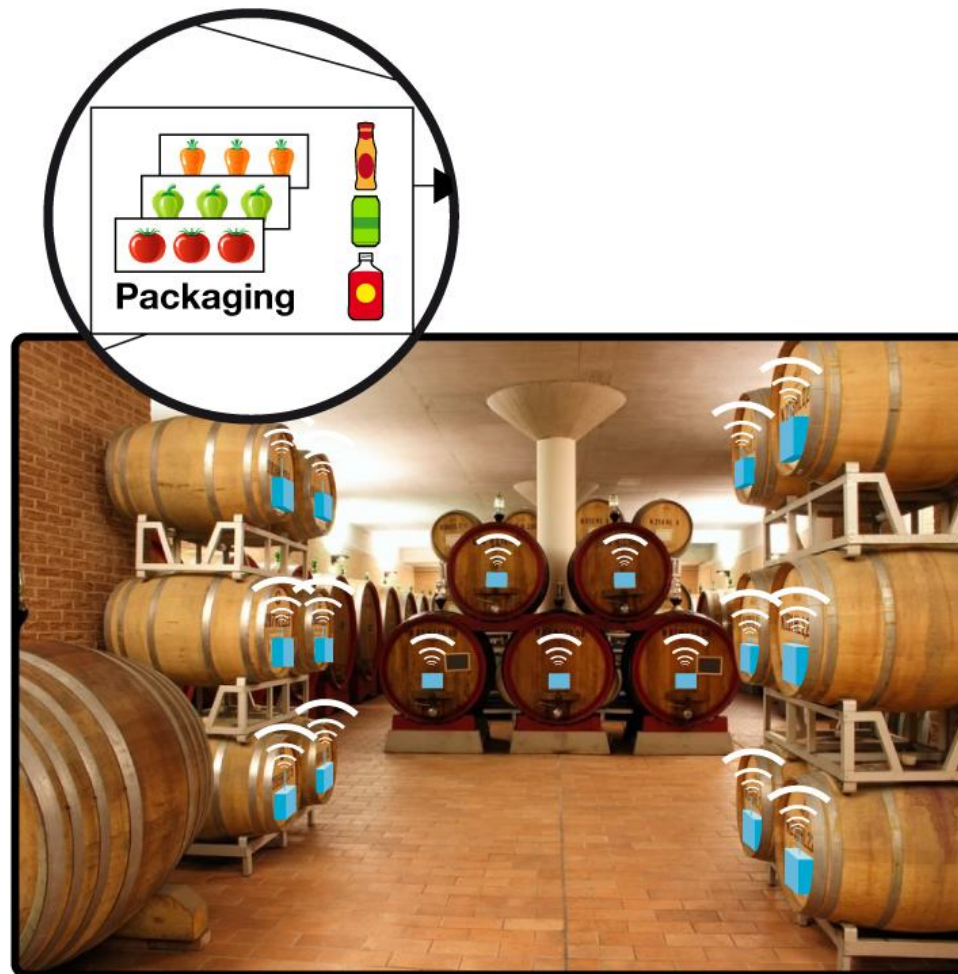
## RFID in the fields



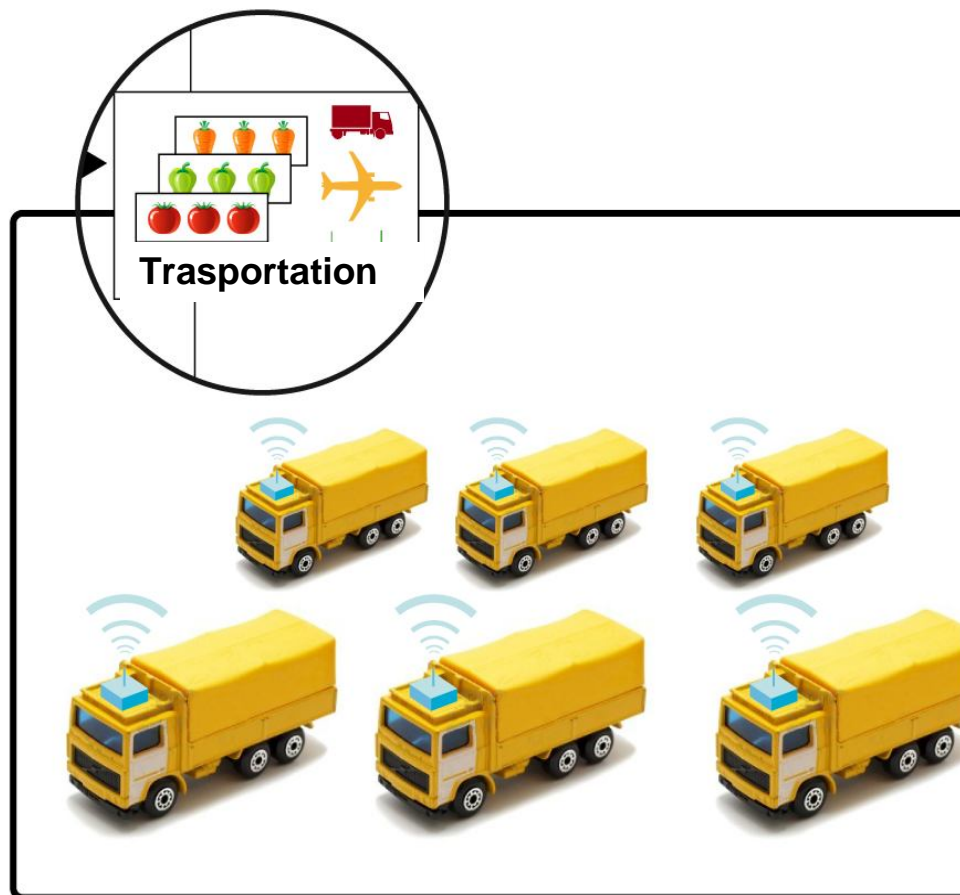
# Trasformation process: ENOCOOP



## Packaging and warehouse materials check

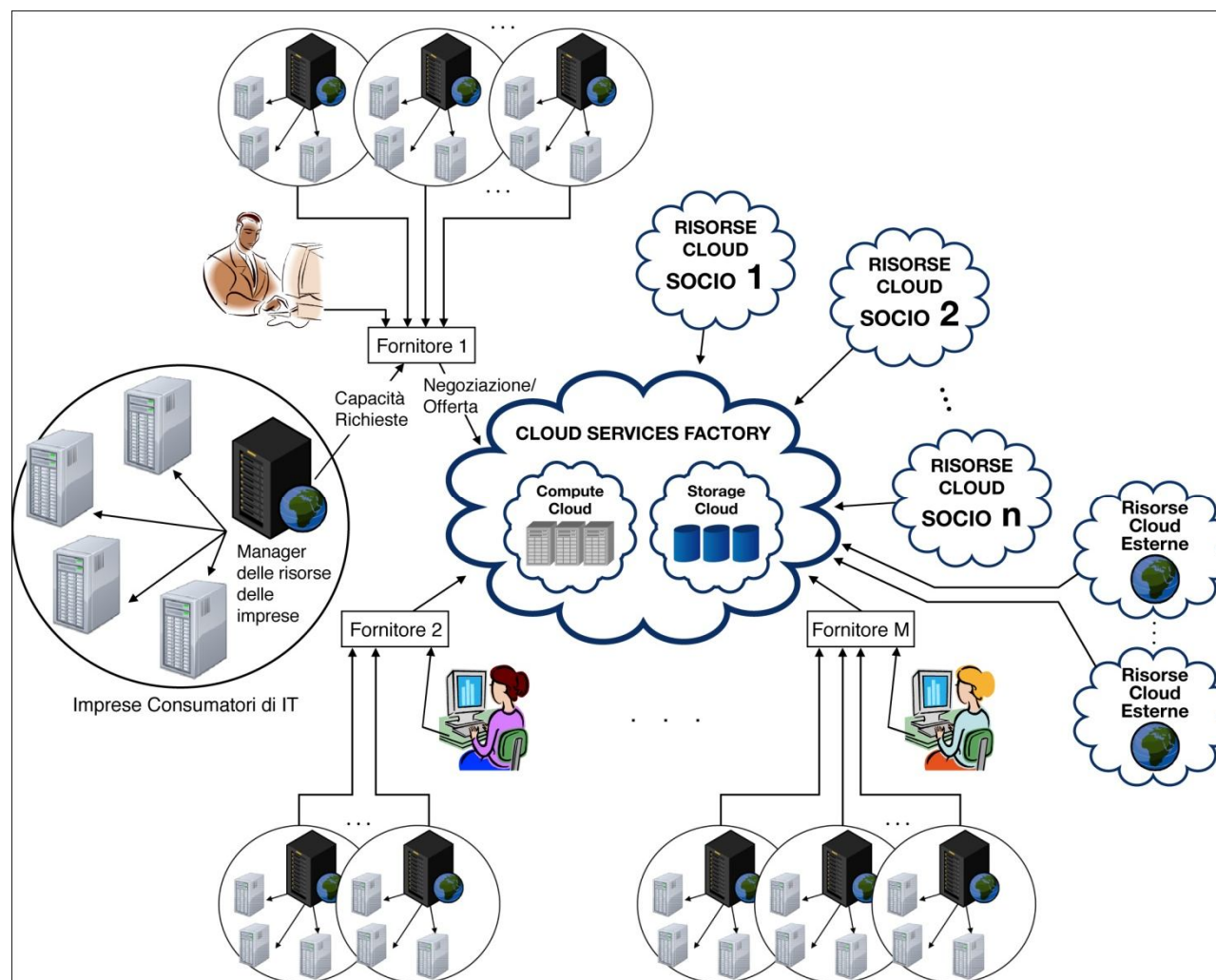


# RFID in the transportation





# Customer choiced Cloud Computing for the DBE



## Why Cloud Computing on System z according with the customer

- **Cooperation.** Provide cooperation between enterprises, systems, people from different cultures and different company or community size
- **Mobility.** People and Systems in communication can move from site to another in the world without any problems, they have only to be in Internet
- **Flexibility.** The needed IT infrastructure can change based on need
- **Skill Sharing.** The complexity and level of technology is transparent to the final user.
- **Sustainability.** The IT infrastructure costs are sustainable by every company of any size since are based on the usage of the IT resource utilized.
- **On demand:** Software as a Service (SaaS) on demand and Infrastructure as a Service (IaaS)

## What provides **Visibility, Control and Automation**

- Tivoli Services Automation Manager
- TSAM WAS component
- Tivoli OMEGAMON
- Tivoli Monitoring for Virtual server
- z/VM
- Linux
- 2 IFL
- Memory
- Network card



# Solution Edition for Cloud Computing

*A service automation and management framework for System z*

**Creates...**

**That delivers ...**

Solution Edition for Cloud Computing

An infrastructure solution for cloud computing built on Tivoli® & System z

The framework to migrate workloads for rapid adoption of cloud computing benefits

## IBM software

**Tivoli software**

**Visibility**      **Control**      **Automation**

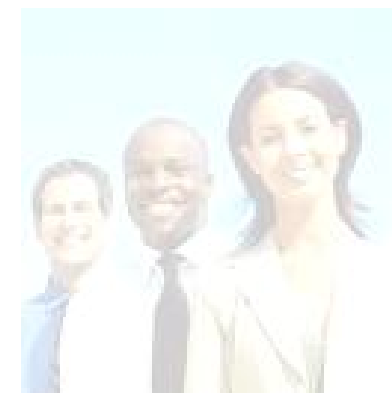
## IBM hardware

*Centralize, Virtualize & Simplify*

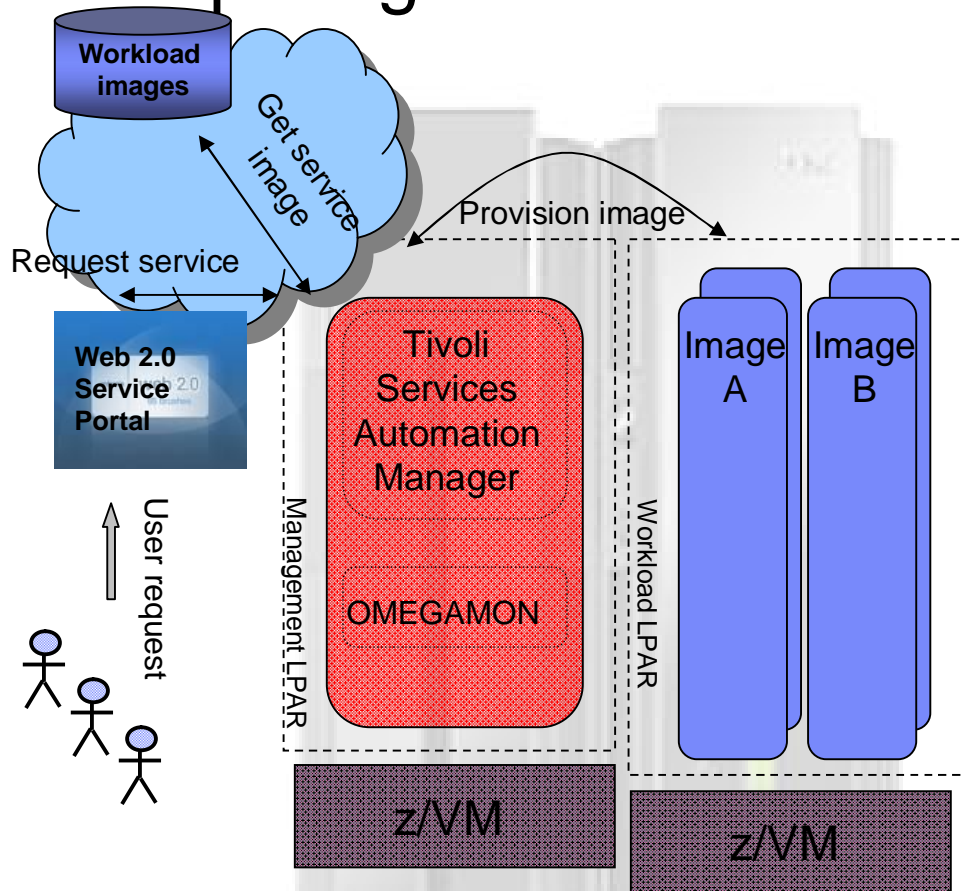


## IBM Services

- Create an awareness of cloud computing deployment opportunities within the enterprise
- Educate the corporation on cloud computing use cases and management scenarios
- Implement the service automation and management tooling to support cloud workloads



# An architecture of the Solution Edition for Cloud Computing



- **Management LPAR provides a “managed from” infrastructure, consisting of Linux (SUSE) guests running TSAM and OMEGAMON**
  - Rapid automation and services lifecycle management for z/VM based Linux cloud services
- **Workload LPAR provides the “managed to” environment, supporting the customer defined cloud images**
  - Supports Linux (SUSE & Redhat) and z/OS® workloads support under z/VM
  - A sample workload is provided

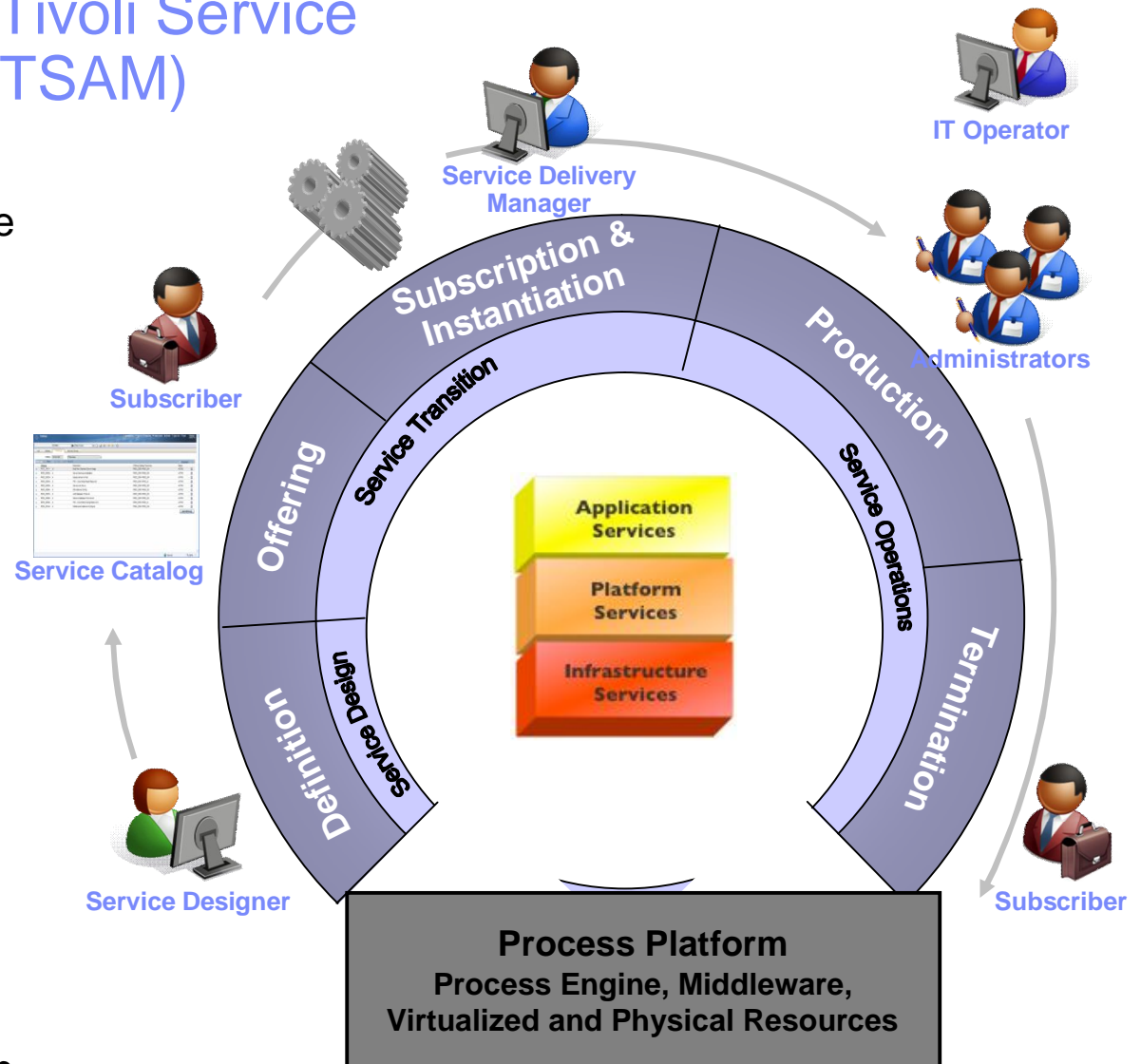
# Supporting cloud with Tivoli Service Automation Manager (TSAM)

## Approach:

- Expose IT services to service consumers
- Managed roll-out of cloud services

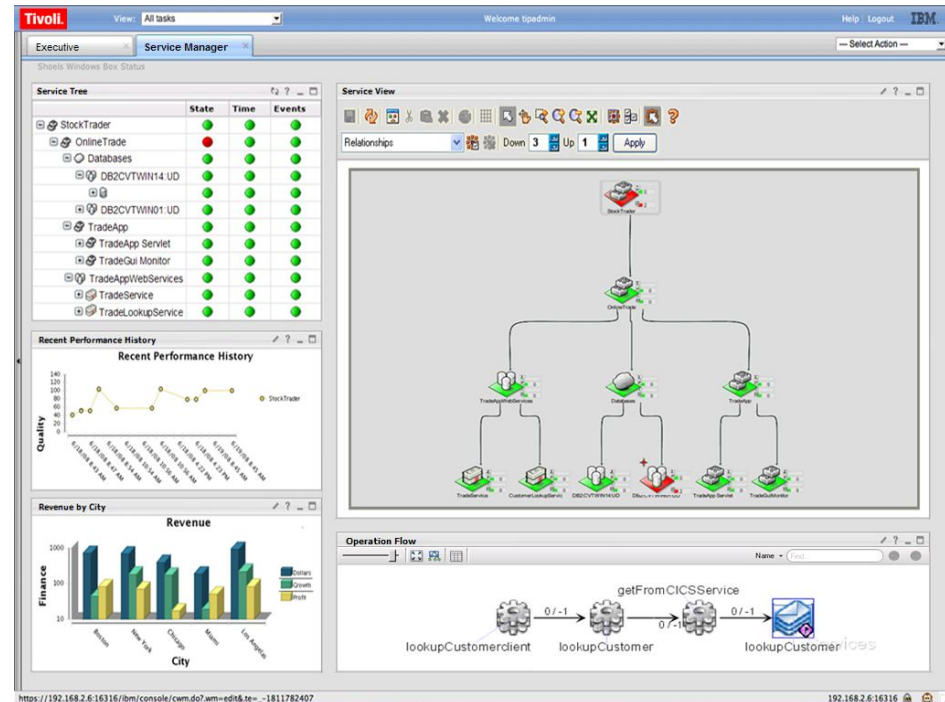
## Capabilities:

- Leverages existing management of virtualized infrastructure
- Definition of service
- Specialized interfaces for service consumers
- Service catalog publishing
- Integrated service request management
- Reservation management
- Application on-boarding
- Provides service consumption data to Tivoli Usage Accounting Manager for chargeback



# What's next? – the evolution to business service management

- **Customer visited the Rome Tivoli Lab on June 3<sup>o</sup> and Business Services Management solution have been demoed**
- **Interest in extending Cloud Computing to distributed windows server**
- **Interest in acquiring Tivoli Omnibus for event management**
- **Need ITUAM for accounting/chargeback**
- **Interest in evolving versus the business management to monitor SLA and KPI**



# IBM Solution Edition for Cloud Computing

*A framework for delivering cloud computing solutions on System z*

**Delivers a service automation management infrastructure for cloud computing on System z**

- Quicker time to value - IBM services creates the private cloud framework on System z at the customer location and provides user training
- Easier implementation - cloud computing management software from Tivoli for automating and maintaining workloads in a cloud
- Greater efficiency - System z with z/VM & Linux provide the foundation to centralize, standardize & virtualize cloud computing workloads

## ***Benefits:***

- **Faster ROI**
- **Self service access to mainframe assets**
- **Reduced operations and labor expenses**
- **Internet scale**
- **Rapid provisioning of workloads**
- **Enterprise qualities of service for cloud workloads**

**Learn more**

: <http://www.ibm.com/systems/z/solutions/editions/cloud/index.html>





**Thank you!**