

IBM System z Technology Summit



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

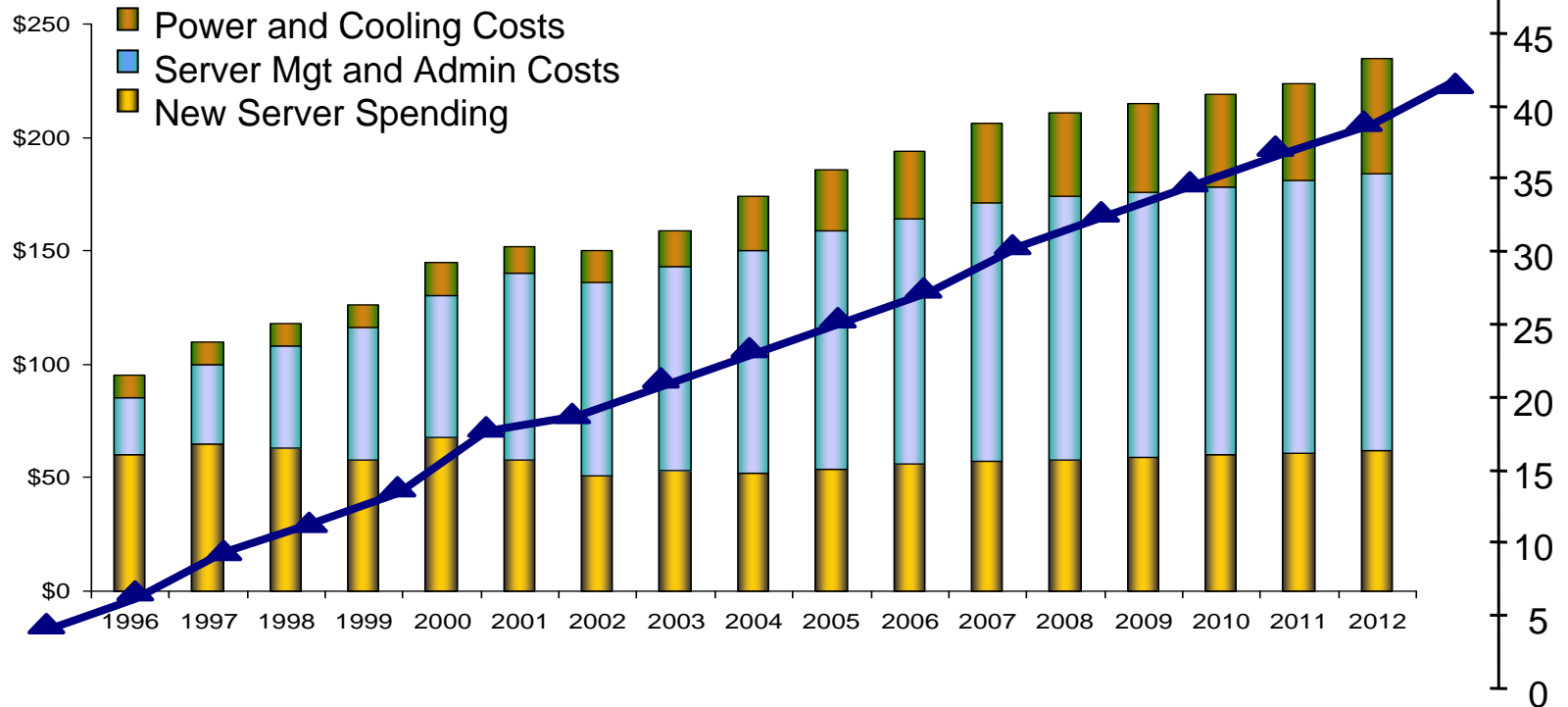


Annual Operating Costs Are Out Of Control

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

Spending
US\$(B)

Physical
Server Installed
Base (Millions)

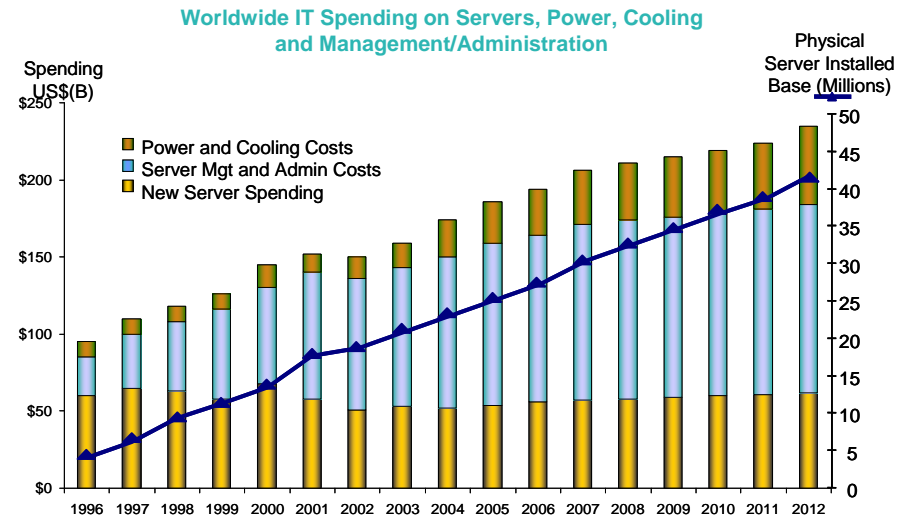


IDC, 2008

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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



IDC, 2008

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

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



Banking

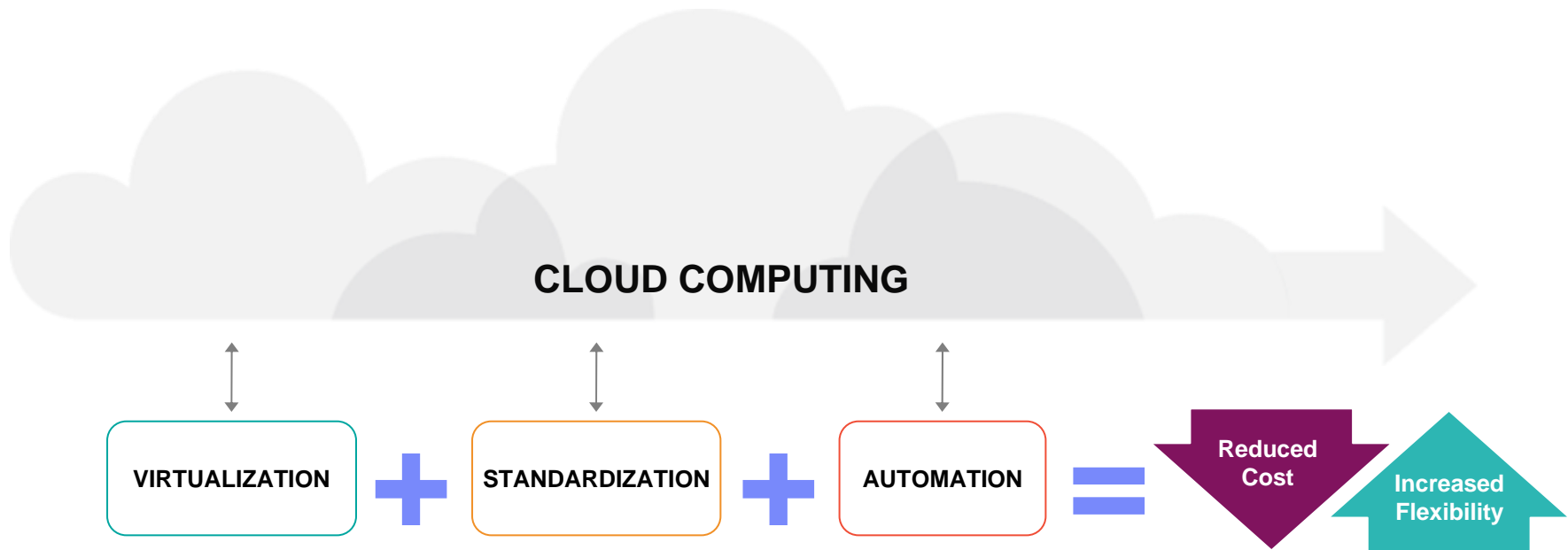


Retail



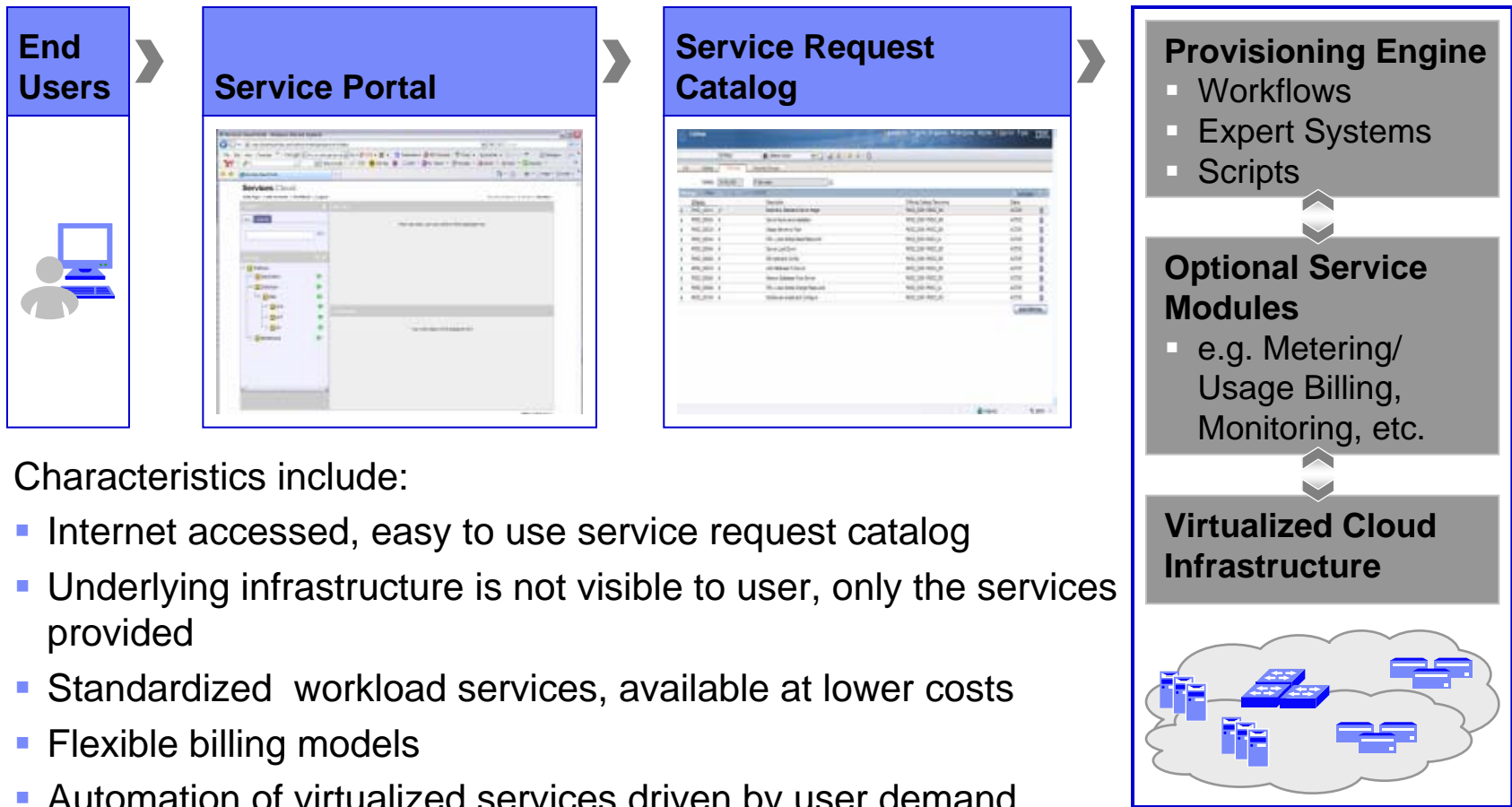
IT

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

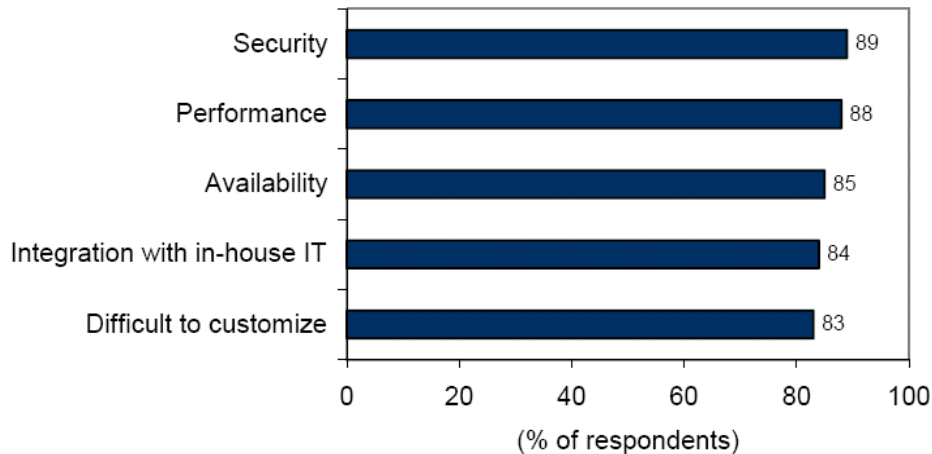
System z and private cloud computing

The right answer for the large enterprise

Enterprises must overcome obstacles to adopt cloud computing ...

...and System z can help.

Cloud Computing Implementation Challenges Described as "Significant"



Note: Multiple responses were allowed.

Source: IDC's Enterprise Panel, 2008



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

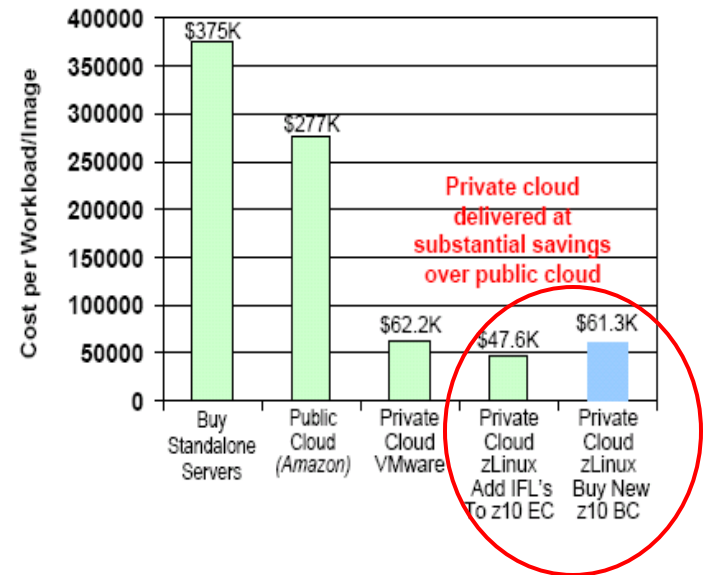
IBM's Project Big Green System z consolidation results in 60-75% gross cost savings (5 yr TCO)

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%

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)



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

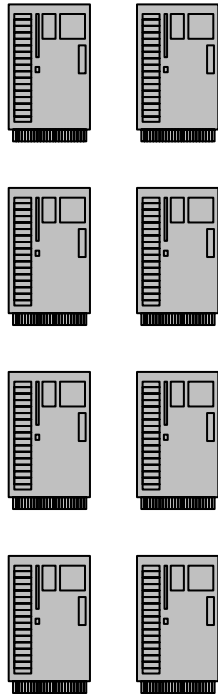


A Benchmark Comparison

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

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

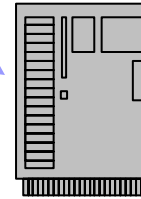
**Intel servers x366
4 cores @ 3.66 GHz
12 GB memory**



**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**

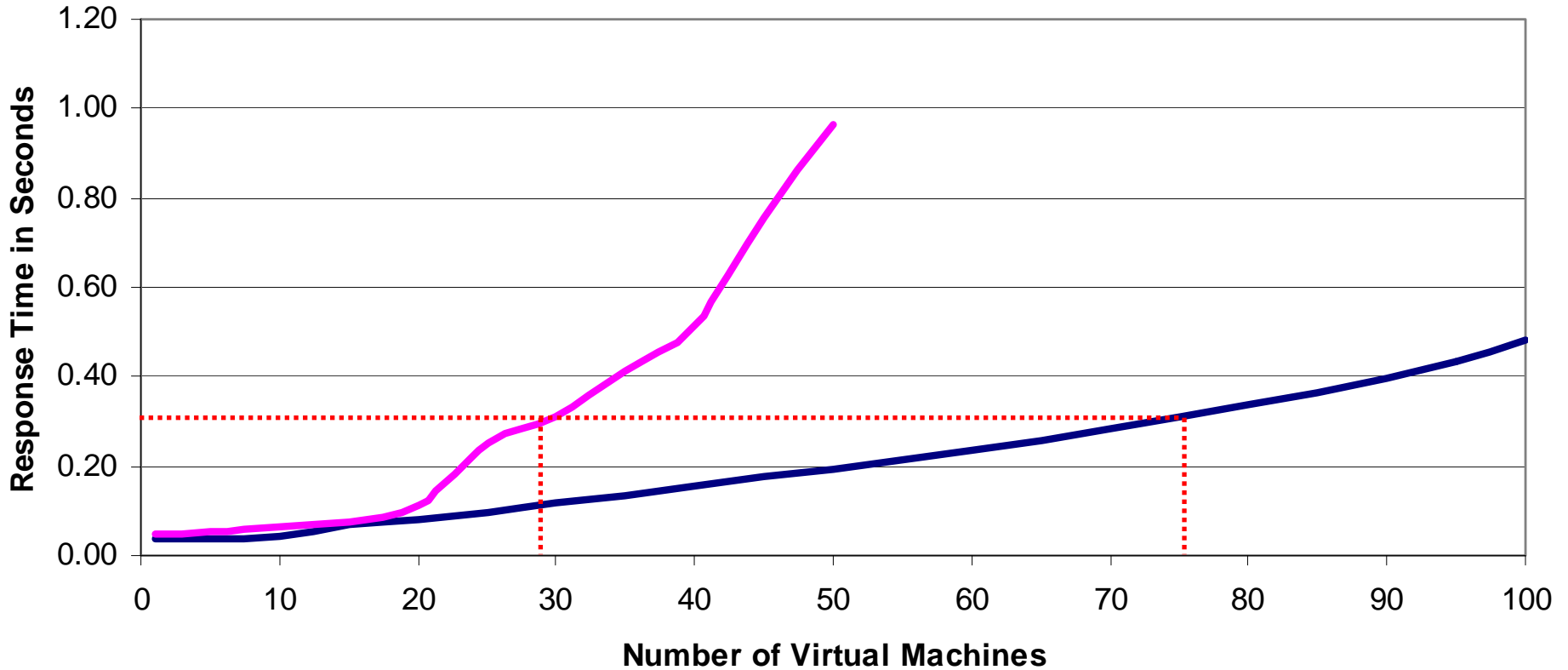
Response Time Comparison

Standalone Server

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

Response Time Comparison

— z/VM — x86 Hypervisor



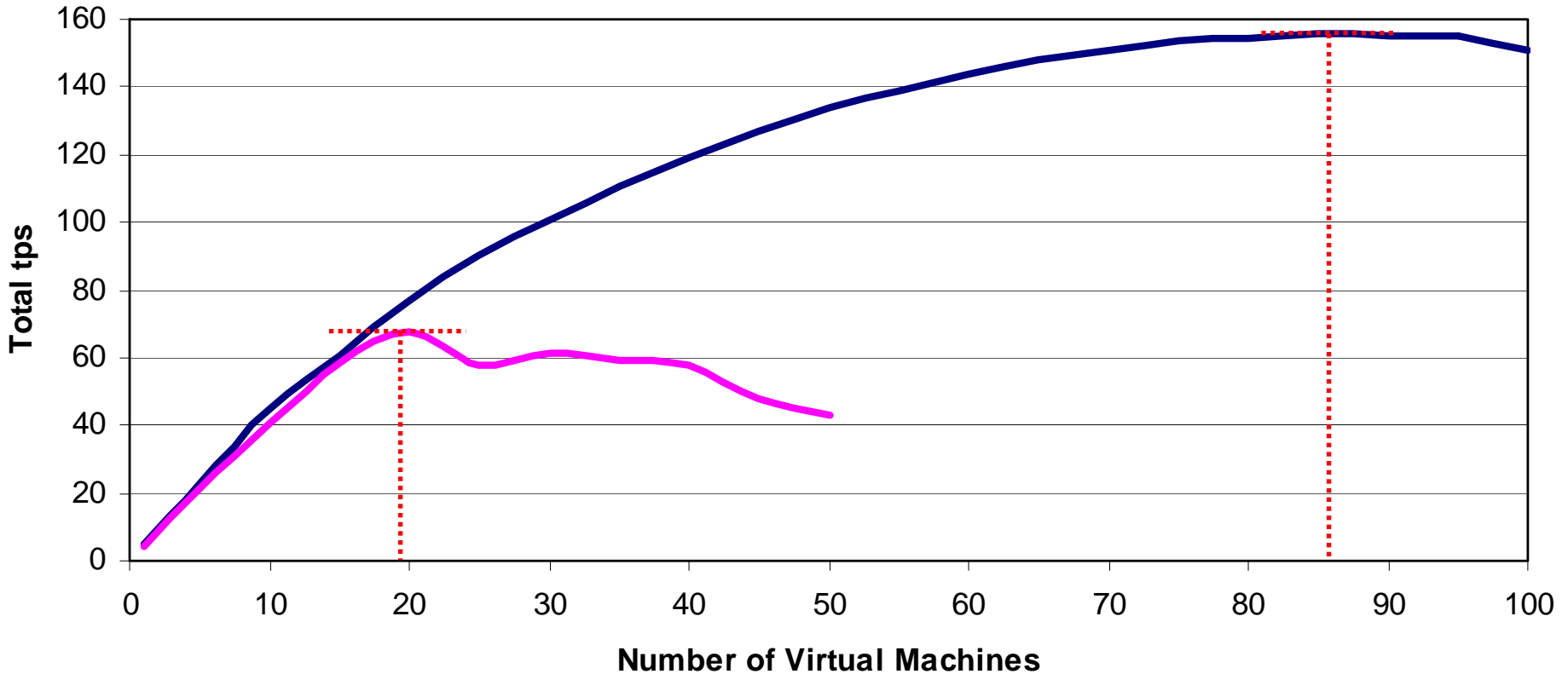
Throughput Comparison

Standalone Server

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

Throughput Comparison

— z/VM — x86 Hypervisor

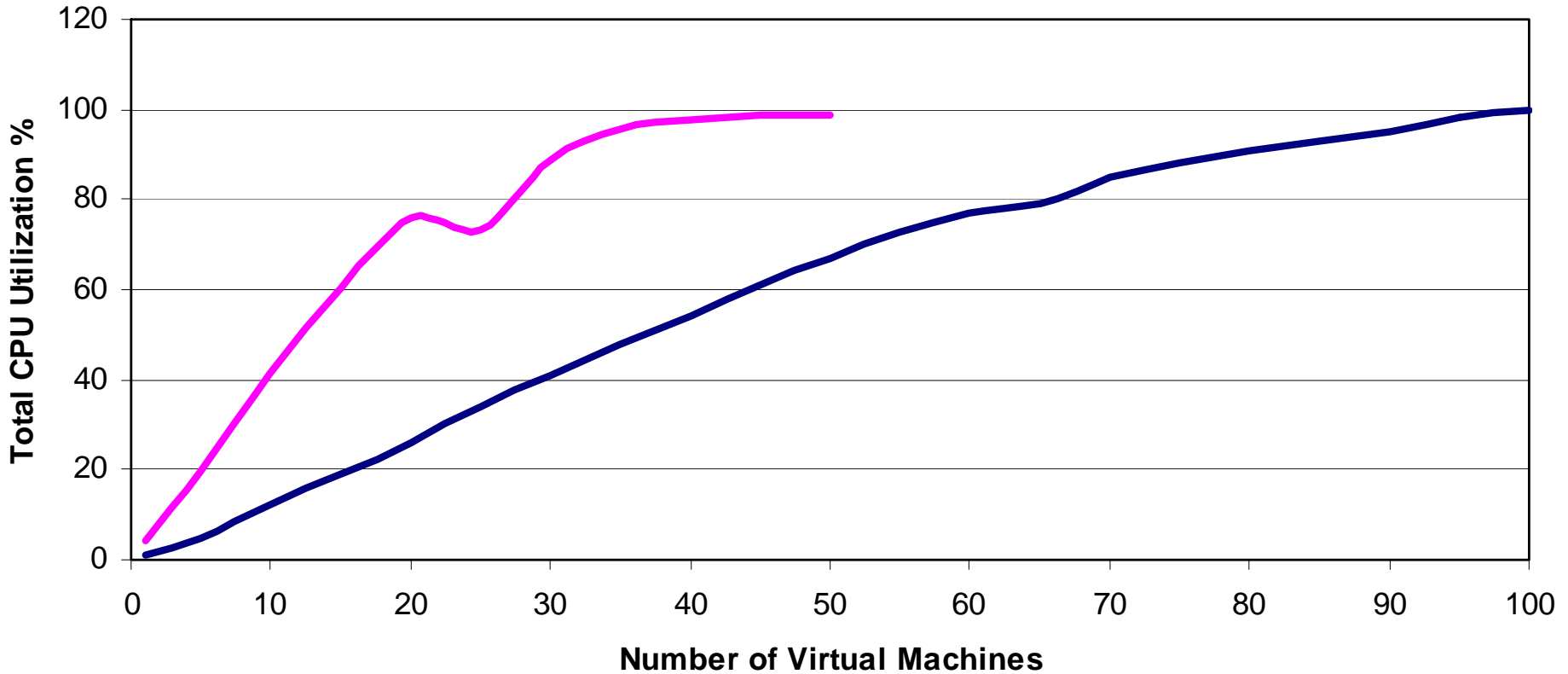


Utilization Comparison

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***

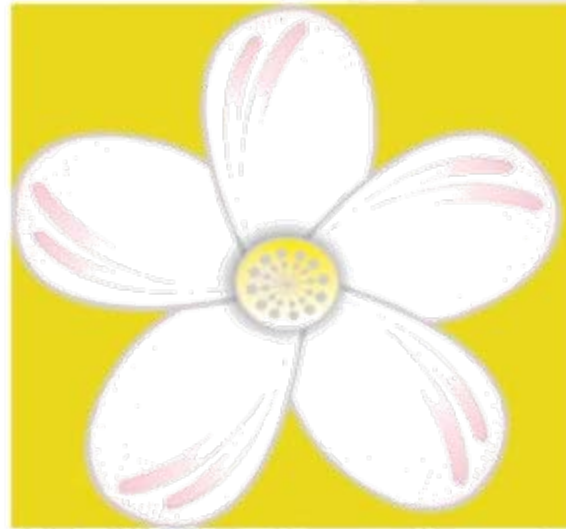


Automation:
*Improve your
Business*

***Lower costs and
build agility***

Success Story at

DI COMPETENZA



DAISY-NET

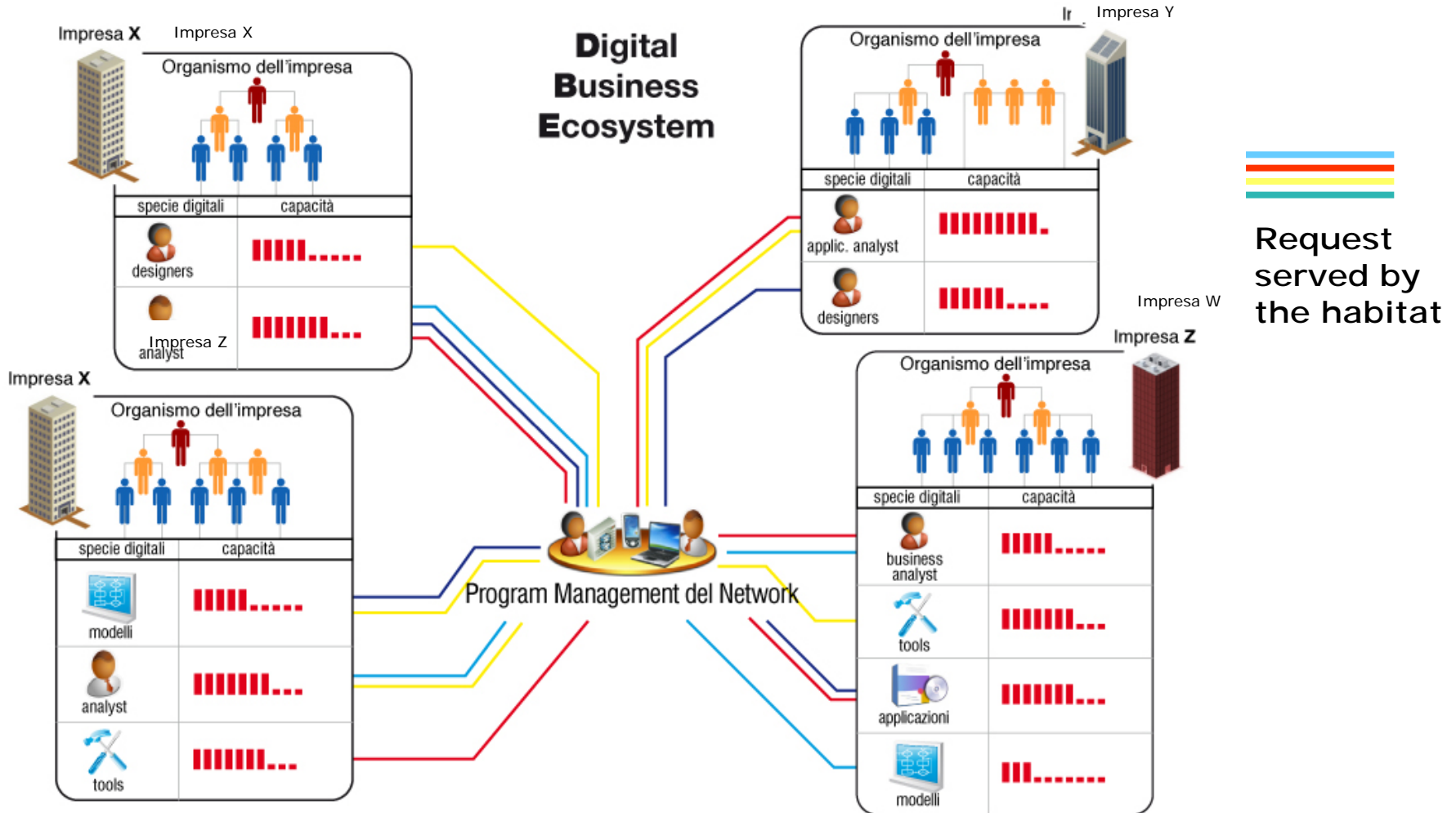
Who is the customer: Status and Company structure

- **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

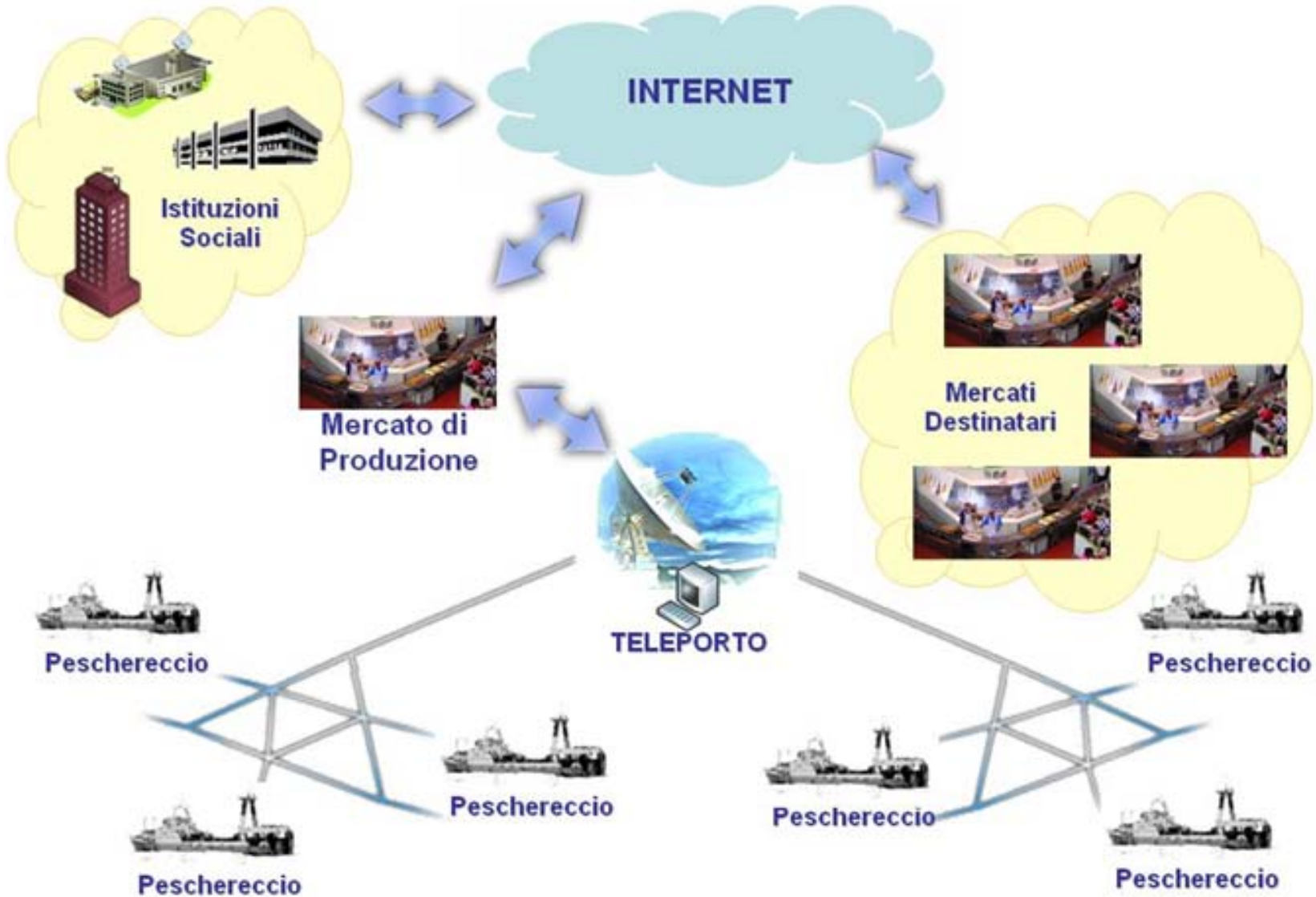


DBE in the Production System ...

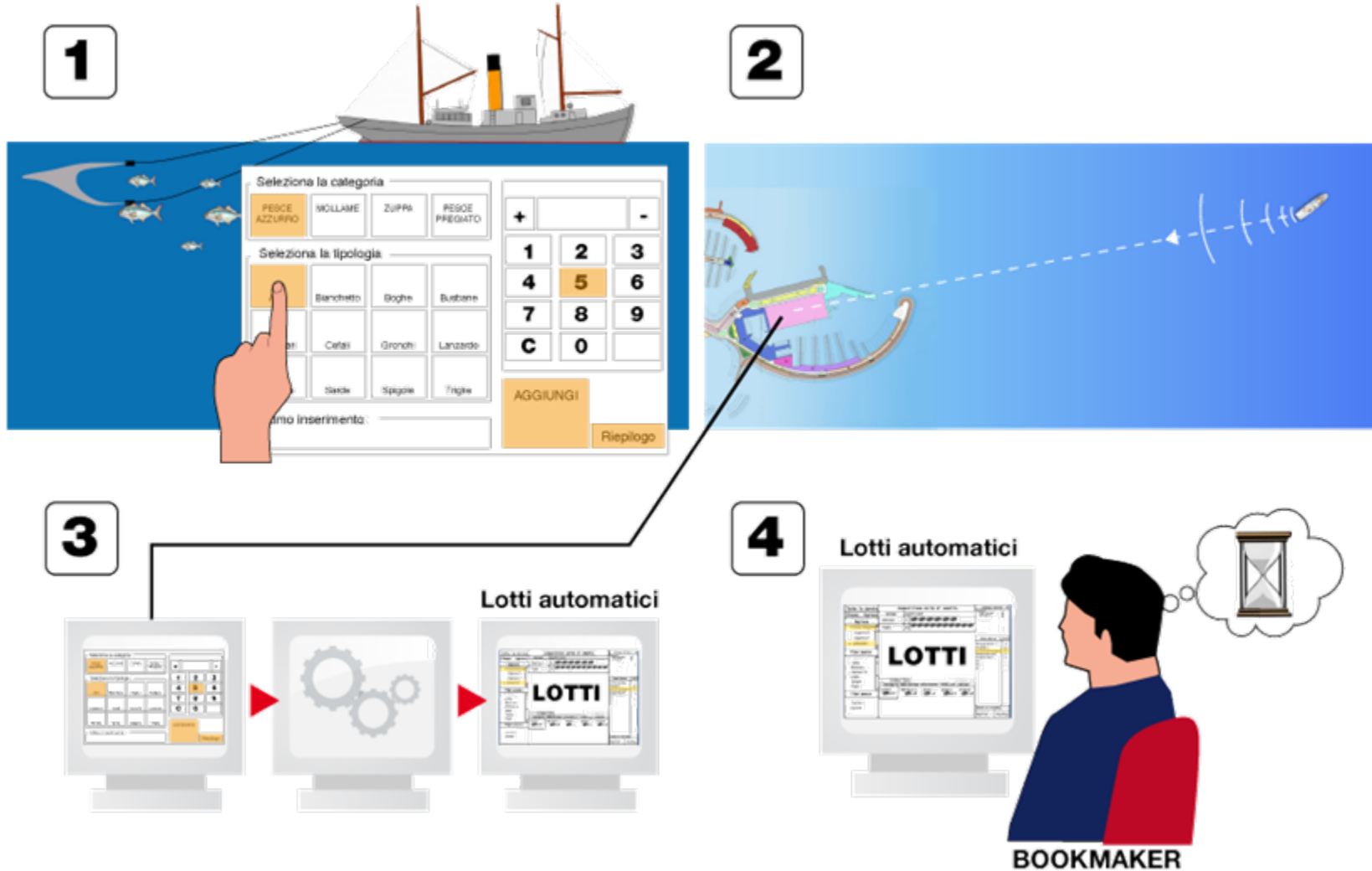
- **Digital Business Ecosystem** is the group of organizations belonging to a community

- **The digital species are:**
 - Software components
 - Software applications
 - Telco device
 - Business process
 - Educations courses
 - Skills

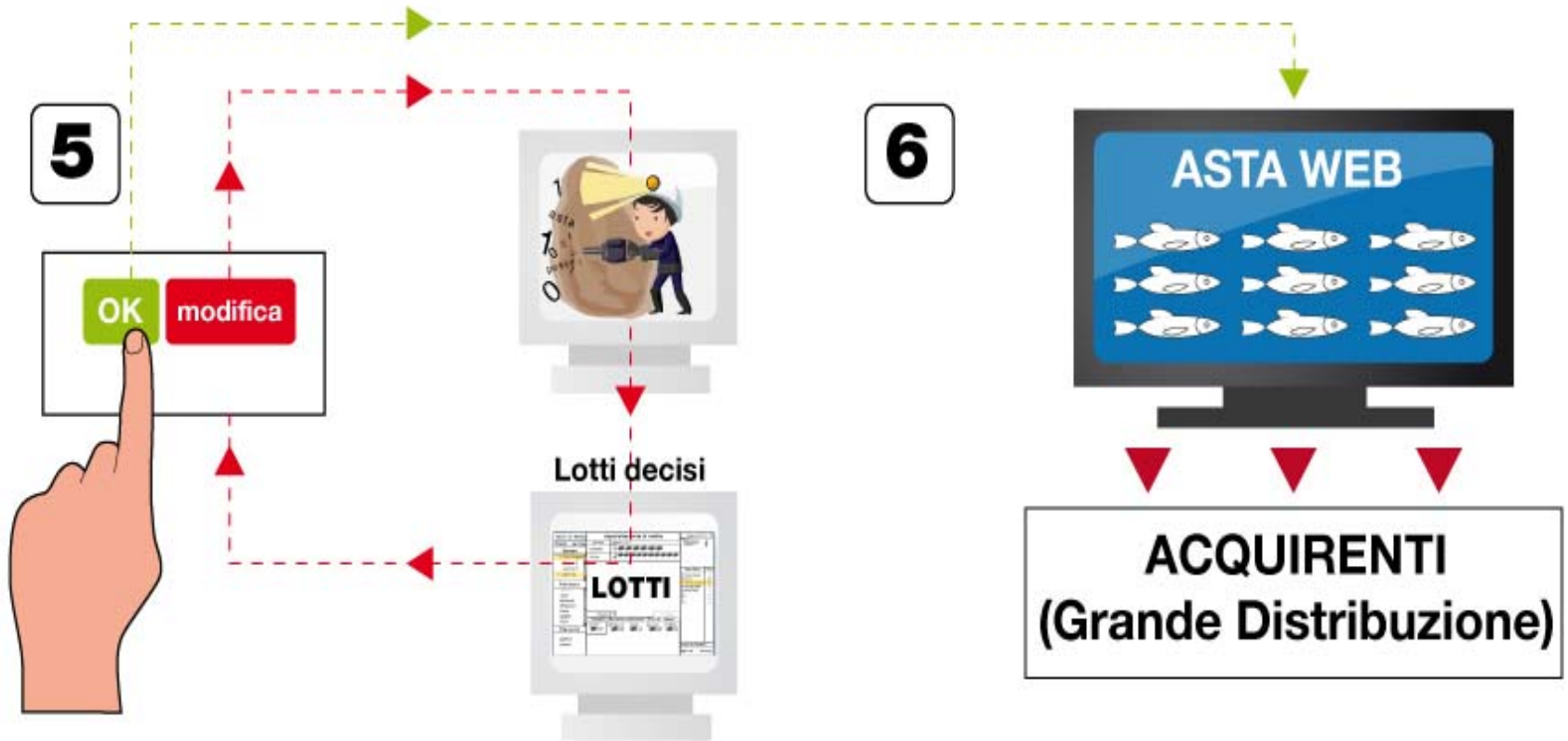
“Smart Fish project” General Overview



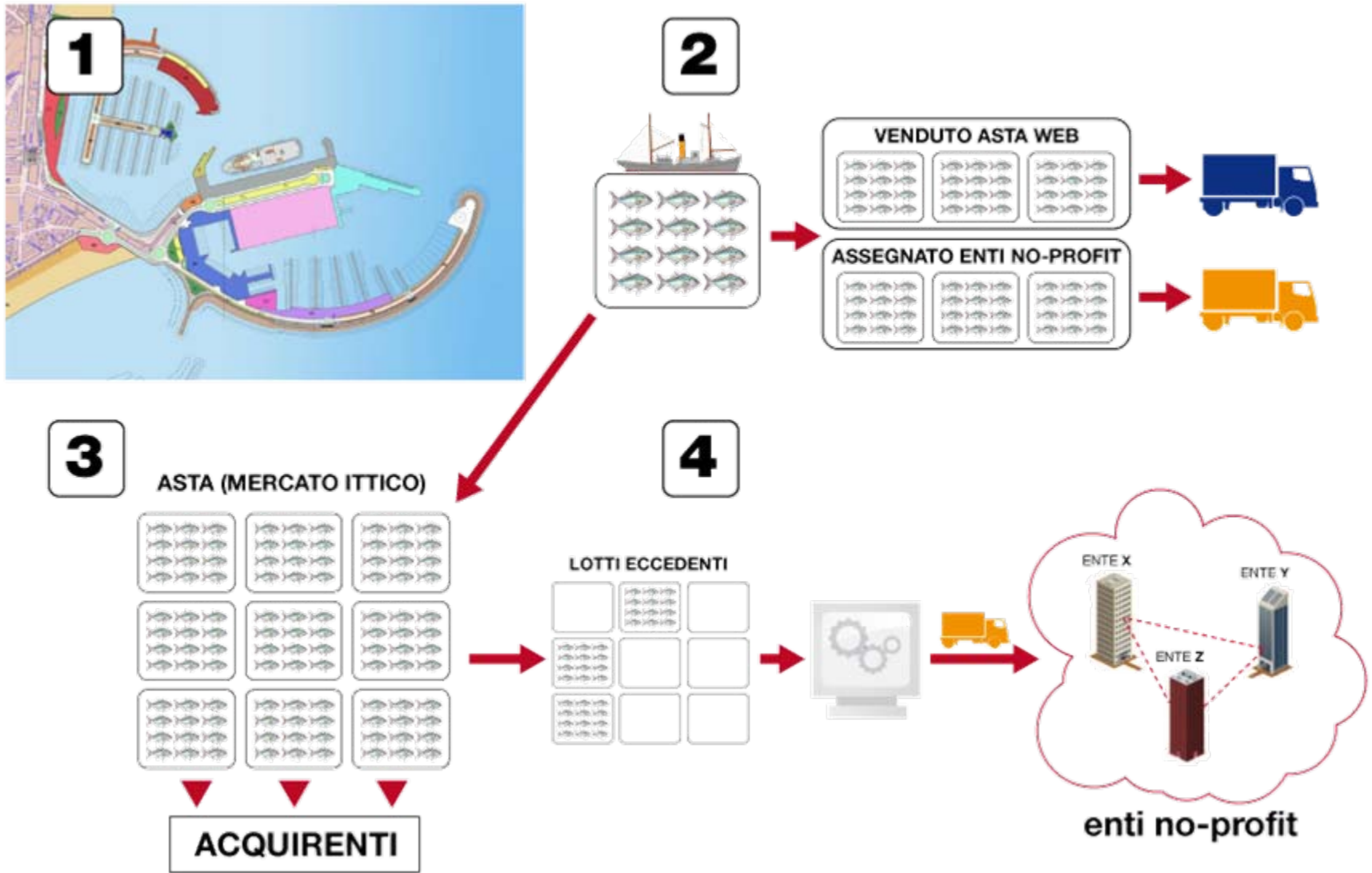
Scenario #1: virtual auction



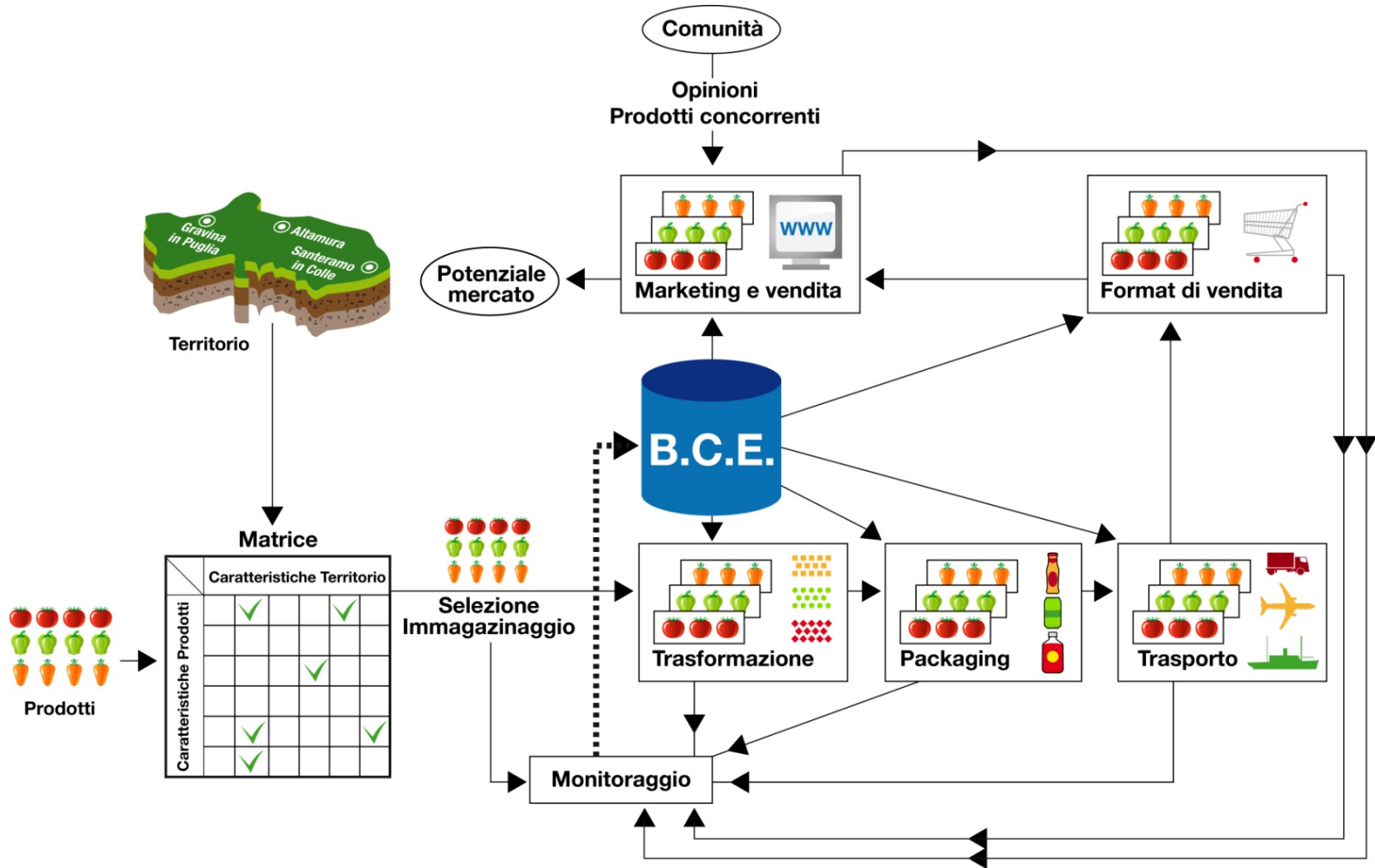
Scenario #1: virtual auction



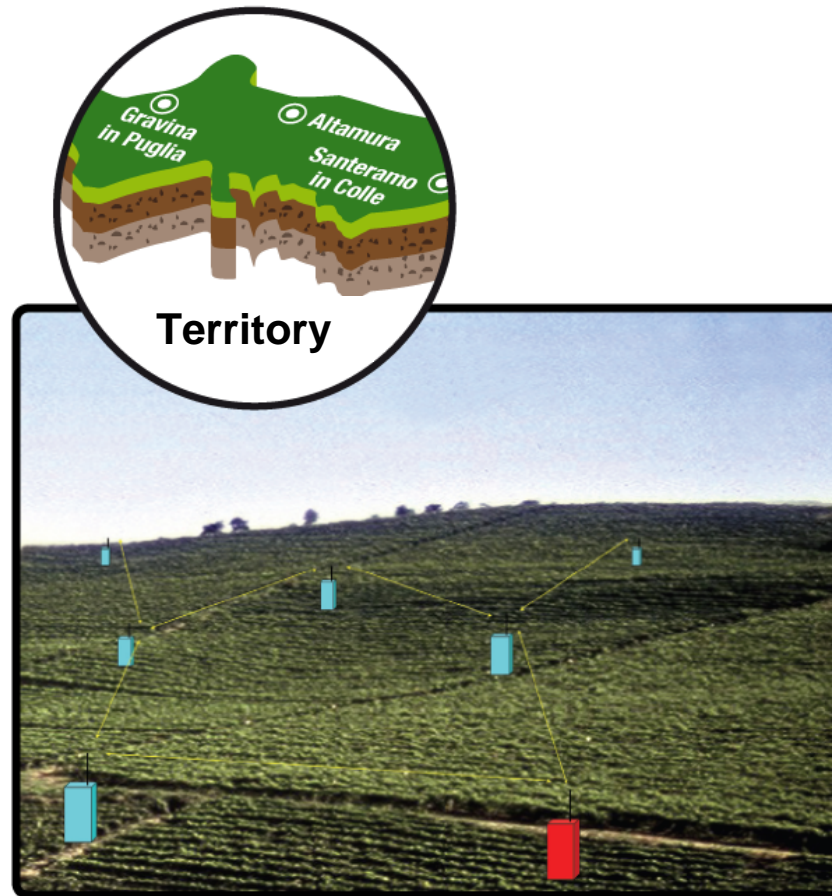
Scenario #2: real auction



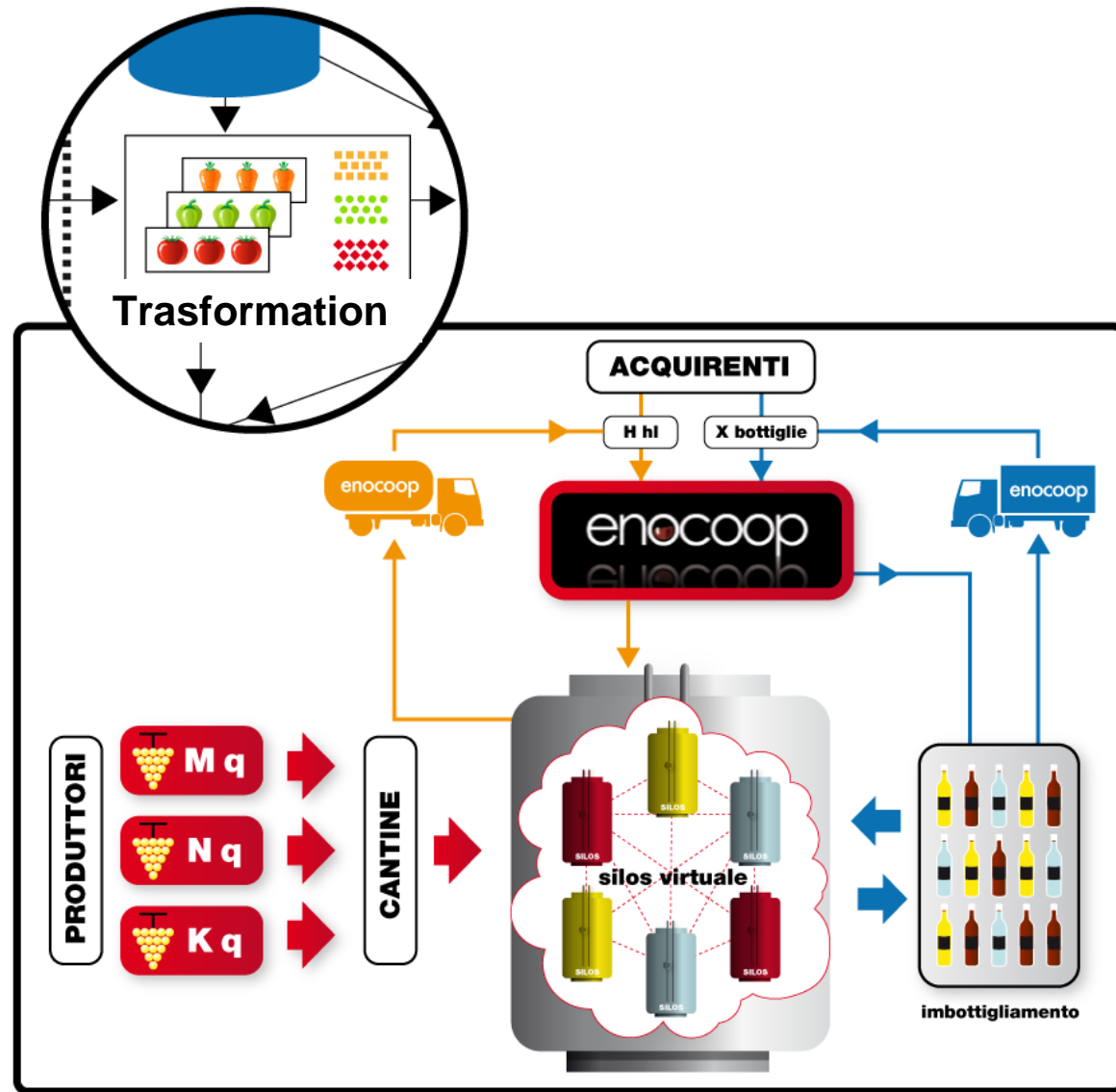
“Monica project” General Overview



RFID in the fields



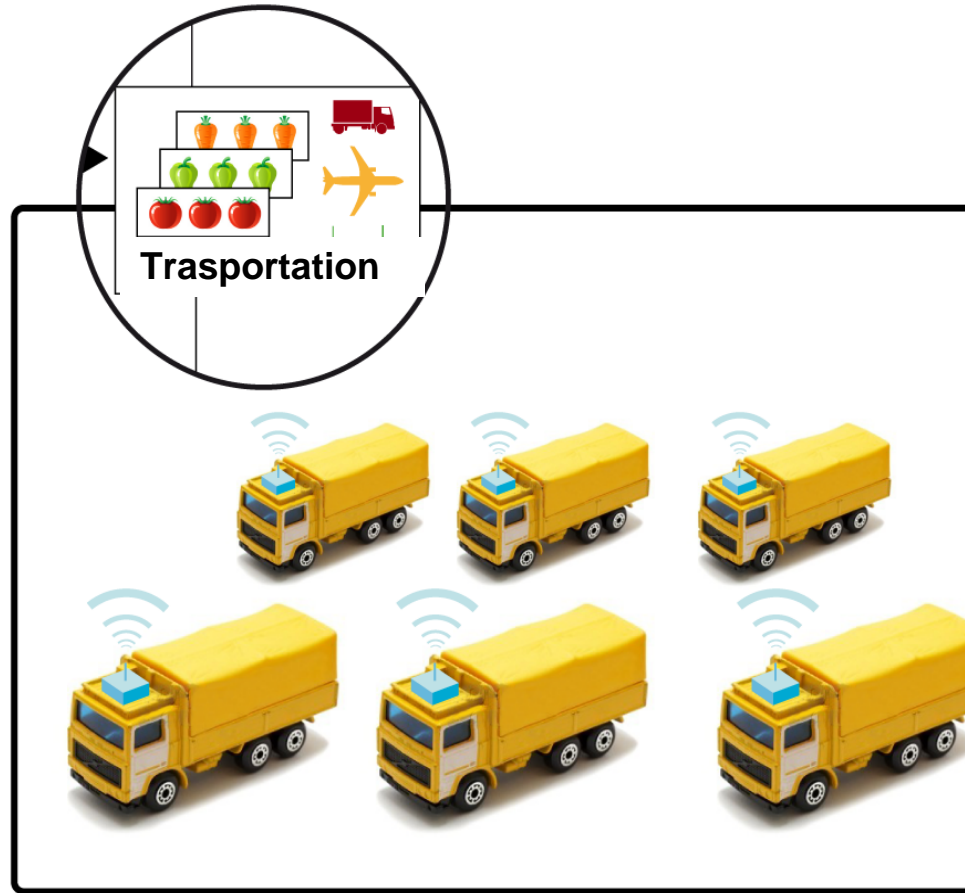
Trasformation process: ENOCOOP



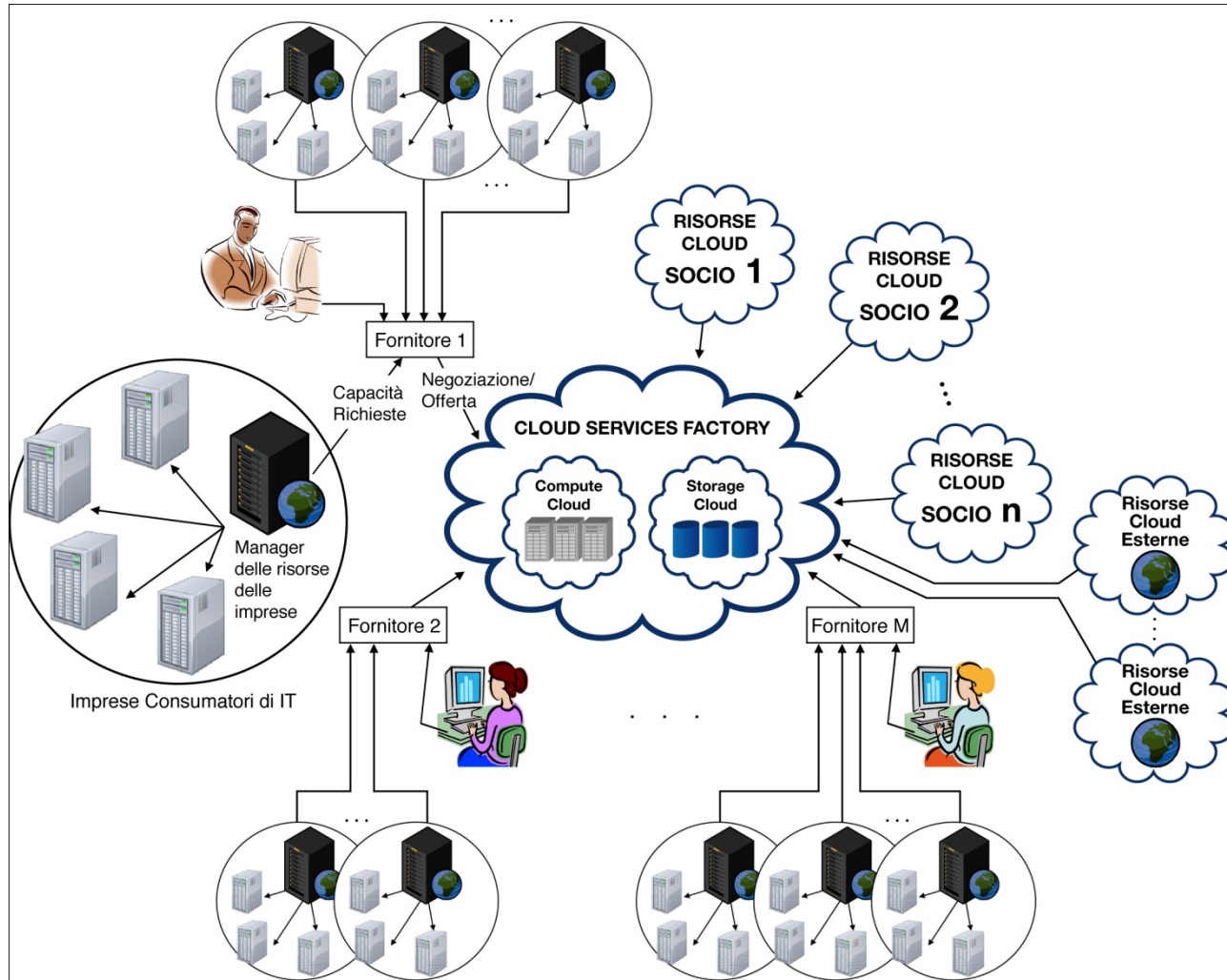
Packaging and warehouse materials check



RFID in the transportation



Customer choiced Cloud Computing for the DBE

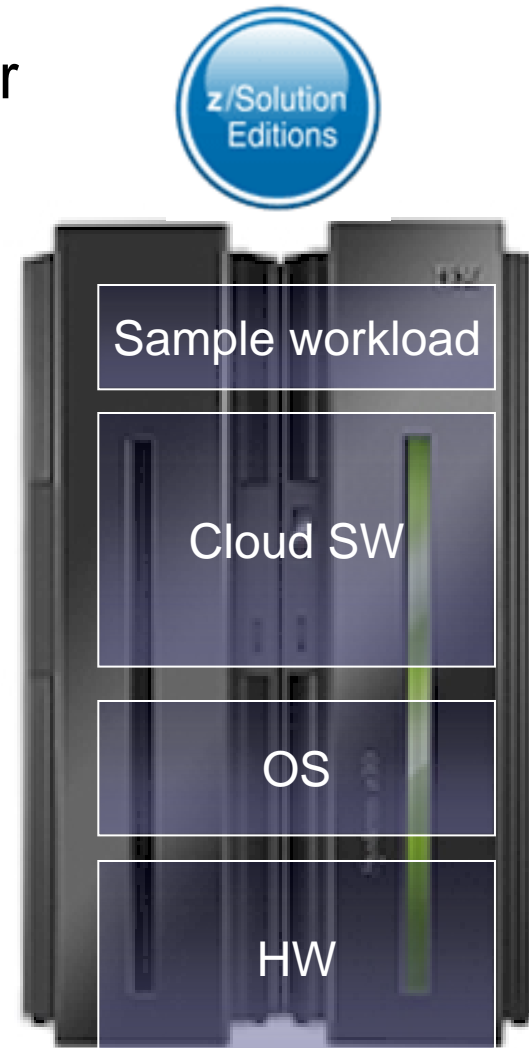


Why Cloud Computing on System z according with the customer

- **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**

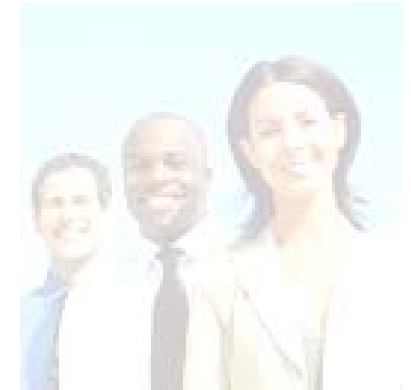
IBM hardware

Centralize, Virtualize & Simplify

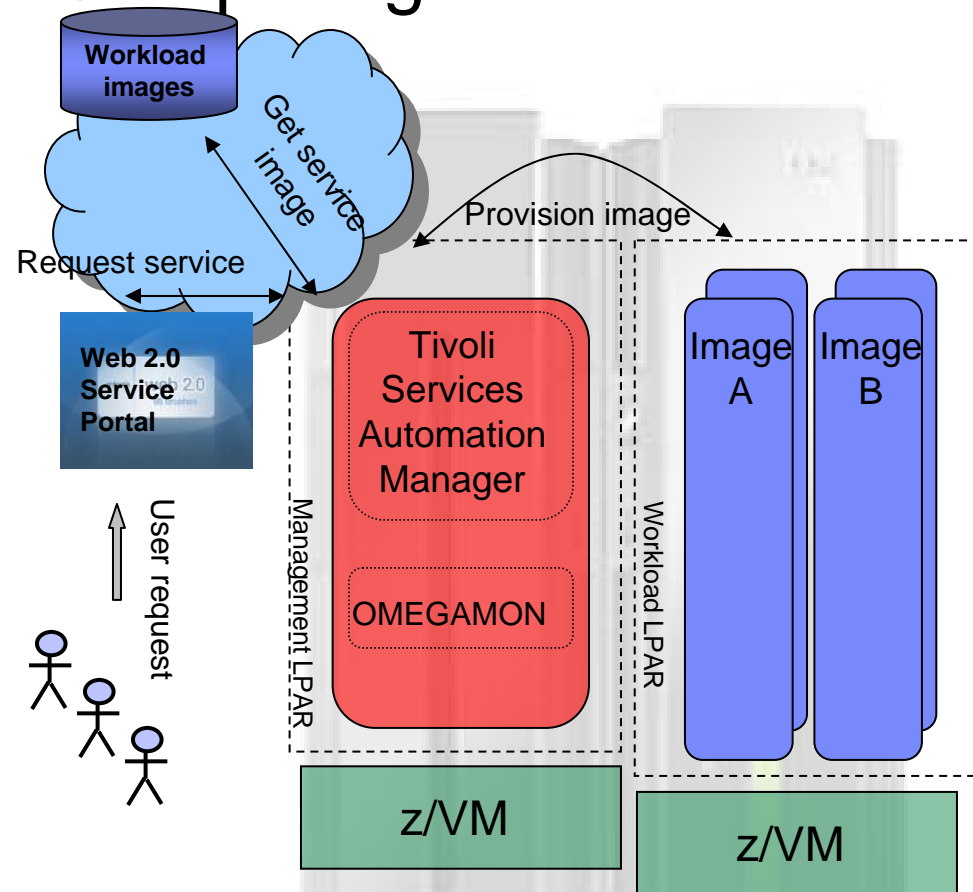


IBM Services

- 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

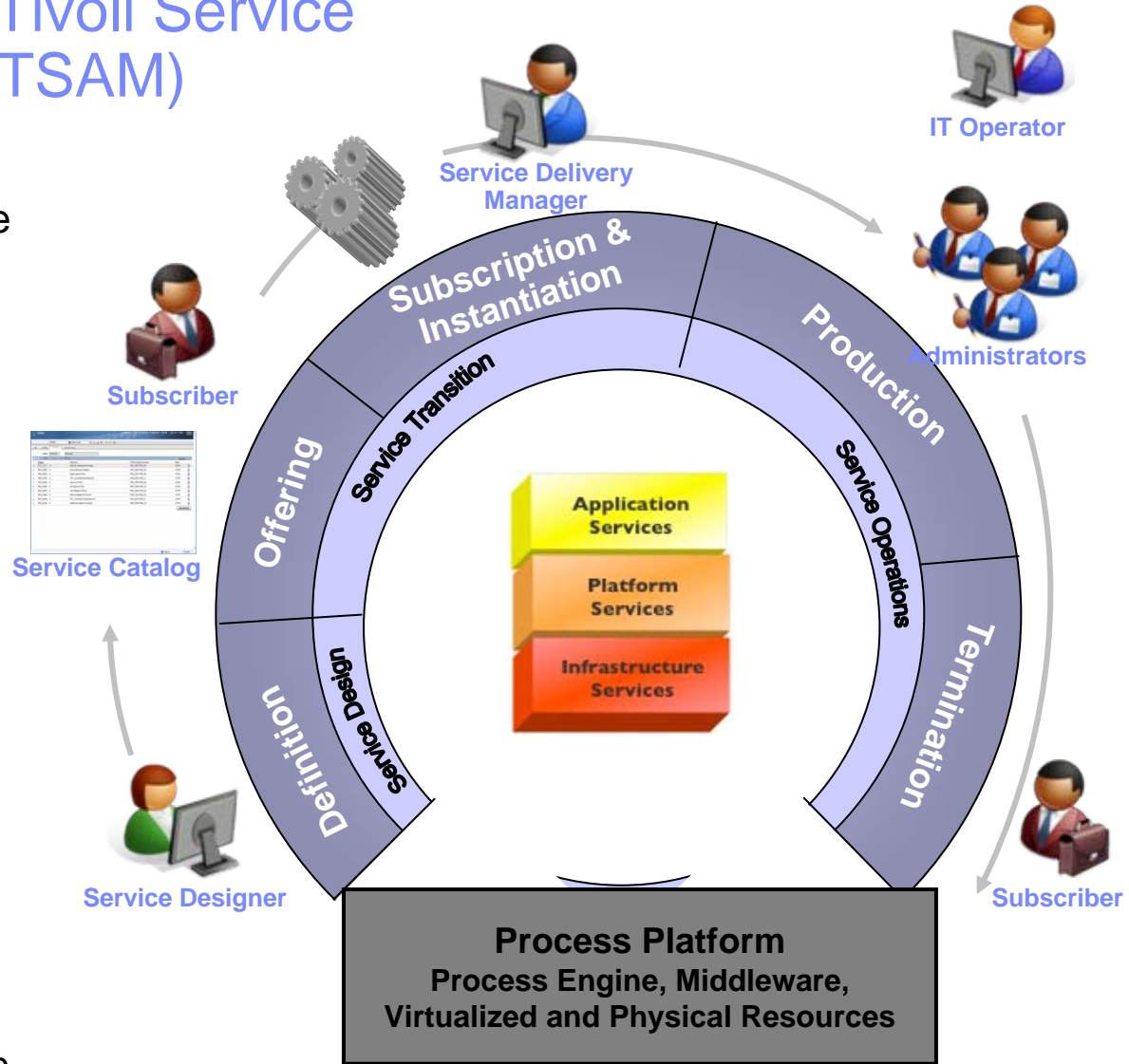
Supporting cloud with Tivoli Service Automation Manager (TSAM)

Approach:

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

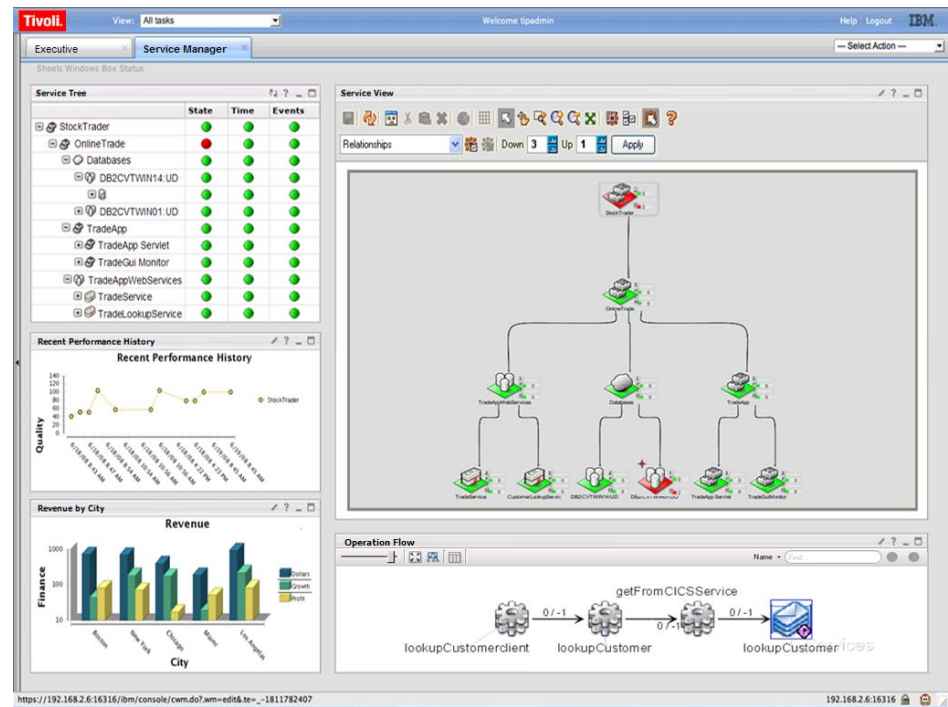
Capabilities:

- 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^o 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!