G09 – Kundenerfahrungen mit Solution Edition for Cloud Computing für Linux auf System z

25. April 2012

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Agenda

Market View - Cloud Implementation Stages

System z Client Samples - Entry & Advanced Cloud Set-up on and with System z

- University of Bari, Italy
- Citigroup, US
- Generali Deutschland Informatik Services, Germany
- Typical Entry Level Cloud Use Cases
- BG Phoenics, Germany

System z Client Samples - zEnterprise & Virtualization - Starter Cloud Set-up

- Client – Marist College, US
- Client Transzap, US
- Client – First National Technology Solutions, US
- Client - Volvo, Sweden
- Client – Kommunale Datenverarbeitung der Region Stuttgart (KDRS), Germany

System z Client Samples – Evaluation

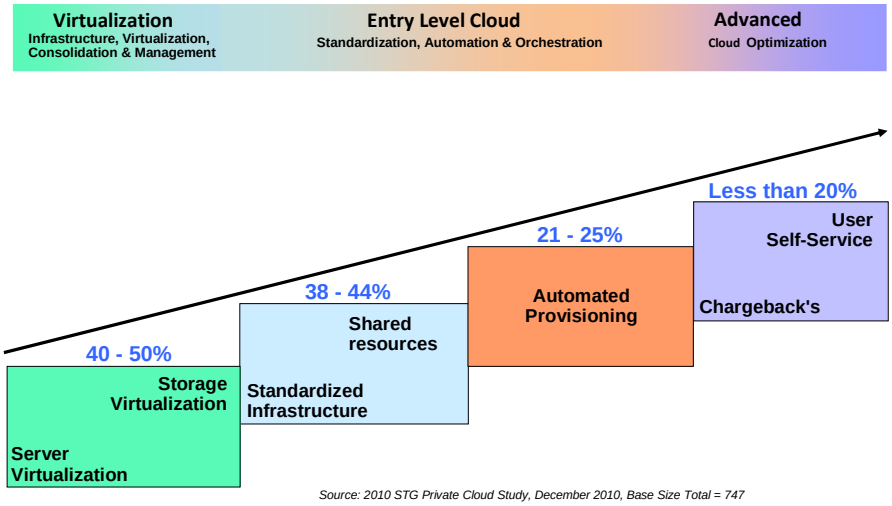
- Germany Cloud Market 1Q12 – System z Fit

IBMSmartCloud Foundation

- System z Offerings 2012
- IBM zEnterprise Starter Edition for Cloud
- IBM System z Solution Edition for Cloud Computing

Multi-System Cloud Management with IBM zEnterprise - Vision of the Future

Market View - Cloud Implementation Stages



Source: 2010 STG Private Cloud Study, December 2010, Base Size Total = 747

System z Client Samples

Entry & Advanced Cloud Set-up on and with System z

Client	Cloud Delivery Model	Cloud Services	Cloud Technology	Industry
University of Bari, Italy	Private cloud on System z Public cloud on System z	IaaS – University and ISV dev/test service SaaS - Fish market demand management	TSAM on zLinux WAS on zLinux	Public Retail /Distribution
Citigroup, US	Private cloud on distr. systems – plus high performance System z cloud	PaaS - Development & test for application developers	TSAM distributed-System z Managed-To	Finance
Generali Deutschland Informatik Services Germany	Private cloud on distr. systems – plus zEnterprise zBX – Proof of Concept	IaaS – Exploit hyprid topology of zEnterprise	TSAM distributed-System z Managed-To	Insurance
Chinese Client	Private cloud on System z/VM - Automated service management	IaaS – Standardized image & server management	TPM on zLinux	Telecommu nication
BG Phoenics, Germany	Private cloud on System z/VM - Automated Linux provisioning	IaaS – z/VM virtual server	Audelium on zLinux	Public Healthcare

Client – University of Bari, Italy

– System z Based IaaS/SaaS Cloud Service for Fishing Industry

NIST (*) Cloud Definition

IaaS – Infrastructure as a Service

PaaS – Platform as a Service

SaaS – Software as a Service

(*) see http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf

http://www.youtube.com/watch?v=8PkbbCf07Co&feature=player_embedded

February 2012

IBM System z Mainframe and Cloud Computing

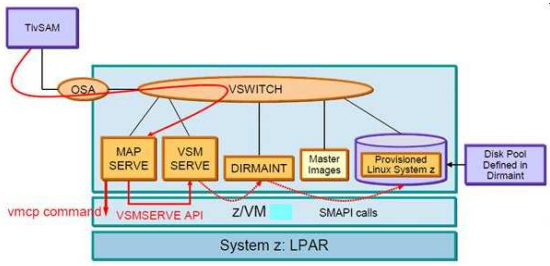
- Transforming a local economy

Use Case

Using a touch screen installed on fishing boats, the cloud-based solution allows them to immediately determine demand in local fish markets

They can enter the type of fish just caught and start a virtual auction with wholesalers on the docks

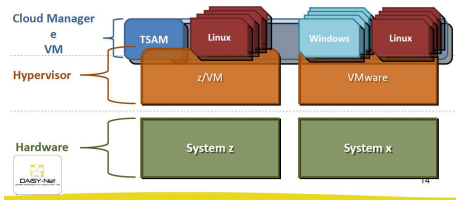
If the price is acceptable, the system automatically provides the necessary distribution between boxes to be packed before the boat arrives at the pier.

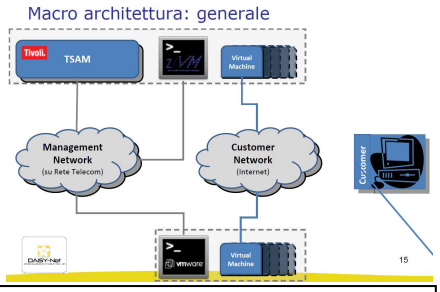


http://thoughtsoncloud.com/index.php/2011/10/transforming-a-local-economy-with-cloud-computing/

University Bari - Insights

ftp://public.dhe.ibm.com/software/it/tivoli/pdf/Cloud_TSAM_implementation.pdf





- DaisyNet is a spin-off of the University:
  - provides **SaaS** to local markets (fishing industry ...) trough WAS on zEnterprise
  - provides **IaaS** to University and software providers trough TSAM on zEnterprise
- TSAM uses resources on zLinux (zLinux) but also on VMWARE (Intel).
- zEnterprise is configured to dispatch the workload on a public cloud (Telecom) when local resources are not available

Client – Citigroup, US

– Private Cloud across heterogeneous resource pools incl.System z

NIST (*) Cloud Delivery

Private	On-premise set-up
Public	Off-premise
Hybrid	Private+public

Cloud Capabilities

Broad network access plus

(*) http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf

http://www-304.ibm.com/easyaccess/fileserve?contentid=223920

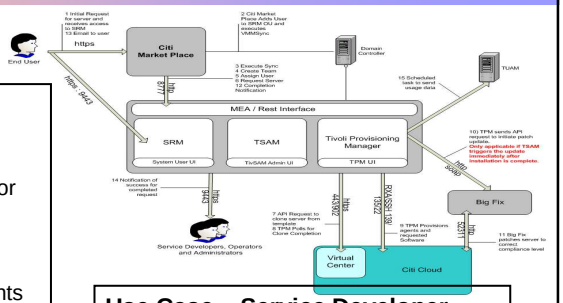
April 2011

Citigroup transforms application development with an IBM cloud solution

Private cloud using **Tivoli Service Automation Manager** enabling:

- Self-service request
- Automated provisioning
- Internal charge-back – measured service
- Improved utilization rates – resource pooling + rapid elasticity

Citigroup – Cloud Use Cases



Use Case – End User

Self-service portal 'Citi Marketplace' for server requests

Image-based standard OS deployments with predefined middleware

Server decommissioning encouraged via usage-based pricing

http://www-304.ibm.com/easyaccess/fileserve?contentid=223920

Use Case – Service Developer, Administrator

Slash operational overhead:

- Unified, real-time visibility and enforcement for software patches
- Ensure security and continuous compliance

Client - Citigroup Application Development Cloud

citi

Solution Components:

Software

- IBM® CloudBurst™ Appliance
- IBM Tivoli® Service Automation Manager
- Tivoli Provisioning Manager
- Tivoli Usage and Accounting Manager
- Tivoli Endpoint Manager

Hardware

- IBM zEnterprise™ System

The benefit

Citigroup slashed server provisioning times **from 45 days to less than 20 minutes**

Systems administrator support more than **600 servers in the cloud compared to 50** servers in the physical environment

Plans are underway to extend cloud deployment to IBM Power Systems and **IBM zEnterprise** System running Linux on System z

Once it is deployed to the zEnterprise 196, Hill says Citigroup will be able to offer the world's fastest private cloud

http://www-304.ibm.com/easyaccess/fileserve?contentid=223920

Client – Generali Deutschland Informatik Services

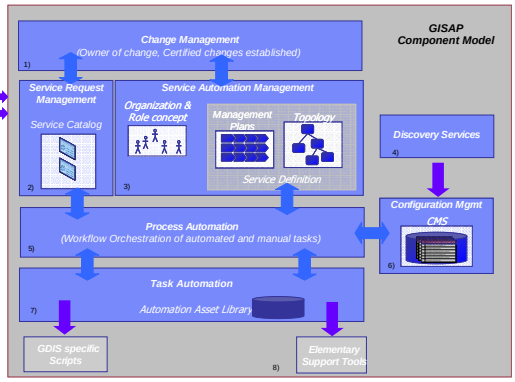
– Private Cloud to Optimize Standardization and Automation based on IBM CCRA

IBM Cloud Computing Reference Architecture (IBM CCRA)

CCRA is intended to be used as a **blueprint** / guide for architecting cloud implementations

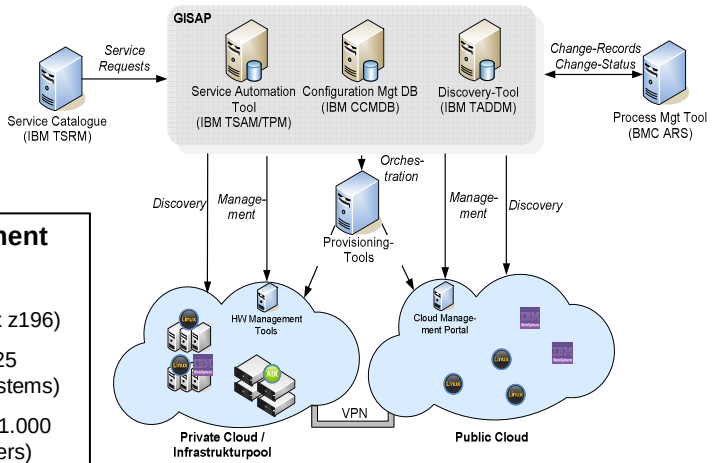
Available CC RA Version 2 document – submitted to Open Group

http://www.opengroup.org/cloudcomputing/uploads/40/23840/CCRA.IBMSubmission.02282011.doc



1) ARS Remedy
2) TSRM
3) TivSAM
4) TADDM
5) TPAe
6) CCMDB
7) TPM
8) NIM, HMC, CSM

Generali Deutschland Informatik Services - Cloud Set-up



IT Environment

Platforms

- System z (2 x z196)
- System p (~ 25 Power 6/7 systems)
- System x (~ 1.000 physical servers)

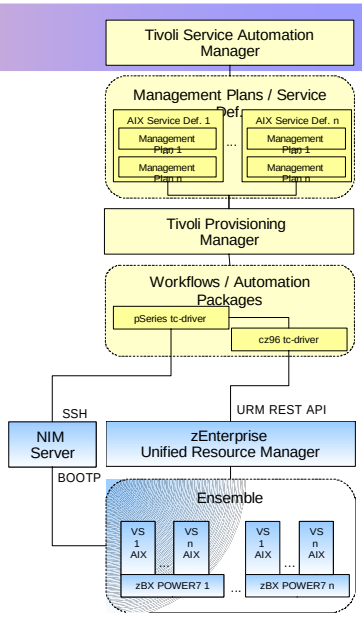
zBX Integration Proof Of Concept

Proof Of Concept Use Case

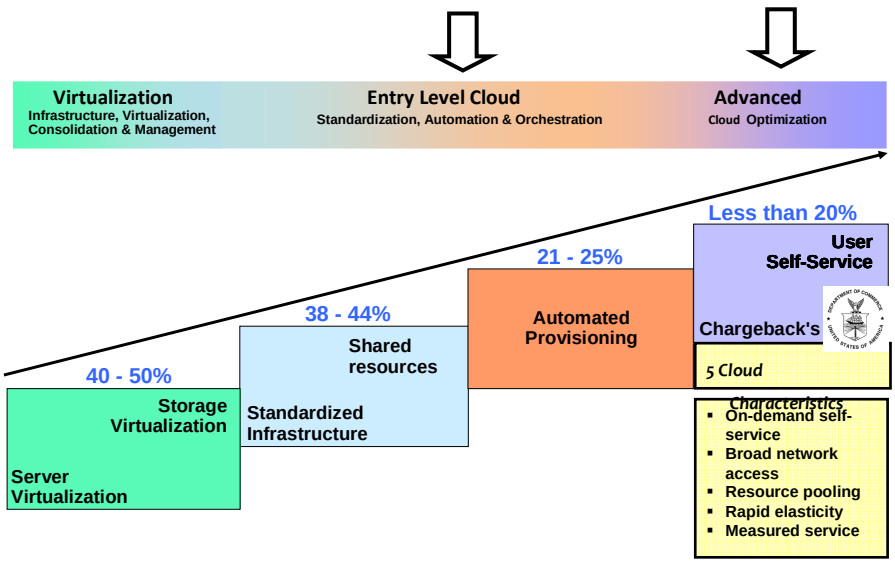
Discover POWER virtual servers attached to zEnterprise

Create/Destroy virtual server on zBX

Provision operating system AIX on virtual server



Market View - Cloud Implementation Stages



Source: 2010 STG Private Cloud Study, December 2010, Base Size Total = 747

Chinese Client - Typical Entry Level Cloud Use Cases

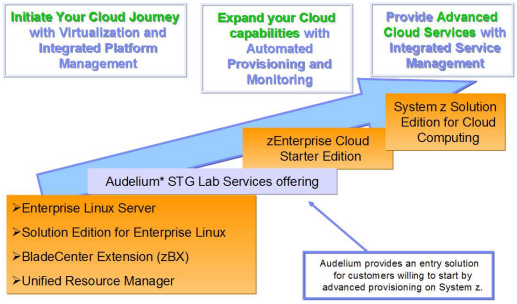
Function Module	Function		Detailed Description
	NO.	Name	
Image Management	1.1	Image list	View image(s) list with detailed information. Currently, images that have been created offline should be listed here. Images information are listed with delimiter
	1.2	Image creation	Create image(s) template which are used for deploy image
	1.3	Image capture	Capture specified virtual server to image. The image can be assign image name, version and description
	1.4	Image deletion	Delete a image
Virtual server management	2.1	Deploy Virtual Server	Deploy a single or multiple virtual server(s) according to specified cpu, memory, disk size and selected image. IP address can be specified automatically to the deployed virtual server(s)
	2.2	Operates Virtual Server	This function is used to start, shutdown, restart the virtual server, reset virtual server user's password, logoff z/VM user ID that are used by this virtual server.
	2.3	View virtual server information	View specified virtual server information including CPU, memory, disk space information, physical server it belongs to etc.
	2.4	Delete virtual server	Delete selected virtual server(s)
	2.5	Adding virtual device	Add a new virtual network adapter or a new disk to this virtual server
	2.6	Adjust virtual server resource	Add/Reduce resources assigned to this virtual server, such as CPU, memory and disk
	2.7	Migrate virtual server	Logical guest relocation to specified physical server.
	2.8	Monitor virtual server	Install ITM Agent to ELS virtual server and register to the ITM server automatically
Physical resource management	3.1	Discover physical configuration information	Discover ELS configuration information automatically through TPM. And record configuration information into TPM DCM. The information should include resources which Cloud need to manage or allocate. These information cover device information including CPU, memory, dasd/minidisk, network devise and operating system information.

Client – BG Phoenics, Germany

http://w3-01.ibm.com/sales/references/crdb/ibmref.nsf/allbydocid/0CRDD-8RZEZL?OpenDocument

The business need

- …lagging gains in administrative cost. As more consolidation projects are going on to lower operational costs, there is a need to **automate the creation and the purge of Linux** guests under z/VM.



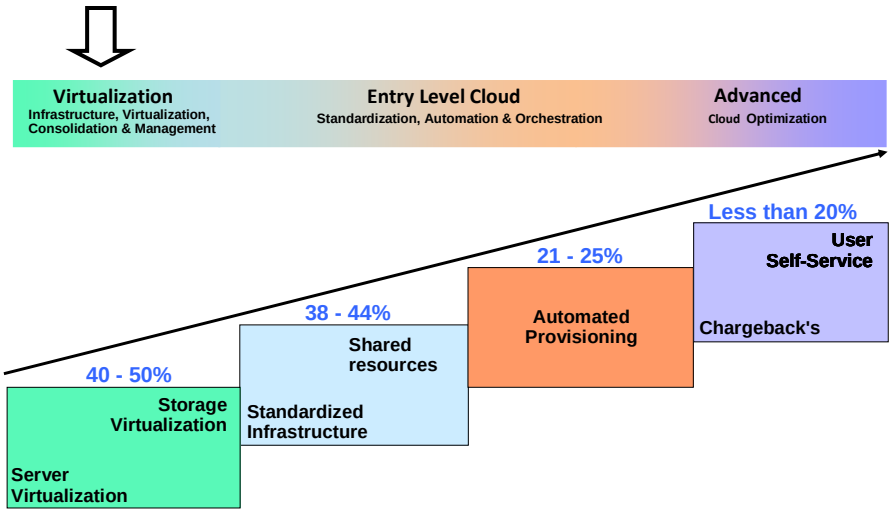
Solution

- Audelium, a technical asset owned by IBM Montpellier PSSC, provided through STG Lab Services. It is a lightweight provisioning framework, positioned as an entry solution to start the journey of Cloud computing on IBM mainframe.
- The deployment of this solution took 1 week.

Benefit

- Using the Audelium solution, the customer is now managing 5 z/VMs partitions in production and 2 z/VMs for test, from a single point of control. The deployment time of Linux virtual machines has now been reduced from 2-3 hours to 10-15 minutes!

Market View - Cloud Implementation Stages



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System z Client Samples

zEnterprise & Virtualization - Starter Cloud Set-up

Client	Cloud Delivery Model	Cloud Services	Cloud Technology	Industry
Marist College, US	Hybrid cloud on System z	IaaS – Development&test, Linux server SaaS – Desktop, Business Analytics, Learning	z/VM with z/OS and Linux	University
Transzap, US	Public cloud on System z	SaaS – Financial services	Linux on System z	Oil & Gas
First National Technology Solutions, US	Public cloud on System z	SaaS – Cobol, PL/I, Fortran, C/C++ Compile service	z/OS, z/VSE	IT
Volvo, Sweden	System z = Mainframe host cloud	SaaS – Truck manufacturing and truck selling applications	System zEnterprise	Manufacturing
Kommunale Datenverarb. Region Stuttgart (KDRS), Germany	System zEnterprise as private cloud enablement system	SaaS – SAP hosting for 'Kommunen'	System zEnterprise	Public

Client – Marist College, US

– System z Based Hybrid Cloud Service for Students, Vendors, Open Source

Use Case

- **Desktop** services for students (e-mail, word processing, …)
- **Dev/test** environment for students that need access to PaaS/ IaaS to innovate new ideas
- Dev/test environment for vendors + open source community (e.g. Debian zLinux is done at Marist)
- **Learning environment** for thousands of students - open source **Sakai** environment as cloud service
- Knowledge center for IBM System z training
- Linux server environment
- **Business analytics** cloud environment – Cognos based
- **Web hosting** services

http://public.dhe.ibm.com/common/ssi/ecm/en/zsc03109usen/ZSC03109USEN.PDF

July 2011

Client – Marist College, US

– Highly Virtualized Environment via z/VM

The **Marist cloud systems environment** consists of:

- 2 IBM System z (running z/OS, z/VM, Linux)
- 11 IBM Power Systems (running AIX, Linux)
- 75 x86-based servers (running Windows, Linux
- 70 Terabytes IBM storage.

This environment is highly virtualized

- **955 virtual servers on System z**
- 40 on its Power Systems
- More than x86 50 virtual machines

Software

- Build on existing cloud environments such as **z/OS**
- Business Analytics: based on **Cognos on Linux** for z, TM1 and Virtual Computing Lab (VCL)

Plans

- Cloud environment based on **Rational Team Concert** for System z for a full SW development environment
- Utilize **Tivoli System Automation Manager** to provision new instances to meet fluctuating demands

Client Transzap, US

Building a strong enterprise cloud foundation is critical to manage growth for SaaS providers

x86 Distributed Infrastructure Issues
- Scalability
- Availability

Resulting in downtime

How do we grow with scalability problems?

Supports Linux

WebSphere
Java

Solid

Reliable

Virtualization

Transzap is an SaaS vendor for the Oil and Gas industry

Transzap needs a scalable solution which offered high availability and security, while also supporting Linux and Java

->Transzap selects System z as the foundation for their enterprise cloud infrastructure

http://www.youtube.com/watch?v=ntIeECRIMZU

Client – Transzap, US

– Challenging Growth, Security & SLA Commitment base on System z RAS

Transzap Cloud

- 2010 - Expected growth to support 69,000 users from 6800 companies
- Clients: Oil and gas companies & suppliers
- Solutions ePayables, eBudgeting, eRevenue, and eStatement are delivered via Internet – data exchange and workflow services
- Security certification key for Transzap clients

Serving
6,000 Companies
170,000 Users

Processing
$130 billion in transaction detail yearly

March 13, 2012-
Transzap Achieves SSAE 16 SOC 1 Type 2 Compliance

TRANSZAP

http://www.transzap.com/index.html

Client – First National Technology Solutions, US

- Public Cloud offering Cobol, PL/I, Fortran and C/C++ Compile Services

Mainframe Cloud

First National Technology Solutions

First National Technology Solutions' cloud offerings allow you to purchase the mainframe resources you need from the cloud. Created using the latest IBM hardware and z/VM software, our cloud solutions deliver the flexibility today's businesses require. They are fully scalable offerings that are a perfect alternative to traditional hosting.

Server by the Slice®

- Defined CPU capacity (LPAR's)
- Ability to burst over defined CPU thresholds
- IBM System software stack
- Third party software stack
- System administration support
- Operational support services
- Redundant network connectivity and support
- Tape backup and offsite storage
- Disaster recovery alternatives

Specialized to Mainframe operating systems

With amazing computing power for your z/OS, OS/390 and VSE cloud solution, you can easily combine other servers for a complete business solution.

http://www.fnts.com/data-center-services/cloud-computing/mainframe-cloud

Client - Volvo, Sweden – Modern Mainframe

VOLVO

8/18/2011

Volvo IT delivers world class mainframe operations

by Volvo IT, Corporate Communications & Marketing, Jan Strandhede

We believe it's important to keep **highly experienced host skills/resources** close to their user communities. Therefore, much of Volvo IT's mainframe operations/support team remains widely distributed onsite at our main production locations in Sweden, Belgium, France, the U.S., Japan, and Brazil.

My mainframe infrastructure and operations staffs work in global teams, with members based at each main Volvo Group production location to closely support our customers' business locally. So, our customers get skilled, local mainframe hosting support while enjoying the best cost economics possible from our efficient, centralized "**mainframe host cloud**" service. It's the best of both worlds for our customers!

http://www.volvoit.com/volvoit/global/en-gb/newsmedia/news/_layouts/CWP.Internet.VolvoCom/NewsItem.aspx?News.ItemId=106997&News.Language=en-gb

Client – Kommunale Datenverarbeitung der Region Stuttgart (KDRS)

- Preparing for Cloud Services

Rechenzentrum der Region Stuttgart erweitert IT-Infrastruktur mit neuem IBM zEnterprise-Großrechner

(PresseBox) Stuttgart/Ehningen, 08.12.2011,

Der Großrechner ist das Herzstück der neuen IT-Infrastruktur der KDRS/RZRS.

Er wird als reiner **SAP-Datenbankserver** genutzt und bildet damit die Grundlage für die SAP-Systeme der Kommunen. Rund 64 SAP-Systeme werden vom Rechenzentrum zentral gehostet. Momentan sind etwa 50.000 Anwender registriert.

Mit der Erneuerung der IT-Infrastruktur möchte das Rechenzentrum den hohen Kundenansprüchen und dem gestiegenen Transaktionsvolumen durch Neukunden Rechnung tragen. Die KDRS/RZRS bleibt mit der Wahl eines zEnterprise-Großrechners wettbewerbsfähig und ist gerüstet für zukünftige IT-Aufgaben. "**Die Themen eGoverment und Cloud Computing werden beispielsweise immer wichtiger für die Kommunen**. Dies führt zu neuen Anforderungen an die IT.

http://www.pressebox.de/pressemeldungen/ibm-deutschland-gmbh-stuttgart/boxid/469352

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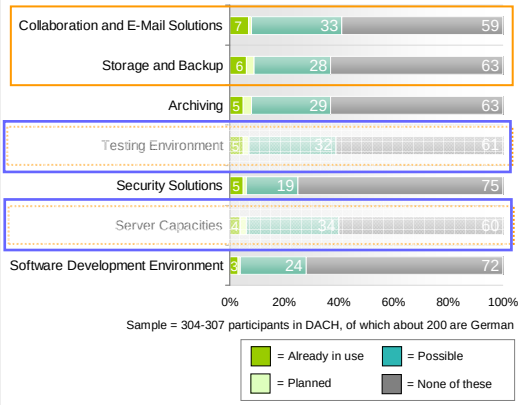
PUBLIC / PRIVAT — IaaS / SaaS — PUBLIC

Germany Cloud Market 1Q12 – System z Fit

Adoption of cloud computing services

Current and prospective use of cloud computing services in DACH, 2011
- All customer sizes - [% of responses of participants]



Source: PAC, Outsourcing Program, User Survey in DACH, September 2011

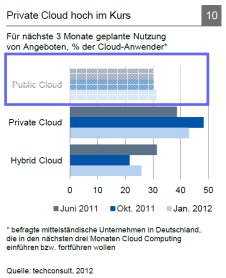
Cloud served market 2012 in Germany

by industry in M$

INDUSTRY	2012
Banking	498
Industrial Products	412
Telecommunications	410
CSI	394
Local Government	392
Media & Entertainment	329
Automotive	274
Wholesale & CPG	251
Insurance	247
Central Government	237
Financial Markets	233
Electronics	192
Utilities	136
Retail	123
Transportation	121
Health Provider	83
Health Payor	72
Chemical	51
Life Sciences	45
Travel	44
Higher Education	34
Petroleum	33
Aerospace & Defense	32
Education(K-12)	15
Grand Total	4.658

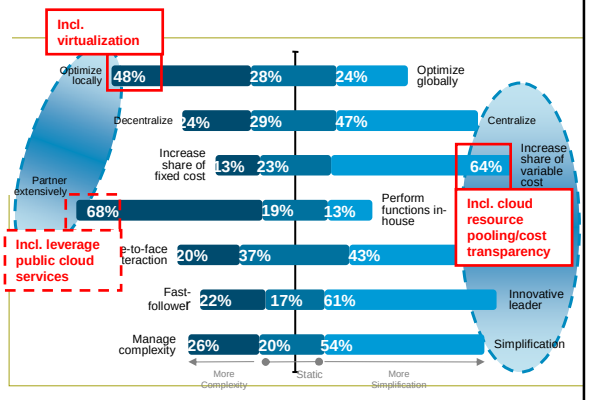
Source: QMV Cloud 3Q11 at served market

Preferred delivery model



- **Public cloud usage is not very pronounced in Germany**. Most companies move towards private cloud first
- **Large companies** prefer **private cloud** and **IaaS**. Interest in the private cloud delivery model is increasing with company size as requirements for ...security & standards are high
- **SMB** are somewhat more open to **public clouds** and **SaaS**.

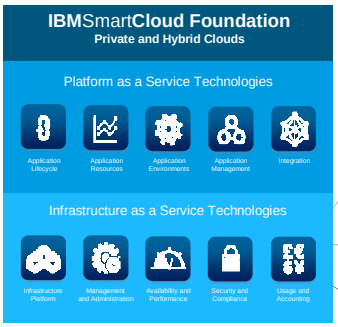
Germany Cloud Market 1Q12



Sources: Experton, ICT Newsletters, 2011; PAC, Cloud Webinar, September 2011; PAC, Outsourcing Program, User Survey in DACH, September 2011
Deutsche Bank & techconsult, Cloud Computing: Freundliche Aussichten für die Wolke, 2012;

IBM SmartCloud Foundation

- System z Offerings 2012



Private Cloud Management Solutions

- IBM SmartCloud Entry
- IBM SmartCloud Provisioning
- IBM Service Delivery Manager (ISDM)
- IBM Tivoli Service Automation Manager
- IBM Tivoli Provisioning Manager (TPM)
- IBM Tivoli Usage and Accounting Mgr (TUAM)
- IBM Tivoli System Automation
- IBM Service Management Pack for Hybrid Cloud
- IBM Solution Edition for Cloud Computing (System z)
- IBM Tivoli Monitoring for Virtual Environment
- IBM SmartCloud Storage Hypervisor

Infrastructure Management Solutions

- IBM zEnterprise Starter Edition for Cloud
- IBM Proventia Virtualized Server Security for VMware
- IBM Systems Director
- Tivoli Storage Manager for Virtual Environments
- IBM SmartCloud Control Desk
- Secure Virtual Server Protection for VMware

Infrastructure Systems and Storage

- IBM iDataplex
- IBM System x with ex5 technology
- IBM Power Systems with POWER7
- IBM System z with Unified Resource Manager
- IBM Scale out NAS Storage Systems (SONAS 1.3)
- IBM BladeCenter Foundation for Cloud
- IBM Storwize V7000 Unified
- IBM XIV Storage Systems Gen 3

IBM System z – Cloud Computing Offerings

Cloud Management - Service Automation Manager Technology

- IBM Offering 'IBM System z Solution Edition for Cloud Computing' – covers Tivoli Service Automation Manager (TSAM) as cloud life-cycle instance, including service catalogue, orchestration of requests and TPM as deployment component

Infrastructure Management - Provisioning Manager Technology

- IBM Offering 'zEnterprise Starter Edition for Cloud' - Tivoli Provisioning Manager (TPM) as cloud service deployment instance

Infrastructure Virtualization – Systems Director, Unified Resource Manager Technology

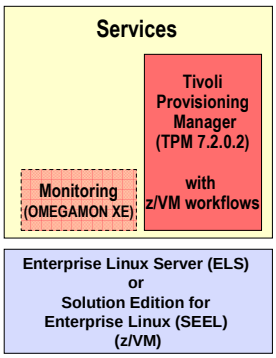
- IBM Systems Director VMControl – Director GUI initiated z/VM virtual server deployment
- Unified Resource Manager (URM) – zEnterprise HMC initiated virtual server deployment (z/VM-Linux, kvm-Linux/Intel, AIX) on zBX

System z Cloud Computing Offerings – Details

Offering	Capabilities	Components
zEnterprise Starter Edition for Cloud	**Data Center Automation** Automation of management of data center assets like: HW – Server, Network, Storage SW – Hypervisor, OS, middleware, applications Automation of data center tasks like SW distribution, patch management,...	• Web Interface • Tivoli Provisioning Manager • z/VM workflows plus set-up IBM Service
IBM System z Solution Edition for Cloud Computing	**Self Service Automation** Automation like above plus: • Automation of processes • Self service offerings managed via a service request management system • Automatic processing of requests and interchange with deployment manager component	Tivoli Service Automation Manager: • Self Service Interface • Service Request Manager • Service Automation Manager • Tivoli Provisioning Manager plus set-up IBM Service

IBM zEnterprise Starter Edition for Cloud - Details

Solution focused on establishing Infrastructure as a Service (IaaS) delivery model



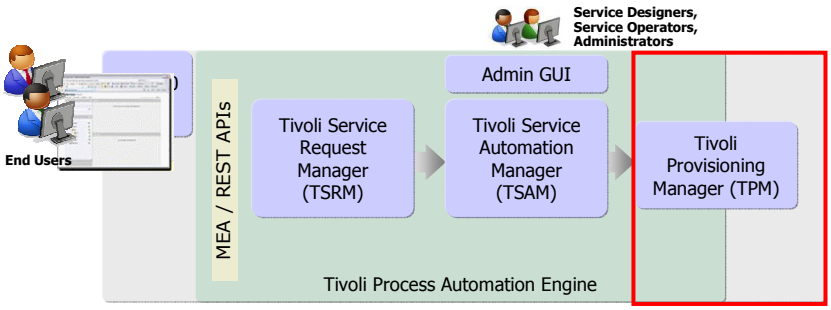
Built on top of Enterprise Linux Server or Solution Edition for Enterprise Linux

Cloud Technology
Tivoli Provisioning Manager Version 7.2.0.2
License PID: 5608-TPM
- RVU License and SW S&S12 Months - D0I32LL
- RVU Annual SW S&S Annual Renewal - E0BI5LL

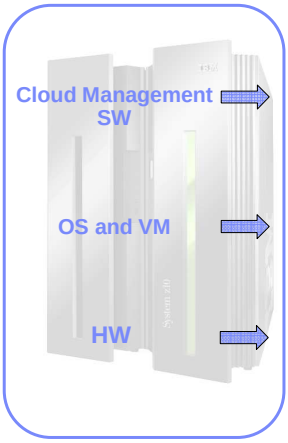
Monitoring (optional)
Tivoli OMEGAMON XE on z/VM and Linux Version 4.2
License PID: 5698-A36
S&S PID: 5608-S73

STG Lab Services (optional*)
Mainframe Cloud Implementation Services
- Up to 80 hours to implement the TPM workflows that provide rapid zLinux provisioning

IBM zEnterprise Starter Edition for Cloud – Growth Option



IBM System z Solution Edition for Cloud Computing – Details



Components

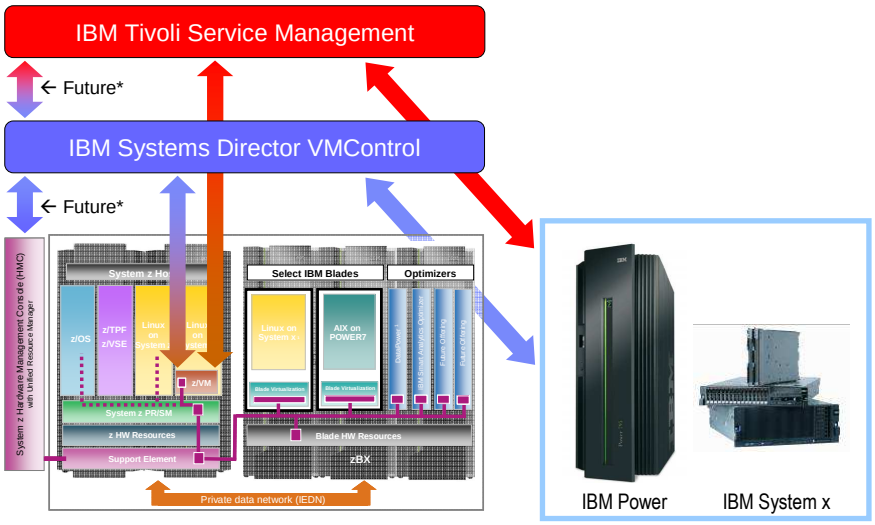
- Tivoli Service Automation Manager
- IBM Tivoli Monitoring: Omegamon XE
- z/VM
- Linux
- IBM System z or IFLs
- Memory
- Storage

IBM Services

- Planning workshop for cloud environment)
- Install/configure
  - HW system (LPAR creation, security)
  - Base z/VM & Linux
  - Tivoli components
- Develop test scenario for service automation and management via Tivoli Service Automation Manager
- Direct to eyeOS image

Multi-System Cloud Management with IBM zEnterprise

- Vision of the Future



Note*: All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice and represent goals and objectives only.

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Many thanks!