Hybrid Cloud with IBM Cloud Manager with OpenStack on z Systems and SoftLayer

Introduction

Frank Heimes – Senior IT Architect
Elisabeth Puritscher – IT Specialist
Hartmut Penner – STSM
z ATS, IBM Client Center, Lab Boeblingen

What Problems Are Clients Trying To Solve Via The Cloud?

Potential Cost Reductions

Re-Focus on Business

Handling Usage Peaks

High Overhead Related to Provisioning New Users/Services

Switching form CapEx to OpEx

Low Server Utilization

Reaching new ecosystems

Secure Access to Data for Mobile Workforce

Delays in Rolling Out New Services

Application Development & Testing

Application Downtime / Availability / Disaster Recovery

Power / Space Constraints

Increase the ease of use, simplicity and efficiency

What is Hybrid Cloud ?

A Hybrid Cloud is the combination of two or more types of cloud implementations, means with different capabilities, user and administrator interfaces, or control mechanisms.

IBM's point of view is that the future will be a hybrid world of traditional IT, private, public, on- and off-premise clouds that enable composable business. This will lead to dynamic cloud environments, that are constantly adapting to meet new requirements.

Typical examples:

- **Two different on premises implementations**
  IBM System z and VMware, both on-premise

- **Two different public clouds**
  IBM SoftLayer and Amazon Web Services, both off-premise

- **Combination of on- and off-premise Clouds**
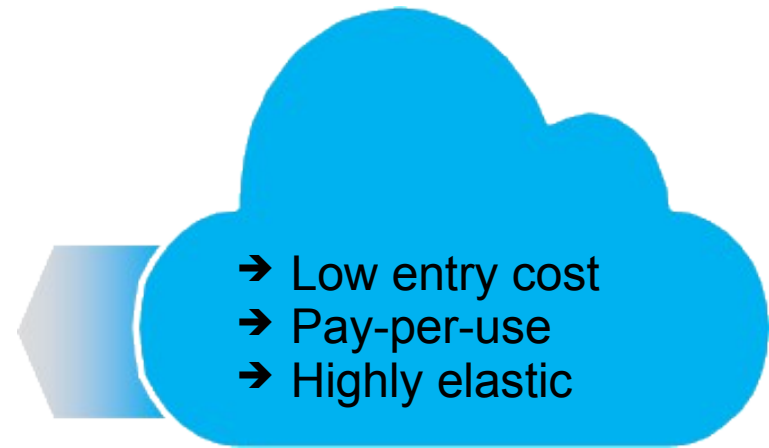 IBM z Systems on-premise and IBM SoftLayer on-premise (→ **Demo)**

Hybrid Cloud Combines the Best of Private and Public Cloud

Private cloud and traditional IT

Public cloud

➔ Fully customizable
➔ Robust management
➔ Secure by design

Hybrid Cloud

➔ Low entry cost
➔ Pay-per-use
➔ Highly elastic

➔ **Maximize return** on existing IT investments
➔ Match workloads to **best-fit infrastructure**
➔ Hit the **right balance** of risk to speed
➔ Meet seasonal capacity **without capital expense**
➔ **Chose** between **rent** vs **buy** (OpEx vs CapEx)
➔ **Innovate** and add new **capabilities quickly**

Hybrid Clouds can Solve a Variety of Needs for Business and IT

Need to integrate social/ mobile and core business systems

CRM
HR
ERP

Systems of record   **Systems of engagement**
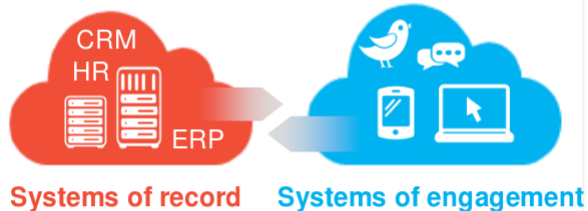
Link new social and mobile systems to core business systems and data for greater insight and value

Backup location for disaster recovery

Private   Public
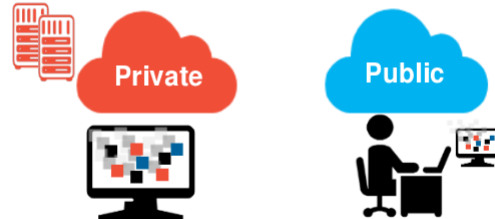
Data sync
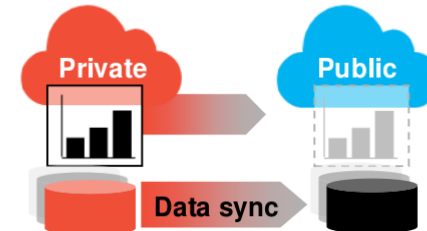
Use private cloud normally and switch to public cloud to recover data and files

Development Lifecycle

Traditional IT

Private   Public
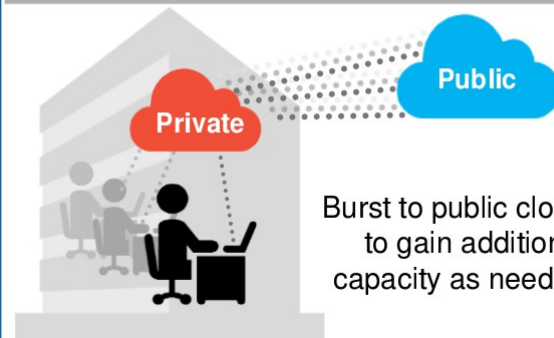
Private cloud for production and public cloud for development and test

Temporary capacity for high-performance workloads

Public

Private

Burst to public cloud to gain additional capacity as needed

Hybrid Cloud Potential

CloudTimes

In Five Years, The Market for Hybrid Cloud Computing is Worth $84.67 Billion

by Saroj Kar on March 17, 2015 · Leave a Comment

MarketsandMarkets, the consulting and market research firm, has estimated that the growth of hybrid cloud will reach about $84.67 billion in 2019. The research examined that the global market for hybrid cloud computing in the organizations is estimated to grow from $25.28 billion in 2014 with a Compound Annual Growth Rate (CAGR) of 27.3% from 2014 to 2019.

Virtualization and Cloud Portfolio for Linux on z Systems

Virtualization Infrastructure & Virtualization Management	Entry Level Cloud Standardization & Automation	Advanced Cloud Orchestration & Optimization

IBM z/VM 6.3

- Support more virtual servers than any other platform in a single footprint
- Integrated OpenStack support

IBM Wave for z/VM

- A graphical interface tool that simplifies the management and administration of z/VM and Linux environments

KVM for z Systems

- SOD*

Differentiation

IBM Cloud Manager with OpenStack

- A simple, entry level cloud management stack
- Based on OpenStack
- Can be run from System z environment ("managed-from")
- Formerly known as SmartCloud Entry

Standardization

IBM Cloud Orchestrator

- Builds on functionality of **IBM Cloud Manager with OpenStack** and adds runbook automation and middleware pattern support for workload deployment
- Based on OpenStack
- System z support as "managed-to"
- Formerly known as SmartCloud Orchestrator

Service Lifecycle Management

IBM Cloud Manager with OpenStack for z Systems (ICM)

Easy to deploy, simple to use Cloud Management Solution

Heterogeneous and integrated management support

- z Systems, Power ® and x86 servers
- Central management across multiple hypervisors & domains
- All IBM server architectures & major hypervisors supported

Accelerated time to market with pattern support

- Chef-based patterns based on OpenStack® Heat pattern engine is now supported across all IBM platforms
- Workload deployment based on patterns speeds delivery of new services

Hybrid Cloud support

- Hybrid Clouds on and off premise options via SoftLayer support

Private Cloud   **Hybrid Cloud**   **Off-premise cloud**

openstack™   CHEF™   HEAT
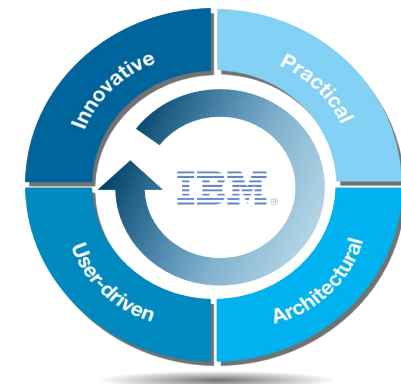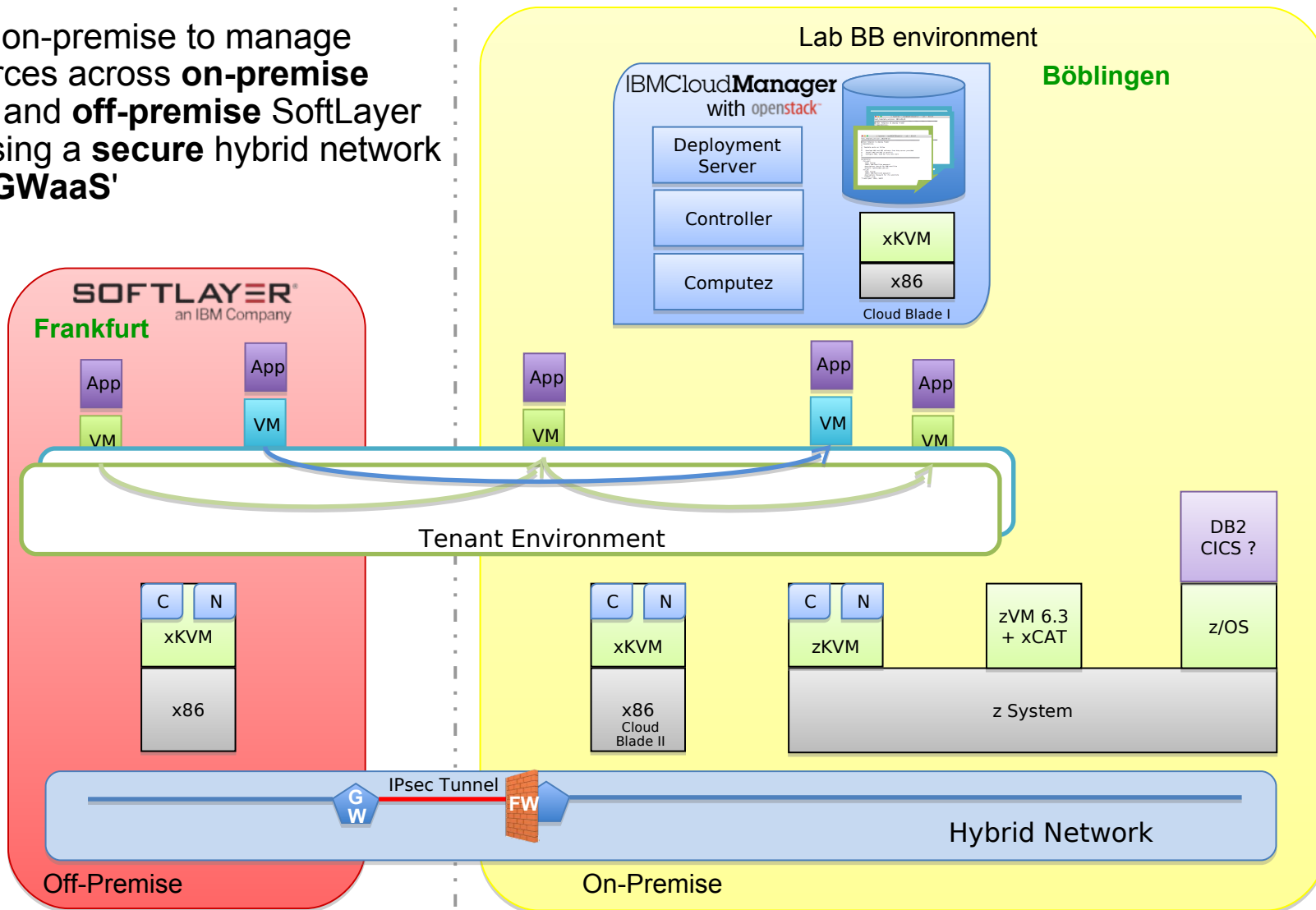
Open 'Plus'
Enterprise-ready delivery
Open by Design ™

Hybrid Cloud – Architecture
Secure Hybrid Cloud with z Systems and SoftLayer using ICM

Using **ICM** on-premise to manage **x / z** resources across **on-premise** datacenter and **off-premise** SoftLayer cloud by using a **secure** hybrid network based on '**GWaaS**'
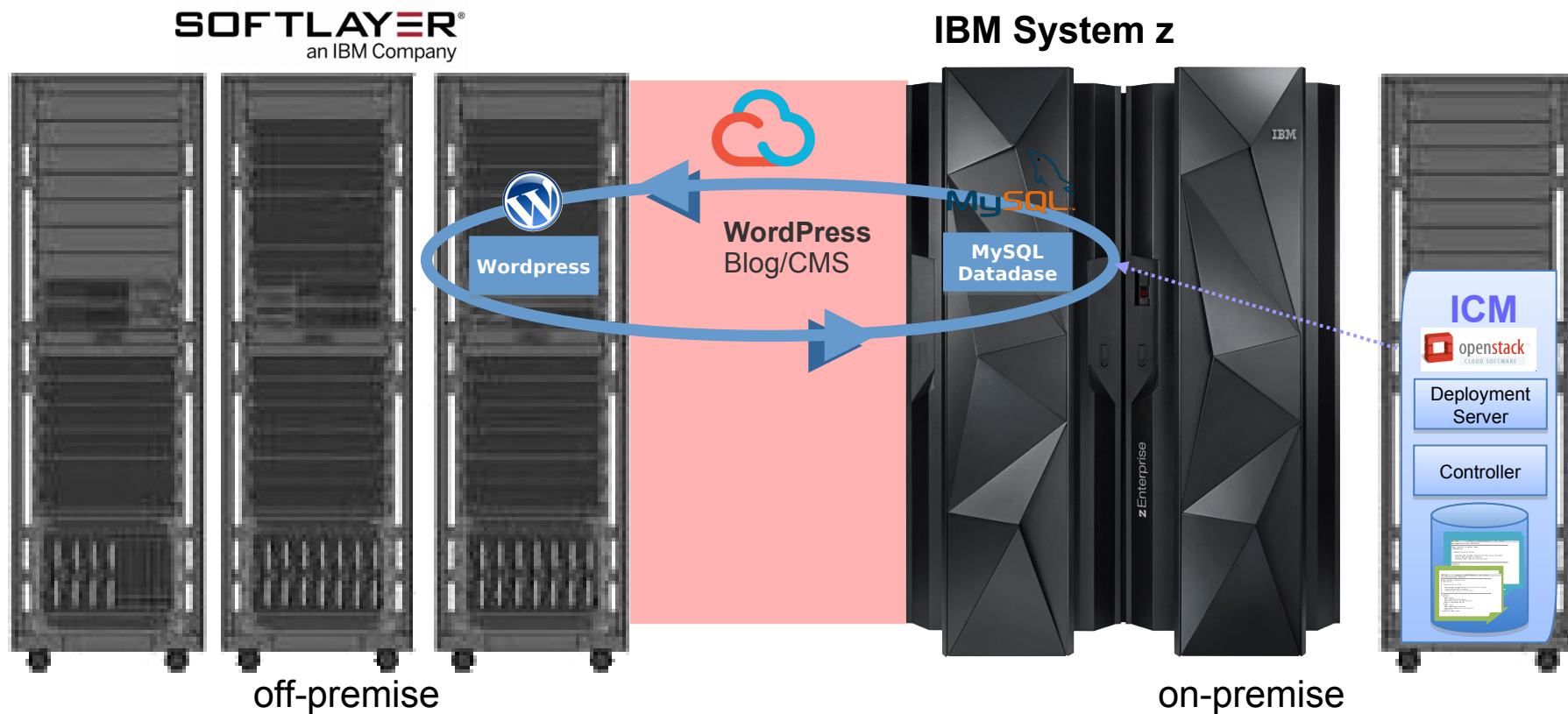
Lab BB environment

Böblingen

IBMCloudManager
with **openstack**

Deployment Server

Controller

Computez

xKVM

x86

Cloud Blade I

SOFTLAYER
an IBM Company

Frankfurt

App

App

App

App

App

VM

VM

VM

VM

VM

Tenant Environment

DB2 CICS ?

| C | N |
xKVM
x86

| C | N |
xKVM
x86
Cloud Blade II

| C | N |
zKVM

zVM 6.3 + xCAT

z/OS

z System

ICM components

| C | Compute node |
| N | Network node |

IPsec Tunnel

GW

FW

Hybrid Network

Off-Premise

On-Premise

SmarterComputing

IBM

Hybrid Cloud – Showcase
Life-cycle management of multi-tenant CRM application

Wordpress on **SoftLayer** and MySQL on **z Systems** **v**irtual **m**achines

- A two-tier CMS application, consisting of Wordpress and a MySQL database, is deployed across two platforms
- Heat templates are used for the deployment
- z/VM is used as hypervisor on z Systems

- The IBM z System machine Is connected to SoftLayer
- On SoftLayer a bare-metal system is used with KVM on x86 as hypervisor
- For a secure and friction-less connectivity the "z Systems Hybrid Cloud Connect" (aka 'GWaaS') is implemented

SOFTLAYER®
an IBM Company

IBM System z

Wordpress

WordPress
Blog/CMS

MySQL
Datadase

ICM

openstack
CLOUD SOFTWARE

Deployment Server

Controller

off-premise

on-premise

Enter the Life Demo ...

Further Information

The demo is accessible via the IBM Client Center Demo Portal:
http://clientcenter.de.ibm.com/democenter/

This is the direct link to the **Hybrid Cloud Demo**:
http://boedom1.boeblingen.de.ibm.com/bpl/depts/d3300/d3300dem.nsf/v17_all_web_demos/61ABA3281BC5C9A5C1257DD5005BD08B?OpenDocument

You will find in the sections at the bottom a link to an **intro**ductory level presentation:
http://boedom1.boeblingen.de.ibm.com/bpl/depts/d3300/d3300dem.nsf/1535deb166254fb4c12579ce003de83d/61aba3281bc5c9a5c1257dd5005bd08b/$FILE/Hybrid%20Cloud%20with%20z%20Systems%20and%20SoftLayer%20-%20Demo-Showcase%20-%20Introduction%20-%20Apr%2001,%202015.pdf
as well as to the **storyboard**:
http://boedom1.boeblingen.de.ibm.com/bpl/depts/d3300/d3300dem.nsf/1535deb166254fb4c12579ce003de83d/61aba3281bc5c9a5c1257dd5005bd08b/$FILE/Hybrid%20Cloud%20with%20z%20Systems%20and%20SoftLayer%20-%20Demo-Showcase%20-%20Storyboard%20-%20Apr%2001,%202015.pdf

If you want to **book** the demo, first check for a free time slot at the Demo Calendar:
http://clientcenter.de.ibm.com/democenter/calendar/
and fill out the **request** form here:
http://clientcenter.de.ibm.com/democenter/request/

The demo can be used and shown from remote (with some little practice), but can also be shown locally and remotely by the IBM Client Center z ATS staff.

The demo is also available as (~ 22 min) **video**:
https://w3-connections.ibm.com/files/app#/file/eb477925-7555-499a-b571-37f12f2dda43
incl. transscript:
https://w3-connections.ibm.com/files/app#/file/a36d0529-7f20-449b-8079-2471f8f023bb

Thank you!

Frank Heimes

Senior IT Architect
IBM Client Center –
Systems and Software –
z ATS
IBM Germany Lab

IBM

Schoenaicher Str. 220
D-71032 Boeblingen

Phone +49 (0)7031-16-4597
Mobile 0172-7348487
frank.heimes@de.ibm.com

One-Pager

Heterogeneous and Hybrid Cloud Demo Showcase with z Systems and SoftLayer

Client Center Boeblingen Demo Portal:
http://clientcenter.de.ibm.com/democenter/

What is it ?

- **Heterogeneous**, because of multiple platforms (x86 and z) and multiple hypervisors (KVM and z/VM)
- **Hybrid** Cloud, because of the different sites aka premises; z on-premise in Boeblingen, SoftLayer off-premise in Frankfurt
- **IBM Cloud Manager with OpenStack** (ICM) running on-premise is the underlying infrastructure solution (IaaS).
- A Cloud workload in this scenario is represented by a 2-tier solution that runs across 2 sites, using 2 different platforms and hypervisors
- The simple 2-tier solution stack is based on **Wordpress** and a backend **database**.
- The "**z Systems Hybrid Cloud Connect Test Drive**" (aka **GWaaS**) implemented and part of the demo environment.

What's the value ?

- **Support** for all **IBM platforms** and **architectures** included.
- **Centralized management** of heterogeneous and hybrid infrastructures via a **single pane of glass.**
- **Life-cycle Management** and **automation** beyond single server provisioning using **HEAT orchestration service** and **patterns** for entire solutions.
- **HEAT** (and Chef) allows to handle entire solution stacks as single entities.
- This significantly increases the **speed of delivery** of **new services**.

Request this demo NOW!

Hybrid Cloud – Architecture
Secure Hybrid Cloud with z Systems and SoftLayer using ICM
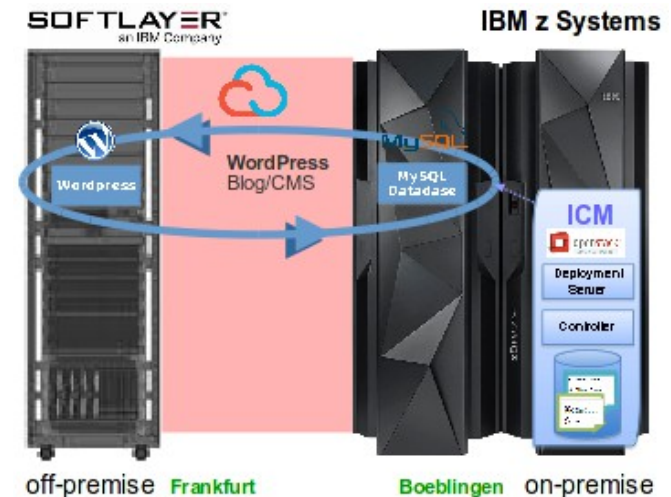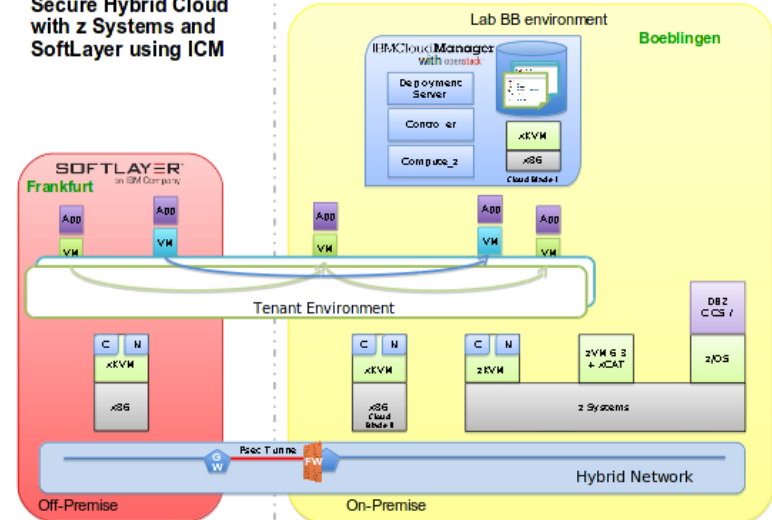
z Systems Hybrid Cloud Connect Test Drive

z Systems Hybrid Cloud Connect Test Drive

z Systems Cloud Initiative Team
Mark Figley, Kershaw Mehta and Roy Moebus

Enabling Friction-less Hybrid Clouds with z System

- Provides the fundamental capabilities necessary for an enterprise customer to integrate on premise enterprise systems with public cloud offerings.
- Reduces time, cost and complexity for implementing a Hybrid Cloud with z Systems while preserving the performance, security and reliability that our enterprise customers need.
- Accelerates time to value for z Systems customers by providing free services from IBM that help a customer get started with their hybrid cloud implementation.

GaaS: Gateway as a Service		Services Enablement	
Agile: No on premise infrastructure additions required.	**Consistent:** Leverages a cloud offering to support a cloud strategy.	**Jumpstart:** Overcomes the initial "where do we start" challenges.	**Partnership:** Experts from IBM combined with customer domain experts

A *hybrid cloud* is a composition of an off-premise public cloud with on-premise private cloud or enterprise systems that remain as distinct entities but are bound together by technology that enables data and application portability.

Use Case Stories / Positioning

This offering is most relevant to customers who are **already interested in pursing a Hybrid cloud strategy,** but may not see z Systems as a relevant part of that strategy.

Client Target Profile:

Clients that are looking to leverage public cloud for Intel but are also looking to maintain their system of record on z Systems and need to connect those two worlds in a seamless, secure, and robust way.

Examples of IT Strategies a customer might be pursuing:

 A strategy that moves their Intel server farm infrastructure from on-premise to a public or dedicated cloud provider.

 A customer with an unpredictable demand profile that needs to expand on-premise Intel capacity with cloud-based capacity on demand.
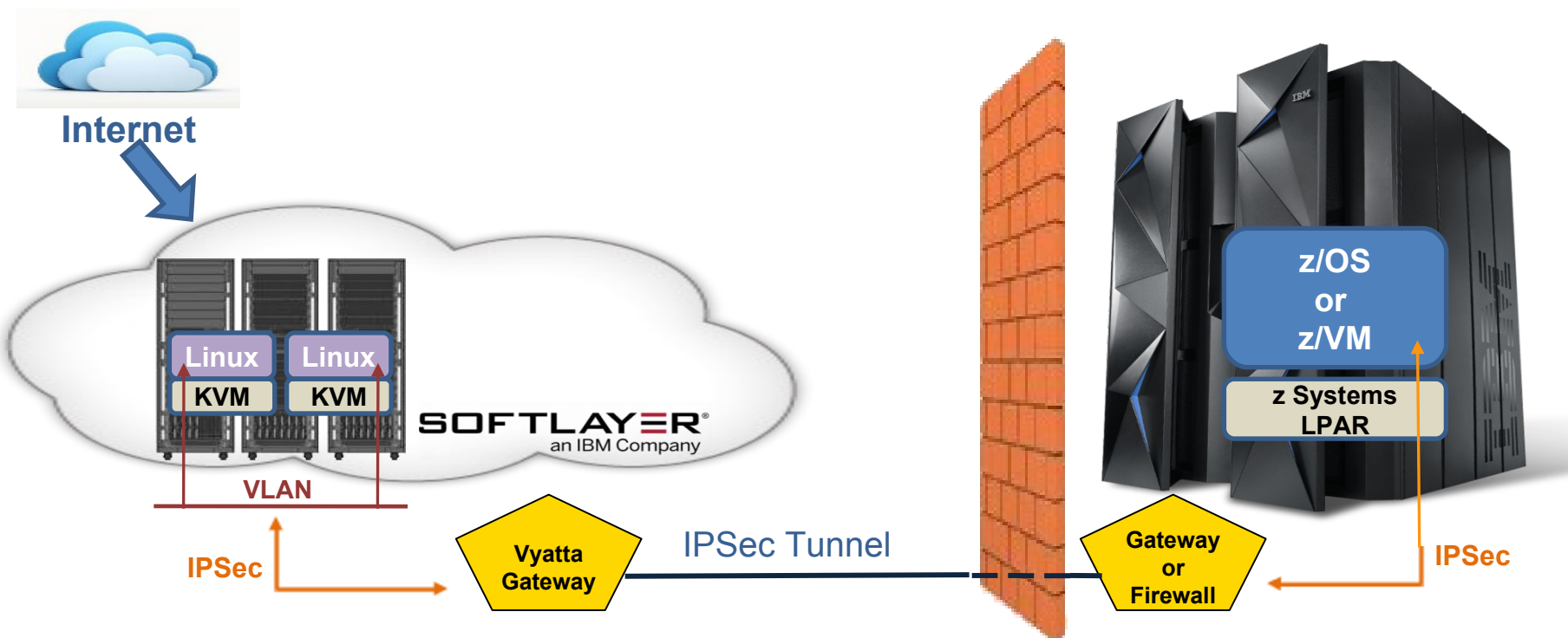
Examples of specific use cases a customer might be pursuing:

 Moving the presentation tier of a multi-tiered web application in the public cloud while keeping the back-end systems on-premise in a secure fashion.

 Dev/Test of portable applications are performed in the public cloud while requiring data from the private cloud (Systems of Record). Upon completion, deployment of application may be brought back to on-premise.

Value Themes: Security, Scalability, Ease of Implementation, and Performance

z Systems Hybrid Cloud Connect Test Drive Architecture

SmarterComputing

IBM

Internet

Linux **Linux**
KVM **KVM**

VLAN

SOFTLAYER an IBM Company

IPSec

Vyatta Gateway

IPSec Tunnel

Gateway or Firewall

z/OS or z/VM

z Systems LPAR

IPSec

SoftLayer
Use SoftLayer Portal to acquire server, storage and establish VLANs

Gateway as a Service
Use GaaS Portal to establish IPSec on SoftLayer VLANs

On-Premise
z Systems of Record is used to maintain secure and operational control of data

© 2015 IBM Corporation

IBM InterConnect Promotion Details

1-2 Day services engagement at no cost to the customer!

Customer Requirements:

- ✓ IPSec capable network equipment at customer datacenter

- ✓ Willingness to configure a connection in their firewall to SoftLayer

- ✓ 1 customer network expert dedicated to the effort for the 1-2 day duration

- ✓ 1 sysadmin on call for the 1-2 day duration

- ✓ A SoftLayer account, or a willingness to open a SoftLayer account

- ✓ 1 or more machines (of any type) onsite that can be used to test connectivity

IBM Provides:

- ✓ An expert resource to setup the secure network gateway that will bridge your datacenter network with infrastructure in SoftLayer.

- ✓ 6 Months of SoftLayer GaaS capability offered at no cost to the customer.

- ✓ 6 Months of 1 SoftLayer Virtual Server offered at no charge to the customer.

If interested, contact:

Mark Figley – figley@us.ibm.com

Roy Moebus – moebus@us.ibm.com

Kershaw Mehta – kershaw@us.ibm.com

Backup

Hybrid Cloud – What is it all about?

Have a look at these presentation decks:

- Hybrid Clouds and z Systems - Positioning, Concerns, Implementation and Solutions
  https://w3-connections.ibm.com/files/app/file/4db897d7-0746-4a20-a8f1-33b06442c058

- Cloud with z Systems - Positioning and Offerings
  https://w3-connections.ibm.com/files/app/file/1976051d-90d4-4698-b20f-372c4f120afe

Open By Design

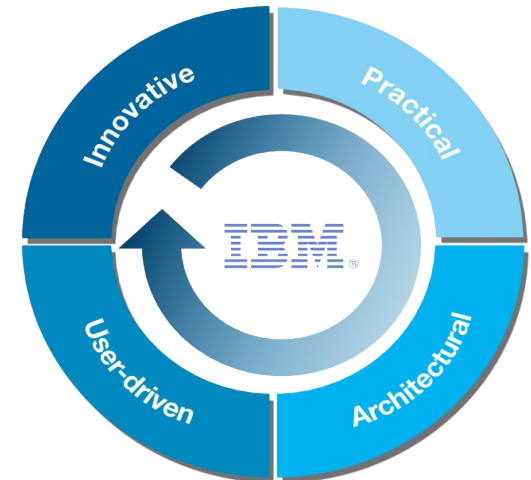# Organizations have a choice to make…

Open Source Only	**Proprietary**	**Open "Plus"**

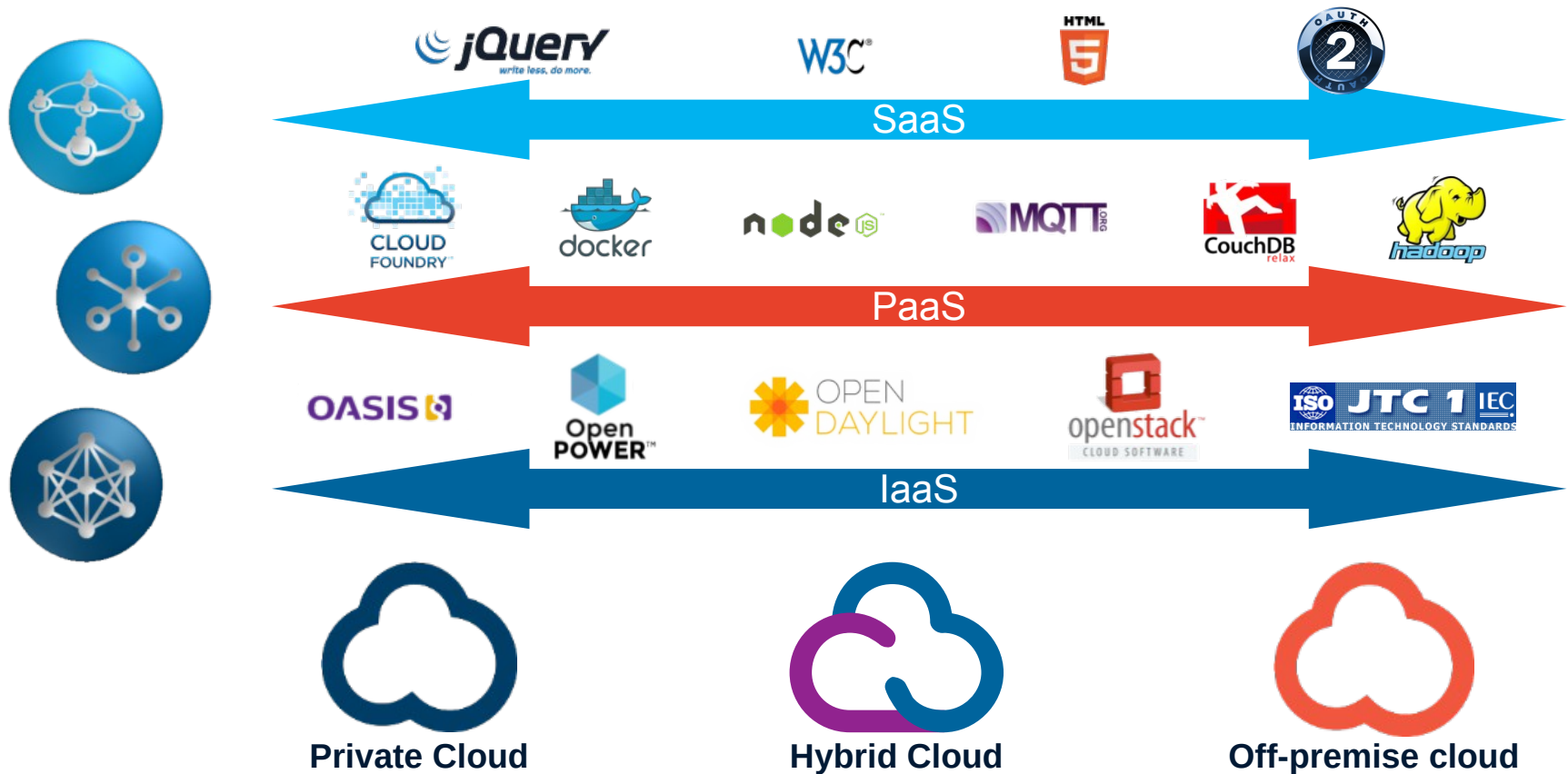| *'Some Assembly Required'*	*Vendor Lock-in Assured*	*Enterprise-ready out of the box*

IBM has established key open technologies

Open technology lynchpins maximize cloud, data & engagement investments

Private Cloud   **Hybrid Cloud**   **Off-premise cloud**

http://www.ibm.com/developerworks/cloud/library/cl-open-architecture/

Don't miss out on the advantages of open technology

IBM Software is Open, by design ᵗᵐ!

Customers are demanding solutions based on market leading open technologies