What’s Happening to the Mainframe?

Today’s mainframe is a hybrid system

DB2 Analytics Accelerator
z/OS
Linux on Sys z
zEnterprise
zBladeCenter
Systems of Record / Systems of Engagement

Touching People / Hosting Processes
How System z Fits

Systems of Engagement  Systems of Record

Client Tier Devices  Middle Tier Server  Back-end Data & Services

Linux on System z  z/OS

The business environment is shifting…

Cloud  Mobile  Social  Big Data  Internet of Things
Gartner: Nexus of Forces

- **Social**: A faster, richer, ubiquitous conversation
- **Information**: Big data evolves toward wisdom – the ubiquitous progress bar
- **Cloud**: The expectation of ubiquitous access
- **Mobile**: Becoming the primary computing platform

Cloud......
The term “cloud computing“ is used so generally and not specifically as to cause confusion.

What does it mean to “move to the cloud?“

A distinction always needs to be made between public cloud and private cloud.
What are the Characteristics of Public Cloud Computing?

- On-Demand Self Service
  - Pick services you need, when you need them
- Broad Network Access
  - Available over network through thin or thick clients
- Resource Pooling
  - Resources are shared, serving multiple consumers
- Rapid Elasticity
  - Capabilities provisioned, in some cases automatically
- Measured Service
  - Pay only for what you use

So then what is a private cloud?

Private cloud is really not a “cloud” at all. It means operating your data center to deliver service in a public cloud-like model.
Why the crazy interest in cloud computing today?

- IT needs to deliver service, to meet the needs of the business you are supporting
- IT has not been doing a good job of this. Users are not satisfied
- A public cloud is a model for IT to do a better job of delivering services to end users
- IT needs to operate as a value center. When IT is a cost center, the only thing they ask you to do is cut costs!
Which of these Characteristics of Public Cloud Computing Interests You as a System z IT Organization?

- **On-Demand Self Service**
  - Pick services you need, when you need them
- **Broad Network Access**
  - Available over network through thin or thick clients
- **Resource Pooling**
  - Resources are shared, serving multiple consumers
- **Rapid Elasticity**
  - Capabilities provisioned, in some cases automatically
- **Measured Service**
  - Pay only for what you use

IaaS with z/VM and Linux on System z

Infrastructure as a Service

Linux on z
z/OS Providing Higher Level Cloud Services

Software as a Service

Platform as a Service

Infrastructure as a Service

z/OS

Linux on z

z/OS in a Hybrid cloud

z/OS

z/OS Connect

Sysplex Distributor

Nodes in a Cloud

REST JSON
Cloud and the API Economy

- API providers and API consumers
- The Enterprise as a Service (EaaS)

Things to remember about cloud and System z

- What is the problem you are trying to solve?
- What is meant by “We should be doing cloud computing?”
- Understand the dissatisfaction with IT that drives the crazy interest in cloud computing.

- The mainframe can provide cloud-like service delivery if that is what your business requires.
- Understand what is going on with public cloud in your shop.
- Make sure you, and System z, are a part of the cloud conversation at your shop.
Mobile.....

When I was your age we didn't play video games or take photos or locate things—we just did one thing and we took our sweet time doing it.
Typical mobile environment

- Client Tier Devices
  - OS Device Variety
  - Screen size variety
  - Various Smartphones
  - Tablets

- Middle Tier Server
  - Web Application Server
  - Mobile Application Runtime Server
  - Security components
  - Back-end access services
  - Caching to back-end services

- Back-end Data & Services
  - Databases and Data sources
  - Transactional services

- Systems of Engagement
- Systems of Record

System z bridges Systems of Record and Systems of Engagement

- Systems of Engagement
  - Mobile Apps
  - Cloud APIs
  - Existing Web Apps
  - Systems of Engagement are cloud-based, decentralized, support rapid app development

- Systems of Record
  - Finance
  - Accounting
  - Order Fulfillment
  - Corporate Data Warehouse
  - Linux on z
  - z/OS
  - Systems of Record are well integrated, trusted repositories
IBM Worklight overview

**Worklight Studio**
The most complete, extensible environment with maximum code reuse and per-device optimization

**Worklight Server**
Unified notifications, runtime skins, version management, security, integration and delivery

**Worklight Device Runtime Components**
Extensive libraries and client APIs that expose and interface with native device functionality

**Worklight Console**
A web-based console for real-time analytics and control of your mobile apps and infrastructure

---

**Worklight Server**

Worklight Server is a WebSphere Application Server (WAS)/Java application, supported on System z Linux – WAS 7, 8, 8.5 on SLES 10, 11, and RHEL 5, 6. It provides:

- **Adapters** are used to communicate to back-end services like databases, transaction systems, MQ, etc.
- **Data Transformation** - JSON is used to communicate to mobile devices – translation is done to HTTP or Web Services that are used by server components.
- Server and device **Security** control
- Controls Application Deployment and **Versioning**
- **Push Notification** administration
- **Analytics** including user adoption and usage data
- An **Enterprise App Store** for your B2E applications.
Re-purposing existing System z data and transactions for mobile

- Subsystems (CICS, IMS, DB2) mobile-friendly with New APIs
- z/OS transactions more mobile-friendly with z/OS Connect
- Seamlessly channel back-end enterprise systems to mobile devices with Worklight Server
- Enable end to end security from mobile device to mainframe with z/OS, RACF and IBM SWG products

Social…….
The social graph is transforming the way we interact

30 billion pieces of content are shared on Facebook each month

Pinterest drives more traffic to retail sites than Google+, YouTube and LinkedIn combined

66% of top financially performing companies leverage social in their processes

More companies Now use social Internally than Externally

Social Media Explained

- "I’m eating a donut"
- "I like donuts"
- "This is where I eat donuts"
- "Here’s a video of me eating a donut"
- "Here’s a vintage photo of my donut"
- "Here’s a pretty donut recipe"
- "Here’s a viral picture of my donut"
- "My skills include donut eating"
- "Now listening to "Donuts"
- "I’m a Google employee who eats donuts"
What is social business?

- A lot more serious than getting a nice presence on Facebook or Twitter or Google+

- The application of social networking tools, ideas and culture to business roles, processes and outcomes
  - Collective intelligence
  - A new way of working
  - Understand market shifts

Three elements of successful Social Business approaches
Social business creates value across every level of your company.

Product Development
- Speed to market
- Can develop and bring new products to market 23% faster

Skill
- Increased interest
- Develop skills 50% faster using the largest network of specialists and experts

Marketing
- Reaching new audiences
- Can achieve 100% increase in market exposure

Sales
- Improving productivity
- Can increase loan/sales volume by 34% and reduce operating costs by 85%

Customer Service
- Improving customer retention
- Deliver customer service 95% faster
- A 24x7 automatic push notification and self-service delivery

Spanning Systems of Record and Systems of Engagement
Collaboration software for Linux on System z

IBM Connections
Social Software for Business

Empowers users to be more innovative and helps them collaborate & execute more quickly with dynamic networks of co-workers, partners and customers.

- **Home page**
  See what’s happening across your social network

- **Communities**
  Work with people who share common roles and expertise

- **Files**
  Post, share, and discover documents, presentations, images, and more

- **Wikis**
  Create web content together

- **Activities**
  Organize your work and tap your professional network

- **Profiles**
  Post updates to your board and find the people you need

- **Forums**
  Exchange ideas with, and benefit from the expertise of others

- **Social Analytics**
  Discover who and what you don’t know via recommendations

- **Blogs**
  Present your own ideas, and learn from others

- **Bookmarks**
  Save, share, and discover bookmarks

---

Big Data......
Technological immortality

- “…each of us now leaves a trail of digital exhaust, an infinite stream of phone records, texts, browser histories and other information that will live on forever.”
  
  - The Human Face of Big Data
Analyzing all the data about customers adds business value.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Analysis</th>
<th>Business Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional ROBMS</td>
<td>Analyze all customer records across departments</td>
<td>Complete view of customer value to the company</td>
</tr>
<tr>
<td>External Data</td>
<td>Analyze customer sentiment and experience</td>
<td>Attract and retain customers</td>
</tr>
<tr>
<td>Real Time Data</td>
<td>Analyze customer data as it happens</td>
<td>Personalize customer interaction in real time</td>
</tr>
</tbody>
</table>
What is big data?

**big data**

Data sets so large and complex that it becomes difficult to process using relational databases

The challenges include capture, curation, storage, search, sharing, transfer, analysis and visualization

Analysis of a single large set of related data allows correlations to be found

Can be used to identify trends, patterns and insights to make better decisions


---

**Traditional IM**

- Requirements based
- Top-down design
- Integration and reuse
- Technology consolidation
- World of DW and ECM
- Competence centers
- Better decisions
- Enterprise

**"Big Data" Style**

- Opportunity oriented
- Bottom-up experimentation
- Immediate use
- Tool proliferation
- "World of Hadoop"
- Hackathons
- Better business
- Marketing (+)
What does a big data platform do?

- Analyze a Variety of Information
  - Novel analytics on a broad set of mixed information that could not be analyzed before

- Analyze Information in Motion
  - Streaming data analysis
  - Large volume data bursts & ad-hoc analysis

- Analyze Extreme Volumes of Information
  - Cost-efficiently process and analyze petabytes of information
  - Manage & analyze high volumes of structured, relational data

- Discover & Experiment
  - Ad-hoc analytics, data discovery & experimentation

- Manage & Plan
  - Enforce data structure, integrity and control to ensure consistency for repeatable queries

The big data starting point

Where are organizations getting the most return on Big Data projects?

“What types of data/records are you planning to analyze using big data technologies?”

- Transactional data from enterprise applications: 72%
- Sensor/machine/device data: 42%
- Social media (Facebook, Twitter, etc.) data: 35%
- Unstructured content from email, office documents, etc.: 35%
- Clickstream: 27%
- Locational/geospatial data: 27%
- Image (large video/photographic) data: 13%
- Scientific/genomic data: 12%
- Other: 7%
- Don’t know: 5%
- Base: 60 IT professionals (multiple responses accepted)

Most big data use cases hype its application for analysis of new, raw data from social media, sensors, and web traffic, but we found that firms are being very practical, with early adopters using it to operate on enterprise data they already have.

Source: 2012 IBM Global Big Data Online Survey
What is Hadoop?

Hadoop is an open source software framework from the Apache Software Foundation that supports data-intensive highly parallel applications.

High throughput, batch processing
Designed to run on large clusters of commodity hardware
- Lots of cores – inexpensive cores working all the time
  - Processors fail – that’s ok – just replace them
- Lots of redundant disks – really inexpensive disks
  - Disks crash – that’s ok – just replace them
  But nothing in Hadoop requires commodity cores and disks!
- Two main components
  - Hadoop Distributed File System (HDFS)
    - Self-healing, high-bandwidth clustered storage
  - MapReduce engine
    - A simple, powerful framework for parallel computation

So what does this have to do with the mainframe?

“You can’t do analytics on the mainframe.”
- most any CIO over the past few decades

“Our thinking has created problems which cannot be solved by that same level of thinking.”
- a pretty wise dude
Two System z solutions for using Hadoop

Veristorm vStorm Enterprise
On-platform analysis of data that does not fit with relational tools
Safely combine z/OS and external data for analysis (e.g. improving claims response time)

IBM InfoSphere BigInsights
VSAM
GSAM
SMF, RMF
System logs
Operator logs
Application logs

vStorm Connect

zDoop

Linux (IFLs)

z/OS

x-based

p-based

DB2 z/OS can integrate insights from big data sources to augment analysis (e.g. improve accuracy of fraud detection with "nuggets" from social media)

System z: An integrated data lifecycle

Faster, more accurate scores
Streamlined decisioning process
Faster transactions
Faster, more accurate reporting

SPSS
ODM/BPM
CICS/IMS
WebSphere
SAP, …

Cleanse Transform Warehouse

InfoSphere IDAA

Cognos
IDAA

SPSS CPLEX
IDAA

Analyze

Report

Scoring

Rules/Processes

Faster transformation of data

(c) Copyright 2014 IBM Corporation
So what’s happening to the mainframe…….? [IBM]

We’re ready to begin the next phase of keeping things exactly the way they are! [IBM]