Effective IT Optimization with IBM System z
From Large to Small IT Infrastructures
What keeps IT executives up at night?

- What direction should we pursue?
- How do I change the culture and speed within the organization?
- How can I increase investors value?
- How do I keep consistent revenue growth and profitability?
- How do I balance cost cutting and control with investment for operational readiness?
- How do I balance competing resource demands across functions?
- How can I meet the expected operational and capital expense?
- How can I be sure our data will not be leaked?
Is virtualization the answer to the question?

- **We know you are virtualizing already, and it helps, but to what extent?**
- **Does it solve your IT budget problem?**
  - How many x86/Unix servers do you still deploy every month – even using virtualization?
  - How much data center space have you saved through virtualization, will it become a problem?
  - How big is the energy consumption growing?
  - How many additional people are required to maintain the growing number of servers?
  - How will the software license cost grow, including the virtualization software?
  - How can IT availability ensured, what happens in the case of a disaster?
Strategies to Reduce Costs and Improve Value

- Optimize the Overall IT Environment
  - Consolidate Hardware Infrastructure
  - Consolidate Redundant Software and Data
  - Improve Service Delivery

**Integrated Service Management**
- Visibility
- Control
- Automation
- Cloud Computing

- SOA
- Compress
- Deduplicate
- Integrate
- Archive
Cloud Computing – Based on Virtualization and Standardization

- **Cloud Computing – characteristics**
  - Rapid elasticity
  - Broad network access
  - Resource pooling
  - Measured service
  - On-demand self-service

## The New Evolution of the IT Infrastructure

### Large Infrastructure
- x86 RACK Systems
  - 15 kw/m²
  - 20x more Expensive
  - 38%

### x86 Blade Center Systems
- Energy Use¹

### IBM zEnterprise
- 1.5 kw/m²
- 95% Less Cost
- 90%

### Small Infrastructure
- Less Space
- Less Power
- Less Admins
- More Efficient

---


© 2013 IBM Corporation
Linux on System z – take back control of your IT
A data center in a box – not a server farm

- Potentially lower cost of operations
  - Less servers
  - Fewer software licenses
  - Fewer resources to manage
  - Less energy, cooling and space

- Simplified hosting for a private cloud
- Increased resource utilization
- Fewer intrusion points
  - Tighter security
- Fewer points of failure
  - Greater availability

It’s simple
System z® and Linux provide a better, faster solution to IT complexity
Linux on IBM System z

*Linux + Virtualization + System z = SYNERGY*

- **The legendary IBM mainframe – IBM System z**
  - Legendary dependability
  - Extremely security-rich, highly scalable
  - Designed for multiple diverse workloads executing concurrently
  - Proven high volume data acquisition and management

- **The IBM mainframe virtualization capabilities – z/VM**
  - Support for large real memory and 32 processors in a single partition
  - Enhanced security and LDAP server/client
  - Enhanced memory management for Linux guests
  - Enhanced management functions for Linux

- **Open standards operating system – Linux for System z**
  - Reliable, stable, security-rich
  - Available from multiple distributors
  - Plentiful availability of skills administrators and developers
  - Large selection of applications middleware and tooling from IBM, ISVs and Open Source
### Client feedback from Systems Directions study

#### Reasons to run workloads on Linux on System z

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Savings</td>
<td>55%</td>
</tr>
<tr>
<td>z/VM virtualization capabilities</td>
<td>45%</td>
</tr>
<tr>
<td>Performance</td>
<td>42%</td>
</tr>
<tr>
<td>Server consolidation ratio</td>
<td>36%</td>
</tr>
<tr>
<td>HA solution</td>
<td>30%</td>
</tr>
<tr>
<td>Access co-resident data</td>
<td>27%</td>
</tr>
<tr>
<td>Security</td>
<td>27%</td>
</tr>
</tbody>
</table>

#### Cost saving is the top driver for running Linux on System z, followed by z/VM virtualization capabilities and performance

### Previous Platform for Consolidated Workloads on Linux on System z

<table>
<thead>
<tr>
<th>Platform</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX based</td>
<td>50%</td>
</tr>
<tr>
<td>Linux from x86/RISC</td>
<td>39%</td>
</tr>
<tr>
<td>Windows based</td>
<td>61%</td>
</tr>
</tbody>
</table>

Source: 2012 IBM Market Intelligence, Percentage of survey respondents
IBM’s Smarter Computing Transformation

Key Technologies

- Comprehensive virtualization
- Ensembles and scalable servers
- Converged networks
- Service Oriented Architecture
- End-to-end service management
- Cloud computing services
System z plays a critical role in optimizing workload deployment

IBM’s Smarter Computing Transformation

- Average utilization increased from <10% to ~60%
- Average reduction in TCO of 70%
- Total cost take-out across 6,500 migrations is ~$50M
- Total cumulative savings project to date ~$100M
- Highest average TCO savings achieved with migrations from UNIX to Linux on System z

Nearly $10,000 per server per year

- Average utilization of System z production servers is >70%
- System z delivers the highest ROI and biggest reduction in TCO of any target platform
- Migrations to System z reduce labor requirements by 50%, freeing up resources for new services

Migrations to System z servers have delivered almost 60% of the project’s total cumulative savings to date

Nearly $10,000 per server per year
What System z hardware can do that x86 cannot

What is different about System z

- **System z hardware is designed to run multiple workloads concurrently**
  - More cache and memory to support shared workloads
  - Dedicated I/O subsystem delivers high bandwidth and achieves high density for workloads with heavy I/O
  - High Performance FICON (zHPF) improves I/O rates and I/O service time
  - Physical I/O adapters and channel are virtualized and shared by workloads
  - Dynamic channel path management (DCM) dynamically adjust the channel configuration in response to shifting workload patterns

- **System z hardware has unique workload management capabilities**
- **System z hardware qualities of service are superior to typical x86 solutions**
What System z hardware can do that x86 cannot

*What is different about System z*

- **System z hardware is designed to run multiple workloads concurrently**
- **System z hardware has unique workload management capabilities**
  - Workload managers efficiently manages dynamically computing resources
  - Workload manager takes processing resources from “donor” workloads when needed
  - Workload management handles workload peaks with maximum core efficiency
  - LPAR isolation/virtualization permits most effective use of resources
  - Sharing resources efficiently with isolation allows multiple environments to co-exist
- **System z hardware qualities of service are superior to typical x86 solutions**
What System z hardware can do that x86 cannot

What is different about System z

- System z hardware is designed to run multiple workloads concurrently
- System z hardware has unique workload management capabilities
- System z hardware qualities of service are superior to typical x86 solutions
  - Comprehensive, multi-layered strategy for reliability and serviceability
  - Concurrent operations with hardware repair and upgrade protects against outages
  - Highest availability and lowest downtime
  - Capacity on Demand provides elasticity to handle unexpected peaks
  - Highest standard for Disaster Recovery
  - Ultimate security – EAL5, virtual machine cannot circumvent workload isolation, HiperSockets™ provide secure memory-speed communication
z/VM – Extreme virtualization

- z/VM helps enterprises meet their growing demands for multi-system server solutions with a broad range of support for operating system environments
- Mature technology – VM/370 introduced in 1972
- Software Hypervisor integrated in hardware
  - Sharing of CPU, memory and I/O resources
  - Virtual network – virtual switches/routers
  - Virtual I/O (mini-disks, virtual cache, …)
- Easy management
  - Self-optimizing workload management
  - Deploy virtual servers in seconds
  - Highly granular resource sharing (<1%)
  - Add physical resources without taking system down, scale out to 1000s of virtual servers
  - Do more with less: More virtual servers per core, Share more physical resources across servers
  - Extensive virtual server life-cycle management
z/VM 6.2 overview

Accelerate the journey to smarter computing with multi-system virtualization and virtual server mobility

**Features:**
- Multisystem virtualization allows up to 4 z/VM instances to be clustered, serviced, and administered as a single system image
- Live guest relocation moves running Linux virtual servers without disruption to the business
- Provides a set of shared resources for the z/VM systems and their hosted virtual machines
- Scales up to four systems horizontally, each with up to 32 CPUs and 256 GB memory
- High server consolidation ratio with support for more virtual servers than any other platform in a single footprint

**Benefits:**
- Relief from the challenges associated with virtual machine sprawl on competitive systems
- Helps clients avoid planned outages for virtual servers when performing maintenance
- Provides a more manageable infrastructure for cloud computing
- Improved systems management to help manage the life cycle of the z/VM hypervisors and the virtual servers
- Enhanced workload balancing with the added ability to move work to available resource in addition to long standing capability to move system resources to work
z/VM 6.3 preview – Smarter Computing with efficiency at scale

- **Improved economies of scale with z/VM support for 1TB of real memory**
  - Better performance for large virtual machines
  - Reduce LPAR sprawl for additional horizontal scalability
  - Reduced administrative expense for management of a smaller number of large capacity z/VM host servers

- **Higher server consolidation ratio with support for more virtual servers than any other platform in a single footprint**

- **Improved performance with HiperDispatch**
  - Improved price performance as a result of higher and more efficient utilization of CPU hardware resources

1. The performance boost expected with HiperDispatch depends on workload characteristics. Memory-intensive workloads running on large numbers of logical processors (16 to 32) are most likely to achieve the highest performance gains.
2. Based on IBM internal measurements and projections.
Virtualization

*What is different about System z*

- **Do more with less**
  - Deploy more servers, more networks, more applications, and more data
  - Achieve nearly 100% utilization of system resources nearly 100% of the time
  - Enjoy the highest levels of resource sharing, I/O bandwidth, and system availability

- **Reduce costs on a bigger scale**

- **Manage growth and complexity**

- **More flexibility, minimize lead time for new projects**
Virtualization

*What is different about System z*

- **Do more with less**
- **Reduce costs on a bigger scale**
  - Save on software license fees
  - Consume less power and floor space
  - Minimize hardware needed for business continuance and disaster recovery
- **Manage growth and complexity**
- **More flexibility, minimize lead time for new projects**
Virtualization

*What is different about System z*

- Do more with less
- Reduce costs on a bigger scale
- Manage growth and complexity
  - Exploit extensive facilities for life cycle management: provisioning, monitoring, security, workload mgmt, capacity planning, charge back, patching, backup, recovery, etc.
  - Add hardware resources to an already-running system without disruption
  - Workload deployment on a “scale up” machine means fewer cables, fewer components to impede growth
- More flexibility, minimize lead time for new projects
Virtualization

*What is different about System z*

- Do more with less
- Reduce costs on a bigger scale
- Manage growth and complexity
- More flexibility, minimize lead time for new projects
  - Workload deployment to a single System z server offers significant advantages in terms of flexibility
  - Rapid provisioning reduces lead time for new IT projects, helping to increase business agility
Examples: Software Costs and Disaster Recovery

*What is different about System z*

Software on Linux is usually priced by the number of processor cores.

On System z, one processor is equivalent to one core!

Coordinated near-continuous availability and DR solution for workloads

Less software acquisition & licensing

DR improvement
Managing Resource Utilization

What is different about System z

- **Software Hypervisor integrated in hardware**
  - Sharing of CPU, memory and I/O resources
  - Virtual network – virtual switches/routers
  - Virtual I/O (mini-disks, virtual cache, …)

- **Shared everything infrastructure through hardware allows for maximum utilization of resources**

- **Designed to support diverse mixed workloads – not just more of the same**

- **Handles peak workload utilization of 100% without service level degradation**
Managing Resource Utilization
What is different about System z

- Software Hypervisor integrated in hardware
- Shared everything infrastructure through hardware allows for maximum utilization of resources
  - Processors, Memory, Network, Adapters, Cryptography, Devices
- Designed to support diverse mixed workloads – not just more of the same
- Handles peak workload utilization of 100% without service level degradation
Managing Resource Utilization

*What is different about System z*

- Software Hypervisor integrated in hardware
- Shared everything infrastructure through hardware allows for maximum utilization of resources
- Designed to support diverse mixed workloads – not just more of the same
  - Intelligent and autonomic management of diverse workloads and system resources based on business policies and workload performance objectives
  - Allows deployment while maintaining one virtual server per application
  - Complete workload isolation
  - High speed inter-server connectivity
- Handles peak workload utilization of 100% without service level degradation
Managing Resource Utilization

What is different about System z

- **Software Hypervisor integrated in hardware**
- **Shared everything infrastructure through hardware allows for maximum utilization of resources**
- **Designed to support diverse mixed workloads – not just more of the same**
- **Handles peak workload utilization of 100% without service level degradation**
  - Utilization often (usually) exceeds 90%
Example: Leverage proximity of data and applications

- Proximity of existing and new applications / data on the same physical System z server allows to “Get the best from your investments”
  - Access from all applications to all data
  - Centralized management
  - High performance
  - High security
Improved IT efficiency and reduced costs

What is different about System z

- Software cost reduction
- Operational and management reduction
- Floor-space and energy reduction
- Network reduction
- Maximizing utilization
- Proximity of data and applications
- Technology refresh effort reduction
- Growth inside a server
- Disaster recovery cost reduction
- Improving security
Best Fit Usage Scenarios for IT Optimization with IBM System z

- Virtualization and server management
- Security services for entire enterprise
- Database and warehouse services
- Cloud and cloud management
- Application development and test
Recommended Workloads for Linux on System z

- **Data services**: Cognos®, SPSS®, DB2®, InfoSphere™, Informix®, Oracle Database, IBI WebFOCUS, …
- **Business applications**: WebSphere Application Server, WebSphere Process Server, Oracle Application Server, …
- **Development and test**: WebSphere®/Java applications – Rational® Asset Manager, Build Forge®, ClearCase®, Quality Manager
- **Email and collaboration**: IBM Domino®, IBM Connections, IBM Sametime, WebSphere Portal, …
- **Enterprise Content Management**: FileNet® Content Manager, Content Manager, Content Manager On Demand
- **Infrastructure services**: WebSphere MQ, WebSphere Message Broker, WebSphere Enterprise Service Bus, DB2 Connect™, FTP, NFS, DNS, Firewall, Proxy, …
- **Cloud management**: Infrastructure (IaaS), Platform (PaaS), Software (SaaS), Business Process as a Service – Tivoli® System Automation Manager, Tivoli Provisioning Manager, Integrated Service Management for System z, Maximo® Asset Management, …

Source: 2012 IBM Market Intelligence, Percentage of survey respondents
Examples of Oracle Solutions on zEnterprise System

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host
- z/OS®
- z/TPF
- z/VSE®
- Linux on System z
- System z PR/SM™
- z/VM
- System z HW Resources
- Support Element

Select IBM Blades
- Certified Oracle Apps
- Linux on System x
- Windows on System x
- AIX on POWER7
- Blade Virtualization

Optimizers
- DataPower XI50z

Blade HW Resources
- zBX

Private data network (IEDN)

Customer Network
- Unified Resource Manager
- Private Management Network INMN
- Private Management Network (information only)
- Private High Speed Data Network IEDN

Examples of Oracle Solutions on zEnterprise System
- Oracle DB 11gR2
- Oracle DB 11gR2
- Certified Oracle Apps
- Certified Oracle Apps
- Certified Oracle Apps
- DataPower XI50z
- DataPower XI50z

Certified Oracle Apps
- Oracle Apps
- Oracle Apps
- Oracle Apps
- Oracle Apps
- Oracle Apps
Linux on IBM System z in 4Q2012

Installed Linux MIPS at 51% CAGR\(^1\)

- 22.8% of total installed MIPS run Linux as of 4Q12
- Installed IFL MIPS increased 32% from 4Q11 to 4Q12
- 36% of System z Customers have IFLs installed as of 4Q12
- 70 of the top 100 System z Customers are running Linux on the mainframe as of 4Q12\(^2\)
- 43% of new System z Accounts run Linux (2010 through 3Q12)
- 32% of all System z servers have IFLs

\(1\) Based on YE 2003 to YE 2012
\(2\) Top 100 is based on total installed MIPS
IT Optimization with IBM System z provides

- **Single server simplicity**
  - Fewer components lead to a simpler and less complex IT environment which requires less administration efforts

- **Efficiency at scale – high flexibility, scalability and resource utilization**
  - All system resources can be shared and directed dynamically between applications, virtually, whenever and wherever they are needed

- **High server capacity with up to 101 cores running at 5.5 GHz**
  - Host up to hundreds of virtual Linux servers in a single footprint

- **Non-disruptive growth within one physical server**
  - Computing capacity can be added on the fly\(^1\)

- **Ultimate security**
  - EAL5 certification and high-speed cryptography integrated as part of the chip

- **Improved economics**
Thanks!

J. L. (Jim) Elliott  
Consulting Sales Specialist – System z  
zChampion & Linux Ambassador  
Systems & Technology Group

IBM Canada Ltd.  
3600 Steeles Avenue East  
Markham, ON  L3R 9Z7

905-316-5813  
Jim_Elliott@ca.ibm.com  
ibm.com/vm/devpages/jelliott/
Backup
## Effective IT Optimization with IBM System z

<table>
<thead>
<tr>
<th><strong>Affordability</strong></th>
<th>Attractive price performance. Offers the lowest TCA for Linux deployment of Oracle database workloads over competition – saving over half the cost¹.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Availability</strong></td>
<td>Near zero downtime/continuous availability, even during maintenance of HW, OS, database and application components. Enhanced disaster recovery responsiveness.</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>Reduced infrastructure complexity through consolidation, automation and virtualization, saving on energy, labor, SW, and more. Management of the end to end applications, fast private network, fewer hops and points of failure. High resource utilization.</td>
</tr>
<tr>
<td><strong>Integration</strong></td>
<td>Capability to handle the largest volumes of data, in a day and age when data is booming. Tight integration and simpler management of data and applications on one system. Homogeneous system environment.</td>
</tr>
<tr>
<td><strong>Scalability</strong></td>
<td>Flexibility and near-linear large scalability, unmatched in the IT world, to grow with your business. Superior virtualization. Unprecedented scale.</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>Comprehensive protection of critical data from all IT security threats. Private server network. Common Criteria Evaluation Assurance Level 5 (EAL5).</td>
</tr>
</tbody>
</table>

¹. Based on measurements at a large bank comparing a production workload running on Oracle RAC DB on distributed versus Oracle RAC DB on Linux a Enterprise Linux Server with cores running at 5.5 GHz.
All information can be incorporated into an enterprise information system on IBM System z.
Deploy Oracle DB to the “Best Fit” technology

Oracle software deployments (incl. consolidations) with an Enterprise Linux Server (ELS) provides an excellent price performance.

- From an Oracle licensing perspective 1 ELS core = 1 core from distributed server
- Less operational efforts
- High levels of security and availability

Business Connexion – South Africa
- ICT services to the financial sector, government, ... and more
- Approximately 50 virtual Linux servers; flexible environment for hosted services; high performance for Oracle databases
- Enabled competitive pricing for client services

Sparda Datenverarbeitung EG – Germany
- IT provider for approximately 4.2 million customers
- Runs a number of very large Oracle databases, where the virtual Linux server requires 30 GB memory and ~350 GB storage
- Experienced >99% availability, which proves the Linux reputation
Upgrading your Oracle DB on Linux for System z to DB2

Some Oracle clients are motivated to look at alternatives

“Most Likely to Succeed” migrations include:
- Simple to moderately complex home-grown applications
- Applications the customer wants to reengineer anyway
- Applications on old or at risk hardware like Itanium
- Applications with available subject matter experts
- Packaged applications that already support DB2

Tools and support to help you move easily:
- Migration Enablement Evaluation Tool (MEET)
- IBM Data Movement Tool (IDMT)
- DB2 Conversion Assessment Questionnaire
- … and much more!

* Based on publically available US $ list prices as of March 15, 2012 including year 1 S&S. DB2 AESE price assumes 100 PVU / core. Oracle price assumes 1.0 multiplier and is calculated by summing the separately purchasable packages and features highlighted on this chart.
Integrated Stack creates compelling value for the Business Users

- Predictive Analytics, BI, DW on highly scalable, secure and available IBM System z®
- Low cost, easy to manage
- Simplified and faster access to the transactional data

Commercial Bank – China

- Wanted to transition to a more suitable platform to support new core-banking system
- zEnterprise is best platform for their large data center - a nationwide consolidation
- Eliminating potential procurement delays

IBM Blue Insight – USA

- IBM’s strategic analytics platform, designed to empower IBM employees
- Offers services for data warehousing and analytics, all based on System z; all data is analyzed using Cognos® for Linux on System z, which generates reports for distribution
- Delivers $25 million savings over five years; enables further savings
SAP Application Server Deployment and Consolidation

**Business Continuity**
- DB on z/OS
- Data Sharing in Parallel Sysplex®
- HA with Tivoli® System Automation

**Server Consolidation**
- Internal near memory-speed communication
- Scale-up and scale-out capabilities
- Fabulous performance throughout

**Embasa - Brazil**
- Manages one of the largest water treatment services
- Needed a high-performance, cost-effective way to introduce SAP software while continuing with the tried and trusted database solution
- Commercially attractive “Solution Edition” gave confidence to go ahead

**Endress+Hauser – Germany**
- Specialist in measurement technology; 89 companies across 42 countries
- Detailed cost-benefit analysis compared Linux on System z to Power®/x86 servers. z/OS, z/VM and a total of 80 IFLs,
- Simple and intuitive user management tools make it possible for just 1.5 FTEs to administer the entire Linux landscape
Develop and Deploy New Applications on System z

- Improved overall batch performance by 50% and data transfer throughput
- HiperSockets™ and virtual networks enable fast communication between Linux and z/OS
- Centralized management helped improve efficiency - reduced operational costs
- Integration of applications within System z made the disaster recovery plan easier
- Only System z is capable of handling a large volume of CICS, DB2 and Java transactions
- “Technical evolution: now we are familiar with Linux on System z and WebSphere for our multiplatform applications in Java.”

Banking Client – Switzerland
- Migration of data warehouse from Oracle applications to DB2 for z/OS
- Migration of Informatica PowerCenter software to new Linux environment on System z
- Developed and deployed new Java™ applications
  - Use of IBM HTTP server and WebSphere Application Server
Build new, modernize and replace old applications utilizing Oracle Database on Linux on System z

- Deploy new applications on System z
- Leverage comprehensive IBM Software portfolio

**Government Client – USA**

- Rich in Sun servers; rapidly growing database workload; running out of space and power
- Solution: IBM zEnterprise 196 (z196), z/VM, Linux, WebSphere Application Server Network Deployment, Tivoli Proventia® Network
- Net result: 106 Solaris/Sun cores down to „just 6“ on z196 (17:1)

- Consolidated Oracle database environment with reduced operating costs and improved performance metrics
- Latency between the Oracle and Solaris environments was greatly reduced
- Long running batch jobs that had took 30 hours in the Sun environment were running in just 15 minutes on the z196
- Server footprint was sharply reduced, giving up valuable floor space while saving energy, maintenance and software licensing costs

**Deploy New Applications to Utilize Oracle Database on System z**
More workloads which Benefit from zEC12

Reliable and Scalable
Business Collaboration
IBM Domino
IBM Sametime
IBM Connections

IBM Enterprise Content Management Solutions
IBM ECM includes one of more of approx. 40 different software products such as FileNet and IBM Content Manager

IBM Maximo Asset Management
Maximo Asset Mgmt. unifies comprehensive asset life cycle and maintenance management on a single platform.

Gruppo API – Italy
The migration of IBM Domino, the corporate email system, worked extremely well. Over a two week period, 1,200 user email boxes were moved to System z without interruption of service to users.

Large Healthcare Insurer – USA
FileNet and Content Manager OnDemand are used with DB2, InfoSphere and Cognos to support the business processes for the Integrated Health Management initiatives.

City and County of Honolulu – USA
With Maximo Asset Mgmt. software, the city deployed a new work order system that combined citizen-provided data and data from the city’s geographic information system to schedule repairs.
Reliable and scalable business collaboration

Imagine the possibilities on zEC12

IBM offers solutions to deliver:
- Exceptional web experience
- Social Software
- Collaboration
- Messaging

IBM's Smarter Computing Transformation
- Highest average TCO savings achieved – $780 per server per month – with migrations from UNIX to Linux on System z.

Gruppo API – Italy¹
- The migration of IBM Domino, the corporate email system, worked extremely well. Over a two week period, 1,200 user email boxes were moved to System z without interruption of service to users.

BG-Phoenics – Germany²
- Email is still highly important; using Linux makes it cost-effective to run this service on the ultra-reliable z196 server with the efficiencies of virtualization on System z.

¹ http://enterprisesystemsmedia.com/article/gruppo-api-consolidates-distributed-platforms-to-system-z10
IBM Enterprise Content Management Solutions

- Enterprise Content Management (ECM) manages unstructured information
  - Capture it, index it, store it, and route it electronically through business processes
  - Analyzing it and deleting it are new capabilities
- IBM ECM includes one of more of approximately 40 different software products
  - e.g. FileNet or IBM Content Manager
- Most components run on Linux on System z.
- IBM is the only ECM solution provider who provides an ECM solution for System z.

- Russian Hydrometeorological Research Institute*
  - World Data Center is the world’s largest publicly available archive for hydrometeorology monitoring data. The solution enables them to collect, process, store and disseminate information digitally. The client can now consolidate different media types and has a simplified data access.

- Large Healthcare Insurer – USA
  - FileNet and Content Manager OnDemand are used with DB2, InfoSphere and Cognos to support the business processes for the Integrated Health Management initiatives. The solution brings together data from disparate sources and creates an enterprise data warehouse that can be used for data mining and forecasting.

IBM Maximo Asset Management

- **Key client business issues:**
  - Cost inefficiencies and operational complexity associated with leveraging the asset infrastructure
  - Need to measure and manage the asset availability and risk across all strategic assets

- **Maximo Asset Management** unifies comprehensive asset life cycle and maintenance management on a single platform.

- **Maximo software provides insight for all of enterprise assets, their conditions and work processes, for better planning and control.**

- **City and County of Honolulu – USA**
  - The original offer was for x86 technology with Oracle on System z, but IBM suggested that a Maximo solution that leverages mainframe application and database would be more advantageous to the customer.

- **Technology Solutions Company – Brazil**
  - Maximo software is used as a single point of management for every aspect of a wide range of public services. Using the solution, a city maintains and monitors its public services, assets, water, roads, parks, urban mobility and utilities, thus performing more preventive and corrective maintenance.

- **IBM Green Data Center – USA**
  - Maximo Asset Management for Energy Optimization transforms data into insights that help staff improve airflow and maximize data center efficiency.

### New Solutions available for System z

<table>
<thead>
<tr>
<th>Solution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IBM Health Plan Integration Hub</strong></td>
<td>The IBM Health Plan Integration Hub is a strategic code and policy management platform that can carry a Health Plan through all the stages of the ICD-10 transformation and beyond: basic code translation, augment with knowledge of policy and business goals, validate to ensure cost neutrality, leverage the ICD-10 granularity to refine service, and keep pace for the next set of codes.</td>
</tr>
<tr>
<td><strong>IBM Intelligent Operations Center for Smarter Cities™</strong></td>
<td>Smarter Operations – across departments and agencies. It leverages information with real-time visibility of key data to drive better decisions, anticipates performance to identify, manage and mitigate incidents that impact operations and coordinates resources and processes to respond to situations rapidly and effectively.</td>
</tr>
<tr>
<td><strong>IBM Smarter Analytics: Anti-Fraud, Waste and Abuse Solution</strong></td>
<td>Detect suspicious transactions prior to payment, minimize loss from overpayments, and recommend method of intervention.</td>
</tr>
<tr>
<td><strong>IBM Smarter Analytic Signature Solution: Anti-Fraud, Waste and Abuse</strong></td>
<td>Detect suspicious transactions prior to payment, minimize loss from overpayments, and recommend method of intervention. It dramatically reduce costs from fraud and abuse, and the more efficient use of investigative resources reduces costs and increases rate of return.</td>
</tr>
<tr>
<td><strong>IBM Genelco® Insurance Administration Solution (IBM GIAS)</strong></td>
<td>Rapidly deploy new policy offerings while improving customer responsiveness. It helps to improve policy servicing and customer responsiveness, accelerate responsiveness to industry and customer change, and to streamline operations through elimination of manual, batch, multi-touch and error prone handling.</td>
</tr>
</tbody>
</table>
Built-in security for Linux workloads

- Industry’s top-rated EAL5+ security classification* for hardware logical partitions (PR/SM LPAR)
- EAL4+ security classification on z/VM offering unmatched levels of secure virtualization and consolidation
- Security-rich holistic design to help protect system from malware, viruses, and insider threats
- Granular access controls integrated across the platform
- Network security features to help address outside threats
- Encryption solutions to help secure data from theft or compromise

The IBM advantage: Only System z can boast the combination of EAL5+, an EAL4+ certified hypervisor, FIPS 140-2 Level 4 and related security certifications

* https://www.bsi.bund.de/ContentBSI/EN/Topics/Certification/newcertificates.html
GDPS/PPRC Multiplatform Resiliency for System z

Configuration example where several Linux nodes are running natively in their own partitions, and all of them are under GDPS® control.

Coordinated near-continuous availability and DR solution for z/OS and Linux