Why you should focus on Linux on IBM z Systems with z13

Session ID: 17776

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World’s leading businesses run on the mainframe

- 92% of the top 100 worldwide banks
- 10 out of 10 of the world’s largest insurers
- 23% of the top 25 US retailers
- 23% out of 25 of the world’s largest airlines

Processing the world’s transactions & data

- 30 billion business transactions processed on the mainframe per day
- 80% of the world’s corporate data resides or originates on mainframes
- 91% of surveyed CIOs said that new customer-facing applications are accessing the mainframe
- 55% of all enterprise applications need the mainframe to complete transactions
New marketplace dynamics will drive hyper growth opportunity for the IBM Mainframe

**Traditional**
1964–2014
- Batch
- General Ledger
- Transaction Systems
- Client Databases
- Accounts payable / receivable
- Inventory, CRM, ERP

**Linux & Java**
1999–2014
- Server Consolidation
- Oracle Consolidation
- Early Private Clouds
- Email
- Java®, Web & eCommerce

**CAMSS**
2015–2020
- On/Off Premise, Hybrid Cloud
- Big Data & Analytics
- Enterprise Mobile Apps
- Security solutions
- Open Source LoZ ecosystem enhancement

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1. MIPS: Millions of Instructions per Second or the metric z uses to measure client workload
2. CAMSS: Cloud, Analytics, Mobile, Social, Security

15 years of Enterprise Linux® on IBM z Systems™ (LoZ)
Linux on IBM z Systems in 2Q2015

Installed Linux MIPS at 45% CAGR*

- 26.7% of Total installed MIPS run Linux as of 2Q15
- Installed IFL MIPS increased by 16% YTY from 2Q14 to 2Q15
- 39% of System z Customers have IFL’s installed as of 2Q15
- 79 of the top 100 System z Customers are running Linux on the mainframe as of 2Q15 **
- 35% of all z Systems servers have IFLs

- 67% of new FIE/FIC z Systems accounts run Linux

* Based on YE 2003 to YE 2014 **Top 100 is based on total installed MIPS
Linux on z Systems omnipresent in Industry

- Banking
- Insurance
- Financial Mkt
- Healthcare
- Education
- Computer Services
- Retail
- Travel&Trans.
- Wholesale Dist.
- Energy&Util.
- Telecom.
- Media&Ent.
- Indust Prod.
- Automotive
- Electronics
- Chemical&Pet.
- Gov't
- Public
- Financial Services
- Distribution
- Comm's
- Industrial
Linux on z Systems value proposition:
Premier quality of service at lowest platform total cost

1. **IT economic** advantage with:
   - Lowest Linux platform TCO for selected workloads & environments
   - Greenest server allowing upgradeability & investment protection

2. **Highly efficient** scaling with industry-leading levels of resource sharing & utilization
   - Scale up - High server capacity with up to 141 cores running at 5 GHz

3. An **open and standard** environment, with support for key open source software & applications

4. **Integrated SOE/SOR environment** for business processes – including cloud, analytics and mobile

5. Leadership levels of **availability & disaster recovery**, with non-disruptive growth of compute capacity

6. Leading **security** environment – EAL5+ support with high-speed cryptography

7. **Cloud ready** with support for multi-tenancy, rapid provisioning, scaling on demand
IBM z13 and Linux
The enterprise grade Infrastructure stack for Linux solutions

**z13**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10 TB</td>
<td>&gt;3X more available memory</td>
</tr>
<tr>
<td>Up to 141</td>
<td>Configurable cores</td>
</tr>
<tr>
<td>Up to 85</td>
<td>Configurable LPARs</td>
</tr>
<tr>
<td>IBM zAware</td>
<td>Maximize service levels</td>
</tr>
<tr>
<td>Larger Cache</td>
<td>More workloads per server</td>
</tr>
<tr>
<td>Crypto Express5S</td>
<td>Performance and function</td>
</tr>
<tr>
<td>SMT2, SIMD</td>
<td>Enhanced performance</td>
</tr>
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</table>

**Enterprise grade Linux solution:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOD:</strong> IBM GDPS® appliance</td>
<td>Continuous availability &amp; Disaster recovery</td>
</tr>
<tr>
<td>IBM Spectrum Scale (IBM GPFS technology)</td>
<td>Clustered file system</td>
</tr>
<tr>
<td><strong>SOD:</strong> KVM for z Systems</td>
<td>Open source virtualization</td>
</tr>
<tr>
<td>IBM Infrastructure Suite</td>
<td>Management suite for z/VM and Linux</td>
</tr>
<tr>
<td>IBM Wave for z/VM</td>
<td>Intuitive virtualization management</td>
</tr>
<tr>
<td>IBM z/VM</td>
<td>Virtualization with efficiency at scale</td>
</tr>
<tr>
<td>IBM z13</td>
<td>Unmatched server technology &amp; capacity</td>
</tr>
</tbody>
</table>

* All statements regarding IBM’s future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

1 Total capacity improvement over zEC12 of 40+ percent
Imagine the possibility of leveraging all of your data assets

Traditional Technique
Structured
Analytical
Logical

Emerging Technique
Creative
Holistic thought
Intuition

New ideas, new questions, new answers

Structured Repeatable Linear

Data Warehouse

Transaction Data
Internal App Data
Mainframe Data
OLTP System Data
ERP Data

Traditional Sources

Hadoop Streams

Unstructured Exploratory Dynamic

Multimedia
Web Logs
Social Data
Text Data: emails
Sensor data: images
RFID

New Sources

Transformational benefit comes from integration of new data sources with traditional corporate data

“Here’s a question, what’s the answer?”

“Here’s some data, are there correlations?”

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Building an Infrastructure for real-time Analytics, Mobile and Cloud consider end-to-end solutions and operational impacts

Real-time “integration of analytics and transaction processing” increases customer value with every interaction

- Deliver real-time insights at the point of impact
- Manage data lifecycle and governance
- Eliminate redundancy and avoid ETL

IBM Software examples

- Cognos BI
- SPSS
- Query Management Facility
- DB2
- DB2 Analytics Accelerator
- InfoSphere® Warehouse
- InfoSphere Information Server
- InfoSphere Data Replication
- InfoSphere Master Data Mgmt
- DB2
- IMS, VSAM
- Non IBM, e.g. Oracle

“Cognos generates insightful reports and sophisticated dashboards, providing quick and accurate information to senior management. We are now adding more reporting functionality - on business revenue, credit data, loan risks, and so on - to make Cognos the complete decision-support system for Sicoob.”

- Paulo Nassar,
  IT Processing and Storage Infrastructure Manager, Sicoob

IBM Cognos Business Intelligence and additional analytics software is running on Linux on z Systems
High Availability scenario as Active/Passive with System z

- **Active / Passive Deployment.**
  - Workload normally contained at Site 1, standby server capability at Site 2
  - Primary and secondary disk configurations active at both sites.
  - During fail over, Capacity Upgrade on Demand (CUoD) adds resources to operational site, and standby servers are started. Helps save hardware and software costs, but requires higher recovery time.

- **Hot / Cold scenario**
  - Workload is not split.
  - Each site is configured to handle all operations
  - Cold environment needs longer to get active – often used in DR

- **Hot / Warm scenario**
  - Workload is not split
  - Each site is configured to handle all operations
  - Warm environment is idling.
High Availability with an active/active environment on System z

- **Active / Active Deployment - Expendable work.**
  - Workload is normally split between 2 or more sites
  - Each site is (over) configured to be able to instantly cover the workload if needed.
  - During normal operation, excess capacity at each site is consumed by lower priority, work like development or test activities
  - In a failover situation, low priority work is stopped to free up resources for the production site’s incoming work.

**Capacity Upgrade on Demand (Active / Active )**
- Workload is normally split between sites.
- Each site is configured with capacity to handle normal operations
- Special setup with Capacity Upgrade on Demand (CUoD).
- In a failover situation, additional CPUs are enabled at the operational site.

IBM System z / zEnterprise

z/VM (SSI)

Network
GDPS for Linux on z Systems: IBM GDPS appliance for Linux on z Systems

- The IBM GDPS appliance for Linux on z Systems will provide high availability in case of system, application or network failure.

- In the first half of 2015, IBM intends to deliver a GDPS/Peer to Peer Remote Copy (GDPS/PPRC) multiplatform resiliency capability for customers who do not run the IBM z/OS operating system in their environment.

- This solution is intended to provide IBM z Systems clients who run IBM z/VM and their associated guests, for instance, Linux on z Systems, with similar high availability and disaster recovery benefits to those who run on z/OS.

- The implementation of the new GDPS Appliance for Linux will offer business continuity for Linux-only environments.
IBM Enterprise Linux Server (ELS) & IBM Enterprise Cloud Server (ECS)

Data center simplicity inside one box

An enterprise grade Linux infrastructure solution

• Proven Linux platform with:
  • Data center simplicity
  • Trusted operations
  • Unrivalled economics
• Allows to start small and grow inside the server
• Server and virtualization capabilities to run a large number of workloads
  • Highly efficient and economical
• Designed from the ground up for enterprise-class workloads
  • Unrivaled levels of qualities of service

• Supports all kind of workload deployments
  • Enables cloud, analytics, mobile computing at an attractive price
Effective Virtualization with Linux on z and z/VM shared memory

Linux Shared Memory Exploitation for many Virtual machines

z/VM Discontiguous Saved Segments (DCSS)

- **DCSS support is Data-in-Memory technology**
  - Share a single, real memory location among multiple virtual machines
  - Can reduce real memory utilization

- **Use Cases:**
  - As fast Swap device
  - For sharing read only data
  - For sharing code (e.g. program executables/libraries)

- The large DCSS allows the installation of a full middleware stack in the DCSS (e.g. WebSphere, DB2, etc)
- The DCSS becomes a consistent unit of one software level

http://public.dhe.ibm.com/software/dw/linux390/perf/ZSW03186USEN.PDF
IBM Cloud Manager with OpenStack for z Systems

- **Heterogeneous and integrated management support**
  - z Systems managing 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 on z Systems
  - Workload deployment based on patterns speeds delivery of new services

- **Hybrid Cloud support**
  - Hybrid Clouds on and off premise options via SoftLayer support

IBM announcement 17.Feb 2015
IBM Cloud Manager (ICM) with OpenStack 4.2

• Easy-to-use cloud management offering based on OpenStack and Chef
  • Integrates Chef server/client for Linux on z; built-in HEAT engine works with Chef
  • IBM value-add: simplification, robustness enhancements, and support
The Cloud Manager Appliance (CMA) – via z/VM 6.3 service

In order to provide an easy method to deploy an OpenStack controller or compute node with z/VM support and to provide an entry level IBM Cloud Manager with OpenStack for z Systems, the z/VM Cloud Manager Appliance (CMA) is provided.

CMA contains the following parts:

- Cloud Manager components
- OpenStack Enterprise Edition
- xCAT

- z/VM 6.3 Support: **VM65676: SUPPORT FOR Z/VM CLOUD MANAGER APPLIANCE 4.2.0.2**
Data: From Database to Information Management

- IBM Data Analytics Accelerator on z Systems
- BI solutions
- IBM BigInsights and Hadoop on z Systems
- DB2 BLU
Columnar Everywhere

- Reduce I/O
- Increase data density in RAM
- Increase CPU efficiency

Skip Boring Data

- Queries skip uninteresting data
- Synopses on every column, automatically.
  - “Data Skipping”

Rethink Memory

- Cache intelligently for analytics
- Predictive I/O with “Dynamic List Prefetching”
- Massive I/O reduction

#ibmblu
DB2 w/ BLU Acceleration for Linux on z Systems

Solution
• DB2 with BLU Acceleration is the preferred solution for customers who would like to run analytics on z Systems Linux data
• Satisfy requirement for a columnar in-memory db
• Alternative of Linux on z Oracle installations
• Enhanced for distributed consolidations onto z Systems
Load-and-go simplicity

• LOAD and then... run queries
  • Significantly reduced or no need for ...
    • No indexes
    • No storage reclaim (it’s automated)
    • No memory configuration
    • No process model configuration
    • No statistics collection (it’s automated)
    • No MDC or MQTs
    • No Statistical views
    • No optimizer profiles/guidelines

“The BLU Acceleration technology has some obvious benefits: ... But it’s when I think about all the things I don't have to do with BLU, it made me appreciate the technology even more: no tuning, no partitioning, no indexes, no aggregates.”

-Andrew Juarez, Lead SAP Basis and DBA

#ibmblu
BLU Acceleration runs Oracle Code

- Oracle compatibility with BLU Acceleration
- Built in PL/SQL compiler
- Source level debugging and profiling
Business Analytics Solutions on zEnterprise

**Business analytics capabilities**

<table>
<thead>
<tr>
<th>Cognos – Business Intelligence</th>
<th>SPSS – Predictive Analytics</th>
<th>TM1 – Performance Management</th>
<th>BigInsights – Investigative Analytics</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Cognos Logo" /></td>
<td><img src="image" alt="SPSS Logo" /></td>
<td><img src="image" alt="TM1 Logo" /></td>
<td><img src="image" alt="BigInsights Logo" /></td>
</tr>
</tbody>
</table>

**Business outcomes/benefits**

- Understand current & potential state
- Monitor results & fine-tune your business
- Inform strategy with a view into the future
- Predict customer segment & category affinity
- Market Basket Analysis to identify NBO
- Overlay browsing history onto purchase history to profile customers
- Reporting, analysis, operational & financial planning and consolidation
- Product profitability across customers, business & channels
- Sales Performance Management to improve efficiency in incentive compensation process
- Gain additional insights from LOGs, social media, streams, machine data, mass archives
- Understand and visualize the context of data in unstructured documents, LOGs and understand customer sentiment
Apache™ Hadoop® is an open source software project that enables distributed processing of large data sets across different clusters

- Leverage the power of Hadoop on z Systems
- Drag-and-drop extracts from z Systems sources
- Protect sensitive data
- Faster application delivery
- Seamless interoperability

IBM InfoSphere® System z Connector for Hadoop

*Fast and seamless data connectivity between a variety of mainframe data sources and IBM InfoSphere BigInsights*
Enrich data-driven applications with social media data

• Data professionals can now incorporate Twitter’s rich data streams into analytic applications using IBM BigInsights for Hadoop on Cloud. BigInsights has social media tooling built-in, allowing you to import data in motion from the Twitter Decahose, and gather, analyze and visualize data from multiple sources.

• Soon, data professionals will be able to integrate Twitter data into IBM DataWorks, a cloud-based data refinery service. And entrepreneurs and developers will be able to bring compelling new insights to applications using Watson Developer Cloud and IBM Bluemix platform-as-a-service.

Integration: Web Application Hosting and SOA Integration - IIB

- **IIB – IBM Integration Bus** - business information to flow between disparate applications across multiple hardware and software platforms.
- Ability to consolidate many Linux and WebSphere Application Server (WAS) instances to a single server footprint
- Better disaster recovery capabilities since all artifacts grouped
- Ability to shared WAS binaries across multiple Linux instances hosted by z/VM virtualization
- Ability to create new instances of WAS very quickly

<table>
<thead>
<tr>
<th><strong>Traxpay - Germany</strong></th>
<th><strong>Bank of Tokyo-Mitsubishi UFJ (BTMU) - Japan</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Traxpay looked to redesign the B2B payment process to offer an innovative financial transactions platform, enabled 24/7</td>
<td></td>
</tr>
<tr>
<td>- Banking connections are implemented in Java using WebSphere Application Server. Highly secure point-to-point communication links are established with IBM WebSphere MQ</td>
<td></td>
</tr>
<tr>
<td>- ELS and WebSphere allows to deliver the utmost in online performance, reliability, and security for our customers</td>
<td></td>
</tr>
<tr>
<td>- BTMU developed a Service Oriented Architecture (SOA) platform to realize this &quot;cloud-banking&quot; concept</td>
<td></td>
</tr>
<tr>
<td>- It does „not only enables service linkage on Linux and other systems, but also scalability“</td>
<td></td>
</tr>
<tr>
<td>- SOA platform, leveraging WebSphere Message Broker, has accelerated the ability to build services in response to business issues</td>
<td></td>
</tr>
<tr>
<td>- 18% increase of re-utilization rate of services*</td>
<td></td>
</tr>
</tbody>
</table>

* as of March 2012
Benefits from the IBM Integration Bus (IIB)

- Flexible integration with Cloud, Analytics and Mobile
- Standard Interfaces,
- Intelligent transformation and routing
Open technologies with IBM Integration Bus (IIB)

- Removal of MQ as a Pre-req - First class support for MQ, but no long a must have

- New IIB initiative to develop integration components as open source
  - Part of continuing tradition of IIB supporting open standards
  - Source freely available on popular Github website under flexible Eclipse Public License
  - Community contributions (including modifications) actively encouraged!
  - Fully supported technologies delivered into IIB as appropriate

- Varied initial contributions targeting transferrable, embeddable assets
  - MQTT Client connectors
    - Easy-to-use inbound and output connectors to MQTT servers
    - Uses open framework for platform-independent connectors
  - DFDL Schemas for popular industry formats
    - E.g. HL7, ISO8583, IBM4690-TLOG, NACHA, PCAP, EDIFACT
  - Chef cookbooks for simplified IIB provisioning
    - Customizable scripts allows building of complete IIB environments
  - Tools for easier conversion between integration products
    - Initially targeting WESB to IIB
  - Source for common integration patterns (e.g. event filter)
The MobileFirst hub on IBM z13 connecting to Core Systems

- Mobile protocol connectivity with cloud, SOA, SAP and core z Systems applications including CICS, IMS, TPF, MQ, IIB and DB2

- Mobile application support with WebSphere Application Server on z Systems

- Server side software components and adapters for channeling z Systems to mobile devices with IBM MobileFirst Server V7
The ultimate JavaScript environment: Node.js

Node.js and Linux on z Systems

High Performance
- Highly scalable, event-driven platform with non-blocking I/O
- Thousands of concurrent connections with minimal overhead
- Unified JavaScript ecosystem for client and server
- Up to 29% better performance over Intel on AcmeAir*
- One of the fastest growing eco-systems

z Systems Connectivity
- Co-locate Node.js applications for reduced latency accessing z/OS data/services

Security and Dependability
- Leverages the trusted environments of z Systems to maximize security and uptime of critical Node.js applications.

Unified Diagnostics and Monitoring with IBM
SDKs for Java®
- Compatible with latest Joyent Node.js v0.10.* releases

Core Strength
- Node is FAST and highly concurrent
- Node is built for I/O
- Node is perfect for APIs
- Node powers full-stack JS

Integration with JSON APIs

IBM SDK for Node.js Version 1.1 for Linux on z Systems

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- New Java 8 Language Features
  - Lambdas, virtual extension methods

- IBM z13 exploitation
  - Vector exploitation and other new instructions
  - Instruction scheduling

- General throughput improvements
  - Up-to 7% better application throughput
  - Significant improvements to ORB

- Improved crypto performance for IBMJCE
  - Block ciphering, secure hashing and public key
    - Up-to 4x improvement to Public Key using ECC
    - CPACF instructions: AES, 3DES, SHA1, SHA2, etc

- Significantly improved application ramp-up
  - Up-to 50% less CPU to ramp-up to steady-state
  - Improved perf of ahead-of-time compiled code

- Improved Monitoring
  - JMX beans for precise CPU-time monitoring

- Enhancements to JZOS Toolkit for Java batch
Z13 and Java 8 performance boost
WAS Liberty 8.5.5.5 – SSL enabled DayTrader

WAS 8.5.5.5 with SSL (clear key)
z/VM Linux on z - 5 IFLs

(Controlled measurement environment, results may vary)
IBM Spectrum Scale for Linux on z Systems

Provides fast data access and simple, high available data management

- Streamline Data access
- Centralize Storage Management
- Improve Data Availability
IBM Spectrum Scale for Linux on z Systems
Based on IBM GPFS technology

Robust clustered file system

- Concurrent high-speed, reliable data access from multiple nodes
- Extreme scalability and accelerated performance
- Smooth, non disruptive capacity expansion and reduction

One cluster configuration example

Linux instances in LPAR mode or on z/VM, on the same or different CECs

Up to 32 cluster nodes with same or mixed Linux distributions / releases

Support for ECKD™-based and FCP-based storage

Heterogeneous clusters w/ client nodes w/o local storage access running Linux on x86 or POWER®

Supported storage:
- DS8000®, IBM FlashSystem™, IBM Storwize® V7000, SVC, IBM XIV®,

Supported workloads:
- WebSphere App. Server, IBM MQ® or similar workloads
Drive more business value with FlashSystem
Linux on System z & IBM FlashSystem: Highest Reliability, Maximum Performance

Linux on System z can help achieve a smarter IT infrastructure that:

- Provides efficiency at scale on a single physical server
- Delivers industry-leading virtualization for effective deployment
- Enables flexible delivery of services through a private cloud
- Delivers real-time information and insight from data
- Provides unmatched security and reliability

Performance of Linux on System z with FlashSystem
I/O bound relational databases, like Oracle, can benefit from IBM FlashSystem over spinning disks.

- 21x reduction in response times*
- 9x improvement in IO wait times*
- 2x improvement in CPU utilization*

Now you can leverage the “Economies of Scale” of Flash

- Accelerate Application Performance
- Gain Greater System Utilization
- Lower Software & Hardware Cost
- Save Power / Cooling / Floor Space
- Drive Value Out of Big Data

Why IBM FlashSystem for Linux on System z?

Extreme Performance
- Cut IO Wait Time 80%
- 3X increase in IOPS
- Latency Under 100 Microseconds

Enterprise Reliability
- Highest Reliability levels
- Purposed-built, Enterprise Architecture

Macro Efficiency
- No application or architecture changes
- Reduce floor space, power & cooling
- Benefits & economics out weigh disk

IBM MicroLatency™
- Servers, Applications and Databases are FASTER!
- Go FROM 7 milliseconds to 700 microseconds

* IBM internal test results
IBM zAware V2.0 - Analyze Linux on z Systems

IBM zAware is available with z13 for Linux on z Systems to deliver a creative availability solution to help maximize service levels

- Faster insight into the health of the Linux on z images
- Identify unusual system behavior of the Linux on z images
- Support for Linux on z message log analysis

- User can group multiple systems' data into a combined model: by workload (e.g. for all web servers), by solution (e.g. one model for your cloud), or by z/VM host
- Support for native or guest Linux on z images
- IBM zAware delivered on IBM z13 builds on previous IBM zAware function
Linux on z13
An Enterprise grade Linux on z Systems solution portfolio

Cloud
Custom Patterns for Linux on z Systems
PostgreSQL

Data and Analytics
IBM InfoSphere BigInsights
IBM DB2 BLU

Mobile
Node.js
Internal Integration

Trusted Computing
Spectrum Scale (GPFS technology)
IBM zAware V2.0
Crypto Express5S
SOD: GDPS Virtual appliance

Openness and Pricing
OpenSource and SOD: KVM
Large memory
Enterprise Linux Server and Enterprise Cloud System

Outstanding Capacity
IBM z13

- 141 High performance cores
- Simultaneous multi-threading
- 10TB Memory
- 320 16 GB/sec Channels
- 2X Cache and I/O Bandwidth
- Single instruction, multi data
Clients run many different workloads on Linux on z Systems

- Databases
  - Database deployment

- Web application and SOA infrastructure
  - WebSphere Application Server
  - WebSphere MQ
  - IBM Integration Bus

- Real-time insights
  - SPSS
  - Cognos
  - Warehouse
  - BigInsights
  - Info.Server
  - Master Data Mgmt

Open Source Priorities in 2015

Databases-Messaging
- PostgreSQL
- MongoDB
- CouchDB
- RabbitMQ
- MariaDB

Dev Languages-Environments
- Node.js
- Ruby
- OCaml
- Erlang
- Python
- GCC
- Go

Cloud Infrastructure
- Docker
- OpenStack
- Chef
- Puppet Labs
- Cloud Foundry

Cluster Computing
- GemFire
- Cloudant
- Spark

Details in Session IIM2757 on Thursday May 14, at 1:45
New Open Source products Ready for Download

**Linux on System z Open Source Ecosystem**
ibm.com/developerworks/community/groups/community/lozopensource

<table>
<thead>
<tr>
<th>Package</th>
<th>SLES 12 x</th>
<th>RHEL 7.x</th>
<th>SLES 11x</th>
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<td>IBM zEnterprise is Enterprise Cloud Infrastructure</td>
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http://www.vm.ibm.com/education/lvc/

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Questions?

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