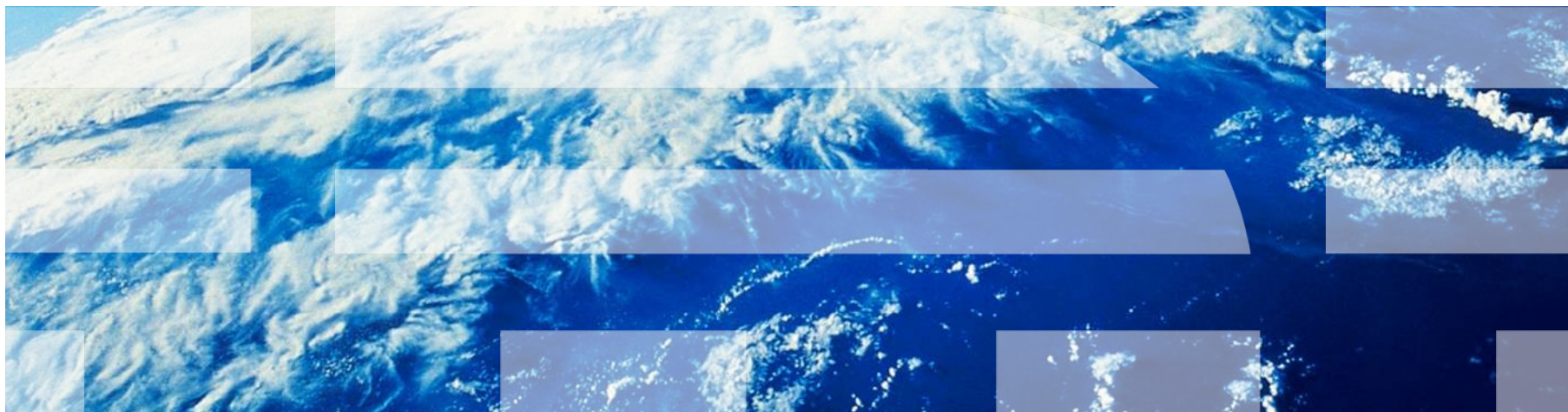


Open Source and Linux on the Mainframe



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Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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Agenda

- Open Source and Open Standards
- Linux on System z
- Linux Distribution
- Open Source Software beyond Linux Distributions
- Linux Distributions for Linux on System z
- OSS & Middleware Integration
- Strategy and Outlook



Open Source Software (OSS)

- **The basic idea behind open source is quite simple:**
 - ▶ When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves
 - ▶ People improve it, people adapt it, people fix bugs
 - ▶ And this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing

- **What is Open Source?**
 - ▶ Community develops, debugs, maintains
 - ▶ “Survival of the fittest” – peer review
 - ▶ Generally high quality, high performance software
 - ▶ Superior security – on par with other UNIX, superior to Windows



Open Source Initiative, OSI: www.opensource.org

Beginning of Open Source Software

- Free software has been available on the mainframe since the early days
- But at that time the wording was different, not Open Source
- Starting at IBM 704 / 705 days – magnetic tapes, the first movable electronic data storage mediums that could be easily reproduced, were introduced
- Code was mainly exchanged on tapes, but also before on card decks
- Tapes were shared at conferences and maintained by a few individuals
- Large collections are still available <http://www.cbttape.org/histmods.htm>
- Today large packages for VM/370, MVS, OS/390 and z/OS are available as Open Source



Open Source Software for the Mainframe except Linux

Perl **BASH** **Info-ZIP** *gzip*



- **Open Source Software for z/OS and OS/390 UNIX**

Redbook, by M. Maclsaac, S. Bárány, et al

<http://www-03.ibm.com/servers/eserver/zseries/zos/unix/redbook/index.html>

Apache, PHP, Emacs, GNU Tools, Samba, MySQL, and more (bin & src)



- **z/OS UNIX tools**

<http://www-03.ibm.com/servers/eserver/zseries/zos/unix/bpxa1ty2.html>

- **Tools and toys (external project links)**

<http://www-03.ibm.com/servers/eserver/zseries/zos/unix/bpxa1toy.html>



- **IBM Ported Tools for z/OS**

http://www-03.ibm.com/servers/eserver/zseries/zos/unix/port_tools.html

<http://www-03.ibm.com/servers/eserver/zseries/zos/unix/bpxa1ty1.html>



- **OS/390 and z/OS Freeware** by Lionel B. Dyck

<http://www.lbdsoftware.com/>

http://www.lbdsoftware.com/Packaging_zOS_Open_Source_Software_For_Distribution.pdf



- **To some extent part of the Unix System Services (former OpenEdition)**

- **And much more...**



Linux and Open Source are part of Open Computing

Open standards

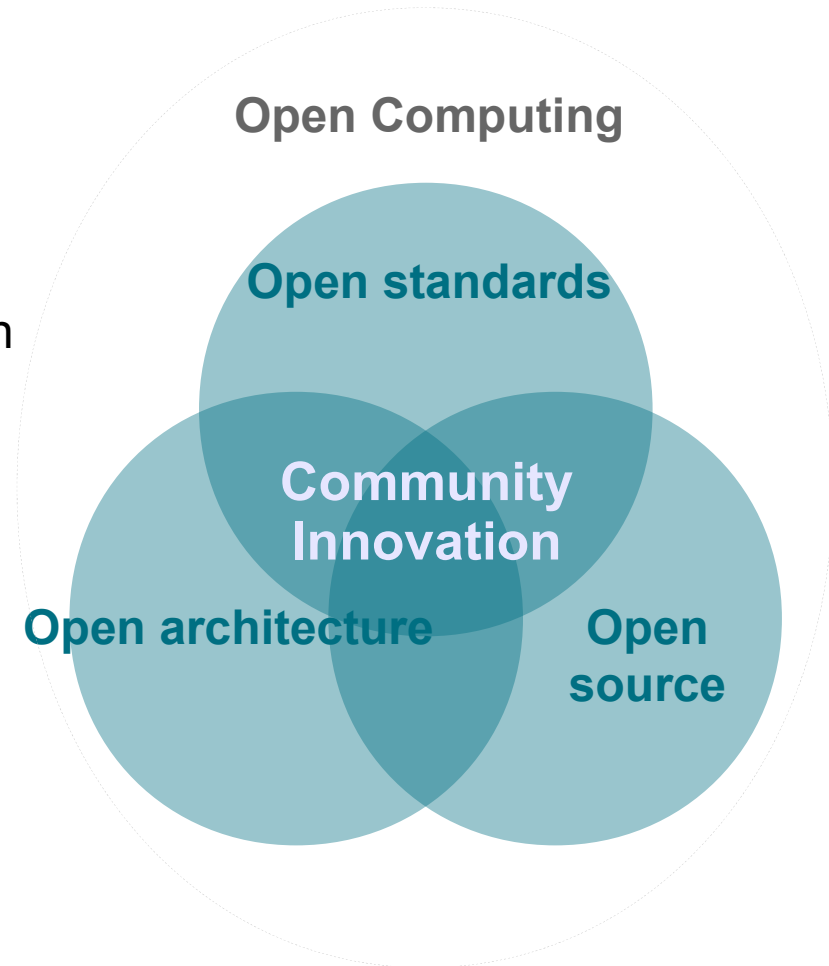
- Improving information sharing by simplifying integration of disparate technologies
- Promoting interoperability by using open published specifications

Open source

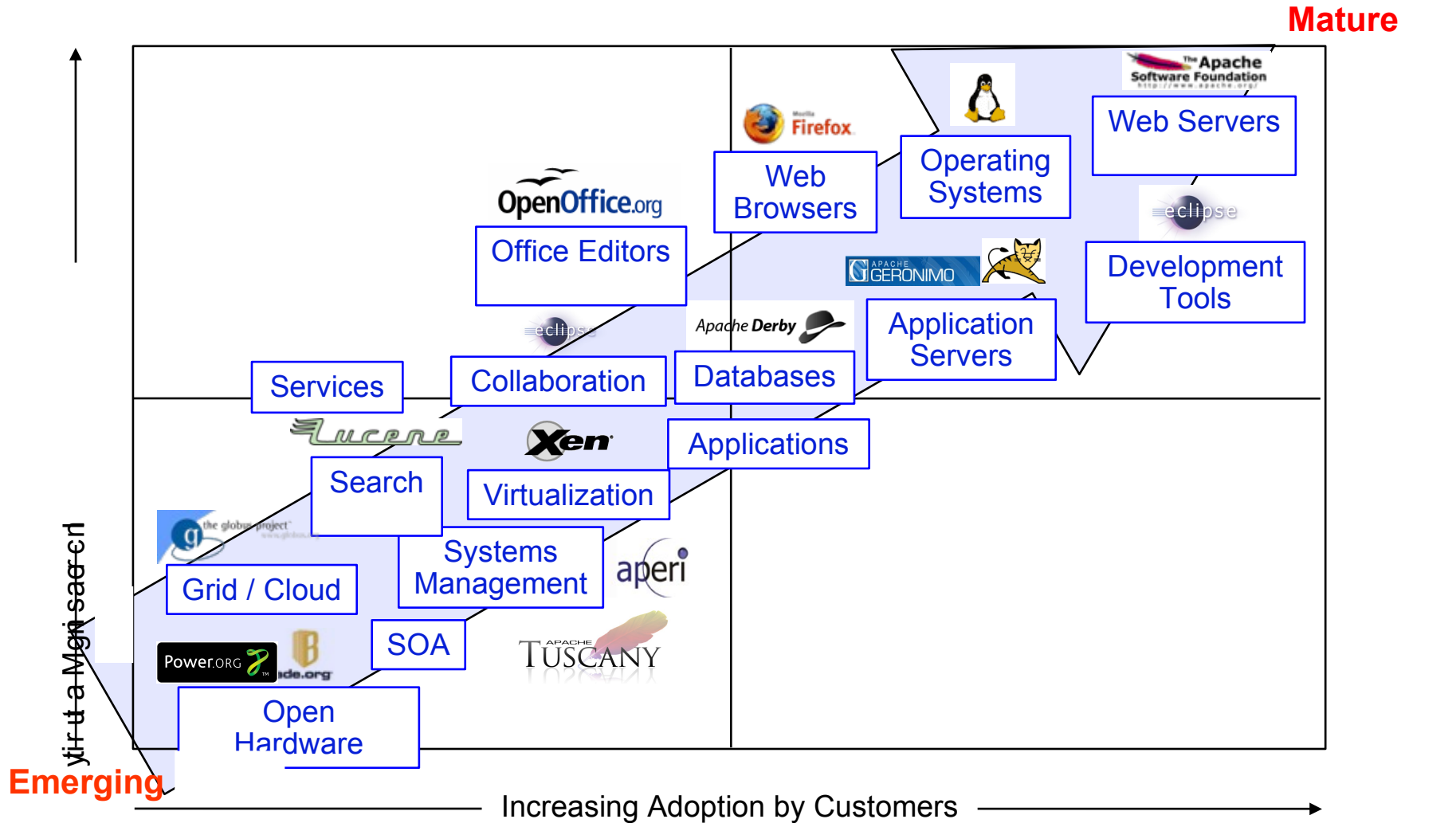
- Promoting innovation by leveraging community development
- Accelerating open standards adoption

Open architecture

- Increasing collaboration by easily extending business processes – e.g. SOA
- Innovating on top of common hardware specifications



Open Source Maturity and Customer Adoption



Source: IBM, December 2007

IBM Open Standards Accomplishments



•1998-2001

- **Java, XML**
- Co-led XML4J, W3C DOM, XSL
- Led Apache XML projects Xalan, Xerces, SOAP
- Founder XML.org
- Co-author WSDL, SOAP 1.1
- Cofounder UDDI.org
 - Author UDDI specification
- Founder Eclipse.org
- Co-author W3C XML Schema
- Chair OASIS WS-Remote Portlets TCs
- Participation in Mozilla
 - Led submission of WSDL to W3C
 - Led RTSJ –JSR 1

•2002-2003

- **WS-I, OMA and WS-Security**
- Founder WS-I.org
 - Founder OMA
- Co-author BPEL, WS-TX, WS-TC
- Co-author WS-Security
 - Co-chair UDDI TC
- Linux contributions to scalability
- Co-Chair OASIS WS-Security 1.0
- Co-chair OASIS WS-DM TC
- Submitted WS-DM to OASIS
- Submitted BPEL to OASIS
- Submitted CBE to OASIS
- RTSJ 1.0 accepted by JCP

•2004-2005

- **Web Services**
- Chair WS-I Basic Profile 1.1
- Co-chair OASIS WS-Notification TC
 - Co-chair WS-Resource Framework TC
- OASIS ODF V1.0 Approved
- Chair OASIS DITA
 - Submitted WS-Addressing to W3C
- Contributed UML2 to Eclipse
 - IBM named chair IETF
- IBM commitment to RF in OASIS
 - Lead OASIS standardization of WS-DM and DITA
- Pledged 500 patents to Open Source

•2006

- **Web Services Reliability**
- WS-I initiated two Profiles based on IBM RAMP Profile
- OASIS ODF cmte formed
- Co-chair of WS-Policy WG
- DITA XML.org formed
- WS-Security 1.1 becomes OASIS Standard
- Co-Author WS-Policy, WS-Eventing
- OASIS ODF wins ISO approval (ISO 26300)
- WS-Notification 1.2 approved as OASIS standard
- OpenAjax launched

•2007

- **SOA / Open Standards**
- WS* stds approved: WS-BPEL, WS-Policy, WS-Trust, WS-Secure Conversation, WS-Transactions, WS-Reliable Messaging, WS-SecurityPolicy
- SCA/SDO OASIS TC's
- BPEL4People submitted to OASIS, chair
- Service Modeling Language submitted to W3C, co-chair
- W3C XQuery1.0, XSLT 2.0 and XPath2.0 become W3C Recommendations
- Co-Chair ODF TC; of SOA work group at TOG
 - WS-ResourceCatalogue submitted to DMTF
 - SOA Maturity Model submitted to TOG
 - IBM non-assert pledge
- Joined Khronos; OpenGL, OpenCL, COLLADA WGs
- WS Federation OASIS TC formed, co-chair

•2008-2009

- **Business process / Web 2.0**
- EBPMN 2.0 submission to OMG
 - WS-I Profiles attain ISO Status
 - Web Services Test Forum (WSTF)
- W3C HTML5 WG chair
 - Joined CESI
- WS-Remote Portlet 2 approved
- W3C Service Modeling Language 1.1
- OASIS IMI and ORMS TC's formed, co-chairs
 - Content Mgmt Interoperability Services submitted to OASIS
- Initiated OASIS ODF TC for Interoperability, Conformance, ODF toolkit union
 - EPTS launched
- OpenAjax WGs for Secure Mashups, Widgets, IDEs
- OASIS Interoperability and Conformance of ODF

Pledged hundreds of patents to the Open Source community

Involved in hardware, software, services and architectural standards

Collaboration with major standardization organizations

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- Linux Distributions for Linux on System z
- OSS & Middleware Integration
- Strategy and Outlook



What is Linux – Briefly

- In August 25, 1991 the historic post was sent to the MINIX news group by Linus Torvalds:



From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)
 Newsgroups: comp.os.minix
 Subject: What would you like to see most in minix?
 Summary: small poll for my new operating system
 Message-ID: <1991Aug25.205708.9541@klaava.Helsinki.FI>
 Date: 25 Aug 91 20:57:08 GMT
 Organization: University of Helsinki

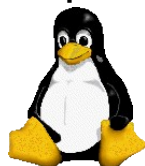
Hello everybody out there using minix -
 I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system(due to practical reasons) among other things). I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-)

Linus (torvalds@kruuna.helsinki.fi)

PS. Yes - it's free of any minix code, and it has a multi-threaded fs. It is NOT protable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-).

- A (free) **open source** (GPL) and highly portable Unix-like operating system
- Developed by a world wide team of volunteer programmers, called the **Community**
- Community members usually work for large companies, like Novell, Red Hat or IBM
- Many companies, called **Distributors**, offer Linux package collection (Distributions)
- Distributions are usually acquired on a support **subscription** basis

- The Linux Logo is Tux:

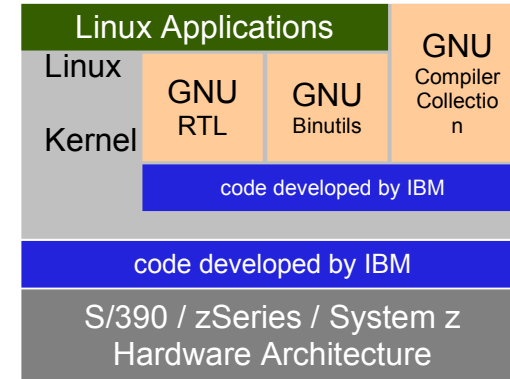


and the IBM version wears blue:



What is Linux on System z?

- How do we name it?
 - **Linux on System z** (or zSeries) refers to Linux on the mainframe in **general**
 - **Linux for System z** (or zSeries) refers to a **64-bit** Linux distribution for Linux on System z (Machines: z10 EC, z10 BC, z9 EC, z9 BC, z990, z890, z900, z800 Linux architecture: s390x)
 - **Linux for S/390** refers to a **31-bit** distribution for Linux on System z (Machines: 9672, G5, G6, and Multiprise Linux architecture: s390)
- Port of the open source GNU/Linux operating system to the System z architecture
- Pure Linux – it's an ASCII environment like other Linux too
- Natively exploits IBM System z hardware – no emulation
- Runs native, in an LPAR or virtualized under z/VM
- Design Principles of Linux on System z:
 - Not a unique version of Linux (no changes to the standard kernel)
 - No changes regarding Look & Feel
 - Not a replacement for an other IBM eServer operating system



Initially the System z related code was less than 1% !

	Total loc	System z loc	% of code
Linux Kernel	2,300,000	45,000	2.0
gcc	1,700,000	9,000	0.5
gdb	1,500,000	8,000	0.5
glibc	1,200,000	5,000	0.4
binutils	800,000	6,000	0.75
strace	41,000	200	0.5
	7,441,000	73,200	0,987... < 1%

Synergies of Linux on System z



- **What Linux brings to System z**

- Open Standards
- Open Source software
- One common operating system across all architectures
- Rapid innovation from the Linux and Open Source community
- Large portfolio of applications, tools and enablers
- Large numbers of trained programmers and administrators

- **What System z brings to Linux**

- The most reliable hardware available anywhere
- The most secure hardware
- Complete workload isolation
- Unmatched scalability
- The ability to run many (100s) Linux servers on a single hardware platform
- High speed inter-server connectivity
- Designed to support multiple diverse workloads
- Simplified systems management

What's unique to Linux on IBM System z

- z/VM based Virtualization

- HIPERSOCKETS
 - ▶ synchronous data movement between LPARs and virtual servers
 - ▶ network transfer at memory speed
 - ▶ very low latency

- Security features
 - ▶ each Crypto Express2 feature on a System z, with both adapters configured as accelerators, is designed to provide thousands SSL handshakes per second

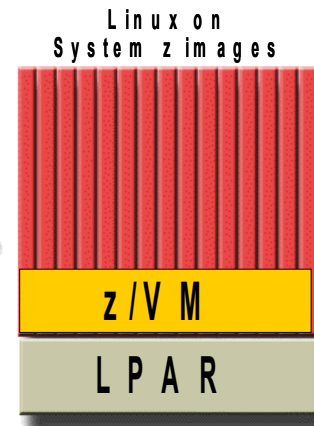
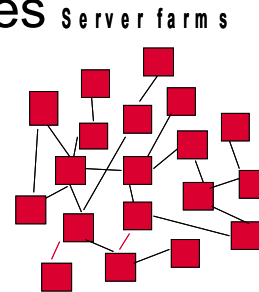
- Management of the environment
 - ▶ cloning (in minutes)
 - ▶ same configuration for the Linux virtual machines

z/VM for System z Virtualization

- Massive consolidation platform
 - 100s to 1000s of virtual servers under z/VM
 - Virtualization is built-in, not added-on (HW support is decades ahead)
 - Sharing of CPU, memory and I/O resources
 - Virtual I/O (mini-disks, virtual cache, guest LAN, ...)

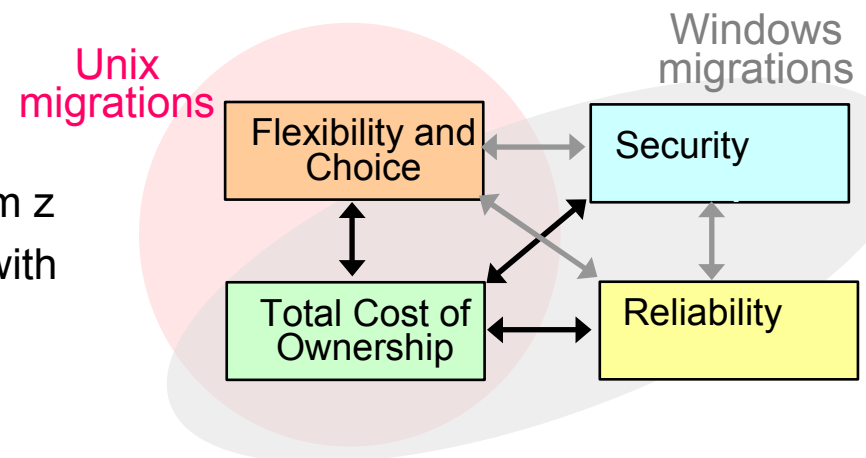
- Intelligent and autonomic management of diverse workloads and system resources
 - Rapid install of new servers

- Utilization often exceeds 90%
 - Handles peak workload utilization of 100% without service level degradation



Value of Linux on System z

- Reduced Total Cost of Ownership (TCO)
 - Environmental savings – single footprint vs. hundreds of servers
 - Consolidation savings – less storage, less servers, less software licenses, less server management/support
- Improved service level
 - Systems management (single point of control)
 - Reliability, availability, security of System z
 - High performance and tight integration with z/OS and z/VM
- Speed to market
 - Capacity-on-demand capability on System z
 - Dynamic allocation of Linux images
less than a minute to add a new Linux server image using z/VM and IBM DS8000

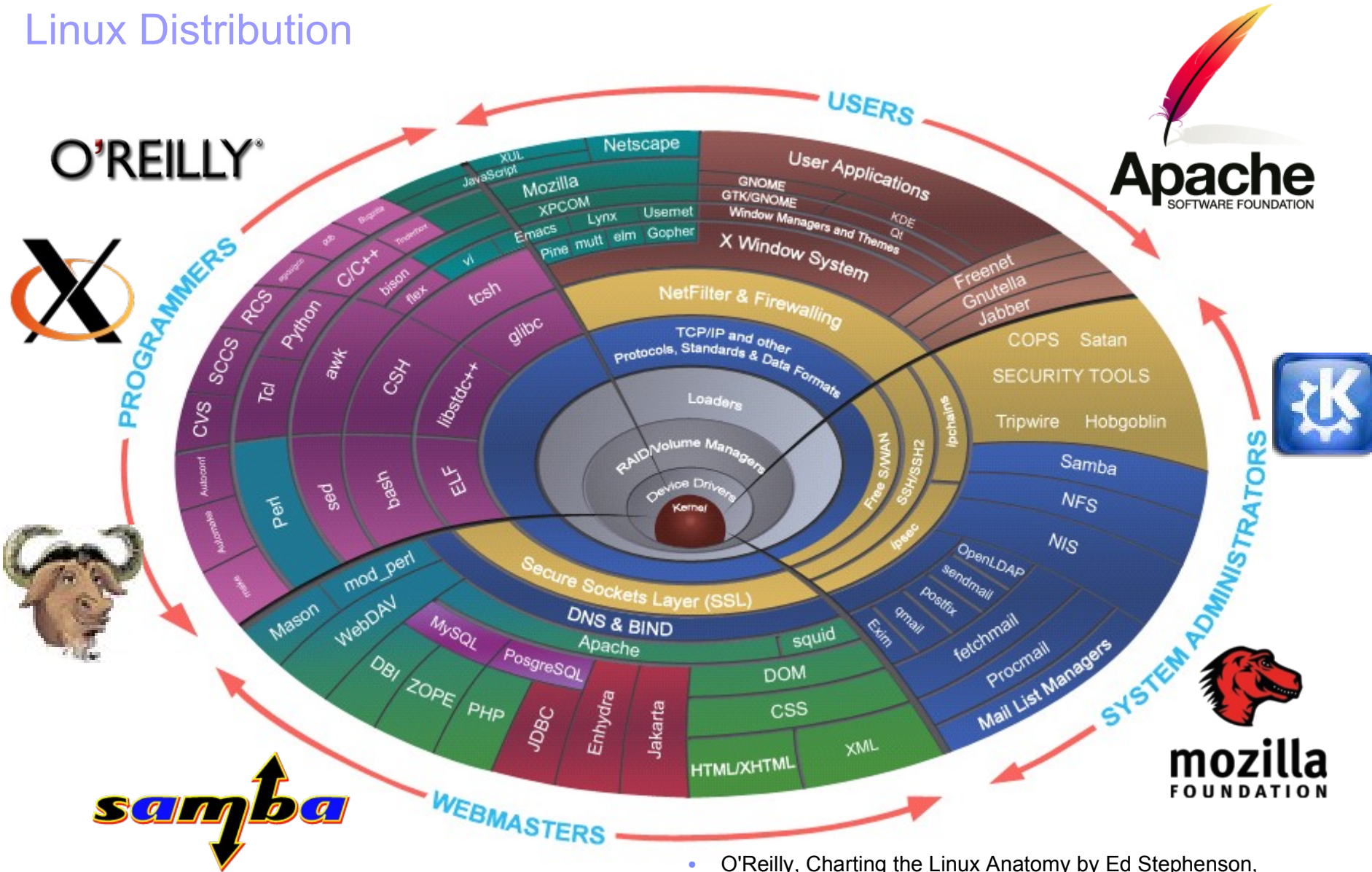


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Linux Distribution



O'REILLY®



samba

Apache
SOFTWARE FOUNDATION



mozilla
FOUNDATION

- O'Reilly, Charting the Linux Anatomy by Ed Stephenson, 01/29/2001
- http://www.oreillynet.com/pub/a/oreilly/linux/news/linuxanatomy_0101.html

Linux Distribution

O'REILLY®

• Network Services:

- DHCP (ISC)
- DNS (bind)
- LDAP (OpenLDAP)
- NFS (nfsv4)
- Samba (SMB/CIFS File, CUPS, Authentication)
- Kerberos (MIT krb5)
- MTAs (cyrus, fetchmail, IMAP4, Postfix, sendmail)
- FTP (atftp, pure-ftpd, tftp, vsftpd, wuftp)
- Socks (dante)
- Remote Login (telnet, rsh, VNC, OpenSSH)
- VPN (pptp, OpenSWAN)
- Proxy (dante, squid)
- NIS (ypserv)
- HTTP Server (lighttpd, Apache 2)
- News (INN, dmapi)
- and much more ...

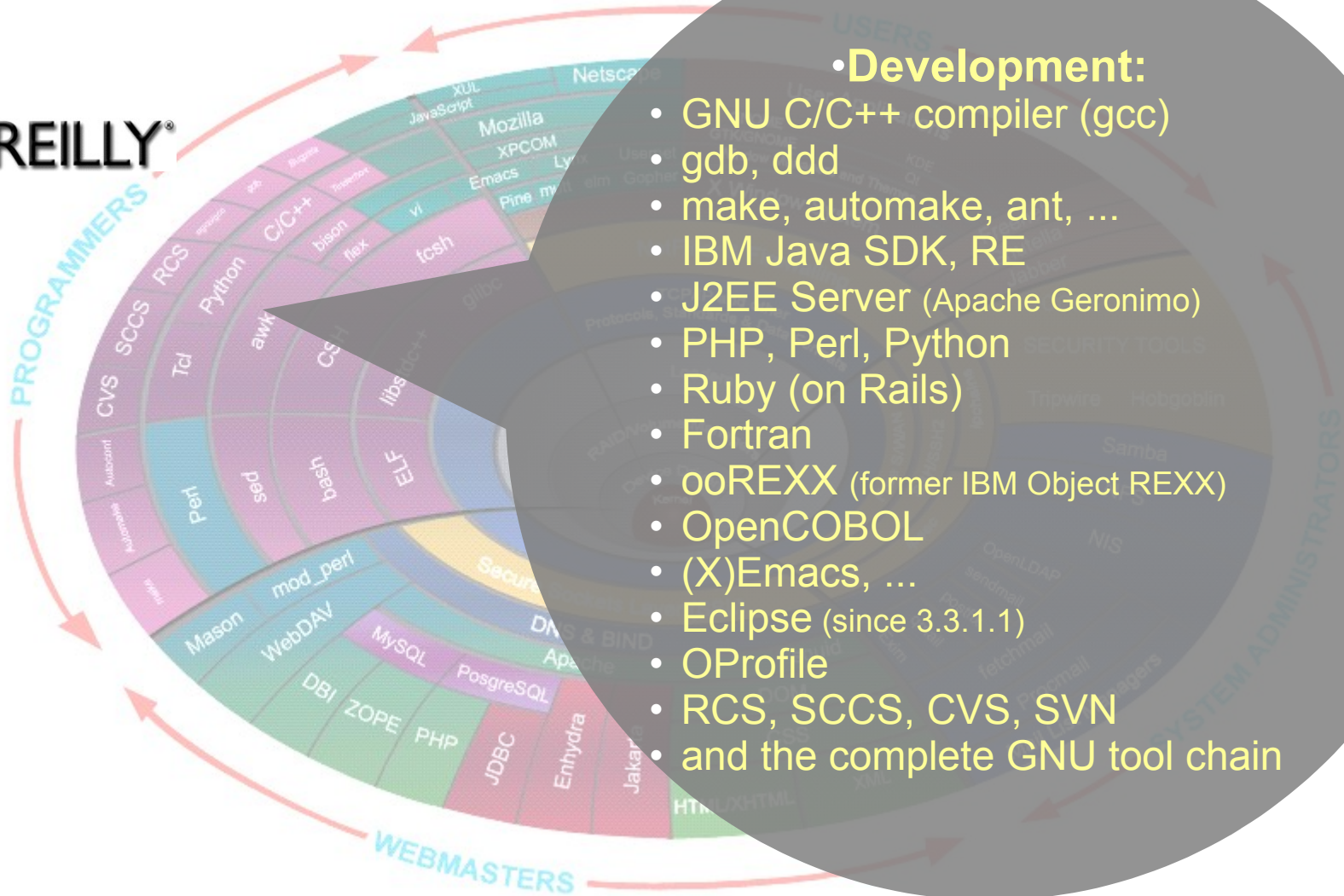
USERS

SYSTEM ADMINISTRATORS

- O'Reilly, Charting the Linux Anatomy by Ed Stephenson, 01/29/2001
- http://www.oreillynet.com/pub/a/oreilly/linux/news/linuxanatomy_0101.html

Linux Distribution

O'REILLY®



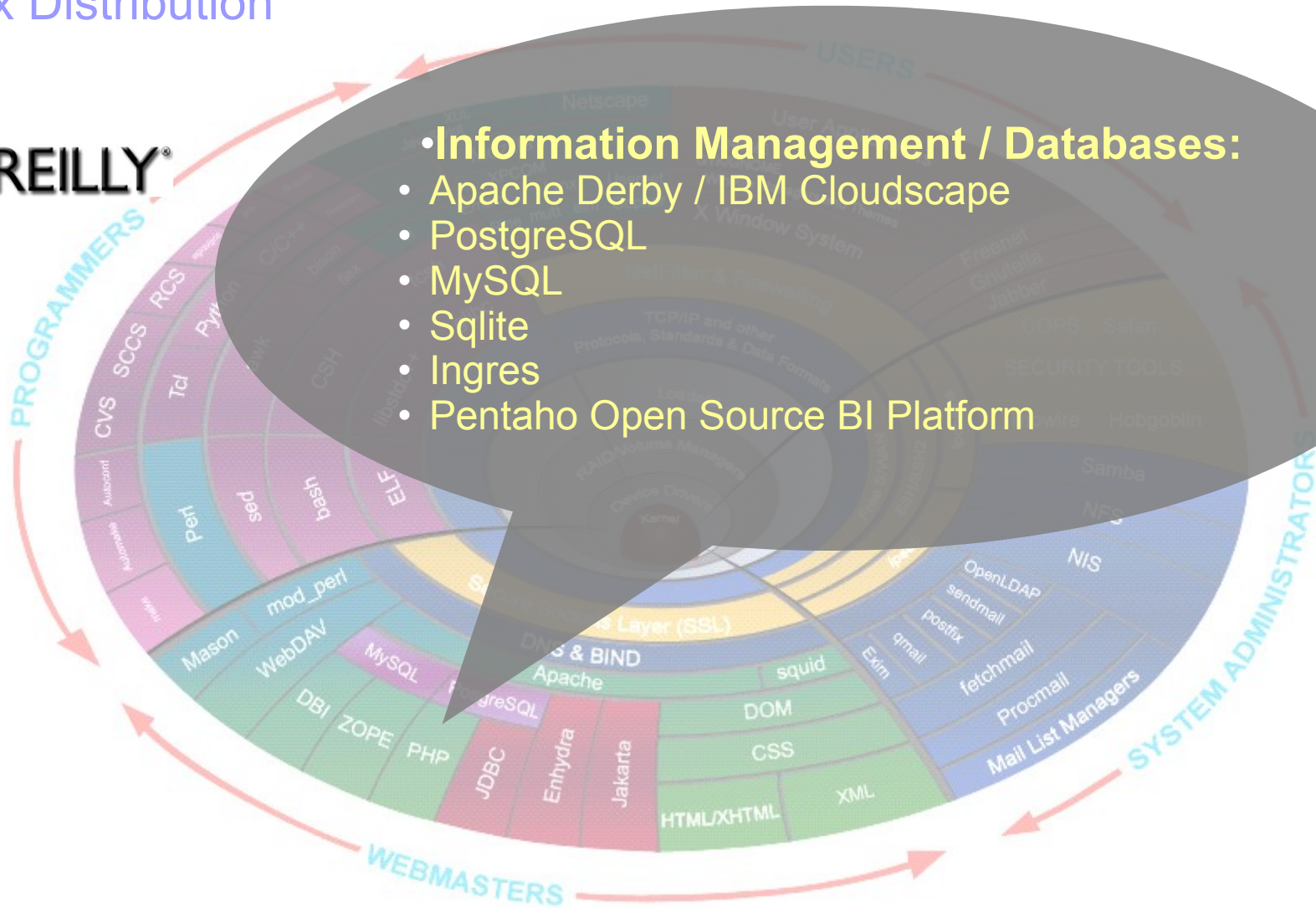
• Development:

- GNU C/C++ compiler (gcc)
- gdb, ddd
- make, automake, ant, ...
- IBM Java SDK, RE
- J2EE Server (Apache Geronimo)
- PHP, Perl, Python
- Ruby (on Rails)
- Fortran
- ooREXX (former IBM Object REXX)
- OpenCOBOL
- (X)Emacs, ...
- Eclipse (since 3.3.1.1)
- OProfile
- RCS, SCCS, CVS, SVN
- and the complete GNU tool chain

- O'Reilly, Charting the Linux Anatomy by Ed Stephenson, 01/29/2001
- http://www.oreillynet.com/pub/a/oreilly/linux/news/linuxanatomy_0101.html

Linux Distribution

O'REILLY®

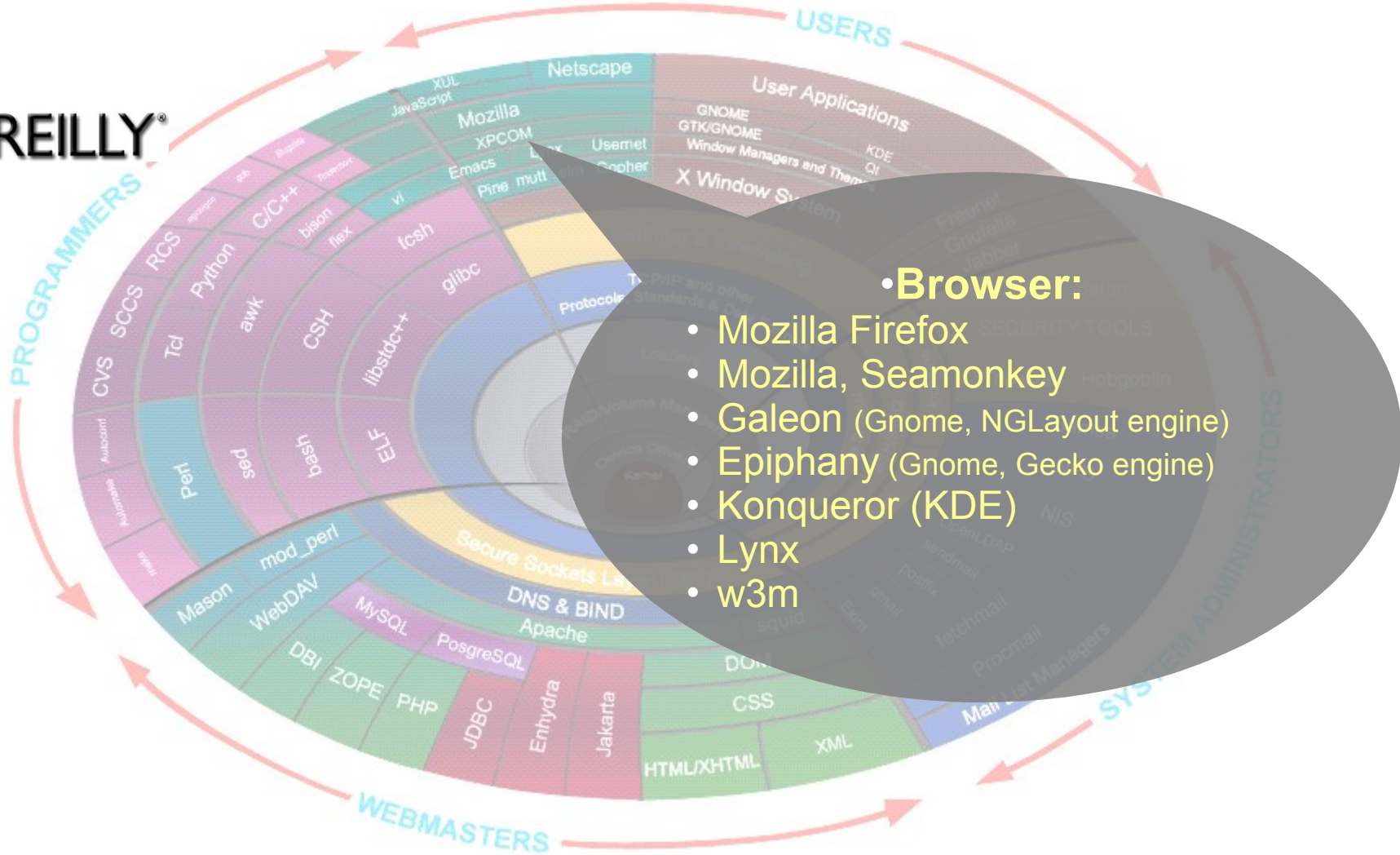


- **Information Management / Databases:**
 - Apache Derby / IBM Cloudscape
 - PostgreSQL
 - MySQL
 - Sqlite
 - Ingres
 - Pentaho Open Source BI Platform

- O'Reilly, Charting the Linux Anatomy by Ed Stephenson, 01/29/2001
- http://www.oreillynet.com/pub/a/oreilly/linux/news/linuxanatomy_0101.html

Linux Distribution

O'REILLY®



- O'Reilly, Charting the Linux Anatomy by Ed Stephenson, 01/29/2001
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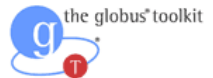
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Additional OSS for Linux on System z

- **Apache Derby**
Pure-Java, full relational database, aka IBM Cloudscape or JavaDB
- **Enhydra**
Open Source J2EE Application Server, supporting EAF, JonAS, JBoss and Apache Geronimo containers
- **Globus Toolkit**
Platform for Grid Computing
- **Nagios**
Network and system monitoring tool
- **JBoss**
Red Hat's Open Source Application Server and Middleware
- **GFS**
Red Hat's Global File System, an open source cluster file system (according to Red Hat under consideration)
- **WAS Community Edition (WAS-CE)**
IBM's open source Java EE application server



Additional OSS for Linux on System z

- **Object Rexx for Linux**

Open Object Rexx (ooRexx) is the free Open Source (CPL) Rexx implementation of the Rexx Language Association (RexxLA)

<http://www-306.ibm.com/software/awdtools/obj-rexx/linux/index.html>

<http://www.rexxla.org/>



- **THE, The Hessling Editor**

GPL text editor similar to the VM/CMS text editor XEDIT

<http://hessling-editor.sourceforge.net/index.html>



- **OSOA – Open Service Oriented Architecture**

<http://www.osoa.org/display/Main/Implementation+Examples+and+Tools>

Open Source Implementations of SDO and SCA

- **Apache Tuscany:** <http://cwiki.apache.org/TUSCANY/>

- **Fabric3:** <http://fabric3.codehaus.org/>

- **The Newton Project:** <http://newton.codecauldron.org/>

- **SOA PHP Project:** <http://www.osoa.org/display/PHP/SOA+PHP+Homepage>

- **Eclipse SOA Tools Platform Project:** <http://www.eclipse.org/stp/> ...



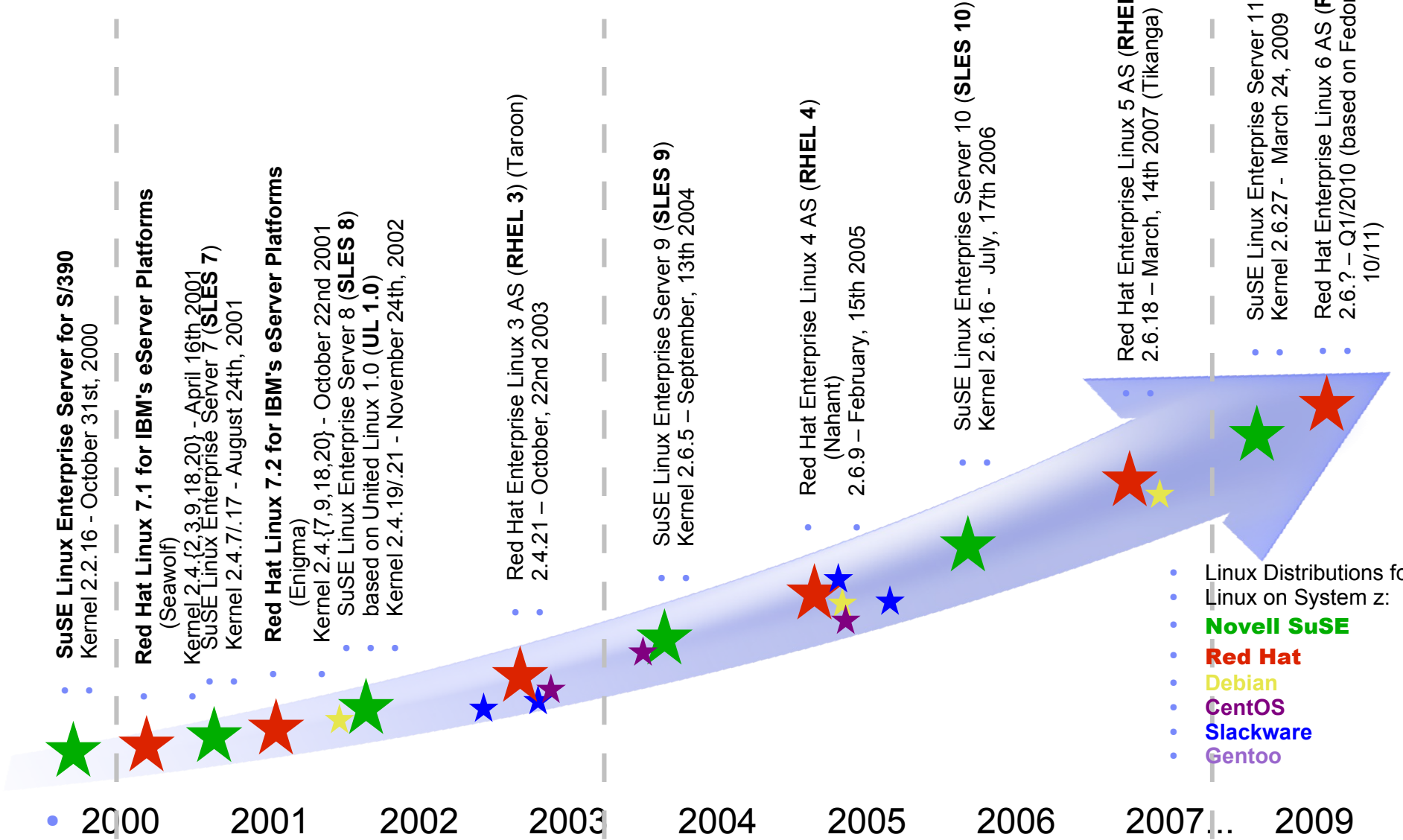
- And much more...

Agenda

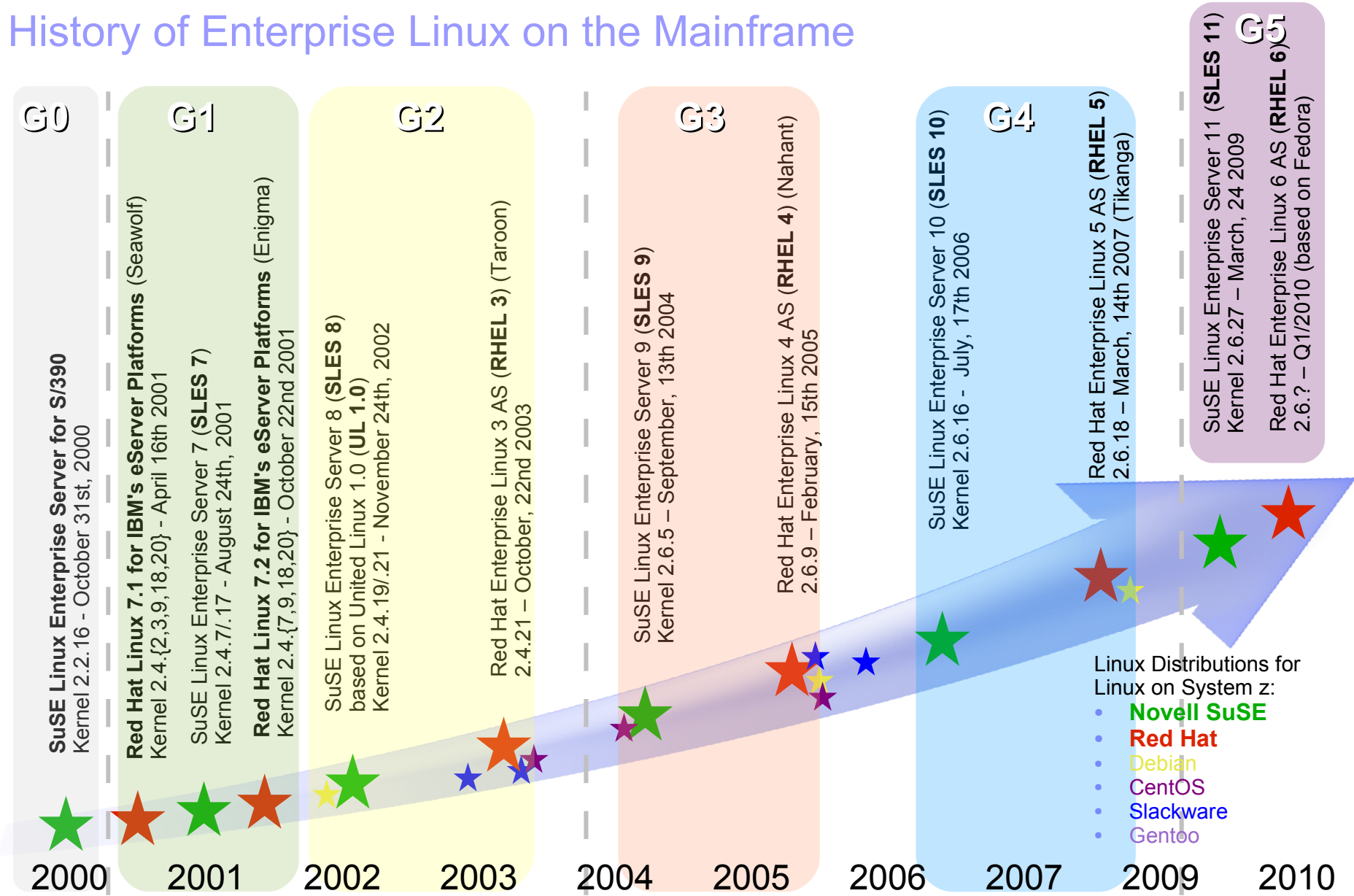
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History of Enterprise Linux on the Mainframe



History of Enterprise Linux on the Mainframe



Enterprise Linux Distributions – Tested & Supported (64-bit)

- The table below shows IBM tested Linux environments.
- IBM remote technical support for these environments is provided when you obtain a Support Line contract.
- You may also find support for these environments by contracting with a third party provider.

Hardware Platform and Operating System Software Compatibility			
64-bit environment			
Release	zSeries	System z9	System z10
★ SLES 9	✓	✓	✓
★ SLES 10	✓	✓	✓
★ SLES 11	✗	✓	✓
★ RHEL 3	✓	*	–
★ RHEL 4	✓	✓	✓
★ RHEL 5	✓	✓	✓

Enterprise Linux Distributions – Tested & Supported (31-bit)

- The table below shows IBM tested Linux environments.
- IBM remote technical support for these environments is provided when you obtain a Support Line contract.
- You may also find support for these environments by contracting with a third party provider.

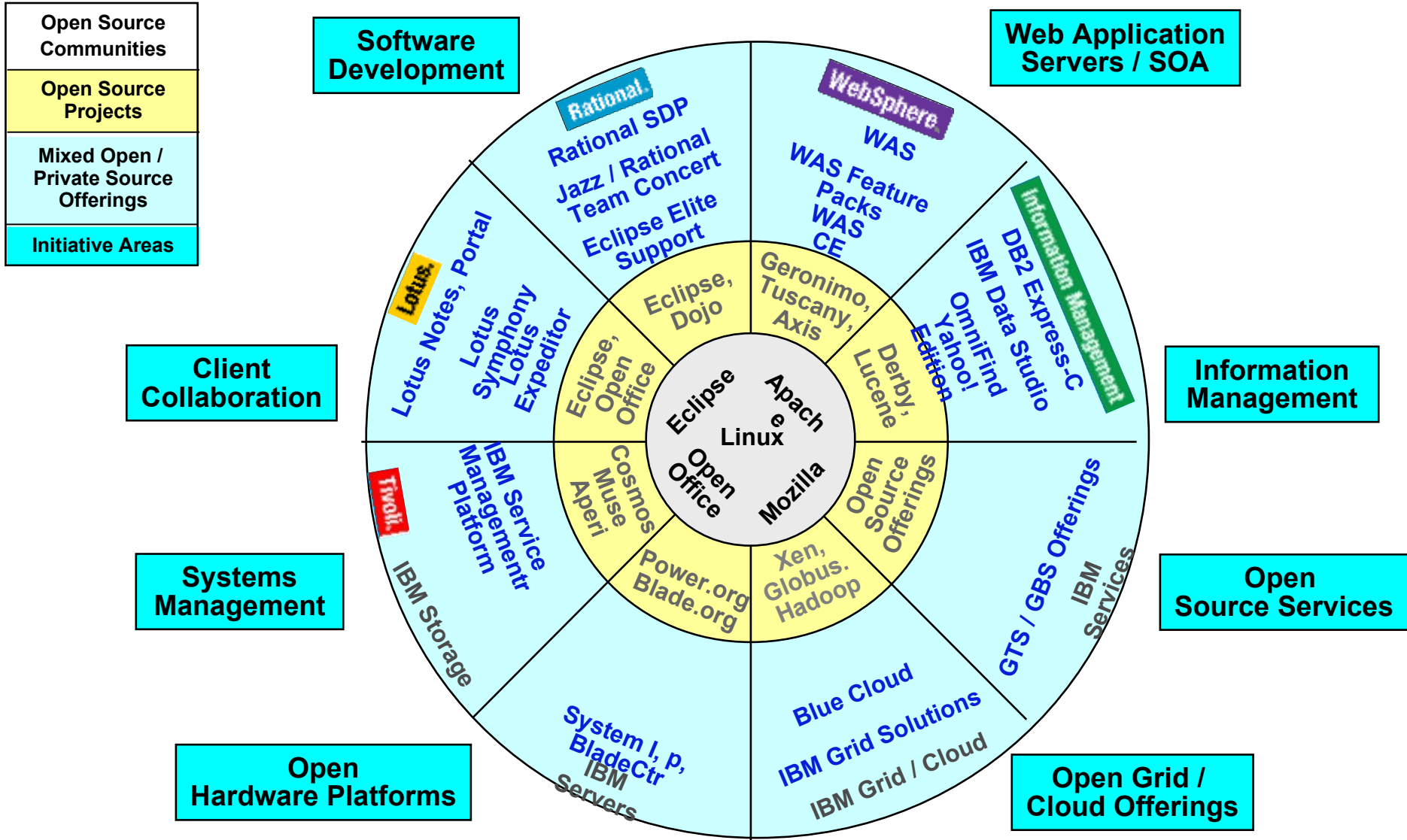
Hardware Platform and Operating System Software Compatibility			
31-bit environment			
Release	zSeries	System z9	System z10
★ SLES 9	✓	✓	✓
★ SLES 10 ⁽¹⁾	–	–	–
★ SLES 11 ⁽¹⁾	–	–	–
★ RHEL 3	✓	*	–
★ RHEL 4	✓	✓	✓
★ RHEL 5 ⁽¹⁾	–	–	–

Agenda

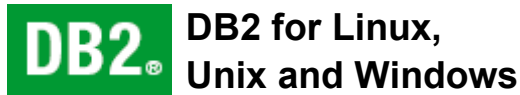
- Open Source and Open Standards
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Open Source and IBM Middleware – Overview



Open Source and Middleware Integration on Linux for System z



DB2 can be programmed with various open source programming languages:



IBM Cloudscape was contributed to the Apache Foundation
now known as *Apache Derby* **Java DB** (incl. in JDK 6)



Lotus Domino is able to exchange data with PHP via XML
and supports the *dojo* the javascript toolkit for AJAX/Web 2.0

Rational Team Concert



Jazz Team Server offers
Open Lifecycle Service Integrations

Open and extensible on

- Collaborate in context
- Right-size governance
- Day one productivity

IBM WebSphere sMash



Project Zero delivers agile web 2.0 situational applications for SOA
with scripting, REST, , and Dojo in an integrated Java
runtime ...



Open Source and Middleware Integration on Linux for System z

WebSphere. Application Server

WebSphere Application Servers includes IBM HTTP Server which is powered by Apache (with some value adds)



WebSphere. WAS CE


WebSphere Application Server Community Edition is based on the J2EE 5.0 compliant Application Server Apache Geronimo (with some value adds)



WebSphere. MQ

WebSphere MQ (former MQSeries) fully implements JMS Messages and can interact with  **OpenJMS** and  **ActiveMQ** (which fully supports JMS 1.1)

Tivoli. System Automation

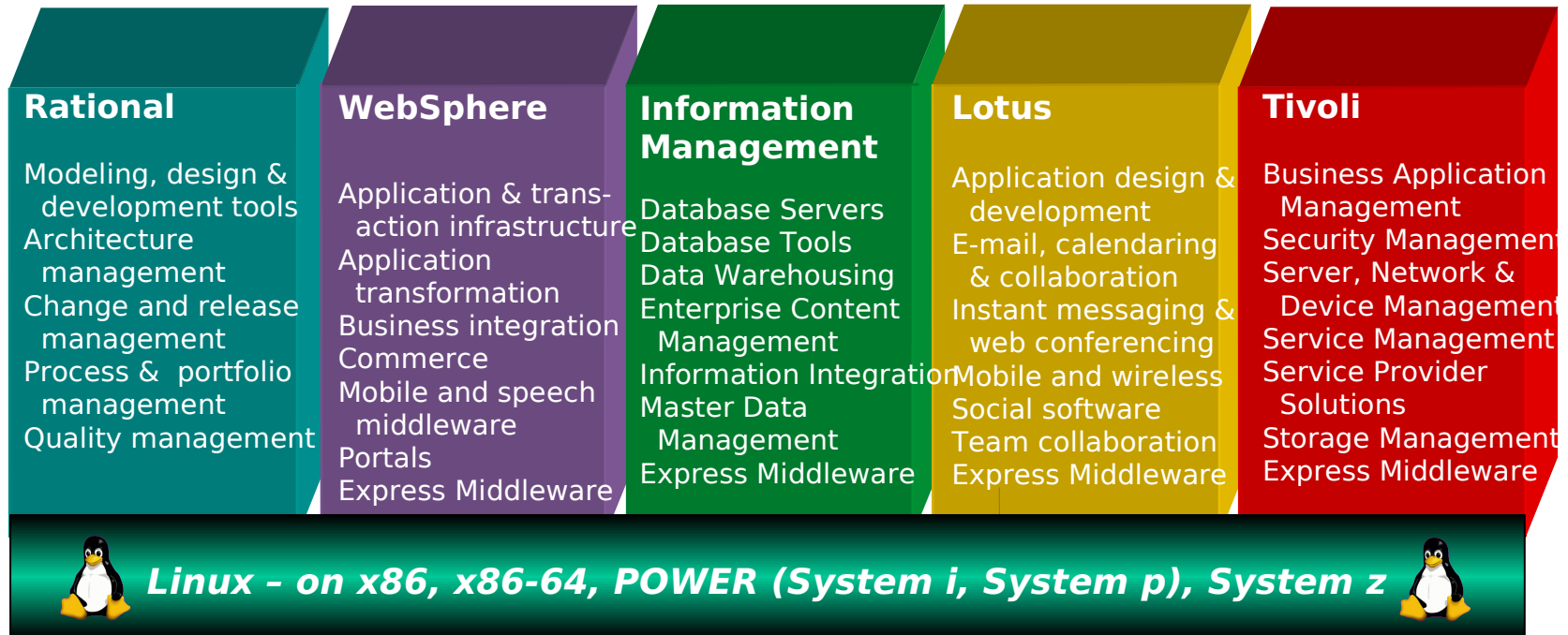
An adapter for Tivoli System Automation End-to-End,  allows to integrate with heartbeat, from the Linux-HA project **HighAvailability**

Tivoli. Directory Integrator

Tivoli Directory Integrator is able to connect to OpenLDAP and other LDAPv3 compliant directory servers



IBM Software for Linux



Rational.

- Business driven development

WebSphere.

- Integration and business flexibility

Information Management

- Information management

Lotus.

- Collaboration

Tivoli.

- Service management

Over 500 Linux offerings – see the matrix at: <http://www.ibm.com/linux/matrix>
IBM Software for Linux: <http://www.ibm.com/software/os/linux/software/>

IBM Software Products for Linux on System z – non-complete list (80)

WebSphere / AIM

CICS Transaction Gateway
 IBM Java SE
 WebSphere Application Server
 WebSphere Application Server ND
 WAS Community Edition
 WebSphere Extended Deployment
 WS Business Events
 WS Business Modeler Publishing Server
 WS Business Monitor
 WS Business Services Fabric
 WS Commerce
 WS Enterprise Service Bus
 WS Message Broker
 WS MQ
[WS MQ File Transfer Edition](#)
 WS Process Server
 WS Service Registry & Repository
[WS sMash](#)

Information Management

Alphablox
 Cognos 8 Business Intelligence
 DataQuant
 DB2 for LUW
 DB2 Connectit
[Content Integrator](#)
 DB2 Content Manager
 DB2 Content Manager OnDemand
 Filenet P8
 Content Manager
 Records Manager
 Information Server
 WS DataStage
 WS Federation Server
 WS QualityStage
 Informix Dynamic Server
 InfoSphere Master Data Management Server
[InfoSphere Warehouse on System z](#)

STG & GTS

IBM Active Energy Manager
[IBM VMControl – Image Manager](#)
 IBM Systems Director
 IBM Integrated Removable Media Manager
 z/VM

Lotus / Workplace

Domino
 WS Portal
[Lotus Forms](#)
[Lotus Connections](#)

Rational

Asset Manager
 BuildForge
 ClearCase
[Team Concert for System z](#)

Tivoli

Service and Process Automation

- Application Dependency Discovery Manager
- Business Continuity Process Manager
- Change & Configuration Management Database
- Dynamic Workload Broker
- Provisioning Manager
- Provisioning Manager for SW (TCM)
- [Provisioning Manager for OS Deployment](#)
- Release Process Manager
- Service Request Manager
- [Service Automation Manager \(TSAM\)](#)
- System Automation
- System Automation Application Manager
- Workload Scheduler

Service, Availability and Performance Management

- Business Systems Manager
- Composite App Manager
 - for Appl Diagnostics
 - - Web Resources
 - - WebSphere
- for SOA
- Monitoring
 - for Applications
 - for Databases
- NetView
- OMEGAMON XE for z/VM and Linux

Security Management

- Access Manager
- Director Integrator
- Director Server
- Federated Identity Manager
- Identity Manager

Network Management

- Enterprise Console
- NetCool/Omnibus
- Network Manager IP Edition

Asset Management

- Asset Management for IT
- Maximo Asset Management
- License Compliance Manager
- Usage and Accounting Manager

Storage Management

- Storage Manager
- [TPC Agent](#)

IBM Software for Linux Middleware Matrix

<http://www.ibm.com/linux/matrix/>

United States [change] [← United

Home Solutions ▾ Services ▾ Products ▾ Support & downloads ▾ My IBM ▾ Welcome Mr. F

Linux & IBM

IBM Solutions for Linux

- IBM Systems
- IBM Software
- IBM Services

IBM & the Linux Community

Linux distribution partners

Migrating to Linux

IBM Linux Technology Center

IBM Linux Integration Center

Drivers & technical resources

Linux & IBM News

The Linux Library

Global Linux Portals

IBM & the Linux >

IBM Software for Linux

IBM Middleware Available on Linux

The IBM Middleware Available on Linux matrix provides information regarding IBM Middleware availability on Linux. You can find information such as:

- Product name and version
- Links to product pages
- Linux distribution and kernel support
- Related sources of additional information: announcement letters, product matrix, download Web sites, FAQs, release notes

All this information is available in this [PDF file \(.17MB\)](#), which was last updated Sep 13, 2009.

New hardware category: POWER

The IBM Middleware Available on Linux matrix now includes a new inclusive hardware category known as POWER. Linux on POWER includes support for Linux on iSeries, Linux on pSeries, Linux on OpenPOWER, and Linux on JS20 blades. Can't find the product that you are looking for under pSeries and iSeries? Check under the POWER hardware category. Many products have been reassigned to POWER.

Powered by Linux is a registered trademark of Linus Torvalds

Additional Links

- IBM Smart Planet
- Linux for Business Partners
- developerWorks



Agenda

- Open Source and Open Standards
- Linux on System z
- Linux Distributions
- Open Source Software beyond Linux Distributions
- Linux Distributions for Linux on System z
- OSS & Middleware Integration
- Strategy and Outlook

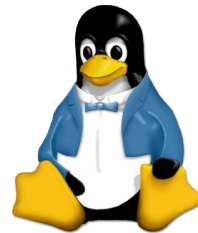
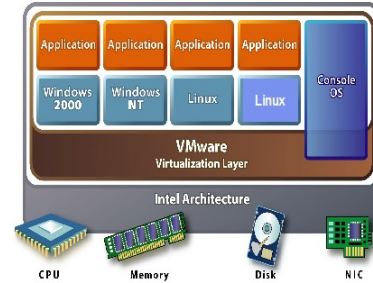


Linux on IBM Systems

- **Linux on System z**
- Applications close to the data
- Applications need “Mainframe“ criteria
- superior horizontal scaling (hundreds of virtual servers at the same time)
- excellent workload-management
- excellent virtualization



- **Linux on System x**
- Low-priced entry
- Simultaneous operation of Windows and Linux via virtualization
- High reliability and simple manageability by Enterprise X-Architektur
- Very good price / performance ratio via Clustering
- Big performance density by BladeCenter



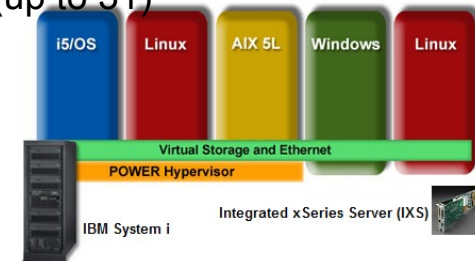
- **Linux on POWER**
- Applications demanding high performance
- Consolidation of multiple servers / applications via LPARs
- Native Linux or AIX



- **Linux on CBE**
- Applications demanding highest performance
- special purpose



- **Linux on System i**
- If an integrated solution is required (hardware / software / network)
- Simple administration and operation
- If midrange system is required
- Consolidation of applications via LPARs (up to 31)
- High degree of security



Linux on System z Strategy

- **Application Sourcing Strategy**
 - The IBM commitment to z/OS and z/VSE is **not** affected by this Linux strategy
 - Linux for System z is not and will not replace any other System z operating system
 - Focus on tight integration solutions with a z/OS data serving back end
 - New doors are opened to bring Linux-centric workloads to the System z platform
 - Customers are offered add. opportunities to leverage their investments through Linux
- **Expanding the Virtualization Leadership**
IBM Director and IBM Dynamic Infrastructure
- **Business Continuity**
Expanding Linux capabilities for real time data mirroring solutions
- **Server Consolidation**
“Take back control”
- **IT Simplification**
improving the ease of use, better exploit the System z values
- **Extension to a SOA Hub**
IBM Information Server for Linux on System z
- **Expanding the Linux Ecosystem**
ISVs, business partner, developer, porting initiatives, etc.



IBM SWG's 64-bit Linux Strategy

- The IBM SWG strategically supports Linux on the following architectures:
 - **x86** Architecture and follow on: xSeries, eServer e32x IA-32, EM64T (IA-32e), AMD64 (x86_64)
 - **POWER** Architecture: pSeries, OpenPower, iSeries
 - **zSeries** Architecture: zSeries, System z
- Beginning with RHEL 4 and SLES 9 the 64 bit Linux distributions became strategic.
- IBM SWG focuses on 64 bit transition for server platforms:
 - **EM64T / AMD64**
 - **POWER / PowerPC**
 - **zSeries / System z**
- But no requirement for middleware to be 64 bit exploitive
- 31-bit middleware still runs in toleration mode

Hardware Platform and Operating System Software Compatibility				
Release / IBM System z environment	zSeries	zSeries	System z9	System z9
Addressing Mode	31 bit	64 bit	31 bit	64 bit
SLES 9	✓	✓	✓	✓
SLES 10	*	✓	*	✓
RHEL 3	✓	✓	**	**
RHEL 4	✓	✓	✓	✓
RHEL 5	*	✓	*	✓

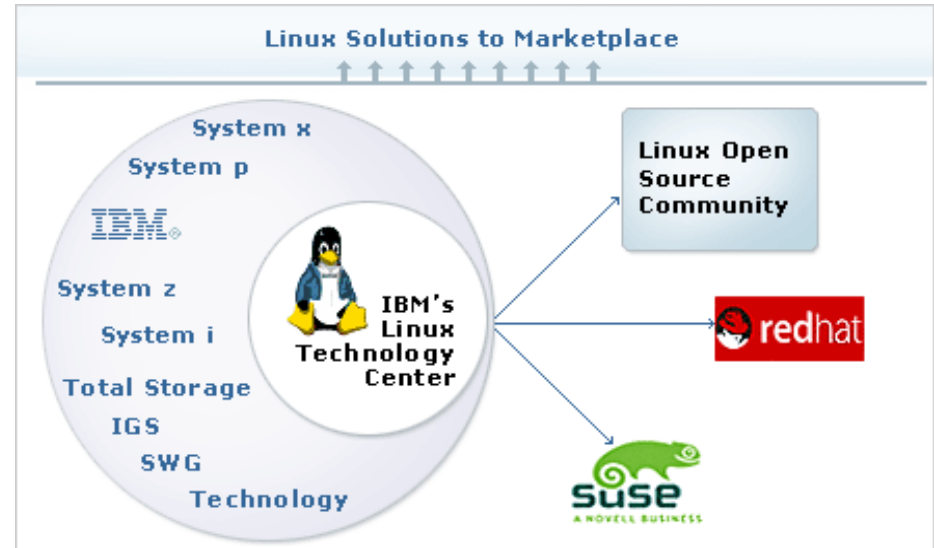
IBM STG Linux Technology Center, LTC

■ IBM Linux Technology Center (LTC)

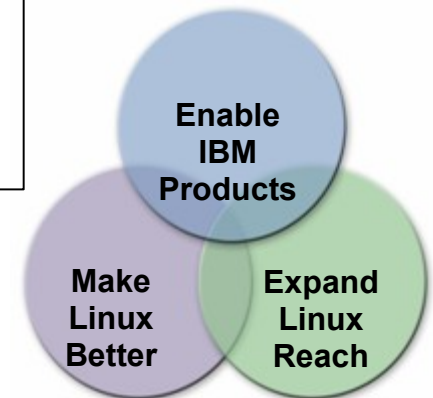
–Development team for all server and software platforms and other key initiatives, such as:

- Real Time Linux
- Security: EAL certifications, Trusted Computing, SELinux, sHype
- Linux on POWER, Linux on Cell, Linux for System z and z/VM
- Virtualization: Xen/KVM, APV support
- Systems Management: kdump, SystemTap

–Technical liaison to IBM's customers and Linux Distribution Partners



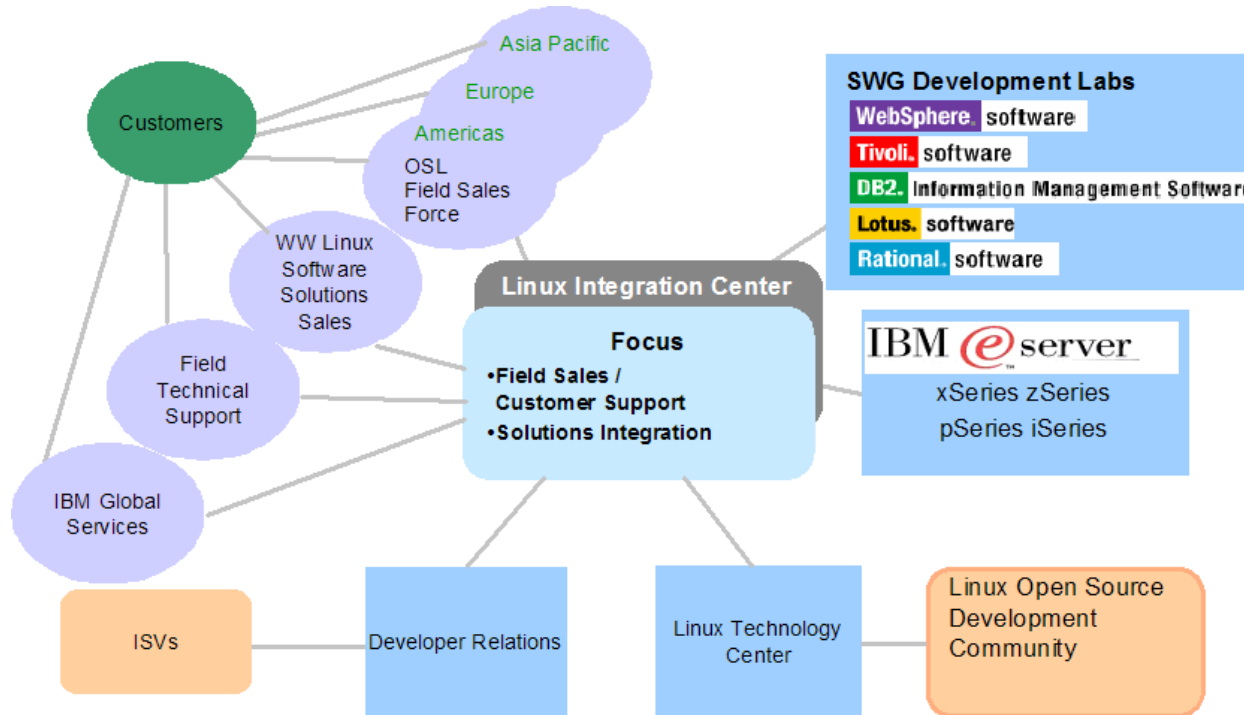
LTC:
 Over 600 developers
 40+ locations
 100+ projects



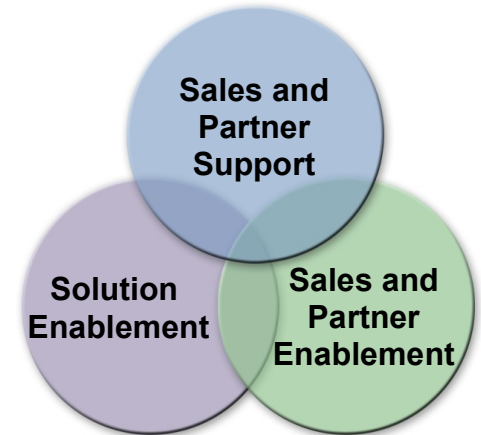


IBM SWG Linux Integration Center, LIC

Helping customers create mission critical solutions using IBM software on Linux.
 Drive the adoption of IBM middleware solutions in the Linux mid market space.
 Supporting the Linux OSL sales team in delivering Linux-based IBM middleware solutions.
 Drive specially the Open Client related Lotus products for Linux on the Desktop (internal and external).



- ~ 40 People
- 6 Locations
- 700+ Customer engagements



Intranet: <http://lic.austin.ibm.com/>
Internet: <http://www.ibm.com/linux/lic.html>

IBM Continues to Support the Linux Partner Ecosystem

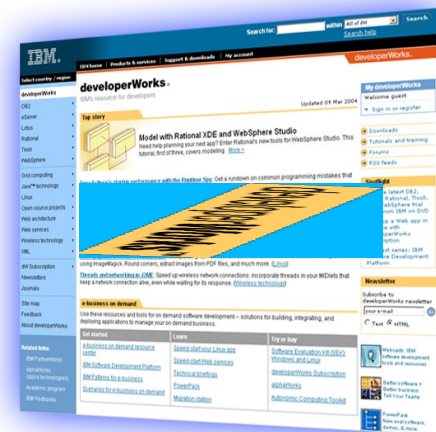
• IBM Business Partner Programs

- Over 6,000 IBM Business Partners
- Leaders for Linux Program
 - Custom co-marketing campaigns
- PartnerWorld Industry Networks
- Solution Builders Express
- Value Networks
 - Creating repeatable solutions
- Chiphopper
 - Porting ISV Applications



• IBM Developer Programs

- developerWorks Linux zone
 - Tutorials, Redbooks, best practices, etc.



IBM - Investing in Linux Around the World

Worldwide Porting Centers

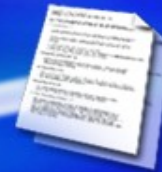
Technical Support



Linux Technology Center



WW Competence Centers



Linux Integration Center



OSDL



Products



Linux Services



Linux Enabled Business Partners



www.ibm.com/linux



Thank you – Any questions ?

Obrigado

Portuguese

Merci

French

Thank You


English

Gracias

Spanish

Deutsch

German

ibm.com/linux 

Linux and IBM:
In-demand skills for an on demand world.

IBM.

ibm.com/education/students



LIBERTE

General Linux



IBM software for Linux
providing an open, robust and scalable
platform for applications

- IBM Linux Home Page (external)
<http://www.ibm.com/linux/>
- IBM Software for Linux Home page (external)
<http://www.ibm.com/software/os/linux/software/>
- IBM Software Matrix
<http://www.ibm.com/linux/matrix>
- Additional Linux Links
<http://www-1.ibm.com/linux/links/index.shtml>

Additional Linux-related

- IBM Linux on System z
ibm.com/eserver/zseries/linux
- IBM z/VM resources for Linux on IBM System z
ibm.com/vm/linux
- IBM z/VM
vm.ibm.com
- Novell SUSE Linux Enterprise
novell.com/products/server/
- Red Hat Enterprise Linux
redhat.com/rhel/server/mainframe/
- IBM developerWorks
ibm.com/developerworks
- IBM Linux on System z newsletter
zLinux-Infos@de.ibm.com
- External Linux on System z Forum
www.marist.edu/htbin/wlvindex?linux-390



Redbooks for Linux on System z

www.redbooks.ibm.com

- Currently more than 140 entries, like for example:
 - ▶ **IBM System z9 109 Technical Introduction**
Redbook SG24-6669-00, 26 July 2005
 - ▶ **z/VM and Linux on zSeries: from LPAR to Virtual Servers in Two Days**
Redbook SG24-6695-00, 20 June 2005
 - ▶ **IBM Communication Controller Migration Guide**
Redbook SG24-6298-01, 14 June 2005
 - ▶ **Linux on zSeries: Samba-3 Performance Observations**
Redpaper REDP-3988-00, 1 April 2005
 - ▶ **IBM eServer zSeries Connectivity Handbook**
Redbook SG24-5444-04, 15 February 2005
 - ▶ **Experiences with Oracle 10g Database on Linux for zSeries**
Redpaper REDP-3859-00, 22 December 2004
 - ▶ And much more ...

[http://publib-b.boulder.ibm.com/cgi-bin/searchsite.cgi?query=Linux+and+\(System+and+z9+or+zseries+or+S/390\)](http://publib-b.boulder.ibm.com/cgi-bin/searchsite.cgi?query=Linux+and+(System+and+z9+or+zseries+or+S/390))