Optimizing your Oracle investment with System z

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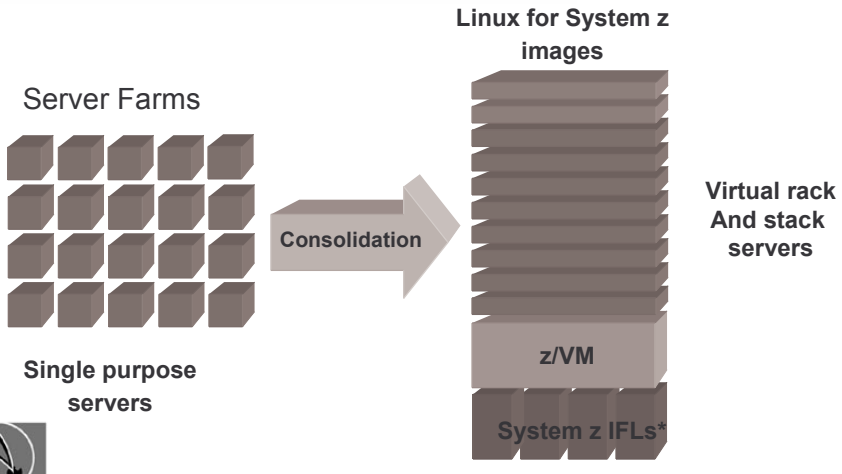
Agenda

- Aren't you from IBM?
- The business case for Oracle on z
- Running Oracle on System z
- Summary

Aren't you from IBM?

- YES! ☺
- But, if your company already has substantial investments in Oracle databases running on Unix/Intel…
- Changing DBMSs may be difficult
- It's in IBM's best interests to make sure your chosen DBMS runs well on System z
- And, Oracle does!
- Available in two flavours
  - Linux®
  - z/OS®

Linux for zSeries Opportunity - 'The Server Farm in a Box'

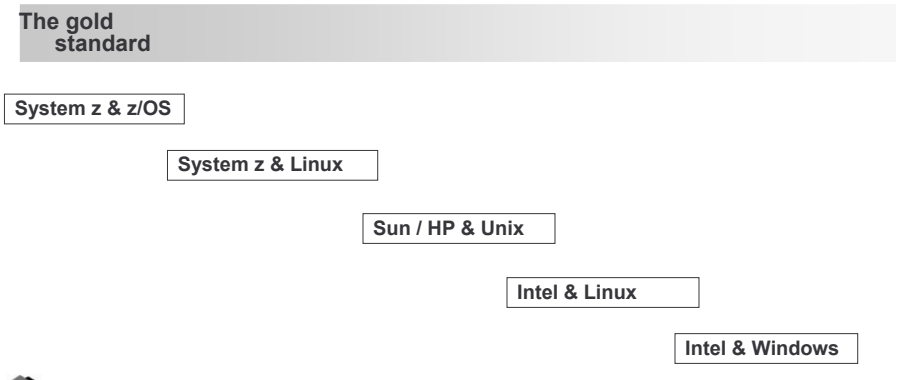


*IFL – Integrated Facility for Linux

Is anyone really running Oracle on System z?

- Yes!
  - Many customers in production with Oracle9*i,* some with 10g
  - Both Enterprise and Standard editions supported
  - System z Oracle Special Interest Group (SIG) quite active
- References
  - Government / Eduction
  - Utilities / Telco
  - Insurance / Financial
- What is a typical installation?
  - Biggest is 280 z990 CPUs in total (4 x z9-S54 plus 2 x z990-D32)
  - Smallest is 9672 RA6 (1 CPU)
  - Average is several IFLs, several databases and plus other infrastructu or middleware
- Why run Oracle on System z?

The RAS continuum



How is Oracle licensed on System z?

- The same as any other platform – by processor
- Number of cores x ProcessorFactor x $40,000(US list for Enterprise Edition)

Technology	Factor
UltraSparc T1	0.25
AMD/Intel	0.50
All other multi-core chips	0.75
Single core servers	1.00

- For complete pricing details see: http://www.oracle.com/corporate/pricing/index.html
- Also see: http://www.oracle.com/corporate/pricing/sig.html for "Software Investment Guide"

Source: http://www.oracle.com/corporate/pricing/multicore_faq.pdf - Mar 27 2006 and http://www.oracle.com/corporate/pricing/eplext.pdf - June 16, 2006

A sample business case

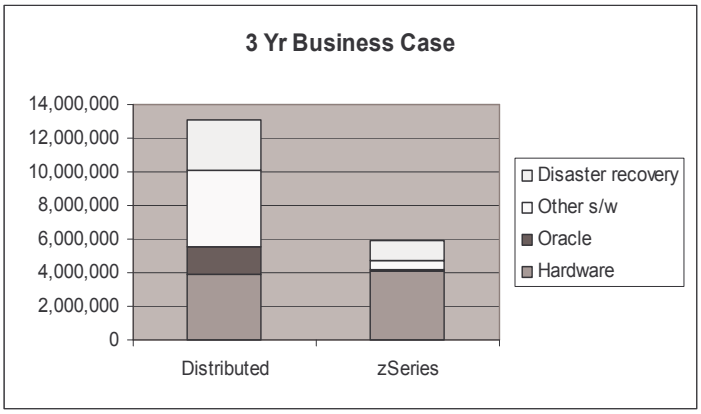
- **UNIX Servers - 15 E4500s & 35 E450s**
- **Linux Server - 5 G6 engines, or 4 zSeries IFLs (z900)**
- **Per CP software pricing (eg. Websphere, Oracle)**

Source: Scorpion Study 1999 - 2002

3-year UNIX TCO is 3.7x the cost of a Linux mainframe server

Source: IBM scorpion study

A Canadian customer



- **226 distributed CPs to 16 z9 IFLs**
- **Net new all-IFL z9. Adding IFLs to existing zSeries would reduce the cost**
- **Refresh of old distributed machines not included**
- **People, floor space, power, cooling not included**

Source: IBM Canada Ltd client study

A State government

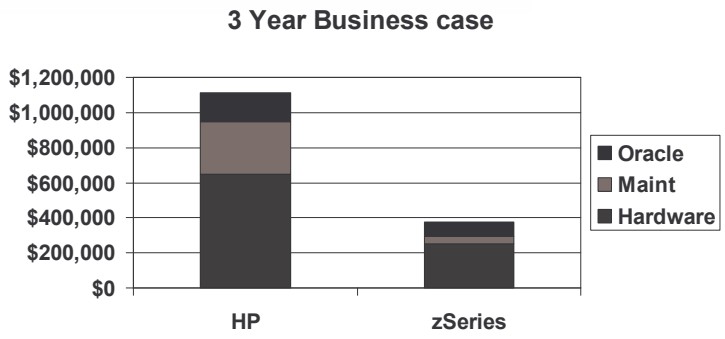
Current Oracle Linux on System z Strategy

Consolidate small, low utilized Oracle servers from the Intel & Sun environment onto Suse zLinux under zVM on IFLs

Linux on z - Oracle Benefits

- Rapid deployment of new servers
  - Minutes versus weeks
- Improved manageability
  - Fewer footprints & OSs
  - Established backup & recovery
  - Ease of prioritizing applications & resources
  - Possible chargeback
- Lower TCO
  - Oracle CPU license same as Intel CPU
  - Shared CPU cycles – less white space
  - Fewer footprint – less environmentals
  - Better manageability – less time required for maintenance, more time for new initiatives

Another state government



- 20% Reduction in child welfare response time
- Additional $95,000 in unscheduled downtime avoidance
- Costs reflect incremental IFLs on zSeries Vs HP upgrade

Source: IBM Corp, client study

An elapse time example…

Source: Oracle zSeries SIG, Yann Kindelberger, IBM France
http://zseriesoraclesig.org/2006presentations/Wed_KindOracle_on_Linux_zSeries_SIG_V3.zip

InformationWeek

Guru Vasudeva, enterprise chief architect at Nationwide Mutual Insurance, said during one presentation that his company plans to consolidate 600 Linux servers as virtual machines on two IBM mainframes by year's end.

The move will cut electricity use, data center space, and server costs, amounting to projected savings of $15 million in the next three years, Vasudeva said. Approximately 350 of those servers already have been consolidated. Before the project began, 78% of the company's 5,000 servers were using 10% or less of their capacity, he said.

IBM's and Oracle's pricing schemes work to Nationwide's benefit, Vasudeva said. Neither vendor points it out, but there are significant software license savings if you run their databases and middleware in virtual machines on mainframe processors. Software licenses are calculated based on the number of processors used, whether they're mainframe CPUs or Intel. "But mainframe processors are more efficient in how they manage the workload," Vasudeva said.

A report from LinuxWorld Aug/06:
http://www.informationweek.com/story/showArticle.jhtml?articleID=192202104

Customer Statement

I am running Linux on System z under z/VM today with … 45 Virtual Servers… I contrasted the costs between running the 45 servers on Intel versus the z/900. I took very conservative costs for the Intel machines ($2K per server), Switches ($10K), and Firewall's ($10K) and all with no support (this $0). On the Intel side I had Linux for $0 and on the zSeries, I bought SuSe Linux, Novell e-Maintenance, and IBM 24/7 "Support". The Middleware software was from IBM and it is licensed per processor. This is true of most all Distributed products including Oracle. Using Oracle in this would driven the numbers sky high for it is $40K per processor. Thus on the IFL it is $40K and on Intel it would be $200K and that premised 1-engine Intel machines. So I used the DB2 solution for the comparison. In the end the z-Solution was about $240K and the Intel solution was $840K.

As an aside, remember I kept the Intel side of the costs as low as possible, and the zSeries side I bought Linux with full 24/7 Support. Thus my gut says the number in the Intel side is closer to about $1M+ if one factors in support, increasing the speed of the connections for Switches and Firewalls, plus support for the software and upgrades. The beauty of z/VM is getting all the V-Lans, V-Routers, and V-Firewalls you want for nothing, and then all that "V-Cabling" running at memory speeds, and also Hypersockets for LPAR connections.

It is my conclusion that there are a number of reasons why one does not hear many stories about it. One story is those who do it quite well do not want to reveal the competitive advantage they have. Another, is the company is ashamed to admit they get benefit out of the mainframe when there is such a bias against the mainframe. I know of other places who admit the facts, but IT management wants no part of it; this is not what the trade press and their background says is so. Then in most places, Windows and Linux would be done by the Distributed or Network side of IT and not the mainframers; so why give up turf. Besides more and more servers to manage increases the size of management and their paychecks. Lastly why would those who have Windows machines (MSCE) and Cisco hardware (CISCO certified) turn things over to mainframe systems type to replace them. They will fight to the death to hang onto all their turf.

Another argument is z/VM is so tough. Back in the late 1980s I was forced over into VM (Dark Side for an MVS Bigot) of IBM systems and mastered the work in much less than a year, whereas MVS takes years to be able to do most all of it. IBM has a free 4 day z/VM and SuSe Linux school, to which I sent my z/OS Bigots, and they came back able to install, implement and get things running. Bringing up a z/VM system only to run zLinux is by far easier than supporting VM users using CMS, etc.

Source: Capt Jim Marshall USAF(ret) used with permission
http://bama.ua.edu/archives/ibm-main.html, #1609 June 2006

What's with this certification stuff?

- System z is a vendor-supported operating environment for Oracle database
- By Operating System levels / distributions
  - Oracle and IBM do not have to recertify anything for z9
  - Many more servers can be migrated to a z9 IFL
- Applications vendor needs to support database release level and hardware platform
  - IBM's Dallas systems center resources for ISVs can be used
  - Not an issue if it's your own custom written application

Certification matrix

- Oracle 10gR2
  - SUSE SLES 9
  - Red Hat AS 4 & ES 4
- Oracle 10gR1
  - SUSE SLES 8 and 9
- Oracle 9iR2 (31-bit)
  - SUSE SLES 8
  - SUSE SLES 9 (non-RAC)

- See Oracle's Metalink website for details and patch levels

Source: http://metalink.oracle.com – Certifications for database Enterprise Edition on IBM's zSeries Linux

Give it a try… at no-charge!

- Download Linux for System z, or z/OS, version directly from Oracle.
- No-charge development license limited to one server for prototyping purposes. Also 30 day test period for regular licenses. See license agreement at:
  - http://www.oracle.com/technology/software/products/database/oracle10g
- Also see Oracle's Software Investment Guide for further licensing details
  - http://www.oracle.com/corporate/pricing/sig.html

Source: http://oracle.com

Hints & tips

- Monitor memory management for to double paging issues
- Reduce memory size of the Linux guests to minimize Linux swapping
- Consider disabling z/VM minidisk cache
- Minimize dedicated OSA, FCP and Hipersocket devices.
- Use z/VM 5.2 or later
- IBM technical contacts for Oracle database on z:
  - Denny Dutcavich – Americas - 845-689-2226
  - Yann Kindelberger- Europe - 33 (0)4 67 34 67 00
  - Naoshi Kubo – Asia Pacific – nkubo@jp.ibm.com

Information Sources

- http://www.ibm.com/redbooks
  - SG24-6552-00 Experiences with Oracle9*i* for Linux on zSeries
  - SG24-6482-00 Experience with Oracle Database 10g on Linux for zSeries
  - SG24-6669-00 Linux for IBM System z9 and zSeries
- http://www.oracle.com/ibm
  - IBM platform information
- http://otn.oracle.com
  - (Select "Downloads")
- http://www.vm.ibm.com/perf/tips
  - General z/VM Tuning Tips
- http://www.vm.ibm.com/perf/tips/2GSTORAG.HTML
  - 2GB I/O information
- http://www-124.ibm.com/developerworks/oss/linux390/index.shtml
  - Lot's of information on Linux for zSeries
- http://awlinux1.alphaworks.ibm.com/developerworks/linux390/perf/tuning_rec_dasd.shtml
  - Hints and Tips for Selecting and Tuning I/O options
- http://www.zseriesoraclesig.org
  - Special Interest Group of Oracle users on the mainframe (z/OS and Linux)
- http://www.mail-archive.com/linux-390%40vm.marist.edu/
  - Marist List Server
- **http://www.miracleas.dk/WritingsFromMogens/YouProbablyDontNeedRACUSVersion.pdf**
  - Alternatives to Oracle RAC

Dec 7 webcast replay

- For the PDF:
  - https://whiteglove.on.raindance.com/confmgr/view_stored_doc.jsp?docId=980661729576564286233873272 85
  - http://tinyurl.com/2adsro
- For the webcast:
  - https://whiteglove.on.raindance.com/confmgr/view_stored_doc.jsp?docId=914020506420502947540172043 5&docType=recording
  - http://tinyurl.com/yq5tml

Summary

- RAS Continuum
- “Server Farm in a Box”
- Oracle database 9i and 10g, for Linux on System z, and zOS
- “per processor” pricing may make System z an attractive alternative to distributed environments
- Reduce/deploy existing Oracle licenses
- System z Oracle SIG – others have gone before you

- Thank you!

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