Wilhelm Mild – IT Architect

10 / 2013

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How to survive an Oracle PoC on System z

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Agenda

- Why Oracle on System z?
- Consolidation methodology
  - Scope of the project
  - Sizing (CPU and Memory)
- PoC phase
  - Preparation: what is needed
  - During the PoC: how to proceed
  - After the PoC: outcomes and next steps
- Real cases examples
- How we can help you?

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- **Why Oracle on System z?**
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IBM and Oracle Have a Long-Standing Relationship

Co-opetition is alive and well

IBM Oracle Alliance

Sustaining relationship of 150K + clients
- Oracle 25 years, PeopleSoft 23 years, JD Edwards 35 years, Siebel 13 years

Mutual executive commitment
- Dedicated, Executive-led Alliance teams, Regular Senior executive reviews

Vibrant technology relationship (Diamond Partner)
- Sustained investment in skills and resources including dedicated international competency centers

Market-leading services practice
- IBM GBS is Oracle's #1 SI partner (7,500 joint projects) with 5,000 people dedicated to Oracle

Unrivalled client support process
- Dedicated on-site resources and significant program investments ($77M on 1000+ assets)

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Value of Oracle consolidation with System z

Do more with less

- Exploit the System z global virtualization with Oracle workload
- Consolidate servers, networks, applications, and more data with Linux running on z/VM
- 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
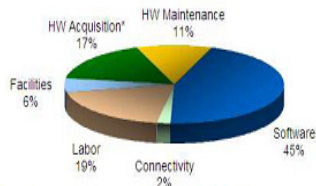
- Significant savings derived from reductions in server footprints, simplified infrastructure, lower software costs and a flexible and simplified infrastructure which is easy to manage.
- Consume less power and floor space
- Save on software license fees.
  - Consolidating from 86 servers to a single IFL could potentially reduce licensing costs by as much as 97 percent.
- Minimize hardware needed for business continuance and disaster recovery

Manage growth and complexity

- Exploit extensive z/VM facilities for life cycle management: provisioning, monitoring, workload mgmt, capacity planning, security, charge back, patching, backup, recovery, more...
- Add hardware resources to an already-running system without disruption – the epitome of Smarter Infrastructure
- Consolidation on a "scale up" machine like the Enterprise Linux Server means fewer cables, fewer components to impede growth

More flexibility, minimize lead time for new projects

- Consolidating Oracle and Linux environments to a single Enterprise Linux Server offers significant advantages in terms of flexibility
- Rapid provisioning reduces lead time for new IT projects, helping to increase business agility

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Why System z for Oracle?

- High Availability Requirements

- Open Standards and Linux

- Disaster Recovery Requirements

- Scalability for growth

- Increased Performance Requirements

- Economics of Linux (IFL) Specialty Engines

- TCO versus Total Cost of Acquisition

- 'Green' Value from Mainframe

- zEnterprise servers can virtualize everything with up to 100% utilization rates

- zEnterprise is the first Heterogeneous platform in the industry

- System z has the highest security rating or classification for any commercial server

- **IBM Cloud Services:** zEnterprise is a cloud providing server that offers a high degree of efficiency as well as the ability to scale into very large cloud configurations

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Why High-End Servers?

Utilization on x86 systems

Peak 3 Servers

Peak 3 Servers

Peak 3 Servers

Peak 3 Servers

Peak 3 Servers
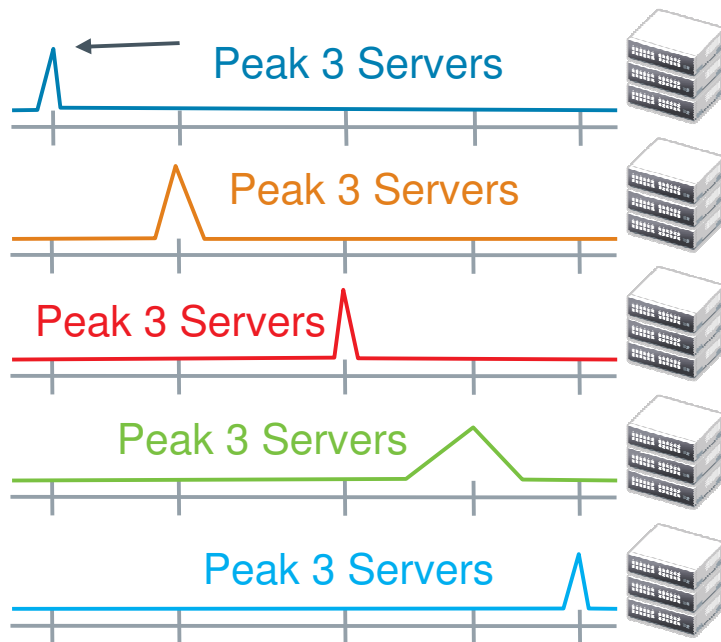
According to a study by Gartner, data centers that do not use virtualization have an average server CPU utilization rate of only 15%.

Mixed Utilization on IBM High End Servers
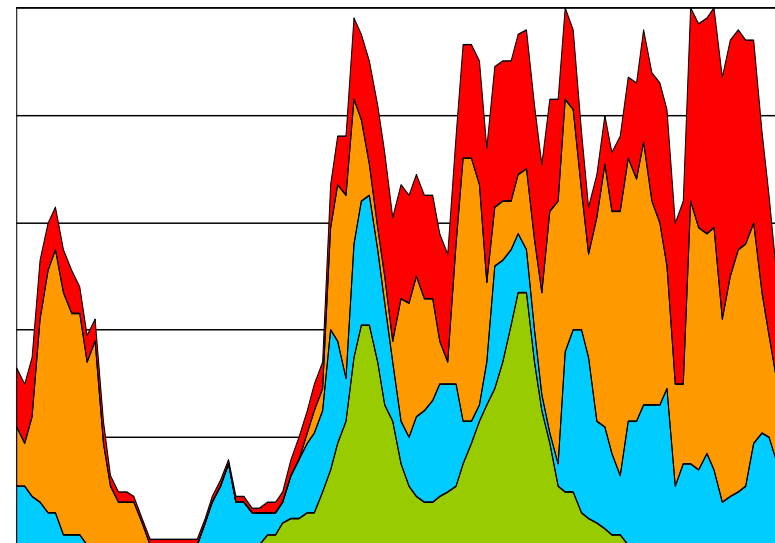
IBM High End Server: Up to 100% utilization

– Highly virtualized and shared resources

– Fewer servers, less power, cooling & admin

– Optimized use of SW assets

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Reducing software cost through consolidation
Example: Oracle database

- License and annual Software Update License & Support is based on processor cores
- A "processor core factor" is applied to adjust for different technologies

	Processor License	Software Update License & Support	Prices in USA (Dollar)
Oracle Database			
Standard Edition One	5,800	1,276.00	
Standard Edition	17,500	3,850.00	
Enterprise Edition	47,500	10,450.00	
Personal Edition	-	-	
Lite Mobile Server	23,000	5,060.00	
Enterprise Edition Options:			
Real Application Clusters	23,000	5,060.00	
Real Application Clusters One Node	10,000	2,200.00	
Active Data Guard	10,000	2,200.00	

Oracle Technology Global Price List
January 7, 2011
Software Investment Guide

Oracle documentation: http://www.oracle.com/us/corporate/pricing/technology-price-list-070617.pdf

Oracle Processor Core Factor Table
Effective Date: March 16, 2009

AMD Opteron Models 13XX, 23XX, 24XX, 41XX, 61XX, 83XX, 84XX or earlier Multicore chips	0.5
Intel Xeon Series 56XX, Series 65XX, Series 75XX, or earlier Multicore chips	0.5
IBM POWER6	1.0
IBM POWER7	1.0
IBM POWER7+	1.0
IBM System z (z10 and earlier)	1.0
All Other Multicore chips	1.0

Oracle documentation: http://www.oracle.com/us/corporate/contracts/processor-core-factor-table-070634.pdf
IBM documentation: http://www-01.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

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Reducing software cost through consolidation
Example: Oracle database

- License and annual Software Update License & Support is based on processor cores
- A "processor core factor" is applied to adjust for different technologies

Oracle Database	Processor License	Software Update License & Support
Database Products		
Oracle Database		
Standard Edition One	5,800	1,276.00
Standard Edition	17,500	3,850.00
Enterprise Edition	47,500	10,450.00
Personal Edition	-	-
Lite Mobile Server	23,000	5,060.00

Prices in USA (US Dollars)

Enterprise Edition **47,500** **10,450.00** US$ annually

Real Application Clusters One Node	10,000	2,200.00
Active Data Guard	10,000	2,200.00

ORACLE
Oracle Processor Core Factor Table
Effective Date: March 16, 2009

AMD Opteron Models 13XX, 23XX, 24XX, 41XX, 61XX, 83XX, 84XX or earlier Multicore chips	0.5
Intel Xeon Series 56XX, Series 65XX, Series 75XX, or earlier Multicore chips	0.5

Intel Itanium **1.0**

IBM POWER6	1.0
IBM POWER7	1.0

IBM System z (zBC12 and z114) **1.0**

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Pricing based on PVU – Processor Value Units

PVU Table per Core (section 1 of 2 - RISC and System z)

Processor Vendor	Processor Name	Server model numbers	Maximum number of sockets per server	Cores per socket						IFL Engine	Proc. Model Number	PVUs per Core
				(1)	(2)	(4)	(6)	(8)	(16)			
IBM	POWER7 [4]	770, 780, 795	> 4			■	■	■			All	120
		750, 755, 760, 775 PS704, p460	4			■	■	■			All	100
		PS700-703, 710-740, p260, p270, 7R1, 7R2, p24L	2			■	■	■			All	70
	POWER6	550, 560, 570, 575, 595	All		■						All	120
		520, JS12, JS22, JS23, JS43	All		■						All	80
	POWER5, POWER4	All	All		■						All	100
	POWER5 QCM	All	All			■					All	50
	zEC12, z196, System z10 [1,5]	All	All							■	All	120
	zBC12, z114, System z9, z990, S/390 [1,2,6]	All	All							■	All	100

Processor Vendor	Processor Name	Server model numbers	Maximum number of sockets per server	Cores per socket						IFL Engine	Proc. Model Number	PVUs per Core
				(1)	(2)	(4)	(6)	(8)	(16)			
HP/Intel®	Itanium® 1.2	All	All	■	■			■			All	100
	PA-RISC	All	All	■							All	100
Sun / Fujitsu	SPARC64 VI, VII, X	All	All	■	■			■			All	100
	UltraSPARC IV	All	All	■							All	100
	SPARC M5	All	96				■				All	120
	SPARC T4/T5	T5-8	8					■			All	120
		T4-4, T5-4	4				■	■			All	100
		T4-1, T4-1B, T4-2, T5-1B, T5-2	2				■	■			All	70
	SPARC T3	All	All				■	■			All	70
	UltraSPARC T2	All	All			■	■	■			All	50
	UltraSPARC T1	All	All			■	■	■			All	30
Any	Any single-core	All	All	■							All	100

*Requirements as of publish date: 19 September 2013

http://www-01.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

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When is an Oracle Consolidation paying out

- starting with 2 Server (RAC) installation

- Real customer situation
- For an Installation of Oracle (RAC) starting with 2 servers
  - Severs with 6 Cores - 2 X 6 = 12 Cores
  - Oracle Enterprise Licenses
  - RAC Feature
- Replacement with z114 - much cheaper and effective
  - workload could be handled with 2 IFLs

- Price saving over 3 years:
  - almost one million Euro savings

Confronto spesa triennale
Oracle Enterprise Edition

ORACLE

Su x86:
1°   Anno: € 814.656,65
2°   Anno: € 146.904,60
3°   Anno: € 146.904,60

Totale Triennale
€ 1.108.465,85

ORACLE

Su System Z114 IFL:
1°   Anno: € 135.776,10
2°   Anno: €   24.484,10
3°   Anno: €   24.484,10

Totale Triennale
€ 184.744,3

Risparmio ORACLE su System Z114
- € 923.721,55

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Method proposed for Oracle on z projects

- **1 - Scope of the project delimitation – feasibility study**
  - Gather information on existing environment (servers, applications, network)
  - Fit for Purpose (F4P) study
  - Prioritize the non-functional requirements (RAS, scalability, performance, management)
  - Assess the skills
  - Can follow a Cost & Value study
- **2 - Architecture design and sizing exercise**
  - Select applications and servers to be consolidated (check support !)
  - Definition of the targeted architecture – Physical model development
  - Collection of performance and monitoring data from current distributed environment
  - Initial sizing exercise in collaboration with IBM Techline
- **3 - Proof of Concept**
  - Functional Validation
  - Performance and Sizing Validation (if benchmark)
  - Targeted architecture validation
  - zLight can be a good option for a PoC
- **4 - Pre-production tests**
  - Validation in the real environment
  - Environment health check before production (LPAR, z/VM, Linux, Middleware)
  - Skill transfer phase
- **5 - Put to production**
  - Iterative put to production
  - Monitor the system to tune it accordingly

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Hyperion EPM
Version 11.1.2.3
accessing Oracle DB
10g Release 2
11g Release 2
Q213

Siebel CRM
Version 8.1.1.10
accessing Oracle DB
11g Release 2
10gR2
Q213

PeopleSoft 9.2
PeopleTools 8.53
accessing Oracle DB
11g Release 2 11.2.0.3
10gR2 10.2.0.5
Q213

Siebel
Public Sector,
Loyalty Management
Version 8.2.2.3
accessing Oracle DB
11g Release 2
10gR2
Q213

SOA
WebCenter
11gR1 PS6
WebLogic Server
11gR1 11.1.1.6
Q213

Oracle BIEE
Version 11.1.1.7
with Oracle DB
as DSR*
10g Release 2
11g Release 2
Q213

*Oracle DB
11g Release 2
Version 11.2.0.3.6
Q213*

*Oracle
Billing and Revenue
Management
Version 7.5.0.0.0
accessing Oracle DB
11g Release 2
Version 11.2.0.3
Q113*

New

Oracle DB
11g Release 2
Version 11.2.0.3
RHEL 6.2 Support
Q113

Hyperion EPM
Version 11.1.2.2
accessing Oracle DB
10g Release 2
11g Release 2
Q212

New

*Oracle DB
11g Release 2
Version 11.2.0.3.5
Q113*

*Oracle DB
10g Release 2
Version 10.2.0.5.10
Q113*

Enterprise Manager
Agent Release 12c
Version 12.1.0.1
Q212

PeopleTools 8.52
accessing Oracle DB
11g Release 2
11.2.0.3.1
Q212

PeopleSoft Campus
Solutions V9
PT 8.52
accessing Oracle DB
11g Release 2
Q411

New

*Oracle DB
11g Release 2
Version 11.2.0.3.4
Q412*

*Oracle DB
11g Release 2
Version 11.2.0.3.3
Q312*

PeopleTools 8.51
accessing Oracle DB
11g Release 2
11.2.0.3
Q212

Oracle DB
10g Release 2
Version 10.2.0.5
PSU 5
Q411

New

WebLogic Server
12c Release 1
Version 12.1.1x
Q212

*Oracle DB
11g Release 2
Version 11.2.0.3.2
Q212*

WebLogic Server,
SOA, WebCenter
11gR1 PS5
Q112

PeopleTools 8.52
accessing Oracle DB
11g Release 2
11.2.0.2
Q411

*Oracle DB
11g Release 2
Version 11.2.0.3
Q411*

New

Enterprise Manager
Agent 12c
Release 2
Version 12.1.0.2
Q212

E-Business Suite
Release 12.1x
accessing Oracle DB
11g Release 2
Version 11.2.0.3
Q112

PeopleTools 8.52
accessing Oracle DB
10g Release 2
10.2.0.5
Q411

*Oracle DB
11g Release 2
Version 11.2.0.3.1
Q112*

Oracle DB
11g Release 2
Version 11.2.0.2
PSU 4
Q411

*Oracle DB
11g Release 2
Version 11.2.0.2.5
Q112*

PeopleTools 8.51
accessing Oracle DB
10g Release 2
10.2.0.5
Q311

*Oracle Solutions Delivered for
Linux on IBM System z®*

Oracle DB
11g Release 2
Version 11.2.0.2
PSU 3
Q311

WebLogic Server
11gR1 PS3
Q111

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* Data Source or Repository

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Oracle DB certifications on Linux on System z

- Oracle has been delivering database solutions on Linux on System z Servers since 2002
- On March 30th, 2011 delivered Oracle 11*g* Release 2 (11.2.0.2) Database for Linux on IBM System z Servers.
- New features such as **Real Application Testing** and **support for huge pages**, make this an interesting Linux on System z option.

	SLES 10	SLES 11	RHEL 4	RHEL 5	RHEL 6
Oracle DB 11.2.0.3	YES	YES	YES	YES	YES
Oracle DB 11.2.0.2	YES	YES	YES	YES	NO
Oracle DB 10.2.0.5	YES	YES	YES	YES	NO
Oracle DB 10.2.0.4	YES	NO	YES	YES	NO

- **E-Business Suite on Oracle Database 11*g* Release 2** is supported as a mixed mode architecture (formerly " split tier architecture"). Database can run on Linux on z. EBS code runs on a different platform (AIX, Linux on x86, etc.)
- **Hyperion** Finance EPM is supported on Linux on System z in a split tier architecture.

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- **Consolidation methodology**

  - Scope of the project

  - Sizing (CPU and Memory)

- PoC phase

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How to gather information about Oracle environment

- **For System information**
  - List of servers models with details (constructor, model, CPU, cores, processor…)
- **For workload information**
  - Type of workload, if we have no information we take DB production
- **For CPU information**
  - Info from 'vmstats', collected 1 or several days during a relevant period. Collect interval should be at most 10min or less, if possible, with either:
    - VMSTAT
    - SAR data
    - NMON
  - If not possible to get the vmstats we need an estimation of CPU utilization during the peak period
- **For memory information (see details on p. 22)**
  - Determine the quantity of SGA and PGA sizes and memory use from:
    - AWR reports
  - Number of concurrent user connections:
    - at the Linux level or AWR reports

CPU and Memory work different on System z than distributed systems - more effective and less invasive

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Oracle Consolidation on System z study : methodology example

Row	Defined Sequence Number	User Desired Sequence	Ex-clude (1)	Application Name	Vendor	Server Hardware Description and Lookup Identification	# OEM Servers Enter #	Result	Case-1 90.0%	Case-2 65.0%	No.	Workload Assignment Description
1	1	1		d-intellinx	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.08	0.08	20.0%	65.0%	33	DB: Production
2	2	2		dw-bo-t	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.17	0.17	20.0%	65.0%	33	DB: Production
3	3	3		IFNPROD	IBM	BladeCenter HS21 Xeon 5150 Dual Core 2.66GHz (1ch/2co)	1.00	1.00	50.0%	65.0%	33	DB: Production
4	4	4		IFNT	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.17	0.17	10.0%	65.0%	33	DB: Production
5	5	5		INTELLINX	IBM	System x3850 (3U) Xeon EM64T 3.66GHz 1MB (4ch/4co)	1.00	1.00	50.0%	65.0%	33	DB: Production
6	6	6		twindba1	IBM	BladeCenter HS22V Xeon L5638 Hex Core 2.0GHz (2ch/12co)	1.00	1.00	10.0%	65.0%	33	DB: Production
7	7	7		managegrid	IBM	BladeCenter HS22V Xeon E5645 Hex Core 2.4GHz (2ch/12co)	0.33	0.33	20.0%	65.0%	33	DB: Production
8	8	8		ORANT1	IBM	BladeCenter HS21 XM Xeon E5345 Quad Core 2.33GHz (2ch/8co)	1.00	1.00	10.0%	65.0%	33	DB: Production
9	9	9		ORANT5	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.33	0.33	20.0%	65.0%	33	DB: Production
10	10	10		ORAST1	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.08	0.08	50.0%	65.0%	33	DB: Production
11	11	11		ORAST3	IBM	BladeCenter HS22V Xeon E5645 Hex Core 2.4GHz (2ch/12co)	0.17	0.17	10.0%	65.0%	33	DB: Production
12	12	12		OraTest1	IBM	BladeCenter HS22V Xeon L5640 Hex Core 2.26GHz (2ch/12co)	0.17	0.17	20.0%	65.0%	33	DB: Production
13	13	13		OraTest3	IBM	BladeCenter HS22V Xeon X5675 Hex Core 3.06GHz (2ch/12co)	0.08	0.08	30.0%	65.0%	33	DB: Production
14	14	14		OraTest5	IBM	BladeCenter HS22V Xeon L5640 Hex Core 2.26GHz (2ch/12co)	0.17	0.17	20.0%	65.0%	33	DB: Production
15	15	15		PCTI-ICON	IBM	BladeCenter HS22V Xeon X5675 Hex Core 3.06GHz (2ch/12co)	0.08	0.08	10.0%	65.0%	33	DB: Production
16	16	16		pdw-boxi	IBM	BladeCenter HS21 XM Xeon E5420 Quad Core 2.5GHz (2ch/8co)	1.00	1.00	10.0%	65.0%	33	DB: Production
17	17	17		PGL	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	0.17	0.17	10.0%	65.0%	33	DB: Production
18		18	1	pisrdb1					40.0%		33	
19		19	1	pisrdb2					50.0%		33	
20	18	20		poralnx01	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	1.00	1.00	30.0%	65.0%	33	DB: Production
21	19	21		poralnx02	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	1.00	1.00	30.0%	65.0%	33	DB: Production
22	20	22		poralnx03	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	1.00	1.00	30.0%	65.0%	33	DB: Production
23	21	23		PRIORITY	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	0.17	0.17	10.0%	65.0%	33	DB: Production
24	22	24		ptm-oradb1.ext	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.17	0.17	40.0%	65.0%	33	DB: Production
25	23	25		qaora1	IBM	BladeCenter HS22V Xeon E5649 Hex Core 2.53GHz (2ch/12co)	0.33	0.33	40.0%	65.0%	33	DB: Production
26	24	26		qaoralnx1	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	0.17	0.17	30.0%	65.0%	33	DB: Production
27	25	27		qasrv1	IBM	BladeCenter HS22V Xeon X5670 Hex Core 2.93GHz (2ch/12co)	0.08	0.08	30.0%	65.0%	33	DB: Production
28		28	1	risrdb1					10.0%		33	
29		29	1	risrdb2					10.0%		33	
30	26	30		saoralnx1	IBM	BladeCenter HS22V Xeon X5650 Hex Core 2.66GHz (2ch/12co)	0.17	0.17	40.0%	65.0%	33	DB: Production
31	27	31		storalnx1	IBM	BladeCenter HS22V Xeon X5650 He						
32	28	32		storalnx2	IBM	BladeCenter HS22V Xeon X5650 He						
33	29	33		storalnx3	IBM	BladeCenter HS22V Xeon X5650 He						
34	30	34		TGL	IBM	BladeCenter HS22V Xeon E5649 He						
35		35	1	tisrsdb2								
36	31	36		toralnx1	IBM	BladeCenter HS22V Xeon X5650 He						
37	32	37		pmove2prod	IBM	BladeCenter HS22V Xeon E5645 He						
38		38	1	TSYSSDB2								
39	33	39		ttm-oradb1.ext	IBM	BladeCenter HS22V Xeon E5649 He						
40	34	40		pemquestpaora	IBM	BladeCenter HS22V Xeon E5645 He						
41		41	1	Tmobidb								
42	35	42		tsysdba1	IBM	BladeCenter HS21 XM Xeon E5345						
43		43	1	Pmobidb								
44		44	1	STmobidb								
45		45	1	QAmobidb								
46	36	46		TPRIORITY	IBM	BladeCenter HS22V Xeon X5650 He						

Note: Fractional values must be less than 1.00

Summary of Servers to be Consolidated

Servers	Chips	Cores	Applications
36	35	172	36

Utilization for Case 1

Processor	Feature	< Complementary Peaks Concurrent >			
		0%	40.0%	70.0%	100%
IBM z196 IFL					
2817-7xx I9	9W IFL	60%	105%	139%	174%
2817-7xx I10	10W IFL	55%	96%	126%	157%
2817-7xx I11	11W IFL	50%	88%	116%	144%
2817-7xx I12	12W IFL	46%	81%	107%	133%
2817-7xx I13	13W IFL	43%	75%	99%	124%
2817-7xx I14	14W IFL	40%	70%	93%	116%
2817-7xx I15	15W IFL	38%	66%	87%	109%
2817-7xx I16	16W IFL	36%	62%	82%	102%
2817-7xx I17	17W IFL	34%	59%	78%	97%

Oracle Consolidation on System z study : methodology example
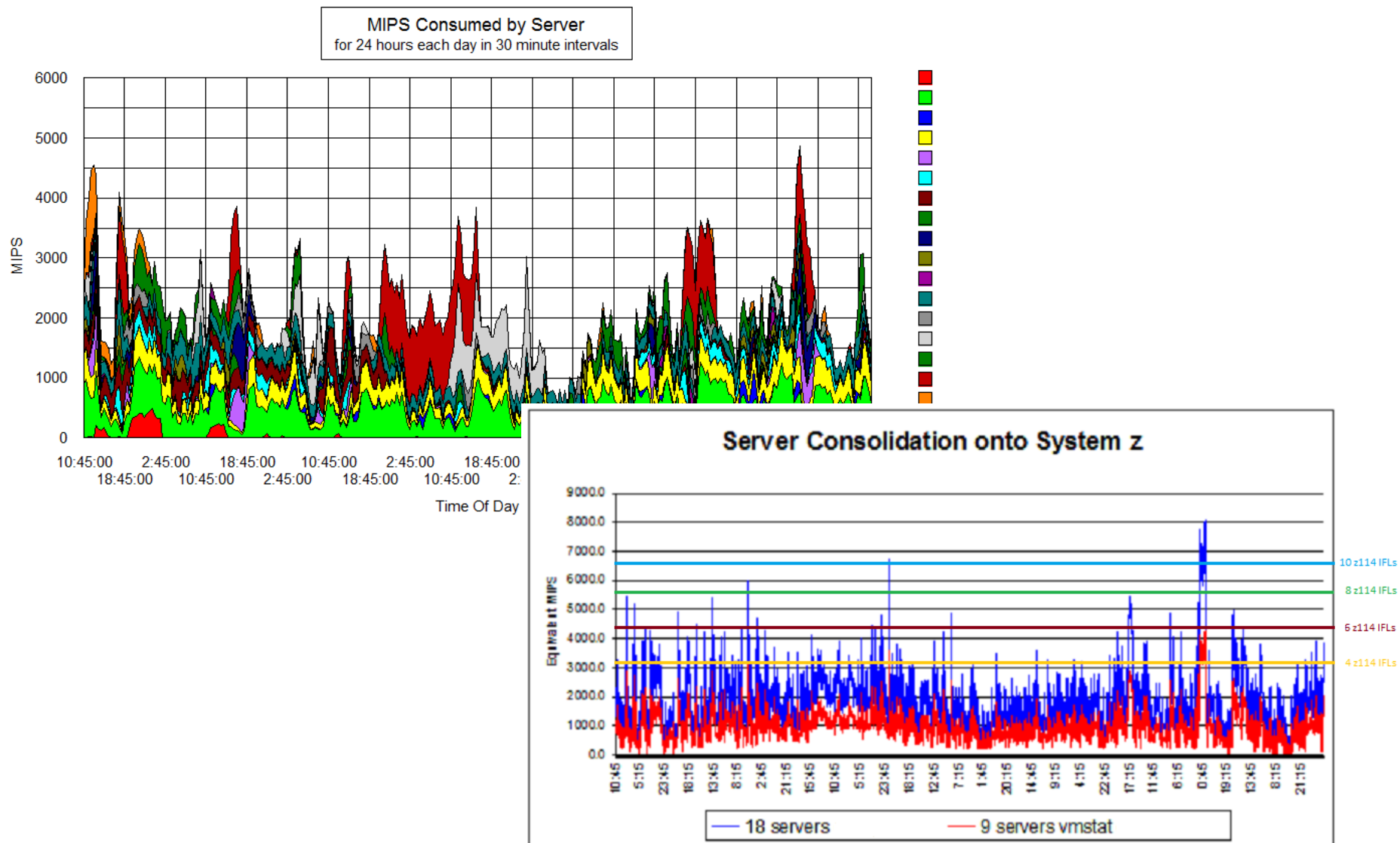
Example of memory sizing for Oracle

- Standard Memory estimation = **sum of**:
  - Memory required for **Linux Kernel**: 512 MB
  - Memory required for **Oracle SGA**: From AWR or per DBA estimation
  - Memory required for **Oracle PGA**: From AWR or per DBA estimation
  - Memory required for **Oracle ASM**: 256 MB to 512 MB (If ASM is used)
  - Memory required for **additional agents** like OEM, Tivoli etc., as needed by the application
  - **Linux Overhead** requirements: 5 % of the total memory

  Starting size = SGA + PGA + 0.5GB for Linux + ASM (if used)

- Oracle recommendations about the memory requirements for dedicated user connections :
  - Depend on workload at the client connections and how many client connections are being used
  - On average, dedicated connections use 4.5MB per connection (with default workarea parameters)
  - See PGA advisor to check if the PGA size is optimum (avoid multipass)

- Memory over-commitment (relationship of virtual to real memory)
  - Limit/avoid memory over-commitment for critical production databases
  - Test/development guests can benefit from z/VM memory over-commitment capability

http://www.redbooks.ibm.com/redpieces/abstracts/sg248104.html

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Example of memory sizing for Oracle (user connections)

- For dedicated connections you can have an idea of the quantity in AWR, section Instance Activity Stats – Absolute Values

Instance Activity Stats - Absolute Values

- Statistics with absolute values (should not be diffed)

| Statistic	Begin Value	End Value
session uga memory	12,618,216	13,589,576
opened cursors current	34	30
logons current	28	28
session uga memory max	502,328,936	1,945,112,232
session pga memory	133,131,664	130,427,632
session pga memory max	156,921,232	154,217,200
session cursor cache count	1,378	1,744

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Oracle Consolidation on System z : provide accurate values otherwise…

Model	Sockets	Cores per Socket	Processor Speed
Intel(R) Xeon(R) CPU X5650	2	6	2.67GHz

- Before consolidation.

- Workload on Intel Xeon registered on July 2012
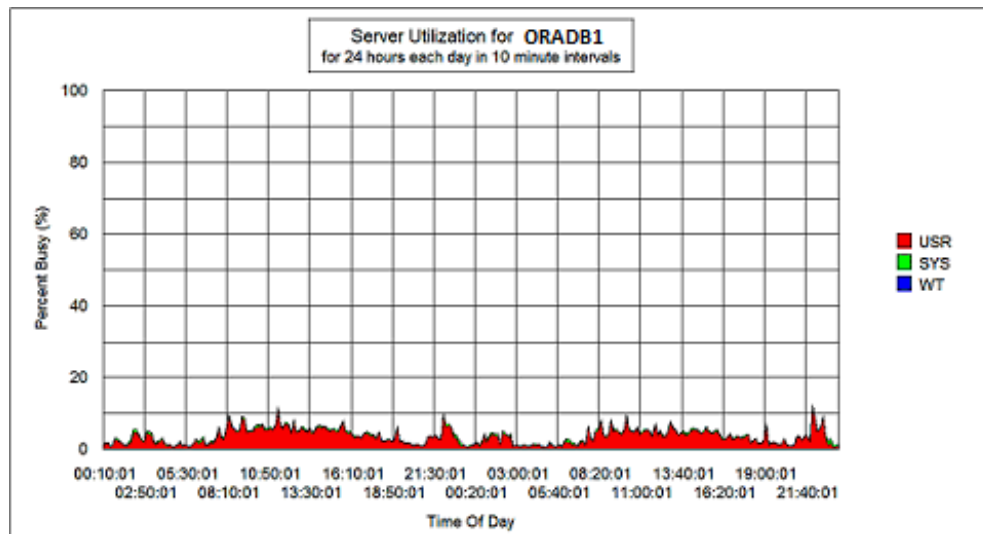
- After consolidation on Linux System z on Sept. 2013

- => the workload is not the same
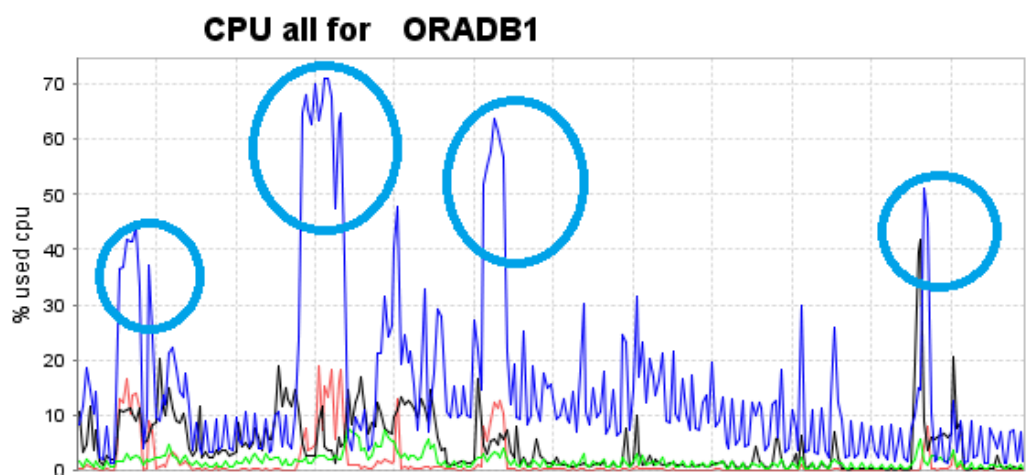
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Agenda

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Proof of Concept preparation (1/3)

- Design the final architecture and review it with System z experts
- Determine the scope of the PoC - Verify all the involved components are supported!
- Determine the success criteria
  - Take performance data on the source platform if you need to do comparison tests
- Determine Hardware configuration
  - Server
    - Model
    - Partitioning
    - IFL (number, shared, dedicated…)
  - Network
  - Storage
    - System and Type of disks (ECKD, SCSI)
- Determine software configuration for z/VM (if used), Linux, Oracle
  - Licenses, Versions
  - Patchset levels
  - For Oracle, Critical Patch Update Advisories are available at the following location:
    Oracle Technology Network:
    http://www.oracle.com/technetwork/topics/security/alerts-086861.html

Best practices: use the latest release and level of patchset to avoid any known bug!

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Proof of Concept preparation (2/3)

- **Make sure all the skills needed are available!**

- Set up the hardware

- Install z/VM and Performance toolkit (if part of the PoC)

- Install Linux

- Test your I/O subsystem with Orion tool (Before Oracle installation, because the writing test will erase the data on the disks)

- Install Oracle
  – Use RPM checker prior to installation: download the appropriate RPM checker from the bottom of the My Oracle Support (MOS) Note 1306465.1
  – Oracle DB installation is identical on System z with distributed platforms
  – Oracle Entreprise Manager is identical

Best practices: Be careful with prerequisites for Oracle Installation!

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Proof of Concept preparation (3/3)

- **Determine the success criteria before the test start – revalidate them with all the stakeholders**
- Apply best practices, among them don't forget:
  - If using ext3 then verify Oracle init.ora has the following settings:
    - filesystemio_options = setall (direct I/O)
    - disk_asynch_io=true

    to eliminate Linux double caching which wastes storage and CPU resources

  - Calibrate I/O with Oracle Enterprise Manager

  - Collect statistics at Oracle level
    - EXEC DBMS_STATS.gather_schema_stats('soe', granularity => 'ALL', cascade => true, options => 'GATHER', degree => x);

    (Where x is number of CPU * 2)

  - Increase the size of the redologs for Oracle (50 MB by default, most of time too small)
    - alter database add logfile ('/logs/swing_log1.log') size 10G

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During the PoC

- Make sure all the skills needed are available!
- Remind the success criteria before the test start – revalidate them with all the stakeholders
- Chose a rigorous approach to store the tests results
- Monitor your system at all levels, for example:
  - Performance ToolKit to monitor z/VM
  - Nmon to monitor the Linux guests
  - SADC and IO stat to monitor the Linux guests in details
  - TPC to monitor the Storage Subsystem
  - Oracle Enterprise Manager DB console to monitor Oracle Database
- Keep a trace of all the results of your tests, with the changes you made (one change at a time!)

- **Document all changes made during PoC**

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After the PoC: Outcomes and next steps

- Write down a document to keep a trace of the PoC
  - For this specific case (used parameters, workload optimization…)
  - For reuse for other cases!

- Present and explain the results to the customer

- Discuss the next steps
  - Additional NFR like HA or DR (often not considered during the PoC)
  - Sizing validation
  - Further functions to tests
  - Migration considerations
  - Put to production

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Best practices / Return of experience

- Project management
  - Need to have an accurate statement of work
    - Description of what is expected
    - Who is doing what
  - Need to have a dedicated project manager for
    - Preparation
    - PoC
    - Results presentation and explanation

- Technical issues
  - Use best practices to set up your systems/software
  - Use the last level of patches for each component

- Skills
  - If the PoC is done at customer site we need to make sure all the skills will be available (no bottleneck during the PoC!)

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Real case example 1: IT Service provider

PoC at Customer: without Lab involvement - challenges and long

- Context
  - This IT service provider has a lot of Oracle DB on distributed systems
  - They had some experience with Linux on System z (just for test)
  - They wanted to be able to quickly develop new Oracle servers
  - They wanted to test their own infrastructure (« background task »)

- During the PoC
  - They asked for help for installation documentation
  - They experienced errors during the installation

- Results and return of experience
  - No planning, no dedicated resources =>it took a long time to take a decision (several months)
  - Customer in production now
  - Trend is to go towards a « Cloud » environment

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Real case example 2: Travel and Transportation
PoC at customer: with joined expertise Boeblingen and Montpellier
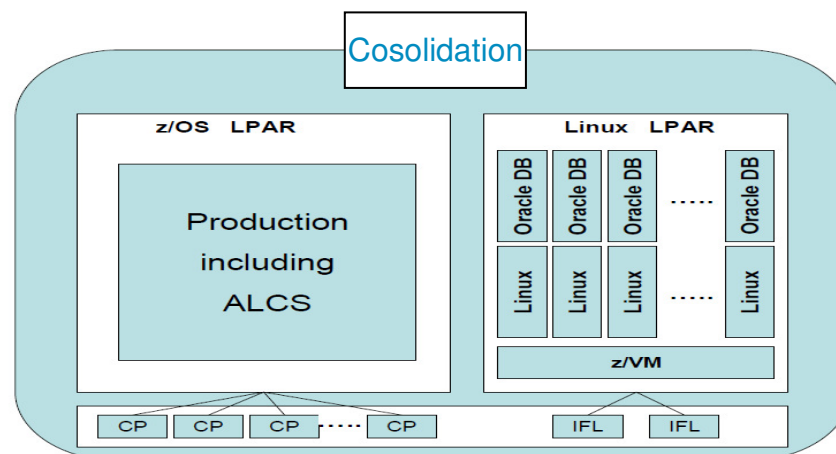
- Context
  - This System z customer (legacy) wanted to leverage their System z infrastructure
  - They had more than 250 Oracle databases
  - They wanted to be proven that:
    - A Linux would have no impact on their production environment
    - Oracle DB was running fine on Linux on System z

- PoC description
  - Statement of work IBM/Customer
  - Set up phase
  - Test phase
  - Results delivery phase and next steps

- Results
  - The Poc was done at their site with the help of BOE people (on site) and Mop people (remotely)
  - After this first step, a workshop was done at their site for HA/DR with Oracle DB on System z environment
  - Customer now in production

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Real case example 3: Public Sector, Government

PoC at a Lab: Leveraging joined expertise Boeblingen and Montpellier

- Context
  - System z existing customer with strong knowledge on Linux on System z
  - They wanted to consolidate Oracle DB from Intel to System z
  - Some very critical applications needed to be at least as faster on System z as Intel to carry on consolidation

- During the PoC
  - The PoC took place in BOE with MOP support as well, and last a short period (days)
  - All the team (IBM local team, BOE, MOP and customer team) worked together
  - As soon as issues arose they were corrected immediately

- Results and return of experience
  - In most of the cases, after tuning, most of the test cases were in favor of System z
  - This PoC was key to close the deal
  - Customer is in production now

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Some Reference Customers
Linux on System z with Oracle

bnz
Bank of New Zealand

Sparda-Banken
freundlich & fair

The Department of National Defence
and the Canadian Forces

Le Ministère de la Défense nationale
et les Forces canadiennes

KMD
IT MED INDSIGT

Nationwide®
Nationwide®
Insurance

IDAHO POWER.
An IDACORP Company

Dundee
City Council
www.dundeecity.gov.uk

miamidade.gov

Centre
de services partagés
Québec

TRANSZAP

Oklahoma Department of Human Services
OKLAHOMA
OKDHS
EXCELLENCE

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The IBM Oracle Centers

MISSION

Help IBM customers to deliver integrated solutions with Oracle Software Products on IBM Infrastructures

STRENGH

Cross platform team with strong knowledge on Oracle products and a wide network within IBM and Oracle ecosystem

ACTIVITIES

• Convince : Briefings & Conferences
• Build : Architecture, Design, Sizing
• Demonstrate : Proof-of-Concept, Benchmarks
• Deliver : Publications & Workshops

COVERED PRODUCTS

• IBM Platforms (System z,Power, System x, Total Storage)
• Oracle Technologies (Oracle DB, RAC, ASM, Dataguard)
• Oracle Applications (EBS, Siebel & OBI & OWI)
• Entry point to other on Industry Solutions (BRM, iFlex, RETEK, Weblogic...)
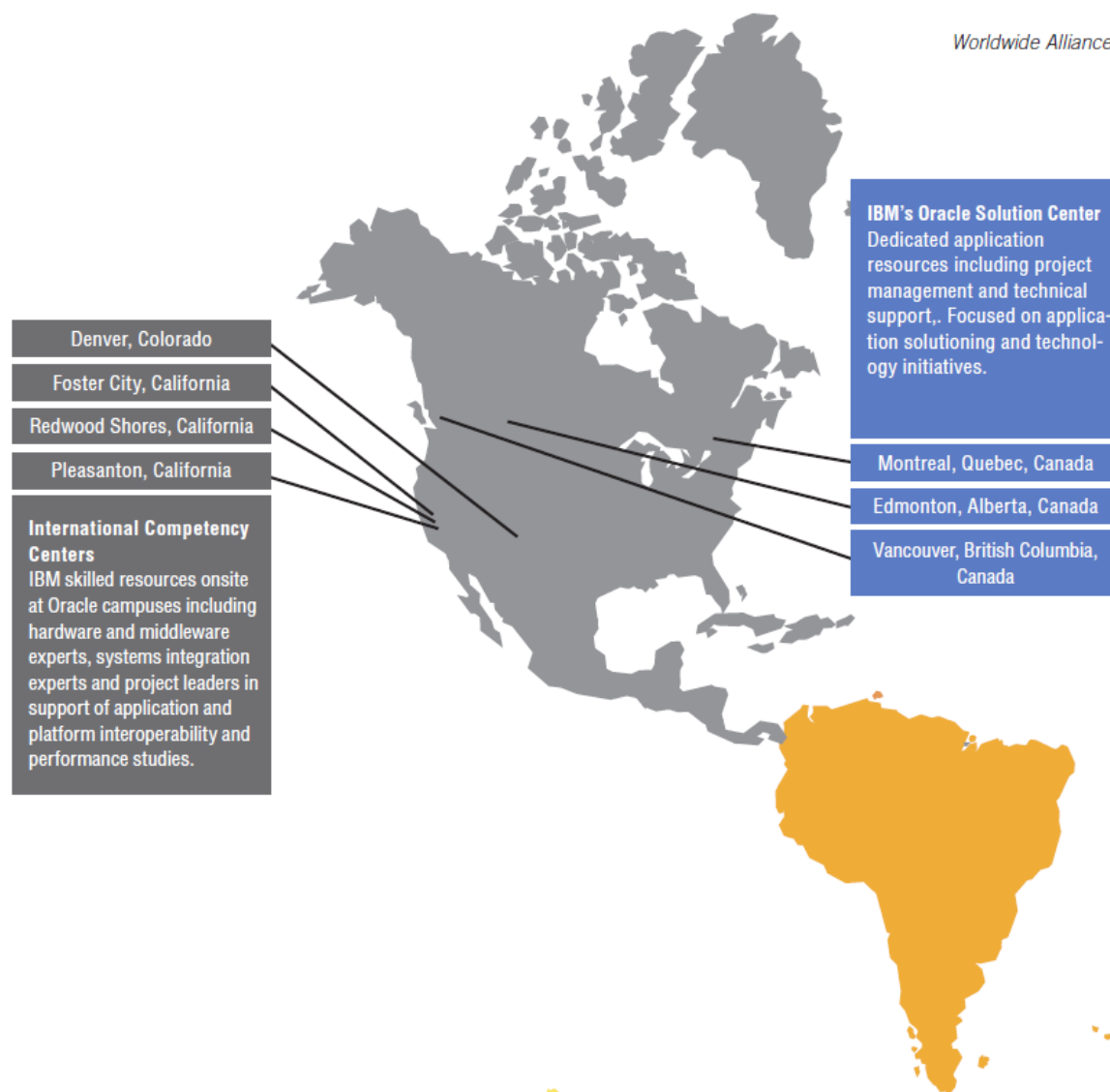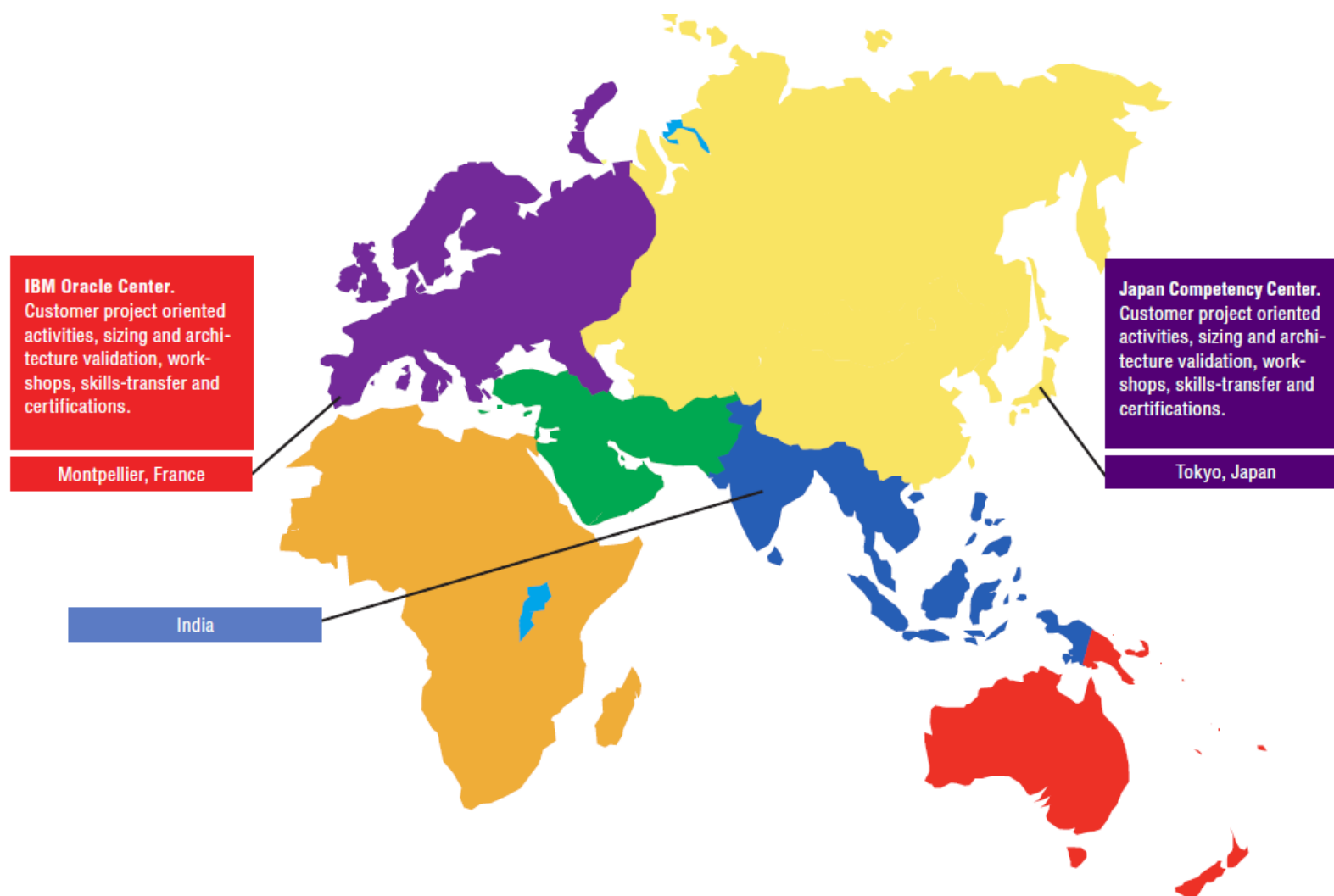
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IBM Oracle Competence Centers

Worldwide Alliance Resources

IBM's Oracle Solution Center
Dedicated application resources including project management and technical support,. Focused on application solutioning and technology initiatives.

Montreal, Quebec, Canada

Edmonton, Alberta, Canada

Vancouver, British Columbia, Canada

Denver, Colorado

Foster City, California

Redwood Shores, California

Pleasanton, California

International Competency Centers
IBM skilled resources onsite at Oracle campuses including hardware and middleware experts, systems integration experts and project leaders in support of application and platform interoperability and performance studies.

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IBM Oracle Competence Centers

IBM Oracle Center.
Customer project oriented activities, sizing and architecture validation, workshops, skills-transfer and certifications.

Montpellier, France

Japan Competency Center.
Customer project oriented activities, sizing and architecture validation, workshops, skills-transfer and certifications.

Tokyo, Japan

India

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Light Oracle on Linux on z environment for Demo's and POC

Light Oracle on zLinux offerings for System z are predefined remote system environments for Linux & Oracle on System z, with supporting middleware, that are "automatically" provisioned and made available for small PoC's or Functional Benchmarks.

The objective is to provide small, low cost, low touch, short term, repeatable system environments to IBM FTSS teams and Business Partners to support STG sales & growth opportunities, such as new workloads, new clients, or new ISVs.

1 to 4 weeks

Quick start

Performed Locally

zLight Benchmark Offering:
- ❑ 2 pre-selected environments (fast-start, last certified &updated levels) are available now (up to 4 weeks).
    - · Linux on System z; Linux on System z guest hosted on a z/VM LPAR; up to 4 CP shared, 4GB memory, 14GB storage; software code (WebSphere, Oracle, DB2…) downloadable from a NFS. SUSE (SLES 11 SP2) and Redhat (RHAT 6.0) versions of Linux are available.
    - · Oracle solution on System z; Oracle 11g (Single Instance on SLES 11 SP2 or REDHAT 5.7) on one Linux guest + Oracle RAC 11g on 2 Linux guests (cluster, on SLES 11 SP2 or REDHAT 5.7), 4GB and 4CP per guest, up to 300GB storage.
- ❑ Support :
    - · First level support provided by local IBM FTSS or BP
    - · Second level support provided by the STG Mainframe Benchmark Centers in Montpellier
    - · « On-demand » specific support (to be defined)
- ❑ POC or functionnal tests performed remotely by the customer/ISV and IBM team
- ❑ Infrastructure & IBM products 2nd level support assumed by STG Benchmark Center skilled people for no / small costs

KEY ADVANTAGES
❑ **Pre-generated and Up-to-date environments**
 ➢ Help to answer to short duration RFP
 ➢ Practice, education to improve knowledge and to move faster than competition
❑**Prove customer solution on STG platforms**
 ➢ Validate technical alternatives and produce inputs for future innovation plan for Customer
 ➢ Support small business opportunities as well as strategic ones.
❑ **Validation of customer applications and larger benchmark needs** (unit/acceptance tests, build DB volumes and needed growth and workloads, perform small performance tests, ...)
❑ **Easy access to IBM Benchmark Centers infrastructure & support** for customers & local team with limited travel capabilities.
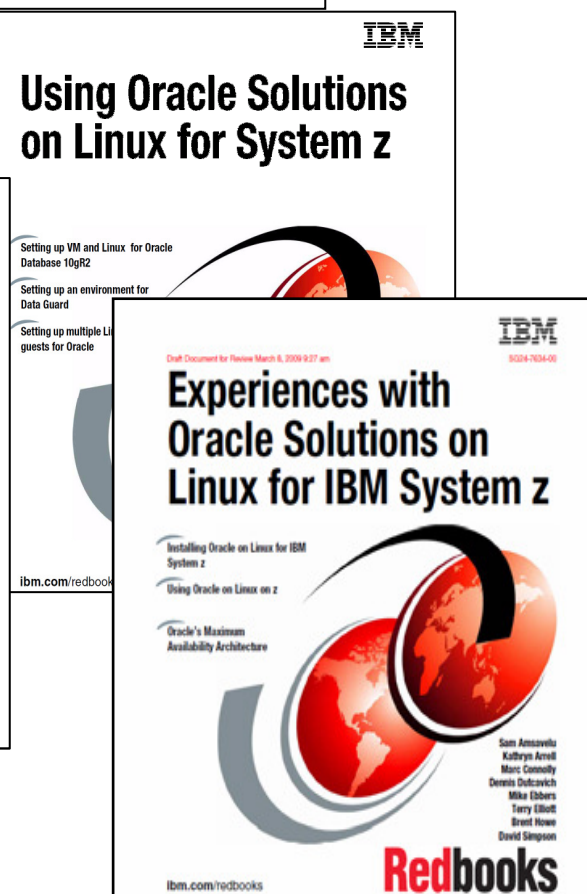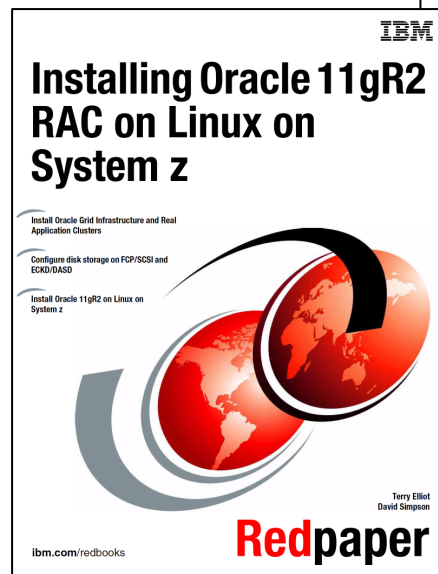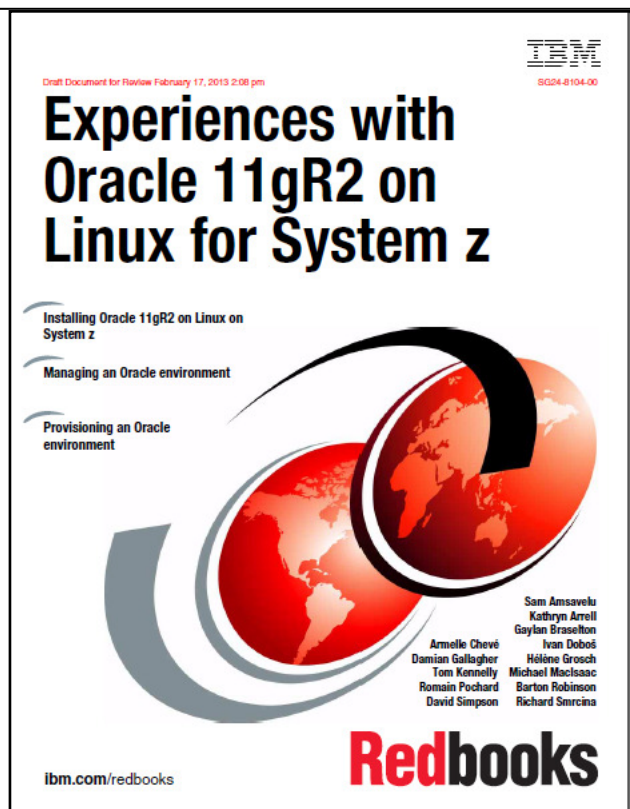
Contact: ioc@fr.ibm.com

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Oracle and Linux on System z –
IBM & Oracle working together

- Linux on System z is Oracle's platform for the mainframe
- Oracle database 11g R2 available on Linux on System z (since 1Q2011)

http://www.redbooks.ibm.com/abstracts/sg248104.html?Open

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Resources

- **RedBooks**

    – Experiences with Oracle 11gR2 on Linux for System z

    http://www.redbooks.ibm.com/redpieces/pdfs/sg248104.pdf

    – Experiences with Oracle Solutions on Linux for System z

    http://www.redbooks.ibm.com/redbooks/pdfs/sg247634.pdf

    – Using Oracle Solutions on Linux for System z

    http://www.redbooks.ibm.com/redbooks/pdfs/sg247573.pdf

- **DeveloperWorks Linux on System z**

    – Tuning Hints and Tips

    http://www.ibm.com/developerworks/linux/linux390/perf/index.html

    – Database Tuning for Linux on System z

    http://www.ibm.com/developerworks/linux/linux390/perf/tuning_database.html

New !

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Questions?

Wilhelm Mild

IBM IT Architect

THE *Open* GROUP
Master
Certified IT Architect ™

*IBM Deutschland Research
& Development GmbH
Schönaicher Strasse 220
71032 Böblingen, Germany*

*Office: +49 (0)7031-16-3796
mildw@de.ibm.com*

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धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Thank You
English

شكراً
Arabic

Merci
French

Obrigado
Brazilian Portuguese

Bedankt
Nederlands

多谢
Simplified Chinese

Danke
German

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다

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