

Centrelink Performance Update

Leon Rasheed - May 2007



Mainframe Details

Canberra :

CBRA	IBM 2094	712	5482 MIPS
BNEA	IBM 2094	716	6914 MIPS
PERA	IBM 2094	712	5482 MIPS

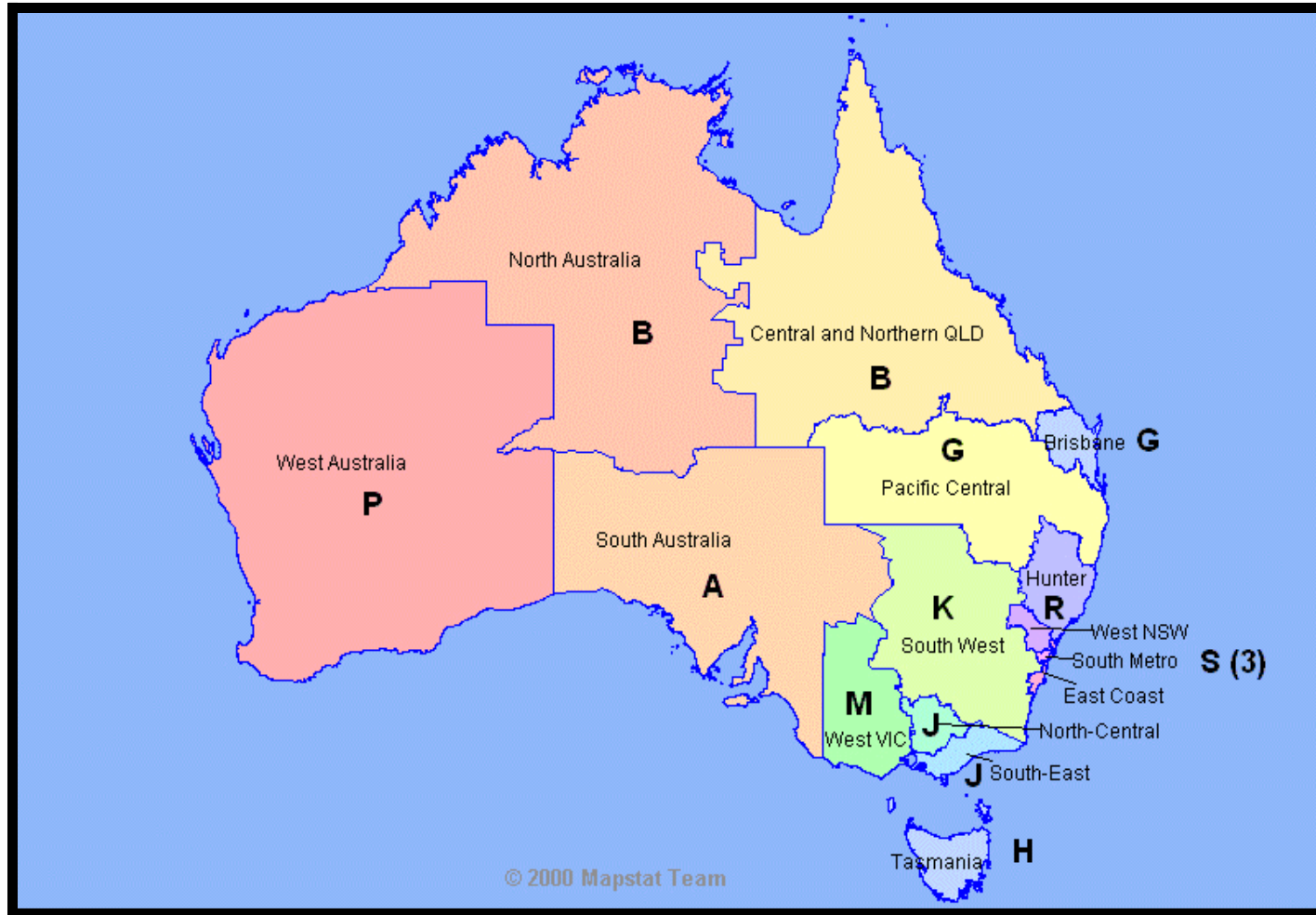
Bruce :

MELA	IBM 2094	710	4720 MIPS
SYDA	IBM 2094	713	5851 MIPS
SYDB	IBM 2094	703	1658 MIPS

Total

30107 MIPS

Centrelink Onlines

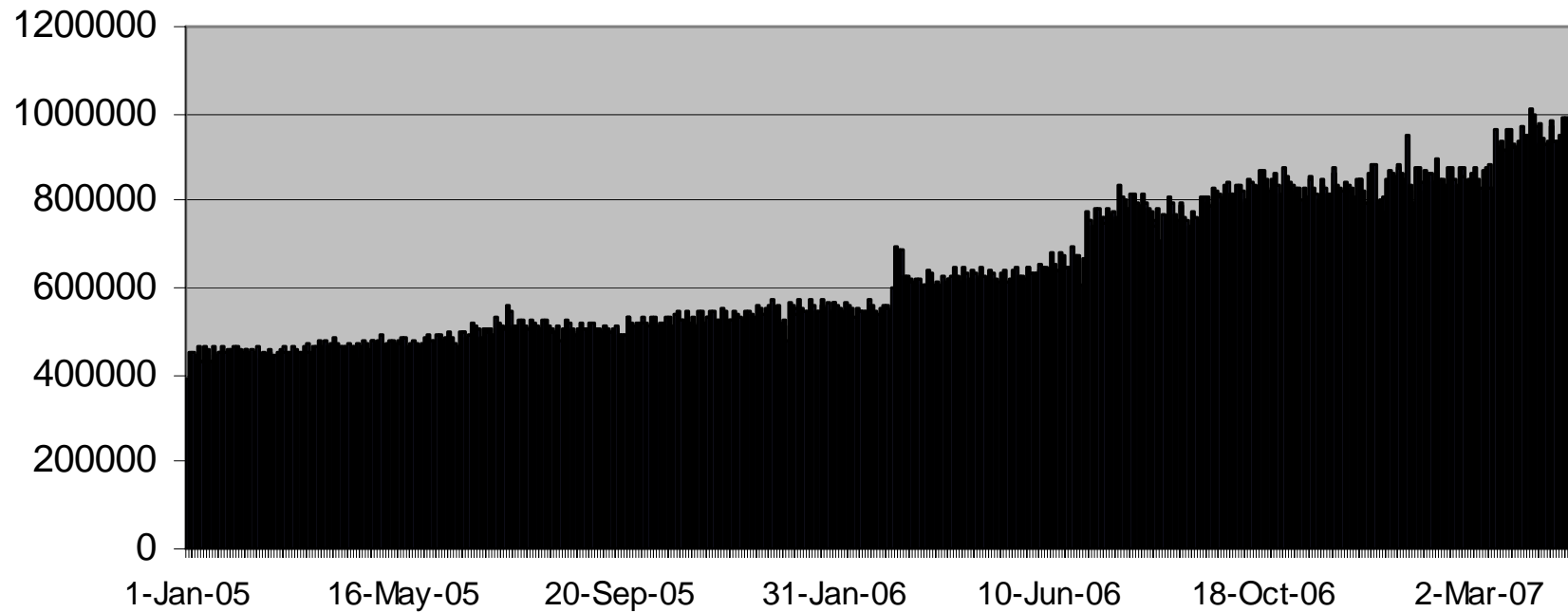


Online Details

	#users	Scr /sec	CPU%	I/O rate	#buffers	#servers
A	1800	95	260	5000	180000	205
B	2000	105	350	6500	180000	205
G	2300	125	420	7000	180000	225
H	650	40	110	3000	20000	50
I	120	10	25	250	2000	60
J	2200	120	370	6500	180000	220
K	1900	100	290	6000	180000	205
M	1900	100	290	6000	180000	205
P	1800	95	280	5000	180000	205
R	1750	95	260	5500	180000	205
S	2300	120	350	7000	180000	220
NX	100	20	40	1200	80000	50
Tot	18820	1025				

Growth in CCATEMP usage

CCATEMP High Water Mark - G Online



Sirmon from a production Online

----- System --- G#204US1/6.2.0F/BNEA ----- Interval: 1.81 SEC--
 ==>>> Mon 07/04/30 14:23:49

	CPU	SCRNS	UPTRANS	SVIO	CHKPIO	JRNLIO	LOGIO	CFRCONF	PCPU
SEC	3.626	119.98	62.74	135.39	189.87	90.26	69.35	46.23	94.21
SCR	0.030	1.00	0.52	1.13	1.58	0.75	0.58	0.39	94.21
TOT	149155	2588100	1885049	2108219	433941	4489432	2463947	1145854	95.81
	DKRD	DKWR	DKPR	DKRDPRP	DKSAW	DKRDG	DKWRG	CCATRD	CCATWR
SEC	6933.96	1356.08	430755	98.39	1133.19	924.05	69.35	0.00	0.00
SCR	57.79	11.30	3590.28	98.39	9.44	7.70	0.58	0.00	0.00
TOT	161977K	29534K	69204K	134.05	17231K	44438K	7458541	0	0
	LKWAIT	OBJSWAP	DIRRCD	DKRR	ECCALL	MQGETS	MQPUTS	TCPBNR	TCPBNW
SEC	17.06	14871	2.75	0.00	18.16	3.30	1.10	56.69	0.00
SCR	0.14	123.94	0.02	0.00	0.15	0.03	0.01	0.47	0.00
TOT	1617382	289186K	113559	0	1086945	378909	401883	1571838	210
	RESPMED	RESP90	RESPAVG	VTAMBW	RSXCOMP	RECENQP	CCATMPP	CCATMHP	TCPREF
CUR	0.01	0.16	0.09	0	0	66.80	91.62	92.66	0
	CHKPTO	CHKPTOU	CHKPNCK	CHKPALP	JRNLLALP	SDMACT	SDMACTH	SDMFREL	SDMUNAV
CUR	0	-1	1	9.15	93.22	649	752	248	0
	NLOGON	NREDY	NBLKI	NBLKO	NOFFQ	NWTSV	NRUNG	NWTCFR	SNAPID
CUR	2198	11	162	1	2022	0	2	0	0

What has changed?

- Sirius Mods 7.0
- M204 Version 6.2
- Funload 4.4
- New Softspy version
- zOS 1.7
- Janus & Sirius Debuggers
- DASD upgrades from Sun and HDS

7.0 Mods

- INITIAL clause for Longstring variables
- Janus SOAP ULI enhancements
- Janus SOAP XML classes
- Sirtune enhancements

Sirtune enhancements

- System methods reported separately
- SYSPARM report

Sirtune System Methods Reporting

Report STATE RUNG QUAD

Rank Quad	Percent	Total %
..		
1 ENRACO	8.034	8.034
2 ENRASSF	6.268	14.303
3 QENDF	4.207	18.510
4 FEO	3.982	22.493
5 \$FIELD_LISTI	3.619	26.112
..		
24 XMLDOC:SELECTSINGLENODE	0.987	57.021
..		
30 BRANGE	0.588	61.783
31 \$LISTADD	0.588	62.372
32 XMLDOC:ADDSUBTREE	0.588	62.961
33 XMLDOC:LOADXML	0.588	63.549

M204 6.2

- Availability enhancements
- Scalability enhancements
- Performance enhancements

Availability enhancements - why?

- File Reorgs
- Cycle journal
- Install procedure changes

Availability enhancements

- Table X
- COMPACTB (with DELETE option)
- SWITCH STREAM
- Dynamic increase for Table B
- Automatic increase for Table B

Table X: Storing Extension Records Away From Table B

- Permits use of all 16.7 million Table B record slots
- Parameters Very 'B Like'
 - XRECPPG
 - XRESERVE
 - XREUSE
- Maximum of 512 Million X Slots
- RECRDOPT parameter (on file) limits the size of Base Records so you **will** be able to get (BRECPPG * BSIZE) records in a file

Table X: Case Study 1 - IS1AUDT0

- 2+ Million, very large records
 - 7k average record length
 - 10k standard deviation
- Rarely create new base records but existing records grow
- Too many wasted records slots used by extensions

Case Study 1 - With Table X

- Size Table B at 90%
 - 210k pages
 - BRECPPG 10
 - RECRDOPT = 1 (as in all these cases)
- Table X is where the growth is:
 - 10 million pages (target 70% used)
 - XRECPPG 25 (seemingly no impact of wasted X slots)

Table X: Case Study 2 - IS1CIRC0

- 12+ Million Records
- Very Irregularly Sized
- Reaching Tuning 'point of no return': Can not Increase Size of Table B without decreasing BRECPPG

Case Study 2 - With Table X

- Size Table B for 16.7 million records
 - BRECPPG = 20
 - BSIZE = 835000
- Generous TABLE X fits in existing file size
- Should not hit 16.7 million limit for a number of years (we'll think of something)

Table X: Case Study 3 - IS1TRIGO

- Contains individual transaction triggers
- Differing characteristics in each release
- For upcoming major release
 - 11 Million Records:
 - ▶ 9 Million very small (50 bytes)
 - ▶ 2 Million 8 times this size
- Difficult to get a well balanced BRECPPG

Case Study 3 - With Table X

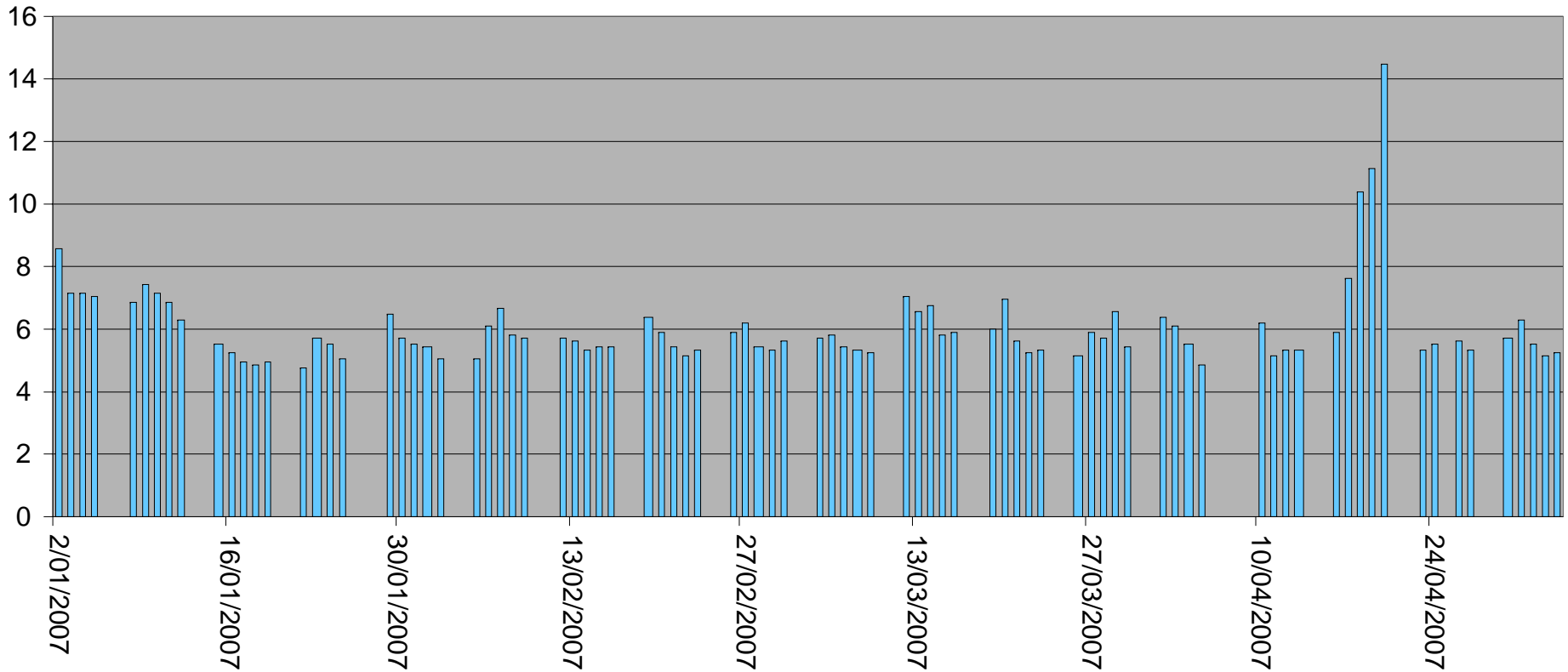
- Size Table B for the predominant small records:
 - BRECPPG = 110
 - BSIZE = 151000
- Larger records extend to Table X:
 - XRECPPG = 20
 - XSIZE = 200000
- Only the 'offending' records extend

Table X: Final Thoughts

- Our implementation is still a 'Work in Progress':
 - how best to split records?
 - perhaps only put preallocated fields in B and let everything else extend?
 - When, if ever, might we use Table X without RECRDOPT?
- and, of course, note that with no slots wasted, the indices are more compact

COMPACTB Might Not be the Answer

Average CPU per run for @AYSRCH

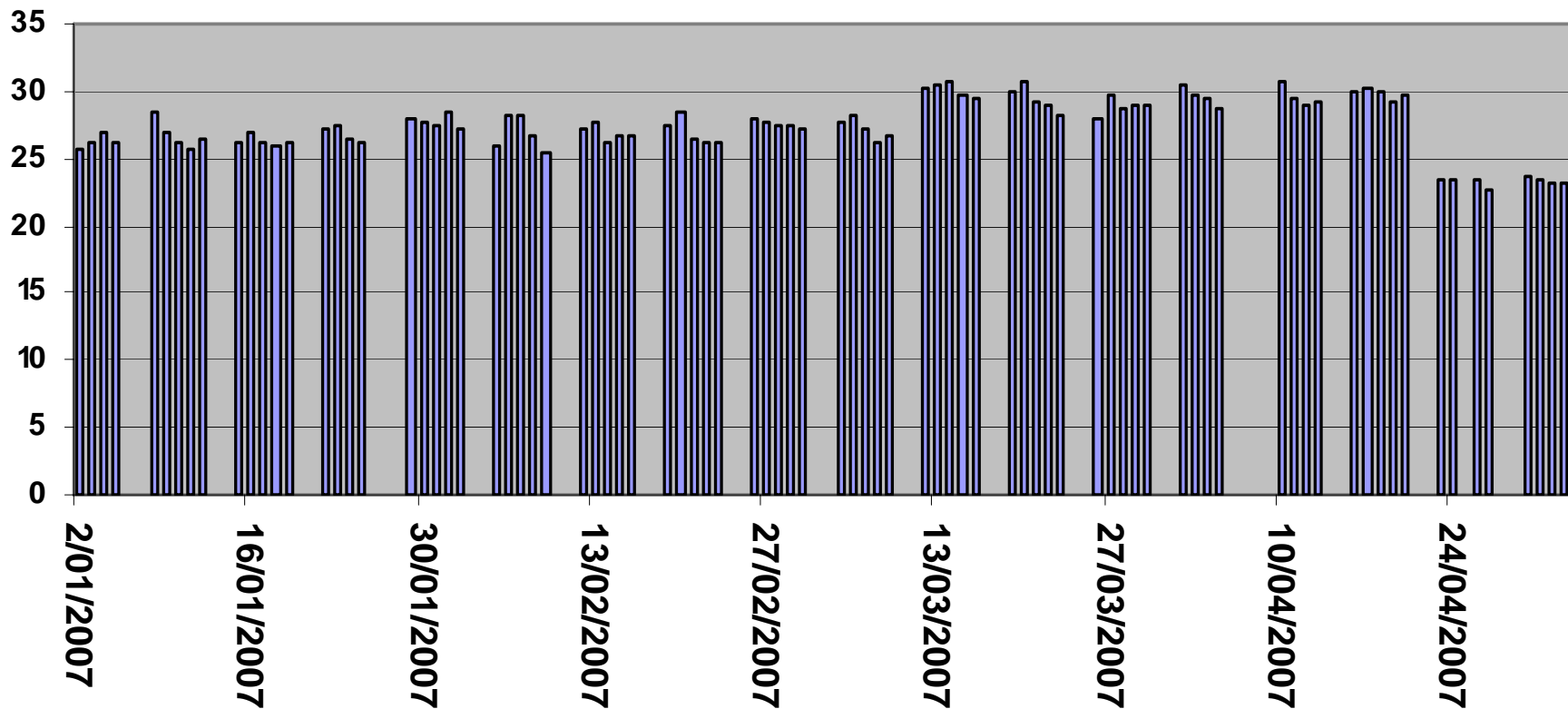


Scalability enhancements

- 64-bit support - NUMBUFG parameter
- Improve M204 ability to exploit more processors from a single Online
- Table X - 16 million records

Impact of NUMBUFG in Production

Average I/O per Scr



Performance enhancements

- Fileorg=X'80' to speed up field scanning
- Various other tweaks to internal M204 code
- 9% reduction measured

Softspy enhancements

- Support for M204 version 6.2

Funload 4.4

- Support for TableX
- Support for Fileorg=X'80'
- Large Object support introduced in Funload 4.3

Janus and Sirius Debuggers

- Now part of developers tool set
- Functionality being increased incrementally by George
- GUI enhancements coming out often - up to build 19

End of presentation

Questions?

