SHARE Live!
The Cheryl & Frank zRoadshow

Session 18017
March 4, 2016

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#SHAREorg

SHARE is an independent volunteer-run information technology association that provides **education**, professional **networking** and industry **influence**.

Welcome

- THANK YOU for attending this session! We hope you enjoyed the week, we sure did!

- Who are we and what we do:
  - Three-person company; started in 1987
  - Quarterly subscription-based newsletter –
    - Cheryl Watson's Tuning Letter
    - Cheryl Watson's System z CPU Chart
  - Public and private classes and consulting on z/OS new features, WLM, performance, Parallel Sysplex, high availability, software pricing, outsourcing contract reviews, and chargeback.
  - Software products – GoalTender and BoxScore
  - For more info on any of this see our **NEW** website: www.watsonwalker.com

Welcome

- Topics to cover:
  - IBM Model z13s
  - End of Marketing/End of Support
  - Our Survey Results
  - New SCRT
  - z/OS Continuous Delivery

Welcome

- Topics:
  - USAA Capacity/RNI experiences
  - z13 Performance tips
  - Data center costs
  - ATS tools
  - New WLM Mobile support (OA47042)
  - New WLM capping options (OA47752, OA49201)
  - SHARE Live

IBM Model z13s

- New z13s Models
  - 26 families (Axx-Zxx) of six models each (e.g. A01-A06)
  - Upgrade path for z114 and zBC12 models
  - Sessions this week:
    - 19059 – IBM z Systems February 16th Announcement Overview, **David Morlitz**
    - 18321/18322 - The New IBM z13s and z13 GA2 Updates Part 1 and 2, **Harv Emery**
    - 18352 – SHARE Live!: z13s User Experiences, **George Handera, Edward Jaffe, Sam Knutson, Keith Sisson**
    - 18325 – z/OS Support for the IBM z13 and z13s, **Riaz Ahmed**

z13s Models – Some Interesting Points

- Upgrades from zBC12 models to z13s models

z13s Model	z13s MIPS	z13s MSUs	z13s MIPS/MSU		zBC12 Model	zBC12 MIPS	zBC12 MSUs	zBC12 MIPS/MSU	Chg in MIPS/MSU	Chg in MIPS	% Chg in MIPS	Chg in MSU	% Chg in MSUs	Diff in MIPS / MSUs
A01	80	10	8.0		D01	80	10	8.0	0.0	0.0	0.0%	0	0.0%	0.0%
A02	150	19	7.9		D02	146	18	8.1	-0.2	4.0	2.7%	1	5.6%	-2.8%
A03	217	27	8.0		D03	208	26	8.0	0.0	9.0	4.3%	1	3.8%	0.5%
A04	281	35	8.0		D04	266	33	8.1	0.0	15.0	5.6%	2	6.1%	-0.4%
A05	341	42	8.1		D05	321	40	8.0	0.1	20.0	6.2%	2	5.0%	1.2%
A06	398	50	8.0		D06	373	47	7.9	0.0	25.0	6.7%	3	6.4%	0.3%
B01	88	11	8.0		E01	88	11	8.0	0.0	0.0	0.0%	0	0.0%	0.0%
B02	165	21	7.9		E02	161	20	8.1	-0.2	4.0	2.5%	1	5.0%	-2.5%
B03	239	30	8.0		E03	229	29	7.9	0.1	10.0	4.4%	1	3.4%	0.9%
B04	309	39	7.9		E04	293	37	7.9	0.0	16.0	5.5%	2	5.4%	0.1%
B05	375	47	8.0		E05	353	44	8.0	0.0	22.0	6.2%	3	6.8%	-0.6%
B06	438	55	8.0		E06	410	51	8.0	-0.1	28.0	6.8%	4	7.8%	-1.0%

IBM Model z13s

- New z13s AEWLC Price discount – TU4
  - Major reduction (9-13%) in cost for IBM software such as z/OS, CICS, DB2, IMS, etc.
  - If moving from zBC12, you have to back off discount that you already have from TU2 (about 5%)
  - z114s will stop being maintained; cost of z13s can be easily outweighed by reduction in software costs

Schedule of AEWLC reductions for Technology Update Pricing for the z13s (TU4)

Number of z13s Full-Capacity MSUs	Reduction in monthly AEWLC
1 - 10 MSUs	13.0%
11 - 17 MSUs	13.0%
18 - 30 MSUs	13.0%
31 - 45 MSUs	10.0%
46 - 87 MSUs	9.0%
88 - 175 MSUs	9.0%
176 - 260 MSUs	9.0%
261 - 315 MSUs	9.0%
316 - 390 MSUs	9.0%
391 - more MSUs	9.0%

Schedule of AEWLC reductions for Technology Update Pricing (TU2)

Number of zBC12 full-capacity MSUs	Reduction in monthly AEWLC
1 - 7 MSUs	5.0%
8 - 17 MSUs	5.0%
18 - 30 MSUs	5.0%
31 - 45 MSUs	5.0%
46 - 87 MSUs	4.0%
88 - 175 MSUs	4.0%
176 - 260 MSUs	4.0%
261 - 315 MSUs	4.0%
316 - 390 MSUs	4.0%
391 - more MSUs	4.0%

IBM Models z13 and z13s

- World Wide Port Name (WWPN) Prediction Tool – For z13 see RPQ 8P3003 to carry forward the I/O serial number part of the WWPN to new machine
- z13/z13s Memory Pricing (“It depends”)
  - Get price for carry forward
  - Get quote for price for 3X current memory
  - Get quote for price for 5X current memory
  - Instead of getting memory for Plan Ahead Memory (or Flexible Memory on z13, not z13s), get it all initially and use it – it might cost less
  - Utilize that memory to reduce I/Os and, therefore, reduce RNI to get more MIPS

IBM Models z13 and z13s

- z13/z13s Memory Pricing
  - If you have lots of memory, exploit it!
  - See SHARE Session 18489 – *z/OS Large Memory Migration, Implementation, and Test*, **Peter Relson**
    - More memory can help and/or hurt
    - SMSVSAM console dump – 1.5 hours to initialize IPCS directory
    - DB2: ITR 24.7% improvement moving from 160GB to 638GB buffer pools; ETR 37.7% improvement
  - See Redpaper REDP-5238-00 – *Benefits of Configuring More Memory in the IBM z/OS Software Stack*

End of Marketing

- z114/z196
  - z114 and z196 was withdrawn from marketing on June 30, 2014
  - This included any upgrades from z9 and z10
  - Features and conversions delivered via modification to Licensed Internal Code (LIC) were not available after June 30, 2015

End of Marketing

- zBC12/zEC12
  - zBC12 and zEC12 will be withdrawn from marketing on June 30, 2016 (in some countries) and on December 31, 2016 in rest
  - This includes any upgrades from z10 and z114/z196
  - Features and conversions delivered via modification to Licensed Internal Code (LIC) will not be available after December 31, 2017
  - Capacity on Demand billing features will be withdrawn from marketing on June 30, 2018

End of Service

- Software - http://www.ibm.com/software/data/support/lifecycle/
- z/OS 1.13
  - End of Service will be September 30, 2016
- z/OS 1.12
  - End of Service was September 30, 2014

September Conference in Boeblingen

Complete your session evaluations online at SHARE.org/SanAntonio-Eval

Our Survey Results

- September 2015 Boeblingen IBM/GSE Conference (Frank Kyne speaking)
- 90% of attendees were from sites that were using z/SOMF and SMF Logger

Our Survey Results

- z Systems Technology Exploitation survey
  - https://www.surveymonkey.com/r/RJ57FBL
  - Cheryl's List #190 (>220 responses)

Answer Options	Currently using	Plan to use	Will not use	Don't know / Does not apply
IBM Automatic Binary Optimizer for z/OS	5	25	48	127
z Systems Collocated Application Pricing (zCAP)	7	23	59	119
Country Multiplex Pricing (CMP)	9	36	72	94
z/OS-related cloud services	17	23	96	73
Simultaneous Multi-Threading (SMT)	19	64	37	88
zEDC	22	51	49	88
Mobile Workload Pricing (MWP)	22	33	66	90
Analytics on z/OS	25	30	80	72
RLS-Managed Catalogs	35	50	43	82
2GB Pages	39	75	30	67

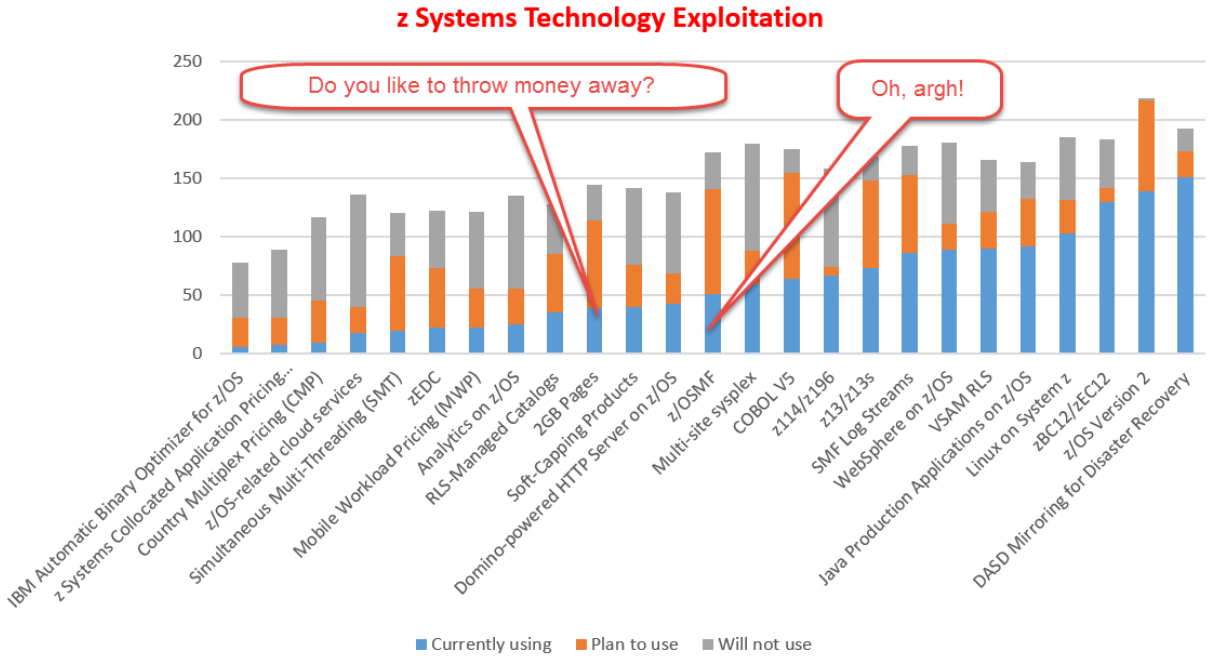
Our Survey Results

- z Systems Technology Exploitation survey

Answer Options	Currently using	Plan to use	Will not use	Don't know / Does not apply
Soft-Capping Products	40	36	66	70
Domino-powered HTTP Server on z/OS	42	26	70	72
z/OSMF	51	90	31	41
Multi-site sysplex	59	29	92	38
COBOL V5	64	91	20	39
z114/z196	67	7	84	38
z13/z13s	73	75	21	44
SMF Log Streams	86	67	25	38
WebSphere on z/OS	89	22	70	32
VSAM RLS	90	31	45	48
Java Production Applications on z/OS	92	40	32	48
Linux on System z	103	28	54	30
zBC12/zEC12	130	12	41	21
z/OS Version 2	139	78	2	2
DASD Mirroring for Disaster Recovery	151	22	20	23

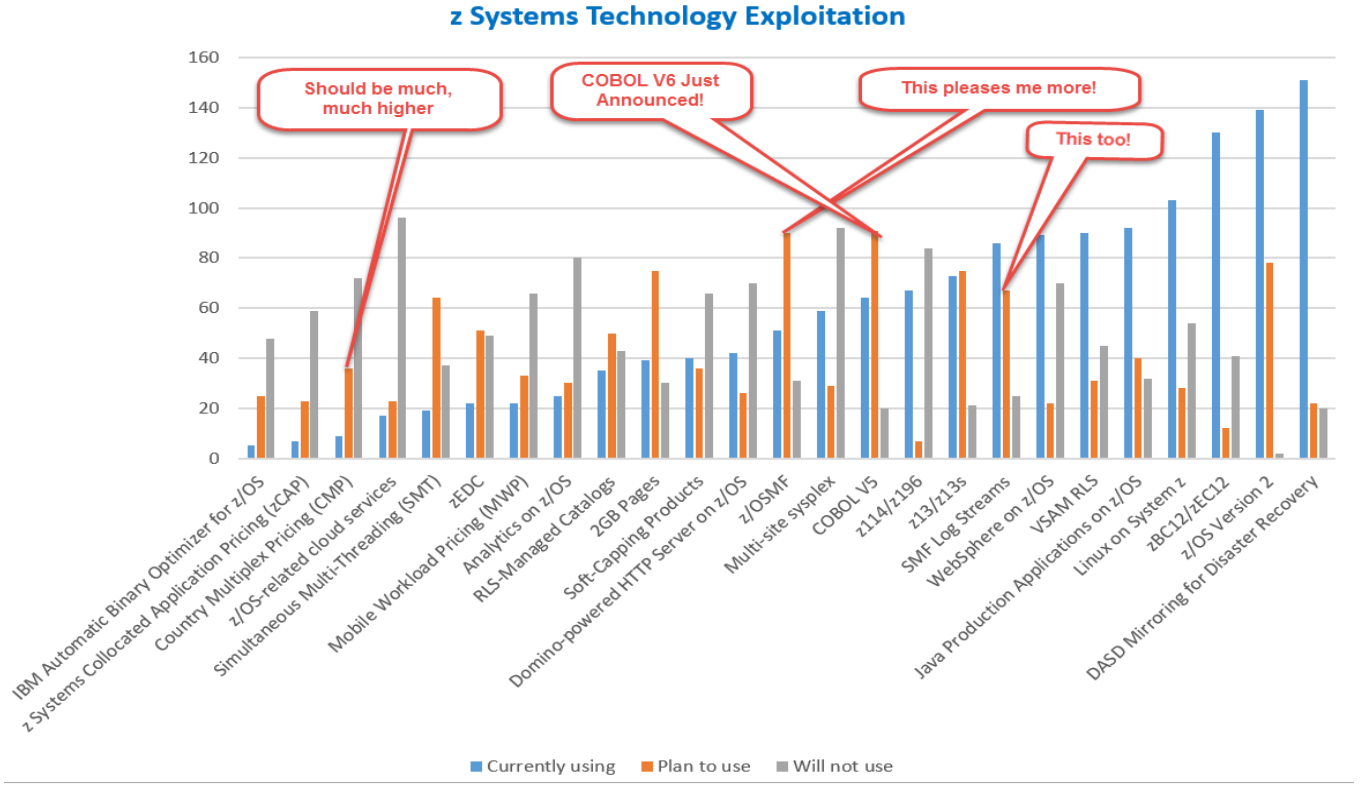
Our Survey Results

- Things to take to heart



Our Survey Results

- Same data – look at planning



My Latest Passion – New SCRT

- New Sub-Capacity Reporting Tool
  - See session 18356 from **Andrew Sica** – *Introduction to the New SCRT*
  - New pricing options couldn't be supported in old SCRT, so new MWRT tool was created
  - SCRT (z/OS) → MWRT (PC) → SCRT (z/OS, Java)
  - Classic SCRT release – V23 R7 (next is 3/10/2016)
  - Java SCRT release – V23 R13 (next is 3/10/2016)
    - (Started at V23 R10)

My Latest Passion – New SCRT

- Java SCRT release
  - Supports CMP, MWP, zCAP, and new features
  - Detailed data available (optional)
    - MSUs by hour by LPAR
    - Shows MWP and zCAP adjustments
    - Can sort easily by R4HA to find the next peak
    - Can be used to determine/confirm ISV charges
  - When first released, IBM suggested using the classic version UNLESS you needed the new features
  - With latest release, you would be better off to use the new version

My Latest Passion – New SCRT

- Examples from Andrew's presentation
  - D5 – Special Conditions (e.g. MWP)
  - E5 – Product Summary Information
  - P5 – Product Max Contributors
  - V5 – Mobile/zCAP Pricing Detailed Data
- Country Multiplex Example
  - W3 – Detailed Interval Data

Thanks to Andrew Sica, © IBM, D5/E5

=D5===
SPECIAL CONDITIONS

MWP_Input_From_WLM

Special condition generated

WLM classification is source of mobile data.

=E5===
PRODUCT SUMMARY INFORMATION

MLC Product Name	MLC Product ID	Tool MSUs	Footnotes
z/OS V2	5650-ZOS	1269	(d)
DB2 11 for z/OS	5615-DB2	1269	
CICS TS for z/OS V5	5655-Y04	1269	
IBM MQ for z/OS V8	5655-W97	1269	
IMS V13	5635-A04	1269	

(d) footnote is applied to highest z/OS version.

IPLA Product Name	IPLA Product ID	Tool MSUs	Footnotes
IBM WebSphere Application Server for z/OS V8	5655-W65	3	(iv)
IBM Integration Bus for z/OS V9	5655-IBB	28	(iv)
IBM Multi-site Workload Lifeline V2	5655-UM4	1269	

(d) footnote explanation generated.

Footnotes:
(iv) Product's Tool MSUs are based on Getting Started Sub-capacity Pricing from one or more LPARs
(d) Mobile Workload Pricing transaction data from this product was included from one or more LPARs

Thanks to Andrew Sica, © IBM, P5

Either source → Section P5 Impacts.

Note: these values reflect the mobile adjustment.

Adjustment during peak hour

-P5-

PRODUCT MAX CONTRIBUTORS

Product Name	Product ID	Highest	Date/Time	LPAR LPAR1	Mobile MSU Reduction
z/OS V2	5650-ZOS	1525	08 Feb 2015 - 17:00	1525	60
DB2 11 for z/OS	5615-DB2	1525	08 Feb 2015 - 17:00	1525	60
CICS TS for z/OS V5	5655-Y04	1525	08 Feb 2015 - 17:00	1525	60
IBM MQ for z/OS V8	5655-W97	1525	08 Feb 2015 - 17:00	1525	60
IMS V13	5635-A04	1525	08 Feb 2015 - 17:00	1525	60
IBM Enterprise Cobol for z/OS V4	5655-S71	1525	08 Feb 2015 - 17:00	1525	60
File Export for z/OS V1	5697-I12	1525	08 Feb 2015 - 17:00	1525	60
Migration Utility for z/OS V4	5655-MGU	1525	08 Feb 2015 - 17:00	1525	60

Thanks to Andrew Sica, © IBM, V5

Both sources of MWP data→ With "Generate_Detailed_Data"

=V5=

MOBILE/ZCAP PRICING DETAILED DATA

MLC Products

Adjusted LPAR value

CSV input for CICS Family

WLM classified mobile workloads

Combined Mobile Reduction

5650-ZOS z/OS V2

Date Time of RMF Interval	Type	CPC MSU	Partition JA0	CICS Mobile Partition JA0	WLM Mobile Partition JA0	Total Mobile MSU Reduction	CPC Total
01 Dec 2015 - 06:00	2817-760	5001	799	4	51	55	799
01 Dec 2015 - 07:00	2817-760	5001	840	8	54	62	840
01 Dec 2015 - 08:00	2817-760	5001	936	11	60	71	936
01 Dec 2015 - 09:00	2817-760	5001	1057	15	68	83	1057
01 Dec 2015 - 10:00	2817-760	5001	1161	15	75	90	1161
01 Dec 2015 - 11:00	2817-760	5001	1265	15	81	96	1265
01 Dec 2015 - 12:00	2817-760	5001	1269	15	82	97	1269
01 Dec 2015 - 13:00	2817-760	5001	1259	15	81	96	1259
01 Dec 2015 - 14:00	2817-760	5001	1255	15	80	95	1255
01 Dec 2015 - 15:00	2817-760	5001	571	15	37	52	571
01 Dec 2015 - 16:00	2817-760	5001	154	15	10	25	154
01 Dec 2015 - 17:00	2817-760	5001	325	15	22	37	325
01 Dec 2015 - 18:00	2817-760	5001	452	15	29	44	452

==W3==========

Detailed Interval Data

MLC Products

5650-ZOS	z/OS V2 (Traditional)														
Processor Type Serial	2827-20202								2827-30303						
Date Time of RMF Interva	Type	CPC MSU	Partition					CPC Total	Type	CPC MSU	Partition				CPC Total
			NSYS	PRD1	TST1	TSYS	USYS				CPUC	CPUG	LPAR3	LPAR8	
02 Aug 2014 - 00:00 UTC	2827-706	957	14	110	47	179	13	363	2827-705	813	157	35	69	18	279
02 Aug 2014 - 01:00 UTC	2827-706	957	14	89	45	159	13	320	2827-705	813	180	34	96	16	326
02 Aug 2014 - 02:00 UTC	2827-706	957	13	70	44	166	14	307	2827-705	813	202	33	137	16	388
02 Aug 2014 - 03:00 UTC	2827-706	957	14	61	44	217	15	351	2827-705	813	224	42	148	12	426
02 Aug 2014 - 04:00 UTC	2827-706	957	13	54	45	253	17	382	2827-705	813	263	51	167	12	493
02 Aug 2014 - 05:00 UTC	2827-706	957	13	48	45	255	16	377	2827-705	813	248	50	155	12	465
02 Aug 2014 - 06:00 UTC	2827-706	957	13	52	48	250	16	379	2827-705	813	229	50	136	11	426
02 Aug 2014 - 07:00 UTC	2827-706	957	13	60	49	192	17	331	2827-705	813	205	41	152	11	409

2827-40404				2827-50505							MultiPlex
Type	CPC MSU	Partitio	CPC Total	Type	CPC MSU	Partition				CPC Total	Total
		CPUA				CSYS	DSYS	ESYS	PSYS	QSYS	
2827-703	511	226	226	2827-509	588	41	12	7	11	14	85	953
2827-703	511	229	229	2827-509	588	36	11	7	12	14	80	955
2827-703	511	291	291	2827-509	588	33	10	6	12	14	75	1061
2827-703	511	326	326	2827-509	588	31	11	7	12	14	75	1178
2827-703	511	364	364	2827-509	588	32	10	6	13	15	76	1315
2827-703	511	381	381	2827-509	588	49	14	6	11	15	95	1318
2827-703	511	333	333	2827-509	588	55	47	6	12	15	135	1273
2827-703	511	282	282	2827-509	588	53	77	6	10	15	161	1183

My Latest Passion – New SCRT

- Problem: Many ISVs use MIPS pricing for contracts
  - There's little problem if product is run on one LPAR
  - There's a MAJOR problem if product runs on more than one LPAR
    - Can't determine peak usage without processing type 70 records for every day and every month during the month for each LPAR
    - What happens during an audit when you need a year's worth of data?
    - Try to get ISVs to agree to use SCRT reports!
    - New detailed report let's you take any combination of LPARs to find the peak period of two or more LPARs

Continuous Delivery of z/OS

- IBM agrees that some features of z/OS should be rolled out without waiting for the two-year release cycle
- How can z/OS keep current with new technologies without faster delivery?
- z/OSMF has a 6-month rollout period, and other facilities want to do the same
- So IBM is embracing ‘Continuous Delivery’, and you can expect more SPEs and New Function APARs

Continuous Delivery of z/OS

- Consider how you can keep up with IBM's rollouts
- Do you apply all RSUs as they become available or shortly thereafter, or do you do maintenance twice a year?
- Do you do rolling IPLs so users are never down, or are users impacted each time you need to IPL?
- Do you have a plan to review and exploit each new function as it appears?

Continuous Delivery of z/OS

- What can you do?
  - Attend every SHARE to see what's new in each component
  - If you take our Tuning Letter, review our New Function APARs each quarter
  - Register to be notified of New Function APARs - **Marna Walle**, IBM, provided a new feature to be notified of New Function APARs – WSC doc PRS5188
  - Set up schedule to review and exploit each of the new functions as they come along

Welcome

- Topics:
  - USAA Capacity/RNI experiences
  - z13 Performance tips
  - Data center costs
  - ATS tools
  - New WLM Mobile support (OA47042)
  - New WLM capping options (OA47752, OA49201)
  - SHARE Live

Holistic Capacity Planning

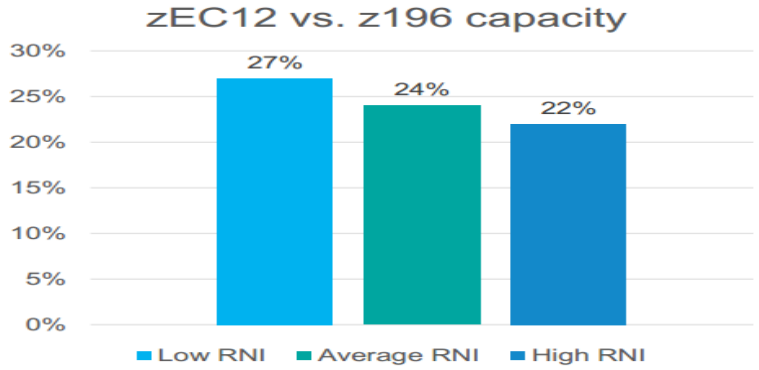
- Todd Havekost from USAA kindly shared his z13 upgrade experiences with us for a Tuning Letter article, and also at Session 18345 on Wednesday morning.
- USAA upgraded 4 zEC12s to 4 z13 CPC. Initially went to 711 models (from EC12 711s), then to 716s, then to 726s using 'banked MIPS'.
- The results of the upgrades were:
  - zEC12 to z13 **In**crease in MIPS consumption of 4000 MIPS
  - Z13 711 to 716 **De**crease in MIPS consumption of 9000 MIPS
  - Z13 716 to 726 **De**crease in MIPS consumption of 4000 MIPS
- This equates to an MSU reduction of about 1600 MSUs in monthly SW bills, comparing z13 711 to 726.
  - Apply your own $ per MSU to see how much this would save in *your* environment.

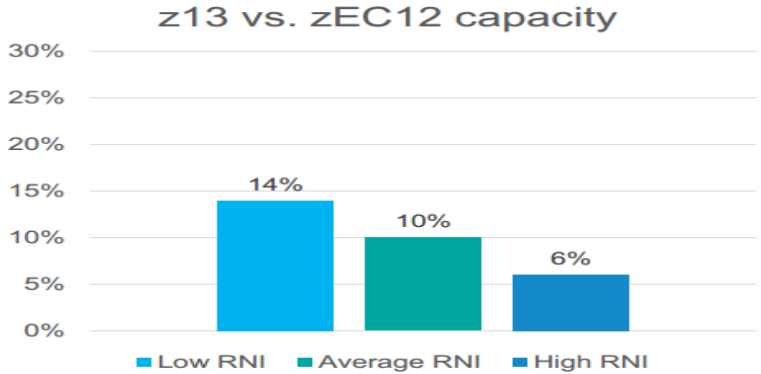
Holistic Capacity Planning

- Lessons learned:
  - "Mainframe hardware is expensive". Have you looked at your *software* bill recently? Hardware costs are more-or-less a one time charge – your software bill is like the Jello of the Month club – the gift that keeps giving (or taking, in this case)… To determine the optimum TCO you need to include *all* costs - SW, HW, maintenance, and so on.
  - GHz of z13 is 10% lower than zEC12, yet average MIPS on z13 is 10% more than zEC12. As discussed in Gary King's *To MIPS or Not to MIPS* session (18643), the increased capacity was achieved through design changes. It is likely that some workloads will really love the new design, and some less so. As a result, you need to be careful when using the "average" number.

Holistic Capacity Planning

- Lessons learned:
  - When moving from z196 to zEC12, there was a 5% difference in additional capacity for High vs. Low RNI workload (22% vs. 27%). When moving to z13, there is an 8% difference between Low and High RNI (6% vs. 14%).





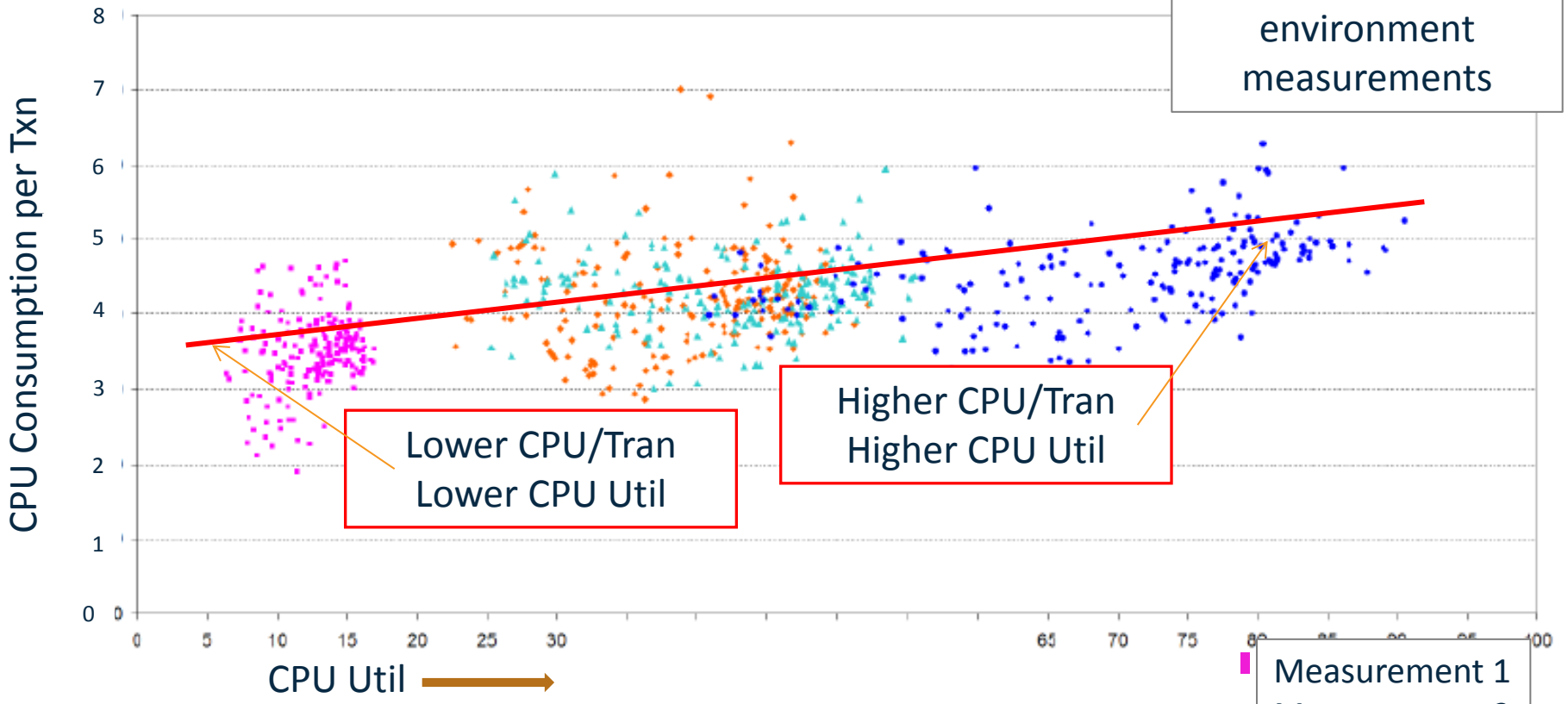
  - Software MSUs are based on Average RNI workloads, so if you move a High RNI workload from zEC12 to z13, you might see that more MSUs are consumed to perform the same amount of work. USAA's main workload RNI was *Very* High RNI – IBM projected that they would see a 4-5% capacity increase, rather than the 10% indicated by the IBM MIPS number (which is based on Average RNI workload).

Holistic Capacity Planning

- Because z13 is so sensitive to cache usage, USAA enabled some of their additional CPs (moving from 711 to 716). This provided more cache, more Vertical High CPs, reduced the RNI, and reduced MIPS usage. Based on that experience, they then enabled their remaining CPs to move from 716s to 726s. This reduced the RNI further and reduced MIPS utilization again.
- Lesson:
  - Know your RNIs. Critical for upgrade planning, valuable for tuning.
    - See **John Burg's** *CPU MF Update* slides (Session 18652) for more info.
    - If your RNI is higher than the normal High range, talk to IBM before finalizing your target configuration.
  - Optimize your HiperDispatch config to maximize your number of VH CPs.
    - Use **Alain Maneville's** LPARDesign tool on the WLM web site.
  - Provide enough memory to avoid CPs or zIIPs in one drawer having to access memory in a different drawer.
  - Every additional 10% of CPU utilization increases CPU/Txn by between 3% (Low RNI workload) and 5% (High RNI workload). So, *reducing* CPC utilization reduces CPU/Txn by a similar amount.

Impact of CPU Utilization on Txn CPU Time

Actual customer production environment measurements



Holistic Capacity Planning

- MP effect means that capacity does not grow linearly. To allow for this, IBM MSUs/CP decrease as you add more CPs. The MSUs/CP for a z13 711 is 160, vs. 131 for a 726 – an 18% difference. However, MP effect is related to utilization – lower utilization should result in a lower MP effect. So, running an identical volume of work on a 726 should result in a smaller SW bill than running that work on a 711. THIS IS GOODNESS.

- WLM Type 99.14 SMF records provide invaluable information about the HiperDispatch topology, and are very low volume (about 250 per day) – make sure that you do not suppress them in your SMFPRMxx member (Type 99s are normally suppressed). And collect them on EVERY system!
  - Use WLM Topology Report to view them: http://www.ibm.com/systems/z/os/zos/features/wlm/WLM_Further_Info_Tools.html#Topology
- EVERYONE should collect and keep the HIS (SMT Type 113) records for every system all the time (this is WSC Best Practice).
  - Use tools such as SAS/MXG, Intellimagic, or Pivotor to format them.
  - If you don't have any tools, use the SMF113 Reporting Tool, available from:
    - http://watsonwalker.com/software/free-tools/ or http://www.ibm.com/systems/z/os/zos/features/wlm/WLM_Further_Info_Tools.html#SMF113

Holistic Capacity Planning

- If you have banked MIPS, consider enabling them.
  - If you *don't* have banked MIPS, consider moving to sub-capacity CPC when upgrading – provides more cache and more CPs for the same number of MIPS.
- Don't forget hardware maintenance costs – but also allow for warranty on new CPC.
- Vital to get sub-capacity pricing for all software products.
- Don't forget to factor Technology Update discount into the business case.

Holistic Capacity Planning

- References:
  - SHARE Live!: Achieving Significant Capacity Improvements on the IBM z13: User Experience, by **Todd Havekost**, Session 18345
  - To MIPS or Not to MIPS, That is the CP Question!, by **Gary King**, Session 18643
  - z13 User Experience, by **George Handera**, Session 18352
  - 'Holistic Capacity Planning' article and 'HiperDispatch Questions and Answers' article in *Cheryl Watson Tuning Letter 2015, No. 4*.
  - IBM Redbook *z13 Technical Guide*, SG24-8251.

More z13 tips

- One of the best things you can do for z13 performance is to avoid situations where a CP in one drawer has to access memory in a different drawer.
- PR/SM can move CPs and zIIPs between drawers. It can also ‘move’ memory between drawers.
  - It can configure online memory in one drawer and config off a corresponding amount of memory in another drawer in an attempt to have all of a an LPAR’s memory in the same drawer as its CPs and zIIIPs.
  - But it is limited by what is physically installed in each drawer.
- ‘Smart’ planning when you are ordering memory can increase the amount of memory that PR/SM has to play with…..

More z13 tips

What you paid for

What IBM installs

Customer Memory	Model N30	Model N63		Model N96			Model NC9 and Model NE1			
(GB)	CPC drawer 1	CPC drawer 1	CPC drawer 2	CPC drawer 1	CPC drawer 2	CPC drawer 3	CPC drawer 1	CPC drawer 2	CPC drawer 3	CPC drawer 4
64	320	320	320	320	320	320	320	320	320	320
96	320	320	320	320	320	320	320	320	320	320
128	320	320	320	320	320	320	320	320	320	320
160	320	320	320	320	320	320	320	320	320	320
192	480	320	320	320	320	320	320	320	320	320
256	480	320	320	320	320	320	320	320	320	320
320	640	320	320	320	320	320	320	320	320	320
384	640	480	480	320	320	320	320	320	320	320
448	960	480	480	320	320	320	320	320	320	320
544	960	480	480	320	320	320	320	320	320	320
640	960	640	640	480	480	480	320	320	320	320
736	1280	640	640	480	480	480	320	320	320	320
832	1280	640	640	480	480	480	320	320	320	320
928	1280	960	960	480	480	480	480	480	480	480
1056	1920	960	960	640	640	640	480	480	480	480

Source: z13 Technical Guide - http://www.redbooks.ibm.com/abstracts/sg248251.html?Open

More z13 tips

- z13 *really* doesn't like programs that store into the instruction stream (SIIS). IBM have warned against this for years, but it is more of an issue on z13.
- Modern compilers are designed not to do this, so this is unlikely to be an issue for high level languages compiled. However, if you have Assembler programs that do a lot of this, that could be an issue.
  - Likely to show up as programs that use a lot more CPU on z13 than on previous processors.
  - To detect this situation, use SMF Type 113 records:
    - (E163/B2)*100 indicates the relative percentage of SIIS L1 I-cache misses compared to the total number of L1 I-cache misses as counted by B2 (Basic Counter Set).

More z13 tips

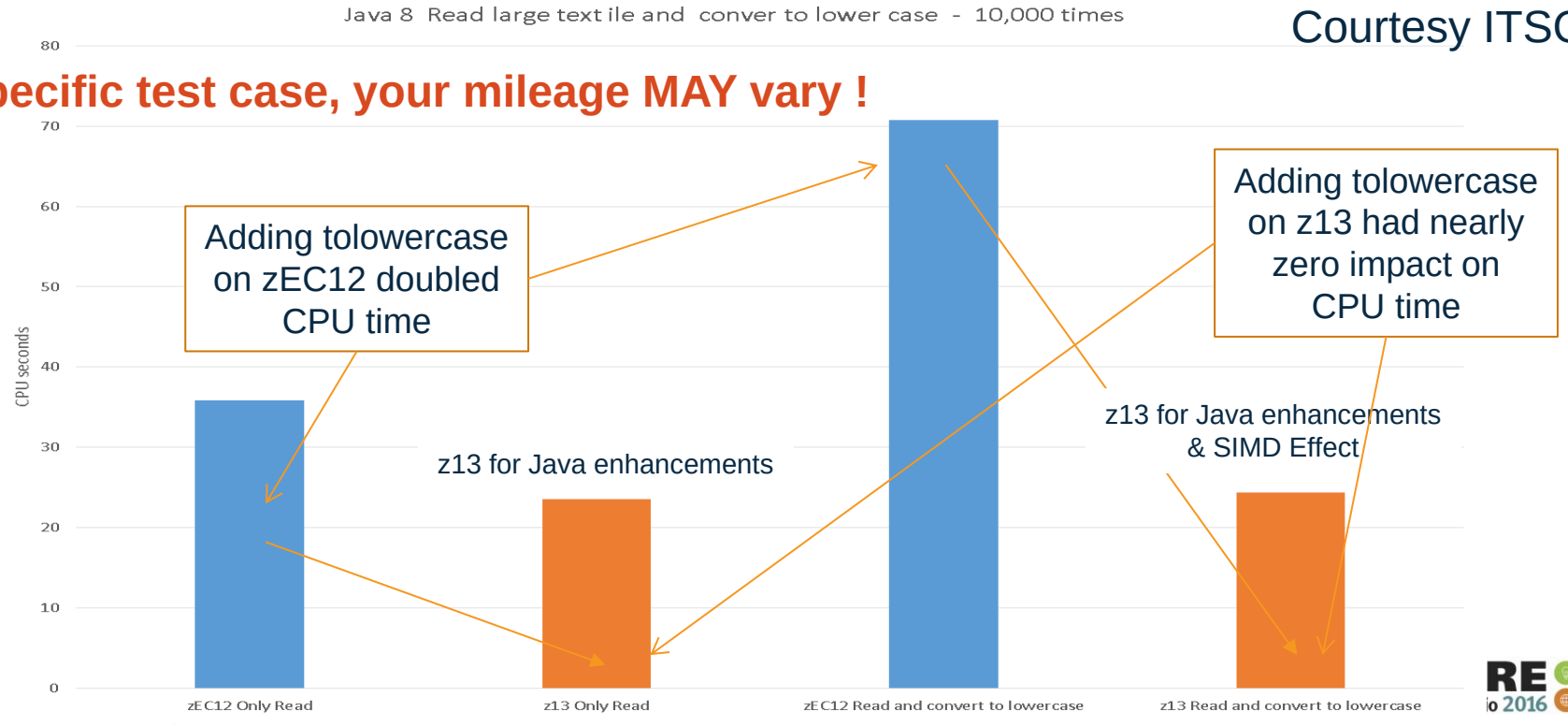
- Hardware compression (not to be confused with zEDC) uses about 50% less CPU on z13 than on zEC12.
  - Hardware compression is still important even if you have zEDC.
  - zEDC is better than hardware compression FOR THE DATA TYPES THAT SUPPORT IT.
  - VSAM KSDS, IMS, and DB2 do NOT support zEDC.
- If you looked at database compression in the past and discounted it because of CPU cost, go back and look at it again.
- If you use database compression today, expect to see CPU savings when you move to z13.

And One More - SIMD

- If you have lots of Java, SIMD might deliver significant CPU savings…

Courtesy ITSO

Specific test case, your mileage MAY vary !



Data center costs

- Is anyone fed up with hearing about how expensive the mainframe is, compared to other platforms?
- Who pays for *your* data center? Is the cost apportioned out based on floor space requirements? Or power/cooling requirements? Or does the mainframe cover the entire data center running costs?
- **Keith Sisson** had 2 excellent slides (13 & 14) in his *z13s User Experience* presentation (Session 18352), showing how cloud and z13s dramatically reduced their data center costs.
- The next time you get into a discussion about mainframe costs, it would be prudent to find out how this is handled in *your* site.

ATS Tools

- z Systems Batch Network Analyzer (zBNA) should be a part of every performance analysts toolkit. Used for data set tuning, batch workload analysis, modeling impact of CPU upgrades, identifying benefits of zEDC. And it's free!
  - The zBNA development team are now working on an enhancement to provide a **critical path analysis** function, using information from job schedulers.
  - They are looking for customers that would be willing to contribute information from their job scheduler to help broaden the range of schedulers that zBNA will support.
- zPCR currently models CPC capacity based on LSPR measurements taken at 90% busy. No adjustments are made for reduced MP effects if the target configuration utilization is going to be less than 90%.
  - However, they are willing to review that strategy if there is sufficient interest from customers.
- If you are interested in either of these, send an email to **John Burg** (jpburg@us.ibm.com).

WLM MWP Support

- Recent WLM APAR provide new capabilities aimed at MWP.
  - There is a new Reporting Attribute in WLM that lets you identify work as being MWP-eligible. WLM then tracks CPU (general, zIIP, zIIP on CP) usage of those 'transactions' at the service class, report class, and system level. It also tracks the R4HA of the MOBILE workload.
- For anyone using MWP, this is *huge*.
  - Potentially eliminate the need to process SMF 110, IMS logs, and other transaction-level (very high volume) SMF records.
  - IF you have regions dedicated to MWP, can also use this capability to capture region overhead time.
  - Lets you calculate the MWP-adjusted R4HA in real time – this is vital to anyone that wants to effectively manage soft-caps on a dynamic basis.
  - AND, as soon as the APARs are installed (even if you don't assign ANY txns to MOBILE), CICS and IMS transaction service classes now report txn response times, txn numbers, AND CPU TIMES – woohoo!

WLM MWP Support

- Requirements:
  - WLM APAR OA47042, RMF APAR OA48466, and z/OSMF APAR PI47638.
  - CICS TS 5.3 or later.
  - IMS V14 or later with APARs PI46933 and PI51948.
- References:
  - *Workload Management (WLM) Update for z13, z/OS V2.2 and V2.1*, by **Andreas Henicke**, Session 18626.
  - *Containing MLC Costs For Mobile and New Workloads*, by **Cheryl Watson** & **Frank Kyne**, Session 18456.

WLM New Capping Support

- Just when you were despairing that there are no more ways to hog-tie your systems, WLM comes to the rescue

Initial capping

Resource groups

Group capping

Absolute capping

Soft capping

WLM New Capping Support

- z13 GA2 provides a new group absolute cap capability.
  - Cap amount and group name are specified on the HMC. Cap is for a group of LPARs and is specified in terms of hundredths of a CP.
  - Just like absolute capping introduced on zEC12 GA2, but for a group of LPARs.
  - Aimed primarily at Linux environments, but all PU types supported.
  - Limit is enforced by PR/SM, but WLM (with APAR OA47752 for z/OS 2.1 & 2.2) is aware of the limit and uses it when calculating potential LPAR capacity.

WLM New Capping Support

- WLM APAR OA49201 introduces ability to have WLM cap an LPAR based on *actual* MSU (not Rolling 4-Hour Average).
- Controlled using AbsMSUcapping keyword in IEAOPTxx and MSU value specified on HMC.
  - Can mix AbsMSUCapping YES and NO systems in the same LPAR group.
- Works for both individual LPAR and LPAR Groups.
- Presumably aimed at situations where you want to limit the actual capacity available to an LPAR or group of LPARs.

SHARE Live!

- Did you miss some key presentations?
- Did you hear about some fantastic presentation that you did not attend?
- Maybe you had multiple sessions that you wanted to see at the same time and had to choose just one of them?
- Did you attend a session that you would like your colleagues to see/hear?

- If you answered yes to any of the above, consider signing up for SHARE Live! See http://www.share.org/salive

Thanks!!

- Thank you for coming and for your support.
- Have a safe trip home.
- Don’t forget to follow up on all those “I must look at that when I get home” items.

- Please complete an evaluation

- See you in Atlanta!

Complete your session evaluations online at SHARE.org/SanAntonio-Eval

Irish SMS Text