

caWorld¹⁰

**new technology – you
asked and we delivered**

Session #: MR030SN

Focus Area: Mainframe Management



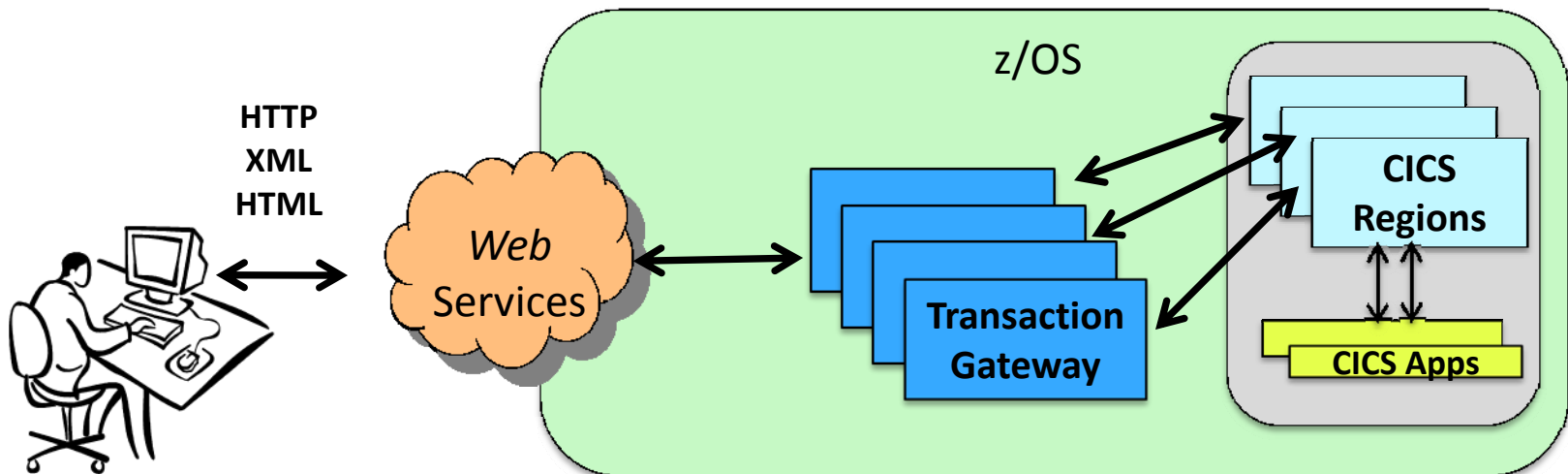
Learn about recent support in CA MICS® for emerging technologies – and how we've responded to your requests. This session will focus on our new support for the CICS Transaction Gateway (CTG), and new measurements we are collecting to help you manage the ever-evolving z/OS environment. Stop in and learn what's happening now.

agenda

- Support for CICS Transaction Gateway in the CA MICS[®] Analyzer Option for CICS
- IBM Specialty Engine Consolidation—Is it a zIIP or a zAAP?
- z/10 Capacity Provisioning – WLM Goal mode meets On/Off Capacity on Demand
- Q & A

CICS Transaction Gateway

- What is CICS Transaction Gateway (CTG) for z/OS?
 - CTG provides a high-speed, highly scalable connection between web applications and z/OS based CICS regions



- Only remote activity is captured for SMF metrics

CICS Transaction Gateway

- Why was CTG support added to the CA MICS Analyzer Option for CICS?
- You asked for it!
 - CTG support was one of the most frequently requested CA MICS development enhancements
 - Why?
 - Need to support the evolving mainframe role.
 - An increasing number of CA MICS customers rely on z/OS CTG to connect distributed Web applications with CICS regions
- Fulfill the fundamental requirement to measure and trend

CICS Transaction Gateway

– CTG History

- Went mainstream with version 5.0 around 2002
 - Current version: 7.2
- Records activity with SMF type 111 interval records
- Configure CTG for CA MICS
 - CTG configuration file: statsrecording=on **Activates SMF recording**
 - Default interval time: 3 hours
 - Recommended: 10 – 30 minutes **Useful Granularity**
 - Default interval boundary: 00:00:00
 - Recommended: 00:59:00 **End Time Stamp = HOUR**
- Only remote activity is monitored for SMF metrics

CICS Transaction Gateway

– What is measured and recorded in SMF type 111 records?

- Gateway Daemon statistics ✓
- All CICS Region statistics ✓
- Connection Manager statistics ✓
- Protocol Handler statistics ✓
- Worker Thread statistics ✓
- System Environment statistics ✓
- Individual CICS Region statistics ✗

- Would require separate file with CICS region as key

“✓” in new Gateway Server Activity (CTGGSA) file

CICS Transaction Gateway

– What is required to activate CTG processing in CA MICS?

- Update prefix.MICS.PARMS(INPUTCIC)
 - TCE: Add //INPUTSMF DD DSN(s) with SMF 111
 - CMF: Add SMF 111 DSN(s) to existing //INPUTSMF DD
 - Regenerate DAILY
- Update prefix.MICS.PARMS(CICOPS)
 - Add a “GATEWAY ACTIVE” statement
 - Execute prefix.MICS.PARMS(CICPGEN)
 - Enables DAY040 to read SMF type 111 records
 - Examine your DAY040 step MICSLOG

CICS Transaction Gateway

– Examine the DAILY job DAY040 step MICSLOG

```
CIC07080I SMF TYPE 111 GATEWAY RECORD PROCESSING DETAILS
CIC07080I
```

CIC07080I TYPE 111 GATEWAY RECORDS INPUT	1176
CIC07080I RECORDS REJECTED BY USRSGSA EXIT	0
CIC07080I RECORDS REJECTED DUE TO UNDEFINED GATEWAY APPLID	1176

```
CIC07081W +-----+
```

```
CIC07081W
```

```
CIC07081W Rejected CICS Transaction Gateway data---APPLIDs not defined in CICOPS
```

CIC07081W	ORGSYSID	APPLID	RECORD COUNT
CIC07081W	----	-----	-----
CIC07082W	SYS1	CICSTGWB	168
CIC07082W	SYS1	CICSTGWA	168
CIC07082W	SYS2	CICSTGWA	168
CIC07082W	SYS2	CICSTGWD	168
CIC07082W	SYS4	CICSTGWA	168
CIC07082W	SYS4	CICSTGWB	168
CIC07082W	SYS4	CICSTGWC	168

**Need to add four GATEWAY APPLID
statements to CICOPS
—one for each unique APPLID**

```
CIC07086I +=====+
```

CICS Transaction Gateway

- Update prefix.MICS.PARMS(CICOPS), run CICPGEN

```
EDIT      prefix.MICS.PARMS(CICOPS) - 01.41
```

```
Command ==>
```

```
***** ***** Top of Data *****
```

```
000001  GATEWAY ACTIVE
```

```
000002  GATEWAY APPLID  CICSTGWA CTGA
```

```
000003  GATEWAY APPLID  CICSTGWB CTGB
```

```
000004  GATEWAY APPLID  CICSTGWC CTGC
```

```
000005  GATEWAY APPLID  CICSTGWD CTGD
```

```
000006  other CICOPS statements
```

```
000007  etc.
```

Data Element CTGID

- 2nd Sort Seq in CTGGSA file
- Also in CHECKPT data set

Data Element CTGAPPL

- Daily job DAY040 processes CTG data for specified APPLIDs
- Creates new Gateway Server Activity (CTGGSA) file
 - New CICS Transaction Gateway (CTG) Information Area

CICS Transaction Gateway

– New Report: MICF Inquiry CICLDG – Summary Page

Inquiry : CICLDG
Run Date: 04FEB10

CA MICS - CICS Transaction Gateway Daily Throughput Summary

PAGE 001

Data Summarized by CTGID and DAY

Report Start: 14JAN10:00:00

REPORT PAGE: Data for Date=14JAN10

Report End : 14JAN10:23:59

		+----- Gateway Daemon Activity -----+					+----- CICS Server Activity -----+				
		Client	Client	Client	Client	Client	CICS	CICS	CICS	CICS	CICS
		Requests	Request	Resp	Request	Avg Resp	Requests	Request	Resp	Request	Avg Resp
SYSID	CTGID	Processed	MB Data	MB Data	per/sec	Time	Processed	MB Data	MB Data	per/sec	Time
----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SYS1	CTGA	814	13.46	13.42	0.009	0.4918	814	13.34	13.34	0.009	0.4857
	CTGB	813	13.45	13.41	0.009	0.4886	813	13.32	13.32	0.009	0.4825
----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	*ALL*	1627	26.91	26.83	0.019	0.4902	1627	26.66	26.66	0.019	0.4841
SYS2	CTGA	198691	2101.27	1875.41	2.300	0.1322	162153	2074.78	2074.07	1.877	0.1209
	CTGB	289657	2978.36	2670.29	3.353	0.1140	231676	2938.29	2937.60	2.681	0.1038
	CTGC	159940	1080.72	938.36	1.851	0.0739	109439	1056.54	1055.61	1.267	0.0779
----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	*ALL*	648288	6160.35	5484.07	7.503	0.1097	503268	6069.62	6067.28	5.825	0.1037

CICS Transaction Gateway

– New Report: MICF Inquiry CICLDG – Detail Page

Inquiry : CICLDG
Run Date: 04FEB10

CA MICS - CICS Transaction Gateway Daily Throughput Detail
Data Summarized by CTGID and DAY

PAGE 012

Report Start: 14JAN10:00:00

Report End : 14JAN10:23:59

SYSID : SYS2
Gateway ID: CTGA

APPLID: CICSCTWA

Release Level:7.2.0

REPORT PAGE: Data for Date=14JAN10

		+----- Gateway Daemon Activity -----+					+----- CICS Server Activity -----+				
Day of Week		Client Requests Processed	Client Request MB Data	Client Resp MB Data	Client Request per/sec	Client Avg Resp Time	CICS Requests Processed	CICS Request MB Data	CICS Resp MB Data	CICS Request per/sec	CICS Avg Resp Time
----	HOURL	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Thu	0	6975	19.57	11.86	1.938	0.0380	2673	18.31	18.27	0.742	0.0750
	1	699	6.92	6.83	0.194	0.3090	699	6.85	6.83	0.194	0.2790
	2	659	6.43	6.34	0.183	0.2890	659	6.35	6.35	0.183	0.2560
.					
.					
	9	22845	316.23	279.58	6.346	0.1580	22173	313.61	313.52	6.159	0.1190
	10	18684	234.12	207.36	5.190	0.1760	17695	231.89	231.95	4.915	0.1430
	11	15722	213.86	193.17	4.367	0.1580	14860	211.99	212.02	4.128	0.1200
	12	10563	157.11	140.44	2.934	0.1580	10357	155.92	155.92	2.877	0.1120
	13	17016	258.89	233.70	4.727	0.1570	16912	256.98	256.98	4.698	0.1080
	14	11917	171.03	152.19	3.310	0.1810	11667	169.69	169.66	3.241	0.1380
	15	13717	190.53	171.90	3.810	0.1620	13091	188.92	188.95	3.636	0.1220
.					
.					
	20	471	2.98	1.99	0.131	0.4620	369	2.90	2.26	0.102	0.5560
	21	57	0.60	0.60	0.016	3.6350	57	0.60	0.60	0.016	3.5810
	21	57	0.60	0.60	0.016	3.6350	57	0.60	0.60	0.016	3.5810
	22	21	0.24	0.24	0.006	13.4460	21	0.24	0.24	0.006	13.4170
	23	38788	45.48	39.91	10.774	0.0170	12776	38.16	38.15	3.549	0.0450
-----		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTALS		198691	2101.27	1875.41	2.300	0.1322	162153	2074.78	2074.07	1.877	0.1209

CICS Transaction Gateway

– CA MICS Support for CICS Transaction Gateway

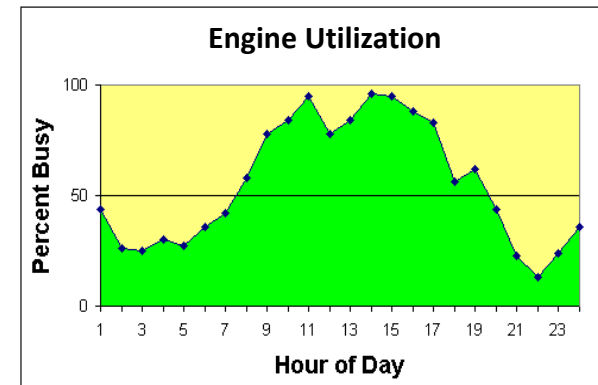
- Product change CIC6715: available NOW
- You can:
 - Process CTG raw data along with traditional CICS raw data
 - Process standalone CTG raw data in separate unit
- CA MICS customers have tuned CICS units to process high volumes of CICS transaction data
 - Processing of CTG SMF type 111 has minimal performance impact on daily update DAY040 step
- If concerned, process standalone in separate unit

IBM Specialty Engine Consolidation— Is it a zIIP or a zAAP?

IBM Specialty Engine Consolidation— Is it a zIIP or a zAAP?

— Beginning with z/OS V1.11

- zIIP engines can process both zIIP and zAAP eligible work
- Same functionality with APAR OA27495 for z/OS V1.9–V1.10



— IBM reasoning:

- Some customers do not have enough zAAP or zIIP eligible work to justify purchase of zAAP or zIIP engines
- But they do have enough z-eligible work to justify the purchase of a specialty engine that processes both zIIP and zAAP eligible work
- Now, zIIP engines can process BOTH zIIP and zAAP eligible work

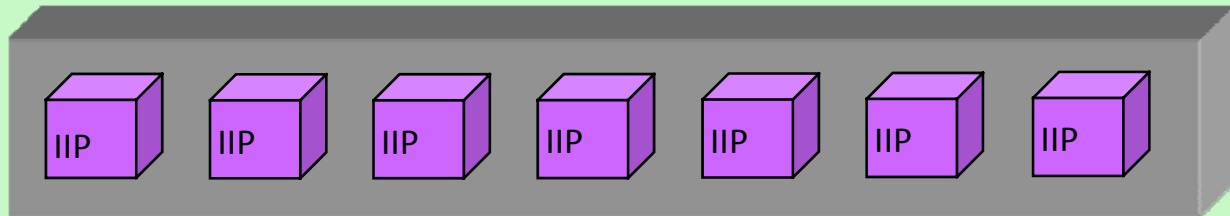
IBM Specialty Engine Consolidation— Is it a zIIP or a zAAP?

- Requirements to run zAAP workloads on zIIP
 - Must have a z9 or z10 server
 - Must have one or more zIIP engines
 - Must have zero (0) zAAP engines
 - IFL, ICF, and SAP engines do not matter
 - SYS1.PARMLIB(IEASYSxx) ZAAPZIIP (ZZ)=YES
 - default for z/OS V1.11: ZZ=YES
 - default for z/OS V1.9 – V1.10: ZZ=NO
- If these requirements are met—
 - Both zIIP and zAAP eligible work will run on zIIP engines

IBM specialty engine consolidation— is it a zIIP or a zAAP?

zAAP and zIIP Specialty Engine Pools

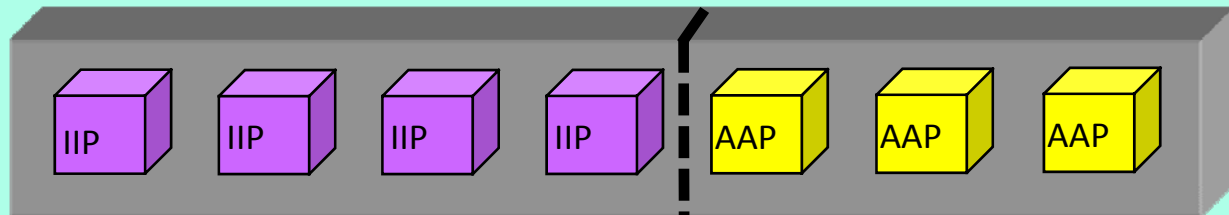
z9 or z10 Server



This configuration is eligible for zAAP workloads to run on zIIP engines
(ZAAPZIIP=YES)

zAAP and zIIP Specialty Engine Pools

z9 or z10 Server



This configuration is not

At this time IBM does not recommend converting zAAP engines to zIIP!

IBM Specialty Engine Consolidation— is it a zIIP or a zAAP?

- How are CA MICS measurement impacted?
- In a zIIP only configuration with ZIIPZAAP=YES
 - All zAAP related CPU measurements will be zero (0)
 - zIIP related CPU measurements include both JAVA and enclave SRB activity
 - No way to separate what part was “zAAP” versus the part that was “zIIP”
 - With SYS1.PARMLIB PROJECTCPU=YES
 - All zAAP/zIIP eligible work will show up as zIIP eligible
 - All zAAP eligible CPU fields will be zero
- Lose ability to determine the CPU usage of JAVA versus enclave SRB for specific workloads...
- But potential to more fully utilize your specialty engines

IBM z/10 Capacity Provisioning

IBM z/10 Capacity Provisioning

- Provisioning: *"providing" or making **something** available*
- Capacity provisioning:
*"providing" or making **capacity** available*
- Available only for z/10 Series CPCs (and later models)
 - Logical extension to On/Off Capacity on Demand
 - Tight integration with z/OS Workload Manager (WLM)
 - Rules and temporal based policies
 - Faster response to resource requirements
 - Four implementation modes

IBM z/10 Capacity Provisioning

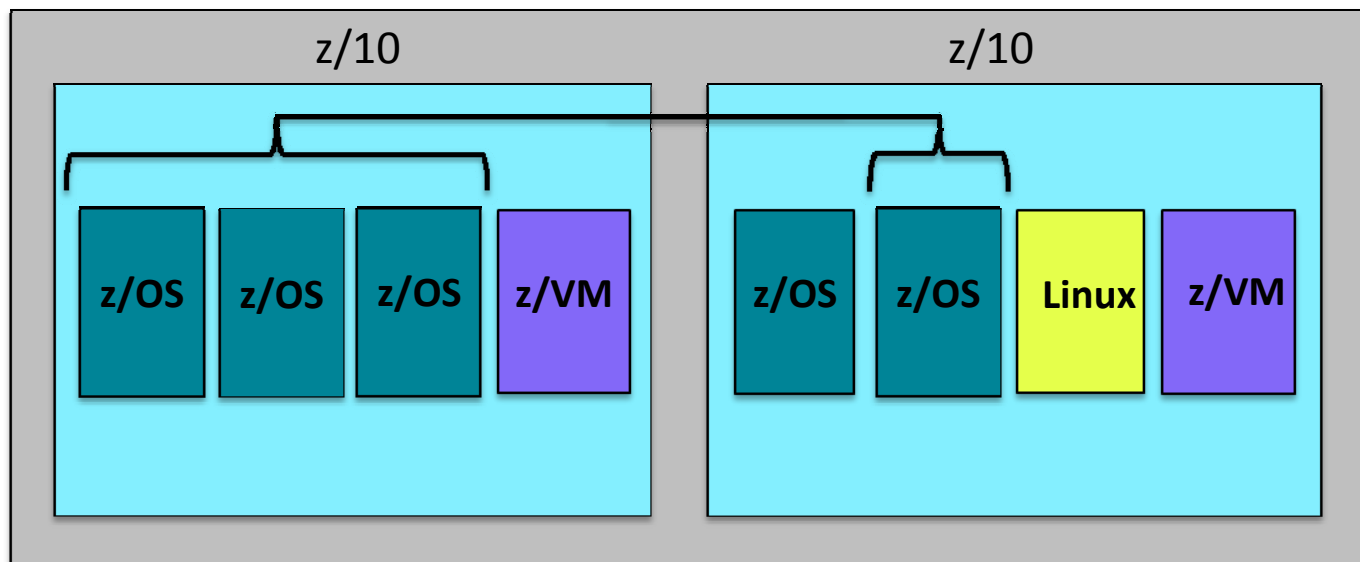
why capacity provisioning?

- Excess CPU capacity is expensive
- When capacity is constrained, however...
 - WLM makes some tough decisions
 - Highest priority workloads get attention at the expense of lower priority workloads
- Lower priority workloads are not always discretionary
- CuOD (permanent) and On/Off CoD (temporary) are limited
 - And time consuming...
 - Problem often fixed too late

IBM z/10 Capacity Provisioning

– Capacity provisioning components

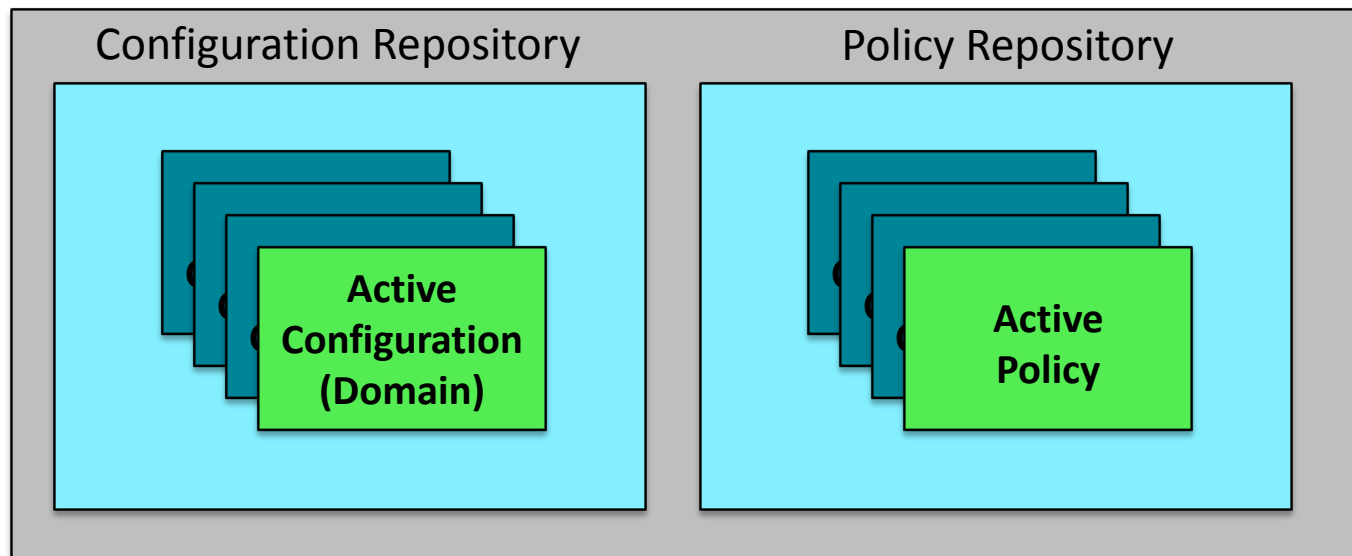
- Capacity provisioning manager (CPM)
- Capacity provisioning control center (CPCC)
- One or more z/10 CPCs



**provisioning
configuration
domain**

IBM z/10 Capacity Provisioning

- Capacity provisioning manager (CPM)
 - Monitors LPARs in a provisioning domain
 - Proposes (or activates) temporary capacity changes
 - Based on active domain configuration and active policy



IBM z/10 Capacity Provisioning

provisioning policy: how much, when, why, and how

– How much capacity can be added?

- General processor CPs – expressed as max MSUs per CPC
- zAAP and zIIP processors – expressed as max additional processors

CPC	Max MSUs	Max zAAPs	Max zIIPs
CPC1	800	2	3
CPC2	1200	3	0

– Several different rules can be triggered in the same time window

– But these maximums will never be exceeded

- Even if, for example, two rules are triggered and each calls for 2 zIIPs
- Only 3 will be added due to max zIIP limit of 3

IBM z/10 Capacity Provisioning

provisioning policy: how much, when , why, and how

- Why can capacity can be added? – provisioning rules
- Workload condition
 - Sysplex filter
 - System (LPAR system name)
 - Importance filters
 - Included service class periods
 - Excluded service class filter
- Provisioning criteria
 - Provisioning PI value
 - Duration (minutes)
 - Deprovisioning PI value
 - Duration (minutes)
 - PI scope (sysplex or system)
- Performance Index (PI)
 - < 1 Exceeding goal
 - = 1 Meeting goal
 - > 1 Missing goal

If service class “JAVAAPP” has a sysplex PI of 1.6 for 8 minutes, add 1 zAAP to CPC “CPC1.” If it subsequently has a PI of 1.2 for 10 minutes, remove capacity.

IBM z/10 Capacity Provisioning

provisioning policy: how much, when , why, and how

- When can capacity can be added? – provisioning rules
 - Time condition are defined
 - Each time condition has a start time, deadline, and end time

Name	Start Time	Deadline	End Time
TimeC1	05.20.2010 06:00:00	05.22.2010 14:00:00	05.23.2010 22:00:00
TimeC2	11.22.2010 22:00:00	11.28.2010 06:00:00	11.30.2010 18:00:00

- Start and end time define the capacity increase boundaries
- If not triggered by deadline time, capacity will not be increased
- After end time, additional capacity is “deprovisioned”


IBM z/10 Capacity Provisioning

provisioning policy: how much, when , why, and how

- How is capacity added (and taken away)?
 - Manual mode
 - Use the CPM interface to manually modify capacity
 - Analysis mode
 - CPM is active and makes suggestions—you implement manually
 - Confirmation mode
 - CPM wants to make adjustments, and asks your permission. If you OK, changes are made
 - Autonomic mode
 - You are out of the loop

IBM z/10 Capacity Provisioning measurement challenges

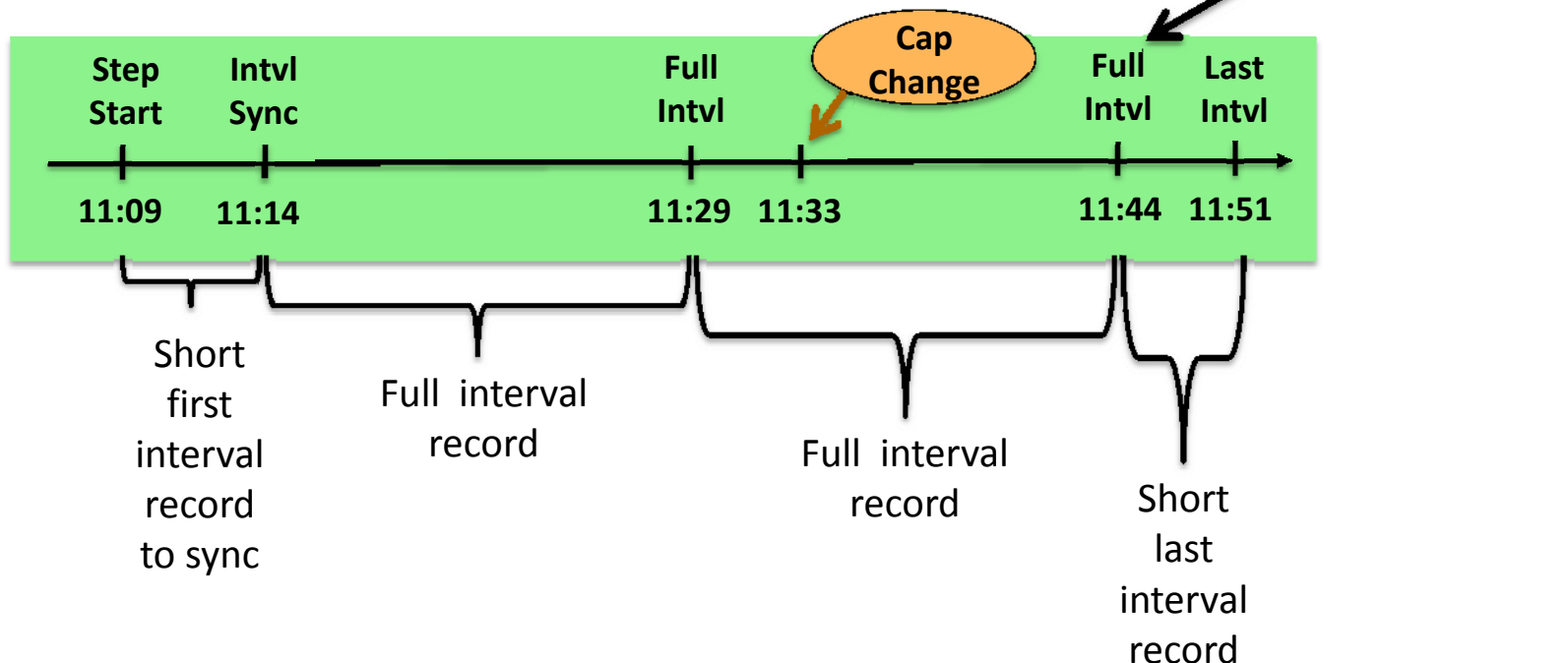
– RMF CPU (LPAR) measurements

- Capacity values reflected in RMF type 70 CPU Activity record
- Metrics reflect end-of-interval values
 - Number of physical processors
 - Number of logical processors per LPAR
 - Online time for logical processors 
 - MSU model and ratings for temporary capacity increases
- Are we ready for “short” RMF interval records?
 - Generated when capacity changes?
 - Enormous impact on RMF record post-processing programs

IBM z/10 Capacity Provisioning measurement challenges

– Existing paradigm

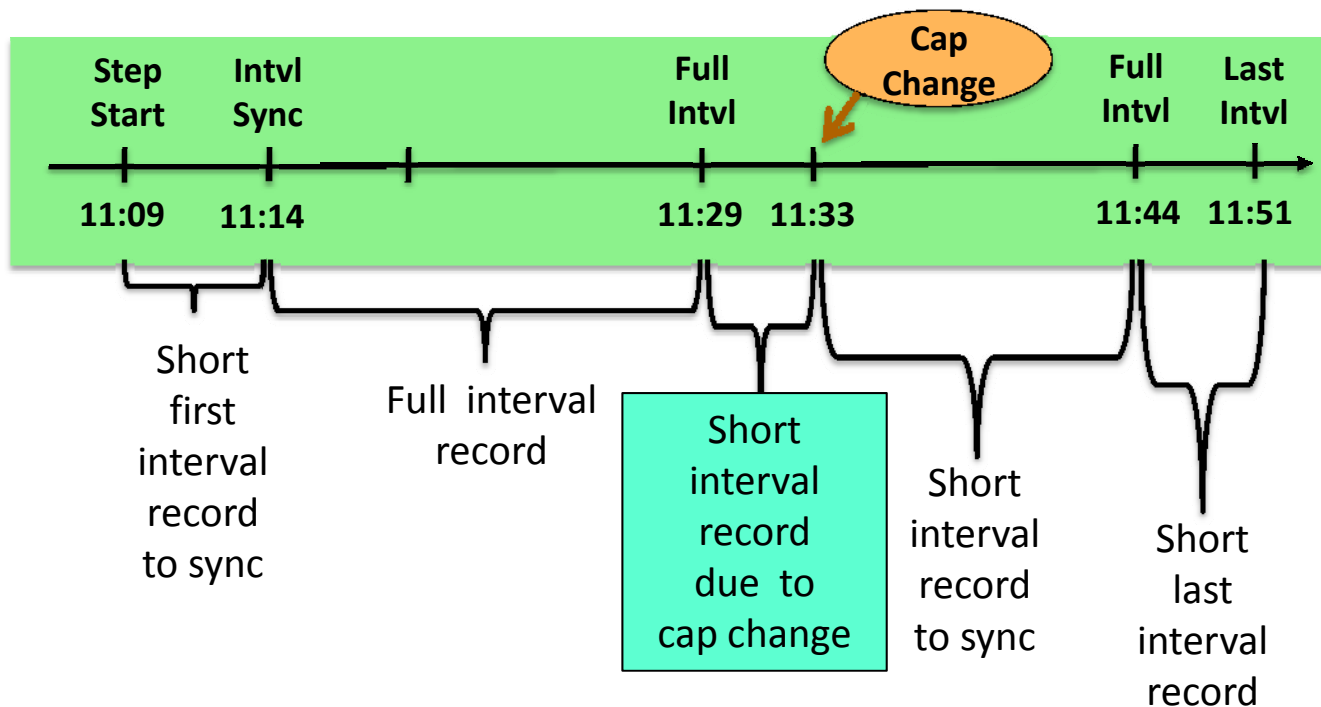
- Current SMF type 30 address space interval records
- CA MICS step level files (BATPGM, BAT_ST, BAT_TS, etc.)
- Metrics related to capacity show end-of-interval values



IBM z/10 Capacity Provisioning measurement challenges

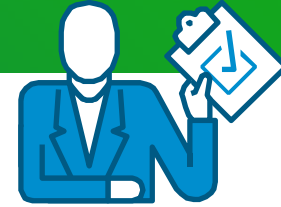
– What we would like to see

- Future “event driven” SMF type 30 address space interval records
- Step level files (BATPGM, BAT_ST, BAT_TS, etc.)
- Event based interval records associated with cap change: SU/CPU sec



IBM z/10 Capacity Provisioning measurement challenges

- What are the accounting and chargeback implications?
 - Capacity changes impact software license fees
 - Do you expect to change rates based on temporary capacity changes?
 - Should “innocent” users’ job costs be affected?
- What are the CPU utilization charting analysis implications?
 - Percent utilization over time when capacity frequently changing
 - Many of you may have already dealt with this with CuOD and On/Off CoD
- Expect CA MICS to provide useful updates that:
 - Support your cost accounting requirements
 - Help you understand the impact of temporary capacity changes
 - Support your capacity planning requirements



- If you use CICS Transaction Gateway (CTG)...
 - Take advantage of the new support added to the CA MICS CICS Analyzer
 - Use the new CTGGSA file to trend CTG performance and to adjust settings for optimal performance
- Investigate if an all zIIP environment makes sense for you
 - You can use existing CA MICS base components to fully understand your specialty engine eligible workloads
 - Potential for better overall engine utilization
- Stay tuned for CA MICS updates regarding capacity provisioning
 - The paradigm where capacity changes frequently is a new one
 - Interesting reporting challenges ahead!

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Q&A

mainframe networking

Mainframe MIPS Lounge —
Mainframers can relax and talk
informally

Islander D
Monday: 12 PM – 4:45 PM
Tuesday & Wednesday: 8 AM – 6PM
Thursday: 8 AM – 12 PM

Mainframe Networking Lunches

Where: Islander Ballroom, Salon B

When: Tuesday and Wednesday

Time: 12:00pm - 1:15pm



Seating is limited and
will be on a first
come, first served
basis



Mainframe-only party,
Wed night, 7-10pm, House of Blues
(Mandalay Bay)
Need entry pin, get them in the
Mainframe lounge

related sessions

SESSION #	TITLE	Day / Time Room: <u>Tropics A</u>
MR030SN	CA MICS Technology Support – You Asked, We Delivered!	Monday / 1:15
MR050SN	Have You Checked Your CA MICS Implementation Lately?	Monday / 3:45
MR230SN	CA MICS Observations: Practical Best Practices	Tuesday / 9:00
MR090SN	Digging for Gold – How to Mine and Share CA MICS Data, Quickly and Easily	Tuesday / 2:30
MR210SN	CA MICS Tape Analyzer Option – With Six You Get HYDRA	Tuesday / 3:45
MR110SN	Are You Drowning in SMF Data?	Wednesday / 9:00
MR130SN	Get Your Data Faster (and More Easily) – A User Success Story	Wednesday / 1:15
MR170SN	CA MICS Customer Panel – CA MICS <u>NOTE different room: Islander G</u>	Wednesday / 2:30
MR150SN	CA MICS Resource Management in the CA Data Center – A Success Story	Wednesday / 3:45
MR250SN	CA MICS Global User Community Meeting	Wednesday / 5:00

exhibition center

related CA technology

- CA Mainframe area
 - Booth 182 Stop by to see MICS reporting with Q&R
- Exhibition Center Tours
 - Sign up at the Info Desk in the Exhibition Center

please complete a session evaluation form

- The number for this session is **MR030SN**
- After completing your session evaluation form, place it in the basket at the back of the room

thank you