

What You Need to Know About IBM's Sub-Capacity Pricing & SCRT

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Objectives for Today

- Overview of Sub-Capacity Workload License Charges
 - Including “Monthly License Charge” and zIPLA Products
- Overview of the SCRT process

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Workload License Charges

- In 2000 with z/OS V1 and the z900 machines IBM introduced Sub-Capacity Workload License Charges
 - As sites moved to z/OS V1 and z900 machines they could begin to pay for their Monthly License Charge (MLC) products based on the LPAR's in which the product executes
 - Previously IBM's (and most other vendors) licensed software to specific machines and their "full capacity", as if they were always 100% busy
 - Growth in LPAR usage between 1988 and 2000 led to some software being used in only some LPARs
- Overview of the SCRT process

Workload License Charges

- WLC helps reduce the mainframe Total Cost of Ownership
- WLC tries to remove the “Software Cost” obstacle that slows down hardware growth and sales
- WLC Evolves over time due to new Ts&Cs, new HW, & new metrics
- WLC started simply in 2000
 - Pricing Metrics: FLAT, PSLC, ULC, VWLC and FWLC
 - PSLC, ULC were used on most older machines
 - VWLC and FWLC on the z900s
 - Now it is quite Complicated

zSeries, z/OS and zWorkload zPricing

- 16 columns of Machines & Pricing Plexes
- 18 rows of metrics

Metric	Description	Sub-Capacity Allowed?	Aggregation Allowed?	Qualified Hardware																	
				9672 & All Others	MP3K	z800 Standalone	z800 in a Qualified Sysplex	z890 Standalone	z890 in Pricing Plex	z900, z990, z9-109 in Pricing Plex	z9BC, z10BC Stand-Alone	z9BC, z10BC in Pricing Plex	z9EC, z10EC Stand-Alone	z9EC, z10EC in Pricing Plex	z114 Stand-Alone	z114 in Pricing Plex	z196 Stand-Alone	z196 in Pricing Plex	zEC12 Stand-Alone	zEC12 in Pricing Plex	
MLC	GOLC	Growth and Opportunity License Charge - One of oldest models, Operates at a Group Level				Yes															
MLC	FLAT	Much Older Fixed MLC		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
MLC	PSLC	Parallel Sysplex License Charge	No	Yes	Yes		Yes		Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
MLC	ULC	S/390 Measured Usage License Charge	No	Yes	If PSLC	If GOLC	Part of PSLC Sysplex		Part of PSLC Sysplex	Part of PSLC Sysplex		Part of PSLC Sysplex	Part of PSLC Sysplex	Part of PSLC Sysplex		Part of PSLC Sysplex		Part of PSLC Sysplex		Part of PSLC Sysplex	
MLC	zELC	zSeries Entry License Charge	No, Model Based Only		or equivalent to z800		Yes	110 Model only	118 Model only		A01 Model Only	A01 Model Only									
MLC	AWLC	Advanced Workload License Charges, Full and Sub-Cap	Yes	Yes											NO	Yes, if All Others z196	Yes	Yes, if all z196	Yes	Yes, Mixed Pricing Plex with z196s	
		Technology Update Pricing for AWLC	Yes	Yes															Yes	Yes, if All zEC12s	
MLC	VWLC	WorkLoad License Charge, Full and Sub-Cap	Yes	Yes			Yes	Yes	No, Use EWLC	Yes	Yes	No, Use EWLC	Yes	Yes	Yes	No	No	No	In Transition	No	In Transition
MLC	GSSP	Getting Started SubCapacity Pricing	Yes	Yes								Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	IWP	Integrated Workload Pricing	Yes	Yes								No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
MLC	FWLC	WorkLoad License Charge - Fixed Price Per Footprint	Yes	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
MLC	EWLC	Entry Workload License Charge	Yes	No			Yes		Yes	No, Consider WLC	Yes	No, Consider WLC									
MLC	EWLC Full Cap	Entry Workload License Charge		No	OS/390 Allowed		OS390 allowed, or not zArch		OS390 allowed	OS390 allowed		OS390 allowed	OS390 allowed								
MLC	AEWLC	Advanced Entry Workload License Charges, Full and Sub-Cap	Yes	No											Yes						
MLC	TWLC	Tiered Workload License Charge		No			Yes	Yes			Yes				Yes						
MLC	NALC	New Application License Charge (not available after z/OS 1.8)	Yes w/WLC, No w/PSLC	No	w/PSLC		No, Use z/OS.e	No, Use z/OS.e	No, Use z/OS.e	Yes	Yes	No, Use z/OS.e	No, Use z/OS.e	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC
MLC	zNALC	System z New Application License Charges	Most, Execution, Reference & z/OS Based	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OTC (S&S)	Value Unit	Value Unit (Tivoli, Tools, WebSphere App Server, etc.)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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zSeries, z/OS and zWorkload zPricing

		Qualified Hardware										
Metric	Description	Sub-Capacity Allowed?	Aggregation Allowed?	z114 Stand-Alone	z114 in Pricing Plex	z196 Stand-Alone	z196 in Pricing Plex	zEC12 Stand-Alone	zEC12 in Pricing Plex	zBC12 Stand-Alone	zBC12 in PricingPlex	
MLC	FLAT	Much Older Fixed MLC			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	AWLC	Advanced Workload License Charges, Full and Sub-Cap	Yes	Yes	NO	Yes, if All Others z196	Yes	Yes, If all z196	Yes	Yes, Mixed PricingPlex with z196s		Yes, Mixed PricingPlex with z196s
MLC	TUP	Technology Update Pricing for AWLC	Yes	Yes					Yes	Yes, if All zEC12s		Yes, if All zEC12s
MLC	VWLC	WorkLoad License Charge, Full and Sub-Cap	Yes	Yes	No	No	No	In Transition	No	In Transition		In Transition
MLC	GSSP	Getting Started SubCapacity Pricing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	IWP	Integrated Workload Pricing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	FWLC	WorkLoad License Charge - Fixed Price Per Footprint	Yes	No			Yes	Yes	Yes	Yes	Yes	Yes
MLC	AEWLC	Advanced Entry Workload License Charges, Full and Sub-Cap	Yes	No	Yes							
MLC	TUP	Technology Update Pricing for AEWLC	Yes	No							Yes	
MLC	TWLC	Tiered Workload License Charge		No	Yes						Yes	
MLC	zNALC	System z New Application License Charges	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OTC (S&S)	Value Unit	Value Unit (Tivoli, Tools, WebSphere App Server, etc.)	Most, Execution, Reference & z/OS Based	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Evolution Example

- zIPLA products have a One Time Charge (OTC) and optionally Subscription and Support (S&S)
- Traditionally based on full installed capacity of licensed machines
- August 2004, Sub-Capacity zIPLA
 - Direct Execution; processed and reported by SCRT
 - Based on z/OS Sub-Cap MSUs
 - Referenced Based to IMS, CICS, or DB2 Sub-Cap MSUs
 - In the PricingPlex
 - A full, still at the box level
- *Every Sub-Cap MLC site should be Sub-Capacity IPLA*

WLC Evolutionary Step Example

- At Announcement: “Does this matter to my site?”
 - IBM: “No You Are Properly Licensed Today”
 - That was a correct answer
- Very Important at the time of the next Upgrade
- Otherwise with a new machine and full cap IPLA you pay for the whitespace on the new machine

- You need to study the evolution:
 - Why is IBM doing this?
 - Does it apply to my site?

Technology Update Pricing

- Tiers in the pricing tables provide a volume discount
- The highest tier of PSLC (announced in April 1994) began at 316 MSUs. DB2 V7 was 71USD for the 316th MSU and every MSU above that is also 71USD
- WLC (October 2000) added tiers at 576, 876, 1316 and 1976 MSUs. CICS, IMS, DB2 and others only used the new 576 level. Only z/OS lowered the prices at the higher tiers
- The biggest pricing change in recent years is "Technology Update Pricing for AWLC" announced with the zEC12s
- zBC12s have a new similar approach to TUP

New Levels of Discounts Above 1,976

5694-A01 S00T4FR z/OS V1 Base	PSLC PERMSU	Early VWLC PERMSU	Current VWLC PERMSU	AWLC PERMSU	TUP 316+ - 4.5%	TUP 1,316+ 5.0%	TUP 2,677+ 6.0%	TUP 5,477+ 7.0%
Base Charge 3 MSUs	3,921	3,735	3,921	3,921	3,744.56	3,724.95	3,685.74	3,646.53
4 - 45	865	800	383	368	351.44	349.60	345.92	342.24
46 - 175	277	255	320	301	287.46	285.95	282.94	279.93
176 - 315	207	110	226	216	206.28	205.20	203.04	200.88
316 - 575	159	110	120	115	109.83	109.25	108.10	106.95
576 - 875	159	85	93	88	84.04	83.60	82.72	81.84
876 - 1,315	159	60	65	62	59.21	58.90	58.28	57.66
1,316 - 1,975	159	45	49	47	44.89	44.65	44.18	43.71
1,976 - 99,999,992	159	36	39	38	36.29	36.10	35.72	35.34

New Levels of Discounts Above 1,316

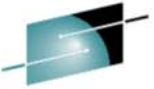
5605-DB2 S015SW2 DB2 V10	PSLC PERMSU	Early VWLC PERMSU	Current VWLC PERMSU	AWLC PERMSU	TUP 316+ 4.5%	TUP 1,316+ 5.0%	TUP 2,677+ 6.0%	TUP 5,477+ 7.0%
Base Charge 3 MSUs	5,560	N/A	5,259	5,259	5,022.35	4,996.05	4,943.46	4,890.87
4 - 45	300	N/A	292	281	268.36	266.95	264.14	261.33
46 - 175	127	N/A	145	137	130.84	130.15	128.78	127.41
176 - 315	95	N/A	108	104	99.32	98.80	97.76	96.72
316 - 575	71	N/A	82	78	74.49	74.10	73.32	72.54
576 - 875	71	N/A	61	59	56.35	56.05	55.46	54.87
876 - 1,315	71	N/A	61	56	53.48	53.20	52.64	52.08
1,316 - 1,975	71	N/A	61	54	51.57	51.30	50.76	50.22
1,976 - 99,999,992	71	N/A	61	54	51.57	51.30	50.76	50.22

- This example is DB2 V10, other products have similar “patterns”
 - Large base, each tier lower cost than the preceding tier
- The green shading shows tiers, that are not taken advantage of by MLC Products other than z/OS
- TUP provide discounts for CICS, DB2, IMS and others beyond the tier pricing at 1,316 MSUs

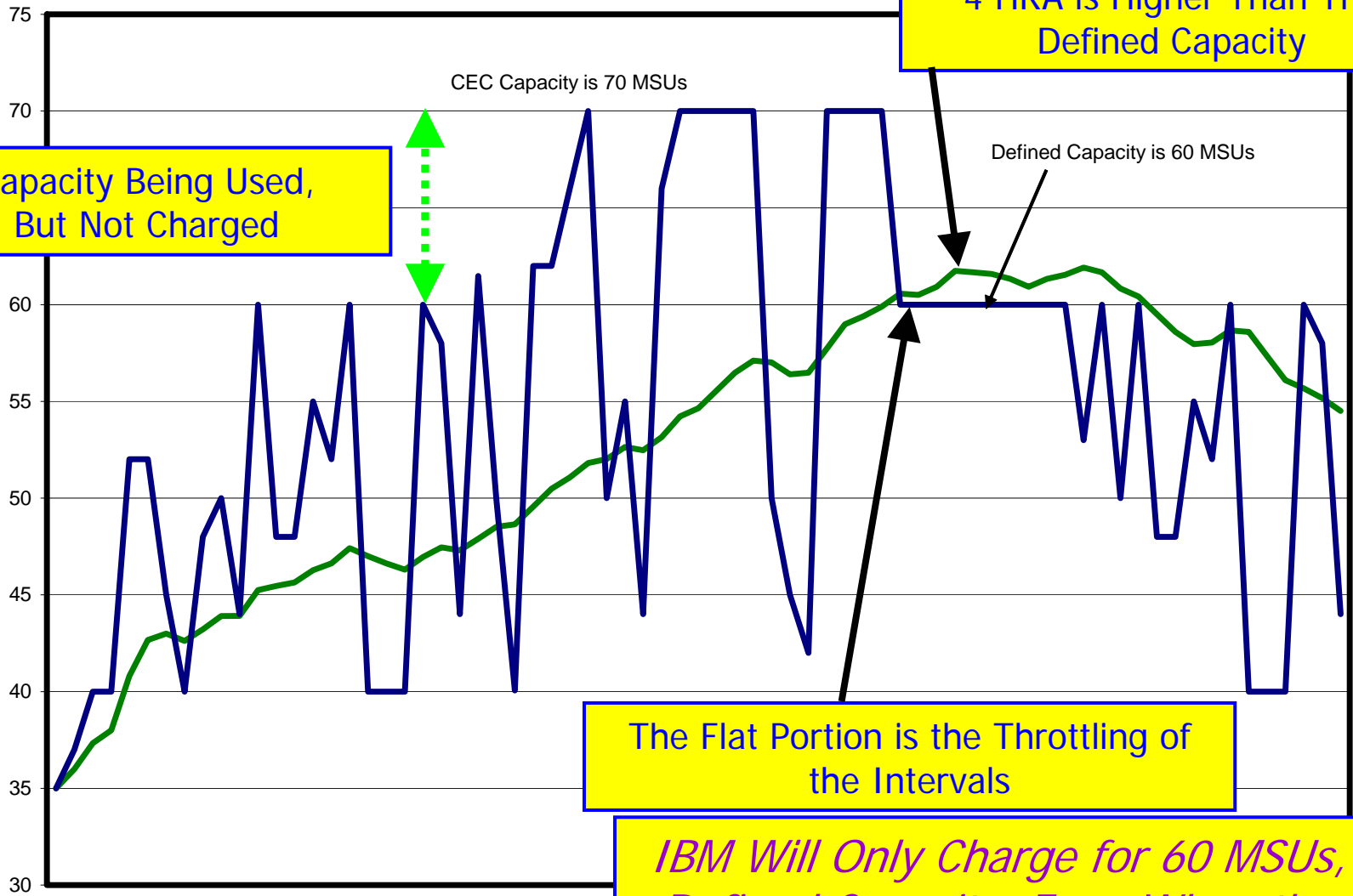
Today's Billable MSUs

- LPAR's have many "sizes"
 - Initial weights specify a percentage of share engines
 - Logical engines, running at 100% busy
 - And others
- Billable MSUs use the 4-hour rolling average (4HRA) of the LPAR's utilization expressed as Software MSUs
 - WLM does the calculations, RMF reports via the SMF 70
- SCRT uses the 4HRA to compute the billable MSUs

4 Hr Rolling Average & Defined Capacity



SHARE
Inc.



Capacity Being Used,
But Not Charged

4 HRA is Higher Than The
Defined Capacity

The Flat Portion is the Throttling of
the Intervals

*IBM Will Only Charge for 60 MSUs, the
Defined Capacity, Even When the 4Hr
Rolling Average is 62 MSUs*

High Level View of SCRT

- For most products SCRT uses SMF89 data to determine in which hours a product is executing in an LPAR
- SMF70 data provides SCRT with the 4HRA of the LPAR
 - Think of the LPAR as a “container”
 - In general all products in the LPAR, regardless of their individual CPU usage, are assigned the LPAR’s 4HRA as the product’s billable MSUs in the LPAR
- SCRT builds hourly simultaneous 4HRA (S4HRA) for each product across the machine’s LPARs
- A Product’s billable MSUs are the maximum S4HRA

I Did It, A One Page Overview of SCRT

High Level View of SCRT

- The exceptions to using LPAR/container MSUs
 - For “Getting Started Sub-Capacity Pricing” (GSSP) for WebSphere brand products their actual CPU consumption will likely be used to calculate billable MSUs less than the 4HRA of the container/LPAR
 - ***Automatically calculated by SCRT if applicable***
 - For “Integrated Workload Pricing” (IWP) the MSUs of WebSphere Application Server and some other products may be subtracted from the 4HRA of the container/LPAR
 - ***Not Automatic. You must sign an addendum to your IBM Customer Agreement***
- Not enough time in this session to provide details on these

Defined Capacity & LPAR Group Capacity Limits

- Defined Capacity limits the 4HRA MSUs that an LPAR may contribute to the Maximum Simultaneous 4HRA reported by SCRT
- LPAR Group Capacity Limits provide a similar function for a group of LPARs. The Group may only contribute up to the Group's specified Limit
- There can be more than one Group on a machine
 - Defined on HMC, can cross Sysplex Boundaries
 - Each LPAR manages themselves within the group
 - Monitors the group limit and all the other LPARs,
 - Balancing is based on the weights

New with zEC12 GA2 and zBC12, Requires z/OS 1.12+



- Absolute physical HW LPAR capacity setting is a new capability on the newest machines
 - Also referred to as “Absolute Processor Capping”
- On the HMC sites can define, in the image profile for shared processors, the absolute processor capacity that the image is allowed to use (independent of partition weight or other cappings).
- To indicate the logical partition can use the not dedicated processors absolute capping, select Absolute capping on the image profile processor settings, to specify an absolute number of processors to cap the logical partition's activity. The absolute capping value can either be “None” or a number of processors value from 0.01 to 255.0 can be specified.
- Machine SW MSUs/Number of CPs = SW MSUs/CP

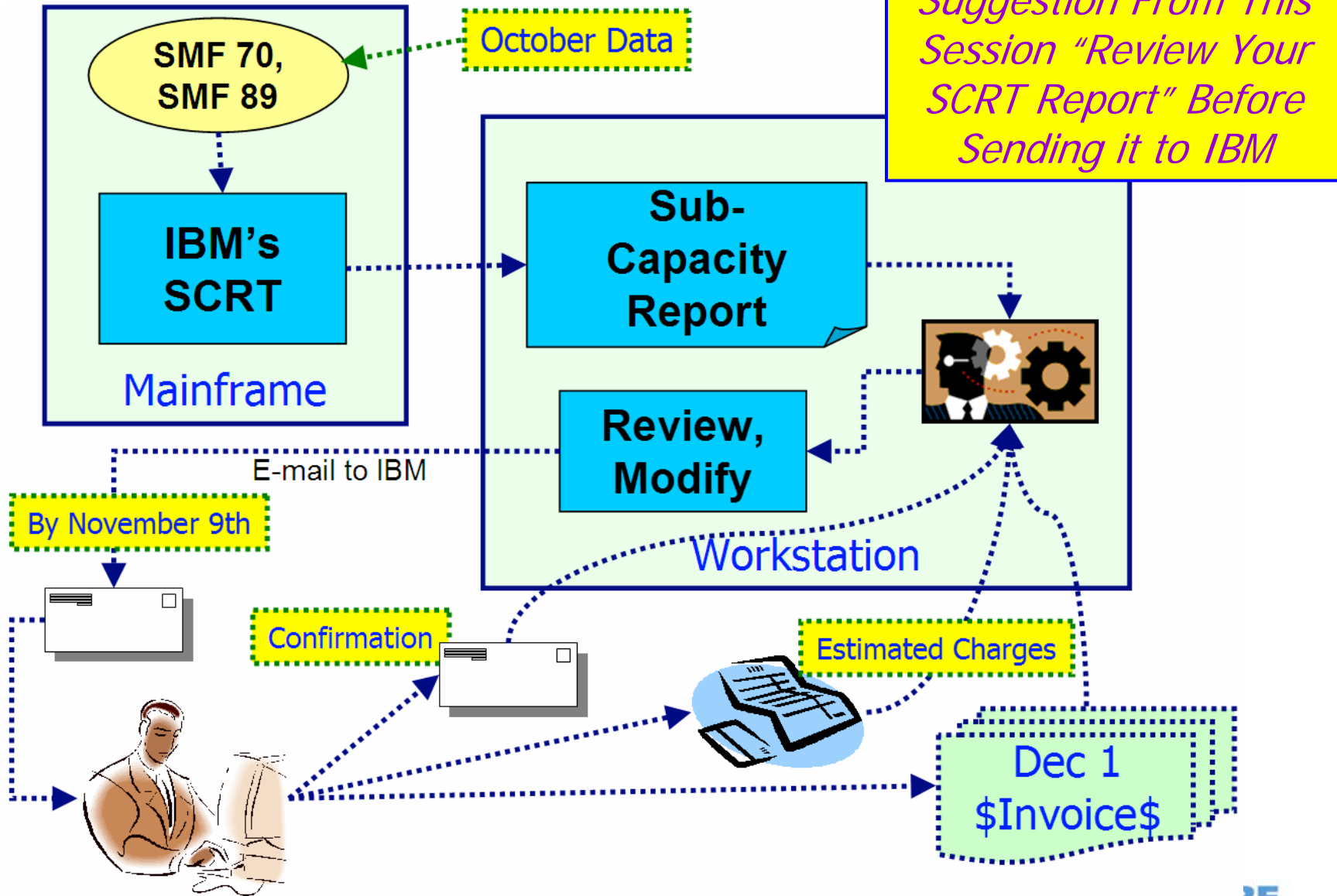
SCRT NO89 Products

- 109 sub-capacity products do not generate SMF89
- SCRT uses NO89 parameters so customers can list the LPARs that execute these products
 - COBOL (not V5) and PL/I compilers, NetView, Workload Scheduler, SYS Auto, Fault Analyzer, Migration Utility, many others
- SCRT assumes these products are running 24x7, so the LPAR's peak 4HRA is used as each product's 4HRA
 - That assumption is good for products like NetView and the Workload Scheduler
 - Not a good assumption for the compilers or many tools

COBOL V5 Generated SMF89

- V5 5655-W32, (US Announcement 213-144) is not a NO89 product
- Customer's have asked for this for years.
- Why COBOL V5? Why Now?
 - I don't know
 - Maybe from session #13662: "How to Take Advantage of the New COBOL V5 Compiler – Migration":
 - More time required to compile
 - *5 to 15 times as much time, depending on OPT level and source program size*
- Will other compilers and products generate SMF89?

SCRT with Time Frames



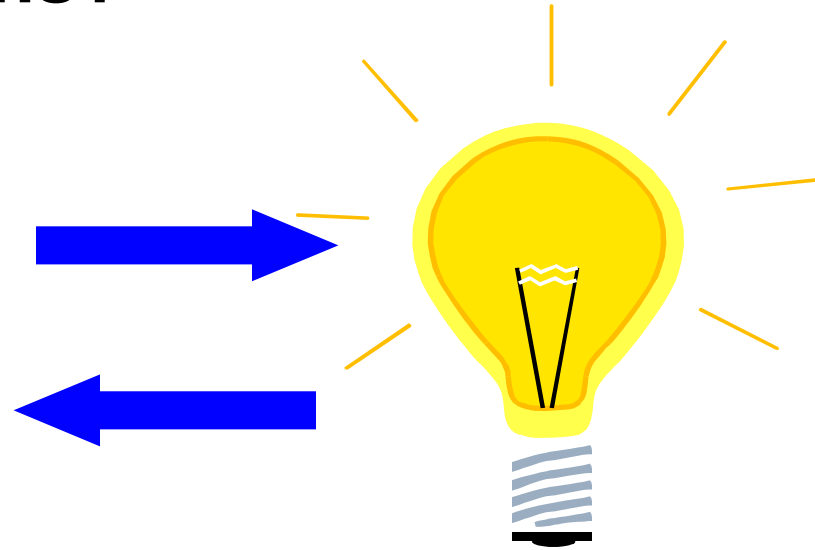
What You Should Look For

- Section C5: % Data Collected Near %100
- Section E5: Unexpected High MSUs or Unexpected Products?
 - Did you have an Unusual Situation?
- Section H5: Near 100% “Report Period Data”?
- Section N5: Highest two MS4HRA as Expected?
- Section P5: Peaks when you Expect Them?
 - Are you paying for off shift peaks or prime shift peaks?
- *Can You Lower Your Billable MSUs?*

What You Should Look For

- Your Team for a Review:
 - System Programmers Understand the LPARs
 - Software Asset Manager
 - Unexpected products and unexpected MSUs
- I recommend:
 - You Audit the SCRT Reports
 - “IBM is our Partner, we don’t need to audit this”
 - ***If IBM is auditing you, why aren’t you auditing IBM?***
 - With the SCRT report IBM will generate your MLC and zIPLA OTC Invoices
 - Audit the invoices also

Discussion, Questions?



Thank You!
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