Session z100832
What is Container Pricing Really All About?
—
Cheryl Watson
cheryl@watsonwalker.com
Watson & Walker

TechU

2018 IBM Systems Technical University

May 2, 2018

Orlando, Florida

IBM

Please note

IBM's latest Software Pricing initiative, Container Pricing, is still in its infancy. The information in this presentation is our best understanding of how Container Pricing works, based on the available documentation and discussions with IBM. However, as with any decision that has financial repercussions, you should verify your assumptions with IBM before making a final decision.

Introduction

Thank you for coming.

Who am I?

- President of Watson & Walker Inc. since 1986

- Working on IBM mainframes since 1965

- We publish Cheryl Watson's Tuning Letter (since 1991)

  o   Now available to subscribers online at www.watsonwalkerpublications.com

- We teach classes, consult, and have three software products: BoxScore, BoxScore II, GoalTender

- Our latest SCRTPro Service Offering processes SCRT reports and helps to control your IBM Software costs

- z/OS evangelists, Subject Matter Experts in Software pricing, Parallel Sysplex, and Workload Manager.

What we are going to talk about today:

- IBM Container Pricing – the big picture, and how to prepare yourself for it.

Feel free to ask questions and make this session as interactive as possible.

Container Pricing

For years, customers have grumbled about mainframe software costs.

And for years, IBM has delivered software pricing options to reduce the cost of a selected subset of your workloads:

- Parallel Sysplex Aggregation (PSLC and ULC)

- Sub-Capacity Pricing

- GSSP (Getting Started with Sub-Capacity Pricing)

- IWP (Integrated Workload Pricing)

- zNALC (z Systems New Application License Charge)

- MWP (Mobile Workload Pricing)

- zCAP (z Systems Collocated Application Pricing

- zWPC (z Systems Workload Pricing for Cloud)

- CMP (Country Multiplex Pricing)

- Many others, including zAAPs and zIIPs

Container Pricing

Despite all the complaining about prices, many customers still don't use the available pricing options

- **Don't understand, or even know about, all the pricing options.**
- The available options are often complex, making it hard to select the *best* option for your environment.
- Don't like the hassle of having to create dedicated LPARs. (e.g. zNALC).
- Too hard to identify which transactions/workloads apply to which pricing option – required information might not even be available in the SMF records. (MWP).
- Too much work on the system to churn through all the SMF records to extract the required information.
- Whole manual process of gathering and formatting the CPU consumption data seems like more hassle than it is worth.

Container Pricing

Container Pricing was previewed as part of the z14 announcement. It is IBM's attempt to:

- **Keep Dev/Test on the mainframe where it is eventually executed in production.**
- **Enable you to add new z/OS workloads without increasing the MLC cost of existing workloads.**
- Address customer complaints that it is difficult, if not impossible, to accurately predict the software cost for proposed new applications – "It depends" doesn't cut it.
- Provide a "cloud-like" software pricing model for customers that desire that.
- Break the connection between how much you pay for software and how you configure your systems.
  - Objective is to let you configure systems and applications in whatever way makes the most *technical* sense.
- Greatly simplify the whole process of identifying qualifying work, gathering and tracking resource consumption, getting that info into SCRT, and sending it back to IBM.
- Enable software bills to be based on metrics other than peak R4HA CPU consumption.

Container Pricing

Some very important points before we get into details about Container Pricing:

- Container Pricing has **NOTHING** to do with Docker Containers!
- Most existing pricing options deliver savings by reducing the number of MSUs that your bill is based on.
- Two of the three currently-announced Container Pricing "Solutions" involve fixed costs for the Solution.
- In some scenarios, the Container Pricing Solution will be the most cost effective (or the most attractive for some other reason). In other scenarios, one of the existing pricing options might be the most cost-effective.
- IBM has not withdrawn the existing pricing options – Container Pricing gives you a *additional* choices.
- In order to select the best option, you *must* understand the basics of software pricing and the Rolling 4 Hour Average.

Container Pricing

There are **two** parts to Container Pricing:

- Set of infrastructure enhancements that will enable simpler and far more flexible software pricing on z:

  - The enhancements are intended to let you add new workloads to a z/OS environment with "no" impact on the MLC cost of the existing z/OS applications.

  - Over the longer term, the enhancements will enable software billing based on many different metrics, not just peak R4HA.

- New pricing options, called 'Solutions', that exploit the infrastructure.

  - Three Solutions are available since December 2017.

  - We will provide an overview here, but go into much more detail in Session z100833 this afternoon (3:15 pm in this room).

Container Pricing

At the time of writing, IBM has announced three Container Pricing based Solutions:

- Application Dev/Test Solution (217-490)

- New Application Solution (217-519)

- Payments Processing Solution (217-518)

There are also rumors that more Solutions are on the way.

Container Pricing

Container Pricing

- ALL of these solutions differ from previous software pricing options because they rely on the Container Pricing enhancements to deduct the R4HA of the container from the CPC's or Multiplex's R4HA.
- The other thing they have in common is that you must submit a request to IBM, describing the workload that you will place in the container. If IBM approves the request, you must retrieve the Solution ID from LMS and use it in the Tenant Resource Group (TRG) definition (for collocated containers) or in the SCRT control statements (for dedicated LPAR containers).
- Other than these two aspects, each solution offering is quite different from the others…

Container Pricing

DevTest Solution

- At the 50,000 foot level, the DevTest solution lets you grow your DevTest workload to up to 3x current size with no increase in your MLC costs (assuming nothing else changes).

Container Pricing

DevTest Solution

- The <u>cost</u> of your DevTest workload:
  - Gives you a <u>fixed MLC price</u> for the container that you use for your Dev and Test workloads.
    - The workloads can be in dedicated LPARs or in shared LPARs.
  - The fixed price is based on the portion of your bill for each MLC product that is attributable to your DevTest workload, averaged over the last 3 months.

Container Pricing

DevTest Solution

- The <u>cost</u> of your other workloads:
  - When determining the R4HA for your other workloads (Production), SCRT deducts the R4HA for the DevTest container from the total R4HA.
  - NOTE: The MSU reduction is based on the R4HA of the DevTest container for each corresponding hour. It is *not* based on the R4HA from the 3-month base period, nor on the peak R4HA for the container.
- The bill for the production part of your workload is based on the adjusted R4HA, after deducting the DevTest R4HA. *Specifically, the fixed price you pay for your DevTest container has nothing to do with the bill for the production workload*.

Container Pricing

DevTest Solution

- The size of your DevTest container:
  - The average of the peak R4HA for the DevTest workload for the 3-month measurement period is deemed to be your base. This is likely to a higher number than the value that is used to set your fixed price.
  - You can grow the DevTest container up to 3X that size for that same fixed price.
  - You don't *have* to go for 3X – you can select any maximum size between 1X and 3X.
  - If the DevTest container will use any IPLA software, you must purchase sufficient Value Units on day 1 to cover the maximum container size.

Container Pricing

See later session for update!

Legend: —DevTest LPARs Activity   —All LPARs Activity

Courtesy Andrew Sica, IBM

Peak R4HA MSUs for month for all LPARs=1100 MSUs

Actual peak MSUs for month of DevTest LPARs=350 MSUs

This is the '1X' number.

100 MSU DevTest contribution during peak
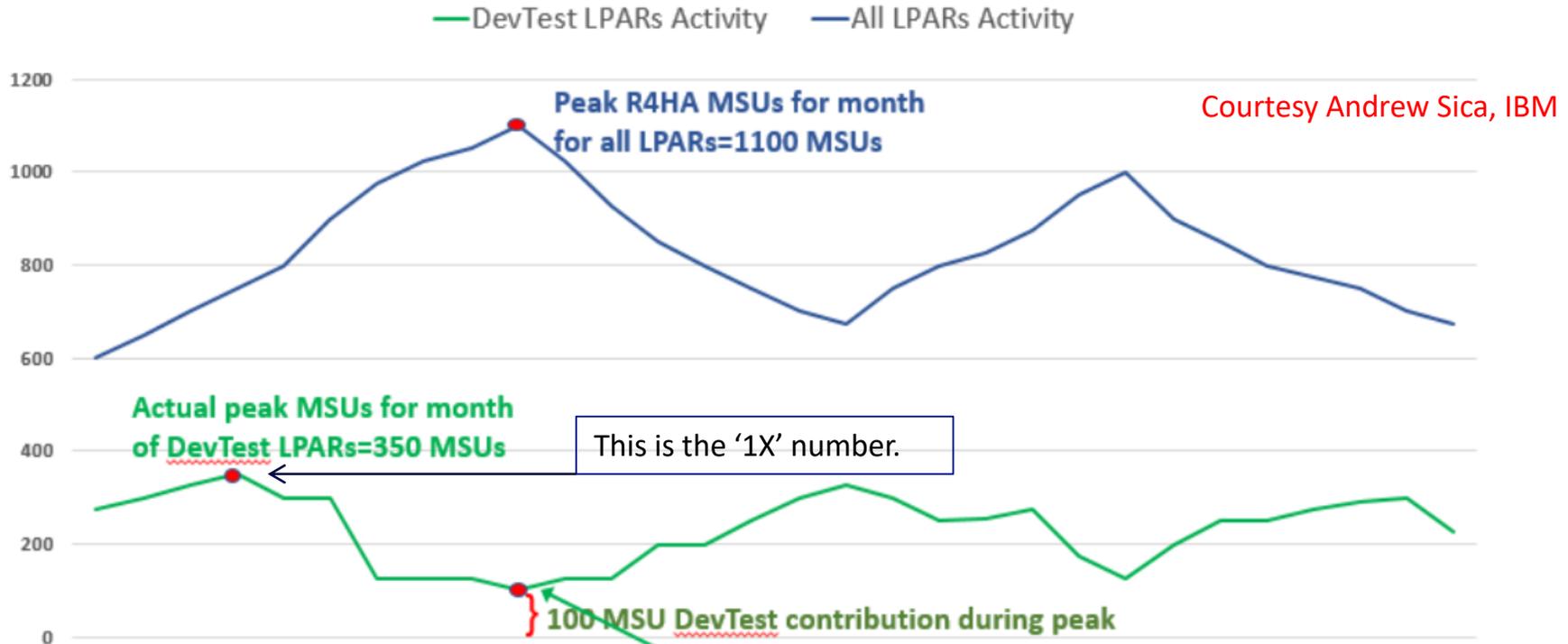
In this example, actual peak for DevTest is seen as 350 MSUs so up to 1050 MSUs permitted at no extra MLC cost (subject to HW MIPs and zIPLA SW coverage being available)

Contribution of DevTest to peak R4HA used for billing. $ value calculated by excluding from SCRT run and calculating delta versus BAU total $ cost based on announcement letter terms – this becomes the MLC $ cost for DevTest workload going forward.

Container Pricing

DevTest Solution

- Based on customer feedback, the DevTest Solution is the one that is attracting the most attention at the moment.
- It is easy to implement, especially if you have dedicated Development and Test LPARs.
- Many installations cap their development LPARs during peak hours, to limit their impact on SW bills. This impacts programmer productivity and reflects poorly on z/OS. This Solution potentially lets you significantly increase the capacity available to Development and Test LPARs without increasing your MLC costs.
- The devil is always in the details, and like all SW pricing options, this one requires careful evaluation to see if it is appropriate for *your* shop.
- See this afternoon's session z100832 at 3:15 pm for more detail.

Container Pricing

New Application Solution:

- This is intended to protect you from the CPU consumption of a new application increasing the costs of your traditional applications.
- Also it provides a fixed price estimate earlier in the process.

Container Pricing

New Application Solution

- The next most popular Solution is the New Application One.
- Like the other Container Pricing Based solutions, this one is intended to protect you from the CPU consumption of a new application increasing the costs of your traditional applications.
  - The R4HA of the container is deducted from the total R4HA, with the intent that the cost of the non-container workload would be roughly the same as it would be if the container workload didn't exist.
- It also addresses the requests of customers for 'line-of-sight pricing' – in other words, they want predictable costs and the ability to know the cost in advance.

Container Pricing

New Application Solution

- This solution also supports both collocated applications and applications running in a dedicated LPAR.
- The fixed cost is based on information you provide about the expected size of the container and the set of products that the application will use.
  - z/OS is priced at a 50% discount on the MzNALC price.
  - All other products used by the application must be IPLA, and Value Units for the full container size must be purchased on Day 1.

What is Collocated?

Example of zCAP or container pricing application that is the first user of CICS in an IMS/DB2 shop (assumes all products have peak R4HA at same time).

Standard LPAR Value = 1000

z/OS	IMS & DB2
1000	1000

Standard LPAR Value = 1100

z/OS	IMS & DB2	CICS
1100	1100	1100

Standard LPAR Value = 1100 z/OS, other programs adjusted

z/OS	IMS & DB2	CICS
1050	1000	100

© Watson & Walker 2017

Example courtesy of David Chase, IBM
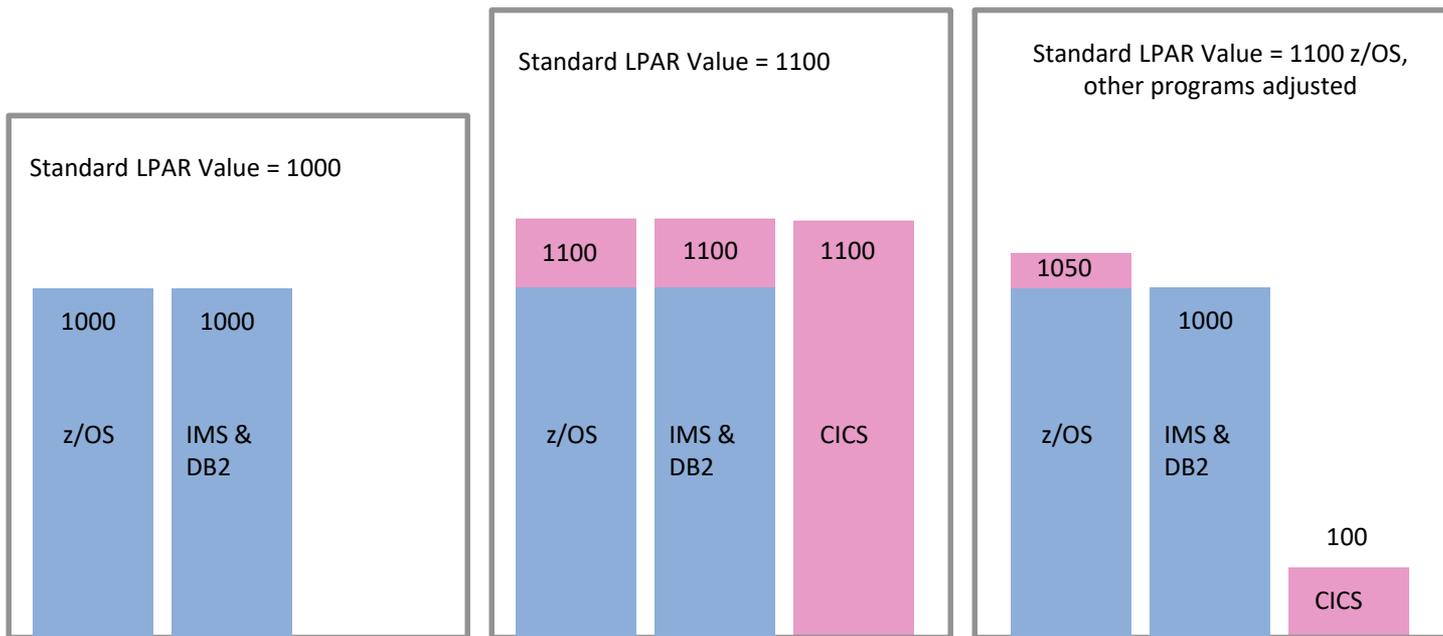
Container Pricing

Payments Processing Solution

- This solution is aimed at a very niche market, so we won't get into all the details.
- *However*, the model that it uses is very interesting as a possible indicator of what IBM has in mind for future offerings.

Container Pricing

Payments Processing Solution:

- Unlike the TestDev or New Application Solutions, this one does not have a fixed price for the container.
- Instead, the cost of the container is based on the number of payments that are processed by Financial Transaction Manager for z/OS, the heart of the offering.
- This provides a direct correlation between the price the customer pays for the container and the business value delivered by the product – if FTM processes more payments, that means more business value and therefore a higher bill. Fewer payments would mean a smaller bill.

Container Pricing

Payments Processing Solution

- This is interesting from a number of perspectives:
- It uses the container pricing infrastructure to measure the R4HA of the container so that the R4HA of all other work can be adjusted accordingly.
- It is supporting two metrics – one metric (# of payments) determines the cost of the container, and a quite different metric (R4HA) is used to ensure that the cost of other workloads is not affected by the presence of the container workload.
- In the future, this concept could be extended to things like transaction counts, TBs read, total CPU time consumed, jobs run, just about anything that can be measured programmatically and audited could be used as the basis for the container bill.

Container Pricing

Now back to the infrastructure. There are a number of objectives:

- Get the *system* to associate work with a pricing option, gather information about the resource consumption of the work and save it to SMF, pass that to SCRT, and have SCRT deduct that capacity from the total R4HA.
- Make it easier to define the qualifying workload to WLM.
- Make it easier to associate a given workload with a particular pricing option.
- Give customers the option to place the application in its own LPAR, *or* in shared LPARs, *or* in both.
- Allow the customer to limit the resource consumption of the new workload.

Container Pricing

How does it achieve these wondrous things?

- IT DEPENDS! (Remember that more flexibility usually results in more complexity).
- If the workload is running in a dedicated LPAR, you simply associate the Solution ID with that LPAR using SCRT control statements.
- IF the workload is collocated with other work (shared LPAR), then you use the new z/OS infrastructure enhancements that have been added for Container Pricing support.
- **NOTE**: Use of the new WLM constructs is ONLY required for collocated applications.

Container Pricing

How does it achieve these wondrous things?

- All the definition, tracking, and gathering for collocated applications is consolidated into WLM – this is becoming the focal point for software pricing controls as well as performance controls.
- Objective is that you define the work *once* in WLM, and everything after that (all the way through to sending the information to IBM) happens with minimal intervention.
- To provide this, WLM (OA52312), SMF (OA53033), RMF (OA52694), SDSF (PI82528), SCRT 25.2 (now a component of z/OS 2.3), and z/OSMF (PI89361 & PI89935) have all been updated to support Container Pricing.

Container Pricing

Tenant Resource Groups (TRGs)

- Tenant Resource Groups (TRG) (think traditional WLM Resource Groups with a few new frills). These are used to track resource usage by qualifying work.
- Even though we are used to using Resource Groups as a way to limit the capacity used by some workload, it is NOT necessary to cap a TRG. It is just a mechanism for tracking the resource consumption of all the work in that TRG.
- When you define a TRG to WLM, you MUST specify a 'Solution ID' that you get from IBM if you want to test this capability or if you have signed a Solution contract. The Solution ID is uniquely associated with a specific Solution in your company. The Solution ID is like a tag that can be used to identify which Solution used how much CPU time.

Container Pricing

Tenant Resource Groups (TRGs)

- While you *can* have multiple TRGs associated with a single Solution, this is not necessary unless you want to use capping and don't want to cap all parts of the Solution.
- The SMF type 70 record has new Tenant Resource Group data sections, 1 per TRG – this information comes from a new IWM4QTNT WLM interface. The new section contains most of the info from the TRG definition, plus SUs for zAAP, zIIP, and GCPs, plus the GCP R4HA MSUs for that TRG.
- RMF PP Reporting on TRGs is based on the existing WLM Resource Groups reporting. The RMF Overview reports have been enhanced to support the new Type 70 fields.

Container Pricing


```
   Tenant-Resource-Group   Notes   Options   Help
---------------------------------------------------------------
                  Create a Tenant Resource Group
Command ===>  _____

Enter or change the following information:

Tenant Resource Group Name   TESTTRG    (required)
Description . . . . . . . . . Test TRG
Tenant ID . . . . . . . . . . _____                   Optional
Tenant Name . . . . . . . . . _____
Solution ID . . . . . . . . .
     _D9F4555-114E99A-2BE9DC541E-4D5664C9-409A-4AA8-9D47-7B017E-10A2DF

Define Capacity: 4    1.   In Service Units (Sysplex Scope)      Optional
                      2.   As Percentage of the LPAR share (System Scope)
                      3.   As a Number of CPs times 100 (System Scope)
                      4.   In accounted workload MSU (Sysplex Scope)
Maximum Capacity . . . . . . . . . . . 30_____
Include Specialty Processor Consumption NO_      (YES or NO)

    Selection List empty. Define a Tenant Resource Group. (IWMAM530)
```

Container Pricing

What is a Container?

- This is purely a pricing construct. It is the set of TRGs and dedicated LPARs that have the same Solution ID.
- It is used mainly in SCRT:
  - For dedicated LPARs, to assign the Solution ID associated with that LPAR.
  - For all Solutions, to assign a name that is a little more user-friendly than the 64-byte Solution ID.
  - In SCRT Report sections that are related to Solutions (SCRT uses the term 'Containers' rather than 'Solutions').

Container Pricing

What is a Container?

- The container is the z/OS representation of the Solution. The combined R4HA of the TRGs AND the dedicated LPAR(s) (where appropriate) in the Container represents the CPU consumption of the workloads in the Solution.
- The Solution will have an agreed size (specified in the contract with IBM). If the Container peak R4HA exceeds that size, additional charges will be applied.
- You can define a cap for each TRG, but there is no way to specify a cap at the container level (assuming that there are multiple TRGs in the container).

Container Pricing

Tenant Report Classes (TRC)

- Traditionally, work is assigned to a WLM Resource Group indirectly – the service class is assigned to the RG, and work is assigned to the Service Class.
- This would not work for Solutions because single address spaces (DB2DBM1, for example) can be shared between your traditional workloads AND by work in the Solution. If you assigned the Service Class to the TRG, you would pick up more work than is qualified.
- To get around this, IBM created Tenant Report Classes (TRCs). A TRC is associated with one, and only one, TRG.
- Work is assigned to the TRC using the WLM classification rules.

Container Pricing

```
 Tenant-Report-Class   Notes   Options   Help
 ------------------------------------------------------------------
                       Create a Tenant Report Class
 Command ===> _____

 Enter or change the following information:

 Tenant Report Class Name . . .  TESTTRC   (Required)
 Description . . . . . . . . . .  Tenant Report Class for testing

 Tenant Resource Group Name . .  TESTTRG   (Required; name or ?)
```

Tenant Report Class MUST be assigned to a TRG

```
 Press EXIT to save your changes or CANCEL to discard them. (IWMAM970)
```

Container Pricing

```
  Subsystem-Type   Xref   Notes   Options   Help
 --------------------------------------------------------------------
                  Modify Rules for the Subsystem Type      Row 1 to 1 of 1
 Command ===> _____    Scroll ===> PAGE

 Subsystem Type . : STC          Fold qualifier names?    Y   (Y or N)
 Description  . . . Started Tasks

 Action codes:     A=After       C=Copy        M=Move       I=Insert rule
                   B=Before      D=Delete row  R=Repeat     IS=Insert Sub-rule
                                                               More ===>
          --------Qualifier--------                  -------Class-------
 Action    Type      Name      Start                  Service     Report
                                        DEFAULTS:
 ____    1 TN        FPKCP1    ____                    SYSSTC      TESTTRC
 ************************** BOTTOM OF DATA **********************************
```

Reuses existing Report Class code in WLM – an address space can't
have both a traditional Report Class AND a Tenant Report Class

```
 Press EXIT to save your changes or CANCEL to discard them. (IWMAM970)
```

Container Pricing Considerations

There is generally no need to create new WLM service classes for the Solution workload

- Remember the RoT to have not > 30 active service class periods in a system.
- We were concerned that potentially having a subset of the work in a service class capped (if you cap the associated TRG) could cause a problem. To avoid potential performance issues, we recommend splitting off a new service class IF you have work that you will assign to a heavily capped TRG.

Container Pricing Considerations

There is generally no need to create new WLM service classes for the Solution workload

- Service classes that are assigned to a traditional WLM Resource Group must not contain work that is assigned to a TRC.
- You can specify an upper limit (cap) for a TRG, but not a minimum limit.
- IBM recommends that you avoid capping a TRG unless it is really necessary.
- At the time of writing, specifying a memory limit for TRGs is not supported. We expect this to be addressed soon.

Container Pricing Considerations

Considerations for TRCs

- Work can only be assigned to a TRC at the address space or independent enclave level.
  - This means that you cannot use shared CICS regions with Solutions.
  - On the other hand, if it is worth going to the trouble to get the application qualified, then it is probably large enough to justify its own region(s).
  - This has the added benefit that *all* of the CICS processing, including the 'overhead' associated with those transactions, is included in the container.

Container Pricing Considerations

Considerations for TRCs

- The following WLM subsystem types can be assigned to a TRC: JES, STC, CB, NETV, LDAP, TCP.
- IBM recommends having a different TRC for each service class that has work in the container.
- Never ever classify heterogeneous work to the same TRC. If you try to do this, WLM will issue a warning message, but you can ignore that and proceed – DON'T!

Container Pricing Considerations

RMF considerations

- TRGs and RGs are reported in the same RMF report, so use Descriptions that make it easier to identify the TRGs…

```
RESOURCE GROUPS
  --NAME--   ----------DESCRIPTION----------   -SYSTEM-   ---CPU CONSUMPTION---     --------CPU CAPACITY---------     ----MEMORY----
                                                          #CPS    MSU  SU/SEC       MIN    MAX    DEFINED AS          USAGE    LIMIT
  BATCHVEL   Velocity and resptime batch work             0.63     71     50K        0    1000K   SU/SEC                         20G
                                                SYSD      0.01      1    472                                          132M
                                                SYSE      0.62     70     49K                                         190M
             ------SERVICE CLASSES   HOTBAT               0.00      0     69
                                     PRDBAT               0.62     70     49K
                                     TSTBAT               0.01      1    783

  REGTSO     Non-priority TSO work                        0.23     27     19K*             3.33   NUMBER OF CPs                    4G
                                                SYSE      0.23     27     19K                                         764M
             ------SERVICE CLASSES   HOTTSO               0.23     27     19K

  TRGCLOUD   Tenant Resource Group for Cloud              0.87    101     71K             500     MSU
                                                SYSD      0.29     34     24K                                         1340K
                                                SYSE      0.58     67     47K                                         6208K
             -------REPORT CLASSES   CLOUD001             0.36     42     29K
                                     CLOUD002             0.51     59     42K
```

Container Pricing Considerations

SCRT Considerations:

- Now that you have everything set up, the information in saved in the new TRG sections of the SMF 70.1 and 89 records, and then processed by SCRT.

- SCRT contains a number of new reports specifically in support of Container Pricing

```
==Q7================================================================
Container Product Grid Snapshot


                                          SYS1      SYS2      SYS4      SYS5
Product Name                   Product ID TGCICS21  TGCICS21  TGCICS21  TGCICS21

z/OS V2                        5650-ZOS     0.60%     0.60%     0.60%     0.60%
CICS TS for z/OS V5            5655-Y04     0.60%     0.60%     0.60%     0.60%
```

- New Q7 section reports on which products were used in which TRGs. This can be used to help you verify that your understanding of which products are being used in each TRG is accurate.

Container Pricing Considerations

SCRT Considerations:

- The T4 report shows the Container Max Contributors for the container shown on the last line – CPS1 in this example.

- This report shows that TRG TGCICS21 was active in 4 LPARs, however it only consumed enough capacity in the SYS1 LPAR to make a contribution to the LPARs R4HA.

```
==T4=========================================================================
CONTAINER MAX CONTRIBUTORS

             TRG          Highest    Date/Time              Contribution to Highest

SYS2         TGCICS21                                                           0
SYS4         TGCICS21                                                           0
SYS1         TGCICS21                                                          14
SYS5         TGCICS21                                                           0

CPS1                      14         25 Sep 2017 - 15:00
```

Container Pricing Considerations

SCRT Considerations:

- The final report shows the total MSUs consumed by each TRG in each LPAR over the reporting period. Note that this is the total, not the peak. None of the currently-announced Solutions charge on total MSU consumption.

```
==T6=============================================================
CONTAINER MSU CONSUMPTION CONTRIBUTORS

CPS1        Z194E15-nnnnnnn-nnnnnnnnnn-nnnnnnnn-nnnn-nnnn-nnnn-nnnnnn-nnnnnn

            TRG                  Contribution to Total Consumed

LPAR1       TRG1                                          26712
LPAR1       TRG2                                          48081
LPAR1       TRG3                                          16027
LPAR2       TRG4                                          29383
LPAR2       TRG5                                          48081
LPAR3       *                                             16027

CPS1                                                     184311
```

Container Pricing Considerations

Resource Group capping

- If you want to cap the Solution, remember that the Container size is based on the Rolling 4-Hour Average, but the Resource Group caps (both traditional Resource Groups and Tenant Resource Groups) are based on rolling 60-second intervals.
  - Even the new type 4 MSU caps are based on these 60-second intervals.

Container Pricing Considerations

Resource Group capping

- Effectively, Resource Group caps behave in a similar way to absolute caps. If you set the Resource Group cap to the same value as the Container size, it is unlikely that the Container R4HA will ever reach the agreed Container size, unless it is CPU bound for a long time.

Container Pricing Considerations

Effects of Collocation

- Even though Container Pricing allows both dedicated and collocated options, there are some things to remember about the collocated option:
  - Adding work to an LPAR *will* generate more work for system components – for example, Master, SMF, XCF, GRS, Catalog, batch scheduler, JES, etc. It is not possible to apportion out the system work caused by the Container workload back to the TRGs.
  - Similarly, while DB2 charges back most of its CPU time to requesters of its services, about 20% remains in DB2. If the DB2 is shared between a new Solution and traditional applications, the subsystem cannot be assigned to a TRG..

Container Pricing Considerations

Effects of Collocation

- Therefore, adding collocated work to an LPAR *will* result in some increase in MSUs for the traditional part of the system.
- Additionally, IBM's guidance is that every 10% increase in physical CPC utilization results in an increase of between 3% and 5% in the CPU consumption of work running in that system. This applies regardless of whether the new workload is collocated or in its own LPAR – it is a result of running more work on the same CPC.

Container Pricing

Summary

- You CAN get started with Container Pricing without making any changes in WLM if the workload will run in dedicated LPARs.
- In parallel with that, it would be a good idea to set up some 'dummy' TRGs, just to get experience with this new capability.
- IBM has provided a set of sample Solution IDs that can be used for testing. For more information about the sample Solution IDs, see https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=ZSL03543USEN&
- Make sure that you use the IGNORE CONTAINER statement to exclude the impact of test Solution IDs before sending the SCRT file to IBM

Container Pricing

Summary

- IBM is putting a lot of time and money into this initiative – this is not just yet another pricing option.
- This is a little like z/OSMF – it will grow in function and pervasiveness over time, so don't ignore it.
- The infrastructure changes are long overdue, but will enable many different pricing models in the future and also make it easier to exploit the available options.
- IBM has not yet removed any of the previously-available pricing options, so you currently have fixed price and variable price options - one of them can very likely save you money.

Container Pricing

Summary

- It is not possible to make a blanket statement about which is the best option – it really does depend on many variables specific to your environment and software stack, so you need to evaluate the options using *your* numbers and projections for the future.
- Attend our z10833 session at 3:15 pm today, here in this room for more information about these options and about Country MultiPlex Pricing.

Container Pricing

For more information about Container Pricing, refer to:

- Announcement letters:

- Container Pricing preview – 117-044.

- Application Development and Test Solution – 217-490.

- New Application Solution – 217-519.

- Payments Processing Solution – 217-518.

- Container Pricing White Paper WP102719.

- List of sample Solution IDs

- SCRT User's Guide

- SHARE in Sacramento Session 22548, *Container Pricing Overview and Sub-Capacity Reporting*, by **Andrew Sica**.

Container Pricing

Summary

We think that about 90% of our clients will be using containers at some point in their future. You can learn it now or learn it later.

Please complete the session survey!

Z100832