CONTAINER PRICING FOR IBM Z

Simplified software pricing for qualified solutions

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1. Introduction

z/OS® is known for its ability to run many concurrent workloads across one or more z/OS images, with very strong availability, reliability and security characteristics. The platform is known for its very large scale transaction processing and its ability to support thousands of users and application programs, all simultaneously accessing system resources, terabytes of information in databases, and with very large-bandwidth communications. IBM Z® servers support the world's leading businesses, including worldwide banks, the world's largest insurers, many of the top US retailers and most of the world's largest airlines.

At the same time, IBM Z software pricing techniques have caused z/OS clients to closely monitor Millions of Service Units (MSU) utilization levels on their systems, especially during prime shifts, since the introduction of new software, or new business usage patterns, can inadvertently cause a significant increase in their IBM software bill. As a result, clients have been hesitant to introduce new z/OS workloads unless they require z/OS-specific environments, such as CICS or IMS transaction processing, a DB2 database, or MQ Series for communication.

z/OS and many of IBM's z/OS software products are priced based on the peak rolling four-hour average, as measured in MSUs, not an individual software product's contribution. In particular, sub-capacity pricing is used to determine operating system and middleware price based on a portion of the capacity consumed by that CPU. The monthly peak rolling four-hour average metric is measured by the Workload Manager (WLM). The Sub-Capacity Reporting Tool (SCRT) tool collects the CPU utilization data, recorded in SMF records, and reports sub-capacity metrics used for pricing purposes. Subsequently, the introduction of a new business application that results in greater MSU utilization during the four hour peak, or causes the creation of a new four-hour peak, can increase the cost of all software products that are running during that period, including IBM middleware and applicable applications, and ISV products.

As technology evolved, new pricing models were introduced as a means to adjust the Z software pricing in ways that allow IBM's new technology to remain competitive[1]. However, the long-term impact of these complex models has caused IBM clients to take actions regarding their software deployment choices that they might not otherwise take.

Container Pricing for IBM Z provides simplified software pricing for qualified solutions, combining flexible deployment options with competitive economics that are directly relevant to those solutions. **This new approach allows IBM-approved solution workloads running on z13 and z14 to scale from collocated solutions within existing LPARs, through to separate LPARs, up to multiple LPAR solutions, without directly impacting the cost of unrelated workloads!**

Specifically, the following solutions benefit from Container Pricing:

- Application Development and Test Solution – highly competitive stand-alone pricing for z/OS based development and test workloads. The workloads may consist of one or more stand-alone LPARs, or collocated with existing workloads.
- New Application Solution – allows clients to add new approved z/OS workloads, such as CICS TS or WebSphere applications, that are not currently running on any Z platform server. Solutions may be collocated with existing workloads, without directly impacting the R4HA, or may maintain an LPAR scope.
- Payments Pricing Solution – a new "per payment" price metric that is tied directly to

[1] Information on many of the pricing approaches may be found at https://www.ibm.com/systems/z/resources/swprice/.

payment volumes, with collocated software and separate LPAR software-hardware versions, based on IBM Financial Transaction Manager (FTM) software. This new offering directly ties operational cost to business value by basing the price on the number of payments process, rather than capacity used to process them.

This whitepaper describes the technical foundation that is used to deliver software solutions via Container Pricing for IBM Z, hereafter called Container Pricing.

2. Technical Highlights

Container Pricing is intended to greatly simplify software pricing for qualified collocated solutions within existing LPARs, through to separate LPARs, up to multiple-LPAR solutions. Ultimately, IBM will support clients' flexible deployment options that support the best technical fit. Container pricing then allows the specified workload to be separately priced based on a variety of metrics. With exploitation of the framework, new approved z/OS solution workloads can be deployed collocated with other sub-capacity products (like DB2, IMS, CICS, MQ and z/OS) with no direct impact on cost of existing workloads.

For collocated workloads, z/OS Workload Manager (WLM) enables Container Pricing using the tenant resource group, which describes the solution workload in terms of its address spaces and independent enclaves. The tenant resource group, combined with a solution ID, represents the IBM-approved solution. The system automatically records data about the tenant resource group. The tenant resource group also allows the workload to be metered and optionally capped, independent of other workloads that are running collocated in the LPAR, while mapping workloads directly to Container Pricing.

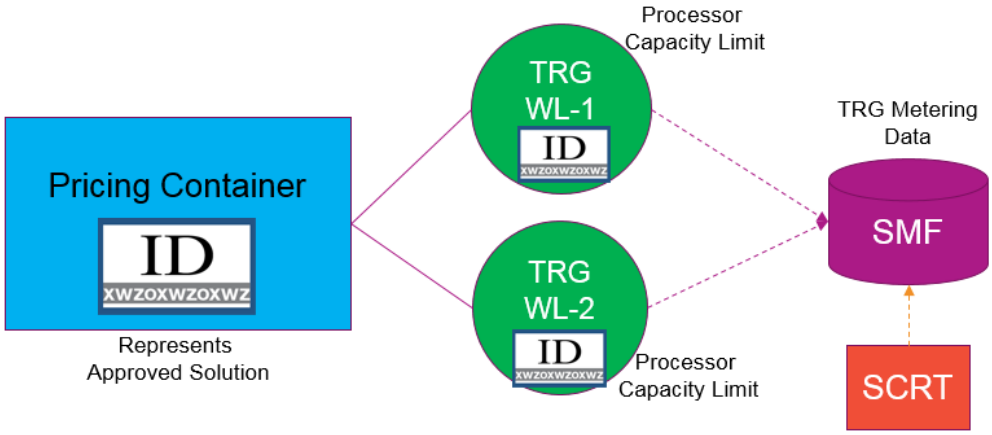


Figure 1: Approved solution ID representing two tenant resource groups (workloads), each with a separately-specified CPU "cap" and metering data available in SMF.

MSU utilization of the defined workload is recorded by z/OS (WLM and the Resource Measurement Facility, RMF) and interpreted by SCRT to remove the solution's MSU capacity from the LPAR rolling four-hour average, as represented in SCRT's report. The solution can then be priced independently, based on MSUs that are consumed by the workload, or based on a business value metric (such as number of payments).

For Container pricing dedicated to one or more LPARs, Tenant Resource Groups are not involved, since an LPAR that is part of a container does not contribute to any product sub-capacity values. Instead, information indicating that the LPAR is part of a Container is provided via an SCRT command. When defining a Container Solution at the LPAR level, definition of

Tenant Resource Groups for the same set of LPARs is not supported. Prior to the availability of this technology, a decision to host new workloads on z/OS often forced undesirable technical changes to the client's business processing, such as requiring a separate LPAR for Solution Editions, or requiring the use of Value Unit Edition products, all requiring systems management impacts to the client's IT environment. The New Application Solution will be the strategic replacement for the current zCAP[2] and IWP[3] priced offerings, which have burdensome monthly reporting requirements for clients to implement to add new workloads without impacting their monthly license charges (MLC).

Container Pricing for IBM Z eliminates the need to deploy new workloads in specific configurations for pricing purposes. With some up-front configuration steps, new solution workloads can be deployed without directly impacting the rolling 4 hour average of collocated workloads, with the system handling previously burdensome tasks. Solutions can be hosted collocated on the same LPAR as existing workloads, on a separate LPAR, or across multiple LPARs, as required by the client's business.

3. The Container Pricing Framework

IBM's goal for Container Pricing is that a system programmer can deploy a new solution workload on z/OS where it makes sense for the client's business. The solution is designed to run co-located in an existing LPAR without direct impact to the rolling four-hour average billing for existing workloads, or on a separate LPAR or across multiple LPARs. While a significant portion of this approach focuses on collocated workloads, the common link among any approved solution is the solution ID, which ties the system environment to the sales contract.

- Container Pricing enables the following capabilities:
  A new solution may be defined as being collocated with other solutions in existing z/OS images (LPARs), in separate LPARs or multiple LPARs (like a Parallel Sysplex or other configuration)
- The collocated solution has no direct impact to the rolling four-hour average. Therefore introduction of a new workload in the same production system has minimal or no impact on the pricing of existing workloads.
- The collocated solution can be measured and its MSU utilization optionally capped, independent of other workloads.
- The system records data about the collocated solution for accounting (SCRT reporting) purposes. SCRT analyzes the recorded data and produces a report for consumption by fulfillment systems, removing the workload's MSU utilization from the rolling four-hour average.

3.1 An illustration of collocated Container Pricing

The following scenario highlights how Container Pricing helps the solution architect and system programmer, by improving deployment decisions on IBM Z servers. While the steps may not

[2] zCAP: z Systems Collocated Application Pricing for z/OS, https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&supplier=897&letternum=ENUS215-174
[3] IWP: Integrated Workload Pricing, https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&supplier=897&letternum=ENUS211-011

completely represent your IT environment, the flow is consistent at a high level based on client interviews.

Step 1: Once a solution is agreed upon with the client, with an agreed price, IBM Sales initiates a sales order, which triggers the creation of a solution ID. The IBM-provided solution ID is a 64-character string representing an approved workload with an entitled MSU capacity in the form of a full-cap pricing container used for billing purposes. For example, the client purchases a utility solution with an initial estimated "size" of 100 MSUs. The solution ID correlates to the IBM sales contract with the actual solution workload(s) and purchased capacity is used for billing purposes.

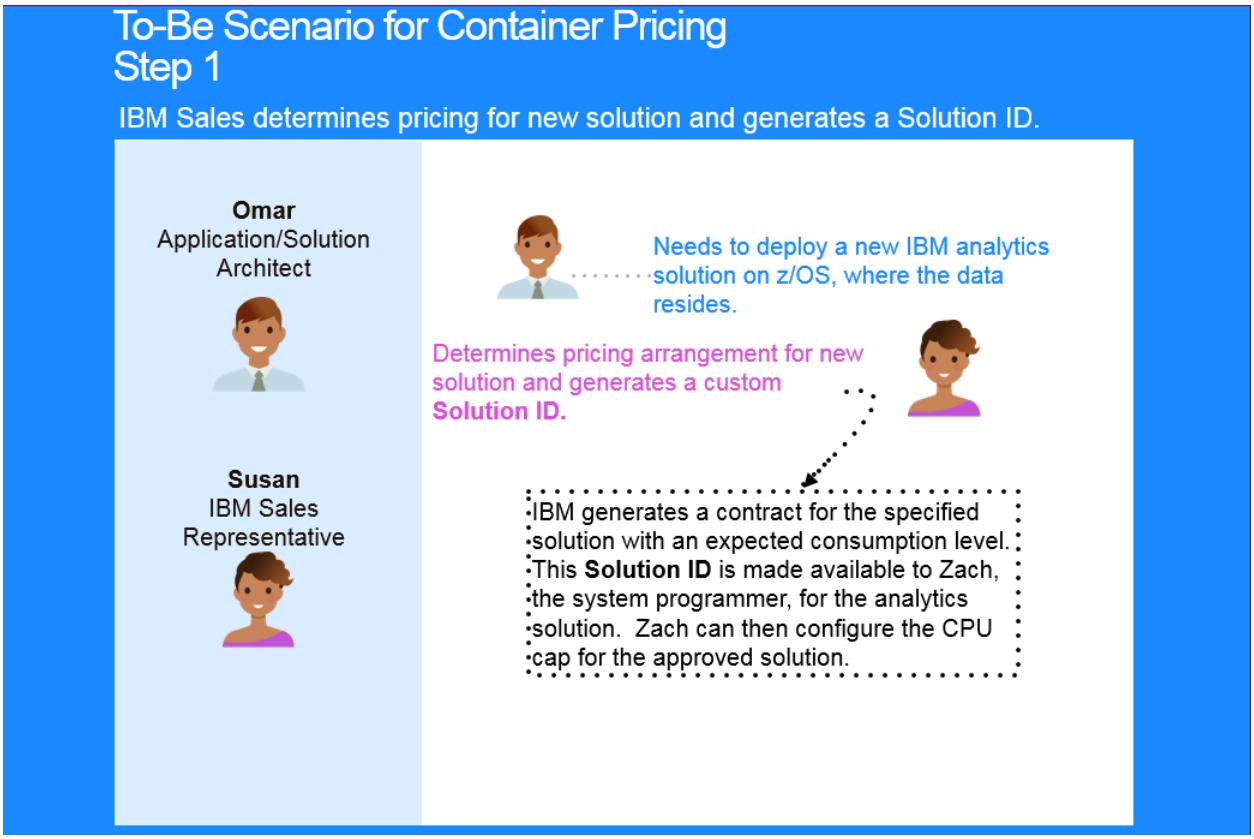


Figure 2: Step 1: IBM sales recommends new solution and generates a Solution ID.

The solution ID is assigned by the IBM License Management Support (LMS)[4] when the sales order is approved. The LMS portal assists the system programmer in submitting SCRT reports to IBM, and now displays solution IDs for each approved software solution based on customer ID. The system programmer can login to the LMS system and obtain the solution ID (such as with copy and paste or email) when creating the tenant resource group(s) for the approved solution.

Step 2: The system programmer creates tenant resource groups in the WLM service definition, using the ISPF WLM administrative application, or the z/OSMF WLM task, to identify the WLM-classified workloads that constitute the approved solution workload. The tenant resource group

[4] License Management Support login, https://www-304.ibm.com/software/lms/OpenServlet.wss

also supports metering and optional capping of the workload's MSU utilization.

When defining the tenant resource group for Container Pricing purposes, the system programmer must also include the 64-character solution ID that was obtained in the prior step, from the LMS web site. That is the link between the approved workload and SCRT's evaluation, and exclusion from the R4HA.

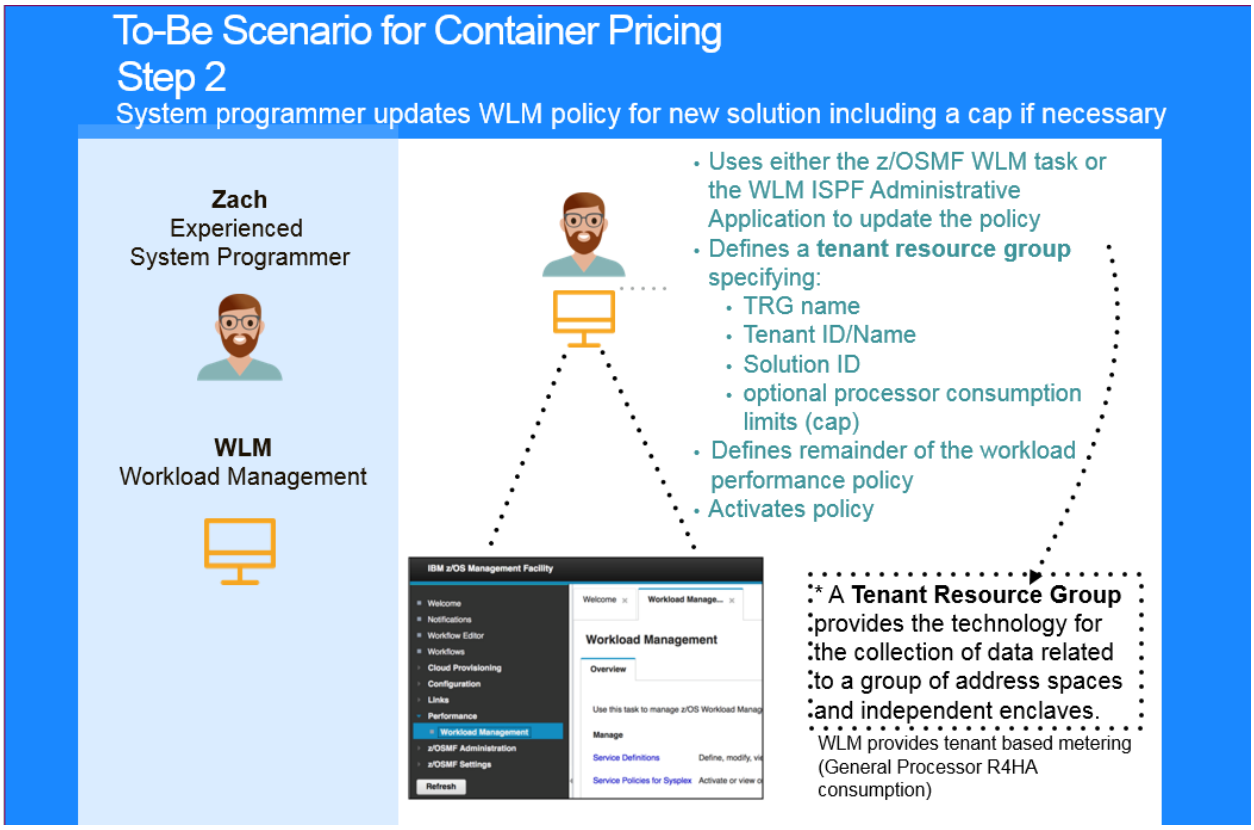


Figure 3: Step 2: System Programmer updates WLM service definition to describe the solution as a tenant resource group.

One or more tenant resource groups can be set up to represent a container-priced solution. For example, if the approved workload consists of 3 products, each product can be (but not required to be) described by a tenant resource group, for convenience, with the same solution ID specified for each group so that SCRT ties them together to represent the combined approved solution.

Step 3: As depicted in Figure 4, when the WLM service definition is activated with tenant resource group definitions and the solution executes, WLM records data related to the workload. RMF then writes each tenant resource group's consumption data to SMF Type 70, Subtype 1 records on its next recording interval. The SMF data may also be used by the z/OS system programmer or performance analyst to monitor workload resource usage, and may be used for other metering purposes such as chargeback related to the specific workload. SMF records written by RMF contain the tenant resource group reference, tying the processing back to the solution ID for SCRT's processing.

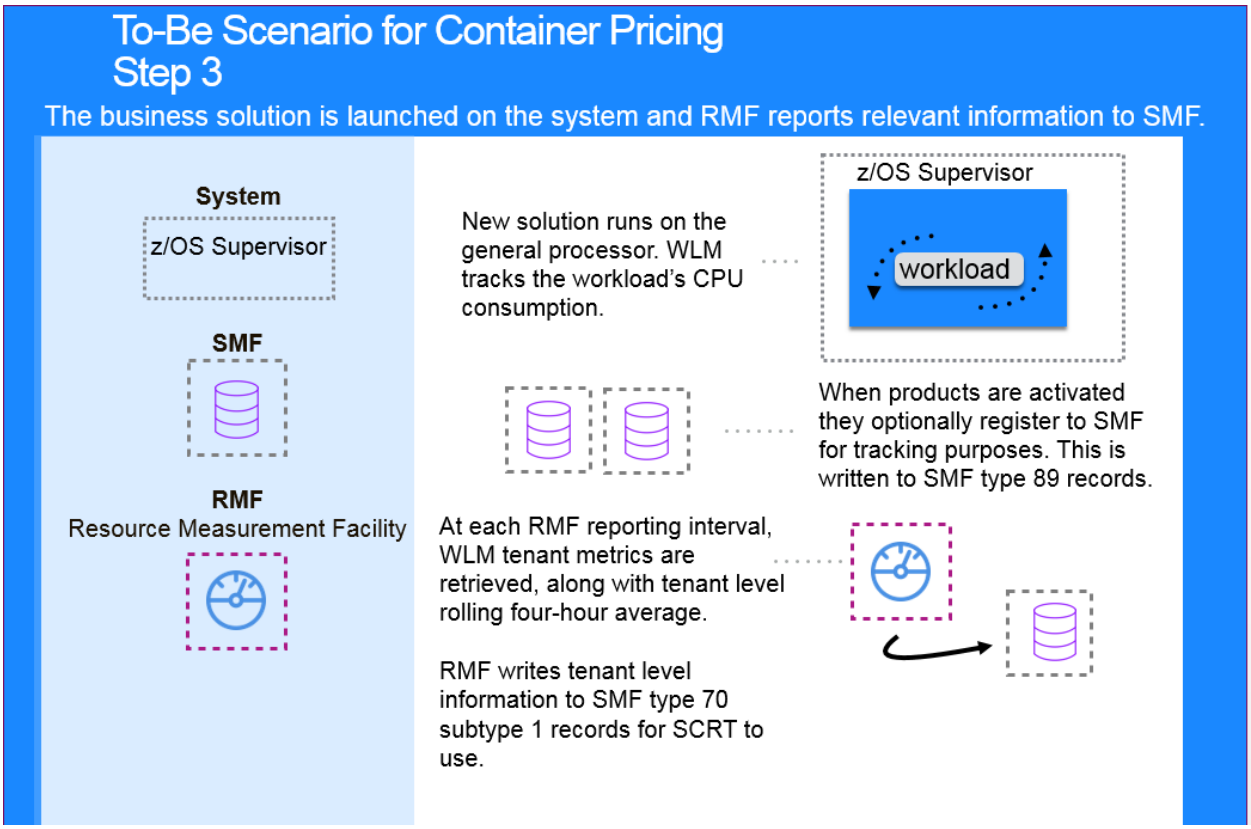


Figure 4: Step 3: New business solution is launched and RMF reports data about the tenant resource group to SMF records.

SCRT's report contains the solution ID for IBM back-office processing to correlate back to the approved workload. In addition, as a result of subsystem use of SMF APIs (IFAUSAGE, IFAEDREG), data is captured in SMF 89 Subtype 1 and 2 respectively, with data related to which products are executing in tenant resource groups, and other identifying information. The example in Figure 4 shows the type of information recorded to SMF data on behalf of CICS regions and other information.

The system programmer can instruct WLM to limit ("cap") processor consumption related to that workload, specified in the tenant resource group policy, independent of the solution contract. Similarly, the cap can be removed (or not specified), allowing processor consumption for that workload to continue unrestrained based on expected workload consumption, without the workload behavior modification that occurs when a CPU cap is reached. The tenant's measurement data is also reported by RMF on a tenant resource group basis.

Note that Container Pricing is different from Mobile Pricing Support (MWP), where MWP allows the system programmer to identify a specific workload based on a wide range of WLM classification work qualifiers (for example, job, transaction, subsystem instance, and so on). The classification allows the client to define a workload based on the type of workload being processed. Container Pricing is oriented toward the collection of address spaces and independent enclaves, and does not support sub-address space filtering at this time.

Many IBM subsystems and sub-capacity products record their own CPU usage directly to SMF, using IFAUSAGE or IFAEDREG. That CPU usage is written as SMF Type 89 Subtypes 1 and 2 records, respectively. In both Type 70 and Type 89 records, data is written in tenant resource group segments, defining the relevant data for each group.

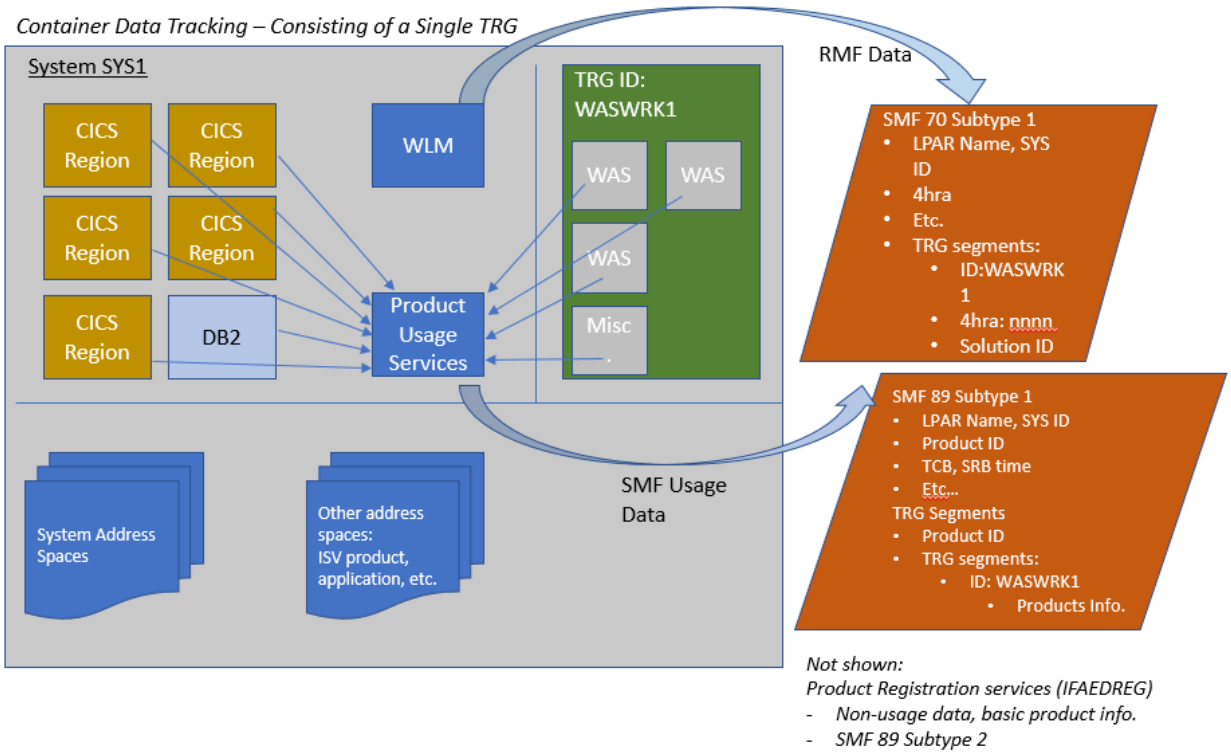


Figure 5: Container Pricing data recorded on behalf of tenant resource groups.

In summary, a container represents a solution workload described by one or more tenant resource groups, each with a solution ID specified. The tenant resource groups define the address spaces and independent enclaves making up the solution with the full set of allowable WLM classifications listed in Section 4.2. More information about setting up tenant resource groups and tenant report classes can be found in Section 4.1.

Step 4: When SCRT is invoked later by the client, it reads the tenant resource group data in SMF 70 and 89 records and reports MSU utilization for each Container in the SCRT report, which includes the solution ID for all defined solutions. Once the system programmer forwards the SCRT report to IBM, the solution ID is used by IBM's billing process to correlate the workload with the entitled Container Pricing(s) for that client, validates the workload and its entitled capacity, and handles software billing based on the report.

Contractually, z/OS clients run the SCRT job monthly to prepare a report of CPU consumed on behalf of workloads run on the system. CPU resource that is reported for the address spaces and independent enclaves that are defined to Container Pricing are subtracted by SCRT from the LPAR rolling four-hour average reported for billing purposes. This allows new workloads to be deployed to existing z/OS systems, and collocated with existing workloads, without impacting the monthly license charges that are associated with z/OS and other middleware running on the same system.

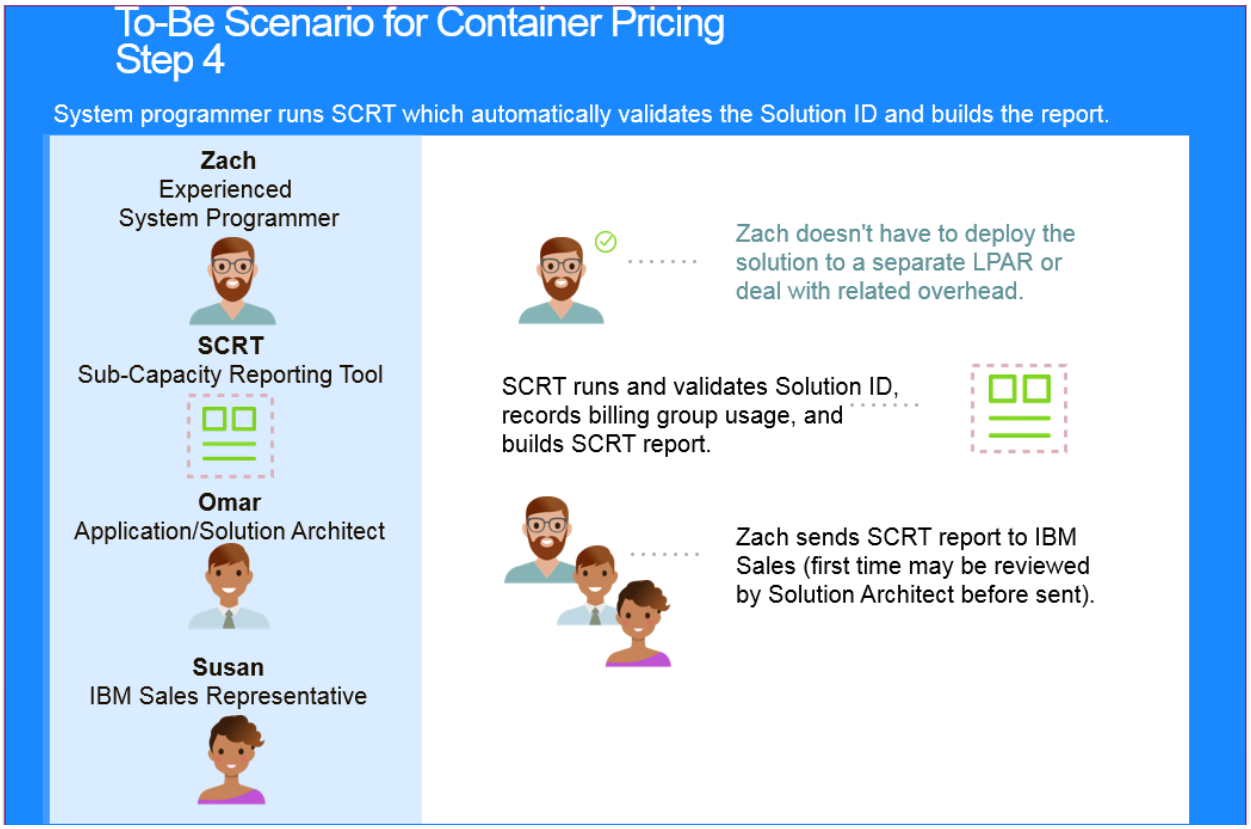


Figure 6. Step 4: System Programmer runs SCRT, which obtains the relevant SMF data and builds the report.

4. Additional Collocated Container Pricing details

The next sections further describe the major elements of Container Pricing for collocated solutions. The technology greatly improves IBM's ability to price and deliver growth solution workloads, and addresses the key client pain points identified above.

4.1 Tenant resource group details

The tenant resource group is defined as part of the WLM service definition, specified using the ISPF WLM administrative application, or the z/OSMF WLM task. Tenant resource groups are defined with a name, description and (optionally) a maximum amount of processor consumption (or cap) for the specified workload. They have sysplex scope, with support for up to 32 tenant resource groups across the sysplex. The system programmer defines one or more tenant *report classes*, which define one or more report classes for tenant resource groups. Tenant *report classes* are similar to standard report classes in that you can configure the information you'd like to see reported on behalf of the associated tenant resource groups and associate classification rules describing address spaces or enclaves via classification rules.

The following information describes a tenant resource group:

Tenant Name	8 characters (maximum)	This name has Sysplex scope. There must not be a tenant resource group with a name equal to the name of a legacy resource group

Tenant ID	8 characters	This ID has Sysplex scope. Note that there may be multiple tenant resource groups with the same Tenant ID.
Tenant Description	32 characters (max)	Description
Solution ID	64 characters	Used to validate and control Container Pricing usage. The ID must not contain the “underscore” character. The solution ID is discussed further in the next section.

WLM tracks the CPU consumed on behalf of the specified workload. During an RMF reporting interval, RMF retrieves the WLM service definition and tenant-level data and writes the data to SMF Type 70, Subtype1 records, making it available to the SCRT utility later in the month.

If the tenant resource group has no solution ID, the group is managed as a z/OS “tenant” with capping and metering capabilities, but with no connection to container pricing. **In other words, the tenant resource group workload’s CPU is not removed from the rolling 4-hour average when not associated with a solution ID.**

In addition, the following rules apply to the definition of tenant resource groups:

- Tenant resource groups must not be linked with service classes that are associated with a legacy resource group. In other words, no unit of work will be subject to capping by BOTH a resource group and a tenant resource group.
- Tenant resource groups can be used to implement processor capping. Maximum limits can be specified but are not required. A minimum limit for processor consumption cannot be specified.
- The (optional) tenant resource group upper processor consumption limit (cap) is a user-defined consumption limit, limiting the processor capacity that may be consumed by the address spaces defined to the tenant resource group. A cap is not required, but may be specified using any of the 4 variants listed below:
    - SU/sec (Sysplex-wide)
    - % LPAR share (weight) of general purpose processors.
    - Fractional number of logical general purpose processors. The value range is 0 to 999999
    - MSU/h. These are NOT R4HA MSUs. The scope of the limit is at sysplex level.
- A maximum of 32 tenant resource groups may be defined within a Sysplex.

A cautionary note about introducing new CPU capacity

As you add capacity for your tenant resource groups, there is no legacy capability to prevent existing workloads from that using that new capacity. Should that happen, the addition of capacity might indirectly increase the LPAR rolling four hour average, even if 100% of the new workload’s CPU is removed from it.

4.2 Supported WLM classifications for Pricing Container Tenant Resource Groups

The following table lists WLM subsystem classifications that are supported for Container Pricing. The "work descriptions" are based on the topic "Defining classification rules" in *z/OS MVS Planning: Workload Management*. Planning: Workload Management section on Defining classification rules.[5]

Supported classifications

Subsystem Type	Work Description	Enclave, address space
JES (jobs)	The work requests include all jobs that JES2 or JES3 initiates.	Address Space
STC (Started Tasks)	The work requests include all work initiated by the START and MOUNT commands. STC also includes system component address spaces such as the TRACE and PC/AUTH address spaces.	Address Space
LDAP	The work requests include all work processed by the z/OS® LDAP server	Enclave
TCP	The work requests include work processed by the z/OS Communications Server (FTP)	Enclave
CB	The work requests include all WebSphere Application Server client object method requests.	Enclave

4.3 SCRT Details

Many of IBM's z/OS software products are priced based on a portion of LPAR CPU capacity, as measured in MSUs. In particular, sub-capacity pricing is used to determine operating system and middleware price based on a portion of the capacity consumed by that CPU. The metric generally used is based on the monthly peak of the rolling four-hour average as measured by WLM. The Sub-Capacity Reporting Tool (SCRT) consumes the CPU utilization data, recorded in SMF Type 70 records, and reports sub-capacity metrics used for pricing purposes.

SCRT post-processes the SMF Type 70 data recorded by RMF and implements workload usage adjustments for all workloads running in z/OS. SCRT determines the highest peak value for a rolling four-hour average, as derived from SMF data. SCRT's output content depends on whether the report is standard sub-capacity or Country Multiplex.

Figure 7: The SCRT batch job requires JCL to be set up to describe special product considerations and location of the LPAR's SMF data. When executed, SCRT analyzes the SMF data, determines the R4HA for sub-capacity pricing, and by Container Pricing.

[5] This information is based on the complete list in the MVS Planning: Workload Management book, https://www.ibm.com/support/knowledgecenter/en/SSLTBW_2.1.0/com.ibm.zos.v2r1.ieaw100/ieaw10061.htm .

In the case of standard sub-capacity, it is a single CPC. In the case of Country Multiplex Pricing, it is all of the customer's eligible machines in a given county. The report summarizes all of the products running in the LPARs hosted on the single CPC and reports on processor consumption. The SCRT report is then forwarded by the client to IBM for validation and billing purposes.

The report also provides information for use by the client, like contributors to peak hours. A number of ISV products also consume the SCRT report to provide advice to clients on how to best schedule their work to minimize license costs.

SCRT is invoked as a batch job with JCL keywords that refer to parameters like the report output location, report period, input SMF files, as well as a number of special report types. A Windows user interface is also available. The resulting SCRT report is organized like a spreadsheet with product summaries, LPAR collection reports, MSU contribution by product and LPAR and maximum contributors.

SCRT also supports Country Multiplex Reporting, which directs SCRT to report on multiple machines rather than a single CPC. This makes reporting easier for workloads that are regularly moved between machines. SCRT generates a Multiplex report providing sub-capacity program utilization peaks across all machines in the Multiplex simultaneously, as opposed to separate peaks by machine, which is how SCRT evaluates processor consumption in a non-Multiplex environment.

Specifying required Container Pricing information

As mentioned in Step 1 in section 3.1, the solution ID is assigned by the IBM License Management Support (LMS)[6] when the sales order is approved. The system programmer logs into the LMS portal and clicks on Container Pricing Solutions to display the solution IDs for each approved software solution, based on the customer ID. Two important fields are provided for each product:

- 64-character Solution ID, which may be copied to the WLM TRG configuration, defining the “container”
- SCRT JCL command, which starts with “UPDATE CONTAINER”

For **all** Container Pricing solutions (collocated or dedicated LPAR), you must copy the “UPDATE CONTAINER” command string to the SCRT JCL as the SPECIAL DD statement. An example of this command string is:

```
UPDATE CONTAINER,ID=solutionID,SET_NAME="Input solution name"
```

For Container Pricing associated with dedicated LPARs, the solution ID and associated LPAR name must be provided through a new SCRT command, CONTAINER.

For example,

```
CONTAINER CPC=tttt-sssss,IMAGE_ID=imageId,ID=xxx_xxx
```

Where IMAGE_ID is the LPAR name, and ID is the 64-character solution ID.

As indicated earlier, when defining a Container Solution at the LPAR level, definition of Tenant

[6] License Management Support login, https://www-304.ibm.com/software/lms/OpenServlet.wss

Resource Groups for the same set of LPARs is not supported.

4.4 RMF

IBM z/OS Resource Measurement Facility (RMF) is IBM's product for z/OS performance measurement and management. RMF also allows you to optimally tune and configure your system according to your business needs.

In comparison, the RMF component of z/OS interprets WLM data related to CPU consumption for all work running on the system, and records that data to SMF Type 70 and 72 records. This allows the information to be accessed later for reporting and comparisons, client chargeback purposes and used by SCRT to build a report of data for sub-capacity billing purposes. Part of +Group, to enforce the capping and the protection algorithms across all systems.

The RMF *product* provides a full complement of reports used typically by a performance analysis. The data includes CPU activity, workload processing and various types of processor and operating system delays related to WLM service classes, report classes and resource groups, as well as resource group capping, address space queues, storage delays, and other data points.

5. Summary

Container Pricing for IBM Z provides simplified software pricing for qualified solutions. With minimal up-front setup, this approach allows IBM-approved solution workloads to scale from collocated solutions within existing LPARs, though to separate LPARs, up to multiple LPAR solutions, without directly impacting the cost of unrelated workloads. Container Pricing allows you to deploy new workloads where you want to for business reasons, and eliminates the need to deploy new workloads in specific configurations, solely for pricing purposes.

Appendix: Configuring Tenant Resource Groups for Container Pricing, using the ISPF WLM Administrative Application

When defining Tenant Resource Groups using the ISPF WLM Administrative Application, a sequence of configuration steps is required to define the appropriate elements and link them together as a WLM service definition. Once the configuration has been confirmed, activation of the policy changes can be scheduled for a convenient change window.

The following example uses the IDAA CDC replication server as an example to show the steps required to definewith example screen images.

Step 1: Ensure you have an IBM solution contract with a Solution ID.

1. Login to the IBM License Management System (LMS), https://www-304.ibm.com/software/lms/OpenServlet.wss

2. Obtain the Solution ID for the product being configured from the LMS Solution ID display.

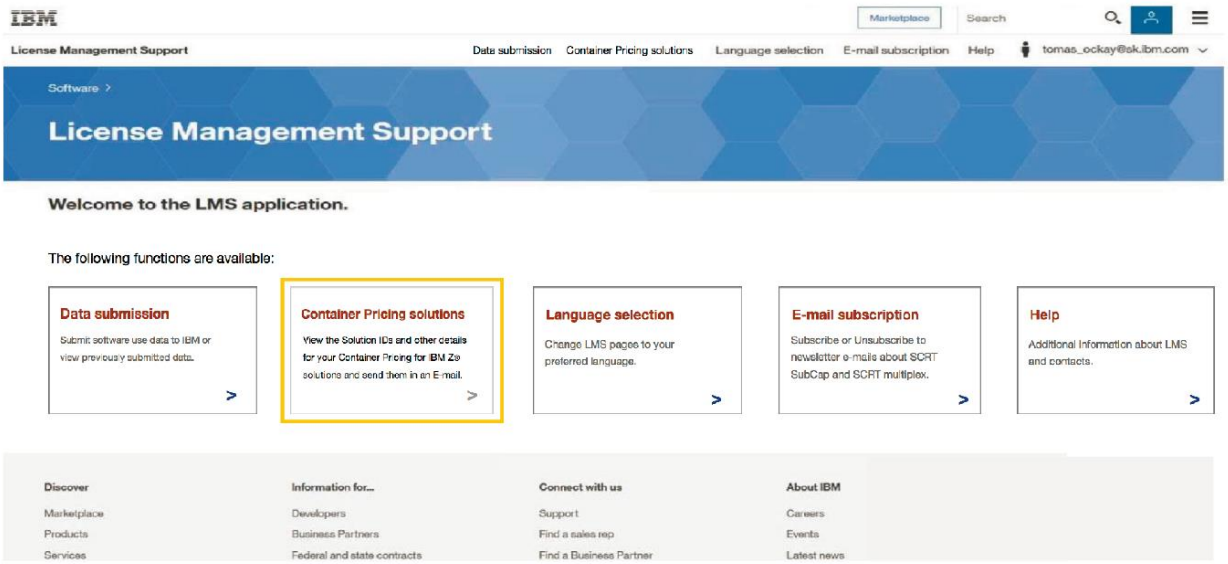


Figure 8: License Management Support, for Container Pricing Solutions

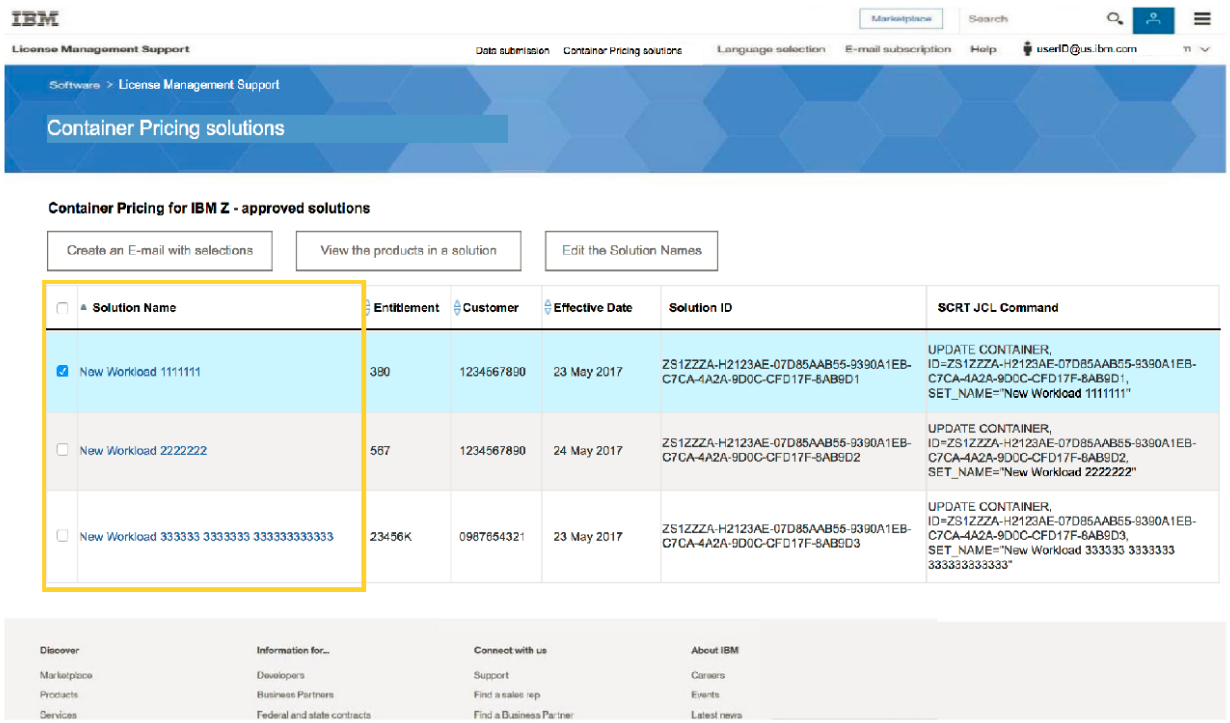
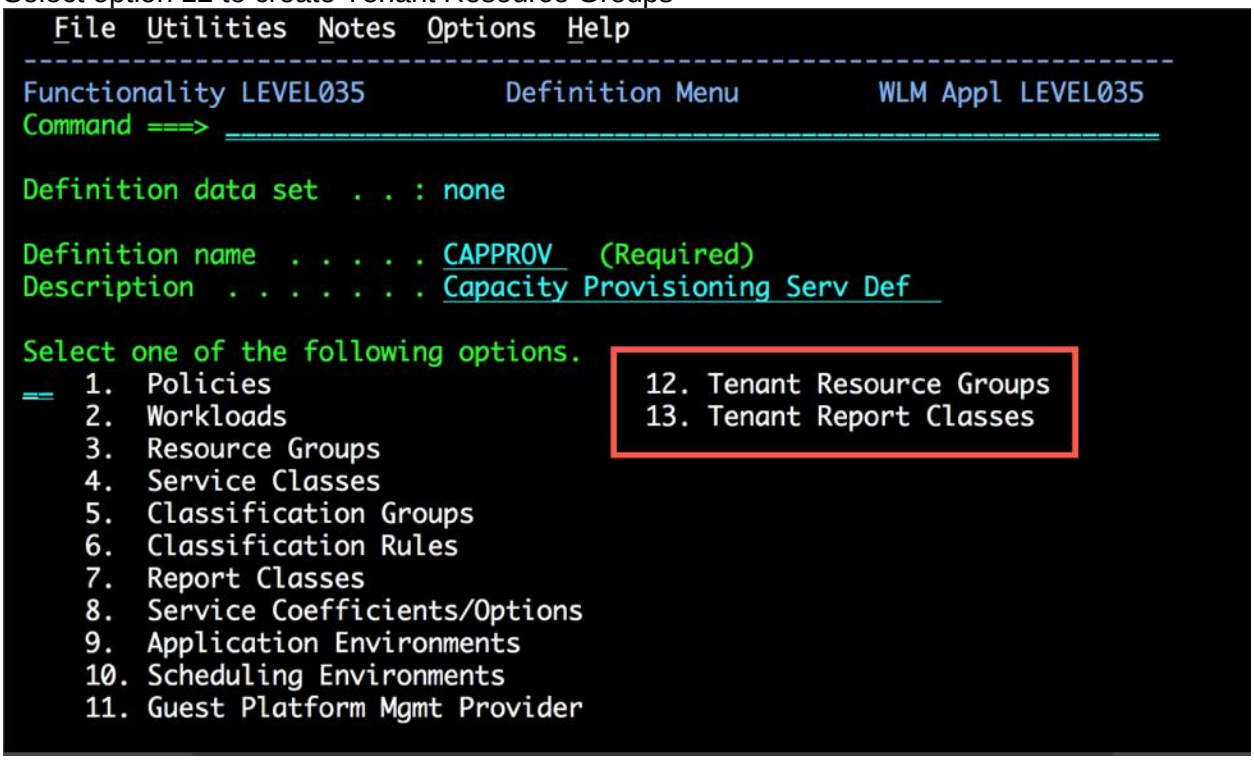


Figure 9: License Management Support - View your Container Pricing solution, and get the solution ID you will need to complete the tenant resource group setup.

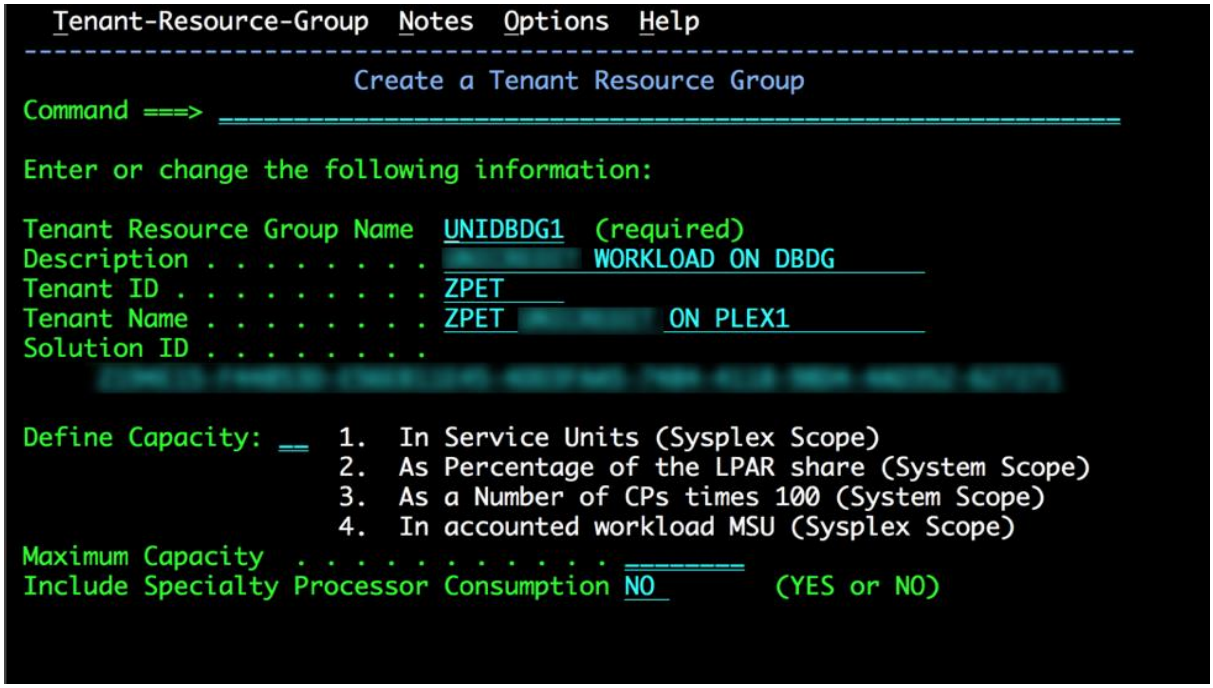
Step 2: Create a Tenant Resource Group (TRG)

Create a Tenant Resource Group (TRG) for the workload. Later we will associate the TRG with the TRCs for the workload elements.

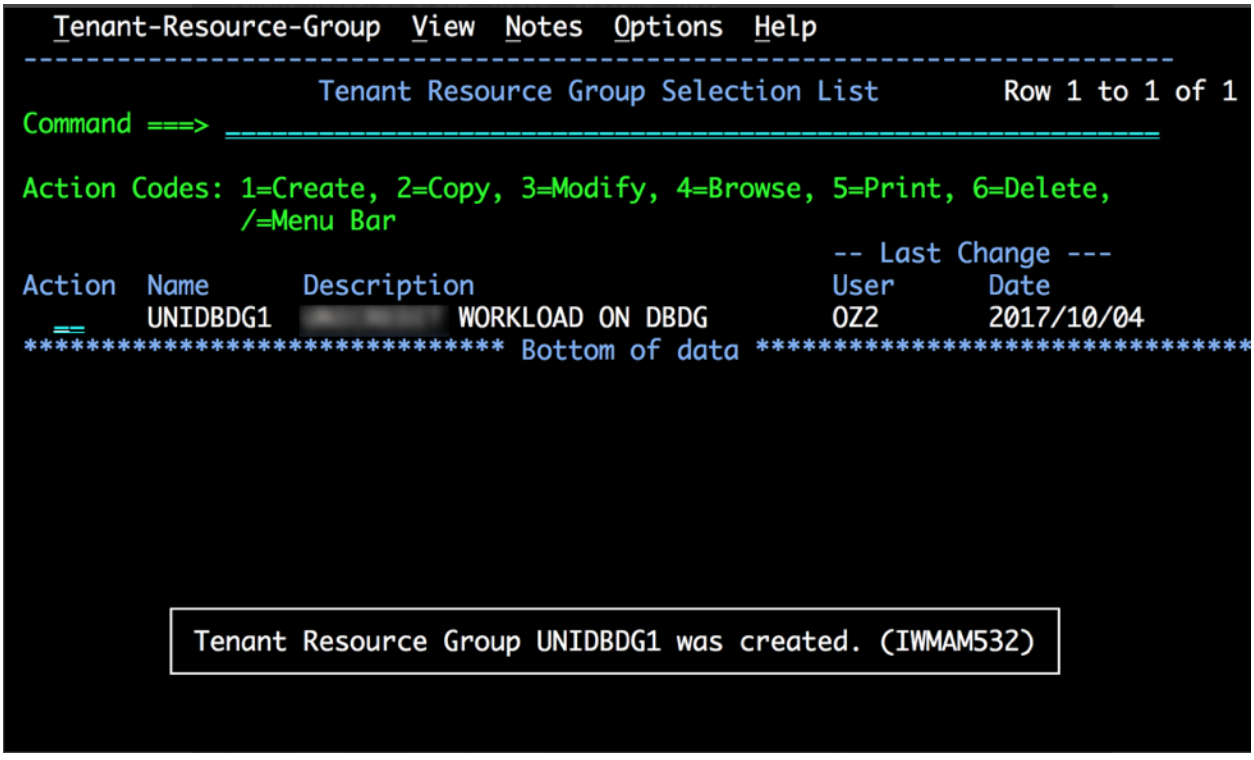
1. Select option 12 to create Tenant Resource Groups



2. Fill in the Tenant Resource Group information. These include:
    a. name, description, Solution ID, tenant ID, tenant name
    b. Indicate maximum capacity (“cap”) if desired



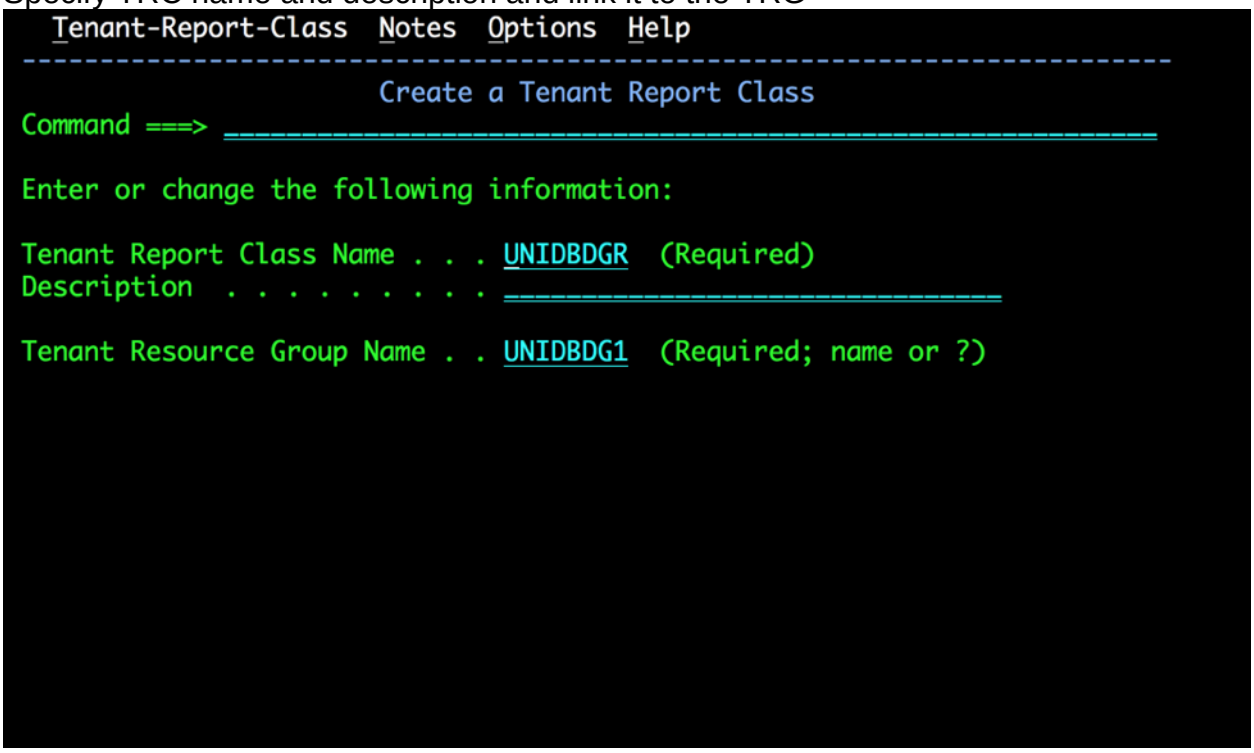
3. The TRG has been created



Step 3: Create/Assign Tenant Report Classes (TRCs)

Create one or more Tenant Report Classes (TRCs) associated with the TRG for the workload. Later we will associate the solution workload with TRCs, which are to be associated with TRGs.

1. Specify TRC name and description and link it to the TRG



2. … and the Tenant Report Class is created.

Step 4: Create classification rules for the workload

Create classification rules for the workload to associate the work with the TRC. This includes jobs/address spaces, as well as some classifications that involve independent enclaves.

1. Define a service class for group of work with similar performance characteristics (e.g., DB2 STCs)
    a. Note: You do not need to create new service classes - you can re-use existing, previously created service classes!

2. Associate the workload with the new Tenant Report Class(es). The workload is then associated with the corresponding TRG(s).

a. In sub-step 1 above, jobs with a prefix of CICSAH* were assigned classification rules to associate with the Tenant Report Class UNIDBDGR.

```
  Subsystem-Type  Xref  Notes  Options  Help
------------------------------------------------------------------------------
                Modify Rules for the Subsystem Type   Row 33 to 40 of 328
Command ===> _____________________________________________ Scroll ===> CSR

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

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: DISCRSTC    DISCRSTC
 ____  1 TN        CICS6*   ___                    STCI2V60    CICSSTC
 ____  1 TN        CICS7AH* ___                    STCI2V60    UNIDBDGR
 ____  1 TN        CICS7*   ___                    STCI2V60    CICSSTC
 ____  1 TN        CICS8*   ___                    STCI2V60    CICSSTC
 ____  1 TN        CICX*    ___                    STCI2V60    CICSSTC
 ____  1 TN        CMAS*    ___                    SYSSTC      SYSSTC
 ____  1 TN        CPO*     ___                    SYSSTC      CPMSTC
 ____  1 TN        CPSM*    ___                    STCI2V60    CICSSTC
```

Step 5: Confirm your setup

Confirm your setup using the TRG, TRC and other display panels. Use SDSF to display the jobs being executed and verify the service class, Tenant Resource Group and Tenant Report Class. In the example, job names starting with CICS7AH are associated with service class STCI2V60 and Tenant Report Class (TRC) UNIDBDGR, which ties the workload to Tenant Resource Group (TRG) UNIDBDG1.

```
SDSF DA JE0      (ALL)    PAG  0  CPU/L    63/ 54      LINE 1-7 (7)
PREFIX=CICS7*  DEST=(ALL)  OWNER=*  SORT=JOBNAME/A  SYSNAME=*
NP   JOBNAME  Workload SrvClass RptClass TenantResGroup ResGroup SP Server
     CICS7AHA STC      STCI2V60 UNIDBDGR YES           UNIDBDG1  1 YES
     CICS7AHB STC      STCI2V60 UNIDBDGR YES           UNIDBDG1  1 YES
     CICS7AHC STC      STCI2V60 UNIDBDGR YES           UNIDBDG1  1 YES
     CICS7TDA STC      STCI2V60 CICSSTC  NO                      1 YES
     CICS7TFA STC      STCI2V60 CICSSTC  NO                      1 YES
     CICS7TGA STC      STCI2V60 CICSSTC  NO                      1 YES
     CICS7THA STC      STCI2V60 CICSSTC  NO                      1 YES
```

If this TRG represents a Container Pricing workload that was not yet tied to a Solution ID, use the “Update TRG” selection to modify the existing TRG and add the Solution ID, obtained from

the License Management Support (LMS) panel described earlier. Update any other fields as necessary, like the CPU cap, etc.