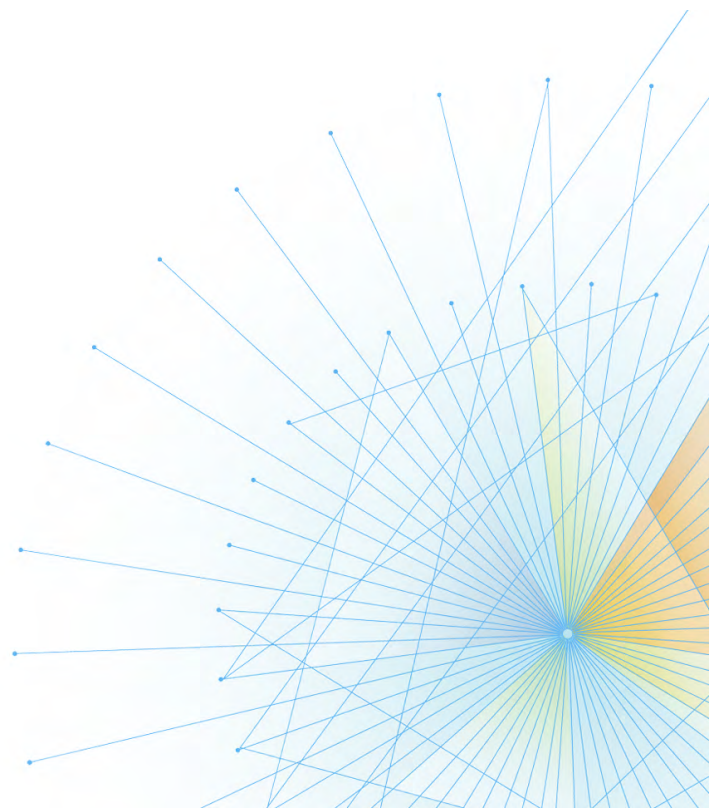




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# ThruPut Manager AE Production Services Supplement

**Release 18.02**



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# Introduction

## Summary of Changes

<b>V1802-7118</b> (April 2019)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7117</b> (January 2019)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7116</b> (October 2018)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7115</b> (July 2018)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7114</b> (April 2018)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7113</b> (January 2018)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7112</b> (October 2017)	<ul style="list-style-type: none"> <li>• No changes</li> </ul>
<b>V1802-7110</b> (July 2017)	<ul style="list-style-type: none"> <li>• Rebranding of MVS Solutions to Compuware. This includes update of cover style, copyright, and changing version release to 18.02.</li> <li>• Production Service Groups have been enhanced: you can now add general constraints and ACM constraints to any Production Service Group.</li> </ul>
<b>V7R1-7109</b> (April 2017)	<ul style="list-style-type: none"> <li>• PCS Groups have been renamed to Production Service Groups to better reflect their role in Production Services aspect of ThruPut Manager.</li> </ul>
<b>V7R1-7108</b> (February 2017)	<ul style="list-style-type: none"> <li>• This is the base manual for ThruPut Manager Version 7 Release 1.0.</li> </ul>

## About This Manual

The *Production Services Supplement* explains the concepts, setup process, and runtime features provided to deploy Production Services, including the Production Services queue and Production Service Groups, in a ThruPut Manager AE environment.

The supplement assumes you are familiar with:

- ThruPut Manager AE essentials and therefore understand the concepts and features covered in the *Concepts Guide to ThruPut Manager AE Essentials*, with its companion *Setup Guide* and *Runtime Guide*.
- a workload being managed by ThruPut Manager AE with appropriate (existing) General Service Groups and JAL statements.
- the ThruPut Manager AE setup and runtime dialogs.



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# Chapter 1

## Production Services Concepts

The Production Services feature of ThruPut Manager AE introduces a number of new concepts upon which subsequent chapters rely.

### Two Models of Batch Automation

The *Production Services* model of batch automation and management is similar in many respects to the General Services model that has been available with ThruPut Manager AE for several years. Comparing the two models, it is evident that Production Services is more suitable for managing production batch and General Services more suitable for managing non-production batch.

It has been common for z/OS installations to separate production and non-production batch, even to the extent of running them in separate LPARs or JESplexes. Production Services allows an installation to logically separate their production and non-production batch by supporting two queues within a JESplex: the General Services queue which current ThruPut Manager AE users are familiar with, and the Production Services queue to further differentiate your production workload. Datacenters benefit from the logical separation of batch that this provides, while TM AE benefits from the broader span of batch importance and service goals and is thereby able to achieve better batch throughput while meeting the batch SLA targets.

In addition to separating production and non-production batch into the Production Services queue and the General Services queue, there are now two types of ThruPut Manager AE Service Groups: General Service Groups are essentially the original Service Groups (Version TM7R1-7108 and earlier) renamed, and Production Service Groups are introduced with features that are oriented to production batch automation and management.

Existing users of ThruPut Manager AE who are running both production and non-production batch under General Services can continue to do so. The Production Services model is available to implement at their convenience.

### Definition of Production Service Groups

Production Service Groups are defined in the SLM Policy and assigned in JAL. When specifying a Production Service Group you provide values for:

- Production importance, which is similar to batch importance for General Service Groups in that it has five values with 1 being the most important and 5 being the least important.
- Target and Acceptable service times, which are similar to those specified for General Service Groups. The Target service time (mmm:ss) is the amount of time ThruPut Manager takes to age the job from the time it is submitted to the target service threshold. The acceptable service time (mmm:ss) is the amount of time ThruPut Manager takes to age the job from the time it is submitted to the acceptable service threshold.

You do not specify a value for the Critical service time since Production Service jobs are automatically aged to the critical service threshold once they reach the acceptable service threshold.

You can also constrain the number of active jobs at the JESplex or member level.

## Production Service Group Jobs

Jobs assigned to Production Service Groups behave similarly at runtime as jobs assigned to General Service Groups, with following differences:

- Jobs assigned to a Production Service Group are placed in the Production Services queue rather than the General Services queue.
- The PS queue has a different set of Service Classes dedicated to it. These Service Classes are generally designed to favor the work in the PS queue over work in the GS queue. They are defined on the `WLM Service Classes Definition` panel.
- While the SLM engine manages both queues, the jobs in the PS queue progress through the service time thresholds differently:
  - they continue to age even when delayed waiting for resources.
  - once they reach the acceptable threshold, they immediately progress to the critical threshold.
  - they are either *preferred* to General Services jobs at the same job selection point, or *preempt* General Services jobs according to the option set on the `Job Selection Option` panel.
  - they are favoured with respect to DFSMSHsm recalls according to options set on the `DFSMSHsm Dataset Recall Customization` panel.

See [ACM Considerations](#) for how these jobs are treated when the capacity levels rise.

## Feedback Provided

The following feedback for jobs assigned to a Production Service Group is provided:

- The SLM dialog displays runtime information for Production Service Group jobs on the `Production Services Job Display` panel, which includes a line command to get UDF information.
- The SLM SELECT, SLM FALLBACK and TM CLASS commands take into account Production Service Group jobs, with their production/noproduction and production\_services parameters.
- SMF records are available for all Production Service Group jobs.
- The Job Summary Report, if selected, includes Production Service Group details rather than General Service Group details.
- The SLM Policy Report includes Production Service Group details.



# Chapter 2

## Setup Process

This chapter explains how to set up Production Service Groups. It includes changes to your ThruPut Manager AE Policy, Service Class definitions and JAL.

### Setup Process Overview

Production Service Groups are straightforward to setup. Here are the steps involved:

1. Set up the new Production Services (PS) queue.
2. Define Service Classes, reserved for the PS queue, in the WLM Policy.
3. Activate the WLM policy.
4. Determine the Production Service Groups:
  - a. For the targeted workload, determine how to categorize it.
  - b. Determine the number of Production Service Groups you need and give them appropriate names.
  - c. Decide the relative importance and service times for each category of work.
5. Update your ThruPut Manager AE Policy:
  - a. Map the Service Classes to the appropriate production importance level.
  - b. Define the Production Service Groups.
  - c. Tailor the prefer/preempt option.
  - d. Tailor the DFSMShsm recall option.
  - e. Activate the updated policy.
6. Update your JAL.
  - a. Add statements to classify your jobs
  - b. Add statements to assign them to the relevant Production Service Groups.
  - c. Identify any Quick Jobs.
  - d. Load the new JAL.

### 1. Set up the Production Services Queue

Use the ThruPut Manager command, `TM CLASS SET PRODUCTION_SERVICES(x)`, to define the job class for the PS queue. As this job class is dedicated to ThruPut Manager processing, it must not be otherwise used.

Assume you choose '2' as your job class:

```

/TM CLASS SET PRODUCTION_SERVICES(2)
DTM3233I TM CLASS LIST
Analysis..... 9
Deferred..... None
Selectable..... A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,R,S,T,U,V,W,X,Y,Z
                0,1,2,3,4,5,6,7,8,9
Exempt..... 0
On_Demand..... 3
Production_Services. 2
General_Services.... 1
Default..... Z

```

## 2. Define Service Classes for Production Services

WLM Service Classes must be dedicated to the ThruPut Manager queues and cannot be used elsewhere. Setting them up is similar to setting up ones dedicated to the General Services queue. You set up five Service Classes, one for each level of production importance. (ThruPut Manager AE assigns WLM Service Classes at job selection, in order to control the amount of execution resources to be assigned to each batch workload.)

We suggest you start with the current Service Classes for the General Services queue and create a parallel set for use within the PS queue, modifying or adding to them as follows:

- Use names for these new Service Classes that are different from any of the current ones, and are unlikely to be used in the future. In the example TMPS1, TMPS2, TMPS3, TMPS4, TMPS5 are used.
- These WLM Service Classes must be dedicated to ThruPut Manager to use with jobs in the PS queue. You must not assign these new WLM Service Classes using the classification rules in the WLM Policy. You simply define them in WLM.
- As a best practice, define five WLM Service Classes, one for each production importance level. However less than five are allowed; the same Service Class may be specified for more than one production importance level.
- Use velocity goals which should not take queue time into account, since ThruPut Manager AE uses JES2 initiators.
- Favor a single performance period, as this allows for more accurate prediction by ThruPut Manager AE of the effect on adding more work in a given Service Class.

Note: Using multiple periods requires ThruPut Manager AE to take a "blended" view of the Service Class performance. If multiple periods must be used, try to select a first period duration such that a significant portion, ideally more than 95%, of jobs using that Service Class complete in the first period.

- The relative Importance Levels and Goals for the individual Service Classes must reflect the relative importance of the categories of jobs. The Service Class assigned to production importance 1 jobs must not have a lower Importance Level or Goal than the Service Class assigned to production importance 2 jobs, and so on.
- Furthermore the relative WLM Importance Levels and Goals for the individual Service Classes must reflect the relative importance of the queues. The Service Class assigned to production importance 1 jobs in the PS queue must not have a lower WLM Importance Level or Goal than the Service Class assigned to batch importance 1 jobs in the GS queue, and so on.

## 3. Activate the WLM Policy

Though obvious the process differs from installation to installation, so ensure this step happens for a smooth implementation.

## 4. Determine Production Service Groups

In our example, Apex Insurance decides their new Human Resources application needs to be handled using Production Service Groups. They determine how to categorize it and determine they need four Production Service Groups, with the following names: HUM, HUMDB, HUMEXPR, and HUMPAYR. They decide the relative importance and service times for each category of work. Here is the result of their analysis:

JAL Jobname Identification	Production Service Group Assigned	Production Importance	Target Service Time (min.)	Acceptable Service Time (min.)
HUMnnnn	HUM	3	20	40
HUMxxDB	HUMDB	1	10	15
HUMXnnn	HUMEXPR	5	2	20
HUMxxPR	HUMPAYR	2	20	25
...				

Create a similar chart for your workload before proceeding.

## 5. Update the ThruPut Manager AE Policy

Use the SLM dialog for the following steps. The Production Service Groups are set up in the same Policy that has your existing General Service Groups. Start with the active Policy and save it with a new name. Coordinate the activation of the new Policy with the JAL refresh suggested in Step 6.

### 5.a. Map WLM Service Classes to Production Importance Levels

Map the WLM Service Classes reserved for use with the PS queue to the five production importance levels.

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	1 Configure JESPLEX Characteristics
Configure JESPLEX Characteristics	1 WLM Service Class Definitions

```

- File                               SLM                               Help
-----
                                WLM Service Class Definitions
Command ==>
  Policy: PSGS01      Description: PS & GS Service Groups      By: USER01
                      Last Modified: 17:03:31
General Services      Production Services
  Batch Importance 1: TMGS1      Production Importance 1: TMPS1
                      2: TMGS2      2: TMPS2
                      3: TMGS3      3: TMPS3
                      4: TMGS4      4: TMPS4
                      5: TMGS5      5: TMPS5
Automated Capacity Management (ACM)
  General Services
  Level 1:           2:           3:           4:           5:
  Production Services
  Level 1:           2:           3:           4:           5:
Press PF1 for information and guidelines on specifying Service Classes.

```

The Service Classes for the Apex implementation are filled out. As a best practice, they started their names with TM in the hopes they would not conflict with the names of other WLM Service Classes now or in the future.

Note: ThruPut Manager uses the Premium Service Class when a Production Services job with PI=1 reaches the critical threshold. If you don't supply a Premium value, the one for Production Importance 1 is used.

## 5.b. Define the Production Service Groups

The data fields for a Production Service Group align with those for a General Service Group:

- Production Importance: has a value of 1-5, with 1 the most important. Jobs assigned to this Production Service Group inherit this production importance and are associated with the corresponding Service Class. More important jobs are favoured when jobs age pass the acceptable threshold, and when recalling datasets or staging virtual volumes. The default value is 3.
- Generate Job Summary: has a value of Y-es or N-o. It acts similarly to the setting for General Service Groups: a Job Summary Report is added to the SYSMSGs dataset when the job completes. The default value is Y.
- Target Service Time: this value is similar to the Target service time specified for General Service Groups: it is the time the job will age before it reaches the target threshold in the queue.
- Acceptable Service Time: this value is similar to the Acceptable service time specified for General Service Groups: it is the time the job will age before it reaches the acceptable threshold in the queue.
- Installation Data: use this field to annotate the Production Services SMF record.

You can also constrain the number of active jobs for this Service Group either at the JESplex or member level, or both.

In our example, the payroll jobs for the fleet drivers are being managed in a separate production group, HUMPAYR. They are constrained to run no more than 5 jobs concurrently on the JESplex..

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	2 Configure Production Services
Configure Production Services	2 Production Service Groups

```

- File                                                                                               Help
----- SLM -----
Production Service Group Management

Command ==>

Line Commands: D - Delete E - Edit

                                     Line 1 of 4
                                     Time To Service Installation
- --Name--  --Description----- P  S  J  -I- -I- -S- -Target / Accept- -Class- --Data--
. HUM       HR undifferentiated jobs  3  3  Y  20:00  40:00 Tmps3  GENERIC
. HUMDB     For HR database jobs     1  3  Y  10:00  15:00 Tmps1  LEGACY
. HUMEXPR   Short but expendable HR jobs  5  3  N  2:00   20:00 Tmps5  EXPRESS
. MONPI3    Default for mon-mode jobs        3  3  N  10:00  20:00 Tmpcspi3
*****
    
```

To create the HUMPAYR service group, Apex Insurance uses the File drop down menu to Configure a new Production Service Group, with the values from our table and to constrain the number of active jobs to five.

```

- File                                                                                               Help
----- SLM -----
Production Service Group Definition

Command ==>
Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 18:59:35                By: USER01

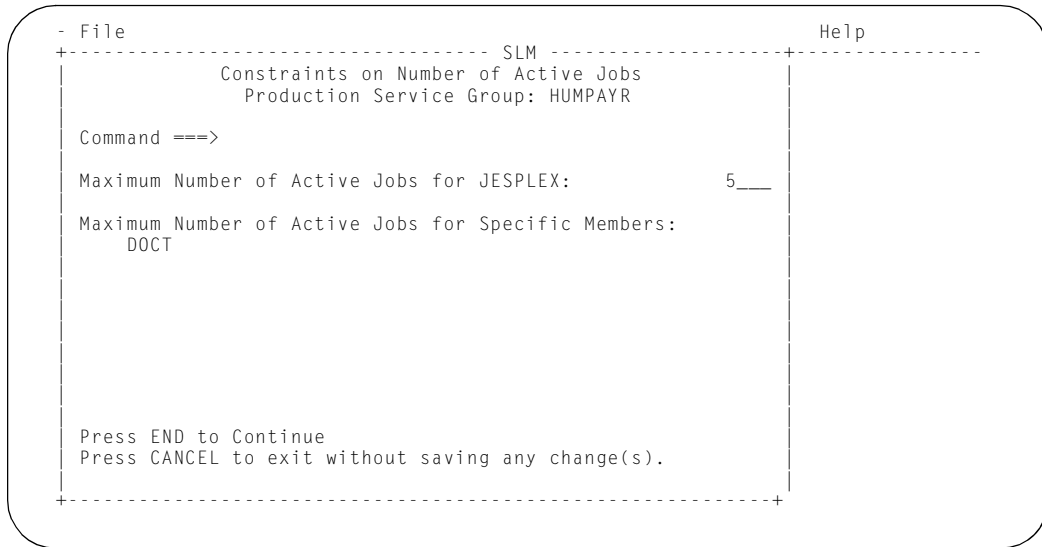
Production Services Group Name: HUMPAYR
Description: For Driver payroll jobs

Production Importance: 2 (1-5)
Scheduler Importance:  3 (1-5)
Generate Job Summary:  Y (Y/N)
Installation Data:     DRIVERS

Service Times in the following line are expressed as mmm:ss
20:00 to Target, 25:00 Minutes to Acceptable

Enter "/" to Update Constraints                               Enabled (Y/N)
/ Constrain by Number of Active Jobs                         N
Automated Capacity Management Constraints (ACM)               N
    
```

Notice the slash to access the Constrain by Number of Active Jobs feature.



Remember to enable the constraint, on the Production Service Group Definition panel, when you want it to be enforced.

### 5.c. Tailor Prefer/Preempt Option

By default the SLM engine will prefer jobs in the PS queue to those at the same service threshold in the GS queue. If you need to change this to the "preempt" option, i.e., select Production Service Group jobs that have passed a job selection point (that you specify) before any GS jobs, then update the following panel.

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	2 Configure Production Services
Configure Production Services	1 Job Selection Option

```

- File                                     Help
----- SLM -----
                Configure Production Services
Command ==> 1
  Policy: PSGS01      Description: PS & GS Service Groups
                    Last Modified: 17:03:31      By: USER01
Select one of the following:
1 Job Selection Option
----- SLM -----
+-----+
| Command ==>                                     |
| Job Selection Option:           Currently set to 1 |
|                                     |
| 1 Prefer Production Services (Default)          |
|   - Prefer selection of a ready Production Services job |
|     over a General Services job of equal or lesser urgency |
|     as determined by ThruPut Manager Automation |
|     Edition.                                         |
| 2 Preempt General Services                      |
|   - Always select ready Production Services jobs that are |
|     approaching or have passed their target selection |
|     time before selecting any General Services job.      |
+-----+

```

## 5.d. Tailor DFSMSHsm Recall Option

The following panel explains the DFSMSHsm recall order for jobs in the Production Services and General Services queues. The default for other jobs (i.e., jobs in neither the GS queue nor the PS queue) is after jobs with batch importance of 3 in the General Services queue, and before jobs with production importance of 4 in the PS queue. You can change the default on this panel.

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	1 Configure JESPLEX Characteristics
Configure JESPLEX Characteristics	2 Customize
JESPLEX Customization	1 DFSMSHsm Options

```

- File                                                    Help
----- SLM -----
DFSMSHsm Data Set Recall Customization
Command ==>

Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 14:20:28          By: USER01

Select Non-SLM DFSMSHsm Recall Priority Index: 3 (1-5)

          TYPE                Mode      Importance
          -----
          Production Services  Preempt  All
          Production Services  Prefer   1
          General Services     Prefer   1
1
          Production Services  Prefer   2
          General Services     Prefer   2
2
          Production Services  Prefer   3
          General Services     Prefer   3
3 > Non-SLM
          Production Services  Prefer   4
          General Services     Prefer   4
4
          Production Services  Prefer   5
          General Services     Prefer   5
5

Maximum number of allowed TAPE recalls: 40

```

## 5.e. Activate the Updated Policy

Once you have validated your Policy successfully, it is ready to be activated. Coordinate the activation of the Policy with the associated JAL changes.

The SLM Policy report, provided by the G-Generate Report line command on the Policy Management display, lists the Production Service Groups for this policy. The example below shows the information applicable the HUMPAYR Production Service Group.

### SLM Policy Report

```

...
000060 Job Selection Option:
000061 1 - Prefer Production Services
000062 Production Service Groups:
...
000110 Name: HUMPAYR Description: For Driver payroll jobs
000111 Production Importance: 2
000112 Scheduler Importance: 3
000113 Generate Job Summary: Y
000114 Service Times in the following line are expressed as mmm:ss
000115 20:00 to Target, 25:00 Minutes to Acceptable
000116 Installation Data: DRIVERS
000118 Constrain by Number of Active Jobs: Y
000119 Maximum Number of Active Jobs for JESPLEX: 5
000121 Automated Capacity Management Constraints (ACM): N
000122 Maximum Number Of Jobs: N
...

```



## 6. Update JAL

Adding a Production Service Group usually requires changes to your JAL to assign jobs to the new group.

### 6.a. Assign a Job to a Production Service Group

Update your JAL to categorize your jobs. To assign a job to a Production Service Group, from which the job receives its goals, use the following JAL action statement:

```
SLM SERVICE PRODUCTION GROUP(groupname)
```

Here's a snippet of the JAL for the example:

#### APEX JAL Source

```
00100 PROC ID(JAL) DESC('JAL FOR APEX WORKLOAD')
000200
000300 /*****
000400 /*
000500 /*... <previous updates>
000600 /*
000700 /* ADDED PRODUCTION SERVICE GROUPS FOR HUMAN RESOURCES
000800 /*
000900 /*****
001000
...
001400 EVAL HUM ($JOBNAME(HUM*) )
001500 EVAL HUMDB ($JOBNAME(HUM??DB))
001600 EVAL HUMPR ($JOBNAME(HUM??PR))
001700 EVAL HUMX ($JOBNAME(HUMX*))
...
003000 /* LOGIC SECTION
...
005000
005100 /* Always manage HUM jobs with a Production Group
005200
005300 IF (HUM)
005500 IF (HUMDB)
005600 SLM SERVICE PRODUCTION GROUP(HUMDB)
005700 ORIF (HUMX)
005800 SLM SERVICE PRODUCTION GROUP(HUMEXPR)
005900 ORIF (HUMPR)
006000 SLM SERVICE PRODUCTION GROUP(HUMPAYR)
006100 OTHERWISE
006110 SLM SERVICE PRODUCTION GROUP(HUM)
006120 ENDIF
006200 ENDIF...
```

### 6.b. Identify a Quick Job in a Production Service Group

This feature may be of interest if your Production Service Groups include very short running jobs that you would like prioritized. It is appropriate to use when there is a mix of "quick" and "normal" jobs. If the environment has only short running jobs, the Quick Job feature is unnecessary.

To identify a Production Service Group job that is to be treated as a Quick Job, include in your JAL:

```
SLM SET QUICKJOB
```



# Chapter 3

## Runtime Features

ThruPut Manager feedback for Production Service Group jobs is similar to other jobs. Significant variations are noted here.

### Runtime Displays

The Production Services Job Display panel is available to view the status of your Production Service Group jobs.

Note: For Production Service Group jobs Exp-Elpsd, and Acceptable Ending Time are not populated and the value of Scheduler is "None".

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	1 Display / Monitor Services
Display Options	2 Service Level Manager Display
SLM Display	2 Job Display
General Services Job Display	Choose DISPLAY menu; 2 Production Services

```

Display Filter View Options                                     Help
----- SLM -----
Production Services Job Display

Command ==>

Line Commands: I - Information (UDF)                               Row 1 to 6 of 6
Jobname=*                                                         Sort=Jobname

Jobname  Jobid  P -Exp- Acceptable  -----Status-----  Sche- Group
          I Elpsd Ending-Time                                     duler Name
. HUMX107T Job01753 5                                     Awaiting Xeq          None HUMEXPR
. HUM1101  Job01748 3                                     Awaiting Xeq          None HUM
. HUM1102  Job01750 3                                     Awaiting Xeq          None HUM
. HUM1204  Job01746 3                                     Executing DOCT        None HUM
. HUM57PR  Job01751 2                                     Executing DOCT        None HUMPAYR
. HUM78DB  Job01747 1                                     Executing DOCT        None HUMDB
  
```

UDF support for Production Service Group jobs is provided. Recall you can use D for more details, V for volume information, and I for initial information, as well as tab to any ThruPut Manager keywords, such as JB or DCS for specific binding or dataset contention information.

This example shows the detailed information for the HUM1102 job.

```

-----ThruPut ManagerUserDisplayServices V7-----
Command ==>
                Production Services Job Display
Command ==>

Line Commands: I - Information (UDF)           Row 1 to 6 of 6
Jobname=*                                       Sort=Jobname

Jobname      Jobid      P -Exp- Acceptable          Scheduler Name
. HUMX107T   Job01753 5          Awaiting Xeq          None HUMEXPR
. HUM1101    Job01748 3          Awaiting Xeq          None HUM
i HUM1102    Job01750 3          Awaiting Xeq          None HUM
. HUM1204    Job01746 3          Executing DOCT        None HUM
. HUM57 *-----Job Detail-----*
. HUM78D | HUM1102(JOB01750) _ SLM DJ JB
          | Awaiting Execution
          | Submission Class          P      Assigned Class          2
          | Submission Priority      9      Assigned Priority        0
          | CPU Time          12951:00 mins  Region Size              0K
          | Physical Tape Cartridges 0      Drives                   0
          | Virtual Tape Volumes    0      Drives                   0
          |-----*

```

## Runtime Commands

Use the usual ThruPut Manager commands (\$DJ LONG, /SLM DISPLAY, /JOB DISPLAY,

/JBS D JOB, etc.) to display the status of Production Service Group jobs. To restrict (and restore) the flow of jobs in the PS queue, use the SLM SELECT command with the NOPRODUCTION and PRODUCTION (and the ALL and NONE) parameters.

The options of the SLM FALLBACK command affects whether a Production Service Group job is included in a "fallback" (and is queued to the job class it would have been queued to had it not been SLM-managed). Production Service Group jobs are included in the ALL and PRODUCTIONONLY parameters.

See the *Command Reference Guide* for exact syntax and parameters.

## Job Summary Report

The Job Summary Report can be included for the jobs assigned to a Production Service Group by selecting the appropriate option on the Production Service Group Definition panel. It is similar to the Job Summary Report for General Service Group jobs, with the differences highlighted on the following example.

```

*****SLM Job Summary*****
*
* Read on Node PARIS, System DOCT      Executed on Node PARIS, System DOCT
* Read at 14:39:52                      Recognized by SLM at 14:39:54
* Elapsed time from when job was read in to SLM recognition... 00:00:02
* Job Selection Option: Prefer Production Service
*
* Production Services Information:
* Production Service Group Name: HUM      Description: HR undifferentiated jobs
* Production Importance: 3 Scheduler Importance : 3
*
* Queue Time Information:
* Actual... 00:00:40 Delay... 00:00:00 Effective... 00:00:40
*
* No Queue Time Delays
*
* Times Restarted... 0
*
* Execution Time Information:
* Job selected on 2017.128 at 14:40:35
* Elapsed... 00:06:40 Delay... 00:00:02 Effective... 00:06:38
* CPU Service Units... 638,235           Effective CPU SU Rate... 1,603.61 SUs/Sec
*
* Execution Time Delays
* Initiation... 00:00:01 DBS... 00:00:00 DCS... 00:00:00 Recalls... 00:00:00 Allocation... 00:00:01
*

```

```
* Summary *
* Elapsed Times *
* Pre-SLM..... 000:00:02 *
* Queue *
* Delay..... + 00:00:00 *
* Effective.....+ 00:00:40 *
* Lost due to Restarts.. + 00:00:00 *
* Execution *
* Delay.....+ 00:00:02 *
* Effective.....+ 00:06:38 *
* Actual Elapsed Time.....= 00:07:22 *
*
*****
```

## SMF record

SMF records are available for each Production Service Group job.



# Chapter 4

## ACM Considerations

This chapter explains how you specify Automated Capacity Management constraints for Production Service Groups.

We assume you are familiar with Automated Capacity Management (ACM) concepts and have set capacity management constraints for General Service Groups. Review the *Automated Capacity Management Guide* for the background motivation and concepts.

### Set up ACM Constraints

ACM constraints on a Production Services job are based on its production importance or its Production Service Group.

The types of constraints available are:

- deferring the selection of a job until it reaches a queue threshold (Job Selection Point), e.g., Target+3/4.
- placing a job into a Service Class with reduced goals.
- limiting the number of jobs per JESplex (or LPAR).

The first and second types can be specified based on production importance, the second and third types, based on PS group. If the Service Class constraint is specified for both levels, the PS Group constraint takes precedence.

ACM is enabled at two levels: the constraints for each Production Service Group can be enabled and disabled independently; and, the overall ACM feature can be enabled or disabled. When the overall feature is enabled, the PI-based constraints and the enabled constraints from Production (and General) Service Groups are applied as the capacity level changes. If the overall feature is disabled, no ACM constraints are applied, whether they are PI-based, or based on service groups.

For example, Apex Insurance determines all Production Service jobs need to use reduced Service Classes at the following capacity levels:

- jobs with PI=5 will be constrained at capacity level 4
- jobs with PI=4 will be constrained at capacity level 3
- jobs with PI=3 will be constrained at capacity level 2
- jobs with PI=2 will also be constrained at capacity level 2, and
- jobs with PI=1 will be constrained at capacity level 1

and that HUMEXPR (set up with PI=5) jobs need to be limited to:

- 16 jobs at capacity level 5
- 8 jobs at capacity level 4
- 6 jobs at capacity level 3
- 4 jobs at capacity level 2
- 1 job at capacity level 1

Therefore jobs belonging to HUMEXPR are limited to the number allowed concurrently starting when the system reaches capacity level 5; they also use the reduced-service Service Class when the system reaches capacity level 4. The constraints for the reduced service class are lifted when the capacity level falls below 4. The constraints for concurrent jobs are lifted when the capacity level falls below 5.

Remember ACM constraints are in addition to any ongoing constraints. To specify the PI-based constraints:

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	2 Configure Production Services
Configure Production Services	3 Automated Capacity Management
ACM Constraints	2 Constraints by Production Importance

```

- File ----- SLM ----- Help
Automated Capacity Management (ACM) Constraints
Command ==>

Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 15:12:38                By: USER01

Select one of the following:
1 Constraints by PCS Application
2 Constraints by Production Importance
+----- SLM -----+
| ACM Constraints by Production Importance)
| Command ==>
|
| Production Importance  Capacity Level
|      1      2      3      4      5
|      | Job Selection Points
|
| 1      ---      ---      ---      ---
| 2      ---      ---      ---      ---
| 3      ---      ---      ---      ---
| 4      ---      ---      ---      ---
| 5      ---      ---      ---      ---
|
| Capacity Level at which jobs will be placed into
| the ACM Service Class.
|
| 1      1
| 2      2
| 3      2      (1-5 or blank)
| 4      3
| 5      4
|
| Press END to accept changes
| Press CANCEL to Cancel
+-----+
    
```

Here's the specifications for the HUMEXPR PS Group. You can enter a slash opposite each capacity level for which you have a value:

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy



From this panel...	key....
Policy Configuration Options	2 Configure Production Services
Configure Production Services	2 Production Service Groups
Production Service Group Management	E for the HUMEXPR group
Production Service Group Definition	/ for Automated Capacity Management Constraints

```

----- SLM -----
Production Service Group Definition
Command ==>
Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 15:12:38      By: USER01

Production Service Group Name: HUMEXPR
Description: Short but expendable HR jobs_____

Production Importance: 5 (1-5)
Scheduler Importance: 3 (1-5)
Generate Job Summary: N (Y/N)
Installation Data:   EXPRESS_

Service Times in the following line are expressed as mmm:ss
__2:00 to Target, 20:00 Minutes to Acceptable

Enter "/" to Update Constraints Y/N)                               Enabled
-----+-----
Automated Capacity Management Constraints (ACM)
Production Service Group: HUMEXPR
Command ==>

----- Capacity Level -----
Enter "/" to select Maximum Number of Jobs by JESPLEX Member
1 / N    2 / N    3 / N    4 / N    5 / N

Enter the Capacity Level at which jobs will be placed into the
ACM Service Class:                (1-5 or blank)

Press END to accept changes
Press CANCEL to Cancel
-----+-----
    
```

You step through each capacity level entering the appropriate value. Here's the first and last panel, with their values:

```

----- SLM -----+
ACM Constraints on Number of Active Jobs
Production Service Group: HUMEXPR
Capacity Level 1
Command ==>

Default Maximum Number of Active Jobs per Member: 1
Maximum Number of Active Jobs for Specific Members:
DOCT

Press END to Continue
Press CANCEL to exit without saving any change(s).
-----+-----
    
```

and

```

+----- SLM -----+
|   ACM Constraints on Number of Active Jobs   |
|   Production Service Group: HUMEXPR         |
|   Capacity Level 5                         |
| Command ==>                               |
|                                             |
| Default Maximum Number of Active Jobs per Member: 16 |
|                                             |
| Maximum Number of Active Jobs for Specific Members: |
|   DOCT                                       |
|                                             |
| Press END to Continue                       |
| Press CANCEL to exit without saving any change(s). |
+-----+
    
```

If they aren't already, enable these constraints on the Production Service Group Definition panel:

```

- File                                                    Help
+----- SLM -----+
|   Production Service Group Definition         |
| Command ==>                               |
|                                             |
| Policy: PSGS01      Description: PS & GS Service Groups |
|                   Last Modified: 13:13:23             | By: USER01
|                                             |
| Production Service Group Name: HUMEXPR             |
| Description: Short but expendable HR jobs          |
|                                             |
| Production Importance: 5   (1-5)                  |
| Scheduler Importance: 3   (1-5)                  |
| Generate Job Summary:  N   (Y/N)                 |
| Installation Data:      EXPRESS                   |
|                                             |
| Service Times in the following line are expressed as mmm:ss |
| 2:000 to Target, 20:00 Minutes to Acceptable      |
|                                             |
| Enter "/" to Update Constraints                    | Enabled |
|   Constrain by Number of Active Jobs              (Y/N) |
|   Automated Capacity Management Constraints (ACM)  Y   |
    
```

## Enable and Activate

Before you activate the new SLM Policy:

- If you haven't already, set up the ACM Service Classes for the PS queue in Workload Manager. Remember to activate your WLM Policy.
- Map these Service Classes to the relevant capacity level on the following panel.

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.

From this panel...	key....
Policy Management	C to copy the active Policy
Policy Configuration Options	1 Configure JESPLEX Characteristics
Configure JESPLEX Characteristics	1 WLM Service Class Definitions

```

- File                                                                                               Help
----- SLM -----
WLM Service Class Definitions
Command ==>
Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 13:16:14                By: RS101AW

General Services          Production Services
                          Premium: TMPS1
Batch Importance 1: TMGS1   Production Importance 1: TMPS1
                  2: TMGS2                               2: TMPS2
                  3: TMGS3                               3: TMPS3
                  4: TMGS4                               4: TMPS4
                  5: TMGS5                               5: TMPS5

Automated Capacity Management (ACM)
General Services
Level 1:           2:           3:           4:           5:

Production Services
Level 1: TMPSCM1  2: TMPSCM2  3: TMPSCM3  4: TMPSCM4  5: TMPSCM5

Press PF1 for information and guidelines on specifying Service Classes.
    
```

- Enable the overall ACM facility on the following panel.

From this panel...	key....
ThruPut Manager Main Lobby	4 Automation Services
Primary Options	2 Automation File Services,
Automation File Services	1 Use an Existing File
AF file pop-up	"Enter" to accept "active" file
Selection Menu	2 SLM - Service Level Manager.
Policy Management	C to copy the active Policy
Policy Configuration Options	4 Automated Capacity Management
Configure JESPLEX Characteristics	1 Configure Automated Capacity Management (ACM)

```

- File                                                    SLM ----- Help
-----
Automated Capacity Management Configuration
Command ==>

Policy: PSGS01      Description: PS & GS Service Groups
                  Last Modified: 18:57:15 By: USER01

Enter "/" to enable option
  / Enable Automated Capacity Management (ACM)
  / Exempt all Quick Jobs from ACM

Enter "/" to update optional values
  Update JESPLEX Member MSU Values

Threshold Values For Capacity Levels
  Descending values with a maximum of 1 decimal place.
  Level 1: 99.9
  2: 95.0
  3: 90.0
  4: 85.0
  5: 80.0

```

This is also where you can exempt Quick Jobs, including jobs assigned to a Production Service Group, from being constrained by the ACM feature.

Remember to activate the new Policy.

## Feedback

The Policy Report contains information on ACM constraints and whether they are enabled or not. As you can see the information is organized under several sections:

```

...
WLM Service Class Definitions
General Services                Production Services
                                Premium: TMPS1
Batch Importance 1: TMGS1      Production Importance 1: TMPS1
                                2: TMPS2
                                2: TMGS2
                                3: TMPS3
                                3: TMGS3
                                4: TMGS4
                                4: TMPS4
                                5: TMGS5
                                5: TMPS5

Automated Capacity Management (ACM)
General Services
  Level 1: _____ 2: _____ 3: _____ 4: _____ 5: _____
Production Services
  Level 1: TMPSCM1_  2:TMPSCM2_  3:TMPSCM3_  4:TMPSCM4_  5:TMPSCM5_
...
Name: HUMEXPR      Description: Short but expendable HR jobs
Production Importance: 5
Scheduler Importance: 3
Generate Job Summary: N
Service Times in the following line are expressed as mmm:ss
  2:00 to Target, 20:00 Minutes to Acceptable
Installation Data: EXPRESS
Constrain by Number of Active Jobs: N

Automated Capacity Management Constraints (ACM): Y
Maximum Number Of Jobs
  Level 1: Y - Default: 1
  Level 2: Y - Default: 4
  Level 3: Y - Default: 6
  Level 4: Y - Default: 8
  Level 5: Y - Default: 16
Capacity Level at which jobs will be placed

```

```

        into the ACM Service Class: _
...
Automated Capacity Management (ACM)
  Constraints by PCS Application
    Constraints by Production Importance
  Prod Imp.          Job Selection Points
  1                1. ____ 2. ____ 3. ____ 4. ____ 5. ____
  2                1. ____ 2. ____ 3. ____ 4. ____ 5. ____
  3                1. ____ 2. ____ 3. ____ 4. ____ 5. ____
  4                1. ____ 2. ____ 3. ____ 4. ____ 5. ____
  5                1. ____ 2. ____ 3. ____ 4. ____ 5. ____

ACM Service Class Capacity Level
1 1
2 2
3 2
4 3
5 4
...

Automated Capacity Management
/ Enable Automated Capacity Management (ACM)
/ Exempt all Quick Jobs from ACM
. Update JESplex Member MSU Value
Threshold Values For Capacity Levels
  Level 1: 99.9
          2: 95.0
          3: 90.0
          4: 85.0
          5: 80.0

```

At runtime feedback on ACM is provided by the SLM DISPLAY SC and SLM DISPLAY JESPLEX commands; note this information is provided when the constraints are in force (i.e., the capacity is at the relevant level).

For a list of constraints that are enabled (i.e., possible constraints if the capacity level rises enough), see the SLM Policy Report.

