

Differences in Missing Data messages between SCRT Classic and SCRT V25 Sub-Capacity Reports

SCRT Version 25 Release 1.0 becomes available on 10 October 2017. Starting with the November 2017 submission period (2 - 9 November) only SCRT Reports generated by SCRT V25 will be accepted by IBM for sub-capacity pricing.

SCRT V25 does not offer a Classic version for z/OS nor for z/VSE. The only three SCRT V25 deliverables offered will be the Java versions of the tool running on z/OS, Linux, and Windows.

There are different "missing data" conditions and messages for Sub-Capacity Reports generated by the older Classic releases of SCRT compared to Sub-Capacity Reports generated by SCRT V25 or later. This document discusses how the Classic report missing data messages are different from the SCRT V25 missing data messages, why they were changed, and what explanations or actions are expected for submission of valid Sub-Capacity Reports.

Note: The missing data conditions and messages appearing in SCRT V25 Sub-Capacity Reports were already implemented in the SCRT Multiplex Reports introduced with Country Multiplex Pricing (CMP) in 2015.

How missing data situations were handled in Classic Sub-Capacity Reports

It is important to understand that at the time sub-capacity pricing was introduced in 2001, the original Classic SCRT program was planned to be a temporary tool, only expected to be used for a year or so. The expectation at the time was that a new "IBM License Manager" product would soon replace SCRT, but that never occurred. Some leniency in the reporting of missing data was acceptable to IBM at that time because it was intended to be a temporary tool.

1. The "overall" data collection was expressed as a percentage in the C5 Tool Information section of the report. This number represented the percentage of hours in the month in which SMF data (and SCRT89 data) was included from at least one LPAR. Many people believed this represented a percentage of all the possible data which was required to be submitted, but that was incorrect.

As long as the percentage reported was 95% or higher then no explanation was required. Many people believed that this 95% threshold is stated in the sub-capacity contract, but it is not. The contract requires that clients collect and submit all SMF data for any period of time that any LPAR is running. The 95% threshold was simply an operational custom IBM implemented at the beginning of sub-capacity in order to allow for clients to take their machines down for short periods of time during the month and not be obligated to explain what they had done. Again, this process was never intended to last for so many years. The contractual requirement was always that all possible data be collected and used in the creation of the report.

If the client shut down all the LPARs on their machine for a period of time, or used Exclude to remove a period of time from all the LPARs, this resulted in an overall data collection percentage of less than 100%. If they shut the machine down long enough to lower the data collection to 94% then they were obligated to explain this via the required comment. If Exclude was used then the explanation for the low data may have been that they used Exclude, and then the required Exclude comment would have to explain why they used Exclude in the first place.

==C5=====					
TOOL INFORMATION					
Tool Release	23.4.0				
Reporting Period	2 Nov, 2015 - 1 Dec, 2015 inclusive (30 days)				
	Justification for low data collection (255 chars max)				
% Data Collected for z/OS	95%				

==C5=====					
TOOL INFORMATION					
Tool Release	23.4.0				
Reporting Period	2 Nov, 2015 - 1 Dec, 2015 inclusive (30 days)				
	Justification for low data collection (255 chars max)				
% Data Collected for z/OS	94%	(required)			

Differences in Missing Data messages between SCRT Classic and SCRT V25 Sub-Capacity Reports

2. The other kind of missing data was when there was an LPAR on the machine which was used at some point but the client did not include any SMF data from it at all. This condition was called a "missing LPAR" and it was reflected in the H5 Detail Data Collection section of the report with a 0.00% data collection percentage and a "(required)" comment place-holder. Notice that other LPARs with less than 100% data collection did not require any explanation. The fact that an explanation was not required did not mean that all the contractually required data was supplied, it only meant that IBM did not intend to ask about every instance of an LPAR which was inactive for an entire month. Only if no data was received was an explanation required with Classic reports.

==H5=====						
DETAIL DATA COLLECTION						
	SYSID	Input Data Start	Input Data End	Report Period	% Data	Customer Comments
MVSA	SYSA	02 Nov 2015 - 00:00	01 Dec 2015 - 23:59	100.00%		
MVSG	SYSG	22 Nov 2015 - 09:17	01 Dec 2015 - 23:59	32.60%		
MVSK	SYSK	02 Nov 2015 - 00:00	01 Dec 2015 - 23:59	100.00%		
MVST	SYST	02 Nov 2015 - 00:00	01 Dec 2015 - 10:07	98.00%		
MVSW	-	-	-	0.00%		(required)
MVSX	-	-	-	0.00%		(required)

The percent data in this section was simply the percentage of the number of hours in the Reporting Period that data was seen from that LPAR. The Classic version of SCRT failed to distinguish between these two situations:

- an LPAR (e.g. MVSG) was only used 32.6% of the hours of the month and all the data was included, versus
- that LPAR was up and running the entire month but the client only supplied data for 32.6% of the hours.

3. Some acceptable reasons for an LPAR to report no data are:
- LPAR was used as a Coupling Facility
 - LPAR only ran z/VM and/or Linux
 - LPAR was Excluded for a valid reason such as a CBU Test or Backup (DR) Test

Some examples of unacceptable (invalid) reasons for an LPAR to report no data are:

- It was used as a Systems Programmer "sandbox"
- It was used for maintenance "testing"
- It was used for installation or service
- It was used for GDPS data replication
- A test LPAR where data is not collected because RMF didn't run there
- A test LPAR where data is not saved because it was inconvenient to do so. An example: "That's a test LPAR, when we're done with the test we reinitialize the disks, we don't save the data generated during a test."

All of these six activities (a – f) are billable workload, since IBM considers all use of LPARs to be billable except for certain DR activities. These invalid reasons may or may not have been serious enough to invalidate the acceptance of the report for sub-capacity billing in the past. Often these situations did not involve a lot of processing or a lot of time, so ordinarily these events were unlikely to affect the peak rolling 4-hour average for the month. But the contractual requirement always was to collect and submit all data from all LPARs for any time the LPAR was used. If not, the Sub-capacity Report might be declared invalid and full capacity billing would be the result for that month.

Differences in Missing Data messages between SCRT Classic and SCRT V25 Sub-Capacity Reports

Another possible reason that a client might have a missing LPAR was when there was a mismatch in the collection of SMF70 records and SMF89 records. If an LPAR had one type of SMF data record but not the other type of data record for the entire reporting period then SCRT issued a message (SCRTT00L053) and did not create any sub-capacity report for this machine at all.

```
SCRTT00L053 2964-87654: NO SMF 70 RECORDS FOUND FOR LPAR SYS1  
SCRTT00L053 2828-01234: NO SMF 89 RECORDS FOUND FOR LPAR MVSZ
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While it is possible that the reason for the missing SMF70 records is that the client forgot to include them in their input dataset, typically when SMF70 records are missing it is because RMF was not running in that LPAR at all that month. (Note: Clients may also use the BMC CMF product to create SMF70 records.) There is nothing a client can do after the fact to go back in time and cause RMF to create these records for a month ago. The only thing the client can do to generate any report at all is to re-run SCRT and use Exclude to remove the existing SMF89 records from that LPAR. This will allow SCRT to produce a sub-capacity report, but that LPAR will be missing, and the client will need to explain why. If in IBM's sole judgement the missing data is too significant to accept the report, full capacity billing could result.

SMF89 records are not created by a separate program such as RMF or CMF, the SMF89 records are created by z/OS itself, and there is no opportunity for the client to forget to start the record creation process, but it is possible that they could fail to specify that SMF89 records should be created at all, though this would be extremely rare. When the SMF89 records are missing this is almost always because the client forgot to include the dataset with those records, or the dataset was damaged or erased accidentally. Again, the only thing they can do in this case is use Exclude, the same as described above in the paragraph discussing missing SMF70 records. If in IBM's sole judgement the missing data is too significant to accept the report, full capacity billing could result.

The SCRTT00L053 situation only happened when there was a mismatch of 70 and 89 records for the entire month. If there were matching SMF70 and SMF89 records for even one hour during the month then the 053 error did not happen, and any mismatched records from any other hours of the month were simply thrown away and not used by SCRT. This is another example of the thinking at the time about how the "temporary" SCRT program was not expected to last more than a year before being replaced with something more robust.

How missing data situations are handled starting with SCRT V25 Sub-Capacity Reports

With the introduction of SCRT V25 in October 2017 all the missing data conditions and messages in Sub-Capacity reports are now standardized on the improved information originally introduced with the Multiplex Report.

1. SCRT V25 Reports no longer show an "overall" data collection percentage. It is not possible to illustrate the various different ways that data can be missing in a single percentage figure at the top of the report. The Classic report 95% threshold was never a good way to understand exactly what was happening, so it was deleted from the new reports. For the same reason the H5 section with its "missing LPAR" comments was also removed.
2. SCRT V25 Reports now have two new sections which report missing data in a more thorough manner. New sections H4 and H6 replace the old Data Collection % and H5 sections.
3. The H4 Missing LPAR Data Details section has two different types of messages, one dealing with mismatches between SMF70 and SMF89 records, and one dealing with LPARs which were seen to be active for a period of time but for which there was no SMF data supplied.

In samples below, the comments in red italics on the right are examples of why a message might have been issued by SCRT. **These are not examples of valid explanations for missing data!** The client must replace the "(required)" placeholder comment with the actual explanation, but it is possible that IBM will not accept the explanation as a valid reason for data to be missing.

==H4=====				
MISSING LPAR DATA DETAILS				
LPARs with unmatched SMF70 and SMF89 records				
	Detected	Resolved (missing hours)	Justification for low data collection (255 chars max)	
SYSA	31 Oct 2015 - 12:00	31 Oct 2015 - 13:00 (1 hour)	(required)	<i>1 hour, likely due to use below 1 hour so no SMF89</i>
SYSC	31 Oct 2015 - 12:00	31 Oct 2015 - 13:00 (1 hour)	(required)	<i>1 hour, likely due to use below 1 hour so no SMF89</i>
SYSE	22 Oct 2015 - 19:00	24 Oct 2015 - 07:00 (36 hours)	(required)	<i>many hours, possibly due to no SMF70s from no RMF</i>
Active LPARs with no SMF/SCRT89 records				
	Detected	Resolved (missing hours)	Justification for low data collection (255 chars max)	
TSTJ	18 Oct 2015 - 07:00	18 Oct 2015 - 19:00 (12 hours)	(required)	<i>TSTJ was active for 12 hours but had no data</i>
TSTK	02 Oct 2015 - 00:00	31 Oct 2015 - 13:00 (709 hours)	(required)	<i>the 2 TSTK rows tell us it was active the entire period</i>
TSTK	31 Oct 2015 - 14:00	02 Nov 2015 - 00:00 (34 hours)	(required)	<i>but only hour 13:00 on 31 Oct had SMF data!</i>
VMLNX	02 Oct 2015 - 00:00	02 Nov 2015 - 00:00 (744 hours)	(required)	<i>VMLNX was active the whole period but had no data</i>

With SCRT V25 Reports we now have a row in the report for each contiguous stretch of time when an LPAR had one type of record but not the other. SMF70 records are typically created 3 or 4 times per hour, so an LPAR doesn't have to be up very long to create at least one SMF70. SMF89 records are normally created at the end of each hour, so if a client keeps an LPAR up for less than an hour they will often be in the situation of having created one or more SMF70s but zero SMF89s, resulting in a 1-hour mismatch message in the report. It is possible for a client to carefully shut down their LPAR by forcing all pending SMF records to be written before the LPAR goes to sleep, but often with test LPARs clients neglect to do this.

[See the SYSA and SYSC messages in the "unmatched records" section of the example.]

If an LPAR has a mismatch between 70 and 89 records for more than an hour it is more likely due to a problem with RMF (or CMF) which caused no SMF70 records to be created for that period of time. If it is the case that SMF89 records are missing for a long period then it is likely that the client either forgot to include an SMF dataset when running SCRT, or possibly an SMF dataset got damaged or deleted.

[See the SYSE message in the "unmatched records" section of the example.]

When generating V25 reports SCRT is smart enough to "know" when an LPAR was active and when it was not, so the only time periods listed here are when it saw the LPAR was active but no SMF data was received from that period of time for that LPAR. Since the LPAR was definitely in use, an explanation is required as to why SMF data was not collected from that LPAR during that time. This is a difference in processing between SCRT V25 reports and Classic reports – an explanation of 'LPAR not in use' might have been accepted in the past but is not acceptable with an SCRT V25 report submission.

[See the TSTJ and TSTK messages in the "no records" section of the example.]

Differences in Missing Data messages between SCRT Classic and SCRT V25 Sub-Capacity Reports

It is possible a client is running something other than z/OS, z/VSE or z/TPF in an LPAR. When that is the case SCRT will always have a "no records" message for the entire reporting period which requires explanation, and the client should use an appropriate explanation such as:

- a) LPAR is a Coupling Facility
- b) LPAR was used for a non-production CBU Test
- c) LPAR is running Linux under z/VM

[See the VMLNX message in the "no records" section of the example.]

Running code in an LPAR which cannot create SMF data is an acceptable reasons for there to be no data. Using an LPAR for a contractually valid and approved CBU Test or Backup (DR) Test is another acceptable reason,

- 4. The H6 Missing CPC Data Details section lists the periods of time during the reporting period where no SMF data was supplied from any LPARs on the machine. The way that SCRT is able to tell if an LPAR is active but not being reported is through information in the SMF70 records from other LPARs.

But if there is an hourly interval where there are no SMF70 records at all, SCRT cannot tell if (1) the machine was active but the client supplied no data, versus (2) the machine was actually shut down and no LPARs were active. Therefore the client is required to explain any periods where no data was received. (Note: If there was an LPAR running and SMF89 records were collected without any SMF70s then SCRT would generate an H4 "mismatch" error instead of an H6 "no machine data" error.)

==H6=====				
MISSING CPC DATA DETAILS				
CPC with no SMF/SCRT89 data	Detected		Resolved (missing hours)	Justification for low data collection
2827-89F87	01 Sep 2015 - 00:00	02 Sep 2015 - 00:00 (24 hours)	(required)	

In this example it appears the client neglected to include the machine's data for the 1st of September which was the final day of the reporting period. SCRT V25 Reports will flag this kind of missing data mistake whereas the Classic SCRT reports would not have. Leaving out data from the final day of the reporting period is never acceptable.

- 5. If there are no missing data errors then the H4 and H6 sections will still appear in the Sub-Capacity Report, but they will indicate that there were no problems.

==H4=====				
MISSING LPAR DATA DETAILS				
All expected data collected				
==H6=====				
MISSING CPC DATA DETAILS				
All expected data collected				