

TIBCO® Object Service Broker for z/OS

Monitoring Performance

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Preface

TIBCO® Object Service Broker is an application development environment and integration broker that bridges legacy and non-legacy applications and data.

This manual provides detailed information about how to collect and analyze performance statistics for a TIBCO Object Service Broker environment. This manual explains how to obtain these statistics on the z/OS platform using TIBCO Object Service Broker tools and SMF records.

Topics

- [Related Documentation, page viii](#)
- [Typographical Conventions, page xiii](#)
- [Connecting with TIBCO Resources, page xv](#)

Related Documentation

This section lists documentation resources you may find useful.

TIBCO Object Service Broker Documentation

The following documents form the TIBCO Object Service Broker documentation set:

Fundamental Information

The following manuals provide fundamental information about TIBCO Object Service Broker:

- *TIBCO Object Service Broker Getting Started* Provides the basic concepts and principles of TIBCO Object Service Broker and introduces its components and capabilities. It also describes how to use the default developer's workbench and includes a basic tutorial of how to build an application using the product. A product glossary is also included in the manual.
- *TIBCO Object Service Broker Messages with Identifiers* Provides a listing of the TIBCO Object Service Broker messages that are issued with alphanumeric identifiers. The description of each message includes the source and explanation of the message and recommended action to take.
- *TIBCO Object Service Broker Messages without Identifiers* Provides a listing of the TIBCO Object Service Broker messages that are issued without a message identifier. These messages use the percent symbol (%) or the number symbol (#) to represent such variable information as a rules name or the number of occurrences in a table. The description of each message includes the source and explanation of the message and recommended action to take.
- *TIBCO Object Service Broker Quick Reference* Presents summary information for use in the TIBCO Object Service Broker application development environment.
- *TIBCO Object Service Broker Shareable Tools* Lists and describes the TIBCO Object Service Broker shareable tools. Shareable tools are programs supplied with TIBCO Object Service Broker that facilitate rules language programming and application development.
- *TIBCO Object Service Broker Release Notes* Read the release notes for a list of new and changed features. This document also contains lists of known issues and closed issues for this release.

Application Development and Management

The following manuals provide information about application development and management:

- *TIBCO Object Service Broker Application Administration* Provides information required to administer the TIBCO Object Service Broker application development environment. It describes how to use the administrator's workbench, set up the development environment, and optimize access to the database. It also describes how to manage the Pagestore, which is the native TIBCO Object Service Broker data store.
- *TIBCO Object Service Broker Managing Data* Describes how to define, manipulate, and manage data required for a TIBCO Object Service Broker application.
- *TIBCO Object Service Broker Managing External Data* Describes the TIBCO Object Service Broker interface to external files (not data in external databases) and describes how to define TIBCO Object Service Broker tables based on these files and how to access their data.
- *TIBCO Object Service Broker National Language Support* Provides information about implementing the National Language Support in a TIBCO Object Service Broker environment.
- *TIBCO Object Service Broker Object Integration Gateway* Provides information about installing and using the Object Integration Gateway which is the interface for TIBCO Object Service Broker to XML, J2EE, .NET and COM.
- *TIBCO Object Service Broker for Open Systems External Environments* Provides information on interfacing TIBCO Object Service Broker with the Windows and Solaris environments. It includes how to use SDK (C/C++) and SDK (Java) to access TIBCO Object Service Broker data, how to interface to TIBCO Enterprise Messaging Service (EMS), how to use the TIBCO Service Gateway for WMQ, how to use the Adapter for JDBC-ODBC, and how to access programs written in external programming languages from within TIBCO Object Service Broker.
- *TIBCO Object Service Broker for z/OS External Environments* Provides information on interfacing TIBCO Object Service Broker to various external environments within a TIBCO Object Service Broker z/OS environment. It also includes information on how to access TIBCO Object Service Broker from different terminal managers, how to write programs in external programming languages to access TIBCO Object Service Broker data, how to interface to TIBCO Enterprise Messaging Service (EMS), how to use the TIBCO Service Gateway for WMQ, and how to access programs written in external programming languages from within TIBCO Object Service Broker.

- *TIBCO Object Service Broker Parameters* Lists the TIBCO Object Service Broker Execution Environment and Data Object Broker parameters and describes their usage.
- *TIBCO Object Service Broker Programming in Rules* Explains how to use the TIBCO Object Service Broker rules language to create and modify application code. The rules language is the programming language used to access the TIBCO Object Service Broker database and create applications. The manual also explains how to edit, execute, and debug rules.
- *TIBCO Object Service Broker Managing Deployment* Describes how to submit, maintain, and manage promotion requests in the TIBCO Object Service Broker application development environment.
- *TIBCO Object Service Broker Defining Reports* Explains how to create both simple and complex reports using the reporting tools provided with TIBCO Object Service Broker. It explains how to create reports with simple features using the Report Generator and how to create reports with more complex features using the Report Definer.
- *TIBCO Object Service Broker Managing Security* Describes how to set up, use, and administer the security required for an TIBCO Object Service Broker application development environment.
- *TIBCO Object Service Broker Defining Screens and Menus* Provides the basic information to define screens, screen tables, and menus using TIBCO Object Service Broker facilities.
- *TIBCO Service Gateway for Files SDK* Describes how to use the SDK provided with the TIBCO Service Gateway for Files to create applications to access Adabas, CA Datacom, and VSAM LDS data.

System Administration on the z/OS Platform

The following manuals describe system administration on the z/OS platform:

- *TIBCO Object Service Broker for z/OS Installing and Operating* Describes how to install, migrate, update, maintain, and operate TIBCO Object Service Broker in a z/OS environment. It also describes the Execution Environment and Data Object Broker parameters used by TIBCO Object Service Broker.
- *TIBCO Object Service Broker for z/OS Managing Backup and Recovery* Explains the backup and recovery features of OSB for z/OS. It describes the key components of TIBCO Object Service Broker systems and describes how you can back up your data and recover from errors. You can use this information, along with assistance from TIBCO Support, to develop the best customized solution for your unique backup and recovery requirements.

- *TIBCO Object Service Broker for z/OS Monitoring Performance* Explains how to obtain and analyze performance statistics using TIBCO Object Service Broker tools and SMF records
- *TIBCO Object Service Broker for z/OS Utilities* Contains an alphabetically ordered listing of TIBCO Object Service Broker utilities for z/OS systems. These are TIBCO Object Service Broker administrator utilities that are typically run with JCL.

System Administration on Open Systems

The following manuals describe system administration on open systems such as Windows or UNIX:

- *TIBCO Object Service Broker for Open Systems Installing and Operating* Describes how to install, migrate, update, maintain, and operate TIBCO Object Service Broker in Windows and Solaris environments.
- *TIBCO Object Service Broker for Open Systems Managing Backup and Recovery* Explains the backup and recovery features of TIBCO Object Service Broker for Open Systems. It describes the key components of a TIBCO Object Service Broker system and describes how to back up your data and recover from errors. Use this information to develop a customized solution for your unique backup and recovery requirements.
- *TIBCO Object Service Broker for Open Systems Utilities* Contains an alphabetically ordered listing of TIBCO Object Service Broker utilities for Windows and Solaris systems. These TIBCO Object Service Broker administrator utilities are typically executed from the command line.

External Database Gateways

The following manuals describe external database gateways:

- *TIBCO Service Gateway for DB2 Installing and Operating* Describes the TIBCO Object Service Broker interface to DB2 data. Using this interface, you can access external DB2 data and define TIBCO Object Service Broker tables based on this data.
- *TIBCO Service Gateway for IDMS/DB Installing and Operating* Describes the TIBCO Object Service Broker interface to CA-IDMS data. Using this interface, you can access external CA-IDMS data and define TIBCO Object Service Broker tables based on this data.
- *TIBCO Service Gateway for IMS/DB Installing and Operating* Describes the TIBCO Object Service Broker interface to IMS/DB and DB2 data. Using this interface, you can access external IMS data and define TIBCO Object Service Broker tables based on it.

- *TIBCO Service Gateway for ODBC and for Oracle Installing and Operating*
Describes the TIBCO Object Service Broker ODBC Gateway and the TIBCO Object Service Broker Oracle Gateway interfaces to external DBMS data. Using this interface, you can access external DBMS data and define TIBCO Object Service Broker tables based on this data.

Typographical Conventions

The following typographical conventions are used in this manual.

Table 1 General Typographical Conventions



Convention	Use
code font	Code font identifies commands, code examples, filenames, pathnames, and output displayed in a command window. For example: Use <code>MyCommand</code> to start the foo process.
bold code font	Bold code font is used in the following ways: <ul style="list-style-type: none">• In procedures, to indicate what a user types. For example: Type admin.• In large code samples, to indicate the parts of the sample that are of particular interest.• In command syntax, to indicate the default parameter for a command. For example, if no parameter is specified, <code>MyCommand</code> is enabled: <code>MyCommand [enable disable]</code>
<i>italic font</i>	Italic font is used in the following ways: <ul style="list-style-type: none">• To indicate a document title. For example: See <i>TIBCO ActiveMatrix BusinessWorks Concepts</i>.• To introduce new terms. For example: A portal page may contain several portlets. <i>Portlets</i> are mini-applications that run in a portal.• To indicate a variable in a command or code syntax that you must replace. For example: <code>MyCommand PathName</code>
Key combinations	Key name separated by a plus sign indicate keys pressed simultaneously. For example: <code>Ctrl+C</code> . Key names separated by a comma and space indicate keys pressed one after the other. For example: <code>Esc, Ctrl+Q</code> .
	The note icon indicates information that is of special interest or importance, for example, an additional action required only in certain circumstances.
	The tip icon indicates an idea that could be useful, for example, a way to apply the information provided in the current section to achieve a specific result.

Table 1 General Typographical Conventions (Cont'd)


Convention	Use
	The warning icon indicates the potential for a damaging situation, for example, data loss or corruption if certain steps are taken or not taken.

Table 2 Syntax Typographical Conventions

Convention	Use
[]	<p>An optional item in a command or code syntax.</p> <p>For example:</p> <pre>MyCommand [optional_parameter] required_parameter</pre>
	<p>A logical OR that separates multiple items of which only one may be chosen.</p> <p>For example, you can select only one of the following parameters:</p> <pre>MyCommand param1 param2 param3</pre>
{ }	<p>A logical group of items in a command. Other syntax notations may appear within each logical group.</p> <p>For example, the following command requires two parameters, which can be either the pair param1 and param2, or the pair param3 and param4.</p> <pre>MyCommand {param1 param2} {param3 param4}</pre> <p>In the next example, the command requires two parameters. The first parameter can be either param1 or param2 and the second can be either param3 or param4:</p> <pre>MyCommand {param1 param2} {param3 param4}</pre> <p>In the next example, the command can accept either two or three parameters. The first parameter must be param1. You can optionally include param2 as the second parameter. And the last parameter is either param3 or param4.</p> <pre>MyCommand param1 [param2] {param3 param4}</pre>

Connecting with TIBCO Resources

How to Join TIBCOCommunity

TIBCOCommunity is an online destination for TIBCO customers, partners, and resident experts, a place to share and access the collective experience of the TIBCO community. TIBCOCommunity offers forums, blogs, and access to a variety of resources. To register, go to <http://www.tibcommunity.com>.

How to Access All TIBCO Documentation

You can access TIBCO documentation here:

<http://docs.tibco.com>

How to Contact TIBCO Support

For comments or problems with this manual or the software it addresses, please contact TIBCO Support as follows.

- For an overview of TIBCO Support, and information about getting started with TIBCO Support, visit this site:

<http://www.tibco.com/services/support>

- If you already have a valid maintenance or support contract, visit this site:

<https://support.tibco.com>

Entry to this site requires a user name and password. If you do not have a user name, you can request one.

Chapter 1 **Monitoring System Statistics**

This chapter describes how to monitor the TIBCO Object Service Broker system statistics.

Topics

- [Monitoring Via the Workbench, page 2](#)
- [Menu Item: Segment Statistics, page 4](#)
- [Menu Item: General Statistics, page 7](#)
- [Menu Item: Buffer Pool Statistics, page 10](#)
- [Menu Item: Users Logged On, page 12](#)

Monitoring Via the Workbench

Using the HURON_STATS Tool

You can use the [HURON_STATS](#) tool to display system monitoring information such as segment, general, and buffer pool statistics that have accumulated since the Data Object Broker started. This information is required for performance monitoring and problem determination.

Invoking HURON_STATS

Invoke the [HURON_STATS](#) tool from:

- A TIBCO Object Service Broker workbench, by typing HURON_STATS beside the EX execute rule option and pressing Enter
- The administrator workbench

From the Administrator Workbench

From the administrator workbench, do one of the following:

- Position the cursor beside the ST Statistics option and press Enter.
- Position the cursor beside the EX execute rule option, type HURON_STATS, and press Enter.

DOB Statistics Menu Illustrated

Using any one of the invocation methods discussed above invokes the following screen:

```
          DOB Statistics Menu
-----
_ Segment Statistics
_ General Statistics
_ Buffer Pool Statistics
_ Users logged on
```

PFKEYS: ENTER=SELECT 3=EXIT 12=EXIT

Accessing the Information

To access the information you want, position the cursor beside the option (for example, Segment Statistics) and press Enter. The appropriate screen appears. The following sections describe each of the options listed.



When viewing the statistics for any of the options, you can update the display at any time by pressing Enter. To view additional fields on some of the displayed screens, press PF11.

Menu Item: Segment Statistics

This menu item displays all the segments known to the Data Object Broker as defined in the DBDGEN.

Segment Status Summary Screen

Segment Status Summary							
Name	Id	Type	Status	Pages	Free	Read	Write
HURON	0	Page	Active	162000	21766	5819	121
SEG2	2	Page	Active	162000	95668	25	11
SEG3	3	Page	Active	3600	2960	0	1

PFKEYS: ENTER=REFRESH 3=EXIT 12=EXIT 6=PAGE STATS

Available Information

The following table describes the fields on the Segment Statistics Summary screen:

Field	Description
Name	The name of the Pagestore segment.
Id	The numeric identifier of the segment.
Type	The storage type (Page).

Field	Description
Status	The status of the segment: <ul style="list-style-type: none">• Active: The segment is online and available• Inactive: The segment is offline and unavailable• Quiesced: The segment is in the process of going offline• Browse: Segment in read-only mode
Pages	Total number of pages in the segment.
Free	Total number of free pages in the segment.
Read	Pages read since the Data Object Broker was started.
Write	Pages written since the Data Object Broker was started.

Viewing Detailed Statistics about Data Sets in a Segment

To view detailed statistics about the data sets in a particular segment, place your cursor beside one of the segment names and press PF6.

Pagestore Statistics for Segment Screen

The following example illustrates the Pagestore statistics for SEG2. Each row on the screen corresponds to one page data set, ordered by data set number. If you are not using a MOD5 display, press PF11 to view additional fields on the screen.

Page Store Statistics for Segment: SEG2						
Volume	Total	Used	Free	%Free	Read	Write
ASL026	126000	42435	83565	66.32	22	6
ASL048	36000	23897	12103	33.61	3	5

PFKEYS: ENTER=REFRESH 3=EXIT 12=EXIT

Available Information

The following table describes the fields on the Pagestore Statistics screen:.

Field	Description
Volume	Symbolic name of the volume where the data set resides.
Total	Total number of pages in the data set.
Used	Number of used pages in the data set.
Free	Number of free pages in the data set.
%Free	Percentage of pages that are free.
Read	Pages read since the Data Object Broker was started.
Write	Pages written since the Data Object Broker was started.
Data	Number of data page reads and writes since Data Object Broker startup.
Indx	Number of index page reads and writes since Data Object Broker startup.
Misc	Other reads and writes, such as for rules, since Data Object Broker startup.

Menu Item: General Statistics

This menu item displays a number of metrics to identify the accumulated workload on TIBCO Object Service Broker.

General Statistics Screen

Data Object Broker: General Statistics							
Msg Traffic		Destination		Logical		Physical	
Send:	76055	Ph0:	326	Get:	6348073	Read:	5868
Recv:	76072	Ph1:	75394	Put:	1681	Write:	133
		Ph2:	528				
Logon:	137	IMS:	0	GetF:	32	Ctab:	478
Logoff:	75	Oper:	93	PutF:	16	Rule:	1131
Snap:	0			Lock:	13817		
				Unlk:	758		
				Ctab:	77346		
				Rule:	53338		
PFKEYS: ENTER=REFRESH 3=EXIT 12=EXIT							

Values to Monitor

You should monitor the Physical Read and Physical Ctab rates on a regular basis. If the ratio of Physical/Logical Reads is too high, it indicates the Resident Page Pool could be too small for the workload and transaction mix. Similarly, if the ratio of Physical/Logical Ctabs is too high, it indicates the CTAB Pool could be too small for the workload and transaction mix. All other values on the display are informational only and, within the context of this display, do not represent tuning information.

You set the size of the Resident Page Pool with the RESIDENTPAGES Data Object Broker parameter and the size of the CTAB Pool with the CTABRESIDENT Data Object Broker parameter.

See Also *TIBCO Object Service Broker Parameters* for information about the Data Object Broker parameters.

Available Information

The fields on the General Statistics screen are organized in the following four groups:

- Msg Traffic
- Destination
- Logical
- Physical

The fields for each group are described in the following sections.

Msg Traffic Group

The following table describes the fields in the Msg Traffic group:

Field	Description
Send	Number of messages sent by the Data Object Broker.
Recv	Number of messages received by the Data Object Broker.
Logon	Number of logins processed.
Logoff	Number of logouts processed.
Snap	Number of snap dumps processed.

Destination Group

The following table describes the fields in the Destination group:

Field	Description
Ph0	Number of transactions recovered at startup.
Ph1	Number of query transactions.
Ph2	Number of update transactions.

Field	Description
IMS	Number of messages from an IMS TM Execution Environment.
Oper	Number of operator events processed.

Logical Group

The following table describes the fields in the Logical group:

Field	Description
Get	Number of get page requests.
Put	Number of updated pages written to the page management memory.
GetF	Number of free page gets.
PutF	Number of released free pages.
Lock	Number of logical lock requests.
Unlk	Number of logical unlock requests.
Ctab	Number of control table requests satisfied from the resident Ctable buffers. This table is used to store the definitions of the tables.
Rule	Number of rule page requests.

Physical Group

The following table describes the fields in the Physical group:

Field	Description
Read	Number of pages reads from DASD.
Write	Number of pages written to DASD (at checkpoint time).
Ctab	Number of control table requests.
Rule	Number of rule page reads.

Menu Item: Buffer Pool Statistics

This menu item displays statistics about some of the TIBCO Object Service Broker buffer pools.

Buffer Pool Statistics Screen

Data Object Broker: Buffer Pool Statistics					
Pool	Get	Free	Wait	Used	NQ
COMM	194	101	0	93	0
SESS	79669	79669	0	0	0
PAGE	6387995	6387995	0	0	0
LOCK	590	569	0	21	0
WORK	387	386	0	1	0
XTAB	149	149	0	0	0

PFKEYS: ENTER=REFRESH 3=EXIT 12=EXIT

TIBCO Object Service Broker Buffer Pools

The following table lists six of the TIBCO Object Service Broker buffer pools and their functions:

Buffer Pool	Function
COMM	Pool for active connections to the Data Object Broker.
SESS	Pool for session units of work, that is, queries or commits.
PAGE	Pool for page image work space used for transaction processing.
LOCK	Pool for the logical lock management.

Buffer Pool	Function
WORK	Pool for small temporary work space.
XTAB	Pool for the screen and report table management.

Information Available on the Buffer Pool Statistics Screen

The following table lists a description of each field on the Buffer Pool Statistics screen:

Field	Description
Pool	Buffer pool identifier.
Get	Number of acquired buffers.
Free	Number of free buffers.
Wait	Number of waits for a buffer.
Used	Number of buffers currently in use.
NQ	Number of requests waiting for a buffer.
Err	Number of errors associated with this buffer pool.
MaxU	Maximum number of buffers used in this pool.
MaxC	Maximum number of requests queued for this buffer pool.

Menu Item: Users Logged On

This menu item displays the number of users logged on to TIBCO Object Service Broker. If the user profile is in use, the display includes the user ID, name, and telephone number of the user. If the user profile is not being used, only the user ID and user type appear.

Users Logged on Screen

Users logged on			

80001	Henry Smith	416-655-3322	TSO User
99999	Mary Rotterdam		CICS User
81015	Albert Hunter	905-467-8800	TSO User
80000	L. Chang	905-467-8970	TSO User
93258	George Bigfall	905-467-8800	CICS User
99562	C. Ross		CICS User
80004	Joe Mann	905-467-8433	TSO User
85003	S. Smith	905-467-8622	TSO User
96743	Donald Fireworker	416-655-3322	TSO User
86042	Harry Pall	905-467-8800	CICS User
91999	T. Th'oy Ho	905-467-8800	TSO User
87811	Krista Murray	905-467-8988	TSO User
98744	Gilbert Chester		TSO User
99199	Kim Wong	416-655-3322	CICS User
84290	John Patterson	416-655-3322	CICS User
84921	W. Walsh	905-467-8876	TSO User
Number of users logged on: 19			
Maximum number of users : 150			
PFKEYS: ENTER=REFRESH 3=EXIT 12=EXIT			

You can also obtain information about logged on users directly from the administrator’s workbench by doing one of the following:

- Place the cursor beside the DU Display Users option and press Enter.
- Type [DISPLAY_USERS](#) beside the EX Execute Rule option and press Enter.

Chapter 2

Additional TIBCO Object Service Broker Tools

This chapter describes additional tools used to monitor the performance of TIBCO Object Service Broker.

Topics

- [Examining the Effects of Rule Changes, page 14](#)
- [Monitoring Message Traffic Data, page 16](#)
- [Monitoring Security Performance, page 18](#)
- [Improving TIBCO Object Service Broker Performance, page 21](#)

Examining the Effects of Rule Changes

Using the @SESSIONCOUNTS Table

The @SESSIONCOUNTS(0) table can be used to optimize applications and monitor the performance of rules by examining the effects of rule changes. It provides data on CPU usage and message traffic.



CPU time represents the total CPU time used by the address space. It is not valid for a session in a multi-user environment, for example, CICS, when other users are active.

Available Information

The following table describes the fields of the @SESSIONCOUNTS table. Fields not listed in this table are reserved.

Field	Description
USERID	Session user ID.
LOCALMESSAGES	Number of messages sent to the local node.
LOCALDELTA	Increment in local message traffic since the last access to the table.
REMOTEMESSAGES	Number of messages sent to a remote node.
REMOTEDELTA	Increment in remote message traffic since the last access to the table.
TABLECALLS	Number of times a TIBCO Object Service Broker table was accessed.
TABLECALLDELTA	Increment in the number of table calls since the last access to the table.
CPUSECONDS	Address space (TCB) time. This value is obtained from the z/OS ASCB structure and is generally reliable within +/- 3%.
SYSTEMSECONDS	SRB time. This value is obtained from the z/OS ASCB structure and is generally reliable within +/- 3%.
CPUDELT	Increment in address space time since the last access to the table.
SYSTEMDELTA	Increment in SYSTEMSECONDS (SRB) time since the last access to the table.

See Also *TIBCO Object Service Broker Shareable Tools* for more information on the [@SESSIONCOUNTS](#) table.

Monitoring Message Traffic Data

Using the @TRACEMESSAGES Table

The [@TRACEMESSAGES\(0\)](#) table provides message traffic data between the Execution Environment and its Data Object Broker. You can use this Message Trace facility, with TIBCO Support assistance, as a diagnostic tool and for tuning the performance of your applications.



Message traffic generated by the [PROCESS_TABLE](#) tool is not collected because this tool does not use the FORALL statement. For more information about the [PROCESS_TABLE](#) tool, refer to *TIBCO Object Service Broker Shareable Tools*.

Invoking the Message Trace Facility

To invoke the Message Trace facility, complete the following steps:

1. Position the cursor beside the ED edit table option on the workbench.
2. Type [@TRACEMESSAGES\(0\)](#).
3. Press Enter.
4. Set the TRACE field to Y.

Refining Collection of Message Traffic

Setting the TRACE field to Y in the [@TRACEMESSAGES\(0\)](#) table causes the messages to be logged in the [@MESSAGETRACE](#) session table. You can refine the collection of message traffic data by modifying control fields in the [@TRACEMESSAGES\(0\)](#) table.

Control Fields to Refine the Collection of Message Traffic

The following control fields can be modified to refine the collection of message traffic. Fields not listed in this table are reserved.

Field	Description
TRACE	Y means trace all messages in @TRACEMESSAGES table. This entry is ignored if MESSAGELOG=Y.
TABLE	Only trace access to the table named.

Field	Description
REQUEST	Only trace access of the named request type (for example, N=FORALLs). Can be specified with or without a table name.
SHOWSYNC	Y means show SYNC messages.
COUNT	The maximum number of rows that the system creates in @MESSAGETRACE and @MESSAGEDUMP session (SES) tables. When the number of rows in the table reaches the number given in COUNT , the table is cleared and restarted.
DUMP	Y means create HEX dump of messages in table @MESSAGEDUMP ; ignored if MESSAGELOG =Y. Use this field only on the advice of TIBCO Support.
OUTDUMPLIMIT	When dumping, the maximum number of bytes to show from the outbound message.
RETURNDUMPLIMIT	When dumping, the maximum number of bytes to show from the inbound message.
MESSAGELOG	Y means create a HEX dump of all messages in the message log. It suppresses inserts to tables and can be used to prove that table inserts are not interfering with other processing. Use this option only when advised by TIBCO Support.
KEEPMESSAGELOG	Y means show all messages on message log, including those normally erased by TIBCO Object Service Broker. It causes the message log to increase in size dramatically. Use only when advised by TIBCO Support.

Monitoring Accesses to Tables

Unless you specifically route messages to the message log or to the [@MESSAGEDUMP](#) table, all messages are logged in the session table [@MESSAGETRACE](#). By analyzing the occurrences in the [@MESSAGETRACE](#) table, you can determine the access paths requested by the Execution Environment for each table access. This information can be used to optimize applications by using different variations of table access statements.

See Also *TIBCO Object Service Broker Shareable Tools* for a description of the fields in the [@MESSAGETRACE](#) table.

Monitoring Security Performance

Using the SECSTATS Tool

The SECSTATS tool is used for monitoring security performance. With SECSTATS you can determine the optimal amount of memory to be used for bound security storage. The availability-to-demand ratios on various memory resident security control lists can be useful indicators of related storage usage performance.

Executing SECSTATS

To execute SECSTATS, do the following:

- 1. Position your cursor beside the EX execute rule option.
- 2. Type SECSTATS.
- 3. Press Enter.

The SECSTATS screen appears as shown in the following example. To view additional fields, press PF11.

Current statistics from bound security									
Size of bound security = 200948 bytes or 196K									
Address of bound security = B15EF08									
List	Address	Entry Size	Entries		Storage		Hits	Misses	Ratio
			Curr.	Max.	Used	Alloc.			
OBJSEC	B168C2C	42	23	975	966	40950	108	24	81.8
OBJACL	B178A0B	35	43	1872	1505	65520	192	43	81.7
TBLACL	B188D64	102	6	642	612	65484	2	6	25.0
USRSEC	B18C788	18	6	796	108	14328	15	8	65.2
OBJSEC : Object security									
OBJACL : Object access control									
TBLACL : Parameterized tables access control									
USRSEC : Userid and security administrator									
USERSEC : User security									
PFKEYS: 3=EXIT 12=EXIT									

Available Information

The following table describes the fields on the SECSTATS screen:

Field	Description
List	Name of the security information area.
Address	Memory location of the first item in the particular list.
Entry Size	Number of bytes occupied by each entry.
Curr. Entries	Number of entries currently in use.
Max. Entries	Maximum entries used in this Execution Environment.
Used Storage	Bytes used by entries currently active.
Alloc. Storage	Bytes allocated by Execution Environment parameter setting.
Hits	Number of times that allocated space was available to activate an entry.
Misses	Opposite of Hits, that is, times that space was not available.
Ratio	Percentage quotient of Hits divided by (Hits + Misses).
Times List Flushed	Number of times that the list for a particular security information area was flushed.
Last Time List Flushed	Time of day when the list was last flushed.

Execution Environment Parameters

The following table shows the Execution Environment parameters that correspond to the bound security data lists shown in the SECSTATS screen:

List Name	Execution Environment Parameter
OBJSEC	SECOBJSIZE
OBJACL	SECACLSIZE
TBLACL	SECPACLSIZE

List Name	Execution Environment Parameter
USRSEC	SECADMINSIZE
USERSEC	SECUSERSIZE

See Also *TIBCO Object Service Broker Parameters* for a description of the Execution Environment parameters.

Improving TIBCO Object Service Broker Performance

Running multiple query tasks improves throughput by allowing more than one query task (APPLTASK) to run in parallel. One query task is the default and normal setting. Up to eight are allowed. With high message volumes or with volumes that peak at certain times, you may want to run multiple query tasks.

To determine if you can benefit from running multiple query tasks, you can do either of the following:

- View a profile of the number of messages waiting to be processed by the Query Task. To do this, use the Profile Display option of the Administration menu and select QUERY ECB WAIT PROFILE.
- Use the S6BSMFQT (Query Task CPU Usage Analysis) utility, which examines your SMF 26 records and reports its findings. To produce these records, you give a value greater than zero to the SMF26INTERVAL Data Object Broker parameter.

We recommend running multiple query tasks if your queue shows more than one transaction waiting for the query task for a significant amount of time. The number of query tasks is set using the MAXQUERY Data Object Broker parameter. If you need advice, contact TIBCO Support through our web site at <http://support.tibco.com>.

See Also [Chapter 5, Interpreting Data Object Broker SMF Records, on page 93](#) for a description of the SMF 26 records.

TIBCO Object Service Broker for z/OS Installing and Operating for information on the Administration menu.

TIBCO Object Service Broker for z/OS Utilities for a description of the S6BSMFQT (Query Task CPU Usage Analysis) utility.

TIBCO Object Service Broker Parameters for a description of the Data Object Broker parameters.

Chapter 3 **Performance Monitor**

This chapter describes the TIBCO Object Service Broker Performance Monitor and its operations.

Topics

- [Overview, page 24](#)
- [Running the Performance Monitor, page 25](#)
- [Performance Monitor Screens on page 26](#)

Overview

The TIBCO Object Service Broker Performance Monitor is an application that you can use to monitor a multi-user Execution Environment on a real-time basis in a z/OS environment.

The Performance Monitor is a menu-driven application. You navigate in the toolbox primarily using individual PF keys from a 3270 device. You select a display by choosing the appropriate PF key to invoke that option. For example, from the initial main menu you would select PF2 to display the actual configuration settings for the Execution Environment being monitored.

Depending on the function selected, some screens contain scrollable screen tables. Other functions use wide 3270 screens that can be viewed by scrolling right and left based on the indicated PF keys. One function that uses this option is the displaying of active users, which is selected with PF9 from the main menu.

Prerequisites

The Performance Monitor is installed with TIBCO Object Service Broker.

You should make sure that you have the latest TIBCO Object Service Broker Hotfix installed before using the Performance Monitor.

Types of Information Displayed

The Performance Monitor is capable of displaying information from a number of functional areas within a multi-user Execution Environment. Today this would include a CICS or Native Execution Environment (NEE) operating in a z/OS environment. General categories of information that appear are as follows:

- Configuration parameter settings for the Execution Environment
- Resource consumption for the Execution Environment for CPU, I/O, and Virtual Storage
- Detailed information of users connected to the region
- Binding information on rules libraries, tables, and security
- The active TIBCO Object Service Broker user on each TCB and what rule is currently executing for that user
- Global and detailed SMF information for the Execution Environment

Running the Performance Monitor

To start the Performance Monitor:

1. Log in to the TIBCO Object Service Broker system as a level-7 user.
2. Execute the HMON rule.

Performance Monitor Screens

General Header for Screens

2007-03-16	Performance Monitor	15:11:27
HDRB ADDR : A4A2000	EE JOB NAME : USR20A22	TDS NAME : HH18SRV2
EE Type : CICS	DOB JOB NAME : USR20P9	NODENAME : USR20

The information displayed is as follows:

Field	Description
HDRB ADDR	The hex address of the Execution Environment Block (HDRB) that is one of the main anchor blocks in the Execution Environment.
EE JOB NAME	The jobname for this Execution Environment, for example, the CICS jobname for a CICS region.
TDS NAME	The communication ID for the Data Object Broker. The Execution Environment specifies this in the TDS Execution Environment parameter. The Data Object Broker specifies this in the VTAMAPPLID parameter.
EE Type	The Execution Environment type. Valid types are CICS, Native, and TSO.
DOB JOB NAME	The jobname for the Data Object Broker to which this Execution Environment is connected.
NODENAME	The node name of the local node used for TIBCO Object Service Broker distributed processing.

Main Menu

The monitor main menu appears after the HMON rule is executed. You select the individual options of the monitor by using the indicated PF key.

2007-03-16	Performance Monitor	11:53:06

MAIN MENU		

PF2	Configuration	
PF3	Storage	
PF4	User List	
PF5	Resource Usage	
PF6	Binding	
PF9	Display Active Users	
PF10	SMF Stats & Tran Mon	
PF11	ObjectStar Tools	
PF12	Exit	
PF14	Storage Dump - HDRB	
PF15	Storage Dump - WALIST	
PF16	Workbench	
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Configuration Settings

2007-03-16	Performance Monitor	12:15:13

CONFIGURATION		

PF2	Region - TCB/MEM/SMF/LIMITS	
PF4	Region - Sort (EXT / INT)	
PF5	Signon - LIB/TEST/BROWSE/PATH	
PF9	Session / Trans Info - Limits	
PF12	Main Menu	
PF22	Exit	

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This menu reads the in-storage control blocks used for configuration settings. There are various places that these configuration parameters are set as shown in the following list:

- The EECONFIG install job that assembles the PARMXXXX members.
- The parameters supplied in the HRNIN DD card.
- Session parameters specified at the start of a TIBCO Object Service Broker session.
- If there is no explicit specification, system defaults are taken.



You can use this to insure that a parameter is in fact set as you want.

See Also *TIBCO Object Service Broker Parameters* for a list of the available parameters.

Execution Environment Parameter Display

2007-03-16		Performance Monitor		12:15:25

Region Level Parameters				

TCB's	Allocated	STAE : Y	TDS : HH1SRV2	MDL : OSB9999

Executor	: 1	BINDING		
File I/O	: 0	-----		
IMS SERVER	: 1	REGIONRULESIZE : 1835008		
SORT	: 0			
MISC	: 0	REGIONTABLESIZE : 524288		
Initiator	: 2			
OPERATOR	: 1			

SMF RECORDING		SECURITY		

Subtype	: 255	SECACLSIZE : 65536	SECPACLSIZE : 65536	
Detail	: NO	SECADMINSIZE : 14336	SECOBJSIZE : 40960	
Performance	: NO		SECUSERSIZE : 14336	

PF12=MAIN, PF2=TCB, PF22=GOODBYE, PF4=SORT, PF5=LIB, PF9=SESS				

TCBs

Executor	Set by the TASKEXECNUM Execution Environment parameter and is the number of executor TCBs available.
File I/O	Set by the TASKFILENUM Execution Environment parameter and is the number of file TCBs available.
IMS Server	Set by the TASKIMSNUM Execution Environment parameter and is the number of IMS/DB gateway TCBs available.
SORT	Set by the TASKSORTNUM Execution Environment parameter and is the number of TCBs available for sorting using an external sort.
MISC	Set by the TASKMISCNUM Execution Environment parameter and is the number of TCBs available for miscellaneous activities such as OAI initialization and termination.

Initiator	Set by the TASKINITNUM Execution Environment parameter and is the number of TCBs available for session initiation and termination.
OPERATOR	Set by the TASKOPERNUM Execution Environment parameter and is the number of TCBs available for servicing operator requests.

SMF Recording

Subtype	Set by the SMFTYPE Execution Environment parameter. This is the SMF record number that is used for TIBCO Object Service Broker SMF records.
Detail	Set by the SMFDETAIL Execution Environment parameter and specifies whether subtype 72 detail statistics are to gathered.
Performance	Set by the SMFPERFORMANCE Execution Environment parameter and specifies whether the performance section of the subtype 72 record is to be completed.

Communications

STAE	Set by the STAE or NOSTAE Execution Environment parameter and specifies whether the session should run with ESTAEs.
TDS	Set by the TDS Execution Environment parameter and specifies the name of the Data Object Broker that this Execution Environment is connected to.
MDL	Set by the MDL Execution Environment parameter and specifies the model to be used for the Execution Environment side of the Execution Environment to Data Object Broker communication.

BINDING

REGIONTABLESIZE	Set by the REGIONTABLESIZE Execution Environment parameter and used to getmain storage for binding table data and definitions.
POOLSIZE (appears only if there are servers running in the Execution Environment)	Set by the POOLSIZE server parameter and is used to getmain storage for servers.

SECURITY

SECACLSIZE	Set by the SECACLSIZE Execution Environment parameter. This specifies the size of the discretionary permission list of TIBCO Object Service Broker objects.
SECADMINSIZE	Set by the SECADMINSIZE Execution Environment parameter. This specifies the size of the area to contain a table of users and their security administrators.
SECPACLSIZE	Set by the SECPACLSIZE Execution Environment parameter. This specifies the size of the discretionary permission access control list for parameterized tables.
SECOBJSIZE	Set by the SECOBJSIZE Execution Environment parameter. This specifies the size of the TIBCO Object Service Broker object security information area.
SECUSERSIZE	Set by the SECUSERSIZE Execution Environment parameter. This specifies the size of the area to contain the user basic security information. There is one entry for each user logged in. When an entry is built, the entry remains in the bound area for the life of the Execution Environment. Note You must press PF8 to see the USERSEC statistics on a 3270 Mod 3.

PF Key Commands

The PF key choices provide direct entry into other configuration screens without going to the configuration menu.

Execution Environment Sort Display

2007-03-16	Performance Monitor	12:18:37

Region Level Parameters		

EXTERNAL SORT	Program Name : SORT	Tasks : 0
	MSGPRT Option : NONE	
	UNIT for SORTWK : SYSDA	
	Allocation - PRIM : 20	
	CYLINDERS - SEC : 30	
	MAX Sortwk Files : 3	
	MAX Memory SORT PGM : 249856	
INTERNAL SORT	MAX PAGES for Rows : 500	
	MAX Memory INCORE : 4194304	
	# Concurrent Sorts : 5	
PF12=MAIN , PF2=TCB , PF22=GOODBYE , PF4=SORT , PF5=LIB , PF9=SESS		

External Sort

Program Name	Name of the external sort program name; for example, SORT.
MSGPRT Option	Option set by the SORTPRINT Execution Environment parameter. This is used for external sort diagnostic messages.
UNIT for SORTWK	The z/OS unit specified in the SORTUNIT Execution Environment parameter that is the default unit used for sort work areas.
Allocation CYLINDERS	PRIM – Primary allocation for sort work data sets set by the TEMPRIMARYCYL Execution Environment parameter. SEC – Secondary allocation for sort work data sets set by the TEMPSECONDARY Execution Environment parameter.

MAX Sortwk Files	Maximum number of sort work files allowed. Set by the SORTWORKFILESMAX Execution Environment parameter.
MAX Memory SORT PGM	Limit for storage that the external sort program can use. Set by the SORTEXTMEMMAX Execution Environment parameter.

Internal Sort

MAX PAGES for Rows	Maximum number of 4 KB pages the internal sort processes before switching to external sort. This is set by the SORTINTPAGESMAX Execution Environment parameter.
MAX Memory INCORE	Maximum amount of in-core memory an internal sort is allowed to consume. Set by the SORTINTMEMMAX Execution Environment parameter.
# Concurrent Sorts	Maximum allowed number of concurrent sorts. This is set by the SORTINTNUMMAX Execution Environment parameter.

PF Key Commands

The PF keys provide a fast path to other configuration screens.

Execution Environment LIB/Search Display

2007-03-16		Performance Monitor		12:19:21	

Region Level Parameters					

	BUILTINS		INSTALLATION		SYSTEM

No. RULES	192		8192		8192
Library			SITE		COMMON

SEARCH PATH : S					
EXECUTE MODE : Y					
BROWSE FLAG : Y					
TEST FLAG : N					
DB2LOG : N					
STATISTICS : N					
DEBUG : N					
LOGONRULENAME : LOGONHURON					
PF12=MAIN , PF2=TCB , PF22=GOODBYE , PF4=					
PF5=LIB , PF9=SESS					

Information Displayed

No. RULES Library	BUILTINS	The estimated number of builtins used to build a hash table for quick lookup. Set by the BLTINNUM Execution Environment parameter.
	INSTALLATION	The estimated number of installation library rules. Used to build a hash table for quick lookup. Set by the INSTLIBNUM Execution Environment parameter.
	SYSTEM	The estimated number of system library rules. Used to build a hash table for quick lookup. Set by the SYSLIBNUM Execution Environment parameter.
SEARCH PATH	Shows the default search path set by the SEARCH Execution Environment parameter.	

EXECUTE MODE	Obsolete. Used to show the level of syntax checking set by the EXECMODE parameter, which is no longer in use.
BROWSE FLAG	Shows the default browse mode set by the BROWSE/NOBROWSE Execution Environment parameter.
TEST FLAG	Shows the default test mode set by the TEST/NOTEST Execution Environment parameter.
DB2LOG	Shows the default for DB2 logging used to build Static SQL. This is set by the DB2LOG server parameter.
DEBUG	Shows the setting of the debug option that is set by the DEBUG Execution Environment parameter.
LOGONRULENAME	Shows the default login rule name and is set by the LOGONRULENAME Execution Environment parameter.

PF Key Commands

The PF keys provide a fast path to other configuration screens.

Execution Environment SESS/TRANS Display

2007-03-16		Performance Monitor		12:20:55	

Session / Transaction Level Parameters					

MEMORY MAX		TAM ROW BUFFER => MIN : 4096			
-----		MAX : 12288			
SESSION	: 16777216	SESS TABLE BUFFER SIZE: 8192			
TRANSACTION	: 16777216	SESS MAX TABLE SIZE : 65535			
MSGLOG	: 2097152	SESS FILE MAXIMUM : 64			

PRINTER	DEST : LOCAL	CLASS		: Y	

STATS COLLECTION :		N	# STATS RECORDS		: 200

----- EXECUTOR SETTINGS -----					
EXECMODE	: Y	BROWSE	: Y	TEST	: N
Hash Size	: 127	Scope Size	: 2048		
Local Name Size	: 12288	Stack Size	: 153600		
Local Size	: 153600	Trans Nesting:	9		

PF12=MAIN, PF2=TCB, PF22=GOODBYE, PF4=					

Information Displayed

MEMORY MAX	SESSION	The setting for the SESSIONMEMMAX Execution Environment parameter, which limits the total session memory one user can use.
	TRANSACTION	The setting for the TRANSACTIONMEMMAX Execution Environment parameter, which limits the total transaction memory one transaction can use.
	MSGLOG	The setting for the MSGLOGMAX Execution Environment parameter, which limits the total memory one user can use for MSGLOG memory.
TAM ROW BUFFER	MIN	The setting for the TAMBMIN Execution Environment parameter, which sets the minimum buffer size for a data row.
	MAX	The setting for the TAMBMAX Execution Environment parameter, which sets the maximum buffer size for a data row.
SESS MAX TABLE SIZE	The setting for the TAMBSTS Execution Environment parameter, which sets the buffer size for session tables.	
SESS FILE MAXIMUM	The setting for the SESSIONFILEMAX Execution Environment parameter, which controls the maximum number of data sets a user can have open at one time.	
PRINTER	DEST	The setting for the PRINTDEST Execution Environment parameter, which sets the default print destination.
	CLASS	The setting for the PRINTCLASS Execution Environment parameter, which sets the default print class.
STATS COLLECTION	Obsolete. Used to be the setting for the STATS parameter, which controlled the production of interpreter statistics.	
# STATS RECORDS	The setting for the STATSBUF Execution Environment parameter, which controls how many statistics buffers each user has allocated. Each buffer is 160 bytes in length.	

EXECMODE	Obsolete. Used to be the setting for the EXECMODE parameter, which controlled the level of default syntax checking.
BROWSE	The setting for the BROWSE Execution Environment parameter, which controls the default browse mode of a transaction.
TEST	The setting for the TEST Execution Environment parameter, which controls the default test mode of a transaction.
SEARCH PATH	The setting for the SEARCH Execution Environment parameter, which controls the default search path for the first rule to be executed.
Hash Size	The setting for the EXECHASHSIZE Execution Environment parameter, which specifies the number of executor rule name hash table buckets.
Scope Size	The setting for the EXECSCOPESIZE Execution Environment parameter, which specifies the number of 4 byte items in the executor scope stack.
Local Name Size	The setting for the EXECLOCALNAMESIZE Execution Environment parameter, which is the size of the local variable name storage area.
Stack Size	The setting for the EXECSTACKSIZE Execution Environment parameter, which is the size of the executor runtime stack.
Local Size	The setting for the EXECLOCALSIZE Execution Environment parameter, which sets the size of the executor local variable storage.
Trans Nesting	The setting for the TRANMAXNUM Execution Environment parameter, which limits the maximum number of transactions allowed in a stream of transactions.

PF Key Commands

The PF keys provide a fast path to other configuration screens.

Storage Subsection

2007-03-16	Performance Monitor	12:46:31

STORAGE		

PF2	Storage Segments Used/Alloc	
PF3	Storage Pools	
PF12	Main Menu	
PF22	Exit	

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The storage subsection shows the TIBCO Object Service Broker storage manager’s view of virtual storage, which it manages. The first option shows the allocated versus use statistics for storage segments getmained from z/OS. The second option shows what type of storage is suballocated from each of the storage segments. Most of the storage used is getmained from extended private storage subpool 52. Storage getmained from 24 bit storage is gotten in 8 KB pieces and use is minimal. Most below-the-line storage is obtained to service older file access methods (for example, QSAM).

Storage SSB Display

2007-03-16		Performance Monitor		15:11:27	
<hr/>					
HDRB ADDR : A4A2000		EE JOB NAME : USR20A22		TDS NAME : HH18SRV2	
EE Type : CICS		DOB JOB NAME : USR20P9		NODENAME : USR20	
<hr/>					
STORAGE UTILIZATION - STORAGE SEGMENTS					
BELOW 16M	SEGSIZE (K)	BLOCKSIZE(K)	ALLOCATED(K)	IN USE(K)	
N	1024	4	1024	28	
N	1024	64	1024	512	
N	1024	256	7168	5376	
<hr/>					
Totals			9216	5916	
<hr/>					
PF12=MAIN , PF2=SSB , PF22=GOODBYE , PF3=SPD					

The SSB display shows the TIBCO Object Service Broker storage utilization for TIBCO Object Service Broker managed virtual storage. Most storage is obtained from z/OS subpool 52 in extended storage. There is one set of storage allocated from below the 16 MB line and is noted by the Below flag being set to Y. This is allocated in 8 KB pieces. When a segment appears on the allocated display, it is not returned to z/OS via a freemain until the Execution Environment is recycled or, in the case of CICS, a HTRM transaction is run. The storage is available for TIBCO Object Service Broker use during this time.

Field	Description
BELOW 16M	Y – Flag indicates storage is 24-bit storage. N – Flag indicates storage is extended 31-bit storage
SEGSIZE	The size of TIBCO Object Service Broker virtual storage segment size in KB. TSO and batch have a segment size of 256 KB. CICS and the Native Execution Environment have a segment size of 1 MB. All allocation for segments below the 16 MB line are 8 KB.
BLOCKSIZE	The block size of each pool of segments in KB.

Field	Description
ALLOCATED	The amount of virtual storage getmained from z/OS that is available to be given out by the TIBCO Object Service Broker storage manager in KB.
IN USE	The amount of TIBCO Object Service Broker managed virtual storage in use in KB.

PF Key Commands

The PF keys provide a fast path to other storage screens.



This display can be used to find the high-water virtual-storage mark for the TIBCO Object Service Broker storage manager. The allocated total is this high-water mark.

Storage Standard Display

2007-03-16		Performance Monitor		15:11:35	

HDRB ADDR :	A4A2000	EE JOB NAME :	USR20A22	TDS NAME :	HH18SRV2
EE Type :	CICS	DOB JOB NAME :	USR20P9	NODENAME :	USR20

STORAGE UTILIZATION - STORAGE POOLS					
DESCRIPTOR NAME:	BLKSIZE(K)	REC SIZE	TOTAL USED	Shared	Above
STORAGE_MANAGER	64	64	7104	Y	Y
TRANSACTION	256	0	1121848	N	Y
SESSIONWORKAREAS	256	4096	8192	Y	Y
SHORTSTACKSEGMENT	256	16384	16384	Y	Y
EVENTWORKAREA	256	24576	49152	Y	Y
STACKSEGMENTS	256	32768	557056	Y	Y
DISPXFERSCRROWS	256	16384	49152	N	Y
\$MEMDESCRIPTORS	64	256	512	Y	Y
REGION	4	0	4232	N	Y
SRE	64	512	2560	Y	Y
RULESBINDING	256	0	216072	N	Y
COMMCONBLK	256	4096	8192	Y	Y
SERVERSESSIONMEM	0	0	4320	Y	Y
DISPXFERSTABLE	256	0	23364	N	Y

Totals			3967 K		

PF12=MAIN, PF2=SSB, PF22=GOODBYE, PF3=SPD					

This display shows which type of TIBCO Object Service Broker storage is in use. The following documents, in alphabetic order, the various storage pools that could appear.

Descriptor Name

Pool Name	Description
\$MEMDESCRIPTORS	\$MEMGET/\$MEMFREE block descriptors.
128KSEGMENTS	128 KB segments.
64KSEGMENTS	64 KB segments.
COMMCONNBLK	Communication connection block.
CONDECONSTRUCT	Buffer for syscall CONSTRUCT/DECONSTRUCT.
DISPXFERSCRROWS	Display and transfer screen rows.
DISPXFERSTABLE	Display and transfer screen table.
EVENTWORKAREA	Event processing work area used for SMF recording.
FILEDESCRIPTORS	OS file descriptors DCBs for QSAM access.
IRE	Initiator request element.
LARGESTACKSEGMENTS	Initial large stack segments.
MESSAGELOGPAGES	Message log pages.
OS_MEMORY_24	z/OS GETMAIN storage - 24BIT addressing.
OS_MEMORY_31	z/OS GETMAIN storage - 31BIT addressing.
REGION	Expandable region storage.
REGIONEXPANDABLE	Region storage.
RULESBINDING	Buffering of rules object code for execution.
SERVERSESSIONMEMORY	External data servers session memory.
SESSION	\$MEMGET/\$MEMFREE storage.

Pool Name	Description
SESSIONWORKAREAS	Session work areas (SMGBLWA); one per user in the Execution Environment.
SHORT24BITSTACKSEGS	24-bit addressing save area stacks.
SHORTSTACKSEGMENTS	Initial short stack segments.
SRE	Service request element.
STACKSEGMENTS	Call stack segments.
STORAGE_MANAGER	Storage manager descriptors.
TRANSACTION	\$GETPERM storage.

Other Fields

BLKSIZE	The block size of the storage pool in kilobytes.
RECORDSZ	The record size of the storage pool in bytes. A zero block size means that the entire block is allocated to the requester.
TOTAL USED bytes	The actual used amount for this storage pool.

PF Key Commands

The PF keys provide a fast path to other storage screens.



This display gives a picture of where what type of storage is being used on a region-wide basis. Transaction storage tends to consume most of the storage managed by TIBCO Object Service Broker. One transaction uses 256 KB of virtual storage.

User List Display

2007-03-16			Performance Monitor				15:11:47	

HDRB ADDR : A4A2000			EE JOB NAME : USR20A22		TDS NAME : HH18SRV2			
EE Type : CICS			DOB JOB NAME : USR20P9		NODENAME : USR20			

USERID(s) Connected to the EE						Scroll :		
ZOOM	USERID :	SESS #	TRANS #	TIME	LVL	RULE OR RMTUSERID	SMFTRANID	
	TAMAPI00	1			0		INACTIVE	
	TAMAPI01	2			0		INACTIVE	
	USR20	7	52	151147	2	HMON_USERLIST	HUSERLST	

PLACE CURSOR BESIDE USERID, THEN MAKE YOUR CHOICE :
ENTER=USERLIST, PF2=STG, PF4=SMF, PF5=SMFP, PF6=SESS, PF9=STATS

ZOOM

This field is cursor-sensitive. By placing the cursor next to the name of the user you want to zoom in on and pressing one of the following PF keys causes different types of information to appear.

ENTER	Refreshes the screen.
PF2	Displays the Execution Environment storage that is managed by TIBCO Object Service Broker and used by a user. The storage pools are documented in Storage Subsection on page 38 .
PF4	Displays the SMF detail information about a user.
PF5	Displays the SMF performance information about a user.

PF6	Displays the number of session tables in use by a user, and the reference counts and the amount of storage used by each session table.
PF9	Displays the interpreter statistics buffers for a user.

Other Fields

USERID	The TIBCO Object Service Broker user ID.
SESS #	The session number assigned for this user. This number is incremented throughout the life of the region as new user sessions are added.
TRANS #	The transaction number of the last transaction run. Example: If trans # is 153, this is the 153rd transaction run within this session.
TIME	The start time of this transaction in hhmmss format.
LVL	<p>The stream level of the session. For example, if the LVL is 2, there is one parent and one child transaction running in this session.</p> <p>Note If a peer server has never been used, the LVL indicator is equal to zero. This means that no transaction was ever executed.</p>
RULE OR RMTUSERID	The last rule that was active. If the user ID is TAMAPIxx, this field is the user ID of the remote user of the peer server.
SMFTRANID	The SMF field set by the \$SETTRANSACTION tool. If this field is filled in by the application, this provides greater granularity in monitoring the flow of an application. If the user ID is TAMAPIxx, INACTIVE shows up in this field if there is no activity on the peer server.

PF Key Commands

The PF keys are cursor sensitive. Place the cursor next to the user that you want to zoom in on.

User List Storage Option

2007-03-16	Performance Monitor	15:11:47

HDRB ADDR : A4A2000	EE JOB NAME : USR20A22	TDS NAME : HH18SRV2
EE Type : CICS	DOB JOB NAME : USR20P9	NODENAME : USR20

STORAGE UTILIZATION - STORAGE POOLS		

DESCRIPTOR NAME:	BLKSIZE(K)	REC SIZE	TOTAL USED	Shared	Above
STORAGE_MANAGER	64	64	4736	Y	Y
TRANSACTION	256	0	1121224	N	Y
SESSIONWORKAREAS	256	4096	4096	Y	Y
EVENTWORKAREA	256	24576	24576	Y	Y
STACKSEGMENTS	256	32768	229376	Y	Y
DISPXFERSCRROWS	256	16384	49152	N	Y
\$MEMDESCRIPTORS	64	256	512	Y	Y
REGION	4	0	160	N	Y
SRE	64	512	512	Y	Y
RULESBINDING	256	0	216072	N	Y
COMMCONNBLK	256	4096	4096	Y	Y
SERVERSESSIONMEM	0	0	4320	Y	Y

Totals	1029 K
STORAGE USAGE FOR USERID :USR20 ==> John User X9280	

This display shows the storage managed by TIBCO Object Service Broker and used by this user. The storage pools are described in [Storage Subsection on page 38](#). This is the total used by this user minus the session table storage.

User List SMF Summary Option

2007-03-16		Performance Monitor		15:12:01			

SMF SUMMARY STATISTICS - USER LEVEL							

MEMORY STATS		EXTERNAL SORT		TIMINGS (SECS)	COUNTS		
-----		-----		-----			
High	:	6864	Count	:	0 Elapsed	:	1800.18731430
Current	:	6856	Recs	:	0 Run	:	184.27753843
Pg Secs	:	0.000	Bytes	:	0 Cpu	:	0.29300754
				Terminal	:	182.99251977	
Interpreter Stats				Lock	:	0.00000000	0
				Queue	:	0.00229868	27
				Resume	:	0.06949597	1123
Rule Loads		441					
Rule Calls		756					
TAM CALLS		827					
DATA REFS		396					
INTR CALLS		293					
EXT Loads	0	MSG	1096	446064	1096	94682	
EXT Calls	0	SEQ	0	0	0	0	
EXCP Count	32	VSAM	0	0	0	0	
		TERM	27	81	27	12077	
PRINT				0	0		
ENTER=REFRESH, PF12=RETURN, PF2=DELTAS							

This display shows the SMF detail buffers for a user. The following statistics are included:

- Memory
- Interpreter
- CPU
- I/O

MEMORY STATS

High	The high-water mark in 4 KB virtual storage pages for this TIBCO Object Service Broker user. This should be similar to the HSR62PGH field in the TIBCO Object Service Broker subtype-62 record.
Current	The number of used 4 KB virtual-storage pages accumulated currently for this TIBCO Object Service Broker user.
Pg Secs	A measure of storage residency. The calculation is derived by the following formula: number of 4 KB pages times the number of seconds. This should be similar to the HSR62PGS field in the TIBCO Object Service Broker subtype-62 record.

EXTERNAL SORT

Count	The number of external sort invocations for this user.
Recs	The number of records processed by the external sort program for this user.
Bytes	The number of bytes sorted by the external sort program for this user.

Interpreter Stats

Rule Loads	The number of rule loads that this session caused as a result of rules execution.
Rule Calls	The number of rules called during this session.
TAM CALLS	The number of table-access calls.
DATA REFS	The number of calls invoked as a result of data reference.
INTR CALLS	The number of calls to TIBCO Object Service Broker routines.

EXT Loads	The number of external routine loads this session caused as a result of rules execution.
EXT Calls	The number of external routine calls this session made.
EXCP Count	The number of I/Os done by this session as a result of rules execution.

TIMINGS

All timings are in seconds.

Elapsed	The time that the session or user has been logged in to the Execution Environment.
Run	The time that the session or user has been running.
Cpu	The TCB time that this session or user has consumed.
Terminal	The amount of time that the TIBCO Object Service Broker session spent waiting for a response from the terminal.
Lock	The amount of time the TIBCO Object Service Broker session spent waiting for Execution Environment locks.
Queue	The amount of time the TIBCO Object Service Broker session spent waiting to schedule a system service in the Execution Environment.
Resume	The amount of time the TIBCO Object Service Broker session spent waiting for resumption of the TIBCO Object Service Broker interpreter following a system service.

User List SMF Performance Statistics

2007-03-16		Performance Monitor				18:53:49	

SMF PERFORMANCE STATISTICS							

-----SHARE-----				-----EXCL			
LOCK NAME	HOLD COUNT	HOLD TIME	WAIT COUNT	WAIT TIME	HOLD COUNT	HOLD TI	

RULEINSI	1194	0.0076597	0	0.00000000	35	0.001	
RULESYSI	138	0.0005353	0	0.00000000	70	0.0026	
RULESBUF	0	0.0000000	0	0.00000000	105	0.0017	
CTABPINX	1547	0.0078142	0	0.00000000	4	0.0001	
SECOSEC	7022	0.0368708	0	0.00000000	112	0.0022	

PROGRAM NAME		TYPE	USE COUNT	ELAPSED TIME	AVERAGE TIME		
-----			-----		-----		
HMON_USERLIST		RULE/ROUTINE	26	30.1264240	1.1587086		
DEL_ANYTABLE		RULE/ROUTINE	432	1.4154746	0.0032765		
HMON		RULE/ROUTINE	37	0.1792790	0.0048453		
HMON_SET_SMF		RULE/ROUTINE	111	0.1368810	0.0012331		
HMON_DATE_TIME		RULE/ROUTINE	104	0.1342814	0.0012911		
PROCESS_USLA_USD		RULE/ROUTINE	14	0.1204595	0.0086042		
HMON_MENU_DRV		RULE/ROUTINE	58	0.1014512	0.0017491		
MESSAGE		RULE/FUNCTION	3	0.0846256	0.0282085		

PRESS ENTER TO REFRESH, PF2 FOR DELTA OR PF14 TO SORT							

This display shows the SMF performance buffers for a user. This is a wide screen that can be scrolled right and left with the PF11 and PF10 keys. The following information is included:

- Execution Environment locking statistics
- Rules statistics

This shows the first 100 rules executed in the most current transaction. When this panel appears for the first time, the number in the lower left corner of the screen shows the number of rules that information was collected for in the display.

Execution Environment Locking Statistics

LOCK NAME	The name of the Execution Environment lock that had activity. Below is a list of valid lock names and meanings.	
	CTABPINX	CTable Permanent index Lock. Used to serialize access to the Ctable index.
	HDRSTATS	Region Update Lock. Used to serialize access to updates to region-wide statistics.
	HDRUSB	Logon List Lock. Used to serialize access to the user login list.
	RULEINSI	Installation Library Index Lock. Used to serialize access to the index for the installation rules library.
	RULESBUF	Rules Buffer Lock. Used to serialize access to the rules buffer.
	RULESYSI	System Library index. Used to serialize access to the system rules library index.
	SECOACL	Object Access Control Lock. Used to serialize access to the bound security area for object access controls.
	SECOSEC	Object Security Structure Lock. Used to serialize access to the bound security area for the object security lists.
	SECTACL	Parameterized Tables Access Control Lock. Used to serialize access to the bound security area for the parameterized tables access control list.
	SECUSEC	User Security Structure Lock. Used to serialize access to the bound security area for the user security list.
	SORTINT	Internal Sort Lock. Used to serialize access to the internal sort structures.
The following fields appear for both shared and exclusive locks.		
HOLD COUNT	The number of times that this lock was held.	
HOLD TIME	The amount of time that the lock was held.	

WAIT COUNT	The number of times that this user had to wait for this lock.
WAIT TIME	The amount of time that the user waited for the lock.

Rules Statistics

These statistics are by default sorted in descending order by elapsed time. Each field can be sorted by placing the cursor on the field and pressing PF14.

PROGRAM NAME	The name of the routine executed.
TYPE	The type of routine. The valid types are as follows: <ul style="list-style-type: none">• RULE/ROUTINE – TIBCO Object Service Broker rule• RULE/FUNCTION – TIBCO Object Service Broker rule or function• BUILTIN – TIBCO Object Service Broker assembler internal routine
USE COUNT	The number of times that this routine has been executed in this transaction.
ELAPSED TIME	The wall clock time in seconds that this routine has run. This time is the accumulation of all iterations of the routine.
AVERAGE TIME	The average time in seconds that this routine takes to run.

Other

NNNN (in the lower left corner of the screen)	The number of rules in the rules subsection of the SMF buffer.
--	--

User List Session Tables

2007-03-16		Performance Monitor		18:53:49	

USERID : USR20		SESSION TABLE(S) INFORMATION			SCROLL :
@#CMB_SES		==> REF:	0000	SPACE:001024:	ROWS:000011
@#CMB_SES		==> REF:	0000	SPACE:001024:	ROWS:000007

This display shows a user’s session table usage. The following information appears.

<i>session table name</i>	The session table name.
REF	The number of times this session table has been referenced. A count of zero says that the session table was used once and not referenced again.
SPACE	The number of bytes occupied by this session table in session storage.
ROWS	The number of rows currently used in this session table.



You can use this to evaluate whether your applications are cleaning up their session tables.

User List Transaction Statistics

These displays show the interpreter statistics for a user.

The three displays below fit on a 3270 model 5 screen. In this manual, the screen is divided into three screens.

2007-03-16		Performance Monitor			15:12:30		
Userid :		Transaction Statistics			Scroll :		
RULESET	USR20 DATE	TIME	RULELOADS	RULECALLS	BLTINCALL	TAM	CALLS
LOGONOBJECTSTAR	95136	144205	14	13	28		1
SHOW_BROADCAST	95136	144205	6	6	3		2
HMON	95136	150857	10	12	5		36
HMON_MENU_DRV	95136	150857	5	4	3		1
HMON_CFG	95136	150940	10	12	5		27
HMON_CFG_MDRV	95136	150940	2	1	1		0
HMON_CFG_EXIT	95136	150958	11	13	5		36
HMON_MENU_DRV	95136	150958	5	4	3		1
HMON_STG	95136	151000	10	12	5		23
HMON_STG_MDRV	95136	151000	2	1	1		0
HMON_STG_EXIT	95136	151027	11	13	5		36
HMON_MENU_DRV	95136	151027	5	4	3		1
HMON_CFG	95136	151032	10	12	5		27
HMON_CFG_MDRV	95136	151032	3	2	3		1
HCFG_SCR_BUILD	95136	151036	15	18	9		21
66			656	1334	461		1325

To see the following columns, scroll right using PF11.

2007-03-16		Performance Monitor			15:12:30		
Userid :		Transaction Statistics			Scroll : P		
RULESET	USR20 CPUTIME(TCB)	DATA REFCALL	EXTRNLOADS		RULESTDSREQ		
LOGONOBJECTSTAR	0.002617		17		0		0
SHOW_BROADCAST	0.001625	1	0		0		
HMON	0.011267	6	0		7		
HMON_MENU_DRV	0.002895	2	0		4		
HMON_CFG	0.009185	6	0		7		
HMON_CFG_MDRV	0.000813	0	0		2		
HMON_CFG_EXIT	0.010249	6	0		8		
HMON_MENU_DRV	0.002539	2	0		4		
HMON_STG	0.009454	6	0		7		
HMON_STG_MDRV	0.000746	0	0		2		
HMON_STG_EXIT	0.010214	6	0		8		
HMON_MENU_DRV	0.002935	2	0		4		
HMON_CFG	0.009324	6	0		7		
HMON_CFG_MDRV	0.001612	4	0		3		
HCFG_SCR_BUILD	0.013687	13	0		12		
66	0.583640	770	0		0		

To see the following columns, scroll right again using PF11.

2007-03-16		Performance Monitor		15:12:30	

Userid : USR20		Transaction Statistics		Scroll : P	
RULESET		MSG_OTHER	MSG_NAM	MSG_SYNC	MSG_IMS

LOGONOBJECTSTAR		0	3	1	0
SHOW_BROADCAST		0	5	0	0
HMON		0	31	0	0
HMON_MENU_DRV		0	11	0	0
HMON_CFG		0	30	0	0
HMON_CFG_MDRV		0	4	0	0
HMON_CFG_EXIT		0	32	0	0
HMON_MENU_DRV		0	11	0	0
HMON_STG		0	30	0	0
HMON_STG_MDRV		0	4	0	0
HMON_STG_EXIT		0	32	0	0
HMON_MENU_DRV		0	11	0	0
HMON_CFG		0	28	0	0
HMON_CFG_MDRV		0	7	0	0
HCFG_SCR_BUILD		0	40	0	0

66		0	0	0	0

Right edge of Window

This is a circular buffer and its size is set by the STATSBUF Execution Environment parameter. The default is 200 buffers. Consider increasing this for a development or new production system to capture better information on how an application is doing. Each entry is 160 bytes in length.

Field	Description
RULESET	The first rule in a transaction started by a TRANSFERCALL, an EXECUTE, or a DISPLAY & TRANSFERCALL.
DATE	The date a ruleset started, in Julian date format (<i>yyddd</i> where <i>yy</i> is the year and <i>ddd</i> is the sequential day of the year).
TIME	The time that the ruleset started in <i>hhmmss</i> format. Note The leading zero is truncated; for example, 92235 is 09:22:35.
RULELOADS	The number of rule loads that occurred in this ruleset.
RULECALLS	The number of rule calls that occurred in this ruleset.
BLTINCALL	The number of calls to TIBCO Object Service Broker builtin routines.

Field	Description
TAM CALLS	The number of table access method calls, which is the number of table accesses for all table types.
CPUTIME(TCB)	The CPU consumed by this ruleset. This is only TCB time. SRB time is kept on an address-space basis.
DATAREFCALL	The number of routine calls as a result of data reference.
EXTRNLOADS	The number of external routine load requests. This is caused by calls to TIBCO Object Service Broker external routines.
RULESTDSREQ	The number of times rules were obtained by going to the Data Object Broker MetaStor (non-buffered rules).
MSG_OTHER	The number of miscellaneous messages to the Data Object Broker.
MSG_NAM	The number of messages sent to the Data Object Broker that in turn cause access to the MetaStor.
MSG_SYNC	The number of commit messages sent to the Data Object Broker.
MSG_IMS	The number of IMS messages sent to the Data Object Broker.

Resource Usage Menu

2007-03-16	Performance Monitor	12:22:31

RESOURCE USAGE		

PF2	CPU Consumption by Load Module	
PF3	Virtual Storage Consumption	
PF12	Main Menu	
PF22	Exit	

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This menu provides selections to find out what CPU, storage, and I/O resources this region is consuming.

Resource CPU Display

2007-03-16		Performance Monitor		12:22:34	

HDRB ADDR : A4A2000		EE JOB NAME : USR20A22		TDS NAME : HH18SRV2	
EE Type : CICS		DOB JOB NAME : USR20P9		NODENAME : USR20	

RESOURCE UTILIZATION - LOAD Module					
ZOOM Occ		EPName		TCB Time	
		IEAVAR00		0.088669	
		IEAVTSDT		0.000117	
		IEFSD060		0.077447	
		IKJEFT01		0.008770	
		IKJEFT02		0.037581	
		IKJEFT09		0.000252	
		ISPMAIN		0.237925	
		ISRPTC		0.084465	
				0.001321	
		IKJEFT02		0.008249	
		HRNTSO		0.004229	

Totals		TCB	1.808857	SRB	0.276204
		CPU	2.085061	I/O	726
PF12=MAIN,PF2=TCB,PF22=GOODBYE,PF3=VIRTUAL					

This display shows the CPU usage for each task in the Execution Environment. The totals are given for total TCB usage, SRB usage, and I/O counts.

EPName	The module name used at the time the attach of the task occurred. Below is a list of valid module names.	
	DFHxxx	The CICS tasks.
	HRNDRMXS	The TIBCO Object Service Broker z/OS server module.
	HFILxxx	The task used to process file requests not defined by a PPT entry in CICS and all file requests for other Execution Environment types.
	HMISCxxx	The task used to link to TIBCO Object Service Broker external routines.
	HSORTxxx	The task used to do external sorting.
	HOPERxxx	The task used to handle operator requests.
	HSINxxx	The task used for session initiation and termination.
	HINTRxxx	The task used to execute TIBCO Object Service Broker rules. The number of each of the tasks are controlled by the Execution Environment parameters prefixed by "TASK".
TCB TIME	TCB time in seconds.	
TOTALS	TCB	Total TCB time in seconds.
	SRB	Total SRB time in seconds.
	I/O	Total I/O counts for this Execution Environment.
	CPU	TCB time total + SRB time total.

PF Key Commands

The PF keys provide a fast path to other resource screens.



By looking at the utilization amount of each TCB, you can decide whether various classes of TCB are under- or over-allocated.

Resource Virtual Storage Display

2007-03-16		Performance Monitor		15:13:21	

HDRB ADDR : A4A2000		EE JOB NAME : USR20A22		TDS NAME : HH18SRV2	
EE Type : CICS		DOB JOB NAME : USR20P9		NODENAME : USR20	

BELOW 16M LINE ABOVE 16M LINE					
MVS VIRTUAL STORAGE LIMITS		6208 (K)		256000 (K)	

MVS VIRTUAL STORAGE USED		5196 (K)		13356 (K)	

MVS VIRTUAL STORAGE AVAIL.		1012 (K)		242644 (K)	
PF12=MAIN , PF2=TCB , PF22=GOODBYE , PF3=VIRTUAL					

This display shows the virtual storage limits, virtual storage used, and the virtual storage available for use in this region. All measures are in KB of storage. These numbers are valid at the time of display and could fluctuate based on z/OS storage requests. The limits remain static for the life of the region.

This information is similar to the following Execution Environment initialization messages, but is dynamic in nature:

- S6BST300I
- S6BST301I

PF Key Commands

The PF keys provide a fast path to other resource screens.

Binding Menu

2007-03-16	Performance Monitor	11:53:06

BINDING		

PF2	LIBRARY - SYSLIB (DEF=COMMON)	
PF3	LIBRARY - INSTLIB (DEF=SITE)	
PF5	TABLES DEFN / DATA	
PF6	SECURITY STATS	
PF12	Main Menu	
PF22	Exit	
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This menu lists the types of binding information that is available for your inquiry. The categories are divided into:

- System library rules binding information
- Installation library rules binding information
- Tables definitions and data binding information
- Security binding information

LIBRARY BINDING

This display represents the usage of the rules binding areas and shows total usage of the region-wide rules binding areas. The system (called COMMON by default) library and the installation (called SITE by default) libraries are shown in detail. If you have large site libraries, these functions are somewhat resource-intensive.

TABLE BINDING

This display shows which table definition and data are bound in the Execution Environment as well as the reference counts for these tables. Bound tables also include bound screens.

SECURITY BINDING

This display shows the statistics for the security binding areas. If you use the [SEC_REBIND](#) tool, the statistics are reset.



You can use this menu to see if rules were in fact being accessed or bound in the installation library. The table binding statistics indicate whether you are getting good hit counts on the bound tables and definitions. You can use the security statistics to size the security areas set by the Execution Environment parameters.

Binding, System Library Information

2007-03-16		Performance Monitor			12:00:15	

BINDING INFORMATION						

Library	Hash Slots	Used	Overflow	No. Rules	Loaded	Rule Storage
COMMON	8192	546	18	564	564	278331
Rulename				SCROLL :		
ACCEPT_INPUT	ACTCALL		ACTION		ACTION_EXECABLE	
ACTIONS	ADD_ATTR		ADD_FIELDREF		ADD_GLOBALS	
ADD_LCOMMAND	ADD_RELOC		ADD_TAM_HEAP		ADD_TOKEN	
ADJ_VERT_SCROLL	ADVANCE_TOKEN		ALT_MAP		ALT_MAP2	
ALT_NEXT_LINE	APPEND_NEXT		ASSIGNBN		ASSIGIN	
ASSIGLOC	ASSIGN_TEXT		ASSIGNMENT		AUTO_NUMBER_ACT	
BUILD_LINE	BUILD_PARM_STR		BUILD_RULE_TEXT		CALC_NSTMNT#	
CALC_OFFSET	CALC_OSTMNT#		CALC_STMNT#		CALL_ARGS	
CALL_NAME	CALL_NAME2		CALNEE_FIX		CALNEE_STRING	
CHAR_TYPE	CHECK_AND_TOKEN		CHECK_AREA		CHECK_AREA2	
CHECK_ASSIGNTARG	CHECK_BUILTINS		CHECK_COND		CHECK_COPY_DOC	
CHECK_DEST	CHECK_ENDS		CHECK_EOS		CHECK_EXISTENCE	
CHECK_EXISTENCE2	CHECK_EXTRA_TOKS		CHECK_FOR_NEXT		CHECK_IN_WINDOW	
PF12=MAIN, PF2=CMMN, PF22=GOODBYE, PF3=SITE, PF5=TABLES, PF6=SECURITY						

This display shows the binding information for the system rules library. Rules are loaded only when accessed. You can expect these statistics to increase over time as more rules are accessed.

Information Displayed

Field	Description
Library	The library name specified in the SYSLIBNAME Execution Environment parameter (COMMON by default).
Hash Slots	This is set by the SYSLIBNUM Execution Environment parameter. Each slot is a four-byte hash bucket that speeds system rules library search.
Used	The number of hash slots currently in use.
Overflow	The number of duplicate hashes that cause overflow chains.
No. Rules	The number of rules in the system rules library.
Loaded	The number of system rules loaded into the region rules binding area during this execution of the Execution Environment.
Rule Storage	The number of bytes used by system library rules in the rules binding area.
Rulename	The names of all the system library rules bound in the rules binding area.

PF Key Commands

The PF keys provide a fast path to other binding screens.



The overflow number is the number of duplicate hashes created in the hashing algorithm. This number should be as low as possible for a more efficient hash. You can control this by finding the prime number closest to but not less than your total number of rules in the system library and specifying this value for the SYSLIBNUM Execution Environment parameter.

Binding, Installation Library Information

2007-03-16		Performance Monitor				15:13:46	

BINDING INFORMATION							

Library	Hash Slots	Used	Overflow	No. Rules	Loaded	Rule Storage	
SITE	45000	6733	18	6751	1	530	
Rulename				SCROLL :			
@MEMORYINSTANCES							

PF12=MAIN , PF2=CMMN , PF22=GOODBYE , PF3=SITE , PF5=TABLES , PF6=SECURITY

This display shows the binding information for the installation rules library. Rules are loaded only when accessed. You can expect these statistics to increase over time as more rules are accessed.

Information Displayed

Field	Description
Library	The library name specified in the INSTLIBNAME Execution Environment parameter (SITE by default).
Hash Slots	This is set by the INSTLIBNUM Execution Environment parameter. Each slot is a four-byte hash bucket that speeds installation rules library search.
Used	The number of hash slots currently in use.
Overflow	The number of duplicate hashes that cause overflow chains.
No. Rules	The number of rules in the installation library.
Loaded	The number of installation rules loaded from the installation library into the rules binding area for the region during this execution of the Execution Environment.

Field	Description
Rule Storage	The number of bytes used by installation library rules in the rules binding area.
Rulename	The names of all the installation library rules bound in the rules binding area.

PF Key Commands

The PF keys provide a fast path to other binding screens.



The overflow number is the number of duplicate hashes created in the hashing algorithm. This number should be as low as possible for a more efficient hash. You can control this by finding the prime number closest to but not less than your total number of rules in the system library and specifying this value for the INSTLIBNUM Execution Environment parameter.

Table Binding Information

2007-03-16		Performance Monitor		15:13:59	

BINDING INFORMATION					

REGIONTABLESIZE :	1835008	USEDSPACE :	19291	DIR :	11
NAME :	REF_CNT	CTABLE_SIZE	TYPE	FIX	
@CHARACTERMAP	12	952	TDS	B	
@OBJDEFNDATA	2	1192	TDS	B	
@OBJECTTYPES	2	644	TDS	B	
@RULESLIBRARY	164	704	OBJ	Y	
ALTERNATIVES	7	384	TEM	Y	
BNF	2	620	TDS	B	
FIELDS	10	1116	TDS	Y	
GRAMMARS	7	716	TDS	B	
SEMANTIC	7	708	TDS	B	
SYS\$OPCODES	8	964	TDS	B	
TABLES	2	1324	TDS	Y	

PF12=MAIN , PF2=CMMN , PF22=GOODBYE , PF3=SITE , PF5=TABLES , PF6=SECURITY
4000

This shows information about the table definition and data binding area. The storage for the table binding area is getmained from subpool 9, which resides above the 16 MB line. The REGIONTABLESIZE Execution Environment parameter is the amount getmained and remaining allocated for the life of the Execution Environment.

Information Displayed

Field	Description
REGIONTABLESIZE	The setting of the REGIONTABLESIZE Execution Environment parameter in bytes. The specification is in kilobytes for the parameter.
USEDSPACE	The amount of the table binding area in use. Tables are bound when accessed if the binding flags are set.
DIR	The number of directory entries used. This is the number of table definitions or/and table data bound.
NAME	The name of the table bound.
REF_CNT	The number of times that this table has been accessed. This is the hit count for the bound table.
CTABLE_SIZE	The size of the control block image of the table definition.
TYPE	The table type of the bound table.
FIX	The flag that denotes whether the definition or data are bound: <ul style="list-style-type: none">• B - both data and definition bound• Y - definition bound
NNNN (in the lower left corner of the screen)	Accumulation of the CTABLE size entries. The difference between USEDSPACE and this number is the space used for bound table data.

PF Key Commands

The PF keys provide a fast path to other binding screens.

Security Stats Binding

Current statistics from bound security									
Size of bound security = 200948 bytes or 196K									
Address of bound security = A6B3F08									
List	Address	Entry Size	Entries Curr. Max.		Storage Used Alloc.		Hits	Misses	Ratio
OBJSEC	A6BBD2A	42	212	975	8904	40950	6564	263	96.1
OBJACL	A6CDEF7	35	7	1872	245	65520	32	7	82.0
TBLACL	A6DDFC8	102	0	642	0	65484	0	0	0.0
USRSEC	A6E1752	18	9	796	162	14328	203	9	95.7
OBJSEC : Object security									
OBJACL : Object access control									
TBLACL : Parameterized tables access control									
USRSEC : Userid and security administrator									
USERSEC : User security									
PFKEYS: 3=EXIT 12=EXIT									

This display shows the security binding information.

The storage for the bound security area is getmained from subpool 9 in extended private storage. The total storage gotten is the sum of the following Execution Environment parameters:

- SECOBJSIZE
- SECACLSIZE
- SECPACLSIZE
- SECADMINSIZE
- SECUSERSIZE

Information Displayed

Size of the bound security	The size in bytes and kilobytes. The method for determining this number is shown above.
Address of bound security	The virtual storage address of the bound security area.

List	The name of the bound security buffer pool.
OBJSEC	Set by the SECOBJSIZE Execution Environment parameter. This specifies the size of the TIBCO Object Service Broker object security information area.
OBJACL	Set by the SECACLSIZE Execution Environment parameter. This specifies the size of the discretionary permission list of TIBCO Object Service Broker objects.
TBLACL	Set by the SECPACLSIZE Execution Environment parameter. This specifies the size of the discretionary permission access control list for parameterized tables.
USRSEC	Set by the SECADMINSIZE Execution Environment parameter. This specifies the size of the area to contain a table of users and their security administrators.
USERSEC	Set by the SECUSERSIZE Execution Environment parameter. This specifies the size of the area to contain the user basic security information. There is one entry for each user logged in. When an entry is built, the entry remains in the bound area for life of the Execution Environment. Note You must press PF8 to see the USERSEC statistics on a 3270 Mod 3.
Address	The virtual storage address of the bound security area.
Entry Size	The size of one entry in bytes.
Curr. Entries	The current number of entries in this bound security area.
Max. Entries	The maximum number of entries allowed in this bound security area. This can be changed by the Execution Environment parameters described above.
Storage Used	The amount of storage used in each bound security area.
Storage Alloc.	The amount of storage allocated as a result of the Execution Environment parameter setting described above.
Hits	The number of bound storage hits for this pool.
Misses	The number of misses for this bound security storage pool.
Ratio	The ratio of hits to misses for each pool.

SMF Statistics & Transaction Monitor

2007-03-16	Performance Monitor	12:27:09

SMF STATS & TRAN MON		

PF2	Summary Statistics - System	
PF4	Users by CPU	
PF5	Users by Messages	
PF6	Users by Memory	
PF9	Transaction Monitor & Tran Log	
PF12	Main Menu	
PF22	Exit	

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This set of screens displays the SMF information for various levels of detail. The summary SMF screen shows the region-level SMF statistics that reflect what is contained in the TIBCO Object Service Broker SMF subtype-52 record. The next three displays are user-related and show the information contained in the TIBCO Object Service Broker SMF subtype-62 record. The various displays contain basically the same information, although they are ordered differently based on your selection.

The Transaction Monitor is an application that demonstrates how you can use rules to access the performance information around your application and rules.

Summary Statistics – System

2007-03-16		Performance Monitor		12:27:15	

SMF SUMMARY STATISTICS - SYSTEM LEVEL					

MEMORY STATS		EXTERNAL SORT		TIMINGS (SECS)	COUNTS
-----		-----		-----	-----
High :	0 Count :	0 Elapsed :	3352.30686004		
Current:	0 Recs :	0 Run :	0.00000000		
Pg Secs:	0.000 Bytes :	0 Cpu :	0.00000000		
0		Terminal:	0.00000000		
Interpreter Stats		Lock :	0.00000000		0
-----		Queue :	0.00000000		0
Rule Loads	0	Resume :	0.00000000		0
Rule Calls	0				
TAM CALLS	0	I/O STATS			
DATA REFS	0	IN	BYTES	OUT	BYTES
INTR CALLS	0	-----	-----	-----	-----
EXT Loads	0	MSG	0	0	0
EXT Calls	0	SEQ	0	0	0
EXCP Count	0	VSAM	0	0	0
		TERM	0	0	0
		PRINT		0	0
PRESS ENTER TO REFRESH OR PF2 FOR DELTA					

This screen displays the SMF information that appears in the TIBCO Object Service Broker SMF subtype-52 record. The statistics in the subtype 52 buffers are accumulated at session end for each user. You could see the counters at zero at the beginning of the region’s operation because no users have logged out.

This display shows the SMF detail buffers for the entire Execution Environment. The following information is included:

- Memory statistics
- Interpreter statistics
- CPU statistics
- I/O statistics

MEMORY STATS

High	The high-water mark in 4 KB virtual-storage pages for this Execution Environment. This should be similar to the HSR52PGH field in the TIBCO Object Service Broker subtype-52 record.
------	--

Current	The number of 4 KB virtual storage pages in use for this Execution Environment.
Pg Secs	A measure of storage residency. The calculation is derived by the following formula. Number of 4 KB pages times the number of seconds. This should be similar to the HSR52PGS field in the TIBCO Object Service Broker subtype-52 record.

EXTERNAL SORT

Count	The number of external sort invocations for this Execution Environment.
Recs	The number of records processed by the external sort program for this Execution Environment.
Bytes	The number of bytes sorted by the external sort program for this Execution Environment.

Interpreter Stats (Region Level)

Rule Loads	The number of rule loads that have occurred in this Execution Environment.
Rule Calls	The number of rules called during this Execution Environment.
TAM Calls	The number of table access calls that have occurred.
DATA REFS	The number of calls invoked as a result of data reference.
INTR CALLS	The number of calls to TIBCO Object Service Broker routines.
EXT Loads	The number of external routine loads this session has caused as a result of rules execution.
EXT Calls	The number of external routine calls this Execution Environment has made.
EXCP Count	The number of I/Os done by this Execution Environment as a result of rules execution.

TIMINGS

All timings are in seconds.

Elapsed	The time that the Execution Environment has been alive.
Run	The time that the Execution Environment has been running.

Cpu	The TCB time that this Execution Environment has consumed.
Terminal	The amount of time that the Execution Environment spent waiting for a response from the terminal.
Lock	The amount of time the Execution Environment spent waiting for Execution Environment locks.
Queue	The amount of time the Execution Environment spent waiting to schedule a system service in the Execution Environment.
Resume	The amount of time the Execution Environment spent waiting for resumption of the TIBCO Object Service Broker interpreter following a system service.

I/O STATS

MSG	The count of messages between the Execution Environment and the Data Object Broker.
SEQ	The count of records read from and written to sequential data sets.
VSAM	The count of records read from and written to VSAM data sets.
TERM	The count of records read from and written to terminals.
PRINT	The count of records written to printers.

The columns are described as follows.

IN	The number of records received into the Execution Environment.
BYTES	The total number of bytes in the records received into the Execution Environment.
OUT	The number of records sent from the Execution Environment.
BYTES	The number of bytes sent from the Execution Environment.

Users by CPU

2007-03-16		Performance Monitor		15:14:43	

USERS BY CPU CONSUMPTION					

USERID		CPU TIME	MESSAGES	MEMORY	ELAPSED TIME
-----		-----	-----	-----	-----
—	USR20	3.28201545	2598	15049	1960.03686830
—	TAMAPI00	0.00043750	0	8	6717.38929209
—	TAMAPI01	0.00039256	0	8	6717.39950733

ENTER=REFRESH , PF2=SMF , PF3=SMFP , PF4=BY CPU , PF5=BY MEM , PF6=BY MSG

This screens displays the SMF information for each user in descending order by CPU usage.

Field	Description
USERID	The TIBCO Object Service Broker user ID that is logged in to this region.
CPU TIME	The total TCB time in seconds used by this user while running on TIBCO Object Service Broker TCBs. This does not include CICS TCB time. This is similar to the TIBCO Object Service Broker SMF subtype-62 HSR62CPU field.
MESSAGES	The number of messages sent to the Data Object Broker as a result of this user's action.
MEMORY	The accumulated number of 4 KB virtual pages used by each transaction in this user session.
ELAPSED TIME	The elapsed time in seconds that this user has been logged in to this Execution Environment.

PF Key Commands

The PF keys provide a fast path to other SMF functions. PF4, PF5, and PF6 are cursor-sensitive. Place the cursor next to the user you want to zoom in on.

Users by Messages

2007-03-16		Performance Monitor		15:14:50	

USERS BY DOB MESSAGES					

USERID		CPU TIME	MESSAGES	MEMORY	ELAPSED TIME
-----		-----	-----	-----	-----
_ USR20		3.33151408	2690	15369	1967.89499730
_ TAMAPI00		0.00043750	0	8	6725.24814209
_ TAMAPI01		0.00039256	0	8	6725.25664933

ENTER=REFRESH , PF2=SMF , PF3=SMFP , PF4=BY CPU , PF5=BY MEM , PF6=BY MSG

This screens displays the SMF information for each user in descending order by the number of messages sent to the Data Object Broker.

Field	Description
USERID	The TIBCO Object Service Broker user ID that is logged in to this region.
CPU TIME	The total TCB time in seconds used by this user while running on TIBCO Object Service Broker TCBs. This does not include CICS TCB time. This is similar to the TIBCO Object Service Broker SMF subtype-62 HSR62CPU field.
MESSAGES	The number of messages sent to the Data Object Broker as a result of this user's action.

Field	Description
MEMORY	The accumulated number of 4 KB virtual pages used by each transaction in this user session.
ELAPSED TIME	The elapsed time in seconds that this user has been logged in to this Execution Environment.

PF Key Commands

The PF keys provide a fast path into other SMF screens. PF4, PF5, and PF6 are cursor-sensitive. Place the cursor next to the user you want to zoom in on.

Users by Memory

2007-03-16		Performance Monitor		15:14:57	

USERS BY MEMORY CONSUMPTION					

USERID	CPU TIME	MESSAGES	MEMORY	ELAPSED TIME	

— USR20	3.38047723	2778	15689	1976.94771930	
— TAMAPI00	0.00043750	0	8	6734.29947509	
— TAMAPI01	0.00039256	0	8	6734.30885933	

ENTER=REFRESH, PF2=SMF, PF3=SMFP, PF4=BY CPU, PF5=BY MEM, PF6=BY MSG					

This screens displays the SMF information for each user, sorted in descending order by the amount of memory used and by the number of transactions used since login (accumulated).

Field	Description
USERID	The TIBCO Object Service Broker user ID that is logged in to this region.
CPU TIME	The total TCB time in seconds used by this user while running on TIBCO Object Service Broker TCBs. This does not include CICS TCB time. This is similar to the TIBCO Object Service Broker SMF subtype-62 HSR62CPU field.
MESSAGES	The number of messages sent to the Data Object Broker as a result of this user's action.
MEMORY	The accumulated number of 4 KB virtual pages used by each transaction in this user session.
ELAPSED TIME	The elapsed time in seconds that this user has been logged in to this Execution Environment.

PF Key Commands

The PF keys provide a fast path to other SMF screens. PF4, PF5, and PF6 are cursor-sensitive. Place the cursor next to the user that you want to zoom in on.

Transaction Monitor and Tran Log

The transaction monitor is a tool that allows customers to monitor the performance statistics of groups of users. To monitor a group of users of an application, the following actions are required:

- The userid(s) to be monitored needs to be added to the monitor using the PF5 option or by updating the table HMON_TRNUSERS directly.
- The statement "CALL HTRN_INIT('HMON_TRANSES');" needs to be added to the start of the application.
- The statement "CALL HTRN_STATS;" needs to be added to the application at points where a statistics record needs to be cut.

The recorded data can be reviewed using the PF2 and PF4 options or by reviewing the table HMON_TRANLOG, which is parameterized by date. It contains the following fields:

Field	Description
KEY	Idgen key for the table.
TIME	Time the record was cut.
USERID	User ID.
SCREEN	Set by running HTRN_SETUSER(SCREEN, ACTION, RULE).
RULE	Set by running HTRN_SETUSER(SCREEN, ACTION, RULE).
ACTION	Set by running HTRN_SETUSER(SCREEN, ACTION, RULE).
CPU	Amount of CPU used in the EE by the session.
RUN	Time the session was not in a wait.
ELAPSED	Wall time since the last record was cut.
MSGS	Number of messages sent to the DOB.
TAMCALL	Number of calls to the Table Access Method.
QUERY	Number of Queries sent to the DOB.
COMMIT	Number of COMMITs sent to the DOB.
LOGRULE	Number of Rules read from the DOB.
LOGPAGEGET	Number of logical Page Gets.
LOGPAGEPUT	Number of logical pages updated.
PHYPAGEGET	Number of pages physically read from segments.
APPLTASKCPU	CPU used in DOB for query portion of session.
FILETASKCPU	Always zero as it cannot be calculated.
COMMTASKCPU	CPU used in DOB for communications.
RULECALL	Number of rules called.

Field	Description
INTRCALL	Number of calls to the interpreter.
CPUPERMSG	APPLTASKCPU divided by MSGS.

Tools Menu

2007-03-16	Performance Monitor	13:10:52

OBJECTSTAR TOOLS		

	PF2	Page Utility
	PF3	Table Space Utility
	PF4	DOB User List
	PF5	General Stats
	PF6	Segment Stats
	PF9	Buffer Stats
	PF12	Main Menu
	PF22	Exit

This display groups other existing tools together for your convenience. Each tool on this menu is documented in the screen-level help. For information on getting a list of users, refer to [Menu Item: Users Logged On on page 12](#). For information on getting statistics, refer to [Monitoring Via the Workbench on page 2](#).

Chapter 4

Collecting and Reporting on Generated SMF Records

This chapter describes how to collect and report information with SMF records generated by TIBCO Object Service Broker.

Topics

- [Introducing System Management Facility \(SMF\) Records, page 78](#)
- [Activating TIBCO Object Service Broker SMF Recording, page 79](#)
- [Reviewing SMF Record Subtypes, page 81](#)
- [Using SMF Record Layouts Supplied as Assembler Macros, page 84](#)
- [Setting Parameters for SMF Record Intervals, page 86](#)
- [Using TIBCO Object Service Broker SMF Utilities, page 87](#)
- [Reporting on TIBCO Object Service Broker SMF Records, page 89](#)

Introducing System Management Facility (SMF) Records

You can generate System Management Facility (SMF) records to collect and record internal statistics about your TIBCO Object Service Broker system. SMF is a component of z/OS. For more information about SMF, refer to your z/OS system documentation.

The following topics are covered in this chapter:

Topic	Description	Page
Activating TIBCO Object Service Broker SMF Recording	Describes how to set up a TIBCO Object Service Broker environment to record SMF data.	79
Reviewing SMF Record Subtypes	Reviews generated Data Object Broker and Execution Environment records that can be used for user billing, reporting, or tuning purposes.	81
Setting Parameters for SMF Record Intervals	Provides default, minimum, and maximum values to set interval times for parameters that correspond to a particular record subtype.	86
Using TIBCO Object Service Broker SMF Utilities	Lists and describes a number of utilities that help you extract and sort the information you need from your SMF data.	87
Reporting on TIBCO Object Service Broker SMF Records	Describes how to create a report using the TIBCO Object Service Broker/SMF reporting utilities.	89

Activating TIBCO Object Service Broker SMF Recording

To generate SMF records from TIBCO Object Service Broker, complete the following tasks:

- [Check Library Authorization, page 79](#)
- [Confirm the SMFRECORD Parameters Are Set, page 79](#)
- [Set the SMFDETAIL Session Parameter, page 80](#)
- [Set the SMFPERFORMANCE Session Parameter, page 80](#)

These tasks are described in the following sections.

Task A Check Library Authorization

To collect SMF records, the Execution Environment and Data Object Broker must each be executed from authorized library. They can run as either a started task or batch job.

Task B Confirm the SMFRECORD Parameters Are Set

You can use one common SMFRECORD value for both Data Object Broker and Execution Environment SMF records.

For Data Object Broker SMF Records

The SMFRECORD Data Object Broker parameter is usually set at initialization. The SMFRECORD and SMF*nn*INTERVAL parameters are defined in the //INITPARM DD of the Data Object Broker JCL.

If the parameter is not explicitly set (for example, if the default SMFRECORD=0 is still in effect), you can issue the following z/OS operator command to initiate the production of SMF records:

```
MODIFY dob_jobname, Parm=SMFrecord=nnn
```

For Execution Environment SMF Records

The SMFRECORD Execution Environment parameter must be set at initialization. The SMF*nn*TYPE, SMFDETAIL, and SMFPERFORMANCE parameters are defined in the //HRNIN DD of the Execution Environment JCL.

Task C Set the SMFDETAIL Session Parameter

Users wanting detailed monitoring of Execution Environment SMF records can log in with the session parameter SMFDETAIL. The SMFDETAIL session parameter does not enable an individual user to turn off Execution Environment SMF monitoring.

If no Execution Environment monitoring is set up (that is, NOSFMDetail is specified for the Execution Environment), the session parameter has no effect.

Task D Set the SMFPERFORMANCE Session Parameter

Users wanting detailed monitoring of Execution Environment SMF records can set the session parameter SMFPERFORMANCE in addition to the SMFDETAIL session parameter. For more information about SMFPERFORMANCE, refer to [Performance Section on page 117](#).

The SMFPERFORMANCE session parameter does not enable an individual user to turn off Execution Environment SMF monitoring.

No Execution Environment Monitoring

If no Execution Environment monitoring is set up (that is, NOSFMPerformance is specified for the Execution Environment), the session parameter has no effect.

SMFDETAIL and SMFPERFORMANCE Parameters

SMFDETAIL generates the subtype 52, 62, and 72 records and SMFPERFORMANCE generates the performance sections that can appear in these records.

The SMFPERFORMANCE parameter behaves as the SMFDETAIL parameter if:

- It is set for the Execution Environment as a whole (the user cannot turn it off).
- It is not set for the Execution Environment as a whole (a session can turn it on, providing the Execution Environment is configured for general or summary monitoring).

See Also *TIBCO Object Service Broker for z/OS Installing and Operating* for more information about Data Object Broker and Execution Environment SMF records.

TIBCO Object Service Broker Parameters for more information about individual parameters.

Reviewing SMF Record Subtypes

Within your chosen SMF Record Type number, TIBCO Object Service Broker produces a variety of statistical record subtypes. These record subtypes are summarized in the following sections:

- [Data Object Broker Record Subtypes on page 81](#)
- [Execution Environment Subtypes on page 82](#)

For details on using supplied assembler macros to generate the SMF copy books, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Data Object Broker Record Subtypes

The following table summarizes the Data Object Broker record subtypes:

Subtype	Description	Page
01	<ul style="list-style-type: none"> • Initialization record • Created to timestamp Data Object Broker startup 	95
02	<ul style="list-style-type: none"> • Normal Termination record • Created to timestamp normal shutdown of Data Object Broker 	95
06	<ul style="list-style-type: none"> • Cumulative Lock Manager statistics • Created when the Data Object Broker is shut down normally 	96
08	<ul style="list-style-type: none"> • Cumulative Query and Commit counts by response time • Created when the Data Object Broker is shut down normally 	97
09	<ul style="list-style-type: none"> • Cumulative message counts by message length • Created when the Data Object Broker is shut down normally 	98
10	<ul style="list-style-type: none"> • Cumulative Data Object Broker general statistics • Created when the Data Object Broker is shut down normally 	99
11	<ul style="list-style-type: none"> • DASD Pagestore statistics • Produced at shutdown time for each data set in the Pagestore 	100

Subtype	Description	Page
12	<ul style="list-style-type: none"> Data Object Broker Checkpoint statistics Produced at every TIBCO Object Service Broker checkpoint Provides checkpoint turnaround time and sizing information 	101
13	<ul style="list-style-type: none"> Pagestore Response Time Statistics One record is produced for every online and active segment at every specified interval. Each record contains DASD response times for each active data set. 	102
22	<ul style="list-style-type: none"> Interval Lock Manager statistics Produced on completion of each interval, unless suppressed 	96
23	<ul style="list-style-type: none"> Query task statistics for query TCBs Produced on completion of each interval, unless suppressed 	105
24	<ul style="list-style-type: none"> Interval Query and Commit counts by response time Produced on completion of each interval, unless suppressed 	97
25	<ul style="list-style-type: none"> Interval Message counts by message length Produced on completion of each interval, unless suppressed 	98
26	<ul style="list-style-type: none"> Interval Data Object Broker general statistics Produced at the end of each interval, unless suppressed If SMF26INTERVAL is set to 0, produced at each TIBCO Object Service Broker checkpoint. 	99
47	<ul style="list-style-type: none"> Interval User Utilization of Data Object Broker Services Activity since previous interval, or login, record for this user 	107
49	<ul style="list-style-type: none"> User Utilization of Data Object Broker Services Produced each time a TIBCO Object Service Broker user logs out from TIBCO Object Service Broker. Also produced for all users logged in at the time of a Data Object Broker shutdown. 	107

Execution Environment Subtypes

The following table summarizes the Execution Environment record subtypes:

Subtype	Description	Page
50	<ul style="list-style-type: none"> • Execution Environment Initialization Statistics • Created at Execution Environment startup 	119
51	<ul style="list-style-type: none"> • Execution Environment Termination record • Produced at Execution Environment termination 	120
52	<ul style="list-style-type: none"> • Execution Environment General Statistics • Produced also at Execution Environment termination, on normal shutdown only 	121
60	<ul style="list-style-type: none"> • Execution Environment Session Logon record • Produced when the session starts 	122
61	<ul style="list-style-type: none"> • Execution Environment Session Logoff record • Produced at a session's termination 	123
62	<ul style="list-style-type: none"> • Execution Environment Session Statistics • Produced also at session termination, if it ends normally 	124
72	<ul style="list-style-type: none"> • Execution Environment Transaction Statistics • Created with every database commit, whichever the commit is of the following: <ul style="list-style-type: none"> — explicit —with a COMMIT rules statement — implicit —at the normal termination of an updating transaction 	126

Using SMF Record Layouts Supplied as Assembler Macros

The SMF record layouts are distributed in machine-readable format as assembler macros. You can use these macros (see below) directly in your own code or print them for reference by running the JCL that follows.

EVNTSMF	HSMF22	HSMF25	HSMF28
HSMF11	HSMF23	HSMF26	HSMF45
HSMF12	HSMF23A	HSMF27	HSMF49
HSMF13	HSMF24		

Here is the JCL:

```
//ASM      EXEC PGM=ASMA90,
//          PARM='NODECK,NOOBJECT,LIST,TERM'
//SYSPUNCH DD DUMMY
//SYSLIB   DD DSN=your.osb.macro.library,DISP=SHR
//SYSTEM   DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
SUBTYPE   TITLE '11 DASD Pagestore Statistics'
HU11      HSMF11 DSECT=YES
          TITLE '12 Checkpoint Statistics.'
HU12      HSMF12 DSECT=YES
          TITLE '13 Pagestore Response Time Statistics'
HU13      HSMF13 DSECT=YES
          TITLE '06 && 22 Pagestore Response Time Statistics'
HU22      HSMF22 DSECT=YES
          TITLE '23 Multiple Query Task Usage Statistics'
HU23      HSMF23 DSECT=YES
          TITLE '23 Multiple Query Task Usage Mapping'
HU23A     HSMF23A
          TITLE '08 && 24 Query and Commit Counts'
HU24      HSMF24 DSECT=YES
          TITLE '09 && 25 Message Counts by Length'
HU25      HSMF25 DSECT=YES
          TITLE '10 && 26 General Statistics'
HU26      HSMF26 DSECT=YES
          TITLE '14 && 27 Query and Commit Extended Response Time Stats'
HU27      HSMF27 DSECT=YES
          TITLE '15 && 28 Server Usage and Response Time Information'
HU28      HSMF28 DSECT=YES
          TITLE '45 Page Sweep Limit Exceeded'
HU45      HSMF45 DSECT=YES
          TITLE '47 && 49 User Resource Consumption'
HU49      HSMF49 DSECT=YES
          TITLE 'EE SMF RECORD LAYOUTS'
EESUBTYP CSECT
          EVNTSMF
          END
```

/*

Setting Parameters for SMF Record Intervals

Interval records are produced in a recurring fashion at regular intervals. The corresponding parameter sets the interval time for a particular record subtype.

Interval Record Times

The following table lists the parameters used to set interval times for their corresponding record subtype. The default, minimum, and maximum values are all in minutes. You can also suppress the production of a particular subtype by supplying an interval time of zero.

Parameter Name	Default	Minimum	Maximum
SMF13INTERVAL	15	1	30
SMF22INTERVAL	30	5	1440
SMF23INTERVAL	30	5	1440
SMF24INTERVAL	30	5	1440
SMF25INTERVAL	30	5	1440
SMF26INTERVAL	30	5	1440
SMF47INTERVAL	30	5	1440

Using TIBCO Object Service Broker SMF Utilities

Using TIBCO Object Service Broker SMF utilities you can perform the following tasks:

- [Summarize SMF data \(S6BSMEJ\), page 87](#)
- [Group reporting information by job name \(S6BSMEJB\), page 87](#)
- [Analyze SMF usage \(S6BSMETY\), page 87](#)
- [Check SMF files \(S6BSMESD\), page 87](#)
- [Add a key to SMF records for sorting \(S6BSMFAK\), page 88](#)
- [Produce a report in the sequence of the SMF file \(S6BSMFCH\), page 88](#)
- [Remove a sort key from SMF records \(S6BSMFDK\), page 88](#)
- [Extract selected SMF records \(S6BSMFEX\), page 88](#)

A brief description of the tasks and utilities is provided in the following sections. For usage information, sample JCL, and sample reports for these utilities, refer to *TIBCO Object Service Broker for z/OS Utilities*.

Task A Summarize SMF data (S6BSMEJ)

The S6BSMEJ utility summarizes SMF data by job, tasks and TSO user. It provides a breakdown of SMF record types, subtypes, counts, and number of bytes of SMF data per job, task, and TSO user.

Task B Group reporting information by job name (S6BSMEJB)

The S6BSMEJB utility groups reporting information by job name. It provides a report similar to that produced by S6BSMEJA, except it groups all executions with the same job name together.

Task C Analyze SMF usage (S6BSMETY)

The S6BSMETY utility analyzes SMF usage. The report produced tells you what types of SMF records you collected and how much space these records occupy.

Task D Check SMF files (S6BSMESD)

The S6BSMESD utility checks an SMF file. It scans an SMF file and produces a report of record counts by date, time, and system ID. The report can also help you to detect missing, duplicate, or out-of-sequence SMF record ranges.

Task E Add a key to SMF records for sorting (S6BSMFAK)

The S6BSMFAK utility adds a key to SMF records for sorting. Job identification within most SMF records is by job name and reader-start data and time. Use this utility to modify SMF records so that their job identification appears at the standard offset. After sorting the records, use S6BSMFDK to restore the modified records to their original layout.

Task F Produce a report in the sequence of the SMF file (S6BSMFCH)

The S6BSMFCH utility produces a report generally similar to S6BSMESD but in the sequence of the SMF file itself. All changes in record date, system ID, or significant time gaps result in a new print line. Bracketing SMF type 2 and 3 records are shown.

Task G Remove a sort key from SMF records (S6BSMFDK)

The S6BSMFDK utility removes a key added for sorting. If you used S6BSMFAK to modify records for sorting, use this utility to restore the records to their original layout.

Task H Extract selected SMF records (S6BSMFEX)

The S6BSMFEX utility extracts selected SMF records. Use it to extract a subset of TIBCO Object Service Broker SMF records. Although it is possible to run the TIBCO Object Service Broker SMF reporting programs using SMF archive tapes, you could decide to extract a subset of SMF records into a sequential disk file so that they can be sorted and processed more rapidly.

S6BSMFEX extracts either all TIBCO Object Service Broker SMF records or job-related SMF records for a job name or job names specified in PARM=. Particular record types can be specifically excluded from the extract. Alternatively, you could use the IFASMFDP z/OS utility. For more information, refer to [Reporting on TIBCO Object Service Broker SMF Records on page 89](#).

Reporting on TIBCO Object Service Broker SMF Records

Report Types

The following reports can be generated from the SMF data you collect:

Report Name	Utility	SMF Subtypes
Data Object Broker Checkpoint Statistics	S6BSMF12	12
Data Object Broker Pagestore Statistics	S6BSMF13	13
Data Object Broker Lock Manager Statistics	S6BSMF22	22, 06
Data Object Broker Query/Commit Counts	S6BSMF24	24, 08
Message Counts	S6BSMF25	25, 09
Data Object Broker General Statistics	S6BSMF26	26, 10
End User Consumption of Data Object Broker Resources	S6BSMF49	47, 49



You can also process your SMF records as TIBCO Object Service Broker import tables and generate your own reports.

Common TIBCO Object Service Broker SMF Report JCL and Characteristics

Certain features are common to all the reporting utilities:

- These utilities process the appropriate records and skip other SMF data.
- Each record of an appropriate subtype results in a report line (or in some cases multiple lines).
- The JCL used is similar to member S6BSMF shipped in the JCL data set. The program name changes depending on the report type.

Modifying the JCL to Produce Required Reports

JCL used to produce a TIBCO Object Service Broker statistics report is shipped as the S6BSMF member in the JCL data set. You can modify the JCL as follows to produce the required reports:

- The last two characters of the program name are the decimal digits of the principal TIBCO Object Service Broker subtype reported by the program, for example, S6BSMF49.
- The report line sequence is the same as the //SMFIN data sequence.
- The EXEC statement `PARM=nn` controls the number of lines per report page, for example, `PARM=60`. The words `LINES PER PAGE` appear as a comment only.
- Specifying `PARM=0` (or a number less than header lines + 1) results in report lines without headings. You can use this for re-processing report information (with //REPORT to a data set, instead of SYSOUT).

TIBCO Object Service Broker SMF record extraction and sorting are described in the sort sequence recommended for all the TIBCO Object Service Broker SMF reporting utilities. You could also re-sort to a temporary file to meet your particular reporting requirements.

Using IFASMFDP to Extract SMF Data

S6BSMFEX is recommended over IFASMFDP in most instances because of its specific capabilities and because it always treats its sequential input file as read-only. S6BSMFEX, however, cannot extract data from VSAM SMF collection data sets.

IFASMFDP is the standard z/OS-supplied utility program for off-loading and initializing SMF collection data sets. It can also be used to extract SMF data by SMF record types, or date and time ranges. Because of its powerful capabilities, it is generally not available in some installations.



Use IFASMFDP with *extreme care* when SMF VSAM collection data sets are referenced to avoid unintentional re-initialization of the collection data sets. Re-initialization of VSAM //DUMPIN data sets can occur by default (subject to local data set access security controls) if //SYSIN or the INDD statements are omitted or through certain INDD statement options. This could cause permanent loss of all SMF records in the collection data sets.

Extracting SMF Records from a SMF Collection Data Set

The `//DUMPIN` statement used in member `S6BSMF` in the JCL data set assumes that you want to extract TIBCO Object Service Broker SMF records directly from an SMF collection data set. SMF is usually extracted from an archive file, which if non-VSAM, is not subject to re-initialization. Modify this statement to reflect the location of your SMF records.

Referencing a Specific Record Type

The `//SYSIN DD` statement references an assumed TIBCO Object Service Broker SMF record type of 255. This value depends upon the setting of `SMFRECORD` in the Data Object Broker parameters. Refer to [Reviewing SMF Record Subtypes on page 81](#) for more information about how the SMF record type number is specified.

See Also *TIBCO Object Service Broker for z/OS Utilities* for usage information, sample JCL, and sample reports for the utilities mentioned above.

Chapter 5

Interpreting Data Object Broker SMF Records

This chapter describes each Data Object Broker SMF record and provides a sample of each of the subtypes. For information on how to collect and report on the records, refer to [Chapter 4, Collecting and Reporting on Generated SMF Records](#), on page 77.

Topics

- [Standard Header](#), page 94
- [Subtypes 01 and 02–Data Object Broker Initialization and Normal Termination](#), page 95
- [Subtypes 06 and 22–Lock Manager Statistics](#), page 96
- [Subtypes 08 and 24–Cumulative and Interval Query and Commit Counts](#), page 97
- [Subtype 09 and 25–Cumulative and Interval Message Counts by Length](#), page 98
- [Subtype 10 and 26–Cumulative and Interval General Statistics](#), page 99
- [Subtype 11–DASD Pagestore Statistics](#), page 100
- [Subtype 12–Checkpoint Statistics](#), page 101
- [Subtype 13–Pagestore Response Time Statistics](#), page 102
- [Subtypes 14 and 27–Cumulative and Interval Query and Commit Extended Response Time Statistics](#), page 103
- [Subtypes 15 and 28–Cumulative and Interval Server Usage and Response Time Information](#), page 104
- [Subtype 23–Multiple Query Task Usage Statistics](#), page 105
- [Subtype 45–Page Sweep Limit Exceeded Record](#), page 106
- [Subtypes 47 and 49–User Resource Consumption Interval and Cumulative Record](#), page 107

Standard Header

The first 42 bytes of all Data Object Broker SMF records is a standard header, as shown in the following illustration:

OFFSET	FIELDNAME	FORMAT	DESCRIPTION
0	XXXXLEN	H	Record length including r.d.w. (42)
2	XXXXSEG	XL2	VBS segment descriptor
4	XXXXFLG	X	System indicator
5	XXXXRTY	B	Record type number (SMFRECORD parm)
6	XXXXTME	BL4	Record time sec/100
10	XXXXDTE	PL4	Record date in hexadecimal format 0CYDDDDF ^a
14	XXXXSID	CL4	System ID
18	XXXXSSI	CL4	Subsystem ID (S6B) ^b
22	XXXXSTY	H	Subtype number
24	XXXXHVR	XL2	OSB VERSION.RELEASE X'VVR'
26	XXXXJBN	CL8	Data Object Broker JOB/STC/TSU name
34	XXXXRST	BL4	Reader start time sec/100
38	XXXXRSD	PL4	Reader start date X'0CYDDDDF'

- ^a Date in packed format when the record was moved into the SMF buffer. The format 0cyydddF is comprised as follows: the first digit, "0", is a literal; "c" indicates the century, where 0 means 19xx, 1 means 20xx, 2 means 21xx, and so on; "yy" are the final two digits of the year, ranging from 0-99; "ddd" is the day of the year, ranging from 1-366, and "F" is a sign value to make the entire field a valid packed number.
- ^b Value can be modified via USERMOD for compatibility with the older releases in which the value was HRN.

Subtypes 01 and 02—Data Object Broker Initialization and Normal Termination

Subtype 01 record is created at Data Object Broker startup time to serve as its initialization timestamp. Subtype 02 record serves to timestamp *normal* Data Object Broker shutdown.

Layout

Subtypes 01 and 02 have the same layout. The layout of these records is simply the standard SMF header. The Subtype Number field contains either “1” or “2”.

Subtypes 06 and 22—Lock Manager Statistics

Subtype 06 record contains TIBCO Object Service Broker Lock Manager statistics. Created at normal termination time of the Data Object Broker, it contains statistics accumulated throughout the entire life of the Data Object Broker. Subtype 22 is its corresponding interval record. Subtypes 06 and 22 have the same layout.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF22 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of the record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtypes 08 and 24—Cumulative and Interval Query and Commit Counts

On normal shutdown, the Data Object Broker creates the subtype 08 record. This record contains statistics on query and commit counts summarized by response time. Subtype 24 is its corresponding interval record. Subtypes 08 and 24 have the same layout.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF24 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of the record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#)



SMF 8 and 24 records and SMF 14 and 27 records are mutually exclusive.

Subtype 09 and 25—Cumulative and Interval Message Counts by Length

Subtype 09 records contain message count statistics summarized by message length. Subtype 25 is its corresponding interval record. Subtypes 09 and 25 have the same layout.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF25 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of the record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 10 and 26—Cumulative and Interval General Statistics

Subtype 10 record is produced on normal Data Object Broker shutdown and contains general Data Object Broker statistics. Subtype 26 is its corresponding interval record. Subtypes 10 and 26 have the same layout.



To find out how much time the various Data Object Broker tasks have used, refer to the fields beginning at offset 352 (160 hex) from the beginning of the subtype 10 record. These fields contain the CPU time (TCB) used in milliseconds for the various Data Object Broker tasks. These values can be used in combination with the number of requests processed by the various tasks to calculate an average value.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF26 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of the record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 11—DASD Pagestore Statistics

Subtype 11 record contains statistics on each data set—page file—defined to the Data Object Broker. The record is produced when the data set is closed, either at shutdown or when the **Dboffline** Data Object Broker command is issued.

For a layout of these record types, described by the HSMF11 MACRO, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 12–Checkpoint Statistics

Subtype 12 record is produced at every TIBCO Object Service Broker checkpoint and contains checkpoint turnaround time and sizing information.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF12 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of the record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 13—Pagestore Response Time Statistics

Subtype 13 records contain DASD response time statistics. One record is produced for every specified interval. Each record contains response times for an active data set.

HU13HDR DSECT is repeated for each data set in the segment. Depending on the number of data sets in the segment, multiple SMF records might exist.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF13 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtypes 14 and 27—Cumulative and Interval Query and Commit Extended Response Time Statistics

On normal shutdown, if the SMF27INTERVAL Data Object Broker parameter is set, the Data Object Broker creates the subtype 14 record, which contains statistics on query and commit counts summarized by response time. Subtype 27 is its corresponding interval record. These subtypes have the same layout.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF27 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of these record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).



SMF 14 and 27 records and SMF 8 and 24 records are mutually exclusive.

Subtypes 15 and 28—Cumulative and Interval Server Usage and Response Time Information

A subtype 28 record contains server usage and response time information. It is produced at the interval specified by the SMF28INTERVAL Data Object Broker parameter. To process the record, the SMFRECORD and SMF28INTERVAL must be set and the Monitor/SMF flag in the resource detail entry must be on. You can turn this flag on in the Resource Manager using the S6BTLADM (Administration Menu) utility. Refer to *TIBCO Object Service Broker for z/OS Installing and Operating* for information about the Administration menu.

If the SMF 28 interval records are cut, the SMF 15 cumulative record is also cut during normal Data Object Broker termination. These subtypes have the same layout.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF28 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of these record types, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 23—Multiple Query Task Usage Statistics

Subtype 23 records contain multiple query task usage statistics. These statistics are produced whenever an end of SMF interval is detected.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. The subtype 23 record consists of a constant portion, mapped by the HSMF23 macro; and a repeating group, one for each enabled query task, mapped by the HSMF23A macro. For details on how to print and use the record layouts and for a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtype 45–Page Sweep Limit Exceeded Record

A subtype-45 record is produced when both of these conditions are true:

- A message requests a logical page read that exceeds the threshold limit specified in the PAGESWEEPLIMIT Data Object Broker parameter.
- The PAGESWEEPACTION Data Object Broker parameter is set to SMF.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF45 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Subtypes 47 and 49—User Resource Consumption Interval and Cumulative Record

Subtype 49 record is produced each time a user logs out from TIBCO Object Service Broker. It is also produced for all users logged in at the time of Data Object Broker shutdown. Subtype 47 is its corresponding interval record. Subtypes 47 and 49 have the same layout.

These subtypes report, in Data Object Broker units of work, the services provided to the Execution Environment user's session. Session totals accumulate from login through logout or shutdown and are produced when the user exits from TIBCO Object Service Broker or when the Data Object Broker is shut down.

Corresponding Execution Environment Subtype

The subtype 49 record (produced by the Data Object Broker) corresponds to the Execution Environment record described in [Subtype 62—Session Termination Statistics on page 124](#). Both records refer to the user and the session by these same parameters:

- In subtype 49, the user ID can be found in the **HU49UID** field. The session number can be found in the **HU49SSN#** field.
- In subtype 62, the user ID can be found in the **HSRUUID** field. The session number can be found in the **HSRUNQID** field.

The unique session identifier is assigned by the Data Object Broker at session initialization time. This identifier can be used to aggregate SMF data from both the Data Object Broker and the Execution Environment.

These fields enable the Data Object Broker to identify multiple and subsequent sessions by the same user across multiple Execution Environments. If the Data Object Broker has been recycled, use the **RECORD TIME** and **RECORD DATE** fields in subtype 62 with the **T.O.D. WHEN DOB READY** field in subtype 49. For specific details, refer to member TOD2YMD in the CLIST data set.

The unique session identifier is also published on the following records:

- Data Object Broker: SMF 47 HU47SSN# field (session interval User Resource Consumption record). The identifier is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment.
- Execution Environment: SMF 60 HSRUNQID (Session Startup).
- SMF 61 HSRUNQID (Session Termination).

- SMF72 HSRUNQID (Execution Environment Transaction Statistics).

Further Discussion

Within an Execution Environment, data is seen logically as tables and rows. Session requests are passed to the Data Object Broker for execution and are tracked as follows:

User Event On Table	EE Request	Counted In Field ^a
Retrieve	Query	HU49QRY
Insert	Commit	HU49CMIT
Modify	Commit	HU49CMIT
Delete	Commit	HU49CMIT

a. HU49QRY + HU49CMIT = Inter-Region Message Count

Logical Requests are implemented by making physical TIBCO Object Service Broker page accesses.

Logical Requests

Logical Request	Physical Request	Counted in Field
Query	Data/Index/Rules Page Gets ^a	HU49GET
Query	Rules Page Gets	HU49RULE
Commit	Data/Index/Rules Page Puts	HU49PUT
Query/Commit	Input/Output	HU49READ HU49WRITE

a. For each page or rules Get, the required page could already be resident in the Data Object Broker Page Pool. Otherwise, required pages are fetched from DASD.

Physical Writes

MetaStor update activity is pooled, therefore physical writes cannot be attributed directly to a particular user. To *estimate* a fair cost for processing, the shared costs are distributed over all active users based on the number of logical puts they requested. This form of estimation is used to set HU47SRB, HU47FCPU, and HU47WRIT fields in the SMF subtype 47 and 49 records.

For Field name HU47SSN#, the identifier is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session. See the HSRUNQID field in EE SMF records 60, 61, 62, and 72.

The SMF record layouts are shipped in machine-readable format as assembler copybooks. For these subtypes, refer to HSMF45 in the MACRO data set shipped with TIBCO Object Service Broker. For details on how to print and use the record layouts and for a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Chapter 6

Interpreting Execution Environment SMF Records

This chapter describes the common sections in the Execution Environment records and each of the subtypes. For information on how to collect and report on the records, refer to [Chapter 4, Collecting and Reporting on Generated SMF Records](#), on page 77.

Topics

- [Common Sections in the Subtypes](#), page 112
- [Process Section](#), page 113
- [Accounting Section](#), page 115
- [Performance Section](#), page 117
- [Subtype 50–Execution Environment Startup](#), page 119
- [Subtype 51–Execution Environment Termination](#), page 120
- [Subtype 52–Execution Environment General Statistics](#), page 121
- [Subtype 60–Session Startup](#), page 122
- [Subtype 61–Session Termination](#), page 123
- [Subtype 62–Session Termination Statistics](#), page 124
- [Subtype 72–Execution Environment Transaction Statistics](#), page 126

Common Sections in the Subtypes

The following table lists the sections that are common to many Execution Environment SMF record subtypes in addition to the Standard Header.

Section	Description	Page
Process	This section includes the details specific to the Execution Environment.	113
Accounting	This section, found in subtypes 52, 62, and 72, includes a number of closely related time fields.	115
Performance	This section, found in subtypes 52, 62, and 72, provides performance information.	117

Process Section

Each Execution Environment subtype record includes a process section that provides for details specifically for the Execution Environment. The following fields are the logical tags that you can use to match Execution Environment SMF records with SMF records generated by the underlying platform:

- HSRENVTR
- HSRENVID
- HSRENVIX

Other standard fields might also be present, in particular HSRUNQID and HSRTRDTE.

HSRENTVTR

This reserved field contains the environment transaction code. In CICS, this field contains a four-character transaction code from EIBTRNID. In IMS TM, it contains an eight-character transaction code.

HSRENVID and HSRENVIX in CICS

In CICS these two fields have the following meaning:

HSRENVID	Relates to the CICS transaction binary task number from EIBTASKN that is active at the time monitoring starts.
HSRENVIX	Relates to the CICS transaction binary task number from EIBTASKN that is active at the time monitoring concludes.

If you are running CICS pseudo-conversationally, the only way to obtain a one-to-one relationship between CICS transactions and TIBCO Object Service Broker transactions is to use DISPLAY & TRANSFERCALL in your TIBCO Object Service Broker rules rather than DISPLAY.

HSRENVID in IMS TM

The HSRENVID field holds the input message sequence number.

HSRUNQID

The HSRUNQID field, located at offset 86, contains the identifier assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session with that collected by the Data Object Broker. See the HSRUNQID field in EE SMF records 60, 61, and 62. See also the fields HU47SSN# and HU49SSN# in DOB SMF records 47 and 49, respectively.

HSRTRDTE

The format for field HSRTRDTE is 0CYYDDDF, where C is a digit representing the century. In the years 1900 through 1999, C=0. In the years 2000 through 2099, C=1. YY is the last two digits of the year. DDD is the day of the year. F is a positive sign value to complete the packed format.

Accounting Section

Time Fields

The accounting section of the general statistics SMF records (subtype 52, 62, and 72) include a number of closely associated time fields:

- **Elapsed time**
- **Runtime**
- **Queue and resume times**
- **Lock time**

Data can be rolled up to the session level from the transaction level and up to the Execution Environment level for run, queue, resume, and lock times.

Elapsed Time

Elapsed time is the clock time from beginning to end of some unit of work, whether a transaction, a session, or region. Elapsed time is the only clock that is overlapping. All other clocks start and stop when scopes change, transactions nest, locks are held, or system services execute.

Runtime

Runtime is the clock time associated with the scheduled execution of a unit of work. For example, the session runtime clock stops when a transaction executes since the unit of work scheduled is the transaction. Similarly, when a TIBCO Object Service Broker transaction spawns another transaction, the runtime of the spawning transaction is suspended until the spawned transaction completes.

In the accounting section, runtime consists of executor and system service runtimes. Performance data provide the runtimes for each system service. Normally, the runtime clock and the CPU clock are concurrent.

Queue and Resume Times

Queue and resume times concern system service dispatch and executor redispach times.

Lock Time

Lock time is the amount of time some unit of work waits for the availability of scarce Execution Environment resources. Locks managed by the Execution Environment never occur at the system service level.

Relationship Between Time Fields

The relationship between the time fields is best explained when a unit of work is at the highest level of execution (that is, when a transaction is at the highest stream level). At the highest level of execution, the summation of run queue, resume, and lock times equals (or nearly equals) the elapsed time of the work unit.

Difference Between Runtime and CPU Time

The difference between runtime and CPU time can be significant and its accountability can be difficult. By definition, runtime is scheduled execution time and CPU time is actual execution time.

Some of the difference between runtime and CPU time can be attributed to the operating system and/or the underlying platform of the Execution Environment. However, you identify large components of wait time in the domain of the Execution Environment by examining the system request section of performance data.

Example

Terminal wait time can be a large element of the difference between runtime and CPU time. Although the terminal wait time is published in the accounting section, it can also be computed by subtracting the CPU time from the runtime of the system service section that monitors all terminal input/output. You can use a similar method to determine the wait time that is associated with Execution Environment and Data Object Broker communications.

Performance Section

Execution Environment SMF subtypes 52, 62, and 72 provide performance as well as accounting information. This information is primarily for use by your TIBCO Support representative. The following types of performance data are recorded:

- System request
- Locking
- Rules and program

How to Generate Performance Data

To generate the performance data for these records, either the Execution Environment or session parameters must include the reserved word SMFPERFORMANCE (abbreviation SMFP).

System Requests

The System Request section records all system functions referenced. System calls invoked at the transaction level accumulate at the session level. As Execution Environment monitoring is also accumulated at the session level, you can find the most heavily used system calls for a specific user transaction or for the Execution Environment as a whole.

Locking

The Lock section records the shared and exclusive use of various locks in the Execution Environment. A section appears in the SMF record only for those locks that are actually sought or obtained. Data can be rolled up to the session level from the transaction and up to the Execution Environment level.

Rules/Programs

The Rule/Programs section records the execution of rules or programs in the Execution Environment. Each section relates to a particular rule/program with no implied order between the sections. The number of rule/program sections that can appear in an SMF record is limited to 100 (the first 100 executed). Data can be rolled up to the session level from the transaction and it can be rolled up to the Execution Environment level.

See Also *TIBCO Object Service Broker Parameters* for more information about the SMFPERFORMANCE parameter.

Subtype 50—Execution Environment Startup

Subtype 50 record contains data captured at Execution Environment startup.

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.

Subtype 51—Execution Environment Termination

Subtype 51 record is produced at termination time of an Execution Environment. For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.

Subtype 52–Execution Environment General Statistics

Subtype 52 record is produced when the Execution Environment is shut down normally.

For data to appear in the performance section, either the Execution Environment or session parameters must include the reserved word SMFPERFORMANCE.

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.

Subtype 60—Session Startup

Subtype 60 record is produced when an Execution Environment session starts up.

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.
- Field HSRUNQID is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session with that collected by the Data Object Broker. See the HSRUNQID field in EE SMF records 61, 62, and 72. See also the HU47SSN# and HU49SSN# fields in DOB SMF records 47 and 49, respectively.

Subtype 61–Session Termination

Subtype 61 record is produced when an Execution Environment session ends.

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.
- Field HSRUNQID is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session with that collected by the Data Object Broker. See the HSRUNQID field in EE SMF records 61, 62, and 72. See also the HU47SSN# and HU49SSN# fields in DOB SMF records 47 and 49, respectively.

Subtype 62—Session Termination Statistics

Subtype 62 record is produced when an Execution Environment session terminates. For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.



The CPU usage of an Execution Environment user is reported in the **HSR62CPU** field of the subtype 62 record. The value shown is the TCB (Task Control Block) time, excluding the TCB time for the CICS task in a CICS Execution Environment.

Collection of Data in the Performance Section

For data to appear in the performance section, either the Execution Environment or session parameters must include the reserved word SMFPERFORMANCE.

Corresponding Data Object Broker Subtype

The subtype 62 record (produced by the Execution Environment) corresponds to the Data Object Broker record described in [Subtypes 47 and 49—User Resource Consumption Interval and Cumulative Record on page 107](#). Both records refer to a user session by the same identifier:

- In subtype 49, the user ID can be found in the **HU49UID** field. The session identifier can be found in the **HU49SSN#** field.
- In subtype 62, this identifier can be found in the **HSRUUID** field. The session identifier can be found in the **HSRUNQID** field.

The unique session identifier is assigned by the Data Object Broker at session initialization time. This identifier can be used to aggregate SMF data from both the Data Object Broker and the Execution Environment.

These fields enable the Data Object Broker to identify multiple and subsequent sessions by the same user across multiple Execution Environments. If the Data Object Broker was recycled, use the **RECORD TIME** and **RECORD DATE** fields in subtype 62 with the **T.O.D. WHEN DOB READY** field in subtype 49. For specific details, refer to member TOD2YMD in the CLIST data set.

The unique session identifier is also published on the following records:

- Data Object Broker: SMF 47 HU47SSN# field (session interval User Resource Consumption record)
- Execution Environment: SMF 60 HSRUNQID (Session Startup)

- SMF 61 HSRUNQID (Session Termination)
- SMF72 HSRUNQID (Execution Environment Transaction Statistics)

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.
- Field HSRUNQID is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session with that collected by the Data Object Broker. See the HSRUNQID field in EE SMF records 61, 62, and 72. See also the HU47SSN# and HU49SSN# fields in DOB SMF records 47 and 49, respectively.

Subtype 72—Execution Environment Transaction Statistics

Subtype 72 record is produced upon termination of an Execution Environment transaction. For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#). Refer to EVNTSMF in the MACRO data set shipped with TIBCO Object Service Broker.

Data Collection in the Performance Section

For data to appear in the performance section, either the Execution Environment or session parameters must include both the reserved words SMFDETAIL and SMFPERFORMANCE.

Transaction and Application Identifiers

For subtype 72 records, the TIBCO Object Service Broker transaction is identified by the starting rule. However, two TIBCO Object Service Broker tools ([\\$SETTRANSACTION](#) and [\\$GETTRANSACTION](#)) enable the application developer to assign an application-specific identifier dynamically.

Management of Transactions That Transcend Stream Boundaries

To manage business transactions that transcend stream boundaries, the following transaction identification rules apply:

- New transactions inherit the application-specific identifier of the parent transaction.
- Transactions that continue at the same stream level via TRANSFERCALL assume the application-specific identifier of the previous transaction.
- Changes to the application-specific identifier do not revert to the parent transaction.

Servers and Distributed Data

Whenever a TIBCO Object Service Broker transaction is executed as a service (that is, to provide services for distributed data requests or to access external database management systems), the subtype 72 record contains two TIBCO Object Service Broker Process Unit ID sections:

- The first section refers to the local transaction that references the data.
- The second section refers to the originator of the request.

User-associated transactions have only one Process Unit ID defined.

See Also *TIBCO Object Service Broker Shareable Tools* for more information about the [\\$GETTRANSACTION](#) and [\\$SETTRANSACTION](#) tools.

For a layout of this record type, see [Using SMF Record Layouts Supplied as Assembler Macros on page 84](#).

Note the following:

- Field HSRSSI can be modified through USERMOD for compatibility with the older releases in which the value was HRN.
- Field HSRENVID is the binary CICS task number from EIBTASKN or the IMS input message sequence number at the start of monitoring.
- Field HSRENVIX is the binary CICS task number from EIBTASKN at the end of monitoring.
- Field HSRUNQID is assigned by the Data Object Broker at session initialization time. This field can be used to aggregate SMF data collected by the Execution Environment for a session with that collected by the Data Object Broker. See the HSRUNQID field in EE SMF records 61, 62, and 72. See also the HU47SSN# and HU49SSN# fields in DOB SMF records 47 and 49, respectively.
- The format of the field HSRTRDTE is 0CYYDDDF, where C is a digit representing the century. In the years 1900 through 1999, C=0. In the years 2000 through 2099, C=1. YY is the last two digits of the year. DDD is the day of the year. F is a positive sign value to complete the packed format.
- Field HSR72ELP is the wall-clock time and includes CPU, wait, terminal think time, and so on.
- Field HSR72RUN is the clock time while the EE is scheduled to perform a unit of work, including execution, queue, and system services time.
- Field HSR72QUE is the elapsed time spent waiting for a resource to become available or for a preempting function to complete.
- Field HSR72RSM is the elapsed time waiting for the redispach of the session due to resumption of Interpreter task or WAIT for a function to complete.
- Field HSR72TRM is the elapsed time waiting for terminal input.
- Field HSR72LCK is the elapsed time waiting for a locked resource to become free plus the time lock held.

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