

IBM OMEGAMON for IMS on z/OS  
5.5.0

*Application History Reference*



**Note**

Before using this information and the product it supports, read the information in [“Notices” on page 67.](#)

**October 2024 Edition**

This edition applies to version 5, release 5, modification 0, of IBM OMEGAMON for IMS on z/OS (product number 5698-T02) and to all subsequent releases and modifications until otherwise indicated in new editions.

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# Contents

<b>Chapter 1. Application Trace Facility overview.....</b>	<b>1</b>
Application Trace Facility components.....	1
The z/OS System Logger.....	2
Planning your ATF installation.....	3
<b>Chapter 2. Activating the Application Trace Facility.....</b>	<b>5</b>
Starting the Application Trace Facility.....	5
Stopping the Application Trace Facility.....	7
Application Trace Facility trace repository.....	7
Trace repository utilities.....	7
<b>Chapter 3. Using the Application Trace Facility.....</b>	<b>11</b>
Managing application trace definitions.....	12
Specifying application trace details.....	14
Viewing application trace data.....	17
Viewing application trace summary data by group.....	18
Viewing application trace summary data.....	21
Viewing application trace overview data.....	24
Viewing application trace detail data.....	28
Viewing application trace DL/I data.....	30
Viewing application trace exception data.....	31
Viewing application trace exception summary data.....	31
Viewing application trace exception overview data.....	34
Viewing application trace exception detail data.....	38
Viewing application trace exception DL/I data.....	40
Filtering application trace data.....	42
<b>Chapter 4. Application Trace Facility batch processing.....</b>	<b>45</b>
Application Trace Facility summary data.....	46
Enabling Application Trace Facility for IMS log processing.....	47
Application Trace Facility response time metrics.....	48
Application Trace Facility summary log record reporting in batch.....	50
The Application Trace Facility summary log record.....	50
<b>Chapter 5. Estimating the size of the Application Trace Facility z/OS log streams...57</b>	<b>57</b>
Sizing utility for ATF z/OS log streams.....	58
Manually estimating the size of the ATF z/OS log streams.....	59
Estimating the size of the ATF summary log stream and the ATF exception summary log stream...59	59
Estimating the size of the ATF detail log stream and the ATF exception detail log stream.....	60
Example: manually estimating the size of the ATF z/OS log streams.....	61
<b>Accessibility.....</b>	<b>63</b>
<b>Support information.....</b>	<b>65</b>
<b>Notices.....</b>	<b>67</b>
<b>Index.....</b>	<b>71</b>



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# Chapter 1. Application Trace Facility overview

This reference provides information about the Application Trace Facility (ATF). Use the Application Trace Facility to collect summary-level metrics and detailed transaction events data, which you can use to understand the operation and performance of your monitored IMS systems.

Application history summary and detailed information and application history exception summary and detailed information can be viewed in the OMEGAMON for IMS Classic interface, the Tivoli® Enterprise Portal, and the OMEGAMON enhanced 3270 user interface.

The Application History Reference describes how to start and stop the Application Trace Facility, and how to use the OMEGAMON for IMS Classic interface to create, activate, and deactivate application trace definitions. You can also learn how to navigate the OMEGAMON for IMS Classic interface screens to view the summary-level and detailed trace data.

The Application Trace Facility collects and displays summary-level metrics and detailed transaction events data. By analyzing the data, you can understand how the monitored transactions operate and perform.

The ATF component collects detailed data about IMS Monitor events that occur within one or more transactions. The ATF supports the MPP, JMP, IFP, BMP, JBP, CICS/DBCTL, and ODBA IMS application and region types, and collects the following types of data:

- Application abends
- Application API call details for each occurrence of a DL/I, Db2 SQL, MQ, and z/OS connect call
- Application elapsed times and processor times for each event and associated region
- External subsystems events that are related to the processing of DB2® and MQ threads
- Other IMS Monitor events that are associated with API calls
- Properties of a transaction and its environment, such as the region where the transaction runs
- Transaction scheduling and termination

You can view ATF data and use it to complete these tasks:

- Fine-tune applications
- Identify applications based on exception criteria (for example, abends, elapsed times, and processor time thresholds)
- Identify transaction response-time components
- Understand how application programs operate

**Note:** For non-message-driven BMP, ATF puts the job name in the Transaction Name field.

The ATF component can write, to the IMS logging environment, one record per transaction or program execution instance. The record contains summaries of DL/I, DB2, and MQ calls with counts, elapsed and CPU times. The records can be used for application charge-back as well as generalized application performance reporting. IBM IMS Performance Analyzer and IMS Problem Investigator have pre-built report sets for these records. For more information, see [IMS Performance Analyzer for z/OS: OMEGAMON ATF reporting](#) and [IMS Problem Investigator for z/OS: Analyzing OMEGAMON ATF records](#).

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## Application Trace Facility components

The Application Trace Facility (ATF) includes ATF Manager, ATF Collector, and ATF Display. These components create the ATF environment, detect transaction events in real time, and transmit the ATF data to OMEGAMON workspaces.

The ATF Manager creates the ATF environment within the OMEGAMON® Classic address space, activates and deactivates the ATF Collector in the IMS environment, and establishes connections to the z/OS® System Logger for archiving collected ATF data.

The ATF Collector detects, transmits, and formats IMS transaction events data. ATF Collector components that are active within the IMS address spaces detect transaction events in real time. Information about the state of IMS and the transaction is gathered and formatted into packets transmitted to the address space. When the ATF packets are received by the OMEGAMON address space, the data is written to one or more log streams.

If you enable the **LOG to IMS** trace specification, the ATF Collector writes a summarized record for each transaction or program instance to the IMS logging environment.

**Note:** You can configure the IMS log record number that the ATF Collector writes.

After the ATF data is written to the log streams, you can view the data in the ATF Display screens or in the enhanced 3270 user interface (e3270UI). You can view the ATF data from the summary level down to the details of each event collected. Both display components also provide filters that you can use to control the amount and type of data to be displayed.

## The z/OS System Logger

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OMEGAMON for IMS on z/OS uses the z/OS System Logger to store the trace data that the Application Trace Facility collects.

You provide log stream parameters when you use Configuration Manager or PARMGEN to configure OMEGAMON for IMS on z/OS. You must run post-configuration jobs to create the log streams that the Application Trace Facility (ATF) uses to store the trace data. You can use Coupling Facility (CF) list structure-based log streams or DASD-only log streams. In most cases, DASD-only log streams are sufficient. However, for high rates of ATF trace data collection, you might consider using CF log streams for better performance.

There is a one-to-one relationship between a monitored IMS system and an OMEGAMON for IMS Classic ATF session. Each ATF Collector uses up to three log streams, one for each type of trace (or *application history*) data that you can collect. When the ATF starts, it connects to the log streams specified on the START ATF command. As data is collected, it is written to the appropriate log stream. At a minimum, you must define a log stream for application history summary data or a log stream for application history exception summary data.

The names of the log streams use the following convention:

```
rtename.imsid.tt
```

where:

***rtename***

Up to eight-character name of the runtime environment.

***imsid***

Four-character name of the IMS system being monitored.

***tt***

Type of trace data stored in the log stream.

**SM**

Application history summary data.

**DL**

Application history detail data.

**SX**

Application history exception summary data.

The IMS Monitor feature of the IMS subsystem can be used to collect transaction events data to be processed by offline IMS utilities for performance reporting. IMS Monitor data and ATF data can be collected concurrently.

The ATF collector writes the performance metrics of IMS applications to different z/OS log streams. The ATF collector requires a summary log stream and a detail log stream. You can have exception summary and exception detail log streams. The ATF z/OS log streams are defined as follows:

### **The ATF summary log stream**

The ATF summary log stream contains one record per IMS application execution instance. Each record contains the following information:

- Elapsed times and CPU times of the application
- A summary of all the IMS DB/DC, Db2, and MQSeries calls that the application issued

Member KI2ATFSM in the TKANSAM library maps the ATF summary record to the ATF summary log stream.

### **The ATF detail log stream**

The ATF detail log stream contains many event records per IMS application execution instance. The number of events per application depends on a few factors. The most important factor is the number of DLI DB/DC, Db2, and MQSeries calls, because other events might occur based on which API calls are issued.

### **The ATF exception summary log stream**

The ATF exception summary log stream contains the type of information that is written to the ATF summary log stream, but at a lower volume. The KI2ATFLS utility estimates the size of the ATF exception summary log stream at five percent of the size of the ATF summary log stream.

## **Planning your ATF installation**

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ATF installation does not require additional IMS system or security configuration.

All the ATF components are in OMEGAMON product libraries. The OMEGAMON libraries are not included in any IMS started tasks. The appropriate IMS RESLIB must be concatenated to the STEPLIB DD in the OMEGAMON Classic address space started task. For IMS V14.1 and above, the ATF requires that an IMSMON-type exit be defined to IMS and be included in a load library that is concatenated to the STEPLIB DD in the JCL for your IMS Control Region. The ATF does not require any special considerations for RACF® or IMS security.

The resources required to run the ATF Collector components in the IMS environment are the same as those required for IMS Monitor. ATF collects data from a single IMS system. If the IMS system that ATF monitors executes in an IMS shared queues configuration, the data is collected only for those events that occur on the monitored IMS.





## Chapter 2. Activating the Application Trace Facility

ATF stores all collected trace information to log stream data sets. The names of the log streams must be specified when ATF starts.

The following topics describe start and shutdown of Application Trace Facility (ATF) and provide information on the VSAM key sequenced data set (KSDS) used to store application trace definitions. They also describe the steps to configure the user exit for the environments and application charge-back and to configure the ATF log record number.

- “Starting the Application Trace Facility” on page 5
- “Stopping the Application Trace Facility” on page 7
- “Application Trace Facility trace repository” on page 7

### Starting the Application Trace Facility

Member `KI2ATFmp` in `rhilev.RKANPARU` contains the command and options to start the Application Trace Facility (ATF).

`KI2ATFmp` is created during the configuration process. It contains the **START** command for the ATF and startup options including the log streams the ATF uses to store application history data.

The **START** ATF command is issued through the MVS **MODIFY** command by using the IMS address space ID and specifying the `KI2ATFmp` member. If you configure the ATF to start automatically when the OMEGAMON Classic address space starts, you might not have to submit the MVS **MODIFY** command. However, you should be familiar with its syntax:

```
f mpimsid,EXEC KI2ATFmp
```

where

#### **mp**

two-character MPREFIX set during installation. The MPREFIX must match the MPREFIX in the OMEGAMON Classic address space JCL.

#### **imsid**

IMS ID specified in the startup PROC.

See the *IBM OMEGAMON for IMS: Planning and Configuration Guide* for information about the **MODIFY** command.

### START command syntax

The syntax of the **START** command to start the Application Trace Facility is:

```
START ATF,keyword=value,keyword=value,
```

The following table lists the ATF startup keywords, their values or value ranges, and default values.

Keyword	Values	Default	Description
ATFACT	ON/OFF	OFF	Activates and deactivates the Application Trace Facility (ATF). If OFF, ATF does not connect to the z/OS System Logger and all other keywords are ignored.

Table 1. Start ATF options (continued)

Keyword	Values	Default	Description
ATFBUFF	1 - 4096	512	Specifies the size (in MB) of the ATF data collector buffer in 64-bit common storage. Use the default value. Lesser values might degrade performance. Configure lesser values only if 64-bit common storage is in short supply.
AUTORESTART	YES/NO	Y	Enables active traces at ATF startup or disables all traces at startup. AUTORESTART=YES (the default), enables, at ATF startup, the trace specifications that are active if ATF is active. ATF reads the trace specifications from the ATF Trace Repository data set and starts up all traces that are active and are not yet expired. AUTORESTART=NO activates no trace specifications.
DETLLOGR	<i>rtename.imsid</i> .DL	(none)	Specifies the name of the log stream used to store application history detail and exception detail data. If you specify DETLLOGR, you must specify SUMMLOGR or SUMXLGR. If you do not specify DETLLOGR, then application history detail and exception detail data is not collected.
SANDBOX	ON/OFF/ <i>nnn</i>	OFF	<p>ON specifies transaction volume is low and data is to be made immediately available for display. ON directs ATF to write data to log streams as soon as a transaction ends, which means that you can view trace data for a transaction as soon as the transaction ends.</p> <p>OFF specifies that transaction volume is high and causes ATF to buffer the trace data. Throughput increases because data is written to the log streams only when the buffer is full. With the OFF option, you can view trace data for a transaction only after the buffer is full and written to log streams.</p> <p><i>nnn</i> (where <i>nnn</i> is 1-999 seconds) indicates that transaction volume is high and causes ATF to buffer the trace data, but also periodically to write the buffered data so that it can display. Data is written to log streams after the buffer is full and every <i>nnn</i> seconds if there is any data in the buffer.</p>
SUMMLOGR	<i>rtename.imsid</i> .SM	(none)	<p>Specifies the name of the log stream used to store application history summary data. If you do not specify SUMMLOGR, then application history summary data is not collected. SUMMLOGR is required for either of the following conditions:</p> <ul style="list-style-type: none"> <li>• If DETLLOGR is specified, SUMMLOGR must be specified.</li> <li>• If SUMXLOGR is not specified, SUMMLOGR must be specified.</li> </ul>
SUMXLOGR	<i>rtename.imsid</i> .SX	(none)	Specifies the name of the log stream used to store application history exception summary data. If you do not specify SUMXLOGR, then application history exception summary data is not collected. SUMXLOGR is required if SUMMLOGR is not specified.

## Stopping the Application Trace Facility

Use the MVS **MODIFY** command to stop the Application Trace Facility (ATF).

The command to stop the ATF is issued through an MVS **MODIFY** command that uses the IMS address space ID. The following example shows the syntax of an MVS **MODIFY** command to stop the ATF:

```
f mpimsid,STOP ID=ATF, where
```

### **mp**

Two-character MPREFIX set during installation. The MPREFIX must match the MPREFIX in the OMEGAMON Classic address space JCL.

### **imsid**

IMS ID specified in the startup PROC.

For more information about the **MODIFY** command, see the *IBM OMEGAMON for IMS: Planning and Configuration Guide*.

The following messages might display when the ATF shuts down:

```
0IR041: TASK HAS BEEN REQUESTED TO STOP
DSM7300I TERMINATION IS IN PROGRESS
ATF2010I APPLICATION TRACE FACILITY TERMINATING
ATF4029I ATF CONTROLLER TASK EXITED
ATF4028I ATF TERMINATED SUCCESSFULLY
```

## Application Trace Facility trace repository

The Application Trace Facility (ATF) trace repository retains trace specifications, or *trace definitions*. You can add, modify, delete, and clone trace definitions.

User-defined ATF trace definitions control the collection of application trace data. Settings in each trace definition control the type of data collected, when collection is to begin, and the length of time for collection. The trace definitions are retained in the ATF trace repository, a VSAM key sequenced data set (KSDS). You can add, clone, modify, and delete trace definitions, as well as activate and deactivate them. All trace definitions (active and inactive) are saved in the trace repository until they are deleted. For more information about trace definitions, see [“Managing application trace definitions” on page 12](#).

The ATF trace repository is dynamically created and allocated by OMEGAMON for IMS; no JCL changes are needed. The values for the RTE\_VSAM\_HILEV and RTE\_NAME parameters in RKANPARU member KOICFGmp are used to define the ATF trace repository data set name, for example:

```
RTE_NAME          IP24
RTE_VSAM_HILEV    TDIMST.I5550SMP
```

The format of the data set name is `RTE_VSAM_HILEV.RTE_NAME.iii.I2ATFTRC`, where *iii* is the IMS ID. A sample ATF trace repository data set name is

```
TDIMST.I5550SMP.IP24.IA1W.I2ATFTRC
```

The following topic provides information about the KOIATRBK and KOIATRRS utilities that you can use to back up and restore the ATF trace repository VSAM KSDS.

## Trace repository utilities

OMEGAMON for IMS on z/OS provides utilities to back up, restore, and deploy the Application Trace Facility trace repository.

The trace repository is a VSAM KSDS that the Application Trace Facility (ATF) uses to store trace definitions. There is one trace repository for each ATF. If the ATF is active for each of your monitored IMS systems, you will have as many trace repositories as monitored IMS systems.

OMEGAMON for IMS on z/OS provides two utilities, KOIATRBK and KOIATRRS, to manage the trace repository data sets.

- Use the KOIATRBK utility to back up the trace repository VSAM KSDS to a sequential file.
- Use the KOIATRRS utility to restore the trace repository VSAM KSDS from the sequential file. Also use the KOIATRRS utility to deploy the trace definitions in the sequential file to the trace repositories for other monitored IMS systems.

The ATF trace definitions for one monitored IMS frequently also apply to other monitored IMS systems. Rather than creating the same trace definitions on each system, you can create them once, then use the trace repository utilities to import the definitions to the other monitored systems.

1. Log on to the OMEGAMON for IMS Classic interface that monitors *IMSA* and create ATF trace definitions.
2. Run KOIATRBK to back up the ATF trace repository from step 1 to a sequential file.
3. Run KOIATRRS to import the sequential file from step 2 to the ATF trace repository for *IMSB*.

The following topics provide more details about the ATF trace repository utilities.

## The KOIATRBK backup utility

Use the KOIATRBK utility to back up an Application Trace Facility trace repository VSAM KSDS to a sequential file.

The Application Trace Facility (ATF) stores trace definitions in a VSAM key sequenced data set (KSDS), called the *ATF trace repository*. The KOIATRBK utility can be used to back up the ATF trace repository VSAM KSDS to a sequential file. The sequential file can later be used to restore the VSAM KSDS or you can import its contents to the ATF trace repository for another monitored IMS system.

KOIATRBK is a member of the TKANSAM data set. Always review the instructions in the prolog before you begin.

1. Copy KOIATRBK from TKANSAM to your RKANSAMU data set, then modify the copy in your RKANSAMU data set.
2. Specify a valid JOB card.
3. Specify appropriate values for the parameters in "USER MODIFY SECTION". These parameters identify the ATF trace repository that is being backed up and are also used to name the sequential data set.
4. Stop the ATF (see [“Stopping the Application Trace Facility”](#) on page 7) or stop the OMEGAMON for IMS Classic address space.
5. Submit KOIATRBK.
6. When KOIATRBK ends, you can restart the ATF (see [“Starting the Application Trace Facility”](#) on page 5) or restart the OMEGAMON for IMS Classic address space, if it was stopped.

KOIATRBK creates a sequential data set with the name *rhilev.rte.imsid.I2ATFTRC.B*. If the data set exists, it is deleted, then re-created.

## The KOIATRRS restore and deployment utility

Use the KOIATRRS utility to restore an Application Trace Facility trace repository VSAM KSDS or import trace definitions to another monitored IMS system.

The Application Trace Facility (ATF) stores trace definitions in a VSAM key sequenced data set (KSDS), which is called the *ATF trace repository*. After you run KOIATRBK to back up the ATF trace repository to a sequential file, the KOIATRRS utility can be used to restore the repository. You can also use KOIATRRS to import the contents of the sequential file into the ATF trace repository for another monitored IMS. Using KOIATRRS, you can replace the contents of the target ATF trace repository or append to the target repository.

KOIATRRS is a member of the TKANSAM data set.

1. Copy KOIATRRS from TKANSAM to your RKANSAMU data set, then modify the copy in your RKANSAMU data set.
2. Specify a valid JOB card.
3. Specify appropriate values for the parameters in "USER MODIFY SECTION". These parameters identify the sequential backup data set used as input, the target ATF trace repository and allocation options, and whether you want to replace or append to the target repository.
4. Stop the target ATF (see [“Stopping the Application Trace Facility” on page 7](#)) or stop the target OMEGAMON for IMS Classic address space.
5. Submit KOIATRRS.
6. When KOIATRRS ends, you can restart the target ATF (see [“Starting the Application Trace Facility” on page 5](#)) or restart the target OMEGAMON for IMS Classic address space, if it was stopped.

If the target ATF trace repository, *rhilev.rte.imsid.I2ATFTRC*, does not exist, KOIATRRS uses the values that are specified in step 3 to create the VSAM KSDS. If you instruct KOIATRRS to replace the target repository, KOIATRRS deletes the VSAM KSDS if it exists, then re-creates it.

In the following deployment scenario, you create ATF trace definitions by using the OMEGAMON for IMS Classic interface and run KOIATRBK to back up the ATF trace repository to a sequential file. Then, you run KOIATRRS to import the backup file to the ATF trace repository for one or more of your other monitored IMS systems.

1. Use the OMEGAMON for IMS Classic interface to create trace definitions in the ATF trace repository, *rhilev.rte.imsid.I2ATFTRC*. For example, if *rhilev*=IBM, *rte*=SYS1, and *imsid*=IMSA, the ATF trace repository is IBM.SYS1.IMSA.I2ATFTRC.
2. Run KOIATRBK to back up the ATF trace repository from step 1, *rhilev.rte.imsid.I2ATFTRC* (IBM.SYS1.IMSA.I2ATFTRC), to *rhilev.rte.imsid.I2ATFTRC.B* (IBM.SYS1.IMSA.I2ATFTRC.B).
3. Run KOIATRRS to deploy the backup file that was created in step 2, *rhilev.brte.bimsid.I2ATFTRC.B* (IBM.SYS1.IMSA.I2ATFTRC.B), to the ATF trace repository for another monitored IMS, for example, IMSB, *rhilev.rte.imsid.I2ATFTRC* (IBM.SYS1.IMSB.I2ATFTRC).



## Chapter 3. Using the Application Trace Facility

You can access all of the Application Trace Facility features from the Application History Menu panel in the OMEGAMON for IMS Classic interface.

The Application Trace Facility (ATF) component in the OMEGAMON for IMS Classic interface is a set of commands and screens that provide access to trace specifications and to the collection of ATF data. Using the ATF screens in the Classic interface, you can create a trace, activate a trace or make a trace inactive, and view trace data. You can also view trace data in the enhanced 3270UI.

**Tip:** When you navigate the ATF screens, use a 43x80 screen size, so that screen options display on a single page. This is especially helpful for the screens that you use to create and modify trace specifications and to set filtering options. If you use a 24x80 screen size, press the **Enter** key on the first screen to update any data on that screen before you page to the next screen.

### Navigating to the Application History Menu panel

You access ATF features from the **Application History Menu** (KOIATF) panel, which is available by using option H on the **OMEGAMON for IMS Main Menu** panel in the Classic interface.

1. The **Main Menu** panel, which is shown in the following figure, is the entry into OMEGAMON for IMS components.

```
----- ZMENU      VTM      OI-II      V550./C IA1A 03/01/23 13:02:30      B
> Help/News PF1      Exit PF3      Keys PF5      Command Mode PF12
> Return to CUA PA2      Colors PF18
>
> Enter a selection letter on the top line.
=====
>
> OMEGAMON for IMS Performance Monitor Main Menu
>
- E EXCEPTIONS ..... Current and potential system problems, latch conflicts
- R RESPONSE TIME .... Transaction response times (RTA users)
- B BOTTLENECKS ..... Resource contention (bottleneck analysis) (DEXAN users)
- H APPLICATION HIST.. Application History
>
- M MONITOR ..... IMS status, graphs, and time controlled operations
- W WORKLOAD ..... PSBs, DMBs, transactions, regions, and classes
- Y OTMA ..... OTMA status, TMEMBERS, and TPIPEs
- L LINES ..... Terminals, nodes, and lines
- A ALL POOLS ..... Communication, database, and program pools
- C COMPONENTS ..... I/O, logging, storage, and control blocks/modules
>
- F FAST PATH ..... IMS Fast Path information
- O OTHER SYSTEMS .... External subsystems (DB2 and MQ) and XRF information
>
- T TOOLS ..... Operator tools
- P PROFILE ..... Profile maintenance and session settings
>
=====
```

Figure 1. OMEGAMON for IMS Main Menu panel

2. Use option **H** to proceed to the **Application History Menu** panel (KOIATF), shown in the following figure.

```

----- KOIATF VTM OI-II V550./C IA1W 03/01/23 14:10:23 B
> Help PF1 Back PF3
>
> Enter a selection letter on the top line
=====
> APPLICATION HISTORY MENU
> ADMINISTRATION:
_ A MANAGE TRACES. . . . . Manage application trace requests

> TRACE RESULTS:
_ B VIEW . . . . . View trace details by Group
_ C GROUP/FILTER . . . . . Specify Group/Filter criteria

> TRACE EXCEPTION RESULTS:
_ D VIEW . . . . . View trace exceptions
_ E GROUP/FILTER . . . . . Specify Group/Filter criteria

=====

```

Figure 2. Application History Menu panel

3. Use the options on the **Application History Menu** panel to access ATF features.

## Managing application trace definitions

Use the **Manage Application Trace** panel to create, clone, delete, activate, deactivate, and modify application traces.

To access the **Manage Application Trace** panel (KOIATMN), use option **A** on the **Application History Menu** panel (KOIATF). The **Manage Application Trace** panel (KOIATMN) automatically issues the **ATMN** command, which displays the set of application traces and their status currently defined to the ATF. Enter an action character to create, clone, delete, activate, deactivate, and modify application traces, or to view the application history data or the application history exception data based on a selected trace.

```

----- KOIATMN VTM OI-II V550./C IB1K 06/07/23 14:15:06 B
> Help PF1 Back PF3 Up PF7 Down PF8
>
> (H.A.A) Manage Application Trace (Define/Start/Stop)
>
> * - Manage Trace B - View Trace C - Search and Filter Criteria
>
-----
ATMN
: TraceID=*_____ StartDate=*_____ (YYYYMMDD) Active=* (*/Y/N)
+
+ Actions: A=Add C=Clone D=Delete I=Activate/Inactivate M=Modify
+ | V=View trace results X=View trace exceptions
+ |
+ |
+ V Trace ID Start Date Time Duration Trace Status Tran. counts, Selection criteria
+ |-----|-----|-----|-----|-----|-----|-----|
: _ CHRGBACK 06/07 14:14 FOREVER Active (0,0),SUM,LOG
: _ ALICE 06/07 14:12 10 Inac-MAN (0,0),LIM=500
: _ BOB 06/07 14:11 15 Active (0,0),TRN=PAYR*
: _ EVERYTHG 06/07 14:01 FOREVER Active (5000,0)

```

Figure 3. Manage Application Trace (Define/Start/Stop) panel

### The Manage Application Trace fields

Output from the **ATMN** command on the **Manage Application Trace (Define/Start/Stop)** panel displays information about the traces defined to the ATF. Type into the TraceID, StartDate, and Active input fields across the top portion of the screen and press **Enter** to filter the list of traces. Type an Action code in the input area for a listed trace and press **Enter** to create a new trace (add, clone), delete the trace, activate or deactivate the trace, modify the trace, view the application history data collected for the trace, or view the application history exception data collected for the trace.



Table 2. *ATMN* fields

Field name	Description
TraceID	Specify the complete Trace ID name (that is, 'TRACE01'), specify a generic trace ID suffixed by an asterisk (*) (that is, 'TRACE*'), or specify an asterisk (*) to display all Trace IDs. The default is *.
StartDate	To filter by start date, use yyyyymmdd. If no date is specified (the * default), all trace specifications are eligible for display.
Active	Specify Y to display only active traces, specify N to display only inactive traces, or an asterisk (*) to display active and inactive traces. The default is *.
Actions	<p>An action character, including A (Add), C (Clone), D (Delete), I (Activate/Inactivate), M (Modify), V (View Trace Results), and X (View Trace Exceptions).</p> <ul style="list-style-type: none"> <li>• Use action character A (Add) to define a new trace specification.</li> <li>• Use action character C (Clone) to copy the contents of a trace specification to use as a model for a new trace specification.</li> <li>• Use action character D (Delete) to delete an inactive trace specification. An active trace cannot be deleted (it must be deactivated by using action character I before it can be deleted).</li> <li>• Use action character I (Activate/Inactivate) to activate an inactive trace or deactivate an active trace. Activating an inactive trace that is not expired causes the trace to activate for the remaining duration. If the trace was inactive because the transaction count limit was reached, the counts reset to 0. Activating an expired inactive trace resets the trace's start date and time to the current date and time, resets the transaction counts to 0, and causes ATF to collect trace data that matches this trace request. If you activate an expired inactive trace and use action character V or X to view the trace results, you only get data collected since the new start date and time. To view the trace data from a previous start date and time or any other criteria, modify the trace specifications or use the options on the <b>Application History Menu</b> panel (KOIATF) to set filter criteria and view the data based on that criteria.</li> </ul> <p><b>Note:</b> When you change trace status, some events might not be filtered as you intend, if they occur at the time of the status change.</p> <ul style="list-style-type: none"> <li>• Use M (Modify) to change a trace specification. If you modify a trace and reactivate it, viewing the trace data by trace ID (action character V or X) displays only the data for the modified trace. To view the trace data for previous trace specifications or any other criteria, modify the trace specifications or use the options on the <b>Application History Menu</b> panel (KOIATF) to set filter criteria and view the data based on that criteria.</li> </ul> <p><b>Note:</b> When an active trace is modified, some events might not be filtered as you intend, if they occur at the time of the modification.</p> <ul style="list-style-type: none"> <li>• Use V to display grouped trace results based on the selected trace. The results are retrieved from the application history summary log stream and are displayed on the <b>View Application Trace Summary by Group</b> panel (KOIATVG). Action character V is not valid on an exception-only trace.</li> <li>• Use X to display exception summary results based on the selected trace. The results are retrieved from the application history exception summary log stream and are displayed on the <b>View Application Trace Exception Summary</b> panel (KOIATXS). Action character X is only valid on a trace that includes exception criteria.</li> </ul>
Trace ID	The eight-character name that is used to identify the trace request.

Table 2. *ATMN* fields (continued)

Field name	Description
Start Date Time	The time when you want to activate the trace request, if not already active. The field value by default represents the current year if you specify a start date of today or a start date in the future.
Duration Minutes	The duration of the trace request in minutes, with valid values 1 - 99999 or forever.
Trace Status	Indicates an active or inactive trace request. Values include Active, Inactive (trace expired or starts in the future), Inac-MAN (a user deactivated the trace), Inac-LIM (the trace is inactive because the transaction count limit was reached).
Tran. counts, Selection criteria	The transaction counts and a summary of the trace filter criteria. <i>T</i> and <i>X</i> indicate the number of transactions ( <i>T</i> ) and exceptions ( <i>X</i> ) traced. The transaction counts are followed by the transaction count limit, if specified, then the trace filter criteria, if specified. An exclamation point character (!) preceding the transaction counts for a trace indicates that exception filtering is used. An <b>X</b> preceding the counts indicates an exception-only trace. SUM indicates that ATF summarizes all collected data and does not retain any detail trace data. LOG indicates that ATF writes one summarized record for each collected transaction to the IMSLOG.

## Specifying trace definitions

You can specify an application trace definition by using **A** (Add). You can clone a trace (**C**) and modify a trace (**M**) in a similar manner.

## Specifying application trace details

The **Specify Application Trace Details** panel (KOIATSP) in the Classic interface specifies application trace details such as future start date, start time, and duration

To access the **Specify Application Trace Details** panel (KOIATSP), enter **A** on the **Manage Application Trace** panel. The **Specify Application Trace Details** panel (KOIATSP) automatically issues the **ATSP** command. Enter the specifications for the new trace in the **ATSP** input fields to save the trace.

By default, the **Start Date** and **Start Time** fields are populated, based on a 24-hour clock, with the current date and time. Specify the start date and time in minutes, 1 - 99999, with a default value of 5 or a duration value of forever.

**Note:** Wildcard specification can increase collection usage.

```

----- K O I A T S P   V T M       O I - I I       V 5 5 0 . / C I B 1 K 0 6 / 0 7 / 2 3 1 4 : 2 0 : 5 8   B
> Help PF1           Back PF3           Up PF7           Down PF8
>
>
> Specify Application Trace Details
-----
>
> Specify start date/time and duration for application trace.
> Specify filter criteria which best suits desired results.
-----

ATSP
+
: Trace ID.....: _____ (Required)
: Start Date.....: 06/07       (Format is MM/DD)
: Start Time.....: 14:20       (Format is HH:MM)
: Duration.....: 5_____ (1-99999 Minutes, or Forever, default 5)
: Transaction Name.: *_____
: Scheduling Class.: *_____ (1-999, default *)
: User ID.....: *_____
: LTERM Name.....: *_____
: Job Name.....: *_____
: PSB Name.....: *_____
: DBD Name.....: *_____
: Summarize Only...: NO__ (YES/NO, default NO)
: Log to IMS.....: NO__ (YES/NO/ONLY, default NO)
: Limit Transaction Count: 0_____ (1-999999999, 0 or blank for no limit)
: BMP Trace by Message/CHKP: N (Y/N)
: Exclude region type (Y/N): BMP N MPP N IFP N JBP N JMP N CICS N ODBA N
+
+ Exception (all values OR'd):
: Exception Only...: N (Y/N)
: ABEND Code.....: _____
: Elapsed Time Total > : _____ (nn.nnnnnn seconds)
: DL/I > : _____ DB2 > : _____ MQ > : _____
: CPU Time Total > : _____ (nn.nnnnnn seconds)
: DL/I > : _____ DB2 > : _____ MQ > : _____
: Dep > : _____ CTL > : _____ DLS > : _____

```

Figure 4. Specify Application Trace Details panel

## The Specify Application Trace Details fields

The **ATSP** command on the **Specify Application Trace Details** panel displays a set of input fields where you define your trace and exception specifications. Use the fields in the top portion of the ATSP output display to specify the trace criteria. Use the fields below the "Exception (all values OR'd):" line to define exception criteria, if applicable.

You can specify a generic filter in certain fields on the **Specify Application Trace Details** panel:

### ABC\*

Specifies a trace of resource names with 'ABC' as the first 3 characters.

### \*

Specifies a trace of all applications.

The fields that accept a generic filter are noted in the table.

Field	Description
Trace ID	The eight-character name that is used to identify the trace request. This field is required.
Start Date	The month and day to activate the trace request. The format is MM/DD. The field value by default represents the current year if you specify a start date of today or a start date in the future. The default is today's date.
Start Time	The hour and minute to activate the trace request. The format is HH:MM. The fields is automatically populated with the current time by default.

Table 3. **ATSP** trace specification and exception criteria fields (continued)

Field	Description
Duration	The duration of the application trace in minutes, with valid values 1 - 99999 or forever. If not specified, the default is 5 minutes.
Transaction Name	The IMS transaction name or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @.
Scheduling Class	The IMS scheduling class. Valid values are 1 – 999 or '*' for all scheduling classes.
User ID	The IMS user ID that initiates the transaction or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @.
LTERM Name	The IMS logical terminal name (LTERM) or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @.
Job Name	The name of the job you want to trace or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @; the first character must be alphabetic or \$, #, or @.
PSB Name	The IMS PSB name or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @; the first character must be alphabetic or \$, #, or @.
DBD Name	The IMS database name (DBD or HALDB partition) or generic filter request. Valid format is a text string of up to eight alphanumeric characters and \$, #, or @; the first character must be alphabetic or \$, #, or @.
Summarize Only	Specify whether detail is written for each transaction (NO, the default option) or that only a summary record is written for each transaction (YES).
Log to IMS	Specify whether the summary record for each transaction is written to the IMS LOG (YES or NO) in addition to writing to the z/OS Log Stream. Specify option ONLY when data is to be written to the IMS LOG and not to the z/OS Log Stream.
Limit Transaction Count	The maximum number of transactions. Specify a value 1 - 999999999. The trace stops when the specified number of transactions are collected or the duration expires. Specify a value of 0 or blank to allow unlimited transactions. The value defaults to the setting in the current profile.
BMP Trace by Message/CHKP	Specify whether each message and CHKP call in a BMP job step is traced as a separate transaction (Y). If N is specified, the BMP job step is traced as a single transaction. The value defaults to the setting in the current profile.
Exclude region type (Y/N)	Specify whether to exclude region types.
<b>Exception criteria:</b> The following fields are used for exception-level tracing only. Exception-level tracing is defined by specifying a value in the Abend Code field, one of the Elapsed Time fields, or one of the CPU Time fields.	
Exception only	<p>The <b>Exception only</b> field can have a value of N (the default) or Y.</p> <ul style="list-style-type: none"> <li>N indicates that the exception criteria fields (<b>Abend Code</b>, <b>Elapsed Times</b>, and <b>CPU times</b>) are optional. If no exception criteria is provided, the data is written only to the application history log streams. If exception criteria are provided, data is also written to the application history exception log streams.</li> <li>Y indicates that the exception data is to be written only to the application history exception log streams. If you specify an Exception only value of Y, you must also specify an abend Code, one of the Elapsed Times, or one of the CPU Times.</li> </ul>

Table 3. **ATSP** trace specification and exception criteria fields (continued)

Field	Description
ABEND Code	Enter a specific abend code to collect data only for applications that match that code. Use an asterisk to collect data for all abended applications.
Elapsed Time	<p>If trace data is to be collected based on one or more elapsed times, enter a value for the required elapsed time (Total, DL/I, DB2, and MQ). Elapsed time values are specified in the format <i>nn.nnnnnn</i> or <i>n.nnnnnn</i> seconds. Trace data is written only for applications that have a corresponding elapsed time value greater than the value specified in the ATSP panel. See the following four elapsed time values:</p> <p><b>Total</b> The total elapsed time for the application.</p> <p><b>DL/I</b> The time that is spent in DL/I calls (DB and TM).</p> <p><b>DB2</b> The time that is spent in DB2 SQL calls.</p> <p><b>MQ</b> The time that is spent in WebSphere® MQ calls.</p>
CPU Time	<p>If trace data is to be collected based on one or more processor times, enter a value for the required processor time (Total, DL/I, DB2, MQ, Dep, CTL, and DLS). Processor time values are specified in the format <i>nn.nnnnnn</i> or <i>n.nnnnnn</i> seconds. Trace data is written only for applications that have a corresponding processor time value greater than the value specified in the ATSP panel. See the following seven processor time values:</p> <p><b>Total</b> Total processor time for the application.</p> <p><b>DL/I</b> Processor time in DL/I calls (DB and TM).</p> <p><b>DB2</b> Processor time in DB2 SQL calls.</p> <p><b>MQ</b> Processor time in WebSphere MQ calls.</p> <p><b>Dep</b> Processor time in the dependent region.</p> <p><b>CTL</b> Processor time on control region TCB.</p> <p><b>DLS</b> Processor time on DLISAS TCB.</p>

## Viewing application trace data

The Application Trace Facility (ATF) includes a set of screen spaces that you use to view application trace data.

From the **View Application Trace Summary by Group** panel (KOIATVG), use **PF11** (Zoom) to display additional levels of summary and detail information.

**Note:** You can also view application trace data in the OMEGAMON enhanced 3270 user interface.

**Important:** Application trace summary and detail data are only available if the application history summary log stream (SUMMLOGR) and application history detail log streams (DETLLOGR) are specified when the ATF starts. Summary data can be enabled by itself, but both log streams must be enabled in order to obtain application history detail data.

These screens display application trace data.

- “Viewing application trace summary data by group” on page 18
- “Viewing application trace summary data” on page 21
- “Viewing application trace overview data” on page 24
- “Viewing application trace detail data” on page 28
- “Viewing application trace DL/I data” on page 30

## Viewing application trace summary data by group

The **Application Trace Summary by Group** panel (KOIATVG) displays high-level application trace data.

If the application history summary log stream (SUMML0GR) is enabled, ATF captures high-level trace data for all selected applications. A summary appears on the collected data on the **View Application Trace Summary by Group** panel (KOIATVG). The [Figure 5 on page 18](#) automatically issues the **ATVG** command to display elapsed time and processor time summary information based on grouping and filtering criteria.

Use one of the following methods to open the panel:

- Option **B** on the **Application History Menu** panel (KOIATF). When you use this method, the data that displays on KOIATVG is filtered by using the information that is specified on the **Application Trace and Filter Criteria** panel (KOIATFL). Line 2 of the **ATVG** command output displays the date and time range or the time span settings that are used to filter the display. The default filter is Last 5 minutes.
- Action character **V** on the **Manage Application Trace** panel (KOIATMN). Use this to filter based on the selected trace. Line 2 of the **ATVG** command output displays the trace ID that is used to filter the display.

By default, the summary information is grouped by transaction name regardless of whether you use option **B** to view the summary data or action character **V** to view the summary data. However, you can override this grouping by using the **Group results by** field in the **Application Trace and Filter Criteria** panel (KOIATFL).

In this example, action character **V** was used to display the summary information based on a selected trace. The information is also grouped by transaction name.

**Note:** You can also view trace data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATVG VTM      OI-II      V550./C IC1A 07/20/23 11:11:36  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
>
> (H.A.B) View Application Trace Summary by Group
>
>
> A - Manage Trace      * - View Trace      C - Search and Filter Criteria
>
-----
ATVG                      TOTAL TIME AVERAGES
+
+ Trace ID: TRACE27      07/03 20:34      FOREVER      ACTIVE      ALL DEFAULTS ARE IN USE
+
+ Group by
+ Trancode      Count      --- Elapsed ----      ----- CPU -----
+ -----      -----      Average      Max      Average      Max      Abends
+ -----      -----      -----      -----      -----      -----      -----
+ ADD          14      0.0531s      0.4993s      1,183µs      2,725µs
+ MPX00100     28      0.1075s      0.9964s      2,182µs      5,258µs      2
+ DELETE      24      4,344µs      0.0802s      613µs      806µs
+ IVTNO       10      8,924µs      0.0539s      869µs      1,500µs
+ AN960C10    5      0.0275s      0.7682s      2,640µs      0.0210s
+ IMSBMP9A    1      0.8142s      0.8142s      0.0629s      0.0629s
+ MPX00110   20      0.2474s      3.3978s      2,287µs      7,445µs      3

```

Figure 5. View Application Trace Summary by Group panel

You can also specify a label on the **ATVG** command and press **Enter**:

- Specifying **e** on the **ATVG** command displays elapsed time.

```

EATVG                                ELAPSED TIME AVERAGES
+
+ Trace ID: TRACE27   07/03 20:34   FOREVER   ACTIVE   ALL DEFAULTS ARE IN USE
+
+ Group by
+ Trancode      Count  ----- DL/I -----  ----- DB2 -----  ----- MQ -----
+ -----
+ ADD           14  0.0379s  0.3969s  0µs    0µs    0µs    0µs  0.0531s
+ MPX00100     28  0.0364s  0.2897s  0µs    0µs    0µs    0µs  0.1075s
+ DELETE       24  1,402µs  0.0221s  0µs    0µs    0µs    0µs  4,344µs
+ IVTNO        10   349µs  1,724µs  0µs    0µs    0µs    0µs  8,924µs
+ AN960C10     5   1,262µs  1,551µs  0µs    0µs    0µs    0µs  0.0275s
+ IMSBMP9A     1   0.6958s  0.6958s  0µs    0µs    0µs    0µs  0.8142s
+ MPX00110    20  0.0685s  0.4894s  0µs    0µs    0µs    0µs  0.2474s

```

Figure 6. EATVG - Elapsed Time Averages

- Specifying **c** displays CPU time.

```

CATVG                                CPU TIME AVERAGES
+
+ Trace ID: TRACE27   07/03 20:34   FOREVER   ACTIVE   ALL DEFAULTS ARE IN USE
+
+ Group by
+ Trancode      Count  ----- API -----  ----- Dep. -----  ----- IMS -----
+ -----      DL/I  ----- DB2 -----  ----- MQ -----  ----- Region -----  ----- CTL -----  ----- DLS -----  ----- Total -----
+ -----
+ ADD           14   413µs  0µs    0µs  1,183µs  0µs    0µs  1,183µs
+ MPX00100     28  1,268µs  0µs    0µs  1,939µs  158µs  84µs  2,182µs
+ DELETE       24   250µs  0µs    0µs   613µs  0µs    0µs   613µs
+ IVTNO        10   144µs  0µs    0µs   862µs  0µs    6µs   869µs
+ AN960C10     5    715µs  0µs    0µs  2,640µs  0µs    0µs  2,640µs
+ IMSBMP9A     1   0.0387s  0µs    0µs  0.0629s  0µs    39µs  0.0629s
+ MPX00110    20  1,495µs  0µs    0µs  1,753µs  284µs  249µs  2,287µs

```

Figure 7. CATVG - CPU Time Averages

## The View Application Trace Summary by Group fields

The output from the **ATVG** command on the **View Application Trace Summary by Group** panel includes the following columns:

Field name	Description
Group by Trancode	The group by level of the display. This field varies based on the user-specified <b>Group results by</b> setting in the <b>Application Trace Filter Criteria</b> (KOIATFL) panel. In these examples, transaction name (the default) is the grouping level.
Count	The number of transactions within this time span or for the trace ID.
Elapsed Average	The average transaction elapsed time within this time span or for the trace ID. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where µs=microseconds, s=seconds, m=minutes, h=hours, d=days.
Elapsed Max	The maximum transaction elapsed time within this time span or for the trace ID.
CPU Average	The average transaction CPU time within this time span or for the trace ID.
CPU Max	The maximum transaction CPU time within this time span or for the trace ID.
Abends	The number of transaction execution abends within this time span or for the trace ID.

The output from **EATVG** includes the following columns:

Field name	Description
Group by Trancode	The group by level of the display. This field varies based on the user-specified <b>Group results by</b> setting in the <b>Application Trace Filter Criteria</b> (KOIATFL) panel. In these examples, transaction name (the default) is the grouping level.
Count	The number of transaction executions within this time span or for the trace ID.
DL/I Average	The average DL/I elapsed time. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where $\mu$ s=microseconds, s=seconds, m=minutes, h=hours, d=days.
DL/I Max	The maximum DL/I elapsed time.
DB2 Average	The average DB2 elapsed time.
DB2 Max	The maximum DB2 elapsed time.
MQ Average	The average MQ elapsed time.
MQ Max	The maximum MQ elapsed time.
Total	The total elapsed time.

The output from **CATVG** includes the following columns:

Field name	Description
Group by Trancode	The group by level of the display. This field varies based on the user-specified <b>Group results by</b> setting in the <b>Application Trace Filter Criteria</b> (KOIATFL) panel. In these examples, transaction name (the default) is the grouping level.
Count	The number of transaction executions within this time span or for the trace ID.
API DLI	The processor time that is spent in DL/I calls (DB and TM).
API DB2	The processor time that is spent in Db2 SQL calls.
API MQ	The processor time that is spent in WebSphere MQ calls.
Dep. Region	The processor time that is spent in the dependent region.
IMS CTL	The processor time that is spent in control region TCB.
IMS DLS	The processor time that is spent in DLISAS TCB.
Total	The total processor time for the trace. Total CPU time is the sum of processor Time in DL/I calls, Db2 SQL calls, WebSphere MQ calls, control region TCB, and DLISAS TCB.

## Zooming to application trace summary information

To view more summary-level details, place the cursor on a highlighted line in the **ATVG** display output and press **PF11** (Zoom). **PF11** opens the **View Application Trace Summary** panel (KOIATVS).

- See [“Viewing application trace summary data”](#) on page 21.



## Viewing application trace summary data

The **View Application Trace Summary** panel (KOIATVS) shows high-level application trace summary data.

If the application history summary log stream (SUMMLGR) is enabled, ATF captures high-level trace data for all selected applications. Summary data appears on the [Figure 8 on page 21](#) (KOIATVS). panel automatically issues the **ATVS** command to display summary information, including start date and time, elapsed time, and processor time, for each transaction instance.

To open the **View Application Trace Summary** (KOIATVS) panel, press the **PF11** (Zoom) key on the **View Application Trace Summary by Group** panel (KOIATVG). A summary line is displayed for each transaction. Line 2 of the **ATVS** command output displays the filtering criteria.

The following figure shows the **View Application Trace Summary** panel (KOIATVS).

**Note:** You can also view trace summary data in the OMEGAMON enhanced 3270 user interface.

```
----- KOIATVS VTM      OI-II  V550./C IC1A 07/20/23 11:16:59  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
> -----
> (H.A.B) View Application Trace Summary
> -----
> A - Manage Trace  * - View Trace  C - Search and Filter Criteria
> -----
ATVS
+
+ Trace ID: TRACE27  07/03 20:34  FOREVER  ACTIVE  ALL DEFAULTS ARE IN USE
+
+ Strt Date\Time  Trancode  PSB Name  RGN Name  LTERM      Elap Time  CPU Time  Abend
+ -----
+ 07/08 14:26:37  AN960C10  DFSSAM02  IMSCAMS1  VMINT      0.1053s   2,671µs
+ 07/08 14:26:38  AN960C10  DFSSAM02  IMSCAMS1  VMINT      0.0116s   2,770µs
+ 07/08 14:26:39  AN960C10  DFSSAM02  IMSCAMS1  VMINT      7,156µs   2,600µs
+ 07/08 14:26:40  AN960C10  DFSSAM02  IMSCAMS1  VMINT      6,957µs   2,650µs
+ 07/08 14:26:41  AN960C10  DFSSAM02  IMSCAMS1  VMINT      6,732µs   2,510µs
```

Figure 8. View Application Trace Summary panel

You can also specify a label on the **ATVS** command and press **Enter** to display alternative information:

- Specifying **e** displays elapsed time summary information.

```

----- KOIATVS VTM      OI-II  V550./C IB1K 06/07/23 14:29:07  B
> Help PF1          Back PF3          Up PF7          Down PF8          Zoom PF11
>
>
>          (H.A.B) View Application Trace Summary
>
-----
>  A - Manage Trace      * - View Trace      C - Search and Filter Criteria
>
-----
EATVS                      ELAPSED TIME SUMMARY
+
+ Date/Time Range: 2016/01/01 00:00:00 to 2016/06/07 23:59:59
+
+ -- Start ---
+ MM/DD HHMMSS Trancode  DL/I  API  MQ  Total  Elapsed  CPU
+ -----
+ 06/07 140356 MPX00010 0.0648s  0µs  0µs  0.0651s  0µs  0µs
+ 06/07 140356 MPX00010 5,092µs  0µs  0µs  5,956µs  0µs  0µs
+ 06/07 140356 MPX00010 8,083µs  0µs  0µs  8,790µs  0µs  0µs
+ 06/07 140356 MPX00010 4,739µs  0µs  0µs  5,369µs  0µs  0µs
+ 06/07 140356 MPX00010 5,430µs  0µs  0µs  7,918µs  0µs  0µs
+ 06/07 140354 MPX00010 9,428µs  0µs  0µs  9,793µs  0µs  0µs
+ 06/07 140354 MPX00010 8,241µs  0µs  0µs  9,311µs  0µs  0µs
+ 06/07 140354 MPX00010 5,989µs  0µs  0µs  7,667µs  0µs  0µs
+ 06/07 140354 MPX00010 3,027µs  0µs  0µs  3,854µs  0µs  0µs
+ 06/07 140354 MPX00010 0.0755s  0µs  0µs  0.0774s  0µs  0µs
+ 06/07 140354 MPX00010 2,336µs  0µs  0µs  4,385µs  0µs  0µs

```

Figure 9. EATVS - Elapsed Time Summary

- Specifying **c** displays CPU time summary information.

```

CATVS                      CPU TIME SUMMARY
+
+ Trace ID: TRACE27  07/03 20:34  FOREVER  ACTIVE  ALL DEFAULTS ARE IN USE
+
+ -- Start ---
+ MM/DD HHMMSS Trancode  DL/I  API  MQ  Dep.  IMS  Total
+ -----
+ 07/08 142637 AN960C10  768µs  0µs  0µs  2,671µs  0µs  0µs  2,671µs
+ 07/08 142638 AN960C10  787µs  0µs  0µs  2,770µs  0µs  0µs  2,770µs
+ 07/08 142639 AN960C10  642µs  0µs  0µs  2,600µs  0µs  0µs  2,600µs
+ 07/08 142640 AN960C10  737µs  0µs  0µs  2,650µs  0µs  0µs  2,650µs
+ 07/08 142641 AN960C10  644µs  0µs  0µs  2,510µs  0µs  0µs  2,510µs

```

Figure 10. CATVS - CPU Time Summary

## The View Application Trace Summary fields

The output from the **ATVS** command on the **View Application Trace Summary** panel includes the following columns:

Field name	Description
Strt Date\Time	The month, day, hour, minute, and seconds the application started.
Trancode	The IMS transaction name.
PSB Name	The IMS PSB name.
RGN Name	The IMS dependent region name.
LTERM	The IMS logical terminal (LTERM) name of the originating message.
Elap Time	The elapsed time of the transaction. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where µs=microseconds, s=seconds, m=minutes, h=hours, d=days.

Table 7. **ATVS** output fields (continued)

Field name	Description
CPU Time	The processor time of the transaction.
Abend	An abend code if an abend occurred.

Table 8. **EATVS** output fields

Field name	Description
Start MM/DD HHMMSS	The month, day, hour, minute, and second the application started.
Trancode	The IMS transaction name.
API DL/I	The DL/I elapsed time of the transaction. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where $\mu$ s=microseconds, s=seconds, m=minutes, h=hours, d=days.
API DB2	The DB2 elapsed time of the transaction.
API MQ	The MQ elapsed time of the transaction.
Total	The total elapsed time for the transaction.
Locks Elapsed	The lock elapsed time of the transaction.
Locks CPU	The lock CPU time of the transaction.

The output from **CATVS** includes the following columns:

Table 9. **CATVS** output fields

Field name	Description
Start MM/DD HHMMSS	The month, day, hour, minute, and second the application started.
Trancode	The IMS transaction name.
API DL/I	The processor time that was spent in DL/I calls (DB and TM).
API DB2	The processor time that was spent in DB2 SQL calls.
API MQ	The processor time that was spent in WebSphere MQ calls.
Dep. Region	The processor time that was spent in the dependent region.
IMS CTL	The processor time that was spent in control region TCB.
IMS DLS	The processor time that was spent in DLISAS TCB.
Total	The total processor time for the transaction. Total CPU time is the sum of processor time in DL/I calls, DB2 SQL calls, WebSphere MQ calls, and control region TCB.

### Zooming to application trace overview information

If the ATF captures detail-level trace data, you can zoom (**PF11**) from the **View Application Trace Summary** panel to the **View Application Trace Overview** panel to see overview information for a specific transaction instance. **PF11** opens the **View Application Trace Overview** panel (KOIATVW).

- See “Viewing application trace overview data” on page 24.

**Important:** Application trace overview data is not available for display if the ATF does not capture application history detail data. In order to collect application history detail data, the application history detail log stream (DETLLOGR) must be specified when the ATF starts.

## Viewing application trace overview data

The **View Application Trace Overview** panel (KOIATVW) displays trace overview data for a transaction instance. Summary information for the DL/I, Db2, and MQ events (calls) executed by the transaction is also shown.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data, including statistics for all API calls that the executed transactions make. Data for a specific transaction instance is displayed on the [Figure 11 on page 25](#) (KOIATVW).

To open the panel, press the **PF11** (Zoom) key on the **View Application Trace Summary** panel (KOIATVS). The panel automatically issues the **ATVW** command to display overview details for the selected transaction instance, as well as summary information about the API calls made by the instance.

The following figure shows the **View Application Trace Overview** panel (KOIATVW).

**Note:** You can also view trace overview data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATVW VTM      OI-II    V550./C IB1K 06/07/23 14:34:14  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
>      Prev Tran Detail PF5    Next Tran Detail PF6
-----
>
>      (H.A.B) View Application Trace Overview
-----
ATVW
+ Transaction instance 000003 of 000261 displayed
+ Transaction . . . . . MPX00010      PSB . . . . . MPP00010
+ Logical Terminal. . . . .          Transaction Class . . 001
+ Region Type . . . . . MPP (PWF1)    Message Source. . . . PROG
+ Region Number . . . . . 3           Primed Message. . . . NO
+ Job Name. . . . . IMSBKMS1         Quick Schedule. . . . NO
+ Step Name . . . . . REGION         Current SPA Size. . . N/A
+ UserID. . . . . SURFIQLD          Abend Code. . . . .
+ Start Date. . . . . 06/07/23       CPU Time in DEP . . . 455µs
+ Start Time. . . . . 14:03:56.816511 CPU Time in DL/I. . . 312µs
+ End Time. . . . . 14:03:56.825301   CPU Time in DB2 . . . 0µs
+ Elapsed Time in DL/I. . 8,083µs     CPU Time in MQ. . . . 0µs
+ Elapsed Time in DB2 . . 0µs         CPU Time in CTL . . . 0µs
+ Elapsed Time in MQ. . . 0µs         CPU Time in DLS . . . 0µs
+ Elapsed Time Total. . . 8,790µs     CPU Time Total. . . . 455µs
+ Elapsed Time in Locks . . 0µs       CPU Time in Locks . . 0µs
+
+ Message arrival date. 06/07/23     Application CPU time. 143µs
+ Message arrival time. 14:02:34.504713 Originated IMS. . . . IB1K
+ Input queue time. . . 1m 22s       Response time . . . . 1m 22s
+ DLI TM calls. . . . . 1           DB2 SQL calls . . . . 0
+ DLI DB calls. . . . . 9           MQ API calls. . . . . 0
+
+ Detail records collected: 21
+
+ ----- DBD event counts ----- Time -----
+ DBD Name      Read      Insert  Update  Delete  Lock  IWAIT  Elapsed  CPU
+ -----
+ BI$HDH00      5         0       0       0       0     6     4,481µs 192µs
+ BD$HDM00      1         0       0       0       0     1     599µs   30µs
+ BA$HDL00      1         0       0       0       0     1     701µs   26µs
+ BF$HDM00      2         0       0       0       0     3     2,303µs 65µs
+
+ -----Duration----- CPU-----
+ Event description  DBD name  Count  Total  Average  Total  Average
+ -----
+ DLI TM GU          1         2µs    2µs    2µs    2µs
+ DLI DB GU          BI$HDH00 5 4,481µs 896µs 192µs 38µs
+ DLI DB GU          BD$HDM00 1 599µs 599µs 30µs 30µs
+ DLI DB GU          BA$HDL00 1 701µs 701µs 26µs 26µs
+ DLI DB GU          BF$HDM00 2 2,303µs 1,151µs 65µs 32µs
+ OSAM I/O IWAIT    BI$HDH00 6 2,035µs 339µs 41µs 6µs
+ OSAM I/O IWAIT    BD$HDM00 1 285µs 285µs 5µs 5µs
+ OSAM I/O IWAIT    BA$HDL00 1 233µs 233µs 5µs 5µs
+ OSAM I/O IWAIT    BF$HDM00 3 1,042µs 347µs 15µs 5µs

```

Figure 11. View Application Trace Overview panel

On the **View Application Trace Overview** panel (KOIATVW), you can also perform the following functions:

- Press **PF6** to view the overview information for the next transaction.
- Press **PF5** to view the overview information for the previous transaction.
- Place the cursor on any highlighted line in the **ATVW** display output and press **PF11** (Zoom) to view details about the API events executed by this transaction.

### The View Application Trace Overview fields

The output from the **ATVW** command on the **View Application Trace Overview** panel displays detailed information about the transaction in the top portion of the screen. Summary information about the DL/I, DB2, and MQ events are displayed in the bottom portion of the screen.

Table 10. **ATVW** output fields

Field name	Description
The top portion of the output results includes the following fields:	
Transaction	The name of the transaction that was traced. The acronym (WFI) or (PWFI) displays next to the transaction name for transactions that are defined as wait-for-input or pseudo-wait-for-input.
Logical Terminal	The logical terminal that initiated the transaction.
Region Type	The type of the IMS region.
Region Number	The number of the IMS region.
Job Name	The name of the IMS region. For DBCTL threads, this name is the CICS region name. For ODBA threads, this name is the job name of the ODBA thread.
Step Name	The job step name of the region.
UserID	The logical terminal that initiated the transaction, which in IMS/ETO systems is synonymous with the user ID.
Start Date	The month, day, and year the application started.
Start Time	The hour, minute, second, and microsecond the application started.
End Time	The hour, minute, second, and microsecond the application ended.
Elapsed Time in DL/I	The elapsed time that was spent in DL/I calls (DB and TM).
Elapsed Time in DB2	The elapsed time that was spent in DB2 SQL calls.
Elapsed Time in MQ	The elapsed time that was spent in WebSphere MQ calls.
Elapsed Time Total	The total elapsed time of the application.
PSB	The name of the PSB that this transaction is using.
Transaction Class	The IMS class that is assigned to this transaction.
Message Source	The source of the input message, including TERM (standard terminal), CPIC (CPIC-driven program), APPC (LU6.2 source), OTMA (OTMA source), and PROG (program-switch source).
Primed Message	An indicator of whether the message is primed for the application program (YES) or (NO).
Quick Schedule	An indicator whether IMS Quick scheduling is in effect (YES) or (NO).
Current SPA Size	For IMS conversational transactions, the current SPA size. Otherwise, N/A is shown.
Abend Code	For transactions that end abnormally, this code is the abend code.
CPU Time in DEP	The processor time that was spent in the dependent region.
CPU Time in DL/I	The processor time that was spent in DL/I calls (DB and TM).
CPU Time in DB2	The processor time that was spent in DB2 SQL calls.
CPU Time in MQ	The processor time that was spent in WebSphere MQ calls.
CPU Time in CTL	The processor time that was spent in the control region TCB.

Table 10. **ATVW** output fields (continued)

<b>Field name</b>	<b>Description</b>
CPU Time in DLS	The processor time that was spent in the DLISAS TCB.
CPU Total Time	The total processor time for the application. Total CPU time is the sum of CPU Time in DEP, CPU Time in CTL, CPU Time in DLISAS, and CPU Time in Other.
Elapsed Time in Locks	The elapsed time spent in lock acquire/release.
CPU Time in Locks	The processor time spent in lock acquire/release.
Message arrival date	The month, day, and year the message arrived on the originating IMS.
Application CPU time	The processor time used by the application for non-API (DL/I, DB2, MQ) work.
Message arrival time	The hour, minute, second, and microsecond the message arrived on the originating IMS.
Originated IMS	IMSID of the IMS where the message originated.
Input queue time	The elapsed time the input message spent on the IMS local and/or shared queues.
Response time	The elapsed time of the transaction. Includes input queue and processing time.
DLI TM calls	The number of DLI TM calls.
DB2 SQL calls	The number of DB2 SQL calls.
DLI DB calls	The number of DLI DB calls.
MQ API calls	The number of MQ API calls.
DBD Name	The accessed database name for the database event counts table.
Read	The number of reads for the accessed database.
Insert	The number of inserts to the accessed database.
Update	The number of updates to the accessed database.
Delete	The number of deletes from the accessed database.
Lock	The number of locks for the accessed database.
IWAIT	The number of IWAITs for the accessed database.
Elapsed Time	The elapsed time, in microseconds, of all DL/I access for the named database.
CPU Time	The processor time, in microseconds, of all DL/I access for the named database.
Event description	The API (DL/I, DB2, MQ) call verb or IMS event.
DBD name	The accessed database name for the event description.
Count	The number of events of this type issued by the application.
Duration Total	The elapsed time, in microseconds, for this event type.
Duration Average	The average elapsed time, in microseconds, for this event type.
CPU Total	The processor time, in microseconds, for this event type.
CPU Average	The average processor time, in microseconds, for this event type.

## Zooming to application trace detail information

To view more details about the API events that were executed by this transaction instance, place the cursor on any highlighted line in the **ATVW** display output and press **PF11** (Zoom). **PF11** opens the **View Application Trace Detail** panel (KOIATVD) which displays the API event details.

- See “Viewing application trace detail data” on page 28.

## Viewing application trace detail data

The **View Application Trace Detail** panel (KOIATVD) shows detailed information about the API calls executed within the transaction instance and associated IMS monitor events.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data, including statistics for all API calls that the executed transactions make. You can then view trace detail data for a specific transaction instance on the [Figure 12 on page 28](#) (KOIATVD).

Press **PF11** (Zoom) on the **View Application Trace Overview** panel (KOIATVW). The **View Application Trace Detail** panel (KOIATVD) automatically issues the **ATVD** command to display details about the API calls and associated IMS monitor events for the transaction instance.

The following figure shows the **View Application Trace Detail** panel (KOIATVD).

**Note:** You can also view trace detail data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATVD VTM      OI-II      V550./C IC1A 07/20/23 11:24:19  B
> Help PF1          Back PF3          Up PF7          Down PF8          Zoom PF11
>
>          Prev Tran Detail PF5      Next Tran Detail PF6
>
>-----
>
>          (H.A.B) View Application Trace Detail
>-----
ATVD
+          Transaction instance 000001 out of 000006 displayed
+ Transaction . . . . . AN960C10          PSB . . . . . DFSSAM02
+ Start Date. . . . . 07/08/23          Region Name . . . . . IMSCAMS1
+ Start Time. . . . . 14:26:37.209549    Total CPU Time. . . . . 2,671µs
+
+          Dura-   Accumul.   Event          Func.
+          Start Time L   tion   CPU Time   Description   Resources   Verb
+-----
+ 14:26:37.209552 0      0µs      2µs MPP SCHEDULING
+ 14:26:37.210202 0      10µs +   289µs DL/I CALL (TM)          I/O PCB  INQY
+          CPU=      10µs      Status=<blank>
+ 14:26:37.312009 0      33µs +   553µs DL/I CALL (TM)          I/O PCB  GU
+          CPU=      29µs      Status=<blank>
+ 14:26:37.312233 0      782µs +   71µs DL/I CALL (DB) DI21PART PARTROOT GU
+          CPU=      235µs     Status=<blank>
+ 14:26:37.312654 1      290µs +   352µs PI ENQUEUE IWAIT
+ 14:26:37.313071 0      26µs +   81µs DL/I CALL (DB) DI21PART STANINFO GN
+          CPU=      26µs      Status=<blank>
+ 14:26:37.313175 0      30µs +   107µs DL/I CALL (TM)          I/O PCB  ISRT
+          CPU=      30µs      Status=<blank>
+ 14:26:37.313256 0      8µs +   57µs DL/I CALL (TM)          I/O PCB  ISRT
+          CPU=      8µs       Status=<blank>
+ 14:26:37.313311 0      7µs +   52µs DL/I CALL (TM)          I/O PCB  ISRT
+          CPU=      7µs       Status=<blank>
+ 14:26:37.313364 0      7µs +   53µs DL/I CALL (TM)          I/O PCB  ISRT
+          CPU=      7µs       Status=<blank>
+ 14:26:37.313591 0      11µs +   228µs DL/I CALL (DB) DI21PART          STAT
+          CPU=      10µs     Status=<blank>
+ 14:26:37.313724 0      8µs +   130µs DL/I CALL (DB) DI21PART          STAT
+          CPU=      8µs       Status=<blank>
+ 14:26:37.313891 0      8µs +   137µs DL/I CALL (DB) DI21PART          STAT
+          CPU=      8µs       Status=GE
+ 14:26:37.313948 0      621µs +   439µs DL/I CALL (TM)          ASRT
+          CPU=      390µs    Status=<blank>
+ 14:26:37.314825 0      0µs +   74µs MPP TERM THREAD

```

Figure 12. View Application Trace Detail panel

On the **View Application Trace Detail** panel (KOIATVD), you can also perform the following functions:



- Press **PF6** to view the details for the next transaction.
- Press **PF5** to view the details for the previous transaction.
- Place the cursor on a highlighted line in the **ATVD** display output and press **PF11** (Zoom) to view more details.

## The View Application Trace Detail fields

The output from the **ATVD** command on the **View Application Trace Detail** panel displays information about the transaction in the top portion of the screen. Detailed information about API calls (such as DL/I, DB2 SQL, and MQ) executed in this IMS application instance and associated IMS Monitor events is shown in the bottom portion of the screen.

<i>Table 11. ATVD output fields</i>	
Field name	Description
The top portion of the output results includes the following fields:	
Transaction	The name of the transaction that was traced. The acronym (WFI) or (PWFI) displays next to the transaction name for transactions that are defined as wait-for-input or pseudo-wait-for-input.
Start Date	The month, day, and year the trace began collecting data.
Start Time	The hour, minute, second, and microsecond the trace began collecting data.
PSB	The name of the PSB that this transaction is using.
Region Name	The IMS dependent region name.
Total CPU Time	The total CPU time for the trace. Total CPU Time is the sum of CPU Time in DEP, CPU Time in CTL, CPU Time in DLISAS, and CPU Time in Other.
The bottom portion of the output results includes the following columns:	
Start Time	The time the event started. The format is HH:MM:SS.tttttt.
L	The IMS depth of the event, shown in ascending order.
Duration	The duration of the event. The format is SS.tttttt.
Accumul. CPU Time	Each line shows total "+delta" CPU time accumulated relative to the preceding event line; the accumulation starts from the first event for this transaction.
Event Description	A description of the event that is being monitored.
Resources	The resources that were used in this event.
Func Verb	The IMS, DB2, or MQ function that was issued.

## Zooming to application trace DL/I detail information

To view extended information about a call that was made by this transaction instance, place the cursor on a highlighted line in the **ATVD** display output and press **PF11** (Zoom). **PF11** opens the **View Application Trace DL/I Detail** panel (KOIATVX) which displays details that include the I/O and key feedback areas for the selected call.

- See [“Viewing application trace detail data”](#) on page 28.

## Viewing application trace DL/I data

The **View Application Trace DL/I Detail** panel (KOIATVX) shows trace detail data for an API call (such as DL/I) that was made by a transaction instance. Detailed information about the call, including I/O and key feedback areas, is displayed.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data, including statistics for all API calls that the executed transactions make. You can then view trace detail DL/I data for a specific API call on the [Figure 13 on page 30](#) (KOIATVX).

To open the **View Application Trace DL/I Detail** panel (KOIATVX), press the **PF11** (Zoom) key on the **View Application Trace Detail** panel (KOIATVD). The **View Application Trace DL/I Detail** panel (KOIATVX) automatically issues the **ATVX** command to display extended details about the API call, including the first 76 bytes of the Segment Search Argument (SSA), I/O area, and key feedback area, if available.

The following figure shows the **View Application Trace DL/I Detail** panel (KOIATVX).

**Note:** You can also view trace detail data for an API call in the enhanced 3270 user interface.

```

----- KOIATVX  VTM      OI-II      V550./C IC1A 07/20/23 11:27:15  B
> ----- Help PF1                                     Back PF3 -----
> ----- VIEW APPLICATION TRACE DL/I DETAIL -----
>  ATVX
+ Transaction . . . . . AN960C10          PSB . . . . . DFSSAM02
+ Start Date. . . . . 07/08/23          Region Name . . . . . IMSCAMS1
+ Start Time. . . . . 14:26:37.209549
+
+ DL/I Call . . . . . GN                  DB. . . . . DI21PART
+ Status Code . . . . . <blank>
+ Start Time. . . . . 14:26:37.313071    Elapsed Time. . . . . 26µs
+ End Time. . . . . 14:26:37.313097    CPU Time. . . . . 26µs
+
+ Segment Search Argument (SSA):
+
+ 0000 D7C1D9E3 D9D6D6E3 4DD7C1D9 E3D2C5E8 *PARTROOT(PARTKEY*
+ 0010 40407EF0 F2C1D5F9 F6F0C3F1 F0404040 * =02AN960C10 *
+ 0020 40404040 5DE2E3C1 D5C9D5C6 D64DE2E3 * )STANINFO(ST*
+ 0030 C1D5D2C5                      *ANKE *
+
+ IO Area:
+
+ 0000 F0F24040 40404040 40404040 40404040 *02 *
+ 0010 4040F7F4 00404045 40404040 40404040 * 74. . *
+ 0020 40404040 40404040 40404040 404040F1 * * 1*
+ 0030 F2F0F040 40F1F440 40404040 40F0F6C3 *200 14 06C*
+ 0040 40404040 4040F0F6 C3404040 * 06C *
+
+ Key Feedback Area:
+
+ 0000 F0F2C1D5 F9F6F0C3 F1F04040 40404040 *02AN960C10 *
+ 0010 40F0F2                      * 02 *

```

Figure 13. View Application Trace DL/I Detail panel

### The View Application Trace DL/I Detail fields

The output from the **ATVX** command on the **View Application Trace DL/I Detail** panel includes the following fields:

Table 12. ATVX output fields	
Field name	Description
Transaction	The name of the transaction that was traced.
Start Date	The month, day, and year when the application started.
Start Time	The hour, minute, second, and microsecond when the application started.

Table 12. **ATVX** output fields (continued)

Field name	Description
DL/I Call	The DL/I function code of the selected call.
Status Code	The DL/I function status code value of the selected call.
Start Time	The hour, minute, second, and microsecond when the selected call started.
End Time	The hour, minute, second, and microsecond when the selected call ended.
PSB	The name of the PSB the application is using.
Region Name	The IMS dependent region name.
DB	The DBD name that is used by the selected call.
Elapsed Time	The elapsed time for the selected call.
CPU Time	The processor time for the selected call.
Segment Search Argument (SSA)	The SSA for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.
IO Area	The I/O area for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.
Key Feedback Area	The key feedback area for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.

## Viewing application trace exception data

You can view application trace exception data in the Application Trace Facility.

ATF includes a set of screen spaces that display application trace exception data. Start from the **View Application Trace Exception Summary** panel (KOIATXS) and use **PF11** (Zoom) to proceed through the series of screens that display additional levels of detailed information.

**Note:** You can also view application trace exception data in the OMEGAMON enhanced 3270 user interface.

**Important:** Application trace exception data is not available for display if the application history exception summary log stream (SUMXLOGR) is not specified when the ATF starts. Detailed exception data require both SUMXLOGR and DETLLOGR to be enabled.

The following topics describe the set of screens that display application trace exception data.

- [“Viewing application trace exception summary data” on page 31](#)
- [“Viewing application trace exception overview data” on page 34](#)
- [“Viewing application trace exception detail data” on page 38](#)
- [“Viewing application trace exception DL/I data” on page 40](#)

## Viewing application trace exception summary data

The **View Application Trace Exception Summary** panel (KOIATVS) displays high-level application trace exception summary data. A summary line is displayed for each transaction instance in the results set.

If the application history exception summary log stream (SUMXLOGR) is enabled, ATF captures high-level trace data for all executions of selected applications that match trace exception criteria. You can then view a summary of the collected exception trace data on the **View Application Trace Exception Summary** panel (KOIATXS). The **Figure 14 on page 32** panel (KOIATXS) automatically issues the **ATXS** command to display summary information, including start date and time, elapsed time, and processor time, for each transaction instance.

Use one of the following methods to open the **View Application Trace Exception Summary** panel (KOIATXS):

- Option **D** on the **Application History Menu** panel (KOIATF). When you use this method, the data that displays on KOIATXS is filtered by using the information that is specified on the **Application Trace and Filter Criteria** panel (KOIATFL). Line 2 of the **ATXS** command output displays the date and time range or the time span settings that are used to filter the display. The default filter is Last 5 minutes.
- Action character **X** on the **Manage Application Trace** panel (KOIATMN). When you use this method, the data that displays on KOIATXS is filtered based on the selected trace. Line 2 of the **ATXS** command output displays the trace ID that is used to filter the display.

The following figure shows the **View Application Trace Exception Summary** panel (KOIATXS).

**Note:** You can also view trace exception summary data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATXS VTM      OI-II      V550./C IB1U 03/12/23 12:27:50  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
> -----
> (H.A.D) View Application Trace Exception Summary
> -----
> A - Manage Trace      * - View Trace      C - Search and Filter Criteria
> -----
ATXS
+
+ Trace ID: TRACE2      03/11 09:48      30 INACTIVE !ALL DEFAULTS ARE IN USE
+
+ Strt Date\Time Trancode PSB Name RGN Name LTERM      Elap Time CPU Time  Abend
+ -----
+ 03/11 09:49:04 PART      DFSSAM02 IMSBUMS1 CDICK      0.0736s      987µs
+ 03/11 09:49:05 DSPALLI DFSSAM07 IMSBUMS1 CDICK      0.0272s      1,004µs
+ 03/11 09:49:06 DSPINV DFSSAM03 IMSBUMS1 CDICK      0.0224s      954µs
+ 03/11 09:49:08 ADDBPART DFSSAM04 IMSBUMS1 CDICK      0.0237s      694µs
+ 03/11 09:49:09 ADDINV DFSSAM04 IMSBUMS1 CDICK      0.0348s      669µs
+ 03/11 09:49:10 DSPINV DFSSAM03 IMSBUMS1 CDICK      0.0488s      897µs
+ 03/11 09:49:11 DSPINV DFSSAM03 IMSBUMS1 CDICK      0.0175s      917µs
+ 03/11 09:49:12 DSPALLI DFSSAM07 IMSBUMS1 CDICK      0.0196s      821µs
+ 03/11 09:49:13 DLETINV DFSSAM04 IMSBUMS1 CDICK      0.0584s      777µs
+ 03/11 09:49:15 DLETPART DFSSAM04 IMSBUMS1 CDICK      0.0219s      759µs

```

Figure 14. View Application Trace Exception Summary panel

You can also specify a label on the **ATXS** command and press **Enter** to display alternative information:

- Specifying **e** on the **ATXS** command displays elapsed time summary.

```

EATXS                                ELAPSED TIME SUMMARY
+
+ Date/Time Range: 2016/01/01 00:00:00 to 2016/06/07 23:59:59
+
+
+ -- Start ---
+ MM/DD HHMMSS Trancode  DL/I      API      MQ      Total  Elapsed  Locks  CPU
+ -----
+ 06/07 140356 MPX00010 0.0648s  0µs      0µs      0.0651s  0µs      0µs
+ 06/07 140356 MPX00010 5,092µs  0µs      0µs      5,956µs  0µs      0µs
+ 06/07 140356 MPX00010 8,083µs  0µs      0µs      8,790µs  0µs      0µs
+ 06/07 140356 MPX00010 4,739µs  0µs      0µs      5,369µs  0µs      0µs
+ 06/07 140356 MPX00010 5,430µs  0µs      0µs      7,918µs  0µs      0µs
+ 06/07 140354 MPX00010 9,428µs  0µs      0µs      9,793µs  0µs      0µs
+ 06/07 140354 MPX00010 8,241µs  0µs      0µs      9,311µs  0µs      0µs
+ 06/07 140354 MPX00010 5,989µs  0µs      0µs      7,667µs  0µs      0µs
+ 06/07 140354 MPX00010 3,027µs  0µs      0µs      3,854µs  0µs      0µs
+ 06/07 140354 MPX00010 0.0755s  0µs      0µs      0.0774s  0µs      0µs
+ 06/07 140354 MPX00010 2,336µs  0µs      0µs      4,385µs  0µs      0µs

```

Figure 15. EATXS - Elapsed Time Summary

- Specifying **c** on the **ATXS** command displays CPU time summary.

```

CATXS                      CPU TIME SUMMARY
+
+ Trace ID: TRACE2      03/11 09:48      30 INACTIVE !ALL DEFAULTS ARE IN USE
+
+
+ -- Start ---
+ MM/DD HHMMSS  Trancode  DL/I      API      Dep.      IMS      Total
+ -----
+ 03/11 094904  PART      184µs    0µs      0µs      975µs    0µs     11µs    987µs
+ 03/11 094905  DSPALLI   111µs    0µs      0µs      1,004µs  0µs     0µs    1,004µs
+ 03/11 094906  DSPINV    110µs    0µs      0µs      943µs    0µs     11µs    954µs
+ 03/11 094908  ADDPART   99µs     0µs      0µs      694µs    0µs     0µs    694µs
+ 03/11 094909  ADDINV    82µs     0µs      0µs      669µs    0µs     0µs    669µs
+ 03/11 094910  DSPINV    92µs     0µs      0µs      897µs    0µs     0µs    897µs
+ 03/11 094911  DSPINV    96µs     0µs      0µs      917µs    0µs     0µs    917µs
+ 03/11 094912  DSPALLI   98µs     0µs      0µs      821µs    0µs     0µs    821µs
+ 03/11 094913  DLETINV   135µs    0µs      0µs      777µs    0µs     0µs    777µs
+ 03/11 094915  DLETPART  118µs    0µs      0µs      759µs    0µs     0µs    759µs

```

Figure 16. CATXS - CPU Time Summary

## The View Application Trace Exception Summary fields

The output from the **ATXS** command on the **View Application Trace Exception Summary** panel includes the following columns:

Table 13. <b>ATXS</b> output fields	
Field name	Description
Strt Date\Time	The month, day, hour, minute, and seconds the application started.
Trancode	The IMS transaction name.
PSB Name	The IMS PSB name.
RGN Name	The IMS dependent region name.
LTERM	The IMS logical terminal (LTERM) name of the originating message.
Elap Time	The elapsed time of the transaction. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where µs=microseconds, s=seconds, m=minutes, h=hours, d=days.
CPU Time	The processor time of the transaction.
Abend	An abend code if an abend occurred.

The output from **EATXS** includes the following columns:

Table 14. <b>EATXS</b> output fields	
Field name	Description
Start MM/DD HHMMSS	The month, day, hour, minute, and second the application started.
Trancode	The IMS transaction name.
API DL/I	The DL/I elapsed time of the transaction. The times display as a number of microseconds; seconds; minutes and seconds; hours, minutes, and seconds; or days, hours, and minutes where µs=microseconds, s=seconds, m=minutes, h=hours, d=days.
API DB2	The DB2 elapsed time of the transaction.
API MQ	The MQ elapsed time of the transaction.

<i>Table 14. EATXS output fields (continued)</i>	
<b>Field name</b>	<b>Description</b>
Total	The total elapsed time for the transaction.
Locks Elapsed	The lock elapsed time of the transaction.
Locks CPU	The lock CPU time of the transaction.

The output from **CATXS** includes the following columns:

<i>Table 15. CATXS output fields</i>	
<b>Field name</b>	<b>Description</b>
Start MM/DD HHMMSS	The month, day, hour, minute, and second the application started.
Trancode	The IMS transaction name.
API DL/I	The processor time that was spent in DL/I calls (DB and TM).
API DB2	The processor time that was spent in DB2 SQL calls.
API MQ	The processor time that was spent in WebSphere MQ calls.
Dep. Region	The processor time that was spent in the dependent region.
IMS CTL	The processor time that was spent in control region TCB.
IMS DLS	The processor time that was spent in DLISAS TCB.
Total	The total processor time for the transaction. Total CPU time is the sum of processor time in DL/I calls, DB2 SQL calls, WebSphere MQ calls, and control region TCB.

## Zooming to application trace exception overview information

If the ATF captures detail-level exception trace data, you can zoom (**PF11**) from the **View Application Trace Exception Summary** panel to the **View Application Trace Exception Overview** panel to see overview information for a specific transaction instance. Place the cursor on a highlighted line in the **ATXS** display output and press **PF11** (Zoom). **PF11** opens the **View Application Trace Exception Overview** panel (KOIATXW) which displays overview details for the selected transaction instance.

- See [“Viewing application trace exception overview data”](#) on page 34.

## Viewing application trace exception overview data

The **View Application Trace Exception Overview** (KOIATXW) panel shows trace overview data for a transaction instance that matches exception criteria. Summary information for the DL/I, DB2, and MQ events (calls) executed by the transaction is also shown.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data for transaction instances that match exception criteria. You can then view trace exception overview data for a specific transaction instance on the **View Application Trace Exception Overview** panel (KOIATXW).

To open the **View Application Trace Exception Overview** panel (KOIATXW), press the **PF11** (Zoom) key on the **View Application Trace Exception Summary** panel (KOIATXS). The **View Application Trace Exception Overview** panel (KOIATXW) automatically issues the **ATXW** command to display overview details for the transaction instance that was selected on the **View Application Trace Exception Summary** panel. The **ATXW** command also displays summary information about the API calls made by the instance.

The following figure shows the **View Application Trace Exception Overview** panel (KOIATXW).

**Note:** You can also view trace exception overview data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATXW VTM      OI-II      V550./C IB1K 06/07/23 14:34:14  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
>      Prev Tran Detail PF5      Next Tran Detail PF6
-----
>
>      (H.D.B) View Application Trace Exception Overview
-----
ATXW
+ Transaction instance 000003 of 000261 displayed
+ Transaction . . . . . MPX00010      PSB . . . . . MPP00010
+ Logical Terminal. . . . .      Transaction Class . . . 001
+ Region Type . . . . . MPP (PWF1)      Message Source. . . . . PROG
+ Region Number . . . . . 3      Primed Message. . . . . NO
+ Job Name. . . . . IMSBKMS1      Quick Schedule. . . . . NO
+ Step Name . . . . . REGION      Current SPA Size. . . . . N/A
+ UserID. . . . . SURFIQLD      Abend Code. . . . .
+ Start Date. . . . . 06/07/23      CPU Time in DEP . . . . . 455µs
+ Start Time. . . . . 14:03:56.816511      CPU Time in DL/I. . . . . 312µs
+ End Time. . . . . 14:03:56.825301      CPU Time in DB2 . . . . . 0µs
+ Elapsed Time in DL/I. . . . . 8,083µs      CPU Time in MQ. . . . . 0µs
+ Elapsed Time in DB2 . . . . . 0µs      CPU Time in CTL . . . . . 0µs
+ Elapsed Time in MQ. . . . . 0µs      CPU Time in DLS . . . . . 0µs
+ Elapsed Time Total. . . . . 8,790µs      CPU Time Total. . . . . 455µs
+ Elapsed Time in Locks . . . . . 0µs      CPU Time in Locks . . . . . 0µs
+
+ Message arrival date. 06/07/23      Application CPU time. . . . . 143µs
+ Message arrival time. 14:02:34.504713      Originated IMS. . . . . IB1K
+ Input queue time. . . . . 1m 22s      Response time . . . . . 1m 22s
+ DLI TM calls. . . . . 1      DB2 SQL calls . . . . . 0
+ DLI DB calls. . . . . 9      MQ API calls. . . . . 0
+
+ Detail records collected: 21
+
+ ----- DBD event counts ----- Time -----
+ DBD Name      Read      Insert      Update      Delete      Lock      IWAIT      Elapsed      CPU
+ -----
+ BI$HDH00      5          0          0          0          0          6      4,481µs      192µs
+ BD$HDM00      1          0          0          0          0          1      599µs        30µs
+ BA$HDL00      1          0          0          0          0          1      701µs        26µs
+ BF$HDM00      2          0          0          0          0          3      2,303µs      65µs
+
+ -----Duration----- CPU-----
+ Event description      DBD name      Count      Total      Average      Total      Average
+ -----
+ DLI TM GU              1              2µs        2µs        2µs        2µs
+ DLI DB GU              BI$HDH00      5      4,481µs      896µs      192µs      38µs
+ DLI DB GU              BD$HDM00      1      599µs        599µs      30µs        30µs
+ DLI DB GU              BA$HDL00      1      701µs        701µs      26µs        26µs
+ DLI DB GU              BF$HDM00      2      2,303µs      1,151µs      65µs        32µs
+ OSAM I/O IWAIT        BI$HDH00      6      2,035µs      339µs      41µs        6µs
+ OSAM I/O IWAIT        BD$HDM00      1      285µs        285µs      5µs         5µs
+ OSAM I/O IWAIT        BA$HDL00      1      233µs        233µs      5µs         5µs
+ OSAM I/O IWAIT        BF$HDM00      3      1,042µs      347µs      15µs        5µs

```

Figure 17. View Application Trace Exception Overview panel

On the **View Application Trace Exception Overview** panel (KOIATXW), you can also perform the following functions:

- Press **PF6** to view the exception overview information for the next transaction.
- Press **PF5** to view the exception overview information for the previous transaction.
- Place the cursor on any highlighted line in the **ATXW** display output and press **PF11** (Zoom) to view details about the API events that were executed by this transaction.

### The View Application Trace Exception Overview fields

The output from the **ATXW** command on the **View Application Trace Exception Overview** panel displays detailed information about the transaction in the top portion of the screen. Summary information about the DL/I, Db2, and MQ events are displayed in the bottom portion of the screen.

Table 16. **ATXW** output fields

Field name	Description
The top portion of the output results includes the following fields:	
Transaction	The name of the transaction that was traced. The acronym (WFI) or (PWFI) displays next to the transaction name for transactions that are defined as wait-for-input or pseudo-wait-for-input.
Logical Terminal	The logical terminal that initiated the transaction.
Region Type	The type of the IMS region.
Region Number	The number of the IMS region.
Job Name	The name of the IMS region. For DBCTL threads, this name is the CICS region name.
Step Name	The job step name of the region.
UserID	The logical terminal that initiated the transaction, which in IMS/ETO systems is synonymous with the user ID.
Start Date	The month, day, and year the application started.
Start Time	The hour, minute, second, and microsecond the application started.
End Time	The hour, minute, second, and microsecond the application ended.
Elapsed Time in DL/I	The elapsed time that was spent in DL/I calls (DB and TM).
Elapsed Time in DB2	The elapsed time that was spent in DB2 SQL calls.
Elapsed Time in MQ	The elapsed time that was spent in WebSphere MQ calls.
Elapsed Time Total	The total elapsed time of the application.
PSB	The name of the PSB that this transaction uses.
Transaction Class	The IMS class that is assigned to this transaction.
Message Source	The source of the input message, including TERM (standard terminal), CPIC (CPIC-driven program), APPC (LU6.2 source), and OTMA (OTMA source), and PROG (program-switch source).
Primed Message	An indicator of whether the message is primed for the application program (YES) or (NO). If a message is marked as primed for the application program, IMS preinstalls the message in a message buffer before the application API call.
Quick Schedule	An indicator whether IMS Quick scheduling is in effect (YES) or (NO).
Current SPA Size	For IMS conversational transactions, the current SPA size. Otherwise, N/A is shown.
Abend Code	For transactions that end abnormally, this code is the abend code.
CPU Time in DEP	The processor time that was spent in the dependent region.
CPU Time in DL/I	The processor time that was spent in DL/I calls (DB and TM).
CPU Time in DB2	The processor time that was spent in DB2 SQL calls.
CPU Time in MQ	The processor time that was spent in WebSphere MQ calls.
CPU Time in CTL	The processor time that was spent in the control region TCB.



Table 16. **ATXW** output fields (continued)

<b>Field name</b>	<b>Description</b>
CPU Time in DLS	The processor time that was spent in the DLISAS TCB.
CPU Total Time	The total processor time for the application. Total CPU time is the sum of CPU Time in DEP, CPU Time in CTL, CPU Time in DLISAS, and CPU Time in Other.
Elapsed Time in Locks	The elapsed time spent in lock acquire/release.
CPU Time in Locks	The processor time spent in lock acquire/release.
Message arrival date	The month, day, and year the message arrived on the originating IMS.
Application CPU time	The processor time used by the application for non-API (DL/I, DB2, MQ) work.
Message arrival time	The hour, minute, second, and microsecond the message arrived on the originating IMS.
Originated IMS	IMSID of the IMS where the message originated.
Input queue time	The elapsed time the input message spent on the IMS local and/or shared queues.
Response time	The elapsed time of the transaction. Includes input queue and processing time.
DLI TM calls	The number of DLI TM calls.
DB2 SQL calls	The number of DB2 SQL calls.
DLI DB calls	The number of DLI DB calls.
MQ API calls	The number of MQ API calls.
DBD Name	The accessed database name for the database event counts table.
Read	The number of reads for the accessed database.
Insert	The number of inserts to the accessed database.
Update	The number of updates to the accessed database.
Delete	The number of deletes from the accessed database.
Lock	The number of locks for the accessed database.
IWAIT	The number of IWAITs for the accessed database.
Elapsed Time	The elapsed time, in microseconds, of all DL/I access for the named database.
CPU Time	The processor time, in microseconds, of all DL/I access for the named database.
Event description	The API (DL/I, DB2, MQ) call verb or IMS event.
DBD name	The accessed database name for the event description.
Count	The number of events of this type issued by the application.
Duration Total	The elapsed time, in microseconds, for this event type.
Duration Average	The average elapsed time, in microseconds, for this event type.
CPU Total	The processor time, in microseconds, for this event type.
CPU Average	The average processor time, in microseconds, for this event type.

## Zooming to application trace exception detail information

To view more details about the API events that were executed by this transaction instance, place the cursor on any highlighted line in the **ATXW** display output and press **PF11** (Zoom). **PF11** opens the **View Application Trace Exception Detail** panel (KOIATXD) which displays the API event details.

- See [“Viewing application trace exception detail data”](#) on page 38.

## Viewing application trace exception detail data

The **View Application Trace Exception Detail** panel shows trace detail data for a transaction instance that matches exception criteria. Detailed information about the API calls executed within the transaction instance and associated IMS monitor events is displayed.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data for transaction instances that match exception criteria. The detail-level trace data includes statistics for all API calls that the executed transactions make. You can then view trace exception detail data for a specific transaction instance on the View Application Trace Exception Detail panel (KOIATXD, below).

To open the **View Application Trace Exception Detail** panel (KOIATXD), press the **PF11** (Zoom) key on the **View Application Trace Exception Overview** panel (KOIATXW). The **View Application Trace Exception Detail** panel (KOIATXD) automatically issues the **ATXD** command to display details about the API calls and associated IMS monitor events for the transaction instance. The details displayed include, where applicable, elapsed time, processor time, resources, and status code.

The following figure shows the **View Application Trace Exception Detail** panel (KOIATXD).

**Note:** You can also view trace exception detail data in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATXD VTM      OI-II      V550./C IB1U 03/12/23 12:30:04  B
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
>
>      Prev Tran Detail PF5      Next Tran Detail PF6
-----
>
>      (H.A.B) View Application Trace Exception Detail
>
-----
ATXD
+ Transaction instance 000002 of 000010 displayed
+ Transaction . . . . . DSPALLI      PSB . . . . . DFSSAM07
+ Start Date. . . . . 03/11/23      Region Name . . . . . IMSBUMS1
+ Start Time. . . . . 09:49:05.599237      Total CPU Time. . . . . 1,004µs
+
+
+ Start Time      L      Dura-  Accumul.  Event      Resources      Func.
+ Start Time      L      tion    CPU Time  Description                                     Resources      Verb
+-----+-----+-----+-----+-----+-----+-----+-----+
+ 09:49:05.599328 0      0µs     22µs  MPP SCHEDULING
+ 09:49:05.599677 0      2µs +   80µs  DL/I CALL (TM)      I/O PCB      INQY
+                               CPU=    2µs      Status=<blank>
+ 09:49:05.601005 0      3µs +  146µs DL/I CALL (TM)      I/O PCB      GU
+                               CPU=    2µs      Status=<blank>
+ 09:49:05.601090 0     51µs +   95µs DL/I CALL (DB)      DI21PART PARTROOT  GU
+                               CPU=   17µs      Status=<blank>
+ 09:49:05.601167 0      5µs +   29µs DL/I CALL (DB)      DI21PART STANINFO  GNP
+                               CPU=    5µs      Status=<blank>
+ 09:49:05.601191 0      3µs +   23µs DL/I CALL (DB)      DI21PART STOKSTAT  GNP
+                               CPU=    3µs      Status=GK
+ 09:49:05.601227 0      5µs +   36µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    5µs      Status=<blank>
+ 09:49:05.601253 0      1µs +   21µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    1µs      Status=<blank>
+ 09:49:05.601276 0      1µs +   20µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    1µs      Status=<blank>
+ 09:49:05.601295 0      1µs +   19µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    1µs      Status=<blank>
+ 09:49:05.601314 0      1µs +   19µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    1µs      Status=<blank>
+ 09:49:05.601381 0      4µs +   68µs DL/I CALL (DB)      DI21PART STOKSTAT  GNP
+                               CPU=    4µs      Status=<blank>
+ 09:49:05.601413 0      1µs +   29µs DL/I CALL (TM)      I/O PCB      ISRT
+                               CPU=    1µs      Status=<blank>
+ 09:49:05.601473 0      5µs +   63µs DL/I CALL (DB)      DI21PART STOKSTAT  GNP

```

Figure 18. View Application Trace Exception Detail panel

On the **View Application Trace Exception Detail** panel (KOIATXD), you can also perform the following functions:

- Press **PF6** to view the details for the next transaction.
- Press **PF5** to view the details for the previous transaction.
- Place the cursor on a highlighted line in the **ATXD** display output and press **PF11** (Zoom) to view more details.

### The View Application Trace Exception Detail fields

The output from the **ATXD** command on the **View Application Trace Exception Detail** panel displays information about the transaction in the top portion of the screen. Detailed information about API calls (such as DL/I, DB2 SQL, and MQ) executed in this IMS application instance, and associated IMS Monitor events are shown in the bottom portion of the screen.

Table 17. ATXD output fields	
Field name	Description
The top portion of the output results includes the following fields:	
Transaction	The name of the transaction that was traced. The acronym (WFI) or (PWFI) displays next to the transaction name for transactions that are defined as wait-for-input or pseudo-wait-for-input.

Table 17. **ATXD** output fields (continued)

Field name	Description
Start Date	The month, day, and year the trace began collecting data.
Start Time	The hour, minute, second, and microsecond the trace began collecting data.
PSB	The name of the PSB that this transaction is using.
Region Name	The IMS dependent region name.
Total CPU Time	The total CPU time for the trace. Total CPU Time is the sum of CPU Time in DEP, CPU Time in CTL, CPU Time in DLISAS, and CPU Time in Other.
The bottom portion of the output results includes the following columns:	
Start Time	The time the event started. The format is HH:MM:SS.tttttt.
L	The IMS depth of the event, shown in ascending order.
Duration	The duration of the event. The format is SS.tttttt.
Accumul. CPU Time	Each line shows total "+delta" CPU time accumulated relative to the preceding event line; the accumulation starts from the first event for this transaction.
Event Description	A description of the event.
Resources	The resources that were used in this event.
Func Verb	The IMS, DB2, or MQ function that was issued.

## Zooming to application trace exception DL/I detail information

To view extended information about a call that was made by this transaction instance, place the cursor on a highlighted line in the **ATXD** display output and press **PF11** (Zoom). **PF11** opens the **View Trace Exception DL/I Detail** panel (KOIATXX) which displays details that include the I/O and key feedback areas for the selected call.

- See “Viewing application trace exception DL/I data” on page 40.

## Viewing application trace exception DL/I data

The **View Trace Exception DL/I Detail** panel (KOIATXX) displays trace detail data for an API call made by a transaction instance that matches exception criteria. Detailed information about the call, including I/O and key feedback areas, is displayed.

If the application history detail log stream (DETLLOGR) is enabled, ATF captures detail-level trace data for transaction instances that match exception criteria. The detail-level trace data includes statistics for all API calls that the executed transactions make. You can then view trace exception detail DL/I data for a specific API call that was made by a transaction instance on the **View Trace Exception DL/I Detail** panel (KOIATXX), below.

To open the **View Trace Exception DL/I Detail** panel (KOIATXX), press the **PF11** (Zoom) key on the **View Application Trace Exception Detail** panel (KOIATXD). The **View Trace Exception DL/I Detail** panel (KOIATXX) automatically issues the **ATXX** command to display extended details about the API call that was selected on the **View Application Trace Exception Detail** panel. The details that are displayed include the first 76 bytes of the Segment Search Argument (SSA), I/O area, and key feedback area, if available.

The following figure shows the **View Trace Exception DL/I Detail** panel (KOIATXX).

**Note:** You can also view trace exception detail data for an API call in the OMEGAMON enhanced 3270 user interface.

```

----- KOIATXX VTM OI-II V550./C IB1U 03/12/23 12:55:36 B
> Help PF1 Back PF3
=====
> VIEW TRACE EXCEPTION DL/I DETAIL
ATXX
+ Transaction . . . . . DSPALLI PSB . . . . . DFSSAM07
+ Start Date. . . . . 03/11/23 Region Name . . . . . IMSBUMS1
+ Start Time. . . . . 09:49:05.599237
+
+ DL/I Call . . . . . GU DB. . . . . DI21PART
+ Status Code . . . . . <blank>
+ Start Time. . . . . 09:49:05.601090 Elapsed Time. . . . . 51µs
+ End Time. . . . . 09:49:05.601142 CPU Time. . . . . 17µs
+
+ Segment Search Argument (SSA):
+
+ 0000 D7C1D9E3 D9D6D6E3 4DD7C1D9 E3D2C5E8 *PARTROOT(PARTKEY*
+ 0010 40407EF0 F2C1D5F9 F6F0C3F1 F0404040 * =02AN960C10 *
+ 0020 40404040 5D000000 00000000 00000000 * ).....*
+ 0030 00000000 *.....*
+
+ IO Area:
+
+ 0000 F0F2C1D5 F9F6F0C3 F1F04040 40404040 *02AN960C10 *
+ 0010 40404040 40404040 4040E6C1 E2C8C5D9 * WASHER*
+ 0020 40404040 40404040 40404040 40404040 * *
+ 0030 40400000 00000000 00000000 00000000 * .....*
+ 0040 00000000 00000000 00000000 *.....*
+
+ Key Feedback Area:
+
+ 0000 F0F2C1D5 F9F6F0C3 F1F04040 40404040 *02AN960C10 *
+ 0010 40 * *
=====

```

Figure 19. View Trace Exception DL/I Detail panel

## The View Trace Exception DL/I Detail fields

The output from the **ATXX** command on the **View Trace Exception DL/I Detail** panel includes the following fields:

Table 18. ATXX output fields	
Field name	Description
Transaction	The name of the transaction that was traced.
Start Date	The month, day, and year when the application started.
Start Time	The hour, minute, second, and microsecond when the application started.
DL/I Call	The DL/I function code of the selected call.
Status Code	The DL/I function status code value of the selected call.
Start Time	The hour, minute, second, and microsecond when the selected call started.
End Time	The hour, minute, second, and microsecond when the selected call ended.
PSB	The name of the PSB the application is using.
Region Name	The IMS dependent region name.
DB	The DBD name that is used by the selected call.
Elapsed Time	The elapsed time for the selected call.
CPU Time	The processor time for the selected call.
Segment Search Argument (SSA)	The SSA for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.

Table 18. ATXX output fields (continued)	
Field name	Description
IO Area	The I/O area for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.
Key Feedback Area	The key feedback area for the selected call. Only the first 76 bytes are displayed. This field is only displayed if it is available.

## Filtering application trace data

Use the **Application Trace Filter Criteria** panel (KOIATFL) to filter and group application trace data. You can specify a time range or time span so that only data within that time period is displayed. You can also filter on specific resource items for greater control of the results that display.

The **Application Trace Filter Criteria** settings filter the data that displays when you use option **B** (view trace results) or **D** (view trace exception results) on the **Application History Menu** panel (KOIATF) to view application trace data. The default filter is Last 5 minutes.

**Note:** When you use **V** (view trace results) or **X** (view trace exception results) on the **Manage Application Trace** panel (KOIATMN) to view application trace data, the data is filtered based only on the selected trace. The **Application Trace Filter Criteria** settings are not used.

When you view application trace summary data by group, regardless of whether you use **B** or **V** to view the summary data, the default grouping is by transaction name. You can use the **Group results by** field in the **Application Trace and Filter Criteria** panel (KOIATFL) to change the grouping.

To access the **Application Trace Filter Criteria** panel (KOIATFL), use **C** or **E** on the **Application History Menu** panel (KOIATF). The **Application Trace Filter Criteria** panel (KOIATFL), shown in the following figure, automatically issues the **ATFL** command, which shows the settings currently in effect. By default, the **Last nn minutes** is set to 5 and **Group results by** is set to TRANS.

```

----- KOIATFL VTM      OI-II      v510./C IC1A 07/20/23 14:28:28  B
> Help PF1      Back PF3      Up PF7      Down PF8
-----
>
> (H.A.C) Application Trace Filter Criteria
> A-Manage Trace  B-View Trace  *-Search/Filter Criteria  D-View Exceptions
-----
ATFL
+
+      Time Range or Time Span
: Start Date.(YYYYMMDD)...: ----- Last nn minutes (1-99)...: _5
: Start Time...(HHMMSS)...: ----- Last nn hours (1-99)...: __
: End Date...(YYYYMMDD)...: ----- Today (Y/N)...: N
: End Time.....(HHMMSS)...: ----- Yesterday (Y/N)...: N
+
+      Filter Criteria
: Transaction Name.....: -----
: Scheduling Class (1-999): -----
: User ID.....: -----
: LTERM Name.....: -----
: Job Name.....: -----
: PSB Name.....: -----
: DBD Name.....: -----
: Abend Code.....: -----
: Exclude Region Type (Y/N) BMP N MPP N IFP N JMP N JBP N CICS N ODBA N
+
: Elapsed Time      Total > : ----- (nn.nnnnnn seconds)
:   DLI > : ----- DB2 > : ----- MQ > : -----
: CPU Time      Total > : ----- (nn.nnnnnn seconds)
:   DLI > : ----- DB2 > : ----- MQ > : -----
:   DEP > : ----- CTL > : ----- DLS > : -----
+
+      Display Options
: Group results by.....: TRANS__ (Trans/PSB/Region/Lterm/None)

```

Figure 20. Application Trace Filter Criteria panel

## The Application Trace Filter Criteria fields

The **ATFL** command on the **Application Trace Filter Criteria** panel displays a set of input fields that define filter and grouping criteria. Type your information in the input fields and press **Enter** to set the criteria. Use the fields in the **Time Range or Time Span** section of the panel to specify a date and time range or a time span filter. Use the fields in the **Filter Criteria** section of the panel to specify additional criteria to further limit the results. Use the **Group results by** field in the **Display Options** section of the panel to specify how you want to group application history summary data; this setting is not used when you display application history exception data.

<i>Table 19. ATFL trace filter fields</i>	
Field	Description
The following elements comprise the <b>Time Range or Time Span</b> section of the panel.	
Time Range	<p>Specify start date and time and end date and time criteria. The format for Start Date and End Date is YYYYMMDD, where</p> <ul style="list-style-type: none"> <li>• YYYY is the four-digit year</li> <li>• MM is the two-digit month</li> <li>• DD is the two-digit day</li> </ul> <p>The format for Start Time and End Time is HHMMSS, where</p> <ul style="list-style-type: none"> <li>• HH is the two-digit hours</li> <li>• MM is the two-digit minutes</li> <li>• SS is the two-digit seconds</li> </ul> <p>The Start Date and Start Time must occur before the End Date and End Time. If you specify a Start Date and optionally, a Start Time, but do not specify an End Date, the End Date defaults to the current date. The End Time defaults to 235959. If you specify a time range, you cannot specify a time span.</p>
Time Span	Indicates the time period. Specify either the Last <i>nn</i> minutes, the Last <i>nn</i> hours, Today, or Yesterday. The Last 5 minutes is the default if you do not specify a time span or a time range. If you specify a time span, you cannot specify a time range.
The following fields comprise the <b>Filter Criteria</b> section of the panel. Multiple values that are entered in the same field are OR'd (for example, TRAN1, or TRAN2, or TRAN3). Separate filter types are AND'd (for example, TRAN1, and PSB1, and USER1). Specifying a minus sign (-) in front of a value (for example, -TRAN1) denotes that matching records be excluded from the display.	
Transaction Name	Transaction Name can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, TRAN1,TRAN2,TRAN3). Generic names can be specified by using an asterisk (for example, TRAN*).
Scheduling Class	Scheduling class can comprise one to three digits, 1 - 999. Multiple values can be entered by separating each value with a comma (for example, 1,99,333). Generic values are not allowed.
User ID	User ID can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, USER1,USER2,USER3). Generic values can be specified by using an asterisk (for example, USER*).
LTERM Name	LTERM Name can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, LTERM1,LTERM2,LTERM3). Generic names can be specified by using an asterisk (for example, LTERM*).
Job Name	Job Name can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, JOB1,JOB2,JOB3). Generic names can be specified by using an asterisk (for example, JOB*).

Table 19. **ATFL** trace filter fields (continued)

Field	Description
PSB Name	PSB Name can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, PSB1,PSB2,PSB3). Generic names can be specified by using an asterisk (for example, PSB*).
DBD Name	DBD Name can comprise up to eight characters. Multiple values can be entered by separating each value with a comma (for example, DBD1,DBD2,DBD3). Generic names can be specified by using an asterisk (for example, DBD*).
Abend code	Each abend code value can comprise up to five alphanumeric characters. Multiple values can be entered by separating each value with a comma (for example, U3303,U0456). A single asterisk indicates to display trace data only if the application had an abend.
Exclude Region Type	Filtering by region type excludes selected regions from the trace displays by specifying a value of Y next to those regions. The default of N indicates that the region type must be included in the trace displays.
Elapsed Time	Elapsed time filters (Total, DL/I, DB2, and MQ) are numeric and entered in the format of <i>nn.nnnnnn</i> or <i>n.nnnnnn</i> seconds. A trace is selected for display when an elapsed time is greater than the specified filter value. Elapsed times and CPU times are OR'd.
CPU Time	CPU time filters (Total, DL/I, DB2, MQ, Dep, CTL, and DLS) are numeric and entered in the format of <i>nn.nnnnnn</i> or <i>n.nnnnnn</i> seconds. A trace is selected for display when a CPU time is greater than the specified filter value. CPU times and elapsed times are OR'd.
The following field comprises the <b>Display Options</b> section of the panel.	
Group results by	The category to group transactions by, including the Trans, PSB, Region, LTERM, or None categories. This option is only applicable when you view data from the application history summary log stream; it is ignored when you view data from the application history exception summary log stream. If no selection is made, the Trans category is selected as the default.



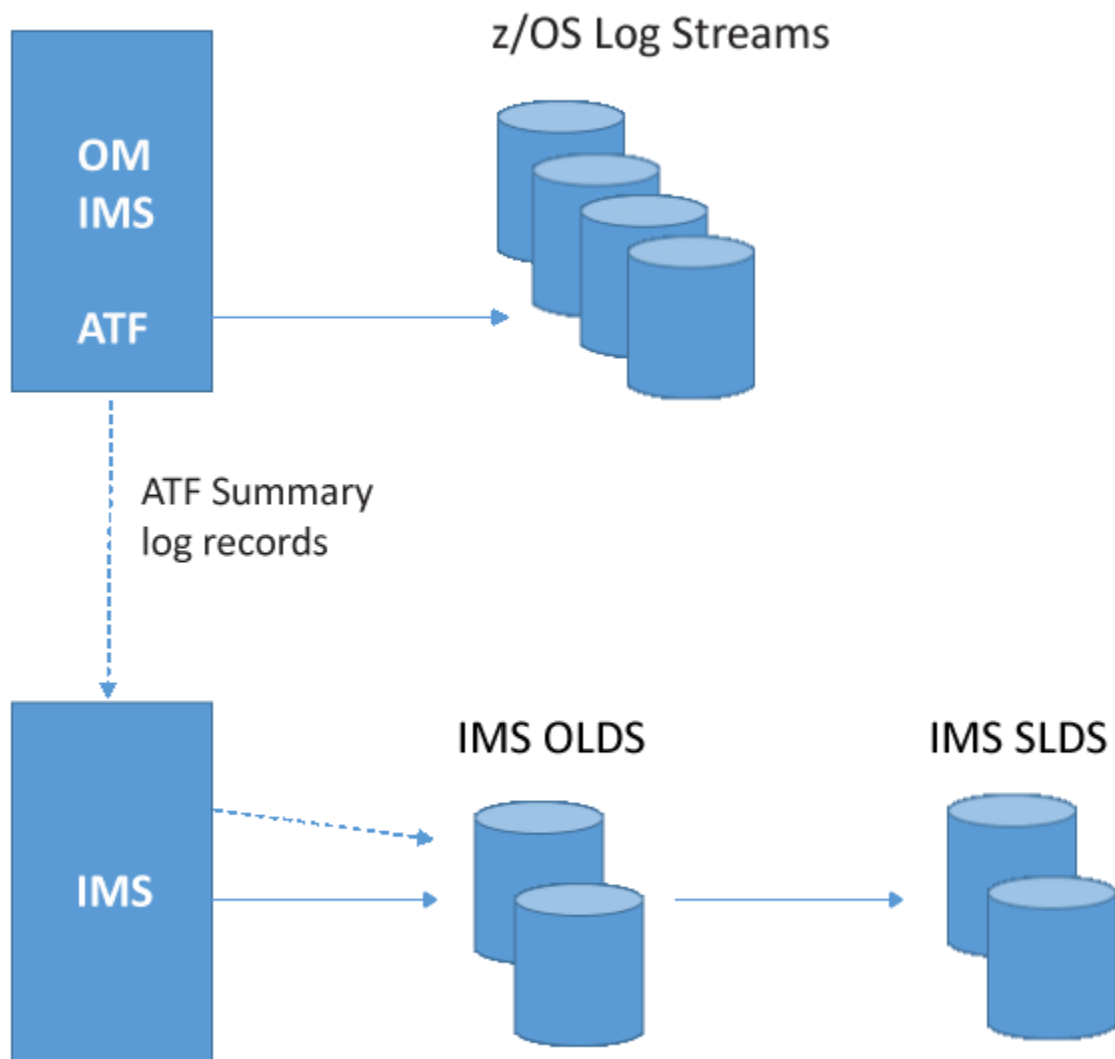
## Chapter 4. Application Trace Facility batch processing

The Application Trace Facility (ATF) writes summary-level and detailed IMS application information to a set of z/OS log streams for the real-time display. In addition, ATF can write to the IMS log one summary log record per IMS transaction or program execution instance. Batch processing reports against the summary log records that are written to the IMS log.

When the ATF summary log records are written to the IMS log, you can have the summary log records reported from the IMSLOG by the IBM IMS Performance Analyzer and user-written applications.

You can use the OMEGAMON real-time ATF Trace Specification (ATSP) command to control whether the ATF summary log records are written to the IMS log. Every ATF summary log record has a log record number that you can configure and specify in the IMS PROCLIB data set.

The following figure shows the overview of the ATF collection architecture:



## Application Trace Facility summary data

---

The Application Trace Facility (ATF) component collects and summarizes the data for all transactions and programs within IMS. The summary log records contain the summarized data.

The ATF component collects and summarizes the following types of data:

- General transaction and program application metrics
- CPU time across IMS regions
- Elapsed time across IMS regions
- Response time
- DL/I: call counts, CPU time, Elapsed time
- IBM DB2: call counts, CPU time, Elapsed time
- MQ: call counts, CPU time, Elapsed time
- Database: Read, Insert, Update, Delete, Locks, IWAITs, CPU and Elapsed Time

Here are some examples of data rendered from ATF summary records:

- ATVG – ATF Group Summary
- ATVS – ATF Summary
- ATVW – Transaction Overview

The following figure shows the overview of transaction (ATVW) from ATF summary records:

```

ATVW
+ Transaction instance 000003 of 000261 displayed
+ Transaction . . . . . MPX00010      PSB . . . . . MPP00010
+ Logical Terminal. . . . .          Transaction Class . . . 001
+ Region Type . . . . . MPP (PWFI)    Message Source . . . . . PROG
+ Region Number . . . . . 3           Primed Message . . . . . NO
+ Job Name . . . . . IMSBKMS1        Quick Schedule . . . . . NO
+ Step Name . . . . . REGION         Current SPA Size . . . . N/A
+ UserID . . . . . SURFIQLD         Abend Code . . . . .
+ Start Date . . . . . 06/07/23      CPU Time in DEP . . . . 455µs
+ Start Time . . . . . 14:03:56.816511 CPU Time in DL/I . . . . 312µs
+ End Time . . . . . 14:03:56.825301  CPU Time in DB2 . . . . 0µs
+ Elapsed Time in DL/I . . . . 8,083µs CPU Time in MQ . . . . . 0µs
+ Elapsed Time in DB2 . . . . . 0µs   CPU Time in CTL . . . . . 0µs
+ Elapsed Time in MQ . . . . . 0µs   CPU Time in DLS . . . . . 0µs
+ Elapsed Time Total . . . . 8,790µs CPU Time Total . . . . . 455µs
+ Elapsed Time in Locks . . . . . 0µs CPU Time in Locks . . . . 0µs
+
+ Message arrival date. 06/07/23      Application CPU time. . . 143µs
+ Message arrival time. 14:02:34.504713 Originated IMS . . . . . IB1K
+ Input queue time . . . . 1m 22s     Response time . . . . . 1m 22s
+ DLI TM calls . . . . . 1           DB2 SQL calls . . . . . 0
+ DLI DB calls . . . . . 9           MQ API calls . . . . . 0
+
+ Detail records collected: 21
+
+ ----- DBD event counts ----- Time -----
+ DBD Name  Read  Insert  Update  Delete  Lock  IWAIT  Elapsed  CPU
+ -----
+ BI$HDH00   5    0    0    0    0    6  4,481µs  192µs
+ BD$HDM00   1    0    0    0    0    1   599µs   30µs
+ BA$HDL00   1    0    0    0    0    1   701µs   26µs
+ BF$HDM00   2    0    0    0    0    3  2,303µs  65µs
+
+ -----Duration----- CPU-----
+ Event description  DBD name  Count  Total  Average  Total  Average
+ -----
+ DLI TM GU          1          2µs    2µs    2µs    2µs
+ DLI DB GU          BI$HDH00  5  4,481µs  896µs  192µs  38µs
+ DLI DB GU          BD$HDM00  1   599µs  599µs   30µs  30µs
+ DLI DB GU          BA$HDL00  1   701µs  701µs   26µs  26µs
+ DLI DB GU          BF$HDM00  2  2,303µs 1,151µs  65µs  32µs
+ OSAM I/O IWAIT    BI$HDH00  6  2,035µs  339µs   41µs   6µs
+ OSAM I/O IWAIT    BD$HDM00  1   285µs  285µs    5µs   5µs
+ OSAM I/O IWAIT    BA$HDL00  1   233µs  233µs    5µs   5µs
+ OSAM I/O IWAIT    BF$HDM00  3  1,042µs  347µs   15µs   5µs

```

Figure 21. Overview of transaction (ATVW) from ATF summary records.

## Enabling Application Trace Facility for IMS log processing

During the initial PARMGEN process, multiple z/OS Log Streams are defined and allocated. Application Trace Facility (ATF) requires these Log Streams to be defined at product initialization. ATF can also optionally write IMS application summary records to the IMS log for OLDS. One summary record per application execution instance can be read from the IMS log for SLDS for charge-back, application performance profiles, and general application reporting.

To enable ATF to write to the IMS log for OLDS and SLDS, complete the following tasks:

1. Enable the IMS Partner Product user exit (PPUE).
2. Define the IMS log record number that ATF uses to write ATF summary records.
3. Specify at least one ATF trace specification to the **LOG TO IMS** option.

Configure the PPUE and load the OMEGAMON for IMS KOIPPUE0 module. The KOIPPUE0 module creates the IMS Type-1 command interface with OMEGAMON and establishes the IMS Logging (ILOG®) support that ATF uses. When ATF is directed by a trace specification request, ATF writes a summary log record by using the ILOG support that the PPUE exit generates.

Module KOIILGx0, where x is the IMS ID identifier, reads the IMS PROCLIB to determine what log record number to use for all ATF summary records that are written to the IMS log. IMS PROCLIB member KOIPIiii, where iii is the IMS ID, defines the **LOGWLOGREC#** parameter. Specify the log record number to

be used by ATF. Valid log record numbers are from 160 to 255. If the parameter is not specified, the ATF component uses 160 by default. Here is an example of the ATF trace specification:

```
LOGWLOGREC#=160
```

The PPUE is called only at IMS initialization. Therefore, an IMS recycle is required when any changes are made to the IMS PROCLIB member KOIPI*iiii*, where *iiii* is the IMS ID. If the PPUE exit is properly configured, the following messages appear on the z/OS console during IMS startup:

- KOII2620I OMEGAMON ILOG EXIT WRITING LOG RECORD NUMBER 160, IMSID=IB1K
- KOII2640I RESOURCE RECOVERY ESTABLISHED FOR OMEGAMON ILOG PROCESSING, IMSID=IB1K

When IMS is properly configured and the preceding messages appear during IMS startup, ATF is ready to write summary records to the IMS log. The OMEGAMON real-time ATF Trace Specification (ATSP) command defines where ATF writes the collected data. By default, ATF writes summary and detailed data to the summary and detailed z/OS Log Streams respectively. The **Log to IMS** parameter specifies whether or not to write application summary records to the IMS log. The following options are available:

- A value of NO requests ATF not to log to IMS. This is the default value.
- A value of YES requests ATF to write both to the summary and detailed z/OS log streams and to the IMS log.
- A value of ONLY requests ATF to write only application summary records to the IMS log. When the ONLY value is specified, no data is written to the z/OS log streams.

The following ATF trace specification defines the collection criteria for an in-house IMS charge-back application. The application reads the ATF summary records to determine costs per department based on internal service level commitments. All applications have summary records that are written only to the IMS log when the **Log to IMS** parameter is set to ONLY, and no data is written to the ATF z/OS Log Streams.

```
ATSP
+
: Trace ID.....: CHRGBACK (Required)
: Start Date.....: 07/01 (Format is MM/DD)
: Start Time.....: 10:45 (Format is HH:MM)
: Duration.....: forever (1-99999 Minutes, or Forever, default 5)
: Transaction Name.: *_____
: Scheduling Class.: *__ (1-999, default *)
: User ID.....: *_____
: LTERM Name.....: *_____
: Job Name.....: *_____
: PSB Name.....: *_____
: DBD Name.....: *_____
: Summarize Only...: YES_ (YES/NO, default NO)
: Log to IMS.....: ONLY (YES/NO/ONLY, default NO)
: Limit Transaction Count: 0_____ (1-999999999, 0 or blank for no limit)
: BMP Trace by Message/CHKP: N (Y/N)
: Exclude region type (Y/N): BMP N MPP N IFP N JBP N JMP N CICS N ODBA
+
+ Exception (all values OR'd):
: Exception Only...: N (Y/N)
: ABEND Code.....: _____
: Elapsed Time Total > : _____ (nn.nnnnnn seconds)
: DL/I > : _____ DB2 > : _____ MQ > : _____
: CPU Time Total > : _____ (nn.nnnnnn seconds)
: DL/I > : _____ DB2 > : _____ MQ > : _____
: Dep > : _____ CTL > : _____ DLS > : _____
```

Figure 22. ATF trace specification for an in-house IMS charge-back application

## Application Trace Facility response time metrics

Because the Application Trace Facility (ATF) collector receives IMS Monitor events that match only part of IMS log record events, some response time values that are displayed by the ATF component in the real-time and OMEGAMON enhanced 3270 user interfaces don't match the response times that are

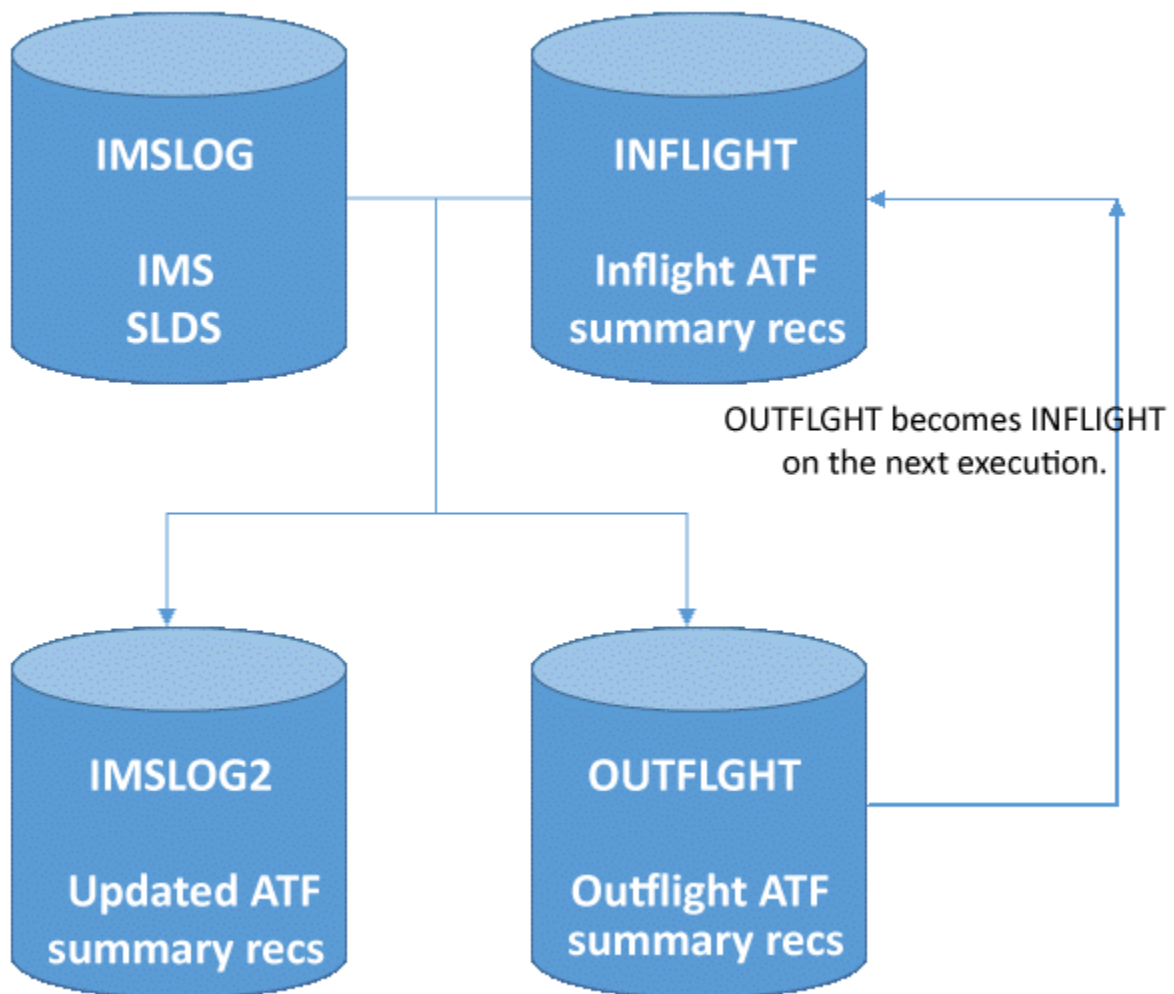
reported by the IBM IMS Performance Analyzer for z/OS. The ATF component ships a batch module, which updates the response time values of the ATF summary records if your installation requires that response time values are calculated from log records.

Member KI2ALA in the *rtehlev*.TKANSAM library contains JCL to execute the ATF Log Analyzer. The utility of executing the ATF Log Analyzer accepts the IMS system log data sets (SLDS) as input and produces an IMSLOG2 file with the updated ATF summary log records. All other IMS log records are not written to IMSLOG2.

The process of executing the ATF Log Analyzer by the KI2ALA JCL member updates the following ATF Summary response time metrics:

- Input Queue Time (AESXSIQT)
- Processing Time (AESELAPS)
- Response Time (AESXSRSP)

The following figure shows the fix-up application response time metrics of the ATF Log Analyzer:



Update the KI2ALA JCL member to meet your installation requirements:

- STEPLIB: Data set name of the *rtehlev*.RKANMOD library
- IMSLOG: IMS SLDS or multiple SLDS in ascending time/date sequence
- IMSLOG2: Data set name of the updated ATF summary log records. Update SPACE and UNIT as required by installation.

- INFLIGHT: Data set high-level per installation standards. Data set is allocated in IDCAMS step.
- OUTFLGHT: Data set high-level per installation standards.
- EXEC PGM: Update program name per IMS level as documented in KI2ALA.
- PARM: Update log record number that is specified in IMS PROCLIB member KIOP*iiii*, where *iiii* is the IMS ID. The default log record number is 160 if IMS PROCLIB doesn't exist.

**Note:** When you run the utility of executing the ATF Log Analyzer, consider the following issues:

- This JCL can be added to the SLDS archive JCL if desired.
- This utility might be run against every SLDS that is created, or once daily against all SLDS that are created.
- Space requirements for the OUTFLGHT data set might need to be adjusted if messages are inserted to the queue for later batch processing. The more possible in-flight messages exist, the greater the space allocation for the OUTFLGHT data set is.

## Application Trace Facility summary log record reporting in batch

IBM IMS Performance Analyzer (IMSPA) supports Application Trace Facility (ATF) summary log record reporting.

Use the IMSPA batch extract utility [SIPISAMP\(IPIATFXT\)](#) to create an extract data set, from which then reports can be produced by IMSPA or one of the following ATF sample programs in the *rtehilev.TKANSAM* library that can be modified to meet your installation requirements:

- KI2ATJDI – JCL to run the IMSLOG reporting sample program KI2ATRDI, which can create a detailed report for either application response times or CPU times.
- KI2ATJDZ– JCL to run the extracted z/OS Log Stream reporting sample program KI2ATRDZ, which can create a detailed report for either application response times or CPU times.
- KI2ATRDI - Assembler program which reads an IMSLOG and produces reports on the ATF summary log records. The ATFGROUP and ATFDETAL reports are written based on the PARM values provided. The *RESP* value generates a response time report whereas the *CPUT* value generates CPU Time reports.
- KI2ATRDZ - Assembler program which reads an ATF log stream extract data set and produces reports on the ATF Summary log records. The ATFGROUP and ATFDETAL reports are written based on the PARM values provided. The *RESP* value generates a response time report whereas the *CPUT* value generates CPU Time reports.
- KI2ATRD1 – Assembler routines common to both KI2ATRDI and KI2ATRDZ.
- KI2ATRD2 – Assembler routines common to both KI2ATRDI and KI2ATRDZ.

## The Application Trace Facility summary log record

The ATF summary log record is mapped by member KI2ATFSM in *rtehilev.TKANSAM*.

An assembler program maps the ATF summary log record area by including the following statement:

```
KI2ATFSM TYPE=DSECT, LOGTYPE=IMS
```

The following table shows the label, type, length, and description of the ATF summary log record area:

Label	Type	Length	Description
AESILL	Hexadecimal (Hex)	2	Length of the IMS log record
AESIZZ	Hex	2	Unused, x'0000'
AESITYPE	Hex	1	Number of the IMS log record

Label	Type	Length	Description
AESISUBT	Hex	1	Subtype of the IMS log record, X'01', which indicates an ATF summary record.
AESRECLL	Hex	2	Length of the ATF summary record
AESTYPE	Hex	1	ATF record type, x'04', which indicates an ATF summary log record.
AESSTYPE	Hex	1	ATF summary record flag
AESPST	Hex	2	Region ID
AESCOR	Hex	14	Correlation ID
AESCRE	Hex	16	IMS recovery token
AESSTART	STORE CLOCK (STCK)	8	Transaction start time
AESELAPS	STCK	8	Processing time
AESTRAN	Character (Char)	8	Transaction name
AESPSB	Char	8	Program name
AESLTERM	Char	8	Logical terminal name
AESUSRID	Char	8	User ID
AESRCVER	Hex	1	OMEGAMON ATF record version
AESCPU	STCK	8	Application CPU time
AESDCOL#	Hex	4	Number of detailed records that are collected
AESDDIS#	Hex	4	Number of detailed records that are discarded
AESTWFI	Hex	8	Transaction Wait-for-Input time in STCK format
AESTU2L	STCK	8	Universal Time Coordinated (UTC) to local offset time-of-day (TOD), which converts to local time on the

Label	Type	Length	Description
			system that data is collected from.
AESOGMSW#	Hex	2	Number of program switches to this input
AESABCD	Char	5	ABEND code (Sxxxx or Uxxxx)
AESRTYPE	Hex	1	Region type, which is mapped by IMS Partition Specification Table (IPST).
AESJNAME	Char	8	Job name
AESSNAME	Char	8	Step name
AESCLASS	Hex	2	Scheduler message block (SMB) scheduling class
AESMSGARR	STCK	8	Message arrival time
AESMSRC	Hex	1	Message source flag from PSTFLAG1
AESVSFLG	Hex	1	Primed message indicator from PSTVSFLG
AESSCHF1	Hex	1	Quick scheduled from PSTSCHF1
AESMI	Hex	1	SPA indicator from PSTMI
AESSPAL	Hex	2	Current <sup>®</sup> SPA size from PSTSPAL
AESCPUD	STCK	8	CPU time application that is used in Dependent region
AESCPUI	STCK	8	CPU time application that is used for DL/I calls
AESCPUB	STCK	8	CPU time application that is used for IBM DB2 calls
AESCPUQ	STCK	8	CPU time application that is used for MQ calls



<b>Label</b>	<b>Type</b>	<b>Length</b>	<b>Description</b>
AESCPUC	STCK	8	CPU time application that is used in IMS control region
AESCPUS	STCK	8	CPU time application that is used in DLISAS region
AESCPUO	STCK	8	CPU time application that is used in all other regions
AESELTI	STCK	8	Elapsed time application that is spent in DL/I calls
AESELTB	STCK	8	Elapsed time application that is spent in DB2 calls
AESELTQ	STCK	8	Elapsed time application that is spent in MQ calls
AESDBS	Structure	Structure	Database usage section
AESXS#DB	Hex	2	Number of DBD items
AESXSODB	Hex	2	Offset from AESXSVAR to start of DBD items
AESXSLDB	Hex	2	Length of each DBD item
AESXS#DL	Hex	2	Number of DLI TM items
AESXSODT	Hex	2	Offset from AESXSVAR to start of DL/I TM items
AESXSLDT	Hex	2	Length of each DLI TM item
AESXS#D2	Hex	2	Number of DB2 items
AESXSOD2	Hex	2	Offset from AESXSVAR to start of DB2 items
AESXSLD2	Hex	2	Length of each DB2 item
AESXS#MQ	Hex	2	Number of MQ items

Label	Type	Length	Description
AESXSOMQ	Hex	2	Offset from AESXSVAR to start of MQ items
AESXSLMQ	Hex	2	Length of each MQ item
AESXS#OT	Hex	2	Number of Other items
AESXSoot	Hex	2	Offset from AESXSVAR to start of Other items
AESXSLOT	Hex	2	Length of each Other item
AESXSSMF	Char	4	SMF ID
AESXSUOW	Char	32	Transaction Unit of Work (UOW)
AESXSoid	Char	4	Originating IMS ID of the first Batch Message Processing (BMP) message
AESXSARR	STCK	8	Transaction arrival time of the first BMP message
AESXSOIL	Char	4	Originating IMS ID of the last BMP message
AESXSARL	STCK	8	Transaction arrival time of the last BMP message
AESXSACP	STCK	8	Application CPU Time
AESXSRSP	STCK	8	Response Time, which is the total amount of time of Input Queue Time and Elapsed Time
AESXSIQT	STCK	8	Input Queue Time
AESXSVAR	Structure	Structure	Start of variable length section, which calculates DBD, DL/I DB, DL/I TM, DB2, MQ, and Other sections.

The following table shows the label, type, length, and description of the DBD item section:

Label	Type	Length	Description
AESXSDBN	Char	8	DBD name

The following table shows the label, type, length, and description of the IMS DB/TM item section:

Label	Type	Length	Description
AESXSDLT	Hex	1	Item code
AESXSDLG	Hex	1	Group bucket number
AESXSDLN	Hex	4	Count
AESXSDLE	STCK	8	Total elapsed time
AESXSDLC	STCK	8	Total CPU
AESXSDLP	Hex	1	Number of parent DBD in the DBD item section

The following table shows the label, type, length, and description of the DB2 item section:

Label	Type	Length	Description
AESXSD2T	Hex	1	Item code
AESXSD2N	Hex	4	Count
AESXSD2E	STCK	8	Total elapsed time
AESXSD2C	STCK	8	Total CPU

The following table shows the label, type, length, and description of the MQ item section:

Label	Type	Length	Description
AESXSMQT	Hex	1	Item code
AESXSMQN	Hex	4	Count
AESXSMQE	STCK	8	Total elapsed time
AESXSMQC	STCK	8	Total CPU



---

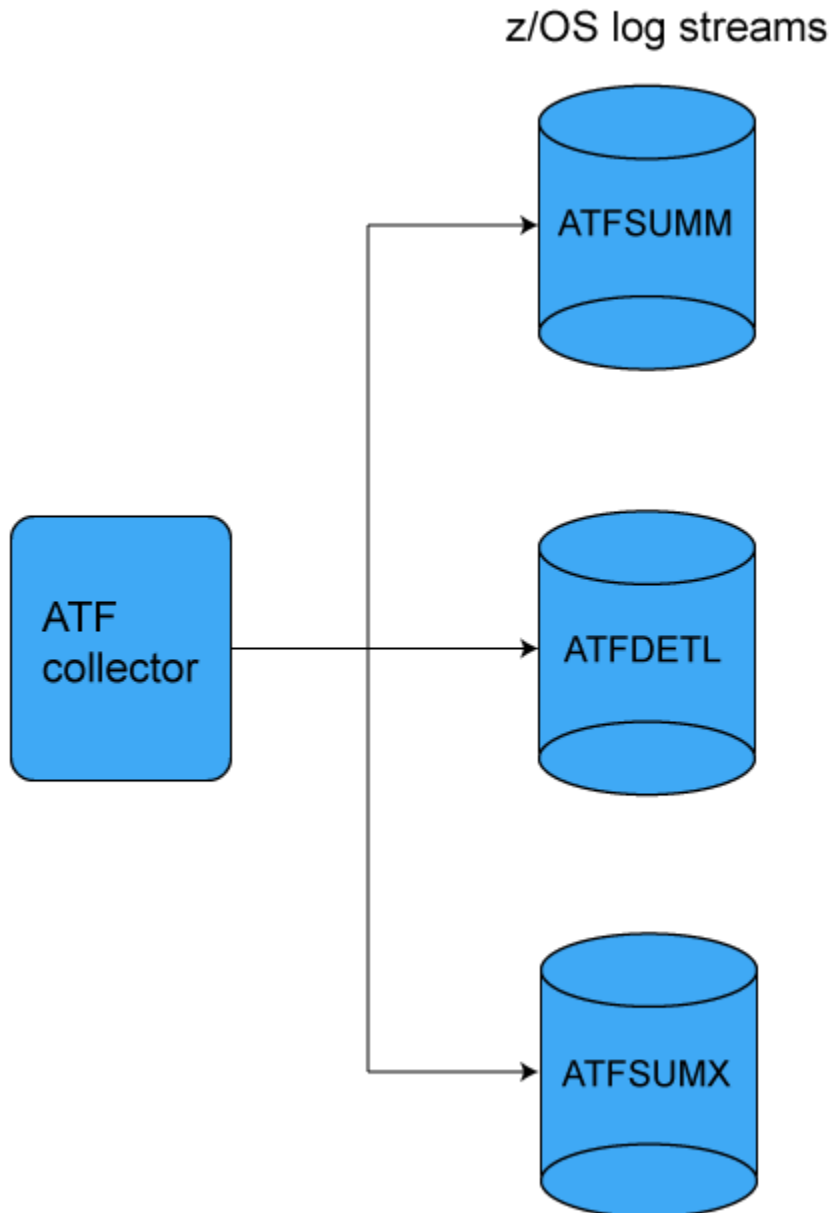
## Chapter 5. Estimating the size of the Application Trace Facility z/OS log streams

The Application Trace Facility (ATF) collector writes the performance metrics of IMS application to different z/OS log streams. Estimate the size of the z/OS log streams before you run Configuration Manager or PARMGEN.

### **About this task**

The ATF collector requires summary log stream and detail log stream. Optionally, you can have exception summary log stream. As a result, you define two or three log streams so that the ATF collector functions properly. For more information about the ATF z/OS log streams, see [“The z/OS System Logger” on page 2](#).

The following graphic shows that the ATF collector writes the performance metrics of IMS application to the ATFSUMM, ATFDETL, and ATFSUMX log streams:



where

- ATFSUMM is the ATF summary log stream.
- ATFDETL is the ATF detail log stream
- ATFSUMX is the ATF exception summary log stream.

If either of the following conditions occurs, the ATF component performance is affected:

- If the ATF z/OS log streams are under-allocated, the z/OS System Logger spends too much time offloading.
- If the ATF z/OS log streams are over-allocated, too many system resources are reserved.

## Sizing utility for ATF z/OS log streams

The ATF collector includes the KI2ATFLS utility to help determine the proper sizing for the ATF log streams. In the TKANSAM data set, member KI2ATFLS contains a JCL stream. When customized, the JCL stream reads a set of IMS system log data sets (SLDS) and estimates the sizing for z/OS log streams based on application performance metrics that are discovered in the IMSLOG.

The following example shows a sizing estimate report that is created from the KI2ATFLS utility:

```

OMEGAMON for IMS ATF LOG Stream   Size Estimator   Date:2016.230

Total records in IMSLOG:          546,450
Total applications executed:      10,268
Delta time (secs) IMSLOG:        2,666
Estimated # applications/day:    328,576
Total DLI TM events:             17,047
Total DLI DB events:             7,726
Total DB2 SQL events:            48,210
Total Other events:              0

Based on IMSLOG provided...

Specify the following in PARMGEN:

LOGR_SIZE_ATFSUMM:                49
LOGR_SIZE_ATFDETL:               7,921
LOGR_SIZE_ATFSUMX:                2

These values are estimates used to provide a starting
point for ATF z/OS Log Stream definitions.
Application performance profiles can vary over time,
especially with different input criteria.
Refer to the System Programmers Guide to:
z/OS System Logger Redbook for additional performance
and tuning assistance.

```

Figure 23. A sizing estimate report from the KI2ATFLS utility

The KI2ATFLS utility creates the sizing estimates for log streams, and then creates interim storage within the coupling facility (CF) or the staging data sets with offloads that occur every 5 minutes. The LOGR\_SIZE\_ATFxxxx values might be adjusted up or down depending on your installation staging and offload requirements.

You can specify the LOGR\_SIZE\_ATFxxxx values in the LPAR-specific CONFIG profile of the PARMGEN runtime environment (RTE) in WCONFIG (Option 1) step. Then, PARMGEN creates the JCL streams to allocate the ATF z/OS log streams in rtehilev.RKANSAMU. For more information about allocating CF structures (optional) or DASD-only structures, see the *PARMGEN post-configuration documentation*.

## Manually estimating the size of the ATF z/OS log streams

To estimate the size of the Application Trace Facility (ATF) log streams manually, calculate the size of the ATF summary log stream and ATF detail log stream, and then apply a percentage to determine the size for the ATF exception summary log stream.

### Estimating the size of the ATF summary and exception summary log streams

To estimate the size of the ATF summary (ATFSUMM) log stream and the ATF exception summary (ATFSUMX) log stream, calculate the average length of the Application Trace Facility (ATF) summary record for each application instance, take the peak number of the blocks that are written to the log stream per minute, and multiply the peak number by the number of minutes that you want between log stream offloads.

#### About this task

**Important:** When you calculate the average length of an ATF summary record, remember that *Call type* is the number of different API call types, not the number of API calls. For example, the following table shows an application that issued 500 IBM DB2 SQL calls has 5 call types:

Table 20. IBM DB2 SQL calls with different call types	
Call types	Number of calls
OPEN	1

Table 20. IBM DB2 SQL calls with different call types (continued)

Call types	Number of calls
SELECT	2
FETCH	494
INSERT	2
CLOSE	1

## Procedure

1. Calculate the average length of an ATF summary record by using the following formula:

```
Average length of ATF Summary record =
  (Length to AESXSVAR (494) +
   (Avg # of DLI TM call types * AESXSDDL (22)) +
   (Avg # of DLI DB call types * AESXSDDL (23)) +
   (Avg # of DBs accessed * AESXSDDL (8)) +
   (Avg # of DB2 call types * AESXSDDL (21)) +
   (Avg # of MQSeries call types * AESXSDDL (21)))
```

**Note:** Estimate the average length of Other types as 50 percent of the total numbers of DLI TM, DLI DB, DB2 accessed, and DB2 SQL call types.

2. Calculate the blocks that are written to log stream per minute by using the following formula:

```
Blocks written to Log Stream per minute =
  (Avg length of ATF Summary record *
   # of applications/minute) / 4096
```

3. Calculate the peak blocks that are written per minute by using the following formula:

```
Peak blocks written per minute =
  (Blocks written to Log Stream per minute * 1.5)
```

4. Multiply the peak number of blocks by the number of minutes that you want between log stream offloads.

**Note:** By default, the KI2ATFLS log sizing utility uses 5-minute log stream offloads.

## Results

The result is the value to assign to the ATFSUMM log stream. The ATFSUMX value is 5 percent of the ATFSUMM value.

## Estimating the size of the ATF detail and exception detail log streams

To estimate the size of the ATF detail (ATFDETL) log stream, calculate the average number of bytes of detailed event data that is written for each application instance, take the peak number of blocks that are written to the log stream per minute, and multiply the peak number by the number of minutes that you want between log stream offloads.

## Procedure

1. Calculate the average number of bytes of detailed data that is written for each application instance by using the following formula:

```
Detail event data bytes per application =
  (Avg # of DLI TM calls * 420) +
  (Avg # of DLI DB calls * 420) +
  (Avg # of DB2 SQL calls * 168) +
  (Avg # of MQSeries calls * 268) +
  (Avg # of Other events * 148)
```



**Note:** Estimate the average number of Other events as 25 percent of the total average numbers of DLI TM, DLI DB, DB2 SQL, and MQSeries calls.

2. Calculate the blocks that are written to log stream per minute by using the following formula:

```
Blocks written to Log Stream per minute =  
(Detail event data bytes per application *  
# of applications/minute) / 4096
```

3. Calculate the peak blocks that are written per minute:

```
Peak blocks written per minute =  
(Blocks written to Log Stream per minute * 1.5)
```

4. Multiply the peak number of blocks by the number of minutes that you want between log stream offloads.

## Results

The result is the value that is assigned to the ATFDETL log stream.

## Example: manually estimating the size of the ATF z/OS log streams

This example shows how you can manually estimate the size of the Application Trace Facility (ATF) z/OS log streams.

### About this task

In this example, you estimate the following average calls per application for different API calls:

- Three different DLI TM calls (GU, ISRT, CHNG) with an average of five total calls per application
- Four different DLI DB calls (GU, GHU, GNP, GHNP) with an average of 150 total calls per application
- An average of four different databases that accessed per application
- Five different DB2 SQL calls (OPEN, SELECT, FETCH, INSERT, CLOSE) with an average of 1,200 total calls per application
- An average of 1,400 applications per second that were run

### Procedure

- Complete the following steps to estimate the size of the ATF summary (ATFSUMM) log stream and the ATF exception summary (ATFSUMX) log stream:
  - a) Based on the preceding information, use the following formula to calculate the average length of the ATF summary record:

```
Average length of ATF Summary record =  
(Length to AESXSVAR (494) +  
(Avg # of DLI TM call types * AESXSDDL (22)) +  
(Avg # of DLI DB call types * AESXSDDL (23)) +  
(Avg # of DBs accessed * AESXSDBL (8)) +  
(Avg # of DB2 call types * AESXSDDL (21)) +  
(Avg # of MQSeries call types * AESXSDDL (21)))
```

In this example, the average length of the ATF summary record in this example is calculated as follows:

```
(494 +          base ATF Summary record length  
(3 * 22) +      Avg # DLI TM call types  
(4 * 23) +      Avg # DLI DB call types  
(4 * 8) +       Ave # DBs accessed  
(5 * 21) +      Avg # DB2 SQL call types  
(8 * 22) +      Avg # Other types (50% of total call types)
```

The average length of the ATF summary record is 965 bytes.

b) Calculate the summary blocks that are written to log stream per minute:

```
Summary blocks written to Log Stream per minute =  
(965 * 1400 * 60) / 4096 = 19790
```

c) Calculate the peak summary blocks that are written per minute:

```
Peak summary blocks written per minute =  
(19790 * 1.5) = 29685
```

d) Multiply the peak number by the number of minutes that you want between log stream offloads. If you want 5 minutes between log stream offloads, you get the following result:

```
If the offload frequency that you want is every 5 minutes:  
(29685 * 5) = 148425
```

As a result, the size of the ATFSUMM log stream is 148,425, and the size of the ATFSUMX log stream is 7,421.

- Complete the following steps to estimate the size of the ATF detail (ATFDETL) log stream:

a) Based on the preceding information, use the following formula to calculate the detailed event data bytes per application:

```
Detail event data bytes per application =  
(Avg # of DLI TM calls * 420) +  
(Avg # of DLI DB calls * 420) +  
(Avg # of DB2 SQL calls * 168) +  
(Avg # of MQSeries calls * 268) +  
(Avg # of Other events * 148)
```

In this example, the detailed event data bytes per application are calculated as follows:

```
( 5 * 420 ) +      Avg # DLI TM calls  
( 150 * 420 ) +   Avg # DLI DB calls  
( 1200 * 168 ) +  Avg # DB2 SQL calls  
( 340 * 148 ) +   Avg # Other events (25%)
```

The detailed event data bytes per application are 317,020.

b) Calculate the detailed blocks that are written to log stream per minute:

```
Detail Blocks written to Log Stream per minute =  
(317200 * 1400 * 60) / 4096 = 6505078
```

c) Calculate the peak blocks that are written per minute:

```
Peak blocks written per minute =  
(6505078 * 1.5) = 9757617
```

d) Multiply the peak number of blocks by the number of minutes that you want between log stream offloads. If you want 5 minutes between log stream offloads, you get the following result:

```
If the offload frequency that you want is every 5 minutes:  
(9757617 * 5) = 48788085
```

As a result, the size of the ATFDETL log stream is 48,788,085.

## Results

Overall, you have the following values to specify in PARMGEN:

- ATFSUMM: 148,425
- ATFSUMX: 7,421
- ATFDETL: 48,788,085

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---

# Index

## A

accessibility features [63](#)  
Application History Menu panel [11](#)  
Application Trace Filter Criteria panel [42](#)  
ATF  
    activation [5](#)  
    ATFSUMM [59](#)  
    ATFSUMX [59](#)  
    batch processing [45, 46](#)  
    components [1](#)  
    data display [17](#)  
    DB2 item section [50](#)  
    DBD item section [50](#)  
    Define log record number [47](#)  
    Enable IMS PPUT [47](#)  
    Enabling ATF for IMS log processing [47](#)  
    estimate  
        example [61](#)  
    exception data display [31](#)  
    IMS DB/TM item section [50](#)  
    installation [3](#)  
    MQ item section [50](#)  
    overview [45](#)  
    reporting ATF in batch [50](#)  
    response time metrics [48](#)  
    security [3](#)  
    size [58–61](#)  
    Specify trace specification [47](#)  
    stopping [7](#)  
    summary data [46](#)  
    summary log record description [50](#)  
    summary record reporting [50](#)  
    trace repository [7](#)  
    Trace Repository [7](#)  
    utility [58](#)  
    z/OS log streams [58, 61](#)  
ATF Collector [1](#)  
ATF Display [1](#)  
ATF Manager [1](#)  
ATF trace repository  
    backup utility [8](#)  
    KOIATRBK [8](#)  
    KOIATRRS [8](#)  
    restore and deployment utility [8](#)  
ATFACT [5](#)  
ATFBUFF [5](#)  
ATFDETL [60](#)  
ATFL [42](#)  
ATMN [12](#)  
ATSP [14](#)  
ATVD [28](#)  
ATVG [18](#)  
ATVS [21](#)  
ATVW [24](#)  
ATVX [30](#)  
ATXD [38](#)

ATXS [31](#)  
ATXW [34](#)  
ATXX [40](#)  
AUTORESTART [5](#)

## B

backup [7](#)  
backup utility [8](#)

## C

cookie policy [67](#)

## D

deployment utility [8](#)  
DETLOGR [5](#)

## I

IBM Support Assistant [65](#)  
ISA [65](#)

## K

KOIATRBK [8](#)  
KOIATRRS [8](#)

## L

legal notices  
    cookie policy [67](#)  
    notices [67](#)  
    programming interface information [67](#)  
    trademarks [67](#)

## M

Manage Application Trace (Define/Start/Stop) panel [12](#)

## N

notices [67](#)

## O

OMEGAMON for IMS Performance Monitor Main Menu panel [11](#)

## P

panel  
    Application History Menu [11](#)  
    Application Trace Facility [11](#)

panel (*continued*)

- Application Trace Filter Criteria [42](#)
- Manage Application Trace (Define/Start/Stop) [12](#)
- OMEGAMON for IMS Performance Monitor Main Menu [11](#)
- Specify Application Trace Details [14](#)
- View Application Trace Detail [28](#)
- View Application Trace DL/I Detail [30](#)
- View Application Trace Exception Detail [38](#)
- View Application Trace Exception Overview [34](#)
- View Application Trace Exception Summary [31](#)
- View Application Trace Overview [24](#)
- View Application Trace Summary [21](#)
- View Application Trace Summary by Group [18](#)
- View Trace Exception DL/I Detail [40](#)

programming interface information [67](#)

## R

- restore [7](#)
- restore utility [8](#)

## S

- SANDBOX [5](#)
- Software Support [65](#)
- Specify Application Trace Details panel [14](#)
- SUMMLOGR [5](#)
- SUMXLOGR [5](#)
- support assistant [65](#)
- System Logger [2](#)

## T

- trace repository
  - backup utility [8](#)
  - KOIATRBK [8](#)
  - KOIATRRS [8](#)
  - restore and deployment utility [8](#)
  - utilities [7](#)
- trademarks [67](#)

## U

- utilities [7](#)

## V

- View Application Trace Detail panel [28](#)
- View Application Trace DL/I Detail panel [30](#)
- View Application Trace Exception Detail panel [38](#)
- View Application Trace Exception Overview panel [34](#)
- View Application Trace Exception Summary panel [31](#)
- View Application Trace Overview panel [24](#)
- View Application Trace Summary by Group panel [18](#)
- View Application Trace Summary panel [21](#)
- View Trace Exception DL/I Detail panel [40](#)

## Z

- z/OS System Logger [2](#)



