

## **Adabas Fastpath**

### **Adabas Fastpath Tools**

Version 7.4.2

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This document applies to Adabas Fastpath Version 7.4.2 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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# 1 Adabas Fastpath Tools

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This document describes the Adabas Fastpath tools.

- **Buffer Operation and Printing (AFPCMD)**
- **Optimization Sampling (AFPLOOK)**



## 2 Buffer Operation and Reporting (AFPCMD)

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The AFPCMD tool provides operation and reporting functions for the Adabas Fastpath buffer. AFPCMD can be invoked online using Adabas Fastpath Online Services or it can be invoked using Natural in batch mode.

## Using AFPCMD in Batch Mode

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In a batch Natural environment

- use AFPCMD as the program name;
- define the Natural printer CMPRT01; and
- execute the utility from the required SYSMW<sub>vrs</sub> library.

The syntax of the AFPCMD service commands is as follows:

*command object [keyword]*

Each line of input to the Natural batch program must contain at least a command and object.

Keywords may or may not be required depending on the particular command/object combination. The required and permissible combinations are defined later in this section.

The commands, objects, and keywords may be entered in any order. Extra, unnecessary keywords are listed with a warning but are ignored. Missing keywords are listed and the command is not executed.

## Using AFPCMD in Online Mode

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In online mode, AFPCMD can be invoked by:

- selecting option 4 from the Online Services Main Menu, or
- by entering the command 4 on any screen command line, or
- by entering AFPCMD on any screen command line.



The Online Printing Facility screen will appear:

```

11:14:31      ***** A D A B A S   FASTPATH SERVICES 7.4.1 *****      2002-09-05
              - On-Line Printing Facility -                               F14000MA

Please enter the following to specify the required report:

Command: _____ DISPLAY, LIST, PARMS

Objects: _____ BUFFER, JOB, AFLOOK, TRACE, DATABASE, FILE, SUMMARY, SET
              or ALL

Keywords: _____
              (Press Enter to be prompted for the appropriate keywords)

Printer: _____
PC          for download via NATURAL CONNECTION to a PC printer or file.
SOURCE      for output to the NATURAL source area.
CONNECT     for output into a CON-NECT folder.
Valid Name  known to COMPLETE, NAF or any spooling system

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help          Exit                               Menu

```

### Online Printing Facility

You must enter a valid **command**, **object**, **keywords** and printer.



**Note:** If you do not have the software to use a printer facility, you must use batch Natural as described earlier.

You can either enter the keywords or repeatedly press the `Enter` key to be prompted for keywords one at a time. When all keywords are valid, the function is executed and control is returned to this screen.

## Commands

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The following commands can be used to:

- communicate with the Adabas Fastpath buffer:

STOP	Stop optimization for the selected object.
START	Restart optimization for an object.
RESTART	Stop and restart the Adabas Fastpath buffer.

- print information from the current Adabas Fastpath buffer:

LIST	List a single line for each object.
DISPLAY	Print full details for each object.

- print parameter information from the configuration file:

PARMS	Print full parameter details from the Adabas Fastpath configuration file.
-------	---

## Objects

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The following objects are listed for selection:

Object	Description
BUFFER	The currently accessible buffer (not valid for PARMS command).
JOB	Jobs for which Adabas Fastpath optimization has been defined.
DATABASE	An Adabas database for which Adabas Fastpath optimization has been defined.
FILE	An Adabas file for which Adabas Fastpath optimization has been defined.
SET	A set of direct access data used by Adabas Fastpath.
SUMMARY	A file/descriptor level summary of the direct access sets used by Adabas Fastpath.
AFPLOOK	Display the full details from the current AFPLOOK.
TRACE	Display the trace counters from the active Adabas Fastpath buffer.
ALL	Display all important data from an active Adabas Fastpath buffer.

## Keywords

The following keywords are available:

Keyword	Description
NODE	The database number of the Adabas Fastpath buffer for which statistics or actions are required. If not specified, the buffer to which the job is connected is used; if there is no connection, an error occurs. If specified, the job executing AFPCMD does not need to have a connection to any buffer.
SVC	Adabas router number. This is only valid in OS/390, z/OS, MSP, and VSE/ESA environments that use multiple SVCs.
DBID	Adabas database number for which the objects are required. The value ALL is also valid except for object AFPLOOK.
FNR	Adabas file number. The value ALL is also valid.
CC	Adabas command code used to help identify direct access sets. Valid codes are: L1 , L3 , L9 , S1 , S2, or ALL.
PD	Adabas primary descriptor used to help identify direct access sets. Valid are two-character Adabas field names. ALL is also valid.
BUFF	Buffer name for PARMs (parameter print). The value ALL is also valid.
JNM	Job name defined to Adabas Fastpath. The values DEFAULT and ALL are also valid.
JTYP	Job type as defined to Adabas Fastpath. Used to uniquely identify jobs to STOP/START. See the description in section <a href="#">STOP/START/RESTART Commands</a> for a list of valid job types. The value ALL is also valid.

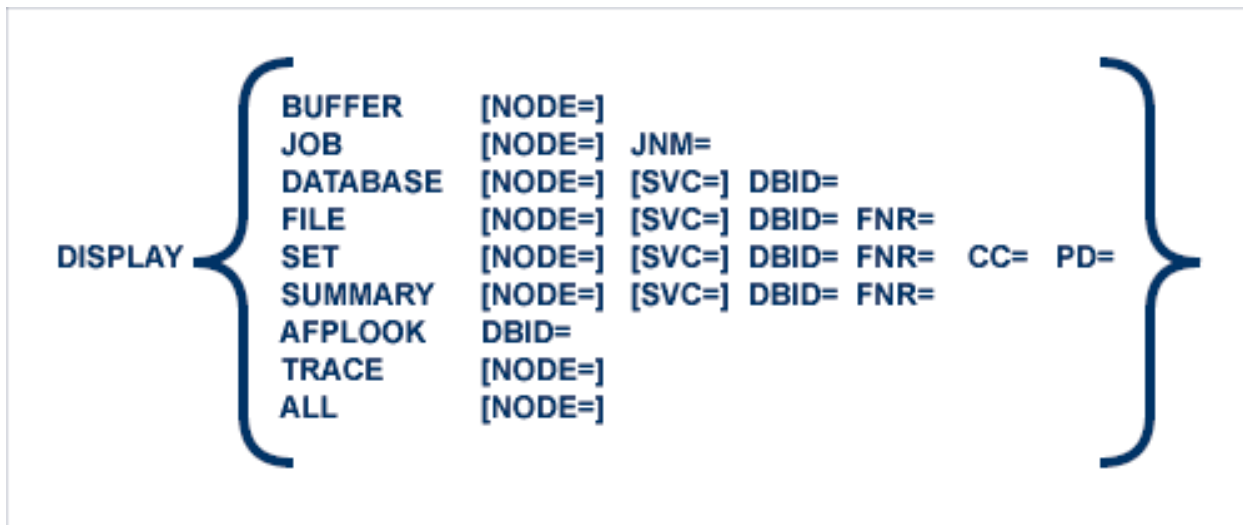
## LIST Command

The LIST command is used to obtain (from either the buffer identified by NODE or the currently accessible buffer) summary information (only) for the particular objects selected. Depending upon the object, keywords may be used to specifically identify or restrict the information to be listed.

LIST	$\left\{ \begin{array}{l} \text{JOB} \\ \text{DATABASE} \\ \text{FILE} \\ \text{SET} \\ \text{SUMMARY} \end{array} \right.$	[NODE=]						$\right\}$
		[NODE=]	[SVC=]					
		[NODE=]	[SVC=]	DBID=				
		[NODE=]	[SVC=]	DBID=	FNR=	[CC=]	[PD=]	
		[NODE=]	[SVC=]	DBID=	FNR=			

Keyword	Description
NODE	Optional. When specified, identifies the database number of the Adabas Fastpath buffer required. If not specified, the buffer to which the job is connected is used; if no buffer is connected, an error message is issued.
SVC	Valid only in OS/390, z/OS, MSP, or VSE/ESA environments that use multiple SVCs. If specified, information is obtained for all objects with that SVC that have been active in the current buffer.
DBID	Mandatory. Identifies the database for which file information is to be obtained. ALL can be used with this parameter to obtain information about all files active within the current buffer.
DBID and FNR	Mandatory. Identifies the database and file for which set information is to be obtained. ALL can be used for either or both parameters to obtain information about all sets active within the current buffer.
CC	Optional. Restricts the set information obtained to the Adabas command code specified.
PD	Optional. Restricts the set information obtained to the Adabas primary descriptor specified. The descriptor must be specified as a two-character Adabas field name.

## DISPLAY Command

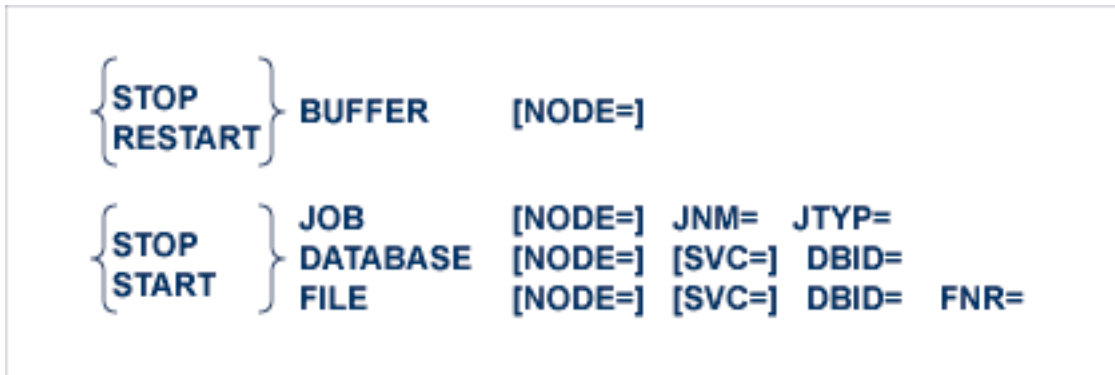


Keyword	Description
NODE	Optional. When specified, identifies the database number of the Adabas Fastpath buffer required. If not specified, the buffer to which the job is connected is used; if no buffer is connected, an error message is issued.
JNM	Used to define the job name for the DISPLAY JOB print. ALL may be specified to provide a full print for all jobs that may have been active in the current buffer.
SVC	Valid only in OS/390, z/OS, MSP, or VSE/ESA environments that use multiple SVCs. If specified, information is obtained for all objects with that SVC that have been active in the current buffer.
DBID	Mandatory. Identifies the database for which file information is to be obtained. ALL can be used with this parameter to obtain information about all files active within the current buffer. The value ALL should be used with caution since its use may produce a longer print than expected.
DBID and FNR	Mandatory. Identifies the database and file for which set information is to be obtained. ALL can be used for either or both parameters to obtain information about all sets active within the current buffer. The value ALL should be used with caution since its use may produce a longer print than expected.
CC	Restricts the set statistics to the Adabas command code specified. ALL may be used to print full statistics for all sets (except as restricted by DBID and FNR).
PD	Restricts the set statistics to the Adabas primary descriptor specified. The descriptor must be specified as a two character Adabas field name. ALL may be used to print full statistics for all sets (except as restricted by DBID and FNR).

DISPLAY AFPLOOK requires the database number in DBID=. This is the only situation where ALL is not permitted.

## STOP/START/RESTART Commands

The STOP and RESTART/START commands issue a request to the Adabas Fastpath buffer manager. All stop/start processing occurs in an orderly manner without affecting the status of the object in Adabas.



Once the STOP BUFFER command is accepted, the buffer manager initiates the stop process, and it is then no longer possible for batch services to start the buffer.

RESTART BUFFER initiates the stop process. After successful completion of the stop process, buffer initialization is started.

Keyword	Description
NODE	Optional. When specified, identifies the database number of the Adabas Fastpath buffer required. If not specified, the buffer to which the job is connected is used; if no buffer is connected, an error message is issued.
JNM	Defines the job to be stopped/started. The value DEFAULT may be used.
JTYP	Must be entered where JNM=DEFAULT or when it is possible to have duplicate job names with different job types. ALL may be used. Following is a list of the common job type entries: BATCH, CICS, CMS, COMPLETE, IMS/DC, NETWORK, SHADOW, TIAM, TSO, UTM.
SVC	Valid only in OS/390, z/OS, MSP, or VSE/ESA environments that use multiple SVCs.
DBID and FNR	Mandatory. Defines the database number and file number.

ALL may be entered for any parameters. ALL should be used with caution since this may stop optimization for any number of objects.

## PARMS Command

The `PARMS` command can be used to display the Adabas Fastpath parameters for the object selected.



**Note:** The information displayed by this command is obtained from the Adabas Fastpath parameter file. Therefore, as opposed to all other AFPCMD commands, the Adabas Fastpath buffer does not need to be active for this command.

```

PARMS    BUFFER    BUFF=
           JOB       JNM=
           FILE     BUFF=  [SVC=]  DBID=  FNR=

```

Keyword	Description
BUFF	Name of the Adabs Fastpath buffer. If ALL is specified, all buffers are selected.
JNM	Job name. The value ALL is valid and prints all parameters for every job defined in the Adabas Fastpath parameter file. The value DEFAULT can be used to print all default parameters for all job types, thus eliminating the need to specify job types.
SVC	Valid only in OS/390, z/OS, MSP, or VSE/ESA environments that uses multiple SVCs.
BUFF, DBID, and FNR	Mandatory for printing the file parameters. ALL is valid.

## AFPCMD Summary

The following table lists all AFPCMD command, options, and keyword combinations, together with the Natural program that performs the function.

Natural Security can be applied as required.

Command	Object	Keywords	Program
LIST	JOB	NODE=	F18110P
	DATABASE	NODE= SVC=	F18120P
	FILE	NODE= SVC= DBID=	F18130P
	SET	NODE= SVC= DBID= FNR= CC= PD=	F18140P
	SUMMARY	NODE= SVC= DBID= FNR=	F18150P

Command	Object	Keywords	Program
DISPLAY	BUFFER	NODE=	F18280P
	JOB	NODE= JNM=	F18210P
	DATABASE	NODE= SVC= DBID=	F18220P
	FILE	NODE= SVC= DBID= FNR=	F18230P
	SET	NODE= SVC= DBID= FNR= CC= PD=	F18240P
	SUMMARY	NODE= SVC= DBID= FNR=	F18250P
	AFPLOOK	DBID=	F18290P
	TRACE	NODE=	F18270P
	ALL	NODE=	F18260P
STOP / RESTART	BUFFER	NODE=	F18510P
STOP / START	JOB	NODE= JNM= JTYP=	F18520P
	DATABASE	NODE= SVC= DBID=	F18530P
	FILE	NODE= SVC= DBID= FNR=	F18540P
PARMS	BUFFER	BUFF=	F18310P
	JOB	JNM =	F18320P
	FILE	BUFF= SVC= DBID= FNR=	F18330P



# 3 AFPLOOK

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The Adabas Fastpath command analysis sampler (AFPLOOK) can be used to determine where the best results may be expected from Adabas Fastpath by reporting on the command constructs that qualify for Adabas Fastpath.

The sampler can be controlled and viewed online using SYSAFP and, in addition, prints the results at normal database termination.



**Note:** For those Adabas customers who do not have an Adabas Fastpath license, the AFPLOOK sampler along with a demo version of SYSAFP is distributed as part of the Adabas release tape. In this form, by default, AFPLOOK will sample a full database session.

## Enabling AFPLOOK

---

AFPLOOK is enabled using the following ADARUN command:

```
ADARUN FASTPATH=YES
```

## Operational Defaults

---

AFPLOOK is set up with certain operational defaults that control the amount of memory used during command analysis by restricting

- the maximum number of files sampled; and
- the number of concurrent users.

If any parameter is exceeded, AFPLOOK tries to ignore the excess while still reporting maximum information. In this way, AFPLOOK audits a general sampling of the database command workload to determine Fastpath optimization parameters. The operational defaults can be modified for site requirements as described in the section [APLOOK Parameters](#).

## AFPLOOK Parameters

---

This section describes the AFPLOOK parameters, which are used to define the boundaries of the sample and limit the amount of memory required.

- [Maximum Files](#)
- [Command/Descriptors per File](#)
- [Maximum Concurrent Users](#)
- [Maximum CIDs per User](#)

- Maximum Commands Processed
- Job Name
- Selected Files

### Maximum Files

The maximum number of files to be sampled.

Once the maximum number of files is put in the analysis table, no additional files are sampled; however, additional files show in a command count so that it can be determined whether or not this parameter should be increased for subsequent executions.

Default: 64

### Command/Descriptors per File

The maximum number of command/descriptor entries per file.

In conjunction with the `Maximum Files` parameter, this parameter restricts the amount of memory used. If the maximum entries is reached for a file, the last entry is converted into a general accumulator. Note that only one entry is required for the Adabas command types L1, L2, S8, and S9.

Default: 32

### Maximum Concurrent Users

The maximum size for the table of concurrent users.

If all the user areas are being used at one time, a new request is satisfied by releasing the 'oldest usage' user area. The number of times this reusage occurs is noted and printed in the summary. When a sample contains a high percentage of reusage, this parameter should be adjusted.

Default: 100

### Maximum CIDs per User

The maximum concurrent Adabas Command IDs (CIDs) sampled for each user processed.

In conjunction with the `Maximum Concurrent Users` parameter, this parameter restricts the amount of memory used. Commands for Command IDs that exceed this maximum are ignored and reported as rejected. When a sample contains a high percentage of rejections, this parameter should be adjusted.

Default: 10

### Maximum Commands Processed

The maximum number of commands to be sampled.

Default: No limit

### Job Name

Used to restrict sampling to a particular job name. One or more asterisks (\*) can be used in the job name as a wild card character so that the sample can select all jobs that match the name ignoring the character positions occupied by an asterisk (\*).

Default: None

### Selected Files

Used to restrict sampling to specific files.

This option may be useful where the maximum files overflowed, or file activity is known and detailed analysis is required.

Default: All files

## AFPLOOK Report

---

This section describes the types of information available on the AFPLOOK report:

- [File Summary](#)
- [Potential Optimization Summary](#)
- [Sample Command Analysis](#)
- [Report Parameters](#)

### File Summary

This section of the report provides a summary of the file commands.

FNR	CC	DESC	DIRECT	ACC	RC	SEQUENTIAL	SEQUENCES
20	L1	--		1			
	L2	--				4	4
	L3	CC		1			
	L9	AA		1			
	L9	BB		2			

L9	CC	2	1	1	
S1	AA		3	1	
TOTALS		7	8		21(18%)
				EXCLUDED COMMANDS:	2
				ALREADY PREFETCHED:	3
(UPDATES 2,INSERTS 1,DELETES 1) (MAX.RBL DA 0,SEQ 32)					

Column	Explanation
FNR	Adabas file number.
CC	Adabas command code.
DESC	Primary descriptor.
DIRECT ACC	Maximum number of direct access commands that can be optimized.
RC	Maximum number of RC commands that can be optimized.
SEQUENTIAL	Maximum number of sequence commands that can be optimized.
SEQUENCES	Number of sequences that caused the number of sequential commands. The sequence factor for optimization may be calculated from these two numbers.

The rightmost number shows the total sampled commands for the file together with the percentage relative to all the sampled file commands. On a large report, this number can be used to determine quickly which files should be considered for optimization.

Commands that have been ignored for the file are also listed along with the reason for exclusion.

The final line shows the update commands as well as the maximum record buffer lengths found for direct access or sequential commands that can be optimized.

### Potential Optimization Summary

This section of the report summarizes the total commands sampled for all files and expresses this as a percentage of all commands seen. Excluded commands are similarly reported.

----- POTENTIAL OPTIMIZATION SUMMARY -----			
SAMPLED COMMANDS		MAXIMUM OPTIMIZATION	
SAMPLED FILE COMMANDS	116 ( 77%)	SEQUENTIAL:	55 (47%)
		DIRECT ACCESS:	32 (27%)
		RCS:	4 ( 3%)
EXCLUDED COMMANDS	33 ( 22%)		
TOTALS	149 (100%)		91 (61%)

The maximum optimization numbers are an estimation of potential optimization. The sequential commands, direct access, and RC totals are expressed as a percentage of the total sampled file commands. The total is expressed as a percentage of all commands.

These numbers indicate the estimated *potential* optimization using Adabas Fastpath. The actual optimization will depend on various factors unique to each user site. Contact Software AG for assistance when interpreting samples.

### Sample Command Analysis

This section of the report provides command analysis information.

```

-----
                                COMMAND ANALYSIS
REJECTED COMMANDS
    MAX. USERS EXCEEDED:           0
    MAX. CIDS EXCEEDED:           0
    MAX. FILES EXCEEDED:          0      0 ( 0%)
EXCLUDED COMMANDS
    BAD COMMANDS:                 4
    NON-FILE COMMANDS:           7
    NON-FILE RCS:                 2
    EXCLUDED FILE COMMANDS:      8
    UPDATE COMMANDS:             4
    ALREADY PREFETCHED:          8      33 ( 22%)
SAMPLED FILE COMMANDS            116 ( 77%)
ALL COMMANDS SEEN                149 (100%)
-----
    
```

The numbers shown:

- illustrate the type of commands processed, and
- put the previous section into perspective.

Rejected commands are categorized by users, CIDs, and files exceeded. If the total percentage is high, estimates reported elsewhere may not give an accurate assessment.

Excluded commands are split into the following categories:

Category	Explanation
Bad commands	Unexpected Adabas response codes.
Non-file commands	Commands that cannot be attributed to a file; for example, OP, CL, ET, C1, RE. Plus file commands HI, LF, RI.
Non-file RCs	All RC commands plus any RC for which the CID is not stored by AFPLOOK.
Excluded file commands	L4, L5, L6, S4, S5.
Update commands	A1, A4, E1, E4, N1.
Already prefetched	Any command that could qualify for sequential optimization that has prefetch or multifetch already set.

## Report Parameters

This section of the report

- shows the important parameters used to produce the report; and
- gives an indication of the parameters needed.

```

-----
PARAMETERS USED
MAX. FILES:      64  FILES NEEDED:      5
  ..MAX. DE:    32  OVERFLOWS:      0
MAX. USERS:     100  HIGH USERS:      15
  ..MAX.CID:    10  HIGH CIDS:       4
* REUSED USER AREA OCCURRENCES:      0
MAX.RECORDS: NO LIMIT
-----

```





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