

Adabas Online System

Space Calculation

Version 8.1.3

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This document applies to Adabas Online System Version 8.1.3 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 Space Calculation

Option "S" on the Basic Services Main Menu displays the Space Calculation menu:

```
13:39:52          ***** A D A B A S BASIC SERVICES *****          2007-08-20
                                - Space Calculation -                                PSP0002

                                Code      Service
                                ----      -
                                A        ASSO
                                C        Cluster-Cache/Lock
                                D        DATA
                                F        DDFILEA
                                S        SORT
                                T        TEMP
                                W        WORK
                                ?        Help
                                .        Exit
                                ----      -

                                Code ..... _
                                Database ID ... 1955    (DB1955)

Command ==>
PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
Help              Exit                      Menu
```

The space calculation function is a planning tool for adding new components or recalculating existing space requirements. Each calculation provides a block or cylinder estimate according to information you provide. In general, you must provide the

- maximum estimated record count;
- average number of MU or PE occurrences, when used as descriptors;

- average descriptor, compressed record, or normal record length;
- estimated padding factor;
- device type where the Adabas component being estimated resides.








In many cases, the results are "best guess" estimates; other than a device type, no defaults are assumed. Because no values are actually changed by the Space Calculation function, unrealistic estimates cause no harm.

Calculations are provided in both cylinders and blocks. In some cases, the block values are required by other Online System/Basic Services functions such as Define New File or Modify File Parameters. All values are lost when you exit from the estimating function, regardless of the cause of the exit. You may want to write down any values you wish to use later.

By changing individual estimated values one at a time, you can see the effect on the calculated result. For example, you can change the device type without re-entering the other values; the revised estimate for that device appears when you press ENTER.

There are equivalent direct commands for each Space Calculation function.

The Adabas Online System Space Calculation documentation is organized in the following topics:

	Estimating Associator Space
	Estimating Sizes for Directory and Data Structures in a Cluster Environment
	Estimating Data Storage Space
	Estimating Space for the DD/FILEA Sequential Dataset
	Estimating the Sort Dataset
	Estimating the Temp Dataset
	Estimating the Work Dataset

2 Estimating Associator Space

Option "A" calculates one of two Associator component values: the address converter (AC) space, or the normal (NI) and upper (UI) index space.

```
08:22:50          ***** A D A B A S  BASIC SERVICES *****          2006-07-14
                                - ASSO Space Calculation -                                PSPA002

                                Code      Service
                                ----      -
                                A        Address Converter
                                I        Normal/Upper Index
                                ?        Help
                                .        Exit
                                ----      -

                                Code .....
                                Database ID ... 105      (RD-MPM105)

Command ==>
PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
Help              Exit                               Menu
```

The equivalent direct command is

```
CALCULATE ASSO
```

AC space is based on the device type and the estimated number of records in the related Data Storage file.

```
08:23:07          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
DBID 105              -  Address Converter  -                      PSPAA02

Maximum number of records ... 0
ASSO Device-Type ..... 8391
Block Size ..... 4136

Required number of blocks ...
Required number of cyls. ....
```

NI/UI calculates index values for a *single* descriptor, requiring you to estimate such things as the average descriptor length, the number of multiple descriptors you expect to have, the total number of unique descriptor values for that field, an Associator padding factor, and a device type if other than the default.

```
08:33:30          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
DBID 105              -  Normal/Upper Index  -                      PSPAI02

Computation for one Descriptor -
Maximum number of records for the file ..... 0
Average number of DE-values per record ..... 1.0
Average length of DE-value in bytes ..... 0
Number of different DE-values in the file ..... 0
Padding factor for ASSO ..... 10 %
ASSO Device Type ..... 8391
ASSO Block Size ..... 4136

                                I Normal Index I Upper Index I
I-----
I Required number of blocks I          0 I          0 I
I Required number of cyls.  I          0 I          0 I
I-----

                                Use ? for Help
```


3

Estimating Sizes for Directory and Data Structures in a Cluster Environment

Option "C" calculates the estimated sizes for directory and data structures in a cluster environment.

The cache structure should be made large enough to provide sufficient space:

- for tracking all blocks kept in the buffer pools of all connected cluster nuclei (directory elements) and
- for keeping all changed blocks until they are written to the database (data elements).

The assignment of total cache space into directory and data elements is done via the `DIRRATIO` and `ELEMENTRATIO` parameters.

```
13:01:16          ***** A D A B A S  BASIC  SERVICES *****          2007-10-02
DBID 1955          -  Cache Structure Calculator  -          PSPC002

Smallest block size in DB ..... 4092
Largest block size in DB ..... 27990
Buffer pool size (LBP) ..... 104857600____
Size proper for caching blocks .. 104800000____
Max nuclei in cluster ..... 3
Directory element size ..... 400
Cache structure size (in KB) .... 256000____
```

For minimum calculation, leave cache structure size field empty.

Modify values, press Enter to provide estimates below.

```
Cache CFRM SIZE/INITSIZE ..... 256000      ( 250.0      MB)

ADARUN DIRRATIO ..... 62

ADARUN ELEMENTRATIO ..... 49

Cache directory elements ..... 128597

Cache data elements ..... 101633

Cache data element size ..... 2048


PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----

Help                Exit          Lock                Menu
```

Input fields:

Field	Description
Smallest block size	Value between 1024 and 32768. Default taken from current AOS DBid.
Largest block size	Value between 1024 and 32768. Default taken from current AOS DBid. If Smallest block size exceeds this value, then Smallest block size is swapped in.
Buffer pool size	Value between 80,000 and 999,999,999,999. Default taken from LBP parameter of current AOS Dbid.
Size proper for caching blocks	Value between 100000 - 999,999,999,999. Default taken from LBP parameter of current AOS Dbid, rounded down to nearest 100000. "Size proper" means that this does not include the overhead in the cache structure required for administering these blocks. Thus this value specifies how much space should be available in the cache structure for keeping changed blocks between buffer flushes and for buffering blocks so that the cluster nuclei do not have to read them from the database.

Field	Description
Max Nuclei in cluster	Value between 2 and 32. Defaults to 3.
Directory element size	Value between 100 and 999. Specifies how much space (including the overhead for the access paths) each directory element will take in the cache structure. Defaults to 400.
Cache Structure size	Blank for minimum calculation, or a value between 100 and 999,999,999 (KB). Although this value is given as an output field, you may want to propose a cache structure size, to see how to allocate the cache space (dir & data elements).

Output fields:

Field	Description
Cache CFRM SIZE/INITSIZE	The recommended cache structure SIZE or INITSIZE specification in the coupling facility resource management policy.
DIRRATIO/ELEMENTRATIO	The recommended ADARUN parameter settings for the cluster nuclei.
Cache directory/data elements	The estimated directory and data element counts resulting from the SIZE/INITSIZE, DIRRATIO, and ELEMENTRATIO settings.
Cache data element size	This (accurate) value depends only on the largest Asso/Data/Work block size in the database.

By hitting PF4, you then go to the Lock Structure Calculator.

Lock Structure Calculator

The Lock Structure Calculator calculates an estimated size for the Cache CFRM SIZE or INITSIZE specification in the coupling facility resource management policy.

The lock structure must be made large enough to provide sufficient space

- for keeping the lock record elements for all locks held at the same time, and
- for avoiding too much false contention on lock structure size as an input field.

The Number of lock table entries and record elements are shown for comparison with the related cluster nucleus message (ADAX70) and to aid users' own calculations.

```

13:42:29          ***** A D A B A S  BASIC  SERVICES *****          2007-08-20
DBID 1955          -   Lock Structure Calculator   -                   PSPL002

Max files in database (MAXFILES) ..... 400
Max number of parallel users (NU) ..... 200_____
Number of hold queue elements (NH) .... 40000
Unique descriptor pool size (LDEUQP) .. 50000
Lock record element size ..... 260
Lock structure size (in KB) .....

```

For minimum calculation, leave lock structure size field empty.
Modify values, press Enter to provide estimates below.

```
Lock   CFRM SIZE/INITSIZE ..... 13232      ( 12.9      MB)
Number of lock table entries ..... 131072
Number of lock record elements ..... 46157      Required min .. 45175
```

```
PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
Help                Exit          Cache                Menu
```

Input fields:

Field	Description
Max files in database	Value between 3 and 5000. The same as MAXFILES parameter of ADADEF and ADAORD. Taken from the current AOS DBid.
Max number of parallel users	Value between 20 and 16,777,215. Default taken from NU parameter of current AOS DBid.
Number of hold queue elements	Value between 20 and 16,777.215. Default taken from NH parameter of current AOS DBid.
Unique descriptor pool size	Value between 1 and 999,999,999. Default taken from LDEUQP parameter of current AOS DBid.
Lock record element size	Value between 100 and 999. Specifies how much space (including the overhead for the access paths) each lock record element will take in the lock structure. Defaults to 260.
Lock structure size	Blank for minimum calculation, or a value between 100 and 9,999,999 (KB). Although this value is given as an output field, you may want to propose a lock structure size, to see the estimated number of lock table entries and lock table elements.

Output fields:

Field	Description
Lock CFRM SIZE/INITSIZE	The recommended lock structure SIZE or INITSIZE specification in the coupling facility resource management policy.
Number of lock table entries	The calculated count of lock table entries resulting from the SIZE/INITSIZE setting.
Number of lock record elements	The estimated count of lock record elements resulting from the SIZE/INITSIZE setting. One has to actually start a cluster nucleus with the specified parameters to see how many lock record elements it gets from the lock structure. The number on the right side is the minimum number of lock record elements that the starting cluster nuclei require to be available.

4 Estimating Data Storage Space

Option "D" calculates Data Storage based on values you provide for estimated maximum record count, the average length of a compressed record, a Data Storage padding factor, and device type. Results are specified in both blocks and cylinders.

```
08:36:55          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
      DBID 105                      -  Data Storage  -                      PSPD002

Maximum number of records for the file .. 0_____
Average compressed record length ..... 0
Padding factor for DATA ..... 10 %
DATA device-type / blk. size ..... 8391 / 10796

Required number of blocks ..... 0
Required number of cyls. .... 0
```

The equivalent direct command is

```
CALCULATE DATA
```


5 Estimating Space for the DD/FILEA Sequential Dataset

Option "F" calculates the space required for the DD/FILEA sequential dataset when it is used with the ADAORD utility. (The dataset is also used with the ADALOD utility.)

```
08:37:35          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - DDFILEA Storage -                                PSPF002

      Code  Reorder                                Maximum Space Required
      ----  -
DB -Function :  A    Asso
                B    Data                        Bytes .....
                C    DB                          Blocks .....
                D    Restruct DB                  Cylinder ...
FILE -Function : E    FAsso                      Blocksize ..
                F    FData
                G    File
                H    Restruct File
                .    Exit
      ----  -

Code ..... _
File .....
Device ... 8391
DB-ID .... 105      (RD-MPM105)
```

The equivalent direct command is

```
CALCULATE DDFILEA
```


6 Estimating the Sort Dataset

■ ADAINV Sort	14
■ ADALOD LOAD Sort	15
■ ADALOD UPDATE Sort	16

Option "S" (Sort) displays the Sort Storage menu:

```
08:44:07          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - SORT STORAGE -                                PSPS002

                                Code  Service
                                ----  -
                                I    ADAINV
                                L    ADALOD load
                                U    ADALOD update
                                ?    Help
                                .    Exit
                                ----  -

                                Code ..... _
                                File Number ..
                                Database ID .. 105      (RD-MPM105)
```

The functions on this menu are used to estimate the storage needed on SORT for the utility function chosen.

This chapter covers the following topics:

ADAINV Sort

The storage needed on SORT for the ADAINV utility function is estimated using the following screen:

```
08:48:25          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - Sort Storage      - ADAINV -          -          PSPSS02

File Number ..... 16
Number of records ( Default:  TOPISN ) ..... 25649      (reduce number if
Name of the field to be processed .....                field is NU)

Average compressed descr. length (in Bytes)
of the biggest descriptor .....
Occurences of periodic groups ..... 1
Occurences of multiple fields ..... 1
SORT device-type ..... 8391
LWP-parameter ..... 1000000
Database-ID ..... 105
Password (if required) .....

-----

Required number of blocks (minimum) .....
```

```

Required number of cyls. (minimum) .....

PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
Help                Exit       Dis Field                Menu

```

PF4 (Dis Field) invokes a Field Selection screen:

```

08:48:27          ***** A D A B A +-----+ 05-03
                        - Sort Storage | 02
                        | Please mark with 'X':
                        |
File Number ..... | Field
Number of records ( Default: TOPI | Selection Name Length | if
Name of the field to be processed | -----
Average compressed descr. length ( | _ LC 250
of the biggest descriptor ..... | _ LG 65_
Occurences of periodic groups .... | _ LK 90_
Occurences of multiple fields .... | _ LM 250
SORT device-type ..... | _ LQ 8__
LWP-parameter ..... | _ LR 8__
Database-ID ..... | _ LS 8__
Password (if required) ..... | _ LT 8__
----- | _ LU 8__ | -
Required number of blocks (minimum | _ LV 96_
Required number of cyls. (minimum | _ LI 32_
| _ L3 14_
| Enter-----PF3-----PF7-----PF8-
PF1----- PF2----- PF3----- PF4--- | Back < > | --
Help                Exit       Dis Fi +-----+

```

ADALOD LOAD Sort

For the ADALOD LOAD calculation, the default number of records is MAXISN rather than TOPISN as it is for the ADAINV function:

```

08:49:51          ***** A D A B A S BASIC SERVICES ***** 2006-07-14
                        - Sort Storage - ADALOD UPDATE - - PSPSS02

File Number ..... 16
Number of records ( Default: 0 ) ..... (reduce number if
                                         field is NU)

```

ADALOD UPDATE Sort

For the ADALOD UPDATE calculation, the default number of records is 0:

```
08:50:42          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - TEMP STORAGE -                                PSPT002

                                Code  Service
                                ----  -
                                I      ADAINV
                                L      ADALOD load/update
                                U      ADALOD delete
                                ?      Help
                                .      Exit
                                ----  -

Code ..... _
File No. ....: 16
Database ID .. 105      (RD-MPM105)
```

7 Estimating the Temp Dataset

Option "T" (Temp) displays the Temp Storage menu:

```
08:53:12          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - TEMP STORAGE -                                PSPT002

                                Code  Service
                                ----  -
                                I    ADAINV
                                L    ADALOD load/update
                                U    ADALOD delete
                                ?    Help
                                .    Exit
                                ----  -

                                Code ..... _
                                File No. ....: 16
                                Database ID .. 105      (RD-MPM105)
```

The functions on this menu are used to estimate the storage needed on TEMP for the utility function chosen.

```
08:55:02          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
                                - TEMP Storage -  ADAINV -                                PSPTI02

File Number ..... 16
Field-Name to be inverted ..
Average descriptor-length ..          ( Default = Field-length)
Max. Number of records ..... 25649    ( Default = TOPISN      )
Device Type ..... 8391
No. of records to delete ...          ( ADALOD Delete only    )
DBID ..... 105                      (RD-105)
Password (if required) .....
```

```

-----
Required TEMP-Blocks .....
      Cylinder ....

PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
Help              Exit       Dis Field              Menu

```

PF4 invokes a Field Selection screen.

The TEMP Storage - ADALOD DELETE screen is identical.

The TEMP Storage - ADALOAD LOAD screen differs in that a message is added reminding the user to multiply TOPISN by *all* occurrences of periodic groups and/or multiple value fields:

```

09:01:45          ***** A D A B A S BASIC SERVICES *****      2006-07-14
                        - TEMP Storage - ADALOD LOAD -                PSPTI02

File Number ..... 16
Field-Name to be inverted ..
Average descriptor-length ..      ( Default = Field-length)
Max. Number of records ..... 25649      ( Default = TOPISN      )
  Make sure to multiply TOPISN by ALL occurrences of PE and/or MU

```

8

Estimating the Work Dataset

The Work dataset requires the most estimating. Although many initial values may be arbitrary, keep a record of them to ensure that subsequent tuning of the Work parameters has a realistic basis. Results comprise block estimates for the three parts of the Work area. A total of these values in blocks and cylinders is also provided.

```
09:02:44          ***** A D A B A S  BASIC  SERVICES  *****          2006-07-14
DBID 105              -  Work Storage  -                               PSPW002

Average compr. record length of an updated record ... 0
Average number of descr. updated per update cmd. .... 0
Average length of an updated decsriptor value ..... 0
Average number of update cmds. per second ..... 0
Average duration of a transactions in seconds ..... 0
TOPISN of the biggest file in the database ..... 0
WORK device type / WORK blk. size ..... 8391 / 13682

Required space (blocks) :   Protection Area (LP) ....      0
-----
                           Intermediate ISN lists          0
                           Resulting ISN lists ....>      0
                           ? -----
                           Total (Blocks / Cyls.)....      0 / 0
```


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