Device and File Considerations

This section provides information for the following device- and system file-related topics:

- installing on fixed-block addressing (FBA) devices;

- defining new devices; and

- changing defaults for sequential files.

- Supported z/VSE Device Types

- FBA Devices

- ECKD Devices

- Adding New Devices

- User ZAPs to Change Logical Units

Supported z/VSE Device Types

The standard characteristics of the device types supported by Adabas are summarized in the following table. The Adabas block sizes and RABNs per track are provided for each component for each device type.

Device	Trks/Cyl	ASSO	DATA	WORK	PLOG/RLOG	CLOG	TEMP/SORT/DSIM	Notes
1512	7	1536:37	18944:37	18944:37	18944:37	18944:37	18944:37	
3375	12	2016:15	4092:8	4096:8	4096:8	4096:8	8608:4	
3380	15	2004:19	4820:9	5492:8	5492:8	4820:9	7476:6	2
3390	15	2544:18	5064:10	5724:9	5724:9	5064:10	8904:6	2
3512	16	4096:64	16384:16	16384:16	16384:16	16384:16	16384:16	
5121	15	2048:16	4096:8	4096:8	4096:8	4096:8	4096:8	
5122	15	4096:8	8192:4	8192:4	8192:4	8192:4	8192:4	
5123	15	4096:8	16384:2	16384:2	16384:2	16384:2	16384:2	
8345	15	4092:10	22780:2	22920:2	22920:2	22920:2	22920:2	
8380	15	3476:12	6356:7	9076:5	9076:5	9076:5	9076:5	1
8381	15	3476:12	9076:5	11476:4	11476:4	9076:5	9076:5	1
8385	15	4092:10	23292:2	23468:2	23468:2	23468:2	23468:2	1
8390	15	3440:14	6518:8	10706:5	10706:5	8904:6	8904:6	1
8391	15	4136:12	10796:5	13682:4	13682:4	8904:6	18452:3	1
8392	15	4092:12	12796:4	18452:3	18452:3	18452:3	18452:3	1
8393	15	4092:12	27644:2	27990:2	27990:2	27990:2	27990:2	1
9345	15	4092:10	7164:6	11148:4	11148:4	22920:2	22920:2	2

Notes:

1. The 8350, 838n, and 839n are pseudo-device types physically contained on a 3350, 3380, and 3390 device, respectively, but for which some or all of the standard block sizes are larger.
2. The IBM RAMAC 9394 emulates devices 3390 Model 3, 3380 Model K, or 9345 Model 2.

FBA Devices

Adabas Version 8.1 users must install three zaps before defining files on FBA devices. The zap numbers vary by 8.1 release and can be found in the Knowledge Center in Software AG's Empower (*https://empower.softwareag.com*) web site. For more information about applying zaps, read *Applying Zaps*.

- For Adabas Version 8.1.2, install zaps AD812064, AD812065, and AD812066.

- For Adabas Version 8.1.3, install zaps AD813034, AD813035, and AD813036.

- For Adabas Version 8.1.4, install zaps AD814004, AD814005, and AD814006.

All device definitions for Adabas control statements for FBA disks should specify one of the following devices types:

- FBA SCSI devices: Specify a device type of 1512.

- Virtual FBA devices: Specify device types of 5121, 5122, or 5123.

Note:
Virtual FBA devices are not permanent and are, therefore, only suitable for holding temporary or work data sets.

Choose a device type based on the block sizes given in the following tables:

SCSI Device Types:

Dev Type	Asso blksz	Data blksz	Work blksz	Temp blksz	Sort blksz	PLOG blksz	CLOG blksz
1512	1536	18944	18944	18944	18944	18944	18944

Virtual FBA Device Types:

Dev Type	Asso blksz	Data blksz	Work blksz	Temp blksz	Sort blksz	PLOG blksz	CLOG blksz
5121	2048	4096	4096	4096	4096	4096	4096
5122	4096	8192	8192	8192	8192	8192	8192
5123	4096	16384	16384	16384	16384	16384	16384

The pseudo-cylinder for each of these devices has a different number of blocks as described below:

- 1512 cylinder = FBA blocks/777

- 5121 cylinder = FBA blocks/960

- 5122 cylinder = FBA blocks/960

- 5123 cylinder = FBA blocks/960

The size definitions for FBA devices on Adabas control statements can specify the number of pseudo-cylinders or the number of Adabas blocks (RABNs).

Make sure that the starting block and the number of FBA blocks on the z/VSE EXTENT statement are on an FBA pseudo-cylinder boundary, which is based on the device as specified above for each Adabas file comprising the database:

- An SCSI pseudo-cylinder (device type 1512) comprises 777 elements of 512 bytes each, or 388K per pseudo-cylinder. For example, an EXTENT entry for a ten cylinder SCSI device might consist of:

  ```
  // EXTENT SYS123,,,,777,7770
  ```

- A virtual FBA pseudo-cylinder comprises 960 elements of 512 bytes each, or 480K per pseudo-cylinder. For example, an EXTENT entry for a ten cylinder virtual FBA device might consist of:

```
// EXTENT SYS123,,,,512,5120
```

ECKD Devices

Adabas supports ECKD DASD devices such as the IBM 3390 with the 3990 controller and ESCON channels.

During an open operation, ADAIOR determines which DASD device types are being used for the ASSO, DATA, WORK, SORT, and TEMP data sets. At that time, Adabas issues an informational message for each Adabas database component, where *type* is the component:

```
ADA164 ... FILE DDtype HAS BEEN OPENED IN ckd/eckd MODE - RABN SIZE rabn-size
```

Note:
Software AG strongly recommends that you avoid mixing ECKD and CKD extents within a file, because the file will be opened only in CKD mode. Mixing extents could degrade performance when file I/O operations are performed.

Adding New Devices

Support for new device types that include user-defined block sizes can be implemented in ADAIOR by modifying one of the table of device-constant entries (TDCEs) reserved for this purpose.

A TDCE is X'40' bytes long and the first free TDCE can be identified by X'0000' in its first two bytes (TDCDT).

For Adabas Version 8.1, TDCE entries are in the ADAIOS CSECT TDCON, which corresponds to ESDID 1EC in object module IOSVSE.OBJ. The first TDCE entry is at offset X'19398' into IOSVSE.OBJ; the first free TDCE entry is at offset X'19898'.

This information is valuable when adding an additional TDCE entry, and when zapping the object module and relinking ADAIOS under z/VSE.

The z/VSE MSHP control statements to add a TDCE entry at the first free entry thus take the form:

```
// EXEC MSHP
CORRECT 9001-ADA-00-vrs :AD99998
AFFECTS MODULE=IOSVSE,ESDID=1EC
ALTER 19898 0000 : nnnn
ALTER 1989A 0000 : nnnn
.
. (etc.)
.
INVOLVES LINK=LNKIOS
/*
```

- Information to be Zapped into the First Free ADAIOR TDCE

- General Rules for Defining Device Block Sizes

- Using 3480/3490 Tape Cartridge Compression (IDRC)

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Information to be Zapped into the First Free ADAIOR TDCE

The information in the following tables must be zapped into the first free TDCE. The rules described in the section *General Rules for Defining Device Block Sizes* must be followed when changing the TDCE.

Label	Offset	Contents
TDCDT	00	Device type in unsigned decimal (X'3385'), must be numeric, and unique among all TDCEs.
TDCKSN	02	Constant set number: must be uniquely chosen from the values X'2B' or X'2E'.
TDCF	03	The flag bit must be set—TDCFCKD (X'40') for CKD devices, TDCFECKD (X'60') for ECKD devices or TDCFECKD (X'61') for ECKD, not user defined devices.
TDCDT1	04	(see note)
TDCDT2	05	(see note)
TDCDT3	06	(see note)
TDCDT4	07	(see note)
TDCMSBS	08	Refer to the TDCMSBS default table in *Maximum Sequential Block Size* in the Adabas z/OS installation instructions for more system- and device-related information.
TDCTPC	0A	Number of tracks per cylinder.
TDCCIPT	0C	Number of FBA blocks or PAM pages per track (if TDCFFBA is set).
TDCBPCI	0E	Number of bytes per FBA block or PAM page (2048 if TDCFFBA is set).
TDCABPT	10	Number of Associator blocks per track.
TDCABS	12	Associator block size.
TDCACPB	14	Number of FBA blocks or PAM pages per Associator block (if TDCFFBA is set).
TDCDBPT	16	Number of Data Storage blocks per track.
TDCDBS	18	Data Storage block size.
TDCDCPB	1A	Number of FBA blocks or PAM pages per Data Storage block (if TDCFFBA is set).
TDCWBPT	1C	Number of Work blocks per track.
TDCWBS	1E	Work block size.
TDCWCPB	20	Number of FBA blocks or PAM pages per Work block (if TDCFFBA is set).
TDCTSBPT	22	Number of TEMP or SORT blocks per track
TDCTSBS	24	TEMP or SORT block size.

Label	Offset	Contents
TDCTSCPB	26	Number of FBA blocks or PAM pages per TEMP or SORT block (if TDCFFBA is set).
TDCPBPT	28	Number of PLOG blocks per track.
TDCPBS	2A	PLOG block size.
TDCPCPB	2C	Number of FBA blocks or PAM pages per PLOG block (if TDCFFBA is set).
TDCCBPT	2E	Number of CLOG blocks per track.
TDCCBS	30	CLOG block size.
TDCCCPB	32	Number of FBA blocks or PAM pages per CLOG block (if TDCFFBA is set).

Note:
One or more z/VSE codes for identifying the device type: PUB device type from PUBDEVTY (refer to the IBM MAPDEVTY macro).

General Rules for Defining Device Block Sizes

The following general rules must be followed when defining Adabas device block sizes:

- All block sizes must be multiples of 4.

- A single block cannot be split between tracks (that is, the block size must be less than or equal to the track size).

Block Rules for ASSO/DATA

The following rules are applicable for Associator and Data Storage:

- Associator block size must be greater than one-fourth the size of the largest FDT, and should be large enough to accept definitions in the various administrative blocks (RABN 1 - 30) and in the FCB;

- The block sizes for Associator and Data Storage should be a multiple of 256, less four bytes (for example, 1020) to save Adabas buffer pool space.

- The Associator and Data Storage block sizes must be at least 32 less than the sequential block size.

- Data Storage block size must be greater than: (maximum compressed record length + 10 + padding bytes).

Block Rule for WORK

The following rule is applicable for Work::

- The Work block size must be greater than either (maximum compressed record length + 110) or (Associator block size + 110), whichever is greater.

Block Rules for TEMP/SORT

The following rules are applicable for TEMP and SORT:

- Block sizes for TEMP and SORT must be greater than the block sizes for Data Storage.

- If ADAM direct addressing is used:

  ```
  size > (maximum compressed record length + ADAM record length + 24);
  size > 277 (maximum descriptor length + 24)
  ```

TEMP and SORT are generally read and written sequentially; therefore, the larger the TEMP/SORT block size, the better.

Block Rule for PLOG or SIBA

The following rules are applicable for PLOG and SIBA:

- The PLOG or SIBA block size must be greater than either (maximum compressed record length + 110) or (Associator block size + 110), whichever is greater.

- It is also recommended that PLOG/SIBA be defined larger than the largest Data Storage block size. This avoids increased I/O caused by splitting Data Storage blocks during online ADASAV operations.

  The block size (BLKSIZE) of a sequential file is determined as follows:

  ```
  if PTTF(JCL) then BLKSIZE is taken from file assignment statement or label;
  if PTTMBS > 0 then BLKSIZE = PTTMBS;
  if PTTMBS = 0 then
  if tape then BLKSIZE = 32760;
  else BLKSIZE = TDCMSBS;
  else if BLKSIZE in file assignment statement or label then use it;
  if PTTF(OUT) then
  if QBLKSIZE > 0 then BLKSIZE = QBLKSIZE;
  if tape then BLKSIZE = 32760;
  else BLKSIZE = TDCMSBS;
  else error.
  ```

  Note:
  QBLKSIZE is an ADARUN parameter.

Using 3480/3490 Tape Cartridge Compression (IDRC)

The use of hardware compression (IDRC) is not recommended for protection log files. The ADARES BACKOUT function will run much longer when processing compressed data. Also, the BACKOUT function is not supported for compressed data.

User ZAPs to Change Logical Units

The specified zaps should be added to the module IOSVSE / phase ADAIOS, not to the specified utility.

PTT entries are in the ADAIOS CSECT I_PTT. The first PTT entry is at offset 0 into CSECT I_PTT.

When zapping the object module and relinking ADAIOS, note that the ADAIOS CSECT I_PTT corresponds to ESDID 000D in object module IOSVSE.OBJ. The offset of CSECT I_PTT into IOSVSE.OBJ is X'1000'.

Utility	File	Default SYS Number	PTT Offset	VER	REP
ADACDC	SIIN	SYS010	6B8	1A0A	1Axx
ADACMP	AUSBA	SYS012	08	820C	82xx
	AUSB1	SYS021	18	8215	82xx
	AUSB2	SYS022	28	8216	82xx
	AUSB3	SYS023	38	8217	82xx
	AUSB4	SYS024	48	8218	82xx
	AUSB5	SYS025	58	8219	82xx
	AUSB6	SYS026	68	821A	82xx
	AUSB7	SYS027	78	821B	82xx
	AUSB8	SYS028	88	821C	82xx
	AUSB9	SYS029	98	821D	82xx
	EBAND	SYS010	A8	180A	18xx
	FEHL	SYS014	B8	820E	82xx
ADACNV	FILEA (OUTPUT)	SYS010	698	820A	82xx
	FILEA (INPUT)	SYS010	6A8	120A	12xx
ADALOD	FILEA (OUTPUT)	SYS012	D8	820C	82xx
	FILEA (INPUT)	SYS012	E8	020C	02xx
	EBAND	SYS010	F8	1A0A	1Axx
	ISN	SYS016	108	1A10	1Axx
	LOB (OUTPUT)	SYS017	118	8211	82xx
	LOB (INPUT)	SYS017	128	1A11	1Axx
	OLD	SYS014	138	820E	82xx
ADAMER	EBAND	SYS010	148	1A0A	1Axx
ADANUC	LOG	SYS012	158	820C	82xx
	SIBA	SYS014	168	C20E	C2xx
ADAORD	FILEA (OUTPUT)	SYS010	178	820A	82xx
	FILEA (INPUT)	SYS010	188	120A	12xx
ADAPLP	PLOG	SYS014	198	1A0E	1Axx
ADARAI	OUT	SYS010	6C8	800A	80xx
ADAREP	SAVE	SYS010	1A8	1A0A	1Axx
	PLOG	SYS011	1B8	1A0B	1Axx

Utility	File	Default SYS Number	PTT Offset	VER	REP
ADARES	SIIN	SYS020	1C8	1A14	1Axx
	BACK	SYS020	1D8	2C14	2Cxx
	SIAUS1	SYS021	1E8	8215	82xx
	SIAUS2	SYS022	1F8	8216	82xx

Utility	File	Default SYS Number	PTT Offset	VER	REP
ADASAV	SAVE1	SYS011	208	820B	82xx
	SAVE2	SYS012	218	820C	82xx
	SAVE3	SYS013	228	820D	82xx
	SAVE4	SYS014	238	820E	82xx
	SAVE5	SYS015	248	820F	82xx
	SAVE6	SYS016	258	8210	82xx
	SAVE7	SYS017	268	8211	82xx
	SAVE8	SYS018	278	8212	82xx
	DUAL1	SYS021	288	8215	82xx
	DUAL2	SYS022	298	8216	82xx
	DUAL3	SYS023	2A8	8217	82xx
	DUAL4	SYS024	2B8	8218	82xx
	DUAL5	SYS025	2C8	8219	82xx
	DUAL6	SYS026	2D8	821A	82xx
	DUAL7	SYS027	2E8	821B	82xx
	DUAL8	SYS028	2F8	821C	82xx
	REST1	SYS011	308	1A0B	1Axx
	REST2	SYS012	318	120C	12xx
	REST3	SYS013	328	120D	12xx
	REST4	SYS014	338	120E	12xx
	REST5	SYS015	348	120F	12xx
	REST6	SYS016	358	1210	12xx
	REST7	SYS017	368	1211	12xx
	REST8	SYS018	378	1212	12xx
	FULL	SYS030	388	1A1E	1Axx
	DEL1	SYS031	398	1A1F	1Axx
	DEL2	SYS032	3A8	1A20	1Axx
	DEL3	SYS033	3B8	1A21	1Axx
	DEL4	SYS034	3C8	1A22	1Axx
	DEL5	SYS035	3D8	1A23	1Axx
	DEL6	SYS036	3E8	1A24	1Axx
	DEL7	SYS037	3F8	1A25	1Axx
	DEL8	SYS038	408	1A26	1Axx
	PLOG	SYS010	418	1A0A	1Axx

Utility	File	Default SYS Number	PTT Offset	VER	REP
ADASEL	EXPA1	SYS011	428	820B	82xx
	EXPA2	SYS012	438	820C	82xx
	EXPA3	SYS013	448	820D	82xx
	EXPA4	SYS014	458	820E	82xx
	EXPA5	SYS015	468	820F	82xx
	EXPA6	SYS016	478	8210	82xx
	EXPA7	SYS017	488	8211	82xx
	EXPA8	SYS018	498	8212	82xx
	EXPA9	SYS019	4A8	8213	82xx
	EXPA10	SYS020	4B8	8214	82xx
	EXPA11	SYS021	4C8	8215	82xx
	EXPA12	SYS022	4D8	8216	82xx
	EXPA13	SYS023	4E8	8217	82xx
	EXPA14	SYS024	4F8	8218	82xx
	EXPA15	SYS025	508	8219	82xx
	EXPA16	SYS026	518	821A	82xx
	EXPA17	SYS027	528	821B	82xx
	EXPA18	SYS028	538	821C	82xx
	EXPA19	SYS029	548	821D	82xx
	EXPA20	SYS030	558	821E	82xx
	SIIN	SYS010	568	1A0A	1Axx
ADATRA	TRA	SYS019	578	820A	82xx
ADAULD	OUT1	SYS010	588	820A	820xx
	OUT2	SYS011	598	820B	820xx
	ISN	SYS012	5A8	820C	820xx
	SAVE	SYS013	5B8	1A0D	1Axx
	PLOG	SYS014	5C8	1A0E	1Axx
	FULL	SYS030	5D8	1A1E	1Axx
	DEL1	SYS031	5E8	1A1F	1Axx
	DEL2	SYS032	5F8	1A20	1Axx
	DEL3	SYS033	608	1A21	1Axx
	DEL4	SYS034	618	1A22	1Axx
	DEL5	SYS035	628	1A23	1Axx
	DEL6	SYS036	638	1A24	1Axx
	DEL7	SYS037	648	1A25	1Axx
	DEL8	SYS038	658	1A26	1Axx

Utility	File	Default SYS Number	PTT Offset	VER	REP
ADAVAL	FEHL	SYS014	668	820E	820xx