Fujitsu Siemens Computers GmbH

HIPLEX AF (BS2000/OSD)
Version 3.2B
April 2008

Release Notice

Release Notice HIPLEX AF V3.2B

1 General

The software product HIPLEX AF V3.2B is the failover manager for the BS2000/OSD platform. HIPLEX AF increases availability of applications by automatically moving the applications and their resources to another system or server if a system fails. HIPLEX stands for Highly Integrated System Complex and is the Fujitsu Siemens Computers GmbH concept for supporting a high availability network comprising multiple BS2000/OSD business servers. AF stands for Availability Facility.

The use of HIPLEX AF is based on the principle of redundancy. Systems with important applications are backed up by additional systems that take over the applications and continue the work of the original systems if they should either partially or completely fail, possibly with reduced performance in some cases. A prerequisite for this is that the applications and their resources to be switched over are configured for this.

During normal operation, the function of HIPLEX AF is totally transparent to the users of the monitored systems. If a system or application fails, HIPLEX AF initiates automatic switchover of the applications running on the work system to a standby system. This switchover is very fast, automatic and also takes place in untended operation.

In addition, applications on the work system can be switched to a standby system at any time with a HIPLEX AF switchover command, e.g. to carry out maintenance on the work system.

HIPLEX AF can also be employed with its functions and user procedures in disaster protection configurations. If a disaster occurs and the original disks (source units) in the local Symmetrix system fail, HIPLEX AF can automatically activate the appropriate target units (copies of the source units) in the remote Symmetrix system.

A shared pubset that is connected to all systems in the network is a component of the HIPLEX AF network configuration. This so-called BASE-PUBSET is used by HIPLEX AF to monitor and control the applications.

HIPLEX AF monitors the console messages on the respective system via PROP-XT V1.2.

This Release Notice is a summary of the major dependencies and operating information with respect to HIPLEX AF 3.2B (*) under the BS2000/OSD (*) operating system.

*2 The release level is that of April 2008.
*2 Changes in this correction level are marked with *2.

This Release Notice is supplied as a file in uppercase/ lowercase. Customers will receive an updated version of this file should any subsequent changes be made.
To print this file, use:
/PRINT-DOCUMENT FROM-FILE=SYSFGM.XAF.032.E, -
/DOC-FORM=*TEXT (LINE-SPACING=BY-EBCDIC-CONTROL)
 (English version).

This Release Notice is also available online under
http://manuals.fujitsu-siemens.com

If one or more previous versions are skipped when this product version is used, the information from the Release Notices (and README files) of the previous versions must be noted.

The use of names, trademarks, etc. in this Release Notice does not entitle readers to assume that these names/designations may be used without restriction by anyone; often the names/ designations are protected by law or contract, even if this is not indicated here.

1.1 Ordering

HIPLEX AF V3.2B can be ordered from your local distributors and is subject to the general terms and conditions of the software product use and service agreement.

1.2 Delivery

The HIPLEX AF V3.2B files are supplied via SOLIS.

The following delivery groups are part of the HIPLEX AF V3.2B delivery scope:

HIPLEX-AF	V3.2B
PROP-XT	V1.2A

The following delivery components are required regardless of the server type:

SINLIB.HIPLEX-AF.032	Library with POSIX scripts
SYSFGM.HIPLEX-AF.032.D	Release Notice (German)
SYSFGM.HIPLEX-AF.032.E	Release Notice (English)
SYSLIB.HIPLEX-AF.032	SNMP agent and cluster MIB
SYSMES.HIPLEX-AF.032	Message file
SYSPRC.HIPLEX-AF.032	User procedures and examples
SYSRMS.HIPLEX-AF.032	Delivery set for RMS
SYSSDF.HIPLEX-AF.032	Syntax file
SYSSII.HIPLEX-AF.032	Structure and installation information for IMON
SYSSSC.HIPLEX-AF.032	Subsystem declaration

The following delivery components are only required on S servers:

SYSLNK.HIPLEX-AF.032	Library containing procedures and the XAFCONF module

The following delivery components are only required on SX servers:

SPMLNK.HIPLEX-AF.032	Library containing procedures and the XAFCONF module

The current file and volume attributes are listed in the SOLIS2 delivery cover letter.

*1 In addition to the BS2000 delivery unit, HIPLEX AF 032 also
*1 includes two packages for X2000. These packages are supplied
*1 as of X2000 V3.0 on the X2000-sparc V3.0Axx CD.
*1 The XAF agent (live monitoring, ssh support) is supplied as
*1 package SMAWLxaf V3.0A under the name XAF_AGENT_V3.0Axx.
*1 The agent for MirrorView support is supplied in package
*1 SMAWLmirv V3.0A as part of X2Tools V3.0Axx.

1.3 Documentation

The following documentation is available for HIPLEX AF V3.2:

TITLE	Order number German	English
HIPLEX AF 3.2A Product Manual	U24401-J-Z125-4	-4-76
PROP-XT 1.1A Product Manual	U22223-J-Z125-4	-4-76

The BS2000/OSD basic configuration manuals are also required to operate HIPLEX AF V3.2.

Literature on the system-related software products:

TITLE	Order number German	English
BCAM V18.0	U22857-J-Z125-8	-8-76
JV V14.0A User Guide + README file JV V14.0B	U3616-J-Z125-9	-9-76
SDF-P V2.2A User Guide	U6442-J-Z125-5	-5-76
SHC-OSD V5.0 User Guide	U41000-J-Z125-5	-5-76
interNET Services V3.0 Administrator	U41095-J-Z125-3	-3-76
interNET Services V3.0 User	U41096-J-Z125-3	-3-76

The BS2000/OSD documentation is also available on CD-ROM in German and English under the title BS2000/OSD SoftBooks.

The documentation is available as online manuals under http://manuals.fujitsu-siemens.com
or can be ordered in printed form at extra cost under http://fsc-manualshop.com.

The product Adobe Acrobat Reader is required for reading and printing the manuals in PDF format.

There may be supplementary README files to these manuals. They contain changes and extensions to the manual of the respective product. The file names have the following structure:

SYSRME.<prod>.<vers>.D	(file with German text)
SYSRME.<prod>.<vers>.E	(file with English text)

The CONTR-CHAR=EBCDIC operand should be specified in the PRINT-FILE command when printing the files.

2 Software extensions

2.1 Live Monitor

The Live Monitor is a component of HIPLEX AF that can also be used without HIPLEX AF monitoring. In conjunction with HIPLEX MSCF it ensures even faster and more secure failure detection and, if necessary, terminates a system within the MSCF network in order to create a definite state.
The software product HIPLEX MSCF V4.0 is required for using the Live Monitor.

2.2 Warm standby

A standard HIPLEX AF network comprises two nodes with one work system and one standby system each. Application switchover from the work server to the running standby server is automatic, i.e. a so-called hot standby concept. In addition to the high-end hot standby variant, HIPLEX AF also offers a more simple warm standby variant. This solution also has automatic failure detection but the automatic switchover to the standby system is only possible after the standby system has been restarted, thus resulting in a slightly longer dropout time. Before taking over, the standby system is in idle mode and has no productive applications. When the productive system fails, the standby server is automatically restarted with the resources of the former production system. The applications are started via the command file CMDFILE. It is not necessary to introduce a virtual host or maintain a second productive system. The warm standby variant is therefore particularly simple to implement but it does not offer any further HIPLEX AF functions such as, e.g. automatic return switchover or moving the production under command control.

2.3 AutoSwap

The AutoSwap function supplements the failover and failback functions in disaster protection configurations with the option of being able to switch Symmetrix systems offline without interruption.
AutoSwap makes it possible in an SRDF configuration to "move" over from the source units (R1 units) of one Symmetrix to the respective target units (R2 units, remote mirror) of the other Symmetrix during operation. This allows a Symmetrix to be "vacated" completely without interrupting operation. Some maintenance work, such as moving to a new location or offline reconfiguration, can also be considerably simplified but, above all, the maintenance work can be carried out without interrupting production.
After completing the maintenance work, the AutoSwap function also allows a return to be made from the target units back to the relevant source units and remote copy operation continued, again without interrupting operation.

2.4 Automatic disaster recovery for SX clusters with FibreCAT systems

*1 HIPLEX AF V3.2 now offers automatic disaster recovery for SX
*1 clusters with FibreCAT systems. The elementary MirrorView
*1 operations are implemented via the scripts of the X2000 package
*1 SMAWLmirv. Failure detection and control of these scripts for
*1 MirrorView switchover with the product Navisphere (under
*1 Solaris) are carried out in BS2000 by the HIPLEX AF Monitor

*1 using the procedures supplied for this (see 2.5.5).
*1 The following functions are supported:
*1 - Manual switchover to a second system
*1 - Hot standby
*1 - Automatic switchover with application, system or FibreCAT
*1   failure and if a disaster occurs.
*1 - Automatic failback
*1 - Detection of link failures

2.5 New user procedures

A whole series of new, helpful user procedures are offered with HIPLEX AF V3.2. These procedures are used to

- monitor SESAM and UTM with HIPLEX AF
- reconfigure VM memory with HIPLEX AF switchover processes
- operate the virtual host as a HIPLEX AF application
- operate pubset sets as a HIPLEX AF application

2.5.1 Monitoring SESAM and UTM with HIPLEX AF

Procedures are provided that can be used to both monitor a SESAM DBH or a UTM application, or start and stop a SESAM DBH or a UTM application, if appropriate enter procedures are created for this.

2.5.2 VM memory reconfiguration with HIPLEX AF

When operating under VM2000, HIPLEX AF V3.2 supports VM memory reconfiguration. When a work system is switched over, the VM memory can be reallocated by withdrawing memory from running guest systems and reassigning it to the new work system.

2.5.3 Pubset sets as an application

HIPLEX AF V3.2 includes a user procedure that allows the user to employ one or more pubsets that are used exclusively within the HIPLEX AF network, as an application in the sense of HIPLEX AF. This allows them to be monitored according to an assigned status, particularly during operation, thus avoiding possible inconsistencies in the HIPLEX AF network.

2.5.4 Virtual host as an application

HIPLEX AF V3.2 includes a user procedure that allows the user to employ the virtual host as an application in the sense of HIPLEX AF. This allows it to be monitored according to an assigned status, particularly during operation, thus avoiding possible inconsistencies in the HIPLEX AF network. In this way, HIPLEX AF ensures that an application, in this case the virtual host, can only be activated with HIPLEX AF resources on a system belonging to the network.

2.5.5 Switch unit for MirrorView

*1 The high availability and disaster protection concept for
*1 FibreCAT systems and using the MirrorView functionality is
*1 implemented by HIPLEX AF with the following three procedures:
*1 - CREATE-SWUDEF-MIRRVIEW
*1   Generation procedure for the two switch units MIRRVIEW (main
*1   switch unit for switching over the applications and disks)
*1   and MIRREVNT (auxiliary switch unit for monitoring the failed
*1   mirrors)
*1 - XAF.MIRROR-VIEW

```
*1    Action (user) procedure with various sub-functions. Executes
*1    the separate actions required in the MirrorView environment,
*1    e.g. switching over or synchronizing the mirror.
*1  - SYSXAF.SWU-DATA.MIRRVIEW
*1    Data procedure containing the expandable mirror data of
*1    MirrorView. The data is evaluated at runtime.
*1
*1  The procedures are supplied in the library SYSPRC.HIPLEX-AF.032
*1  and the parameters must be adjusted as needed by the customer.
```

2.6 Other innovations

```
//ADD-BS2000-ACTION
      TYPE = *SHELL-COMMAND(...)
```
Specifies a shell command in the switch unit. The command can either be executed in the local POSIX shell or in another UNIX system via a remote shell.

```
//ADD-BS2000-APPLICATION
      EXCEPTION-HANDLING = *START-PHASE(...)
```
Starts a phase to start selected operations. Cleanup measures can be executed before restarting an application.

```
//START-DIALOG
```
Links a query into a process. Message XAF6012 is output on the terminal. The operator decides whether the process is to be continued, repeated or aborted.

```
//ADD-BS2000-APPLICATION
      FROM-FILE = *HANDLE-PUBSETS | *HANDLE-VIRTUAL-HOST
```
Pubsets or the virtual host can be monitored as an application with status in the sense of HIPLEX AF.

```
/START-SWITCH-UNIT-MONITORING
      INVALID-OBJECTSTATE = *RESET(...)
```
During the *START-MONITORING phase, the status of an application can be retained or set to the value $T.

3 Technical information

3.1 Resource requirements

Using HIPLEX AF V3.2 requires at least 500 MB free disk storage space under user ID TSOS. The actually required disk storage space depends on the size and number of created logging files ($TSOS.SYSTRC.XAF.*, $TSOS.SYSTRC.XLM.*).

3.2 Software configuration

```
*1  The product HIPLEX AF V3.2 will run with BS2000/OSD-BC as of
*1  V5.0C and OSD/XC as of V1.1.
```

The latest correction level must be used in each case.

The following software products are required to run HIPLEX AF V3.2 (matching the BS2000/OSD version in each case):

- HIPLEX MSCF as of V3.0 or
  HIPLEX MSCF as of V4.0 if the Live Monitor function is used
- JV as of V14.0A
- OpenNet Server as of V1.0A or
  OpenNet Server as of V2.0A if a virtual host is used as an application

- PROP-XT as of V1.2A (supplied with HIPLEX AF)
*1 - POSIX as of V5.0A (If the SRDF, MirrorView or Live Monitor
*1 functions of HIPLEX AF are used)
- SDF-P-BASYS as of version 2.2A
- the optional function A0492286 is required in BS2000-GA as of BS2000/OSD-BC V5.0 or OSD/XC V1.1.

The following are required for using the SRDF functionality of HIPLEX AF (monitoring SRDF configurations and AutoSwap):

- SHC-OSD as of V4.0A
- at least 4 gatekeepers for each Symmetrix system
- all gatekeepers on type S channels must be defined in the GKSELECT file of SHC-OSD
- correction A0516799 (NKV 14.0C)
- correction A0521058 (NKV 14.0C, NKV 15.0A)
*1 - correction A0530808 (NKV 14.0C, NKV 15.0A)
*1 - on SX servers:
*1 X2000 as of V2.5A0210 with OSD/XC V1.1 or V2.0, or
*1 X2000 as of V3.0A0703 with OSD/XC V2.0 as of release B52
- also, the optional function A0453440 in BS2000-GA (forced system run termination after paging error in the home pubset)

*1 The following are required to use the MirrorView functionality
*1 of HIPLEX AF on SX servers:
*1
*1 - OSD/XC V2.0 as of release B52
*1 - X2000 as of V3.0A0703 with X2Tools (package SMAWLmirv) and
*1 HIPLEX-AF-AGENT (package SMAWLxaf)
*1 - FibreCAT software release as of 14 for host + FibreCAT

The following are required for using the Live Monitor functions of HIPLEX AF with X2000 resources on SX servers:

- X2000 as of V3.0A with HIPLEX-AF-AGENT (SMAWLxaf package)
- If the product Secure Shell (ssh) is used on the SX servers that are to be monitored, the product INETSERVE as of V3.0B is additionally required in BS2000.

3.3 Product installation

Installation of the product in BS2000 with the installation monitor IMON is mandatory.

The information concerning installation in the delivery cover letter and in the product documentation must be followed as well as the information given below.

The necessary inputs and the sequence of the installation are described in the IMON documentation.
*1 HIPLEX AF must be installed in POSIX for using the MirrorView
*1 or Live Monitor functions of HIPLEX AF

The X2000 agent XAF_AGENT_V3.0Axx (SMAWLxaf V3.0A package) is installed under SOLARIS on the BS2000 partitions of SX servers and optionally also on the respective SMC.

*1 The X2000 MirrorView agent is part of X2Tools_V3.0Axx

*1 (SMAWLmirv V3.0A package) and is also installed under SOLARIS
*1 on the BS2000 partitions of SX servers.

3.4 Product use

Existing SWITCH-UNIT definition files from HIPLEX AF V3.0 can still be used without any changes.

SWITCH-UNIT definition files from HIPLEX AF V2.0 cannot be used further. The definition files for HIPLEX AF V3.2 must be regenerated with the SWITCH-UNIT-GENERATOR of V3.2 by calling the generation procedure.

The CONVERT-SWITCH-UNIT command must be used to create a generation procedure for HIPLEX AF V2.0 from a HIPLEX AF V1.0 definition file. A definition file in HIPLEX AF V3.2 format is then created by calling this generation procedure

The default job class for batch jobs of user ID TSOS (default name TSOSBAT) must be adapted for using the AutoSwap function. The following settings are imperative for this job class:

- NO-CPU-LIMIT: YES
- RUN-PRIORITY: MAXIMUM = 80 (more accurately: the priority of the SHC-OSD user task, or a better value)

3.5 Obsolete functions (and those to be discontinued)

*1 HIPLEX AF V3.2B now only supports operating system versions as
*1 of BS2/OSD V5.0C or OSD/XC V1.1A.

3.6 Incompatibilities

Due to its many functional enhancements, HIPLEX AF V3.2B is not compatible to HIPLEX AF V2.0A. The HIPLEX AF version used in a HIPLEX AF network should generally be kept homogeneous, i.e. just one single HIPLEX AF version should be used throughout.

3.7 Restrictions

1) Stopping X2000-monitored systems with the Live Monitor:
   - ADD-X2000-MONITORED-SYSTEM STOP-COMMAND = *STD can only be used as of X2000 V3.0A03.

*1 2) FibreCAT monitoring with HIPLEX AF:
*1   After each switchover (promote) to the mirror level, the
*1   mirror configuration data stored by the switch unit gets
*1   more out of date.
*1
*1   This data must be updated manually in the following cases:
*1   - After CHANGE-SWITCH-UNIT-WORK-SYSTEM in switchover
*1   configuration.
*1   - After failback (MV-FABA-xx phases) in all configurations.
*1
*1   The update must be performed on the recording system, i.e.
*1   on the system whose local storage system is switched to.
*1   Updating comprises the following steps:
*1   - call the MV-CLEAN phase
*1   - restart monitoring with STOP-SWITCH-UNIT-MONITORING
*1   and START-SWITCH-UNIT-MONITORING.

*2 3) AutoSwap:
*2   When using Autoswap, make sure that no jobs are started when

```
*2     the switch is made. If jobs are started in this phase, this
*2     can cause an interruption to the automatic run which must then
*2     be continued via manual responses to the remount messages
*2     ('NKVD014').
```

3.8 Procedure in the event of errors

```
    If errors occur with HIPLEX AF V3.2, the following documents,
    will be required for diagnostic purposes:
    HIPLEX AF log files:
    - HIPLEX AF COMMAND-SERVER log file
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.<tsn>.HIPLEXAF
      this file can be changed with
          /CHANGE-HIPLEX-AF-LOGGING-FILE

    - Switch unit log files (main and co-monitor)
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.<tsn>.<swu> and
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.CMON.<swu>
      These files can be changed simultaneously with
          /CHANGE-HIPLEX-AF-LOGGING-FILE

    - *START-OBJECTS phase log file
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.<tsn>.<swu>.STAO

     - *STOP-OBJECTS phase log file
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.<tsn>.<swu>.STOO

    - Other log files of the separate operations
      :<HOME-PVS>:$TSOS.SYSTRC.XAF.<yymmdd>.<hhmm>.<tsn>.<swu>.<xyz>

    - Live Monitor log files:
      :<HOME-PVS>:$TSOS.SYSTRC.XLM.<yymmdd>.<hhmm>.<action>.<system>


      :<HOME-PVS>:$TSOS.SYSTRC.XLM.<yymmdd>.<hhmm>.<tsn>.XAFLIVMO
      This file can be changed with
          /CHANGE-LIVE-MONITOR-LOG-FILE

    - Accurate description of the error condition indicating if and
      how the problem can be reproduced

    - CONSLOG log

    - SWITCH UNIT definition file
      SYSXAF.SWUDEF.<switch-unit-name>

    - Logs of the procedures used in the SWITCH UNIT

    - Any available user or system dumps

    For LIVE MONITOR problems:
    - LIVE MONITIOR definition file
      SYSXLM.SYS.MON.CONF.<name>

*1  For problems with the FibreCAT monitoring:
*1  - Diagnostic information on SMAWLmirv in the X2000 domain:
*1    /var/adm/messages - string 'HIPLEXAF'
*1    /tmp/xaf*.log
*1    /tmp/xaf*.err

    For BCAM problems:
      - Enable all DCM traces with /DCDIAG DCM.,MODE=SAVE,
      - after reproducing the error with
```

```
      /DCDIAG DCM.,MODE=CLOSE,
      save the generated trace files S.DCTRAC.* or
    - use /DCDIAG DCM.,MODE=HOLD to make the diagnostic
      information available in main memory and analyze it
      with ASTRID.

  For MSCF-/shared pubset problems:
    - MSCF-TRACE $TSOS.SYS.MSCF-TRACE.*
      The trace can be enabled or switched to another file with
      the /MODIFY-MSCF-ENVIRONMENT TRACE-FILE=*STD command
```

4 Hardware support

In BS2000/OSD as of V5.0 or OSD/XC as of V1.1, all BS2000/OSD servers and devices that can be controlled with the BS2000/OSD version used are supported.

The SRDF functionality is supported for /390 and SX servers in configurations with at least two Symmetrix systems that are configured for SRDF operation. The Symmetrix connection technology used is irrelevant.

```
*1  The MirrorView functionality is supported for SX servers in
*1  configurations with two CX series FibreCAT systems or FibreCAT
*1  4700 that are configured for operation with MirrorView.
```

FUJITSU

Information on this document

On April 1, 2009, Fujitsu became the sole owner of Fujitsu Siemens Computers. This new subsidiary of Fujitsu has been renamed Fujitsu Technology Solutions.

This document from the document archive refers to a product version which was released a considerable time ago or which is no longer marketed.

Please note that all company references and copyrights in this document have been legally transferred to Fujitsu Technology Solutions.

Contact and support addresses will now be offered by Fujitsu Technology Solutions and have the format *...@ts.fujitsu.com*.

The Internet pages of Fujitsu Technology Solutions are available at *http://ts.fujitsu.com/*...
and the user documentation at *http://manuals.ts.fujitsu.com*.

Hinweise zum vorliegenden Dokument

Zum 1. April 2009 ist Fujitsu Siemens Computers in den alleinigen Besitz von Fujitsu übergegangen. Diese neue Tochtergesellschaft von Fujitsu trägt seitdem den Namen Fujitsu Technology Solutions.

Das vorliegende Dokument aus dem Dokumentenarchiv bezieht sich auf eine bereits vor längerer Zeit freigegebene oder nicht mehr im Vertrieb befindliche Produktversion.

Bitte beachten Sie, dass alle Firmenbezüge und Copyrights im vorliegenden Dokument rechtlich auf Fujitsu Technology Solutions übergegangen sind.

Kontakt- und Supportadressen werden nun von Fujitsu Technology Solutions angeboten und haben die Form *...@ts.fujitsu.com*.

Die Internetseiten von Fujitsu Technology Solutions finden Sie unter *http://de.ts.fujitsu.com/*..., und unter *http://manuals.ts.fujitsu.com* finden Sie die Benutzerdokumentation.