netex

H216R Secure Print File Transfer (PFX-R™)
Receiver Utility
for IBM z/OS Systems

Release 1.4

Software Reference Manual

Revision Record

Revision	Description
1.4 (11/2018)	New Secure PFX-R Product Release

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Preface

This manual describes the user interface to Secure PFX Receiver Utility software for the IBM z/OS operating system. Secure PFX is an extension of the Bulk File Transfer (BFX) utility. BFX in turn is used in conjunction with NetEx/IP® family of software products.

This document contains the following sections:

- Introduction – Secure PFX is introduced and currently supported configurations are described.

- Setting Up a Receiver Job – Control statements and parameters that are used on z/OS hosts are introduced.

- Transmitter Considerations – Describes the DD statements which are sent to IBM z/OS hosts.

- Installation – Describes the installation of Secure PFX on z/OS hosts.

- Internal Operation – Defines the protocol sent between hosts. An understanding of this section is not necessary to use Secure PFX.

- Appendix A. Secure PFX Error Messages – Lists the error messages for Secure PFX on z/OS.

- Appendix B. Secure PFX Condition Codes – Lists the Secure PFX condition codes which indicate the status of the job after execution.

Readers are not expected to be familiar with Secure NetEx before using this manual. However, an understanding of programming and using the host operating system is required.

Reference Material

The following manuals contain related information.

Number	Title and Description
MAN-REF-Hxx4	*Hxx4IP NetEx/IP Software Reference Manual*
MAN-REF-H215	*H215 Secure Bulk File Transfer (BFX™) Utility for IBM z/OS Systems*
MAN-REF-TNPxx4	*TNPxx4 Secure TCP/IP NetEx/IP Proxy (TNP™)*

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The diagnostic tools and programs described in this manual are **not** part of the products described.

Notice to the Customer

The installation information supplied in this document is intended for use by experienced System Programmers.

Software Modification Policy

Modifications to H216R that are not specifically authorized by NetEx Software are prohibited.

Any unauthorized modifications to H216R may affect its operation and/or obstruct NetEx Software's ability to diagnose problems and provide corrections. Any work resulting from unauthorized modifications shall be paid by the customer at NetEx Software's then-current support rates and may result in the immediate termination of warranty/support coverage.

Document Conventions

The following notational conventions are used in this document.

Table 1. Document Conventions	
Format	**Description**
`displayed information`	Information displayed on a CRT (or printed) is shown in `this font`.
`user entry`	*`This font`* is used to indicate the information to be entered by the user.
UPPERCASE	The exact form of a keyword that is not case-sensitive or is issued in uppercase.
MIXedcase	The exact form of a keyword that is not case-sensitive or is issued in uppercase, with the minimum spelling shown in uppercase.
bold	The exact form of a keyword that is case-sensitive and all or part of it must be issued in lowercase.
lowercase	A user-supplied name or string.
value	Underlined parameters or options are defaults.
<label>	The label of a key appearing on a keyboard. If "label" is in uppercase, it matches the label on the key (for example: <ENTER>). If "label" is in lowercase, it describes the label on the key (for example: <up-arrow>).
<key1><key2>	Two keys to be pressed simultaneously.
No delimiter	Required keyword/parameter.

Glossary

buffer: A contiguous block of memory allocated for temporary storage of information in performing I/O operations. Data is saved in a predetermined format. Data may be written into or read from the buffers.

host: A data processing system that is connected to the network and with which devices on the network communicate. In the context of Internet Protocol (IP), a host is any addressable node on the network; an IP router has more than one host address.

Internet Protocol (IP): A protocol suite operating within the Internet as defined by the *Requests For Comment* (RFC). This may also refer to the network layer (level 3) of this protocol stack (the layer concerned with routing datagrams from network to network).

Secure NETwork EXecutive (NetEx/IP): A family of software designed to enable two or more application programs on heterogeneous host systems to communicate securely. Secure NetEx/IP is tailored to each supported operating system, but can communicate with any other supported Secure NetEx/IP, regardless of operating system.

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Introduction

Network Executive Software's Secure Print File Transfer (PFX™) is a utility software package that allows users of Secure NetEx/IP software to privately transfer print files between similar or dissimilar types of processors IP networks at multi-megabit speeds. Secure PFX contains the facilities to select the transfer files and to make the file format conversions necessary for proper printing on the receiving host. Once introduced to the system, Secure PFX operates completely independent of any user.

Secure PFX is designed to allow print transfers to take privately place between operating systems of varied manufactures. Secure NetEx software is designed to handle all communication considerations between different hosts.

The Secure PFX utility is actually made up of two separate units.

1. Together with the Requester, the PFX Transfer utility forms the initiation of the connection. In order to maintain the secure connection on behalf of the Transfer, a node in the LAN is implemented with Secure TNP and Secure NetEx/IP.
2. The second unit contains the Secure PFX Receiver utility (identified as Hxx6R) along with Secure NetEx/IP. This manual describes the H216R Receiver utility for IBM z/OS operating systems.

Secure PFX Advantages

Secure PFX provides the following advantages for its host network:

Improved Printer Utilization: Secure PFX allows printers to be concentrated on one host. In this way, multiple hosts have direct access to a group of printers. This results in higher printer utilization rates and may decrease the number of printers needed.

High-Cost Printer Justification: Secure PFX may justify the cost a very high speed printer (for example, a laser printer) when it serves more than one host. Multiple hosts ensure sufficient printing is available to keep the device busy.

Specialty Printer Justification: A printer with special capabilities can be shared by multiple hosts. Secure PFX removes special operational problems in getting a print file from the point of origin to a host that can do the printing.

Low Operations Costs: Secure PFX allows many printers to be concentrated in one area, so the operator's time can be used more efficiently.

Increased Network Accessibility Print files can be directed to any destination that can be reached by the secondary host. This makes the entire network of the receiving host available to the originating host.

Print Load Balancing Secure PFX can be used to balance the printing load. An operator can redirect output files for transmission to other hosts when an excessive load develops.

Secure Network Transfer All printer communication from remote hosts are private. Data and protocol are securely transferred between the Secure NetEx/IP hosts.

Printer Resource Backup A printer on one host can serve as a backup resource for a printer on another host. If problems develop with a printer, the operator can move the print to the backup device.

Description of Operation

PFX uses a transfer utility and a receiver utility to accomplish print file transfers. The transfer utility obtains files from any of the sending host's print queues, then formats the files and transfers them to the receiving host. The receiver utility takes in the formatted files and places them on the receiving host's print spool.

The system operator can communicate with PFX to: determine the status of the file transfers, stop PFX after any or all files have been transmitted, or request transmission of a particular print queue of files. Communication with PFX is done through the host where the transfer utility resides. Operator commands affect only those print queues that are serviced by the transfer utility.

A one-to-one correspondence must exist between copies of PFX transfer and receiver utilities. For example, if two separate PFX transfer utilities send their print files to a remote host's single printer (or spooler), then two copies of the PFX receiver utility must exist on the receiving host for proper PFX operation. This matching principle allows the control of one transfer/receiver combination to operate totally independent of any other file transfers.

z/OS Secure PFX Receiver JCL Example

The following is a sample Secure PFX receiver job that would receive spool files from a z/OS transmitter initiated on host ZOS1. Note the use of the OUTPUT parameter on DDNAME ONEDD to reference specific output characteristics for a laser printer.

```
//MVSPFXR  JOB ,'PFX USER',
//             CLASS=A,MSGCLASS=A
//*
//*           The following sample JCL starts a PFX Receiver
//*            on the 'local' MVS system.
//*           This job would be started manually or through BFXJS
//*            from the PFX transmitter.
//*           Substitute 'prefix' for the PXR library name
//*
//PFXR    EXEC PGM=PXRTR,              PFX RECEIVER PGM NAME
//             PARM='RECEIVE FROM=MVS1,ID=PFX,TIME,DISCMAX=300'
//STEPLIB  DD  DISP=SHR,
//             DSN=BETATST.H216R104.PXRLOAD
//*        UNCOMMENT NEXT CARD FOR SECUREPFX
//         DD  DISP=SHR,DSN=NETEX.H2140100.SNXLOAD
//LASERF OUTPUT CHARS=GT10,
//             PAGEDEF=A06460,
//             FORMDEF=010111
//SYSPRINT DD  SYSOUT=A,DCB=BUFNO=1
//STDOUT   DD  SYSOUT=A
//STDERR   DD  SYSOUT=A
//SYSUDUMP DD  SYSOUT=A,DCB=BUFNO=1
//*
//*SNXDBG   DD  DUMMY              /* H216 debug flag */
//*SNXLETRC DD  DUMMY              /* H216 debug flag */
//*SNXGTRC  DD  DUMMY              /* H216 debug flag */
//*
//*      Sample Print Group Configuration File
//*           This sample Print Group Configuration File would be sent
//*           to the PFX receiver from the PFX transmitter residing on
//*           MVS host(MVS1).
//*
//*
//*  F03ONEDD
//*  //ONEDD   DD  SYSOUT=J,               LASER-PRINTER OUTPUT CLASS
//*  //            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=2660),
//*  //            OUTPUT=LASERF           OUTPUT REFERENCE
//*  G03TWODD
//*  //TWODD   DD  SYSOUT=A,
//*  //            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=2660),
//*  //            FCB=$FC$
//*
```

Figure 1. Sample Secure PFX Receiver JCL

Setting Up a Receiver Job

Control Statements and Parameters

The following paragraphs describe the Secure PFX receiver utility's execution-time control statements and parameters.

Table 2. Summary of Secure PFX Control Parameters (receiver)	
Parameter	**Summary**
RECEIVE	Indicates direction of transfer
ID xxx	PFX application name
FROM xxx	Originating host
[MSGLVL xxx}	Severity of messages to be logged
[BLOCK xxx]	Specifies the size of data buffers
[CLOSE/NOCLOSE]	Use of SCLOSE
[TIME/NOTIME]	Use of timestamp
[MODE xxx]	Transfer mode of data
[NTXID xxx]	NetEx host name
[UPPER/UPLOW]	Case for the SYSPRINT log
[CONTRY xxx]	Delay between CONNECT attempts
[DISCMAX xxx]	Maximum time for "not offered" to clear
[BUSYMAX xxx]	Maximum time for "busy" to clear

RECEIVE
> This required parameter indicates that the file transfer will be from the remote host to the local host.

ID
> This required parameter specifies a unique identifier for the program in the remote host. The application name specified by the ID parameter may be any uppercase, alphanumeric string, one to eight characters in length. This parameter must match the ID on the PFX transmitters SEND statement.

FROM
> This required parameter specifies the PFX transmitter's HOST name.

MSGLVL (abbreviated MS)

This optional parameter specifies the severity of messages to be logged. Use 4 for file start/end messages. Use 8 for more important messages only. The default is 8.

BLOCK (abbreviated B)

This optional parameter specifies the size of data buffers to be sent to the remote host. This size must be at least large enough to accommodate the largest logical record to be sent. The default is 8192 bytes.

CLOSE
NOCLOSE

This optional parameter specifies whether SCLOSE should be used to terminate PFX instead of SDISC. If SCLOSE is used, the transmitting PFX should also use SCLOSE. The default is NOCLOSE.

TIME
NOTIME

This optional parameter specifies whether a time-of-day timestamp should precede PFX messages. If used, the timestamp will have the format hh.mm.ss, where hh=hours (24-hour clock), mm=minutes, and ss=seconds. The default is NOTIME.

MODE

This optional parameter specifies character of bit mode transfer. The default mode is CHAR.

NTXID

This optional parameter indicates the NETEX subsystem name. The default is NETX.

UPPER
UPLOW

This optional parameter specifies whether the messages in the SYSPRINT log file will be in upper case or mixed upper and lower case. The default is UPLOW.

CONTRY

This optional parameter specifies the interval between CONNECT attempts by the PFX receiver if the transmitting PFX job is reported "busy" or "not present". The default is five seconds.

DISCMAX

This optional parameter specifies the actual amount of time that the Secure PFX receiver will wait for the transmitting job to be offered on the remote host. The default is 30 seconds.

BUSYMAX

This optional parameter specifies the maximum amount of time that the Secure PFX receiver will wait for a "busy" or "MAXSESSIONS" indication to clear. The default is 300 seconds.

Transmitter Considerations

Open Data (DD)

In the z/OS environment, the data sets for the SYSOUT data must be assigned and released at the start and end of each print file. This requires dynamic allocation of the data set at the start of each file. Dynamic allocation is done by passing the DD images (specified in the group configuration file) from the PFX transmitter to the Secure PFX receiver at the start of each print file as open-data.

The open-data images are very similar to the DD images in a z/OS job stream. The images are parsed by the PFX receiver into an internal format and passed to the dynamic allocation handler. If there are any errors, an error message is returned to the PFX transmitter.

DD Statement Format

The format of the DD statement is almost exactly the same as described in IBM's z/OS JCL Reference manual. The changes are in the area of which fields are supported, the number of repetitions certain fields are allowed, and how continuations are specified.

The first two columns of the first open-data image must have a double slash ('//'). This must be followed by the DDNAME. This name must be the same as the print-group name for the transmitting host print files. The DDNAME must be followed by one or more blanks, the keyword 'DD' and one or more blanks. This is followed by the operand field.

The operand field is coded in the normal format. Almost any parameter which can be specified on a normal DD statement can be specified in the same format in PFX. Because the DD is converted to an internal format and passed to DYNALLOC (SVC99), only fields supported by SVC99 are supported by PFX. The supported fields for SVC99 are documented in IBM manual *OS/VS2 MVX System Programming Library: JOB Management for MVX/SP1)* and *OS MVX/XA System Programming Library: System Macros and Facilities (for MVS/XA)*. The unsupported features include Partitioned Data Sets, and the following parameters: AMP, CHKPT=EOV, DATA, CYLOFL, NTM, DLM, DSID, and DYNAM. Basically, anything that would normally be specified for an output data set assignment of any type is supported.

The DD statement will often be longer than one image (71 columns) and must be continued on more images. The only continuation format allowed by PFX is to interrupt a field after a comma, at or before column 71. The next image must have a double slash blank ('// ') in the first three columns. The next field must start before column 17.

There has been no attempt to make PFX check for all of the format restrictions checked by z/OS. PFX has been designed to allow any legal z/OS DD statement, but will not check for illegal statements. After the image is parsed, it is passed to z/OS for processing. At that point, z/OS may detect errors that PFX did not detect. For example PFX will not check for parameter conflicts. z/OS will reject the request, if conflicts exist, and an error message will be returned to the sending host.

Required Fields on a DD Statement

Certain fields are required on the DD statement for use by the PFX receiver. The DDNAME, the SYSOUT parameter, the record format, the record length and the block size are required. The SYSOUT parameter specifies the destination print class. This will vary from site to site. A common class is 'A' and the SYSOUT parameter would be coded as SYSOUT=A. The type of record format must match that of a normal SYSOUT on the host. The record format is normally RECFM=FBA. The 'A' in 'FBA' denotes ANSI control characters. The record length is normally specified as LRECL=133. The length may vary for printers of shorter or longer print lines. The

block size is specified as BLKSIZE=NNN, NNNN is chosen based on the definition of the SPOOL files. The value of 2660 is often used for block size.

An example of the minimum DD is:

```
//PRINT DD SYSOUT=A, DCB=(RECFM=FBA,LRECL=133,BLKSIZE=2660)
```

In addition to the minimum DD parameters, the DEST and FCB parameters and the FORM field on the SYSOUT parameter are often used.

Overriding Fields on SYSOUT

Optional fields can be dynamically overridden by the H216R PFX receiver if the corresponding PFX transmitter is capable of processing these fields. The following is a list of the fields that can be overridden and where they would reside in the print group definitions.

$USERID$

Uses the WTR field in the SYSOUT parameter to pass the original jobname on to the output JES spool.

FC

Passes the originating forms control information (FCB) on to the output JES spool

FL

Passes the originating FLASH id on to the output JES spool.

FM

Passes the originating form number information on to the output JES spool.

UC

Passes the originating UCS id on to the output JES spool.

An extreme example, using all of these fields, would be:

```
//SYS3820   DD SYSOUT=(W,$USERID$,$FM$),
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=2660),
//             FCB=$FC$,FLASH=$FL$,UCS=$UC$
```

Installation

This section describes the installation of PFX in step-by-step procedures.

Prerequisites for Installation

H216R PFX needs the following prerequisites for successful operation:

- An IBM z/OS system that is running the H214 Secure NetEx/IP software product

- For security reasons, the following need to be on the same LAN:

    o A host with its own Secure TNP and Secure NetEx/IP

    o At least one other host with its own and PFX transmitter software and NetEx Requester

Release Distribution

H216R SPFX for z/OS is distributed as a downloadable file.

Distribution Contents

The H216R distribution consists of one distribution file: H216Rvrr.BASE.DISTPKG.XMIT (v=version, rr=release). It is a TSO TRANSMITed file, which when received, results in creating a PDS library that contains three members (PFXRINST, PXRnnn, and COMPDD), which are used to complete the H216R installation. The distribution file can either be downloaded from Network Executive Software, or it can be copied from physical media, depending on the obtained distribution. To download the distribution file, contact support at support@netex.com for download instructions.

PXRvrr (version release)

PXRvrr is a member in the PDS that is created when the distribution file is processed with the TSO RECEIVE command. PXRvrr is another TSO TRANSMITed file that consists of all of the PFX libraries necessary to complete the installation.

PFXRINST

PFXRINST is a member in the PDS that is created when the distribution file is processed with the TSO RECEIVE command. PFXRINST is a job that extracts the installation libraries from PXRvrr, then performs the necessary steps to complete the installation..

Before Installing H216R

Before installing H216R SecurePFX for z/OS, the H214 Secure NetEx/IP installation should first be completed.

Installation Process

This section describes the installation procedure for the H216R PFX.

The following steps outline the installation process. Before proceeding with the installation, please read the Memo to Users accompanying the distribution for any additions or changes to the installation instructions.

Step 1: Obtain the PFXR distribution file.

Step 2. Upload the distribution file to z/OS.

Step 3: TSO RECEIVE the distribution file.

Step 4: Execute the PXRINST job on z/OS.

Step 1: Obtain the PFXR distribution file.

The distribution file "H216Rvrr.BASE.DISTPKG.XMIT" (v is version, r is release) can be downloaded from Network Executive Software. Contact support@netex.com to obtain the download instructions.

Step 2. Upload the distribution file to z/OS.

FTP (binary mode) the distribution file (H216Rvrr.BASE.DISTPKG.XMIT) to the z/OS system as follows:

1) Connect via FTP to your z/OS system.

2) Change the directory to your desired high level qualifier:

    cd 'high-level-qualifier'

3) If necessary, change the location of your local directory to the location of the distribution file:

    lcd 'directory-name'

4) Set the required attributes for the file:

    quote site lrecl=80 blksize=3120 recfm=fb prim=5000 sec=200 blocks

5) Transfer the distribution file in BIN mode:

    bin

    put H216Rvrr.BASE.DISTPKG.XMIT 'your.dataset name'

6) Quit your FTP client

Using the above names results in the distribution file residing on z/OS as the following file:

    'your.dataset.name'

Step 3: TSO RECEIVE the distribution file.

Issue the TSO PROFILE PROMPT command to be sure prompting is allowed. Then issue the TSO RECEIVE command against the distribution file uploaded in "Step 2. Upload the distribution file to z/OS." as follows:

    RECEIVE INDSNAME('your.dataset.name')

        where 'dsn' specifies the name of the distribution file that was FTP'd to z/OS.

The RECEIVE command will issue the following prompt:

    Enter restore parameters or 'DELETE' or 'END'

Reply with:

DSN('dsn1')

> where 'dsn1' specifies the name of the installation library that will be created.

> (for example: DSN('high-level-qualifier.DFILE'))

The resulting 'high-level-qualifier.DFILE' dataset is a PDS that contains three members:

PXRINST

PXRvrr

COMPDD

PFXRINST is a job that uses PXRvrr to create the H216 libraries and performs the installation.

Step 4: Execute the PXRINST job on z/OS.

The PFXINST installation job consists of four phases:

LOAD　　Allocates the H216 base and update installation datasets and loads the datasets from the downloaded distribution.

LINK　　Links the H216 load modules.

EDIT　　Automatically tailors the H216 startup proc and other PFX JCL.

Tailor the installation job in PXRINST.

> **Warning:**　　DO NOT ISSUE "CHANGE xxx ALL" commands against PFXINST. Change the keyword values on an individual basis only.

a) Change the following to your site requirements:

- The JOB card

- The unit name "UNIT=(SYSALLDA,,DEFER)" on the WORK DD card. Change SYSALLDA to a valid unit name matching your site requirements.

b) Review and tailor the installation parameters contained in PXRINST. At a minimum, the following parameters should be specified: (Do not use quote marks on these parameters)

```
HLQ(hlqname)              /* The high level qualifier for all datasets created */
DFILE(dfilename)          /*  The dsn entered at the prompt in step3        */
                          /*     sample:      high-level-qualifier.DFILE   */
NTXHLQ(NETEX.DIST)  /* h214 secure load lib */
```

Tailoring site defaults can be accomplished by making the appropriate parameter changes to the PXRADEF parameters prior to submitting the PXRINST installation job.

NOTE: the PXRINST installation job can be rerun as many times as necessary. If a future customer requirement makes it necessary to change an installation default after product installation, this can be accomplished by merely rerunning the PXRINST job with the new default change.

c) Submit the PXRINST job. This job will allocate and load the following H216 distribution libraries:

hlq.PXRCTL　　　　　Base control library

hlq.PXRMAC　　　　　Base macro library (limited distribution)

hlq.PXRSRC   Base source library (limited distribution)

hlq.PXROBJ   Base object library

hlq.PXRSAMP   Base sample library

hlq.PXRLKED   Base linkedit statements library

hlq.PXRDLOAD   Base load library

hlq.PXRLOAD   Installation load library

hlq.PTFCTL   Update control library

hlq.PTFMAC   Update macro library (limited distribution)

hlq.PTFSRC   Update source library (limited distribution)

hlq.PTFMOD   Update module library

hlq.PTFSAMP   Update sample library

hlq.PTFLKED   Update linkedit statements library

hlq.PTFOBJ   Update object library

hlq.PTFLOAD   Update load library

Internal Operation

When the Secure PFX receiver module (PXRTR begins execution, it starts a sequence of events.

1. Control parameters are passed.
2. The receiver connects to the PFX transmitter and then waits for the first print file to be sent.
3. When the open image and all open-data images (DD cards) arrive, the associated spool data set is dynamically allocated and opened.
4. The actual print records are then received and written out to the spool.
5. When the close image is encountered, the spool is closed.
6. The receiver then waits for the transmitter to send the next print file.

Figure 2 is a graphic representation of the Secure PFX receiver (PFXRTR) modules.

```
                    ┌──────────────┐
                    │   PXRTC      │
                    │  PXR Control │
                    └──────────────┘
          ┌──────────────┐      ┌──────────────┐
          │   PXRPM      │      │   PRRCV      │
          │  Analyze     │      │  File Rcv Ctrl│
          │  Params      │      └──────────────┘
          └──────────────┘
          ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
          │   PXRSCN     │   │   PXRCON     │   │   PXRRBM     │
          │  Scan Parame-│   │  NetEx Con-  │   │  Recv Block  │
          │  ters        │   │  nect        │   │  Module      │
          └──────────────┘   └──────────────┘   └──────────────┘
                                               ┌──────────────┐
                                               │   PXRPRR     │
                                               │  Print Recv Rec│
                                               │  Module      │
                                               └──────────────┘
                                               ┌──────────────┐
                                               │   PXRDAL     │
                                               │  Dynamic Alloc│
                                               └──────────────┘
```

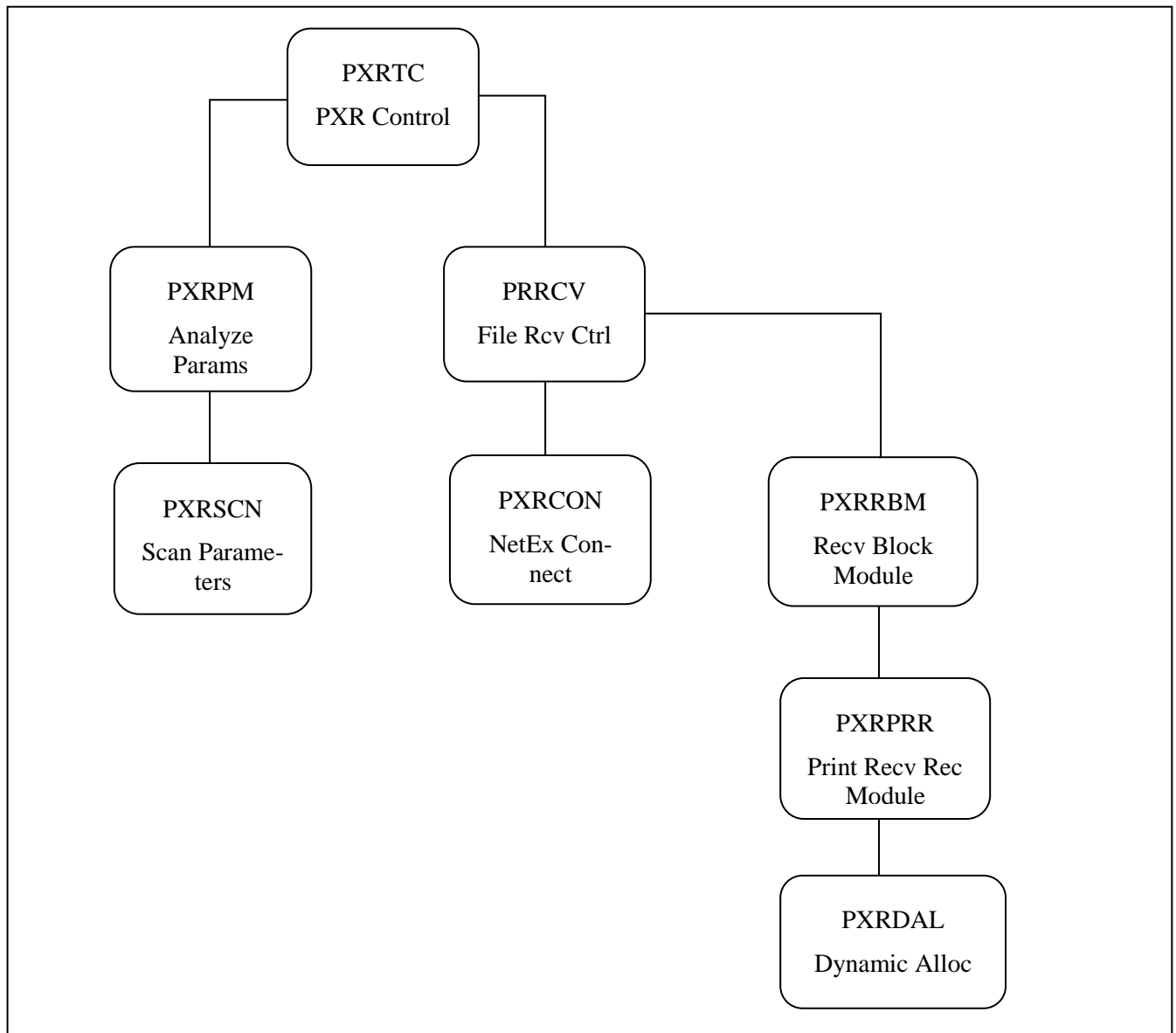**Figure 2. PXRTR Block Diagram**

Using PFX

Refer to the Reference manual on the platform where the PFX transmitter is running.

Using PFX MAN-REF-H216R-R1.4

Appendix A. Secure PFX Error Messages

PFX may generate a variety of messages during execution. Shown below is a list of messages with the suggested response for each. Also shown is the severity of the message (as compared with the MSGLVL parameter to determine if the message should be logged) and the modules that may issue the message. Messages of Severity 12 will be logged to the console as PXRnnns. These can be local or remote messages.

```
ppp BFXnnns message text
```

Where:

ppp Indicates whether the local (LCL) or remote (RMT) PFX issued the message.

BFX Indicates that this is a BFX error code. The messages will be logged to the console as PXR.xxx.

nnn Specifies error number. The messages are listed sequentially.

s Indicates message severity. The following codes are used:

    I   - informational messages

    E   - error messages

    S   - severe error messages

    F   - fatal error messages

    R   - recoverable error messages

message text Is the message text.

These are the messages issued by modules that are common to PFX. Messages number BFX8nn and BFX9nn are unique to PFX.

BFX002F PFX Execution Aborted.
Severity: 15 (Fatal error)
Explanation: The PFX program has detected a condition that makes it impossible to successfully continue execution.
User Response: The reason for the failure will be indicated in previous PFX messages. Take the corrective action indicated by the previous message's description.

BFX005I PFX V1.4.0 Copyright 2018 Network Executive Software
Severity: 15 (Informational)
Explanation: The PFX Version x.yy program has been started.
User Response: None.

BFX006F "xxxxxxxx" not recognized in control statement.
Severity: 15 (Fatal error)
Explanation: When processing the parameters specified in the PARM field or a SYSIN control file, an unrecognized parameter was found. "xxxxxxxx" contains the eight characters including and following the parameter in error. Generally, PFX execution will stop as indicated in subsequent messages.
User Response: Correct the syntax error and resubmit the job.

BFX007R "xxxxxxxx" is only valid for PXTTI jobs -- ignored.
Severity: 9 (Warning)
Explanation: A parameter that is not applicable to this program was encountered. "xxxxxxxx" specifies the parameter in question. The statement is ignored.
User Response: Although processing will continue, the probable cause is an operations or setup error. Verify that the remainder of the PFX run proceeded as intended.

BFX010F TO= or FROM= host name omitted.
Severity: 15 (Fatal error)
Explanation: The control parameters for the first statement if either a PFX transmitter or receiver run did not specify the name of the opposite host to allow a connection to take place. Furthermore, a default host was not specified during installation of the PFX program.
User Response: Supply the TO= or FROM= parameter required and rerun the job.

BFX011F ID= PFX identifier omitted.
Severity: 15 (Fatal error)
Explanation: The ID parameter which uniquely identifies the PFX job on the initiating machine was not supplied. There is no default for this parameter.
User Response: Supply the ID parameter and rerun the job.

BFX012F Specified buffer size too large.
Severity: 15 (Fatal error)
Explanation: The BLOCK= or JBLOCK= parameter specified a value greater than 61440 bytes.
User Response: Correct the BLOCK= or JBLOCK= parameter and resubmit the job.

BFX013F "xxxxxxxx" is not a SEND/RECEIVE/SUBMIT command.
Severity: 15 (Fatal error)
Explanation: The first operand in a control statement was not "SEND", "RECEIVE", "SUBMIT", or a suitable abbreviation. Processing is terminated.
User Response: Correct the erroneous control statement and resubmit the job.

BFX020F NETEX communications subsystem is not running.
Severity: 15 (Fatal error)
Explanation: When the PFX program attempted to establish communications, it found that the NETEX subsystem was not currently running on the local host. Processing is terminated, as data transfer is not possible without NETEX.
User Response: Consult with operations to determine whether NETEX should have been active. Resubmit the job when NETEX is active.

BFX021F NETEX communications subsystem is being shut down.
Severity: 15 (Fatal error)
Explanation: During the connection process or in the middle of a job or file transfer, the PFX program received an indication that NETEX is abruptly terminating. This can be caused by operator cancellation of NETEX or by internal NETEX software problems. Processing is terminated, as no further data transfer will be possible until NETEX is restarted.
User Response: Consult with operations to determine the cause of the NETEX shutdown. Resubmit the job when NETEX is once again active. File cleanup procedures may be needed if a file transfer was in progress at the time of the failure.

BFX022F NETEX system wide capacity exceeded.
Severity: 15 (Fatal error)
Explanation: During the process of establishing communications, NETEX returned an indication that it cannot handle a new connection because a limiting number of NETEX connections are already in use. Processing is terminated, as it is uncertain when the condition will clear up.
User Response: Inform operations or the NETEX system programmer of the problem. If the problem occurs frequently, NETEX will have to be given more resources to handle extra connections.

BFX023F Remote PFX program did not start.
Severity: 15. (Fatal error)
Explanation: The corresponding PFX program was not present when required. If a PFX transmitter program issued this message, then it waited for the TIMEOUT= interval without being connected to by the PXRTR program. If a PXRTR program issued the message, then the originating PFX transmitter program is no longer present to be connected to.
User Response: This is the error that will commonly occur if errors are made in the PFX setup. The most frequent causes of this error are:
- Job Control Language errors in the PXRTR job prevented successful execution of the PXRTR program.
- The TIMEOUT= value of the PFX transmitter job did not allow sufficient time for the PXRTR job to progress through the execution queue and connect to the originating program.
- The ID= fields of the two jobs did not agree with one another.

BFX024F Remote host ceased communicating.
Severity: 15 (Fatal error)
Explanation: During the transfer of a file or a job, the PFX program received an indication from NETEX that all communications with the other host have ceased. This is generally caused by a system crash on the remote host; an abrupt failure or operator cancellation of NETEX on the remote host; or a hardware failure in the physical connection between the two hosts. Processing is terminated, as no further data transfer is possible.
User Response: Consult with operations to determine the cause of the failure. Resubmit the job when the connection is once again active. File cleanup procedures may be needed if a file transfer was in progress at the time of the failure.

BFX025F Remote PFX aborted execution.
Severity: 15 (Fatal error)
Explanation: During the transfer of a file or a job, the PFX program received an indication from NETEX that the PFX program on the remote host abnormally terminated. Processing is terminated as no further transfer will be possible.
User Response: Examine the output from the job on the remote host to determine the cause of the failure. Correct the error and resubmit the job.

BFX026F Remote host NETEX not present.
Severity: 15 (Fatal error)
Explanation: When an attempt was made to connect to the remote PFX program, the NETEX subsystem on the local machine reported that no NETEX subsystem was present on the remote host. Processing is terminated, as data transfer is not possible without NETEX.
User Response: Consult with operations to determine whether NETEX should have been present on the remote host. Resubmit the job when NETEX is available on both hosts.

BFX027F Specified host is not on the network.
Severity: 15 (Fatal error)
Explanation: When PFX transmitter was attempting to connect to the remote host, or when PXRTR was attempting to connect back to the initiating PFX transmitter, the local NETEX subsystem returned an indication that the host name specified is not on the network specified in the Network Configuration Table. Processing is terminated, as data transfer is not possible.
User Response: The probable cause of this error is an erroneous HOST parameter. A second possibility is that the installation has changed the host names used by NETEX. Correct the error and resubmit the job.

BFX028F Access to specified host denied.
Severity: 15 (Fatal error)
Explanation: When PFX transmitter was attempting to connect to the remote host, or when PXRTR was attempting to connect back to the initiating PFX transmitter, NETEX informed the program that access to the specified host has been denied by the local computer operator. Processing is terminated, as communications between the two hosts cannot take place.
User Response: Computer operations is using a feature of NETEX that can temporarily prohibit access to a host that is undergoing maintenance, performing classified or confidential work, etc. Consult with operations to determine when communications with the remote host will once again be permitted. Resubmit the job at that time.

BFX029F Not authorized to use NETEX.
Severity: 15 (Fatal error)
Explanation: When the PFX program attempted to contact NETEX, it was informed by NETEX that the PFX program or user account is not authorized to use NETEX.
User Response: Consult with operations to determine if the restriction on NETEX can be removed. Resubmit the job when the restriction has been eliminated.

BFX030S NETEX error: NRBSTAT = ssss, NRBIND = iii.
Severity: 12 (Severe error)
Explanation: NETEX has reported an error to the PFX program that is not an intercepted condition. "ssss" is the four digit status code returned by NETEX; "iii" is the data or event indication type. Processing is terminated, as the actual severity of the error is not known by the PFX program.
User Response: Refer to NETEX documentation to determine the cause of the error. Frequently this error will be caused by earlier, more comprehensible errors. If other PFX error messages precede this one, take the corrective action suggested by those messages.

BFX040F NETEX communications subsystem terminated.
Severity: 15 (Fatal error)
Explanation: During the connection process or in the middle of a job or file transfer, the PFX program received an indication that NETEX is abruptly terminating. This can be caused by operator cancellation of NETEX or by internal NETEX software problems. Processing is terminated, as no further data transfer will be possible until NETEX is restarted.
User Response: Consult with operations to determine the cause of the NETEX shutdown. Resubmit the job when NETEX is once again active. File cleanup procedures may be needed if a file transfer was in progress at the time of the failure.

BFX042F PFX program timed out to NETEX.
Severity: 15 (Fatal error)
Explanation: The PFX program suspended execution for a sufficiently long time that NETEX terminated the connection between the two PFX programs. The current transfer is aborted, but the remaining transfers will be attempted.
User Response: This is generally because of difficulties in system tuning, or exceptionally long delays in such activities as tape mounting. If the problem was not caused be operational errors, the NETEX system programmer may have to raise the NETEX READTO parameter to compensate for the long delay.

BFX043F BFX protocol error - Premature disconnect.
Severity: 15 (Fatal error)
Explanation: The remote PFX program terminated the connection at a time when termination was not anticipated by the local PFX program.
User Response: This is an internal PFX error. It should be brought to the attention of the installation PFX support personnel.

BFX044F Remote PFX program timed out.
Severity: 15 (Fatal error)
Explanation: The remote PFX program suspended execution for a sufficiently long time that the remote NETEX terminated the connection between the two PFX programs. The current transfer is aborted, but the remaining transfers will be attempted.
User Response: This is generally because of difficulties in system tuning, or exceptionally long delays in such activities as tape mounting. If the problem was not caused be operational errors, the NETEX system programmer for the remote host may have to raise the NETEX READTO parameter to compensate for the long delay.

BFX050F BFX protocol error - Run aborted.
Severity: 15 (Fatal error)
Explanation: One of the two PFX control modules detected invalid protocol in the messages exchanged between them. The PFX programs will abend.
User Response: This is an internal PFX error that should be brought to the attention of PFX support personnel.

BFX101I File ffffffff done; nnnn records sent.
Severity: 6 (Informational)
Explanation: The Networks Systems standard Sending Record Module has detected a normal end of file on the input file specified by the DDNAME ffffffff. The total number of logical records sent for this particular file is "nnnn". At the time the message was issued, the last record of the file will already have been sent to the receiving PFX.
User Response: None.

BFX102S File ffffffff permanent I/O error - RC = rrrr.
Severity: 12 (Severe error)
Explanation: The QSAM access method reported a permanent I/O error reading or writing a file during transfer of the job or transfer of the file. The DDNAME of the file is indicated by "ffffffff". The SYNAD information associated with the error follows the text of the message. Transfer of this file is aborted. If batched transfer of files is being performed, PFX will attempt to transfer the rest of the specified files.
User Response: Determine the cause of the I/O error. If the error can be corrected, rerun the PFX jobs.

BFX124S MODE = parameters not consistent for both BFX jobs.
Severity: 12 (Severe error)
Explanation: In a BFX program pair, one side had MODE=BIT specified and the other had MODE=CHAR. The current transfer is aborted, but the remaining transfers will be attempted.
User Response: Correct the erroneous specification and transfer the files that were not sent.

BFX200I File transfer complete.
Severity: 7 (Informational)
Explanation: This message is issued when the receiving PFX has received an EOI message. The user record module did not supply a message to acknowledge the EOI, so this default message was sent.
User Response: None

BFX201I File ffffffffffff done; nnnnnn records received.
Severity: 6 (Informational)
Explanation: This message is issued when the receiving PFX processes the last record of the file. When issued, it indicates that the last record was received and that the output file was successfully closed. "ffffffffffff" is the logical name of the file used for output; "nnnnnn" is the number of records that were written to the output file.
User Response: None.

BFX202W File ffffffffffff done; nnnnnn records received, ttttt truncated.
Severity: 9 (Warning)
Explanation: This message is normally issued when the receiving PFX program processes the last record of the file. It indicates that the last record was received and that the output file was successfully closed. However, the specified LRECL of the output file was not large enough to hold all data sent from the receiving file; the long records have been truncated. "ffffffffffff" is the DDNAME or FILEDEF of the file used for output, "nnnn" is the number of records written to the file, and "ttttt" is the number of records shortened because their length was greater than the LRECL of the output file. If batched execution is being used, PFX will continue to transfer the batched files.
User Response: If the truncation was expected, this message can be ignored. If it was not expected, then the DCB information for either the input or output file should be corrected and the file transferred again.

BFX203E File ffffffffffff transfer aborted; nnnnnn records received.
Severity: 10 (Error)
Explanation: This message is issued by the receiving PFX when the file transfer process is aborted either because of the loss of NETEX communication or because of some other error detected by the PFX program. "ffffffffffff" is the logical name of the file used for output; "nnnnnn" is the number of records that were written to the output file before the abort caused the transfer to stop. The current transfer is aborted, but the remaining transfers will be attempted. The original error will be reported by other PFX messages.
User Response: Correct the error that caused the abort. Transfer the file again.

BFX204E FILE ffffffffffff transfer aborted; nnnn records received, tttt records truncated.
Severity: 10 (Error)
Explanation: This message is issued by the receiving PFX code when the file transfer process is aborted either because of the loss of NETEX communication or some error detected by the sending PFX. "ffffffffffff" contains the DDNAME or FILEDEF of the output file; "nnnn" contains the number of records written to the output file before the abort caused the transfer to stop. The transfer of this file is always aborted; subsequent files in a batched run will be transferred depending on the condition that caused transfer to abort. The original error will be reported by other PFX messages.
User Response: Correct the error that caused the abort in the first place and transfer the file again.

BFX211S Cannot open output file ffffffffffff. RC = cccccccc.
Severity: 12 (Severe error)
Explanation: The receiving PFX program was unable to open the output file whose logical name is specified by "ffffffffffff". The return code "cccccccc" is in hexadecimal.
User Response: Correct the reason for the open failure. Transfer the file again.

BFX221I Receiving file ffffffffffff.
Severity: 4 (Informational)
Explanation: The receiving PFX has successfully opened the output file and is ready to receive file data. "ffffffffffff" is the logical name of the output file.
User Response: None.

BFX301I Offering sssssssss; block in size bbbbb.
Severity: 2 (Diagnostic)
Explanation: The PFX program has issued a NETEX SOFFR to wait for the corresponding PFX program to connect to it. The name offered is "sssssss", which is the JID or ID parameter specified in an input statement. The block size that the offering program would like to use is "bbbbb".
User Response: None.

BFX302I Connecting to sssssssss on host hhhhhhhh; block in size nnnn.
Severity: 2 (Diagnostic)
Explanation: When PXRTR is connecting back to its starting PFX transmitter, it has issued a NETEX SCONNECT to establish communications. "sssssssss" is the name to connect to as specified in the ID= or JID= user parameters; "hhhhhhhh" is the host name specified in the TO= or FROM= parameters. The direction of file transfer will cause this program to receive the file; the Block size that this program is prepared to receive is nnnn.
User Response: None

BFX304I Connect complete.
Severity: 2 (Diagnostic)
Explanation: A previously issued NETEX SCONNECT has completed successfully.
User Response: None.

BFX305W Connect failed; ssssssssssss busy.
Severity: 1 (Diagnostic)
Explanation: A previously issued NETEX SCONNECT did not succeed because the OFFERed application (BFXJS if issued from the PFX transmitter,: or the PFX transmitter if issued from PFXTR) was currently in use by some other network application. NETEX will retry the connection a number of times and intervals determined during PFX generation.
User Response: None.

BFX306W Connect failed; ssssssssssss not offered.
Severity: 2 (Diagnostic)
Explanation: A previously issued NETEX SCONNECT has completed successfully.
User Response: None.

BFX310I Connect CONFIRM read issued.
Severity: 2 (Diagnostic)
Explanation: Following a successful SCONNECT request, the PFX program has issued an SREAD to obtain the SCONFIRM response from the other program.
User Response: None.

BFX311I Connect confirm complete.
Severity: 2 (Diagnostic)
Explanation: The SREAD issued to accept an SCONFIRM message from the remote PFX program has completed successfully. The NETEX session establishment process is now complete.
User Response: None.

BFX312I Block size bbbbb, datamode dddd, LCM lll.
Severity: 2 (Diagnostic)
Explanation: This message is issued by the PFX program when the session negotiation process is complete. "bbbbb" is the NETEX block size that will be used during file transfer. "dddd" is four hexadecimal digits that give the NETEX DATAMODE to be used based on the requirements of the two PFX programs. "lll" is the Least Common Multiple size negotiated, and will be greater than one when the connection is to a processor which has more than one character per "word".
User Response: None.

BFX318W Connect failed; maximum sessions exceeded.
Severity: 1 (Warning)
Explanation: A previously issued NETEX SCONNECT failed because the NETEX maximum sessions limit had already been reached. NETEX will retry the CONNECT a number of times at intervals determined during PFX generation or at run time.
User Response: None.

BFX801F Request to pass too many DD images.
Severity: 15 (Fatal error)
Explanation: When a file open request arrives, the number of DD cards to follow is compared to the number of cards PFX will accept (MAXCARD). This error indicates the open is attempting to pass too many card images.
User Response: Either request fewer DD cards and continuations or increase MAXCARD in the element BFXPRR.

BFX802F Memory request failed in PXRPRR.
Severity: 15 (Fatal error)
Explanation: The request for memory to pass card images to PXRDAL failed. Not enough memory was free.
User Response: Check for buffers being acquired and never released.

BFX803F Too many open-data cards were passed.
Severity: 15 (Fatal error)
Explanation: The number of cards associated with the file open (DD cards) exceeded the number indicated on the open request. This can also occur if open-data arrives out of order.
User Response: This is probably a fault in the sending program. Check that the correct number of images is passed.

BFX804F File not open when data arrived.
Severity: 15 (Fatal error)
Explanation: Data for a file arrived before the file was opened or after it was closed.
User Response: Check the images issued by the sending program. Also check the BUFLEV of the images to make sure the order is open, open-data, print-data, close.

BFX805F Open-data (BUFLEV = 12) arrived out of order.
Severity: 15 (Fatal error)
Explanation: Images associated with the open-data (DD) arrived before the file was opened or after it was closed or more images arrived than the open request indicated.
User Response: Check the images issued by the sending program. Also check the BUFLEV of the images to make sure the order is open, open-data, print-data, close.

BFX806F DD card scanning error $$ card $$ column$$.
Severity: 15 (Fatal error)
Explanation: The dynamic allocation module PXRDAL returned an error indication. Along with the error indication, the approximate card image number and column number are returned. In some cases (*), the card image and column do not apply. A summary of the PFX806F errors follows:

ERROR 01* SVC99 returned an error.
This is followed by error BFX807F.

ERROR 02* GETMAIN request failed.
Memory request failed. This is for data tables and is about 900 hex.

ERROR 03 Probable coding error.
Some error occurred within PXRDAL which is probably an internal coding error. Please send a copy of the failing DD statement for further analysis.

ERROR 04 DUPL field or DUP too many times.
Either a field was duplicated which is not allowed to be duplicated or a field like SUB SYSTEM parameters which is allowed to be duplicated (repeated) several times has been duplicated too many times. If there is really a need to duplicate this many times, the table sizes in PXRDAL can be increased.

ERROR 05* Continuation specified, no images.
The images were exhausted before the DD statement was finished.

ERROR 06 Illegal field.
This field is not allowed at this location on the DD statement.

ERROR 07 Improper numeric format.
There is something wrong with this number or a number was expected here and not found.

ERROR 08 Popped too many times.
The number of ')' exceeded the number of '('.

ERROR 09 Pushed too many levels.
Too many levels of '(' were found.

ERROR 0A Problems in a quoted field.
There is something wrong with this quoted field. Probably, it is not ended with a quote.

ERROR 0B Syntax error.
Something is wrong with the syntax here. Probably the character pointed to is not a ',', blank, '(', ')' or other legal character.

ERR0R 0C Field truncated.
The field was too long to fit in the space for the value in the DAL buffer. With a few major exceptions the size is probably 8 characters.

ERROR 0D Undefined symbol.
The keyword was not recognized.
User Response: Depends on the error.

BFX807F SVC99 failed, error $$$$ info $$$$.
Severity: 15 (Fatal error)
Explanation: The module PXRDAL issued a request for dynamic allocation. The operating system returned an error status. Check *OS/VS2 MVS System Programming Library Job Management*, or *OS MVS/XA System Programming Library System Macros and Facilities, Vol. l*, under dynamic allocation for ERROR and INFO.
User Response: Based on information in recommended document.

BFX900F Incorrect number of open-data records in file $$$$$$$$
Severity: 15 (Fatal error)
Explanation: The indicated Group Configuration File is set up incorrectly.
User Response: Check the file and correct it.

BFX901I Currently there are no print files to send
Severity: 4 (Informational)
Explanation: This message is sent just before going to sleep to wait for an operator command or a print file.
User Response: None.

BFX905E PFX terminated by operator.
Severity: 10 (Error)
Explanation: This message is issued by PFX when the file transfer process is aborted.
User Response: None

BFX906E PFX transfers aborted.
Severity: 10 (Error)
Explanation: This message is issued by PFX when the file transfer process is aborted because of the loss of NETEX communication of an error is detected.
User Response: If necessary, correct the error that caused the abort. Start PFX again.

BFX920I PFX ready to send files.
Severity: 4 (Informational)
Explanation: The sending PFX is initialized and ready to send spool files to the receiver.
User Response: None.

BFX921I PFX ready to receive files.
Severity: 4 (Informational)
Explanation: The receiving PFX is initialized and ready to receive spool files from the transmitter.
User Response: None.

Appendix B. Secure PFX Condition Codes

After execution of Secure PFX, the user may check for condition codes. These condition codes indicate the status of the job. The user may construct the JCL to continue, restart, or terminate Secure PFX based on the returned codes.

The condition codes are in the form of one or two-digit numbers and have the following meanings.

Code   Meaning

0   The job was completed.

4   The job was completed, but informational messages were issued. Access the messages in the PFX job log.

8   The job was completed, but warning messages were issued. Access the messages in the PFX job log.

12   A fatal error occurred, and the job was not completed. Consult the job log for causes.

16   A fatal error occurred, and the job was not completed. Usually, the connection failed.

20   A fatal error occurred, and the job was not completed. Secure NETEX may not be up, or the user may not be authorized to use Secure NETEX.