

z/OS 2.4 IBM Education Assistant (IEA)

Solution (Epic) Name: PDUU with HTTPS

Element(s)/Component(s): BCP SVA



Agenda

- Trademarks
- Session Objectives
- Overview
- Usage & Invocation
- Interactions & Dependencies
- Migration & Coexistence Considerations
- Installation
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Trademarks

- See URL <http://www.ibm.com/legal/copytrade.shtml> for a list of trademarks.
- Additional Trademarks:
 - None

Session Objectives

- Learn about using PDUU with HTTPS options
- Learn where to find more information

Overview

- Who (Audience)
 - Users of PDUU
- What (Solution)
 - Can send problem documentation to IBM via HTTPS
- Wow (Benefit / Value, Need Addressed)
 - Data is secured during transfer
 - Limited configuration needed for clients
 - Although FTPS and ATTLS over FTP is available, use is not feasible for many implementations
 - Hardware limitations
 - Configuration limitations
 - Clients already receive service updates via HTTPS

Usage & Invocation – New PDUU keywords

- USE_HTTPS – specify USE_HTTPS=Y to use the HTTPS protocol
- HTTPS_KEYFILE | HTTPS_KEYRING – specify a key file or SAF key ring
- HTTPS_KEYSTASH – specify a key stash to go with the key file
- HTTPS session configurations
 - HTTPS_PORT
 - HTTPS_IPSTACK
 - HTTPS_LOCALPORT
 - HTTPS_LOCALIPADDR
 - HTTPS_PROXY
 - HTTPS_PROXYPORT
 - HTTPS_PROXYUSERNAME
 - HTTPS_PROXYPASSWORD
- HTTPS_VERBOSE / HTTPS_VERBOSE_DD – get detailed messages
- See Appendix D for details

Usage & Invocation – Inside PDUU

- With FTP, PDUU takes the input data set and divides it into many parts as specified by (CC_FTP and WORK_DSN_SIZE)
 - Each part is divided and compressed
 - The compressed result is saved to a data set
 - The data set is transferred via FTP to IBM
 - Uses FTP client API calls
- With HTTPS, PDUU also takes the input data set and divides it into many parts as specified by (CC_HTTPS and WORK_SIZE)
 - Each part is divided and compressed
 - The compressed result is saved to a storage buffer
 - The storage buffer is transferred via HTTPS to IBM
 - Uses z/OS client web enablement toolkit

Usage & Invocation – Example 1

- Example 1: Simple HTTPS connection to testcase
- This connection uses the RACF keyring for user TSOUSER named 'pduu'.

```
//FTP      EXEC  PGM=AMAPDUPL
//SYSUDUMP DD    SYSOUT=*
//SYSPRINT DD    SYSOUT=*
//DEBUG     DD    SYSOUT=*
//SYSUT1     DD    DISP=SHR,DSN=H44IPCS.WESSAMP.TRKS055K
//SYSIN      DD    DISP=SHR,DSN=TSOUSER.FTPINFO(TESTCASE)
//          DD    *
TARGET SYS=testcase.boulder.ibm.com
TARGET_DSN=wessamp.bigfile
CC HTTPS=03
WORK SIZE=100
DIRECTORY=/toibm/mvs/
PMR=12345.123.123
USE HTTPS=Y
HTTPS_KEYRING=TSOUSER/pduu
```


Usage & Invocation – Tip

- Tip: You can save your password in a racf protected and encrypted data set
- From the previous example TSOUSER.FTPINFO(TESTCASE) contains:

```
USERID=user@domain.com  
PASSWORD=userpassword
```

Usage & Invocation – Example 2

- Example 2: Simple HTTPS connection with verbose messages
- A key database file created by the gskkyman utility and a matching key database password stored in a key stash is used

```
//FTP      EXEC  PGM=AMAPDUPL
//SYSUDUMP DD   SYSOUT=*
//SYSPRINT DD   SYSOUT=*
//DEBUG    DD   SYSOUT=*
//SYSUT1    DD   DISP=SHR,DSN=H44IPCS.WESSAMP.TRKS055K
//HTTPDEBG DD   DISP=(NEW,CATLG,KEEP),
//          DSN=TSOUSER.HTTPDEBG,DCB=(RECFM=V,DSORG=PS),
//          SPACE=(CYL,(1,1))
//SYSIN     DD   DISP=SHR,DSN=TSOUSER.FTPINFO(TESTCASE)
//          DD   *
TARGET SYS=testcase.boulder.ibm.com
TARGET DSN=wessamp.bigfile
CC HTTPS=04
WORK SIZE=500
DIRECTORY=/toibm/mvs/
PMR=12345.123.123
USE HTTPS=Y
HTTPS KEYFILE=/etc/websrv1/mykeys.kdb
HTTPS KEYSTASH=/etc/websrv1/mykeys.sth
HTTPS_VERBOSE=Y
HTTPS_VERBOSE_DD=HTTPDEBG
```

Usage & Invocation – Example 3

- Example 3: Simple HTTPS connection to ECUREP

```
//FTP      EXEC  PGM=AMAPDUPL
//SYSUDUMP DD    SYSOUT=*
//SYSPRINT DD    SYSOUT=*
//DEBUG     DD    SYSOUT=*
//SYSUT1    DD    DISP=SHR,DSN=H44IPCS.WESSAMP.TRKS055K
//SYSIN     DD    DISP=SHR,DSN=TSOUSER.FTPINFO(TESTCASE)
//          DD    *
TARGET SYS=www.secure.ecurep.ibm.com
TARGET_DSN=wessamp.bigfile
CC HTTPS=04
WORK SIZE=200
DIRECTORY=/toibm/mvs/
PMR=12345.123.123
USE HTTPS=Y
HTTPS_KEYRING=TSOUSER/pduu
```

Region Size Note

- PDUU with HTTPS allocates above the line, below the bar storage for each segment when transferring
- Keep this in mind when selecting `CC_HTTPS` and `WORK_SIZE` parameters
 - In addition to other storage, PDUU allocates 2 `Work_Size` buffers in megabytes for each `CC_HTTPS`, EX:

$$\text{CC_HTTPS} * \text{WORK_SIZE} * 2 * 1\text{MB}$$

- Selecting impossible values will cause storage allocation failures
- Might need to adjust `REGION=` parameters for this job to accommodate the increased storage use

Interactions & Dependencies

- To exploit this item, all systems in the Plex must be at the new z/OS level: NO
- Software Dependencies
 - None
- Hardware Dependencies
 - None
- Exploiters
 - N/A

Migration & Coexistence Considerations

- None, but
- Support will be available via PTFs for OA55959 on z/OS V2R1 to V2R4
- V2R4 base support does not include options
 - HTTPS_PROXYUSERNAME & HTTPS_PROXYPASSWORD
- V2R1 will not support
 - HTTPS_PROXYUSERNAME & HTTPS_PROXYPASSWORD

Installation

- NONE
- Support will be available via PTFs for OA55959 on z/OS V2R1 to V2R4

Session Summary

- Know how to set up PDUU to use HTTPS

Appendix

- A: Contacts and Publications
- B: References
- C: Return Codes
- D: Keywords
- E: Messages

Appendix A: Contacts and publications

- Contacts:
 - Nicholas Jones – nrjones@us.ibm.com
 - Purvi Patel – purvi@us.ibm.com
- Publications:
 - z/OS MVS Diagnosis: Tools and Service Aids
 - AMAPDUPL: Problem Documentation Upload Utility
 - z/OS MVS System Messages, Volume 1 (ABA-AOM)
 - Messages AMA700-799

Appendix B: References

- For information on some options and their values see:
 - z/OS MVS Programming: Callable Services for High-Level Languages
 - z/OS client web enablement toolkit -> The z/OS HTTP/HTTPS Protocol enabler
- For details on setting up a key file:
 - z/OS Cryptographic Services System SSL Programming
 - Certificate/ Key management -> gskkyman
- For details on setting up a key ring:
 - z/OS Security Server RACF Security Administrator's Guide
 - RACF and digital certificates
- Certificates can be found at
 - <https://testcase.boulder.ibm.com/>
 - <https://www.secure.ecurep.ibm.com/app/upload>

Appendix C: AMAPDUPL Return code updates

- 36 – Error in FTP or HTTPS operation
- 68 – Error unloading a PDS or PDSE
- 69 – Failure to attach a subtask
- 70 – Failure in pause element service
- 71 – Failure in BPX1SDD service
- 98 – System or user abend occurred during subtask operation

Appendix D: Keywords – USE_HTTPS

- USE_HTTPS
 - An optional parameter that when specified with a value of 'Y' enables HTTPS mode and indicates that PDUU use the HTTPS protocol to transfer data to IBM.
 - Omitting this parameter results in PDUU using the default FTP protocol.

Appendix D: Keywords – HTTPS_KEYRING

- HTTPS_KEYRING
 - Specify a SAF key ring or PKCS #11 token containing certificates necessary to connect to the HTTPS sessions. Of the form:
 - SAF key ring name, specified as userid/keyring
 - PKCS #11 token, specified as *TOKEN*/token_name
 - See documentation for web enablement toolkit.

Appendix D: Keywords – HTTPS_KEYFILE

- HTTPS_KEYFILE
 - Specifies a path and file name of the key data base file created by the System SSL gskkyman utility.
- HTTPS_KEYSTASH
 - Specifies the path and file name of the password stash file created by the System SSL gskkyman utility. This option is required when HTTPS_KEYFILE is specified.

Appendix D: Keywords – other HTTPS options

- **HTTPS_PORT**
 - An optional parameter when USE_HTTPS=Y is specified indicating the remote port number to which to connect. Default value is 443.
- **HTTPS_IPSTACK**
 - An optional parameter when USE_HTTP=Y is specified indicating the local TCP/IP stack name to be used when connecting to the IBM site. 1-8 characters specifications are allowed.
- **HTTPS_LOCALIPADDR**
 - An optional parameter when USE_HTTP=Y is specified indicating the outgoing IP address from which the connection is to originate. Must specify starting with http:// or https://. For example: http://192.168.1.1
- **HTTPS_LOCALPORT**
 - An optional parameter when USE_HTTP=Y is specified indicating the outgoing port number from which the connection is to originate.
- **HTTPS_PROXY**
 - An optional parameter when USE_HTTP=Y is specified indicating the HTTP proxy to use.
 - Must specify starting with http:// or https://. For example: http://my.proxy.com
- **HTTPS_PROXYPORT**
 - An optional parameter when USE_HTTP=Y is specified indicating the proxy port to which to connect.
- **HTTPS_PROXYUSERNAME & HTTPS_PROXYPASSWORD**
 - Specify username and password for the proxy. (not available in z/OS V2R1)

Appendix D: Keywords – HTTPS_VERBOSE

- HTTPS_VERBOSE
 - An optional parameter when that when specified with a value of 'Y' and when USE_HTTP=Y indicates to the web enablement toolkit to produce verbose messages for HTTPS transfers. These messages can be helpful in diagnosing connection issues and aiding in IBM problem determination. The HTTPS_VERBOSE_DD can be used to change where these messages are sent.
- HTTPS_VERBOSE_DD
 - An optional parameter to specify a 1-8 character DD name that takes effect when the HTTPS_VERBOSE=Y parameter is used. The DD name indicates where the web enablement toolkit is to place the verbose messages. This must meet the requirements as described in *HTTP/HTTPS enabler options and values* in the HWTH_OPT_VERBOSE_OUTPUT option. The default is SYSPRINT when not specified.

Appendix E: Messages – AMA732I

- AMA732I START *number* *type* SESSION
- Explanation
- This message indicates the beginning of FTP or HTTPS session.
- In the message text:
 - *number*
 - The order number of starting FTP or HTTPS session.
 - *type*
 - The type of session, FTP or HTTPS

Appendix E: Messages – AMA747I

- AMA747I ~~INCORRECT NUMERICS IN CC_FTP CONTROL STATEMENT~~
- ~~PARAMETER~~ *parameter* MUST ONLY CONTAIN NUMBERS
- Explanation
- The Problem Documentation Upload Utility (PDUU) encountered an error while reading and interpreting SYSIN data set. The value specified for the *parameter* is invalid.
- In the message text:
- *parameter*
 - The parameter that has characters other than numbers in it.
- User response
 - Correct the *parameter* statement in SYSIN data set and rerun PDUU. For the correct values for the *parameter* statement in SYSIN, see the topic about JCL statements for z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA748I

- AMA748I ~~THE SPECIFIED CONCURRENT FTP COUNT IS NOT BETWEEN 1 AND 20~~
- THE SPECIFIED *parameter* VALUE IS NOT BETWEEN *lowValue* AND *highValue*
- Explanation
 - The Problem Documentation Upload Utility (PDUU) encountered an error while reading and interpreting SYSIN data set. The specified *parameter value* is not within allowable numerical interval.
- In the message text:
- *parameter*
 - The parameter that has an incorrect numeric value
- *lowValue*
 - The minimum numeric value for the *parameter*
- *highValue*
 - The maximum numeric value for the *parameter*

Appendix E: Messages – AMA753I

- AMA753I ~~THE LENGTH OF FTP_INIT_PARM PARAMETER IS NOT BETWEEN 1 AND 64 CHARACTERS~~

THE LENGTH OF PARAMETER *parameter* IS NOT BETWEEN *lowValue* AND *highValue* CHARACTERS

- Explanation
 - The Problem Documentation Upload Utility (PDUU) encountered an error while reading and interpreting SYSIN data set. *parameter* is *either* too long *or* too short.
- In the message text:
- *parameter*
 - The parameter that is either too long or too short
- *lowValue*
 - The minimum length for the *parameter*
- *highValue*
 - The maximum length for the *parameter*

Appendix E: Messages – AMA760I

- AMA760I *module* ENDED ABNORMALLY. SYSTEM COMPLETION CODE = scode, REASON CODE = reasc
- Explanation
 - The Problem Documentation Upload Utility (PDUU) encountered an error while executing *module* and ended abnormally. This message displays completion and reason codes accompanying the abnormal end.
- In the message text:
- *module*
 - The PDUU module that ended abnormally.
- scode
 - The completion code describing the reason for the abnormal end. A value of 0 indicates PDUU could not tell the completion code due to the SDWA not being available.
- reasc
 - The reason code describing the nature of the error. A value of 0 indicates PDUU could not tell the reason code due to the SDWA not being available.

Appendix E: Messages – AMA776I

- AMA776I *parameter* MUST BE SPECIFIED WITH A VALUE OF 'Y'
- Explanation
 - The Problem Documentation Upload Utility (PDUU) encountered an error while reading and interpreting SYSIN data set. The value specified for the *parameter* can only be 'Y' or *parameter* can be omitted.
- System action - PDUU processing ends.
- System programmer response - None.
- User response
 - Correct the *parameter* statement in SYSIN data set and rerun PDUU. For the correct values for the *parameter* statement in SYSIN, see the topic about JCL statements for z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.
- Problem determination
 - This message is accompanied by return code 8 documented in the topic about Return codes for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.
- Source - PDUU
- Module - AMAPDUPL

Appendix E: Messages – AMA779I

- AMA779I *parameter1* AND *parameter2* NOT SPECIFIED, ONE IS REQUIRED
- Explanation
 - *parameter1* and *parameter2* statements were not found in the SYSIN data.
 - One of *parameter1* OR *parameter2* is required for PDUU operation.
 - For example:
 - PMR or CASE supplies data associated with the hardware or software problem, and is necessary to report the problem and track its solution. These parameters have no default value and either PMR, or CASE, must be specified.
- User response
 - Supply *parameter1* or *parameter2* in the SYSIN input and rerun PDUU. For more details about those statements, see the topic about JCL statements for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA782I

- AMA782I *parameter1* AND *parameter2* BOTH SPECIFIED, SPECIFY ONLY ONE
- Explanation
 - *parameter1* and *parameter2* statements were both found in the SYSIN data.
 - Only one of *parameter1* OR *parameter2* is allowed for PDUU operation.
 - For example:
 - Both PMR and CASE statements were found in the SYSIN data. PMR and CASE statements are mutually exclusive. Specify either PMR or CASE.
- User response
 - Supply either a *parameter1* or *parameter2* statement in the SYSIN input and rerun PDUU. For more details about those statements, see the topic about JCL statements for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA783I

- AMA783I HWTH *service* THREAD: *thread* RETCODE: *retcode* REASON: *rsncode* SERVID: *serviceinfo* X: *reasonText*
- Explanation
 - Informational information about the HTTP Enablement Toolkit service is given to aid in problem diagnosis. This will appear in DEBUG if return code is 0, and SYSPRINT if return code is non 0.
- In the message text:
 - *service* - A description of the toolkit service that was performed by PDUU
 - *thread* - The PDUU thread that issued the service
 - *retcode* - The return code for the service.
 - *rsncode* - The reason code for the service.
 - *serviceinfo* - service info returned by the toolkit
 - *reasonText* - When reason text is supplied, it is added after AMA783I beginning with 'X: ' to describe the return code
- System action
 - PDUU processing continues on successful calls to the toolkit and PDUU processing ends on failures.
- User response
 - On failures, See 'The z/OS HTTP/HTTPS protocol enabler' and the linked service return and reason code descriptions to determine why the toolkit service failed.
- Problem determination
 - On failures, this message is accompanied by return code 36 documented in the topic about return codes for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA785I

- AMA785I BPX1SDD Failed RETVAL: retval RETCODE: retcode REASON: rsnocode
- Explanation
 - Service BPX1SDD failed with the stated return codes. PDUU needs to successfully call BPX1SDD when USE_HTTPS=Y.
- In the message text:
 - retval - return value from the BPX1SDD service
 - retcode - return code from the BPX1SDD service
 - rsnocode - reason code from the BPX1SDD service
- System action - PDUU processing ends.
- User response
 - See 'z/OS UNIX System Services Messages and Codes' for information on the failing return and reason codes.
- Problem determination
 - This message is accompanied by return code 71 documented in the topic about Return codes for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA787I

- AMA787I SUBTASK *thread* FAILURE SERVICE: *service* RETCODE: *retcode*
- Explanation
 - A subtask of AMAPDUPL performing processing for a USE_HTTPS=Y session abended.
- In the message text:
 - *thread* - the number of the thread that failed
 - *service* - the service the thread was performing at the time of failure
 - *retcode* - the PDUU return code at the time of failure
- System action - PDUU processing ends.
- User response
 - See accompanying messages to determine the cause of the failure.
- Problem determination
 - This message is accompanied by return code 98 documented in the topic about return codes for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.

Appendix E: Messages – AMA788I

- AMA788I *exitType* EXIT. THREAD: *thread* STATUS: *statusCode* VERSION: *versionCode* REASON: *reason*
Z: *headerName=headerValue*
Y: *bodyContents*
- Explanation
 - A response header or body exit received control and is recording status. This message is followed by the header or body contents when available. This can be helpful in debugging problems.
- In the message text:
 - *exitType* - RESPONSE HEADER or RESPONSE BODY
 - *thread* - The number of the thread
 - *statusCode* - HTTP Status code (e.x. 200, 404)
 - *versionCode* - The HTTP version of the request
 - *reason* - The reason text accompanying the status code
 - *headerName=headerValue* - When *exitType* is RESPONSE HEADER, headers are provided following AMA788I prefixed with 'Z:'
 - *bodyContents* - When *exitType* is RESPONSE BODY, The contents of the response body are provided prefixed with 'Y: '. Blank lines are omitted from the output.
- System action -PDUU processing continues.
- User response
 - On failures, use the provided HTTP status information, headers and body contents to determine the cause of the failure for the request. You might need to set HTTPS_DEBUG and HTTPS_DEBUGDD to further aid problem determination.
- Problem determination - N/A

Appendix E: Messages – AMA789I

- AMA789I parameter1 MUST BE SPECIFIED WHEN parameter2 IS SPECIFIED
- Explanation
 - When *parameter1* is specified *parameter2* must also be specified.
- System action - PDUU processing ends.
- User response
 - Specify *parameter2* or omit *parameter1* in the SYSIN input and rerun PDUU. For more details about those statements, see the topic about JCL statements for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.
- Problem determination
 - This message is accompanied by return code 16 documented in the topic about return codes for the z/OS Problem Documentation Upload Utility in z/OS MVS Diagnosis: Tools and Service Aids.