IBM Education Assistance for z/OS V2R2

Item: IBM HTTP Server move from Domino to Apache
Element/Component: IBM HTTP Server

Material current as of September 2015

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Presentation Objectives

- In z/OS V2R2, IBM HTTP Server Powered by Apache will replace IBM HTTP Server powered by Domino. This presentation will provide a brief overview of some of the installation and configuration tasks required to setup an IBM HTTP Server powered by Apache.
- In addition, this presentation will provide examples of some of the common aspects of a migration from IBM HTTP Server powered by Domino to an IBM HTTP Server Powered by Apache.
- For brevity, IBM HTTP Server powered by Domino will be refered to as DGW, and IBM HTTP Server powered by Apache as IHS Apache.

Overview

- Problem Statement / Need Addressed
  - z/OS V2R2 will not include IBM HTTP Server powered by Domino.
- Solution
  - Migrate to the included HTTP server, IBM HTTP Server Powered by Apache V9.0.
- Benefit / Value
  - DGW has been functionally stabilized for a long time, having undergone no development for several years. Unlike DGW, IHS Apache supports IPv6, 64-bit execution, and includes security authentication and authorization capabilities similar to those provided in DGW. IHS Apache is based on Apache 2.4, with additional fixes. Apache is widely used, with a large user community, making modules, examples, and skills easy to find.

Usage & Invocation

IHS Apache V9.0 Server Configuration, after the SMP/E install:

- Defining a configuration and home directory
  - Create a new directory in the root. The purpose of this directory is to store configurations for new IBM HTTP Servers powered by Apache. It is recommended that a new zFS is created and mounted at this directory for each zOS image. This avoids the possibility of filling up the zFS that backs the root directory.
    - `/ihsconfig`
  - Create a configuration subdirectory for the IHS Apache Server, IHSAE001.
    - `/ihsconfig/ihs/ihsae001`
  - Create a home subdirectory for the user ID that will run the IHS Apache Server, IHSAE001, and for the protected user ID that will be assigned to the started task, IHSAE002.
    - `/ihsconfig/home/ihsae001`
    - `/ihsconfig/home/ihsae002`

- Define USER IDs using RACF
  - Create a user ID called IHSAE001, which will run the IHS Apache Server. Create a second protected user ID called IHSAE002, which will run the started task. These user IDs must have an OMVS segment and should also have home directories in the z/OS UNIX environment. It is recommended that these user IDs have non-zero OMVS UIDs. See the Redbook for further details.

```
     adduser ihsae001 dfltgrp(ihsrb13) name('IHS Server 1') omvs(uid(35001)
home('/ihsconfig/home/ihsae001') program('/bin/sh'))
     alu ihsae001 password(ihsrb13) noexpire
     adduser ihsae002 dfltgrp(ihsrb13) name('Apache Started Task ID')
omvs(uid(35002) home('/ihsconfig/home/ihsae002') program('/bin/sh'))
     alu ihsae001 nopassword
```

Usage & Invocation

- Creating the IHS
  - `/usr/lpp/ihsa_zos/bin/install_ihs /ihsconfig/ihs/ihsae001 8230`
    - Run this command while logged into the ihsae001 user ID.
    - /ihsconfig/ihs/ihsae001 is the installation directory, and ihsae001 is the server name. The ownership of this user-created directory should be set to the ihsae001 user ID.
    - 8230 is the TCP/IP port that the created IHS Apache instance will *Listen* on when started. The default is 80.
    - You can create multiple instances of IHS Apache by running install_ihs once for each instance. However, you must specify a unique server name each time you run the installer program.
    - The started task name and proclib member used for each IHS Apache instance will match the server name.

- Output from install_ihs

```
Copying install directory and creating symlinks...
Updating install paths...
cmd: /usr/lpp/ihsa_zos/bin/postinst -i /ihsconfig/ihs/ihsae001 -t install -v
PORT=8230 -v SERVERNAME=www.yourcompany.com
```

- Defining a RACF STARTED rule
  - Issue the following RACF commands to define the user ID for the started task that will be set up to run the server under. Note that we are assigning the started task to protected user ID IHSAE002.

```
RDEFINE STARTED IHSAE001.* STDATA(USER(IHSAE002))
SETROPTS RACLIST(STARTED) REFRESH
```

Usage & Invocation

- PROCLIB JCL sample: `HAP.SHAPJCL(HAPCPROC)`
  - Take this member and copy it into your SYS1.PROCLIB dataset as IHSAE001. IHSAE001 is the server name and is unique for each server instance.
- Issue start command: `S IHSAE001`
  - Unlike IBM HTTP Server powered by Domino, which only has one started task running when it started, you will see several started tasks running.
  - All the spawned started tasks have the same name because the original started task had eight characters. If the started task name had seven characters or less, the spawned started tasks would each have a digit appended to their name. It is recommended that you use a task name of exactly eight characters to avoid confusion.
- Started tasks running after starting IHSAE001

```
SDSF DA SC55 SC55 PAG 0 CPU/L/Z 3/ 2
COMMAND INPUT ===>
NP JOBNAME StepName ProcStep JobID Owner
IHSAE001 STEP1            STC18072 IHSAE002
IHSAE001 STEP1            STC18068 IHSAE002
IHSAE001 IHSAE001 *OMVSEX STC18082 IHSAE002
IHSAE001 STEP1            STC18086 IHSAE002
IHSAE001 STEP1            STC18094 IHSAE002
IHSAE001 STEP1            STC18092 IHSAE002
```

Usage & Invocation

Operator Commands

These commands are case sensitive, and will only work properly in the System Command Extension area. To use these commands, you must enter a '/' at the Command Input area, then press Enter. Then, in the System Command Extension area, enter the commands below.

- Stop server:
  ```
  s IHSAE001,action='stop‘
  ```
- Graceful stop of server, waits for current processing to complete:
  ```
  s IHSAE001,action=‘graceful-stop‘
  ```
- Restart server without waiting for current processing to complete:
  ```
  s IHSAE001,action='restart‘
  ```
- Graceful restart of server waits for current processing to complete:
  ```
  s IHSAE001,action=‘graceful‘
  ```
- Modify command support
  - Can add this line to the httpd.conf
    ```
    LoadModule zos_cmds_module modules/mod_zos_cmds.so
    ```
  - And can then use these modify commands:
    ```
    P IHSAE001
    F IHSAE001,appl='graceful-stop'
    F IHSAE001,appl='graceful'
    F IHSAE001,appl='restart'
    ```

Usage & Invocation

Command line Operation

- Can issue commands from a telnet or OMVS session
  - Commands act upon the server of the directory you are in
- Starting a server:

```
./apachectl -k start
```

- Stopping a server

```
./apachectl -k stop
./apachectl -k graceful-stop
```

- Restarting a server

```
./apachectl -k restart
./apachectl -k graceful
```

Usage & Invocation

Configuration

- IHS Apache configuration is stored in httpd.conf
  - Located in conf sub-directory
  - Configuration achieved by using:
    - Directives that are native to the original Apache.
    - Directives available due to additional modules and features added by IBM.
    - Directives are configuration commands that control one or more aspects of behavior of the server.
    - Stanzas are enclosed blocks of directives in the configuration file, such as the Virtual Hosting stanza below.

- Virtual Hosting

```
<VirtualHost *:80>
ServerName www.yourcompany.com
DocumentRoot /www/yourcompany
DirectoryIndex index.html index.htm
ErrorDocument 404 /www/yourcompany/error404_1.html
ErrorDocument 500 /www/yourcompany/error500_1.html
ErrorLog logs/yourcompany_80_error.log
CustomLog logs/yourcompany_80_access.log common
Loglevel error
</VirtualHost>
```

Interactions & Dependencies

- For IBM HTTP Server powered by Apache V9.0 installation, a Java Runtime Environment using IBM 31-bit SDK for z/OS Java Technology Edition V6.0 or higher (5655-R31), or IBM 64-bit SDK for z/OS Java Technology Edition V6.0 or higher (5655-R32) must be available on the driving system. This requirement is for installation of the product and service only.

Migration & Coexistence Considerations

In April 2013, IBM recommended that customers migrating to z/OS V2R1 use IHS Apache V8.5.5, available in z/OS Ported Tools, as a replacement for DGW, in anticipation of the removal of support for DGW in z/OS V2R2.

While it is possible to migrate from DGW to IHS Apache V9.0 directly with z/OS V2R2, performing such a complex migration this way could potentially delay your entire z/OS V2R2 migration.

By migrating from DGW to IHS Apache V8.5.5 now, you will have the benefit of a running reference DGW server available on your z/OS system, additional time to test and verify that the functionality of your new IHS Apache V8.5.5 server is comparable to your DGW server, and that the type of IHS in use is transparent to the enduser. The subsequent migration from IHS Apache V8.5.5 to IHS Apache V9.0 will be simple in comparison.

Migration & Coexistence Considerations

A <u>strongly</u> suggested migration path if you are using IBM HTTP Server powered by Domino.

1. **Are you affected? Use the "as is" health check from <u>http://www-03.ibm.com/systems/z/os/zos/installation/HTTP_Health_Checker.html</u>**

   This check will simply tell you if you are using IBM HTTP Server powered by Domino.

2. **While on z/OS V1.13 or z/OS V2.1:**

- Install IBM Ported Tools V1.3 HTTP Server (level 8.5.5, Apache level 2.2).
- Migrate from IBM HTTP Server powered by Domino to the HTTP Server 8.5.5.
  - Use Redbook: **IBM HTTP Server on z/OS: Migrating from Domino-powered to Apache-powered (**REDP-4987)
  - Use z/OS UNIX Tools and Toys **ihsCMT** (<u>http://www-03.ibm.com/systems/z/os/zos/features/unix/bpxa1ty2.html</u>). This tool generates an approximation of an equivalent httpd configuration file for IHSA.
  - You can run the Domino and Apache servers side by side on z/OS V1.13 or V2.1.
    - z/OS Infoprint Server still needs the Domino server prior to z/OS V2.2!

Migration & Coexistence Considerations

A strongly suggested migration path if you are using IBM HTTP Server powered by Domino, continued:

3. When installing z/OS V2.2:

- Migrate to IBM HTTP Server 9.0 (in the z/OS V2.2 base, Apache level 2.4).
  - Use "**Upgrading to 2.4 from 2.2**" http://publib.boulder.ibm.com/httpserv/manual24/upgrading.html .
  - Refer to http://www-01.ibm.com/support/knowledgecenter/SSEQTJ_8.5.5/com.ibm.websphere.ihs.doc/ihs/cihs_upgrading2.html for the general process on how to move from 8.5.5 to 9.0 (although the documentation does not yet discuss z/OS or 9.0).
- Configure **z/OS Infoprint Server (Infoprint Central), PKI**, and **Library Server** to use the new z/OS V2.2 HTTP Server.
- **Take advantage of the migration accommodation for "dual" IHSA (8.5.5 and 9.0), if necessary.**

Migration & Coexistence Considerations

The migration accommodation for "dual" IHSA (8.5.5 and 9.0) on z/OS V2.2

IBM Ported Tools V1.2 and V1.3 HTTP Server feature are at level 8.5.5, and will run on z/OS V1.12, V1.13, and V2.1....and now with a migration accommodation: z/OS V2.2.

It is recommended to use this migration accommodation if you need both IHSA 8.5.5 and 9.0 on z/OS V2.2.

If you use this migration accommodation, it is expected that you will move from IHSA 8.5.5 to 9.0 (and therefore only be using IHSA 9.0) on z/OS V2.2 before the End of Service for z/OS V2.1 (planned to be September 2018).

Thus, you will have approx. 3 years of "dual" IHSA 8.5.5 and 9.0 support on z/OS V2.2.

Migration & Coexistence Considerations

Migration Health Check

- IBM has developed a Migration Health Check to determine if any started tasks are IHS Servers powered by Domino. The suggested check name is ZOSMIG_HTTP_SERVER_DOMINO.
  - Available at the z/OS V2R1 migration and installation support web page.
- If any instances of DGW are found, the Health Check will write the following message to syslog, followed by a list of the instance names: “One or more IBM HTTP Server(s) Powered by Domino were found.”

Migration & Coexistence Considerations

- Note that the IHS Apache V8.5.5 obtained as a feature of WebSphere Application Server V8.5.5 can be used instead of the IHS from z/OS Ported Tools. The Ported Tools version is installed via SMP/E, while the WAS version is installed using IBM Installation Manager.

- See the appendix for the Redbook and the IBM Knowledge Center links for details on migrating from DGW to IHS Apache V8.5.5.

Migration & Coexistence Considerations

- If you have only a few instances of IBM HTTP Server powered by Domino that are not used much and that usage is basic, then your migration plan will be relatively simple to prepare and run. However, if you have many instances of IBM HTTP Server powered by Domino, that use many GWAPI programs and various security functions, your plan will take longer to prepare and be more detailed.

- Study your DGW http configuration file and map out what will need to be done to obtain the same functionality that DGW provided. Here are some examples:
  - Is security being used?
  - Does the server handle multiple hosts?
  - Does it listen on multiple ports?
  - Are GWAPI modules being used, and do you have the source code for these?
  - Is it setup to produce SMF records?
  - Is it running in scalable mode?

Migration & Coexistence Considerations

Virtual Hosts

- Both versions of IBM HTTP Server provide the capability to support multiple virtual hosts.
- The DGW approach is to add the domain name or IP address to the end of directives such as *Exec, Fail, Map, Pass,* and *Redirect.*
- The Apache approach is to use the *VirtualHost* directive to identify a virtual host. Then, within that stanza, you define any other directives that are to apply to that virtual host.
- To migrate from DGW to IBM HTTP Server powered by Apache, you need to identify directives in DGW that have domain name or IP addresses associated with them, then map these to *VirtualHost* type directives.

Migration & Coexistence Considerations

Security

- To set up a port to use SSL, you need to configure a *VirtualHost* stanza that contains an *SSLEnable* directive.
- IBM HTTP Server powered by Domino requires configuring every SSLCipherSpec that you need, whereas IBM HTTP Server powered by Apache enables all SSLCipherSpec by default. If you want to use only certain ciphers, then you can use a combination of SSLCipherSpec and *SSLProtocolDisable* directives.
- The LDAP authentication directives are different in IBM HTTP Server powered by Domino and IBM HTTP Server powered by Apache. For an IBM HTTP Server powered by the Domino *Transport, Host, Port, UserSearchBase,* and *UserNameFilter* directives, they are converted to the IBM HTTP Server powered by Apache *AuthLDAPURL* directive.
- While the reference information in the appendix describes how to enable SSL, and how to create new certificates, many will want to use their existing DGW certificates in kdb files or RACF.

Migration & Coexistence Considerations

Security (cont.)

- In both RACF and the kdb files the issue is access authorization by the IHS Apache Server's Started Task ID, or the ID starting the server within USS.
- Using existing DGW certificates in kdb files
  - Reference the keyfile directive in the DGW httpd.conf file to determine the kdb file being used.
  - The best approach is to create a new directory within the Apache Server's <SERVERROOT> directory. In our example, <SERVERROOT> is /ihsconfig/ihs/ihsae001 .
  - Then copy these 3 files into that location.
    - <filename>.kdb
    - <filename>.rdb
    - <filename>.sth
  - Ensure the owner of the files is the ID of the Started Task or the ID starting the server within USS.
  - Then within the Apache httpd.conf file add the keyfile directive of the location within the <SERVERROOT> directory.

Migration & Coexistence Considerations

Security (cont.)

- Using existing DGW certificates in RACF
  - Reference the keyfile directive in the DGW httpd.conf file to determine the RACF keyring being used.
  - Specify the same keyring in the Apache httpd.conf file. Be sure that the keyring is the fully qualified name. The ID that owns the keyring is the first qualifier of the name.
  - Grant access to the keyring for the ID of the Started Task or the ID starting the server within USS.
  - See Chapter 18, Scenario 7 of the Security Server RACF Security Administrator's Guide for details on the commands below. Issue these commands:
    - RDEFINE RDATALIB WEBSRV.HTTPZ2.LST UACC(NONE)
    - PERMIT WEBSRV.HTTPZ2.LST CLASS(RDATALIB) ID(WEBSRV) ACCESS(READ)
    - PERMIT WEBSRV.HTTPZ2.LST CLASS(RDATALIB) ID(IHSAE001) ACCESS(UPDATE)
    - SETROPTS RACLIST(RDATALIB) REFRESH
    - RLIST RDATALIB WEBSRV.HTTPZ2.LST
  - Note that WEBSRV is the DGW Server ID and only requires READ access. IHSAE001 is the Apache Server ID which requires UPDATE access. The RLIST command is used to confirm what was done and is optional.

Migration & Coexistence Considerations

Logging

- The IBM HTTP Server powered by Domino *AccessLog, AgentLog, RefererLog, ErrorLog, CgiErrorLog, ProxyAccessLog,* and *CacheAccessLog* directives are replaced in IBM HTTP Server powered by Apache with a more powerful and flexible set of log directives called *ErrorLog* and *CustomLog*. You can use these directives for a virtual host container or for the whole server.
- Note that *ErrorLog* will contain both Error and Informational messages.
- While Log Rotation can be setup to avoid restarting the server to move log files, the log files will still need to be moved or deleted via a separate program or process.

Migration & Coexistence Considerations

Logging (cont.)

- IBM HTTP Server powered by Domino log directives

```
AccessLog /ihsconfig/dws/ihsdm001/logs/httpd-log
AgentLog /ihsconfig/dws/ihsdm001/logs/agent-log
RefererLog /ihsconfig/dws/ihsdm001/logs/referer-log
ErrorLog /ihsconfig/dws/ihsdm001/logs/httpd-errors
CgiErrorLog /ihsconfig/dws/ihsdm001/logs/cgi-error
ProxyAccessLog /ihsconfig/dws/ihsdm001/logs/httpd-proxy
CacheAccessLog /ihsconfig/dws/ihsdm001/logs/httpd-cache
```

- IBM HTTP Server powered by Apache log directives

```
CustomLog /ihsconfig/ihs/ihsam001/access_log common
CustomLog /ihsconfig/ihs/ihsam001/referer_log referer
CustomLog /ihsconfig/ihs/ihsam001/agent_log agent
ErrorLog /ihsconfig/ihs/ihsam001/error_log
```

- Log Rotation in IHS Apache

```
CustomLog "|/ihsam001/bin/rotatelogs /ihsam001/logs/access_log
3600" common
```

Migration & Coexistence Considerations

URL and file mapping directives

- All URLs and file directives in IBM HTTP Server powered by Domino can be converted to corresponding ones in IBM HTTP Server powered by Apache. The table below shows the equivalent directives in IBM HTTP Server powered by Domino and IBM HTTP Server powered by Apache.

IBM HTTP Server powered by Domino	IBM HTTP Server powered by Apache
Pass	*Alias*
Exec	*ScriptAlias*
Map	*Rewrite*
Redirect	*Redirect*
Fail	*Deny*
Proxy	*ProxyPass*

Migration & Coexistence Considerations

Timeouts

- The timeout directives in IBM HTTP Server powered by Domino are different from the IBM HTTP Server powered by Apache timeout directives. IBM HTTP Server powered by Domino uses the *InputTimeout, OutputTimeout,* and *ScriptTimeout* directives that in IBM HTTP Server powered by Apache are translated into the *TimeOut* directive. This directive specifies a number in seconds for the amount of time the server will wait for certain events before failing a request. This directive can be specified within the server context and, if needed, within the virtual host context.
- IBM HTTP Server powered by Domino *PersistTimeout* directive translates into the IBM HTTP Server powered by Apache *KeepAliveTimeout* directive, which expresses the amount of time, in seconds, the server waits for subsequent requests on a persistent connection.

Migration & Coexistence Considerations

Timeouts (cont.)

- IBM HTTP Server powered by Apache also uses the *KeepAlive, MaxKeepAliveRequests,* and *KeepAliveTimeout* directives. If set to On, the *KeepAlive* directive enables HTTP persistent connections. The *MaxKeepAliveRequests* directive specifies the number of requests that are allowed on a persistent connection. The *KeepAliveTimeout* directive specifies the amount of time, in seconds, the server waits for subsequent requests on a persistent connection.
- The module mod_reqtimeout provides the *RequestReadTimeout* directive, which can be used to control how long the server should wait for content from the client.

Migration & Coexistence Considerations

GWAPI (Go Webserver Application Programming Interface)

- There is no utility that will convert GWAPI modules to V8.5.5 modules. Both DGW and V8.5.5 provide a way to get the server to perform some action that they cannot do by default. However, the way you need to code the modules to achieve this is different for the two products.
- IHS is based on Apache, which means that you have access to many open source modules. By using IHS Apache V8.5.5 instead of DGW, you have access to a far greater range of already developed modules.
- Additionally, if you have problems developing your own modules or implementing a module, there are various Apache forums where you can post a query to request advice and assistance.
- See the Redbook in the appendix for more details, as well as sample Apache modules to assist you with the task of converting DGW GWAPI modules to Apache-style modules.

Migration & Coexistence Considerations

Migrating from IHS Apache V8.5.5 to IHS Apache V9.0

- IHS Apache V9.0 z/OS FMID SMP/E Install will SUPERCEDE / DELETE IHS Apache V8.5.5 and V7.0 obtained via Ported Tools.
- Any IHS Apache V8.5.5 configuration file that uses authorization will likely need changes.
- In IHS Apache V8.5.5, access control based on client hostname, IP address, and other characteristics of client requests was done using the directives *Order, Allow, Deny,* and *Satisfy*. In IHS Apache V9.0, these directives will be supported in compat mode only. They are replaced by a more expressive system that only uses *Require*, in the same way as other authorization checks.
- See the appendix for the Apache link, for details on migrating IHS Apache V8.5.5 to IHS Apache V9.0.

Migration & Coexistence Considerations

- There is no mechanism supplied by IBM to migrate an existing configuration of an IBM HTTP Server to an IBM HTTP Server powered by Apache V9.0 . Use the following process to migrate to a new version:
  - Install the product code of the new version.
  - Use the new version of the product to create a new server.
  - Modify the new httpd.conf file with the same changes you have made to your existing server.
  - Make any other changes to the new configuration that you made previously to the existing server configuration.
- Supported combinations of IHS Apache V9.0, WebSphere Application Server (WAS), and the WAS Plugin on z/OS V2.2 are:
  - IHS Apache V9.0 (included on z/OS V2.2) and the V8.0 WAS Plugin (included with WAS V8.0), in front of WAS V8.0 or WAS V7.0.
  - IHS Apache V9.0 (included on z/OS V2.2) and the V8.5.5 WAS Plugin (included with WAS V8.5.5), in front of WAS V7.0 or later.

Installation

SMP/E Install Jobs for IHS Apache V9.0

- Receive the product code into the SMP/E environment:
  `RIMLIB(RCVPD0)`
- Allocate the target and distribution data sets:
  `<prefix>.HHAP90P.F1(HAPALL03)`
- Add DDDEFs to SMP/E:
  `<prefix>.HHAP90P.F1(HAPDDDE3)`
- Create filesystem directories
  `<prefix>.HHAP90P.F1(HAPISMK3)`
- Apply the product code into the SMP/E Environment (Wave 1G):
  Sample found in Program Directory
- Accept the product code into the SMP/E Environment (Wave 1G):
  Sample found in Program Directory

Presentation Summary

- Users of IBM z/OS for the past several years have had a choice of two HTTP Servers that they could use. Now one has become strategic while the other has become unsupported. IHS powered by Apache supports IPv6, 64-bit execution, and includes security authentication and authorization capabilities similar to those provided in IHS powered by Domino.
- While migrating from DGW to IHS Apache V9.0 is supported, migrating from DGW, to IHS Apache V8.5.5, to IHS Apache V9.0 is recommended.
- With proper planning, migrating from an IBM HTTP Server powered by Domino to one powered by Apache will provide an HTTP Server of comparable capabilities and performance. This presentation has provided examples of some common aspects of a migration from an IBM HTTP Server powered by Domino to an IBM HTTP Server powered by Apache. Please refer to the references found in the appendix for more examples and additional information.

Appendix

- IBM recommendation to migrate from DGW to IHS Apache V8.5.5.
- Migrating from IBM HTTP Server powered by Domino to IBM HTTP Server powered by Apache V8.5.5
  - IBM Knowledge Center: IHS Apache V8.5.5: Administrator Best Practices
  - IBM Redbook:
    IBM HTTP Server on z/OS: Migrating from Domino-powered to Apache-powered
    (IBM pub #: REDP-4987-01)
  - SHARE Presentation: IHS Apache for z/OS - How to Implement and Exploit
  - IBM Support: z/OS V2R1 migration and installation
- Using existing DGW Certificates
  - IBM Documentation: Security Server RACF Security Administrator's Guide
    (IBM pub #: SA23-2289-00)
- Migrating from IBM HTTP Server powered by Apache V8.5.5 to IBM HTTP Server powered by Apache V9.0
  - Apache Documentation: Upgrading to 2.4 from 2.2