Implementing TLS support with IBM Domino 9.x and IBM HTTP Server (IHS)

19th November 2013

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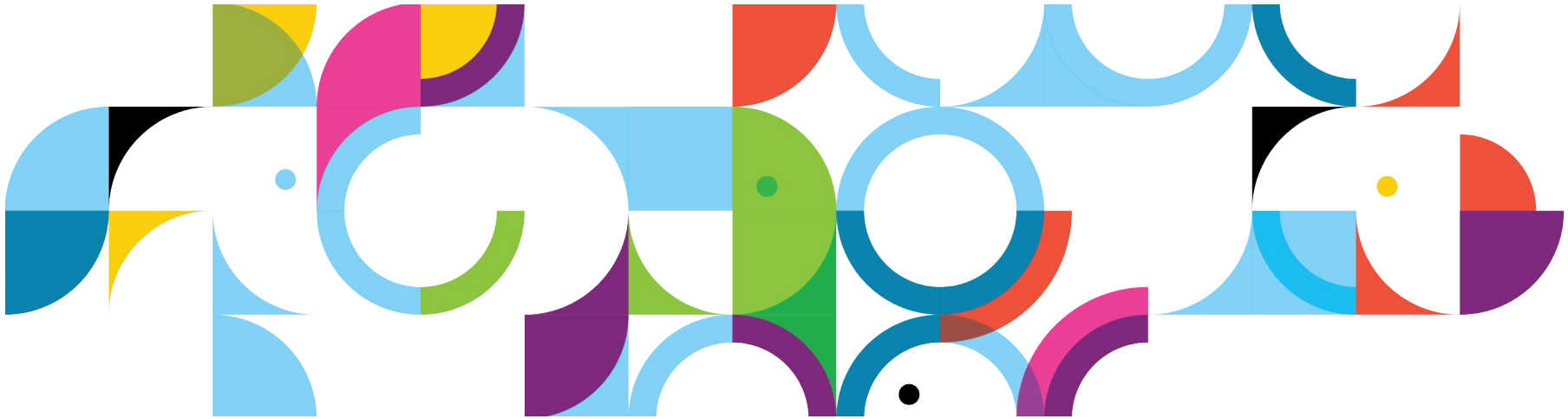
IBM Collaboration Solutions



Agenda

- Background
- IBM HTTP Server(IHS) with Domino explained
- Installation of IHS
- Configuration of the Domino HTTP server
- IKEYMAN
- Creating a CSR
- Configuration of IHS
- Loading the IHS module
- Debugging
- Questions

Background

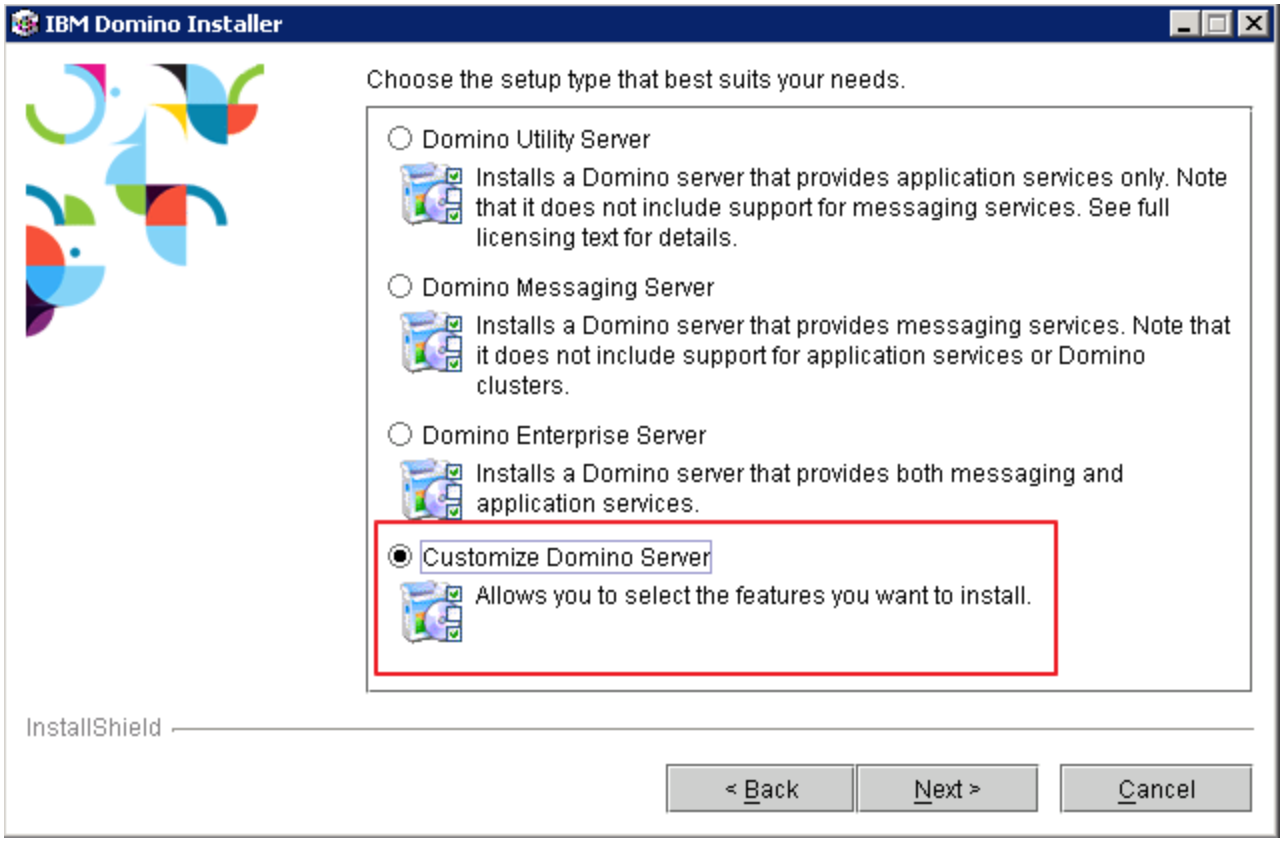
- In previous versions of Domino only SSL 3.0 was supported for secure connections. Later versions such as SSL 3.1 or TLS 1.0,1.1, 1.2 were not supported
- Applications and servers could make the initial connection to Domino using TLS but then Domino would negotiate down to SSL 3.0
- If they did not support negotiated handshakes or SSL 3.0 then the connection was dropped

IBM HTTP Server with Domino explained

- With the release of R9 Administrators now have the option of running the IBM HTTP Server on the same computer as a Domino HTTP server;
- The purpose of this enhancement is to support the Transport Layer Security (TLS) protocol
- A pass-through reverse proxy module named mod_domino is provided to forward HTTP requests to the Domino HTTP server.
- The module creates the context necessary to allow Domino interpret data received from other servers and applications using TLS.
- The IHS server is able to run "in front of" the Domino server.
- Once IHS has been enabled on the Domino server, it stops listening for requests on port 80 and port 443 and only accepts connections that originate from the same computer
- The Domino HTTP server listens on port 9288 for loop back connections from mod_domino/IBM HTTP Server.
- By default, mod_domino uses the local loop back address of 127.0.0.1 to connect to the Domino HTTP server.
- The Domino HTTP server connection settings are overridden with settings that maximize the re-use of connections between mod_domino/IBM HTTP Server and the Domino HTTP server.

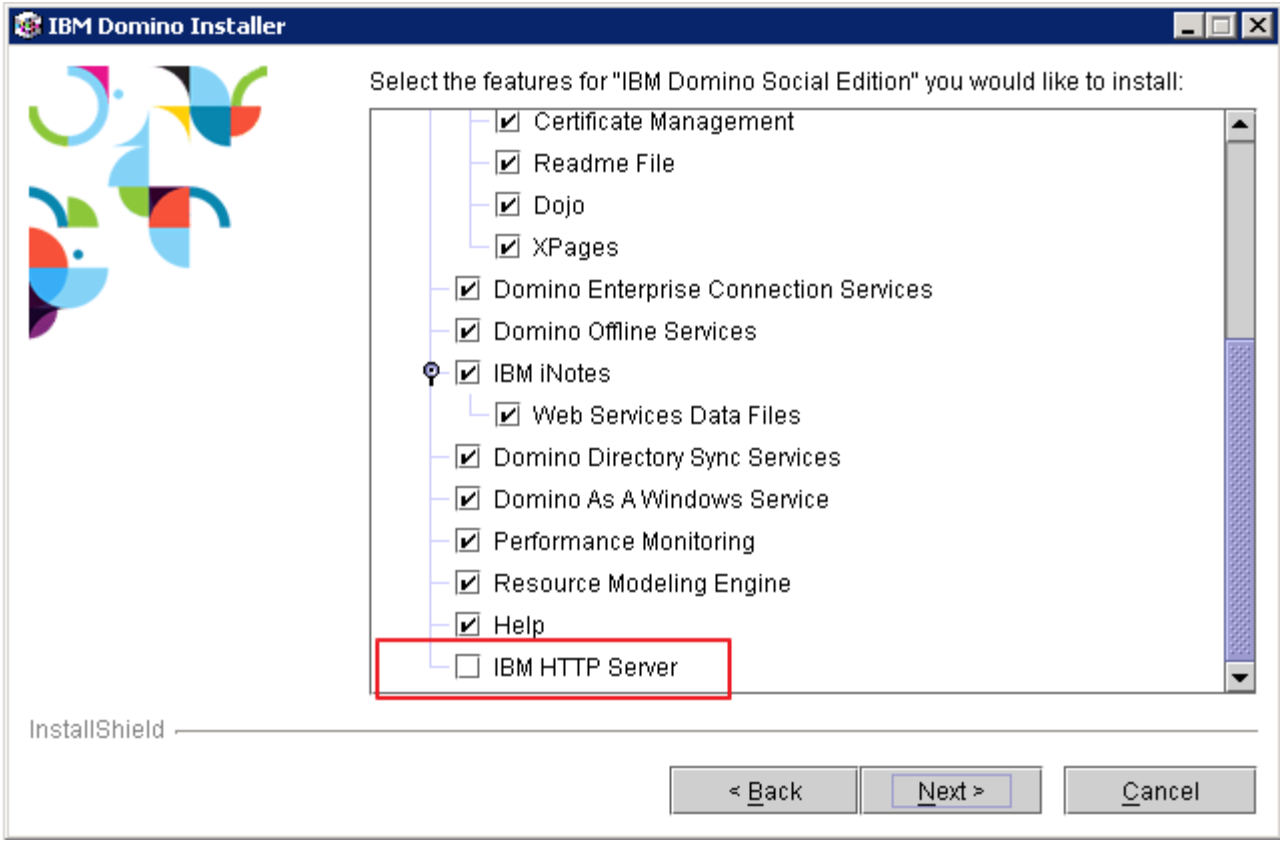
Installing IHS with Domino

- The version of IBM HTTP server required for running on the same machine as Domino is shipped with the R9 installer
- The IHS is not installed by default so select the “Customise Domino Server”



Installing IHS with Domino (cont.)

- Under Select the features for "IBM Domino Social Edition" you would like to install, enable IBM HTTP server.
- Complete the rest of the installation as normal



Configuring Domino

- Add the following parameter to the notes.ini
  - HTTPIHSEnabled=1
- Some environment variables are set prior to Domino HTTP starting the IBM HTTP server (IHS).
- You should not need to modify any of these settings.
- These environment variables are specified in the ihs\conf\domino.conf file
  - DOMINO_IHS_ROOT
  - DOMINO_SERVER_NAME
  - DOMINO_DOCUMENT_ROOT
  - DOMINO_DOCUMENT_DIRECTORY
  - DOMINO_PORT
  - DOMINO_MAX_REQUESTLINE
  - DOMINO_RESPONSE_TIMEOUT
  - DOMINO_THREADS

IKEYMAN

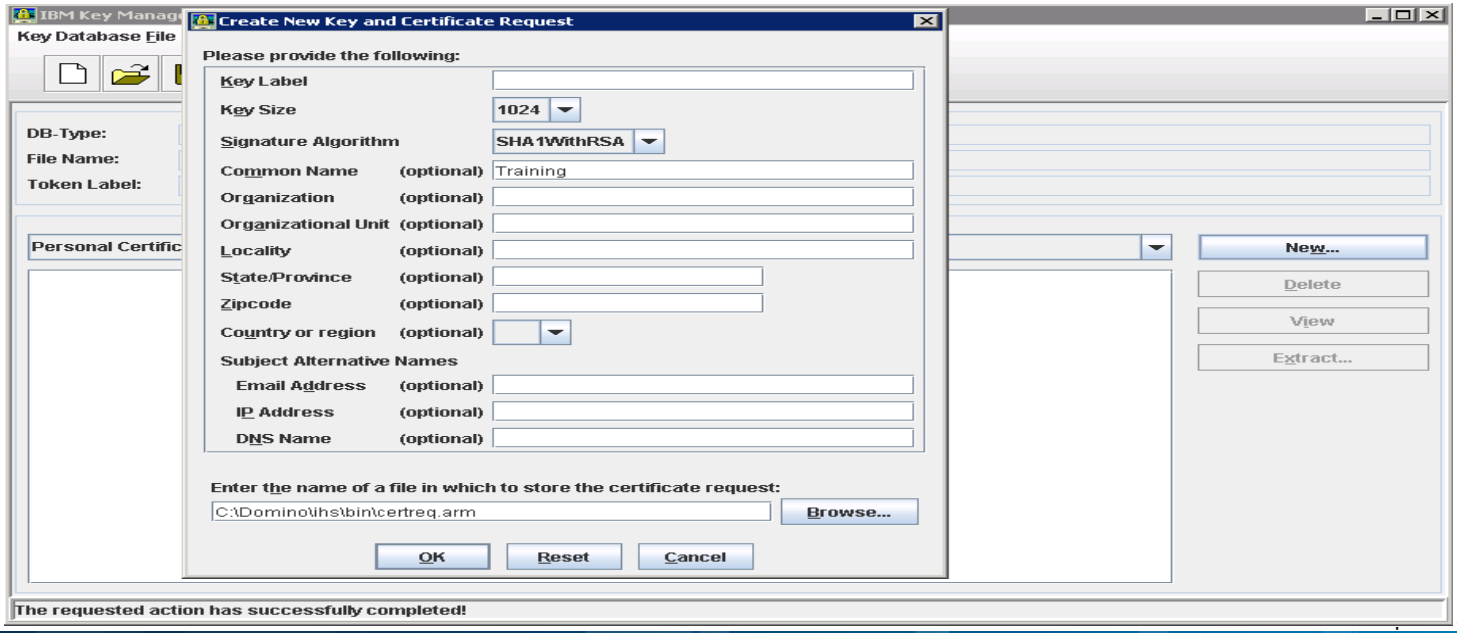
- The IBM HTTP Server uses key database files as keystores to store the certificates used in setting up TLS
- The iKeyman (IBM Key Management) tool is used to manage SSL keys and Trusted Roots.
- IKEYMAN shipped with Domino can be used to create the keystore used by IHS. ikeyman.bat can be found in the following directory \ihs\bin
- It can be launched by double-clicking it or running it from the command line
- You can either generate a new certificate request using the IKEYMAN utility

Creating a Certificate Signing Request (CSR) with IKEYMAN

- From the Menu Bar select Key Database File > New.
- Enter a file name for the new key database file you are creating.
- Enter a location for your key database file(KDB)
- Click OK.
- You are then prompted to enter a password. This is the password that will be used to open the key database file in iKeyman in the future.
- Select the checkbox “Stash the password to a file?” This encrypts the password and saves the file as a .sth file in the same directory as the kdb file

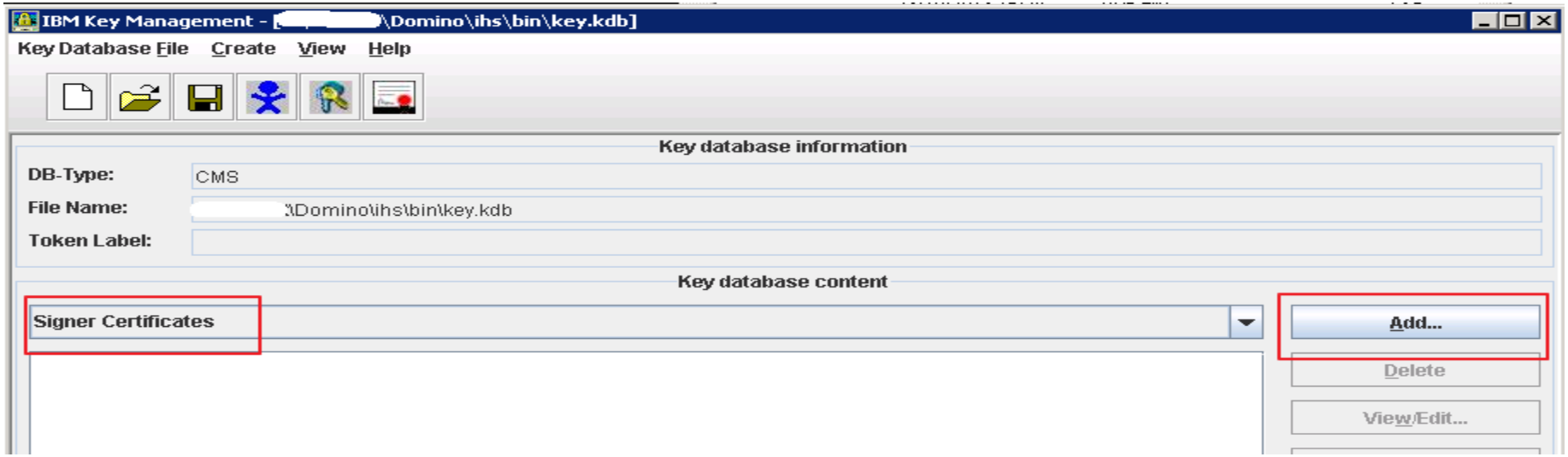
Creating a Certificate Signing Request (CSR) with IKEYMAN

- In the middle of the iKeyman GUI you will see a section called Key database content.
- Click on the "down arrow" to the right, to display a list of three choices.
- Select “Personal Certificate Requests”
- From the Personal Certificate Requests section, click New.
- Enter the relevant details for your certificate request



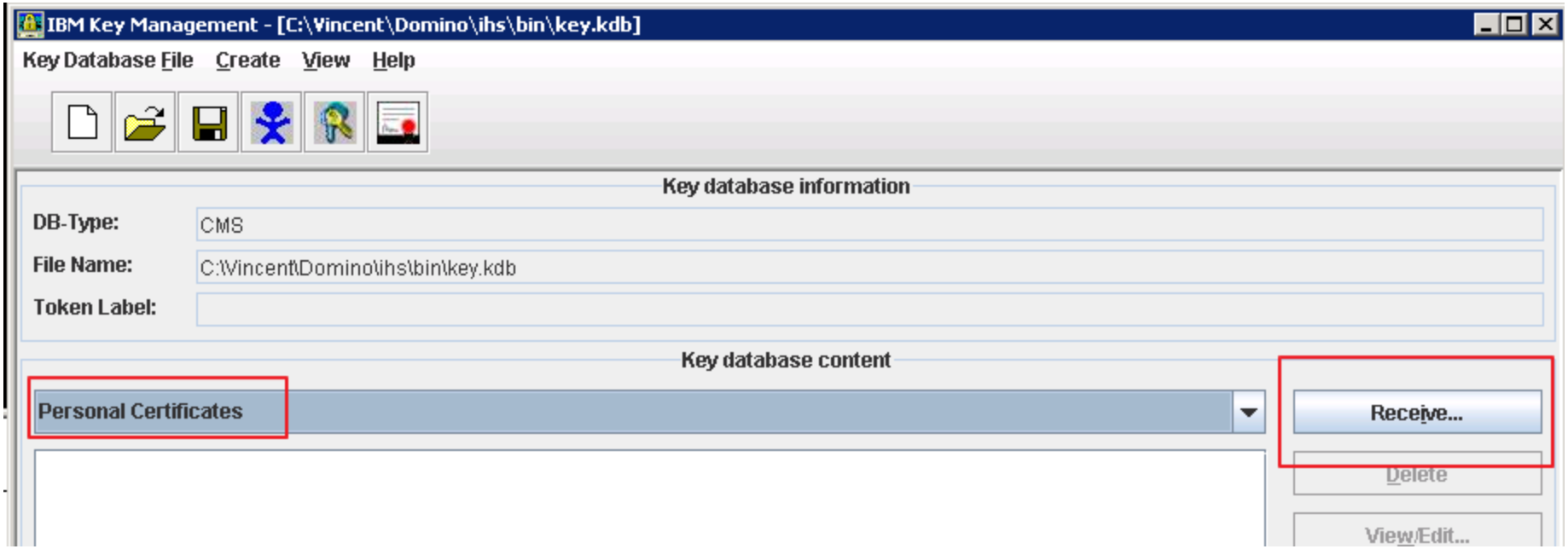
Creating a Certificate Signing Request (CSR) with IKEYMAN

- Once the CSR has been created you are able to submit the request to a 3rd party Certificate Authority or your own CA
- Once you receive your certificate from the CA you will need to import the root certificate and any intermediate certificates first
- To import the root certificate to your KDB file then select 'Signer Certificates' from the Key database content section and click add
- Browse to where you have the root stored and click OK



Creating a Certificate Signing Request (CSR) with IKEYMAN

- To import your server certificate select 'Personal Certificates' from Key database content section and then Receive
- Browse to where you have the personal certificate stored and complete the import
- Your Key database file is now ready to be used in your IHS environment



Configuring your IBM HTTP server

- The IBM HTTP server configuration file that is used to start the IBM HTTP server is named domino.conf and is located in the Domino Program directory under the ihs\conf subdirectory
- By default all listen ports are disabled so you need to modify this file to enable any listen ports you want the server to use
- To enable port 80
  - Remove the comment character (#) from the following line
    - # IPv4 support:
    - Listen 0.0.0.0:80
    - # Uncomment the following line for IPv6 support on Windows XP or Windows
    - # 2003 or later. Windows IPv6 networking must be configured first.
    - # Listen [::]:80

Configuring your IBM HTTP server

- To allow the IBM HTTP Server to accept HTTP SSL connections, enable the SSL/TLS port 443, and remove the comment character (#) for the following lines
  - Listen 0.0.0.0:443
  - ## IPv6 support:
  - #Listen [::]:443
  - <VirtualHost *:443>
  - SSLEnable
  - #SSLProtocolDisable SSLv2
  - #SSLProtocolDisable SSLv3
  - </VirtualHost>

  - KeyFile d:/keys/myserver.kdb
  - SSLDisable
  - #

Configuring your IBM HTTP server

- If you have internet sites enabled with one internet site document with a hostname different from the FQHM
  - Listen 0.0.0.0:80
  - ServerName "${DOMINO_SERVER_NAME}"
  - <VirtualHost 192.168.1.103:80>
  - ServerName www.mycompany2.com
  - </VirtualHost>

  - Listen 0.0.0.0:443
  - <VirtualHost 192.168.1.103:443>
  - ServerName www.mycompany2.com
  - SSLEnable
  - </VirtualHost>
  - SSLDisable
  - KeyFile "c:/program files/ibm http server/key.kdb"

Configuring your IBM HTTP server

- If you have internet sites enabled with multiple internet site documents
  - Listen 0.0.0.0:80
  - ServerName "${DOMINO_SERVER_NAME}"
  - <VirtualHost 192.168.1.103:80>
  - ServerName www.mycompany.com
  - </VirtualHost>
  - <VirtualHost 192.168.1.104:80>
  - ServerName www.mycompany2.com
  - </VirtualHost>

Configuring your IBM HTTP server

- If you have internet sites enabled with multiple internet site documents
  - Listen 0.0.0.0:443
  - <VirtualHost 192.168.1.103:443>
  - ServerName www.mycompany.com
  - SSLServerCert mycompany
  - SSLEnable
  - </VirtualHost>
  - <VirtualHost 192.168.1.104:443>
  - ServerName www.mycompany2.com
  - SSLServerCert mycompany2
  - SSLEnable
  - </VirtualHost>
  - SSLDisable
  - KeyFile "c:/program files/ibm http server/key.kdb"

Loading the IHS server

- Once you have updated the Domino.conf file with the correct settings you are ready to launch Domino and your IHS server
- With the parameter HTTPIHSEnabled=1 enabled the HTTP task loads the IHS server

Debugging

- **HTTPIHSDebugStartup=1**
  - This will display environment variables that are used in the domino.conf configuration file
  - Good to make sure that all settings are being honoured.
- Enable the mod_net_trace in the domino.conf
  - #LoadModule net_trace_module modules/debug/mod_net_trace.so
  - #<IfModule mod_net_trace.c>
  - #NetTraceFile logs/nettrace.log
  - #NetTrace client * dest file event senddata=65535 event recvdata=65535
  - #</IfModule>
- **Enable HTTP thread logs**
  - Tell http debug thread on
- **Collect the following logs**
  - error.log
  - nettrace.log
  - Htthr log files

Issues to be aware of

- DMEA96CMVX
  - infinite redirection issue when HTTPEnableConnectorHeaders is enabled (set to 1) in the notes.ini and when a browser connects directly over SSL to a Domino Server to a resource that requires SSL
  - Fixed in 9.0.1 and also 9.0IF1
- MKEN966HFR
  - IHS sends back a 500 status code if mod_domino receives a 449 status code, causes traveler to fail
  - Fixed in 9.0.1 and also 9.0IF2

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