



IBM Software Group

Debugging HTTP 500 Response Code in an IHS/Plugin/WebSphere Topology

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WebSphere® Support Technical Exchange

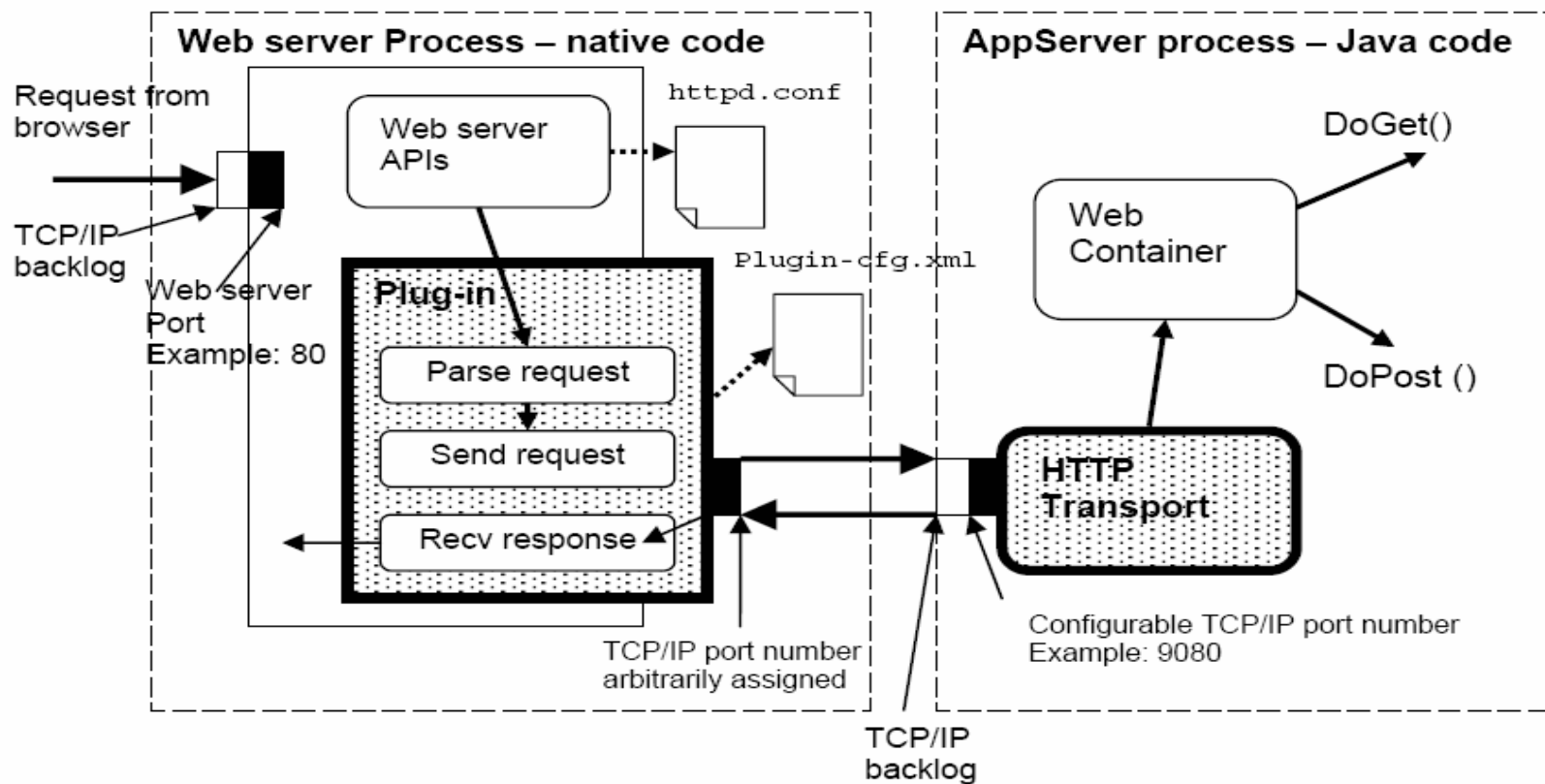


Agenda

- Schematic of Plugin Fundamentals
- Plugin related definitions
- What is http 500
- IHS/Plugin/WebSphere topology and some terms.
- HTTP 500 from a client perspective.
- Preliminary System Integrity Check
- What to collect ? Diagnostics .
- Conditions under which a HTTP 500 error is seen
- Debug procedures for http 500?
- Measures to address the issue
- Summary

A Schematic of WebSphere Plugin Operation.

Figure 2. Detailed view of the plug-in operation



Some Plugin Terms and Definitions

- httpd.conf
- Plugin
- plugin-cfg.xml
- Plugin Elements
- ConnectTimeout
- ServerIOTimeout
- MaxConnections
- Http Transport
- Web Container & WebContainer related timeouts.

What is a HTTP 5XX Error

- The server failed to fulfill an apparently valid request.
- Response status codes beginning with the digit "5" indicate cases in which the server is aware that it has encountered an error or is otherwise incapable of performing the request.
- The server should include an entity containing an explanation of the error situation, and indicate whether it is a temporary or permanent condition. Except when responding to a HEAD request.
- HTTP 500 is generic Internal Server Error

HTTP 500 - From client browser perspective

1. Reload the web page.
2. Clear your browser's cache.
3. Delete your browser's cookies.
4. Troubleshoot as a 504 Gateway Timeout error instead.
5. Contact the website directly.
6. Come back later.

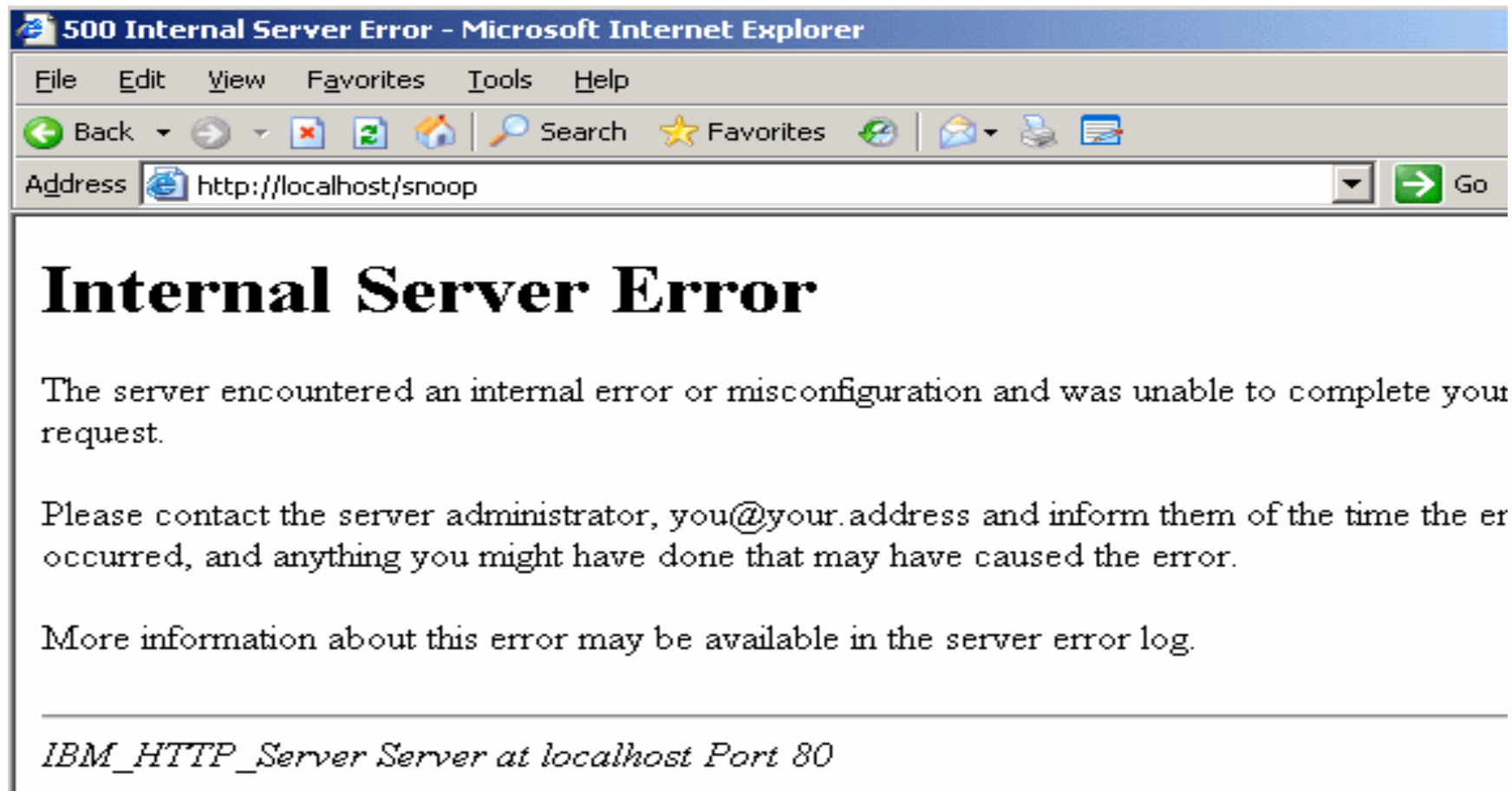
503–Service Temporarily Unavailable.

Service Temporarily Unavailable

The server is temporarily unable to service your request due to maintenance downtime or capacity problems. Please try again later.

IBM_HTTP_Server/7.0.0.25 (Unix) at 9.162.144.27 Port 8443

Typical Http 500



Variations of Http 500 exceptions

- The 500 Internal Server Error message might be seen in any number of ways because each website is allowed to customize the message. Most common format for http 500 exceptions are:
 - "500 Internal Server Error"
 - "HTTP 500 - Internal Server Error"
 - "Internal Server Error"
 - "HTTP 500 Internal Error"
 - "500 Error"
 - "HTTP Error 500"

HTTP 500 – Causes

The http 500 internal server error can be generated at one of the following components:

- a> External web server - due to misconfiguration
- b> Internal web server -due to plugin misconfiguration or because the connection broke between the plugin and webcontainer.
- c> Application server error
- d> Application error (Java error)

Check system integrity

When users receive HTTP 500 error codes and you know the application at the root of the problem, the first thing to check is the integrity of the following system components:

- Web server
- Webserver plug-in
- Application server
- Application

Verify that the application server is started

To verify the health of the hosting application server:

- 1. Determine the server or cluster that hosts the application.
- 2. Check the status of the application server.
- 3. The status of an application can be seen in the administrative console. **Select Applications → Enterprise Applications.**
- 4. Start the application server if it is not running.

Verify that the application is started

- The status of an application can be seen in the administrative console. **Select Applications → Enterprise Applications.**
- A Started status means the application is running
- If not started, select application and click start.
- Make sure application starts up without exceptions thrown in the SystemOut

Example of Normal application startup messages

- A normal Application startup should look something as below

```
ApplicationMg A WSVR0200I: Starting application: [application_name]  
WebContainer A SRVE0161I: IBM WebSphere Application Server - Web  
Container.  
Copyright IBM Corp. 1998-2004  
WebContainer A SRVE0162I: Servlet Specification Level: 2.4  
WebContainer A SRVE0163I: Supported JSP Specification Level: 2.0  
WebGroup A SRVE0169I: Loading Web Module: [web_module_name]  
ApplicationMg A WSVR0221I: Application started: [application_name]
```

Diagnostics/logs

Collect the following diagnostic data:

- Errors displayed by the user browser, including the URL that failed and the timestamp of the request.
- Web server Access log and Debug level Error log
- Trace Level plugin log
- MustGather link
 - ▶ <http://www-01.ibm.com/support/docview.wss?uid=swg21141306>
- If your application is deployed to a cluster, you might need to collect the WebContainer traces logs from each active server in the cluster.

Additional Diagnostics/logs - From Appserver Perspective:

- MustGather: Channel Framework

[http://www-](http://www-01.ibm.com/support/docview.wss?uid=swg21592086)

[01.ibm.com/support/docview.wss?uid=swg21592086](http://www-01.ibm.com/support/docview.wss?uid=swg21592086)

- Trace String (Static trace):
- `*=info:com.ibm.ws.webcontainer*=all:com.ibm.wsspi.webcontainer*=all:HTTPChannel=all:TCPChannel=all:GenericBNF=all`
- TCPChannel trace must be taken statically i.e. with server restart:
- If not taken statically, TCPChannel will not capture “reads”

When does plugin throw Http 500?

- Failed to handle request
- ConnectTimeout on connection to JVM
- ServerIOTimeout marking all Cluster-members down
- MaxConnections Reached for all Cluster members

ConnectTimeout fired.

- It is the time taken for the plugin to establish connection with the backend JVM
- ConnectTimeout not listed or a value of “0” means it is a blocking connect
- ConnectTimeout=”10” means the plugin will wait for 10 seconds for the connection to succeed.
- If no response in 10 seconds, then it will mark that JVM as down
- Request will move to the next in line JVM in cluster until it finds a successful connection in the cluster or
- Throws a failed to handle request.
- Causing Internal Server Error

Thread 0167004e 00000203

- 0167004e 00000203 - TRACE: ws_common: websphereGetStream: Have a connect timeout of 5; Setting socket to not block for the connect
- 0167004e 00000203 - **ERROR: ws_common: websphereGetStream: Connect timeout fired**
- 0167004e 00000203 - TRACE: ws_common: websphereGetStream: socket 12 closed - failed non-blocking connect
- 0167004e 00000203 - **ERROR: ws_common: websphereHandleRequest: Failed to handle request**

ServerIOTimeout

- Simply put, It is the time allotted for the request to complete once a connection the JVM is established.
- Plugin is able to find a route to the Appserver, makes a connection and is waiting for the request to complete successfully.
- If the ServerIOTimeout is not adequately configured to ensure successful request processing, a ServerIOTimeout is fired.
- JVM is marked down if ServerIOTimeout is set -ve

Analysing the plug-in Trace

- From Plugin Log parse all lines containing
- `lib_rio: wait_on_socket: ServerIOTimeout` fired
- Isolate entries based on ThreadID/ProcessID
- Pick out the HTTP/1.1 500 code on the request.
- Match the request with the 500 seen in Accesslog.

Header info from threadID 0000095c

- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: **GET /ToBigToFailBank/changed.login.authenticate.do** HTTP/1.1
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: Host: ToBigToFail.Bank.fantasyland.com
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: Accept-Encoding: gzip, deflate
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: User-Agent: Mozilla/5.0 (iPad; CPU OS 6_0_1 like Mac OS X) AppleWebKit/536.26 (KHTML, like Gecko) Version/6.0 Mobile/10A523 Safari/8536.25
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: Accept-Language: ar
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: X-Forwarded-For: 77.30.XX.94
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: \$WSIS: false
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: \$WSSC: http
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: \$WSPR: HTTP/1.1
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: **\$WSRA: XX.YY.ZZ.99**
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: **\$WSRH: XX.YY.ZZ.99**
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: \$WSSN: ToBigToFail.Bank.fantasyland.com
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: \$WSSP: 80
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: Surrogate-Capability: WS-ESI="ESI/1.0+"
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: _WS_HAPRT_WLMVERSION: -1
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - TRACE: **ws_common: webspHEREExecute: Wrote the request; reading the response**
- [Tue Mar 26 12:46:14 2013] 00000a2c 0000095c - DETAIL: lib_htresponse: htresponseRead: Reading the response: 686b9ac
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: **HTTP/1.1 500 Internal Server Error**
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Content-Type: text/html;charset=ISO-8859-6
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Pragma: no-cache
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Expires: Thu, 01 Jan 1970 00:00:00 GMT
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: \$WSEP:
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Content-Language: en
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Content-Length: 2579
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - TRACE: lib_htresponse: htresponseSetContentLength: Setting the content length |2579|
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: **Set-Cookie: JSESSIONID=0000BlahBigtofailahrtKp5qGwmG:-1; Path=/**
- [Tue Mar 26 12:46:36 2013] 00000a2c 0000095c - DETAIL: Connection: Close

MaxConnections

- is used to gauge when a server is "starting to become overwhelmed".
- By Default the maxConnections is -1. Which means an unlimited number of connections.
- -1 maxConnection setting in a high load environment can overwhelm an Appserver
- ReachedMaxConnectionsLimit 0 or 1 checked on each request.
- MaxConnection does not mark a JVM down
- But is a factor leading to the cluster being marked down.
- Leading to Internal Server Error

Sample plugin-cfg.xml snippet

- ServerCluster CloneSeparatorChange="false" GetDWLMTTable="false" IgnoreAffinityRequests="true" LoadBalance="Round Robin" Name="clusterBB" PostBufferSize="64" PostSizeLimit="-1" RemoveSpecialHeaders="true" RetryInterval="60">
 - <Server CloneID="1795h8v8r" ConnectTimeout="0" ExtendedHandshake="false" LoadBalanceWeight="2" MaxConnections="-1" Name="BigBangNodeA_server1" ServerIOTimeout="0" WaitForContinue="false">
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10200" Protocol="http"/>
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10201" Protocol="https">
 - <Property Name="keyring" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/BBapacheqa1_SSL/plugin-key.kdb"/>
 - <Property Name="stashfile" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/Bapacheqa1_SSL/plugin-key.sth"/>
 - </Transport>
 - </Server>
 - <Server CloneID="1795h5m2c" ConnectTimeout="5" ExtendedHandshake="false" LoadBalanceWeight="2" MaxConnections="-1" Name="BigBangNodeA_server2" ServerIOTimeout="60" WaitForContinue="false">
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10100" Protocol="http"/>
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10101" Protocol="https">
 - <Property Name="keyring" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/BBapacheqa1_SSL/plugin-key.kdb"/>
 - <Property Name="stashfile" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/BBapacheqa1_SSL/plugin-key.sth"/>
 - </Transport>
 - </Server>
 - <Server CloneID="1795hi3jq" ConnectTimeout="5" ExtendedHandshake="false" LoadBalanceWeight="2" MaxConnections="10" Name="BigBang3NodeA_server3" ServerIOTimeout="60" WaitForContinue="false">
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10300" Protocol="http"/>
 - <Transport Hostname="BigBang.courts.judiciary.state.nj.us" Port="10301" Protocol="https">
 - <Property Name="keyring" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/BBapacheqa1_SSL/plugin-key.kdb"/>
 - <Property Name="stashfile" Value="/APACHE/BBwasqa3_SSL_home/Plugins/config/BBapacheqa1_SSL/plugin-key.sth"/>
 - </Transport>
 - </Server>
 - <PrimaryServers>
 - <Server Name="BigBangNodeA_server1"/>
 - <Server Name="BigBangNodeA_server2"/>
 - <Server Name="BigBangNodeA_server3"/>
 - </PrimaryServers>
 - </ServerCluster>

Stripped down ServerCluster stanza

```
ServerCluster Name="clusterBB" RetryInterval="60">  
  <Server CloneID="1795h8v8r" ConnectTimeout="0" MaxConnections="-1"  
Name="BigBangNodeA_server1" ServerIOTimeout="0"  
  </Server>  
  <Server CloneID="1795h5m2c" ConnectTimeout="5" MaxConnections="-1"  
Name="BigBangNodeA_server2" ServerIOTimeout="-60"  
  </Server>  
  <Server CloneID="1795hi3jq" ConnectTimeout="5" MaxConnections="10"  
Name="BigBang3NodeA_server3" ServerIOTimeout="60"  
  </Server>  
  <PrimaryServers>  
    <Server Name="BigBangNodeA_server1"/>  
    <Server Name="BigBangNodeA_server2"/>  
    <Server Name="BigBangNodeA_server3"/>  
  </PrimaryServers>  
</ServerCluster>
```

Failed to Handle request

- [Thu Mar 14 09:51:31 2013] 008300c6 00000203 -
ERROR: ws_common: websphereHandleRequest:
Failed to handle request
- [Thu Mar 14 09:51:31 2013] 008300c6 00000203 -
TRACE: ws_common: websphereCloseConnection

Analyze diagnostics

- The URL that failed
- Where the failure occurred (Web server, plug-in, application server)
- Analyze the diagnostics in the following order:
 - ▶ 1. The browser error display
 - ▶ 2. WebServer Accesslog
 - ▶ 3. Plugin Trace
 - ▶ 4. Appserver log

WebServer Accesslog - LogFormat

- LogFormat variable settings determines the information recorded.
- Tweaking LogFormat settings might be necessary.
- LogFormat "%h %l %u %t \"%r\" %>s %b %{RH}e %{WAS}e
- 9.37.242.147 - - [07/Nov/2006:14:19:59 -0500] "GET /servlet/Silly/ HTTP/1.1" 500 418 (mod_was_ap20_http.c/-2/handler) amadeus.rtp.raleigh.ibm.co:9080
- http://httpd.apache.org/docs/2.2/mod/mod_log_config.html
- %d, %t, %T, %X, modifiers etc.

GSK Errors

- Various GSKit errors in plugin can cause the appservers to be marked down.
- lib_stream: openStream: Failed in r_gsk_secure_soc_init: GSK_ERROR_SOCKET_CLOSED(gsk rc = 420) PARTNER CERTIFICATE DN=CN=jserver,OU=SWG,O=IBM,C=US, Serial=3f:28:2c:f8
- ws_common: websphereGetStream: Could not open stream
- ws_common: websphereExecute: Failed to create the stream
- ws_server: serverSetFailoverStatus: Marking WC_academy_node_server3 down
- This can potentially have a cascading effect and trigger the other criteria for HTTP 500 in case of a single webserver.

GSK err 414

- GSK err 414 which is a bad certificate exception seen in the plugin logs will manifest itself as a HTTP 500 error in the Appserver logs.
- The HTTP 500 in this case will be a JSSE authentication exception at the application level and the application will throw a HTTP 500

500 in JVM logs

Common Cause of a 500 exception - Timeout

- 4 Types of timeout

- Read

- Write

- Persist

- Connect

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JVM Timeouts can come in many flavors

- SRVE0133E: An error occurred while parsing parameters.
- `java.net.SocketTimeoutException`: Async operation timed out
- ▮ SRVE0133E: An error occurred while parsing parameters.
- `java.io.IOException`: SRVE0216E: post body contains less bytes than specified by content-length
- ▮ Just two examples of what a read timeout could look like. The root of the issue is still a `SocketTimeoutException`
- ▮ Most times will look like this:
`java.net.SocketTimeoutException`: Async operation timed out

Verify Web server plug-in is working correctly

- Ensure that the Webserver plug-in was regenerated and propagated to the Web server
- Check other applications on the server
- Access the application directly, bypassing the plug-in.
- Ensure that WebServer and Plug-in are the latest fixpack level.

Debug Web server plug-in problems

- If you can access the application going directly to the application server but not via the webserver, you are most likely experiencing a problem with the Web server plug-in.
- Review the Trace Level http_plugin logs for 500 exception.
- Change timeout or connection values via AdminConsole
- <http://www-01.ibm.com/support/docview.wss?uid=swg21460889>
- Regenerate the plug-in and propagate it to the Web server.
- Restart the Web server or wait for the new configuration to be activated.

Summary

- ▮ From IBM Http Server (IHS):
 - ▮ httpd.conf
 - ▮ error.log
 - access.log
- ▮ From Plug-in: ▮
 - plugin-cfg.xml
 - http_plugin.log <<<< Plug-in trace file
- ▮ From WebSphere Application Server (WAS):
 - SystemOut.log
 - Trace.log (webContainer & Channel Traces)

References:

- LogFormat
- http://httpd.apache.org/docs/2.2/mod/mod_log_config.html
- MUSTGATHER http 500:
- <http://www-01.ibm.com/support/docview.wss?uid=swg21141306>
- Plugin LoadBalancing in a cluster environment
- <http://www-01.ibm.com/support/docview.wss?uid=swg21219567>
- Recommended values for plugin-cfg.xml
- <http://www-01.ibm.com/support/docview.wss?uid=swg21318463>

References

IHS Performance tuning guide

- http://publib.boulder.ibm.com/httserv/ihsdiag/ihs_performance.html

Knowledge Collection – WebSphere Plugin

- <http://www-01.ibm.com/support/docview.wss?uid=swg27021301>

Web container problem determination

- <http://www.redbooks.ibm.com/redpapers/pdfs/redp4309.pdf>

WebSphere 7.0 Infocenter

- <http://pic.dhe.ibm.com/infocenter/wasinfo/v7r0/index.jsp>



Some other WSTEs

- Demystifying the IBM® Web Server Plug-in
- <http://www-01.ibm.com/support/docview.wss?uid=swg27014498>
- Introduction to Mod_Rewrite in IBM HTTP Server
- <https://www-304.ibm.com/support/docview.wss?uid=swg27018905>
- Debugging HTTP 404 Response Code in an IHS/WebSphere Topology
- <http://www-01.ibm.com/support/docview.wss?uid=swg27035752>

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