IBM ITSO Poughkeepsie
OS/390 in an e-business environment

Domino Go Webserver V5 ServletExpress Customization

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WebSphere Strategy

- **Domino Go Webserver 5.0 consists of 3 products**
  - A Web Server
  - A Proxy Server called Web Traffic Express
  - A Java Server called ServletExpress
- **WebSphere Strategy**
  - Short time after DGW 5.0 was GA, IBM announced the WebSphere Strategy
    - See: http://www.software.ibm.com/websphere
- **For OS/390**
  - Web Server for OS/390 will be renamed to IBM HTTP Server
    - Next Version included in OS/390 R7 will be HTTP Server 5.1
  - Java Server is part of the WebSphere Application Server Strategy
    - As a follow on to ServletExpress, WebSphere Application Server 1.0 has been made availabe as a separate program
  - Proxy Server, Web Traffic Express is part of the WebSphere Performance Pack Strategy

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ServletExpress

- **ServletExpress**
  - is the JAVA environment for DGW 5.0
  - Part of DGW 5.0
    - Installed to /usr/lpp/ServletExpress
    - ServletExpress Manager
- **WebSphere Application Server V1**
  - Separate Installable Product
  - Replaces ServletExpress
  - However
    - Domino Go Ca (CAServlet) function not part of WebAS 1.0
    - HTTP Server CA will be part of the Version 5.1 IBM HTTP Server for OS/390 Version 2 Release 7
- **Conclusion:**
  - To run servlets and JSPs, use WebAS
  - To run Domino Go CA, keep ServletExpress

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ServletExpress

- **ServletExpress Customization**

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ServletExpress

- **Httpd.conf configuration directives**
  - Run the SEconfig utility out of `/usr/lpp/ServletExpress/bin`
    - Use superuser authorization to avoid access conflicts
    - `SEconfig /usr/lpp/ServletExpress /web/apple/httpd.conf`
  - SEconfig adds the following directives to httpd.conf

```
ServerInit /usr/lib/libadpter.so:AdapterInit /usr/lpp
-- cont --> /ServletExpress/properties/server/
-- cont --> /ServletExpress/servletservice/jvm.properties
...
Service /*.jhtml     /usr/lib/libadpter.so:AdapterService
Service /*.jsp       /usr/lib/libadpter.so:AdapterService
Service /servlet/*   /usr/lib/libadpter.so:AdapterService
...
Pass /ServletExpress/resources/* /usr/lpp/ServletExpress
-- cont --> /web/resources/en_US/*
Pass /ServletExpress/Docs/*      /usr/lpp/ServletExpress
-- cont --> /system/en_US/admin/*
Pass /ServletExpress/*     /usr/lpp/ServletExpress/web/*
...
ServerTerm /usr/lib/libadpter.so:AdapterExit
```


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- instead of en_US, there could be the Japanese version
- It is possible to copy /usr/lpp/ServletExpress/properties/server/ ServletExpress/servletservice/jvm.properties to your web server root directory like /web/apple/jvm.properties and then change the ServerInit statement accordingly. However if you use the ServletExpress Manager later to manage the ServletExpress configuration, it will refer to the jvm.properties at the "original" directory

ServletExpress

- **SEconfig updates jvm.properties**
  - jvm.properties is located in

```
/usr/lpp/ServletExpress/properties/server/ServletExpress
-- cont --> /servletservice/jvm.properties
```

  - Updated jvm.properties:

```
# @(#)jvm.properties.1.81 97/12/02
#
# Configuration properties for JVM and plugin dll start-up
#

# System Properties
ServletExpressVersion=1.0.0
server.root=/usr/lpp/ServletExpress
server.name=ServletExpress
java.compiler=

# NCF Properties
ncf.service.name=servletservice
ncf.service.class=com.ibm.ServletExpress.service.SEServlet
ncf.plugin.classname=com.ibm.ServletExpress.ServletSystem
```


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- Updated jvm.properties --- cont. :

```
#
# Enable native DLL plugin logging by setting 'ncf.native.logison'
# to 'true'.  Change 'ncf.native.logfile' to the <fully-qualified >
# path of an alternate file location if desired.
#
ncf.native.logison=true
# ncf.native.logfile=/usr/lpp/ServletExpress/logs/native.log
ncf.native.logfile=/web/apple/logs/SE-native.log

#
# Enable JVM logging by setting 'ncf.jvm.stdoutlog.enabled'
# to true. Change 'ncf.jvm.stdoutlog.file' to 'false' to write
# to a Java debugging console or 'true' for output to a log file.
# Change 'ncf.jvm.stdoutlog.filename' to the <fully-qualified >
# path of an alternate file location if desired.
#
ncf.jvm.stdoutlog.enabled=true
ncf.jvm.stdoutlog.file=true
# ncf.jvm.stdoutlog.filename=/usr/lpp/ServletExpress/logs/ncf.log
ncf.jvm.stdoutlog.filename=/web/apple/logs/SE-ncf.log
```


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ServletExpress

- Updated jvm.properties --- cont. :

```
# NCF - Admin Service Properties for BasicNCFConfig Applet
ncf.jvm.classpath=/usr/lpp/ServletExpress/lib/servexp.jar:
-- cont --> /usr/lpp/ServletExpress/lib/jst.jar:
-- cont --> /usr/lpp/ServletExpress/lib/jsdk.jar:
-- cont --> /usr/lpp/ServletExpress/lib/x509v1.jar:
-- cont --> /usr/lpp/ServletExpress/lib:
-- cont --> /usr//usr/lpp/ServletExpress/web/classes:
-- cont --> /usr/lpp/java16/J1.1/lib/classes.zip
ncf.jvm.libpath=/usr/lpp/java16/J1.1/lib:
-- cont --> /usr/lpp/java16/J1.1/lib/mvs/native_threads:
-- cont --> /usr/lib:/usr/lpp/internet/bin
ncf.jvm.path=/usr/lpp/java16/J1.1/bin
ncf.jvm.use.system.classpath=false

# Max Java Heap Size
ncf.jvm.mx=67108864
```


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- For performance reasons make sure that /usr/lpp/java16/J1.1/lib/classes.zip ist the last item in the CLASSPATH statement.

ServletExpress

- Updated jvm.properties --- cont. :

```
#
# Properties for Netscape webserver V2.01 on AIX or SOLARIS
#
#ncf.native.outofproc.runscript=/usr/bin/servlet_eng_runner.sh
#ncf.native.outofproc.port=8090
#ncf.native.outofproc.idstring="servexp"
#ncf.native.outofproc.netscapemime=<netscape_root>/config/mime.types
#
# Properties for Apache webserver on AIX or SOLARIS
#
#ncf.native.apache.outofproc.runscript=
-- cont --> /usr/bin/apache_servlet_eng_runner.sh
#ncf.native.apache.outofproc.port=8082
#ncf.native.apache.outofproc.idstring="apache-servlet-engine"

# Properties for IIS
# ncf.native.iis.extensionloc=/sePlugins/iis20.dll

# Properties for Domino Go
ncf.native.httpd.cnf.path=/web/apple/httpd.conf
```


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- You may comment the properties for the Microsoft web server ...

ServletExpress

- Add the following to jvm.properties:

```
#
# The ncf.jvm.threads.max property is used to increase the number
# of threads that the JVM is allowed to create for threaded
# servlets, chaining servlets or filtering servlets.
# If any of these types of servlets are being executed,
# this property will need to be set to accomodate the
# threading needs.
# ncf.jvm.threads.max=5
ncf.jvm.threads.max=160
```


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- Really performance issue.

ServletExpress

- **ServletExpress Manager Port Number**
  - ServletExpress provides it's own application to manage ServletExpress and the servlets / JSPs etc.
  - Per default the port is 9090 and you need a JAVA enabled browser.
- **If you use the ServletExpress Manager**
  - to manage the ServletExpress configuration, you need to connect it on port 9090. Then you may change it and after restart it'll be another port.
- **Just edit admin_port.properties manually**
  - It is easier to change the port number using a OS/390 editor
    - `/usr/lpp/ServletExpress/properties/server/ServletExpress/adminservice`
    - edit `admin_port.properties`

```
# @(#)admin_port.properties.1.1 97/09/11
# Administration service port for this server
#
#endpoint.main.port=9090
endpoint.main.port=9010
```


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ServletExpress

- **Multiple instances of ServletExpress**
  - We strongly recommend you to install WebSphere Application Server (WebAS) instead of ServletExpress with the one exception:
    - Domino Go CA function for Domino Go Webserver 5.0.
  - Since you would need just one Domino Go CA function, there is no need to set up multiple instances of ServletExpress on the system.
  - We will describe how to set up multiple instances of WebAS later.
  - If you need multiple instances of ServletExpress, then you may follow the description of WebAS and translate them to your needs.

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ServletExpress

- **Start the Web Server to start ServletExpress**
  - During the Web Server startup now the ServletExpress environment will also be initialized.
  - This needs some more resources now and the startup duration will be longer --- much depending on the machine model.
  - Web Server is ready when issuing the Server Ready message

```
IMW3536I SA 1761607710 0.0.0.0:80 * * READY
```


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ServletExpress

Verify a Successful Startup

- Check -vv trace. you will find the following entries:

```
API... Trying to load shared library "/usr/lib/libadpter.so"
ApplEnvFilter... Loading dll "/usr/lib/libadpter.so" due to default
API... Successful loading shared library "/usr/lib/libadpter.so"
API... Trying to get fn pointer "AdapterInit" from module "/usr/lib/libadpter.so

API... Successful getting fn pointer "AdapterInit"
API... Trying to load shared library "/usr/lib/libadpter.so"
ApplEnvFilter... Loading dll "/usr/lib/libadpter.so" due to default
API... Successful loading shared library "/usr/lib/libadpter.so"
API... Trying to get fn pointer "AdapterExit" from module "/usr/lib/libadpter.so

API... Successful getting fn pointer "AdapterExit"
API... Trying to load shared library "/usr/lib/libadpter.so"
ApplEnvFilter... Loading dll "/usr/lib/libadpter.so" due to default
API... Successful loading shared library "/usr/lib/libadpter.so"
API... Trying to get fn pointer "AdapterService" from module

API... Successful getting fn pointer "AdapterService"
API... Trying to load shared library "/usr/lib/libadpter.so"
ApplEnvFilter... Loading dll "/usr/lib/libadpter.so" due to default
API... Successful loading shared library "/usr/lib/libadpter.so"
API... Trying to get fn pointer "AdapterService" from module

API... Successful getting fn pointer "AdapterService"
API... Trying to load shared library "/usr/lib/libadpter.so"
ApplEnvFilter... Loading dll "/usr/lib/libadpter.so" due to default
API... Successful loading shared library "/usr/lib/libadpter.so"
API... Trying to get fn pointer "AdapterService" from module
```


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ServletExpress

Verify a Successful Startup --- cont.

```
APIClassExec Looking up API class "serverinit"
GWAPI: Create a new API data structure
APIClassExec Calling server-init function "AdapterInit"
GWAPI:  HTTPD_extract() called
GWAPI:  HTTPD_extract() args..... name= INIT_STRING ; name size= 11
GWAPI:  HTTPD_extract() args..... buffer= 0x9b58a98 ; buffer size= 1023
GWAPI:  HTTPD_extract()...  Looking up server and CGI variables
GWAPI:  HTTPD_extract()... successful with value= "/web/prod/jvm.properties"
GWAPI:  HTTPD_extract() called
GWAPI:  HTTPD_extract() args..... name= SERVER_SOFTWARE ; name size= 15
GWAPI:  HTTPD_extract() args..... buffer= 0x9e29dc8 ; buffer size= 255
GWAPI:  HTTPD_extract()...  Looking up server and CGI variables
GWAPI:  HTTPD_extract()... successful with value= "Lotus Domino Go Webserver - North
American Edition for OS/390/V5R0M0"
GWAPI:  HTTPD_extract() called
GWAPI:  HTTPD_extract() args..... name= SERVER_NAME ; name size= 11
GWAPI:  HTTPD_extract() args..... buffer= 0x9e29ec8 ; buffer size= 255
GWAPI:  HTTPD_extract()...  Looking up server and CGI variables
GWAPI:  HTTPD_extract()... successful with value= "wtsc58oe.itso.ibm.com"
GWAPI:  HTTPD_extract() called
GWAPI:  HTTPD_extract() args..... name= SERVER_PORT ; name size= 11
GWAPI:  HTTPD_extract() args..... buffer= 0x9b58f68 ; buffer size= 9
GWAPI:  HTTPD_extract()...  Looking up server and CGI variables
GWAPI:  HTTPD_extract()... successful with value= "98"
GWAPI:  HTTPD_log_error() called
GWAPI:  HTTPD_log_error() args..... value= ServletExpress native plugin initalization went
OK :-) ; value size= 54
GWAPI:  HTTPD_log_error()... successful
```


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ServletExpress Manager

- **Access ServletExpress Manager**
  - To access the ServletExpress Manager use a JAVA enabled browser and access your web server on port 9090, or the appropriate port you changed to in admin_port.properties
    `http://www.the-apple.com:9090`
    - Java enabled browser means i.e. Netscape Communicator 4.03 with the JDK 1.1 patch from http://help.netspace.com/filelib.html or a later version
    - MS IE 4.0 or Sun HotJava 1.1 can also be used
  - SE Manager prompts for user ID and password which will be admin/admin for the first time. You may change it then. Password is then stored at
    `/usr/lpp/ServletExpress/realms/data/adminRealm/keyfile`
    - The password is encrypted in that file

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More Hints

- **JAVA Installation**
  - ServletExpress depends on a proper JAVA Installation
  - To retain a "proper" environment for the Web server, make sure that the modules on `/usr/lpp/java16/J1.1/lib/mvs/native_threads` have the extended program-control attribute set.
    - Make sure you are permitted to set the attributes

```
RDEFINE FACILITY BPX.FILEATTR.PROGCTL UACC(NONE)
PERMIT BPX.FILEATTR.PROGCTL CLASS(FACILITY)
ID(TRAUNER) ACCESS(READ)
SETROPTS RACLIST(FACILITY) REFRESH
```

    - Use the OMVS shell, switch to superuser (SU)

```
cd /usr/lpp/java16/J1.1/lib/mvs/native_threads
extattr +p *.*
```

    - Check the attributes

```
ls -E
```


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More Hints

- **Check!**
  - Make sure that the Program Control Flags for the two ServletExpress Modules are set

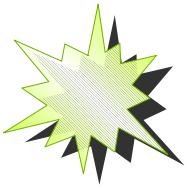
    ```
    /usr/lib/libadpter.so
    /usr/lib/libicsnativ.so
    ```

    - requires RACF access READ to BPX.FILEATTR.PROGCTL in RACF FACILITY class
    - use the ISPF - Shell

      ```
      Option "a" --> Edit --> Extended attributes
      --> Program Control Flag to 1
      ```

    - or the OMVS - Shell

      ```
      extattr +p lib*.so
      ```



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More Hints

- **Check the web**
  - http://www.s390.ibm.com/nc/servlett.html

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