



IBM ITSO Poughkeepsie - the zSeries Redbooks people

WebSphere software

Using & Securing WebApplications in WebSphere SE for z/OS



Holger Wunderlich
wunderl@us.ibm.com

www.redbooks.ibm.com

Copyright IBM Corp 2001



Objectives

- WebApplications in WebSphere SE
 - ▶ WebArchive Overview
 - ▶ Creation of WebApp Archives
 - ▶ Securing WebApplications



www.redbooks.ibm.com

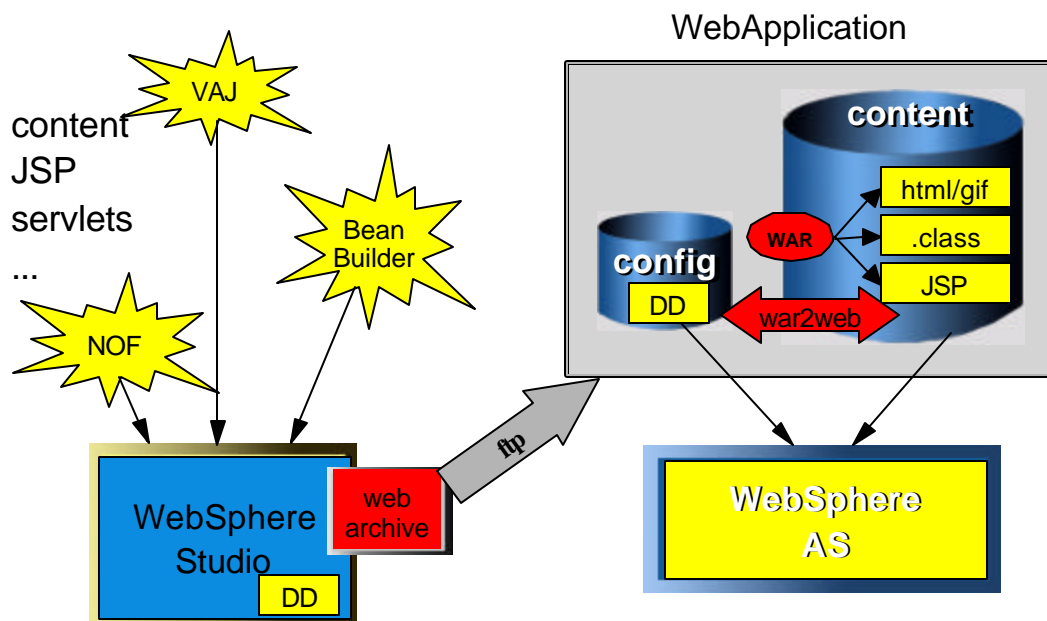
Web Applications

- WebContent & Logic without EJB
- Entity of all content
- Security Entity
- Deployed by a deployer
- Transportable in an WebAppArchive (.war)
- Conform to J2EE Specs



www.redbooks.ibm.com

Concept of WebArchives



www.redbooks.ibm.com

WebArchive Overview / Migration

- WebArchives are stored in .war files
- A .war file contains the WebApplication content (html, gif, jsp, servlet,...)
+ Deployment/Application Descriptor
- Only .war files can be migrated to higher WAS levels
- .war is a proprietary descriptor
- .war is generated using WebSphere Studio

Roles simplified



Programmer	WebMaster	System Admin
Archives Application into WebArchive, resolves DB Mappings, generates .ear	resolves JNDI lookups, deploys application into test server	deploys application in production server
uses WebSphere Studion Workbench & AAT	Uses AAT , SMUI and SMAPI	uses SMAP procedures

Deployment Roles

Who	Programmer: ▶ Graphic artist ▶ Web Programmer ▶ Java Programmer ▶ Enterprise Integrator ▶ Application Architect ▶ Bean Provider ▶ Application Assembler	WebMaster	System Administrator ▶ SysProg ▶ RACF Admin ▶ DB Admin ▶ Storage Manager ▶ Networking Spec ▶ HW Planner ▶ Operation ▶ Change Team
Responsibility (defined by the IT shop)	Content Design, Creation & Integration WebApps	Content Mgmt Change Mgmt Reports/Metrics Test/Prod WAS Deployed WebApps	Infrastructure, SLAs, control & management, planning
Tool	WebSphere Studio WebSphere Application Developer	SMUI, Configuration Files, Commands	Various....SMP/E, RACF, Console, shells, scripts, GUIs...
Deployment Responsibility & Tool	Creation of .war / .ear AAT	Deploy and Migrate SMUI / SMAPI	controlled activation & Fallback SMAPI Batch



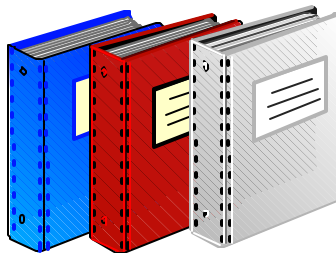
www.redbooks.ibm.com



IBM ITSO Poughkeepsie - the zSeries Redbooks people

WebSphere software

Creating WebApp Archives



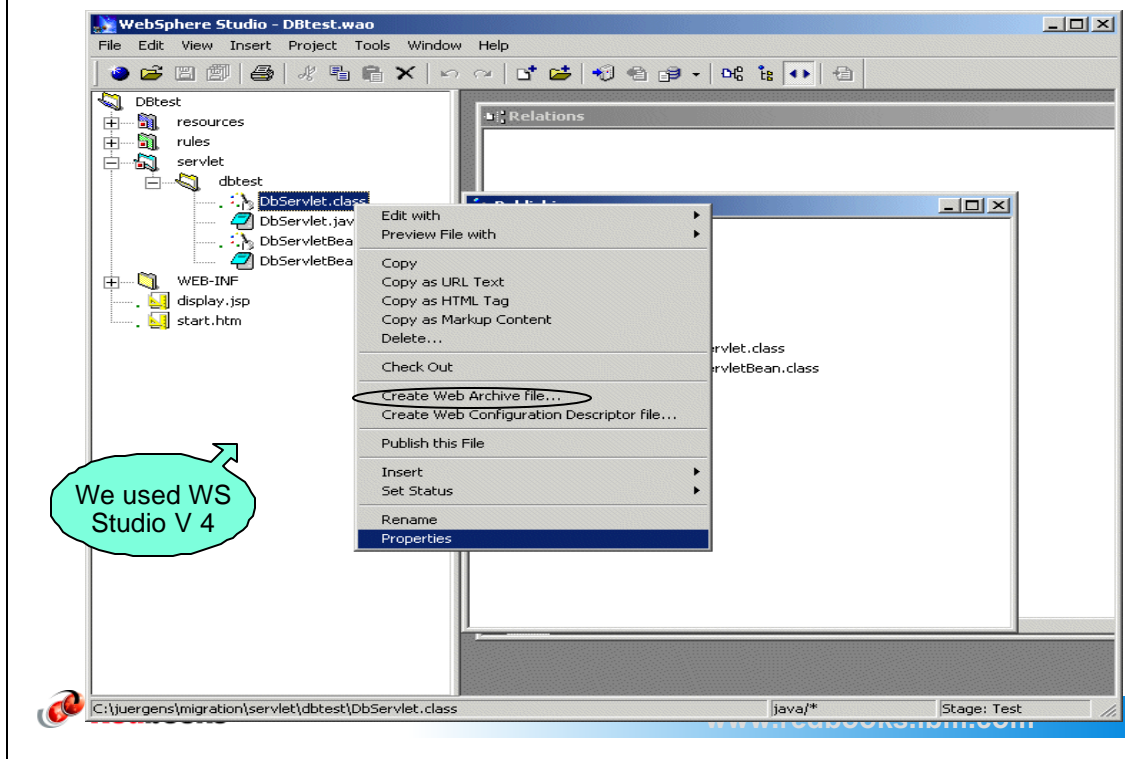
Holger Wunderlich
wunderl@us.ibm.com

www.redbooks.ibm.com

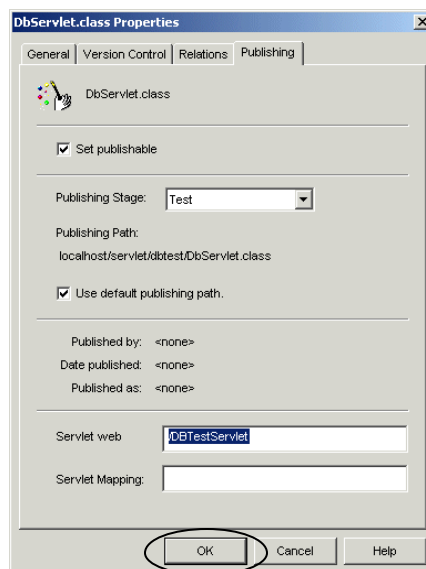
Copyright IBM Corp 2001



Servlet Definitons

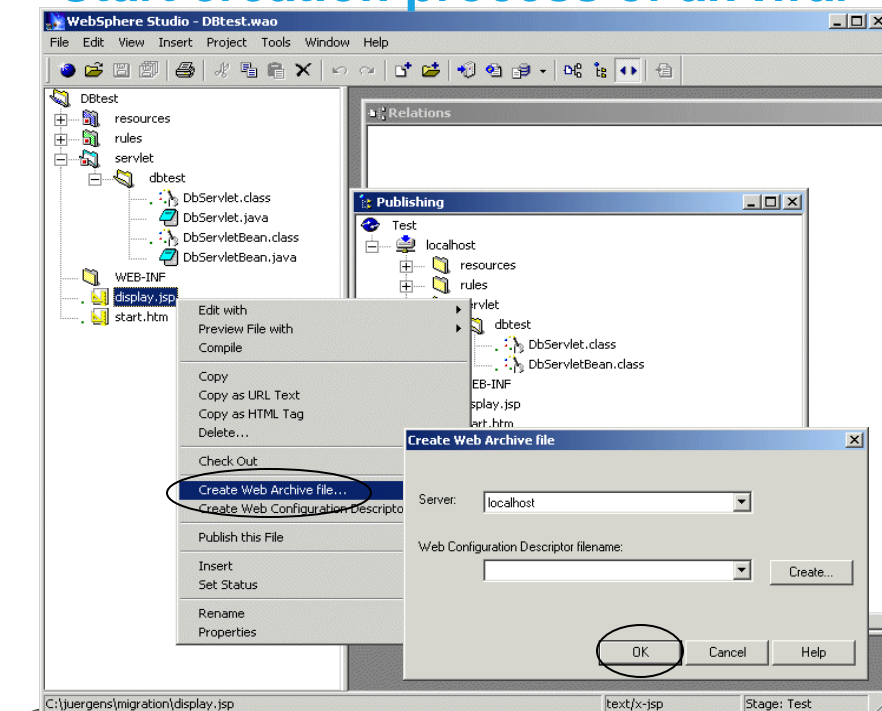


Setting URI for each servlet

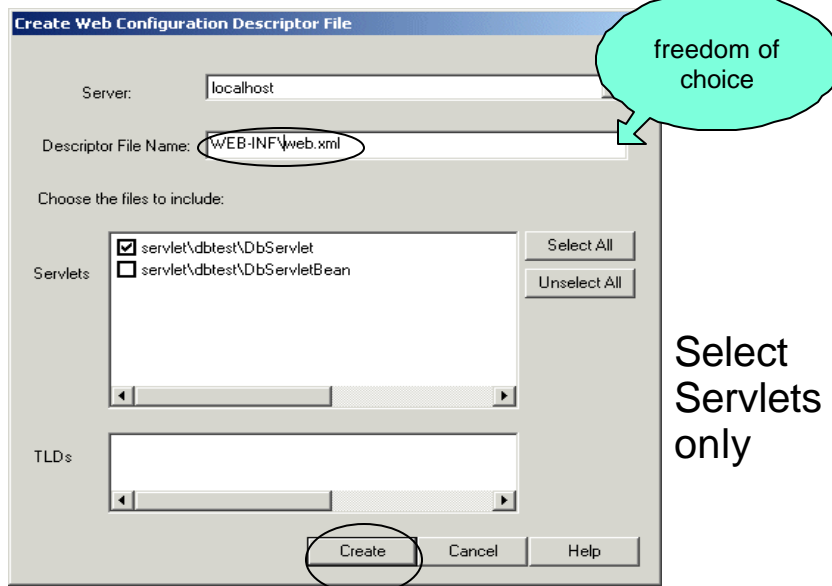


URIs for all the
servlets e.g.
/DBTestServlet

Start creation process of an .war

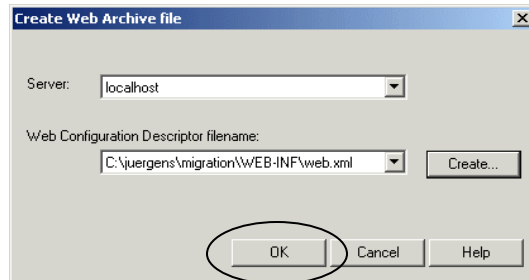


name of deployment descriptor



and here we go

.war file will be created locally and can be transferred (binary) to any target platform for deployment



The Application Descriptor, local

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE web-app PUBLIC "-//Sun Microsystems, Inc.//DTD Web
Application 2.2//EN"
"http://java.sun.com/j2ee/dtds/web-app_2_2.dtd">
<web-app>
<display-name>Dbtest-localhost</display-name>
<servlet>
  <servlet-name>dbtest.DbServlet</servlet-name>
  <servlet-class>dbtest.DbServlet</servlet-class>
</servlet>
<servlet-mapping>
  <servlet-name>dbtest.DbServlet</servlet-name>
  <url-pattern>/DBTestServlet</url-pattern>
</servlet-mapping>
</web-app>
```

► Application contains (amongst other components) servlet-uri

The Deployment Descriptor

- A WebApplication is deployed using **WebApp** and **DeployedWebApp** statements
 - ▶ DeployedWebApp configuration is done by the WebMaster
 - Properties that might change when the application is moved to a different host
 - It describes how the application is deployed to the system
 - ▶ WebApp is generated by the Application Assembler
 - Properties that tend to stay the same even if the application is moved to a different host.
 - Describes the application, URI, Servlet etc.
 - Can be placed in the was.conf or put as a .webapp file in the servlet subdirectory of the deployed application.
 - The WebApp XML description is generated by the deployment tool.
 - ▶ Application Descriptor & Console Input => DDescriptor

wartoweb

- To install a .war file into Version 3.5, a set of conversion tools are provided. The tools convert a WAR file using the following methodology:
 - ▶ Unjar the WAR file.
 - ▶ Create an IBM Web Application directory structure (classpath containing a "servlets" directory and a document root directory called "web")
 - ▶ Copy the contents of the WEB-INF/lib and WEB-INF/classes directories to the "servlets" directory of the IBM Web Application.
 - ▶ Copy the JSP Tag Library .tld files and the remainder of the files in the WAR into the "web" directory of the IBM Web Application.
 - ▶ Transform the information in the web.xml deployment descriptor into a format that is understood by WebSphere: .webapp
 - ▶ Does the codepage conversion

wartoweb

WUNDERL:/web/fish/servlets/war:

```
/usr/lpp/was35/AppServer/bin/wartowebapp.sh localhost.war
```

<

please enter value(s) for the following missing parameter(s):

hfs path	VIRTUAL_HOST_NAME	<null to accept: default_host>
	WEBAPP_NAME	<null to accept: localhost>
content	WEBAPP_DESTINATION	<null to accept: \$was_install_root\$/AppServer/hosts/default_host>
	WEBAPP_PATH	<null to accept: /webapp/localhost>
root uri	/servlets/hellowar	
xalan	WAS_HOME	<null to accept: /usr/lpp/WebSphere/AppServer>
	/usr/lpp/was35/AppServer	
	LOCAL_FILE_ENCODING	<null to accept: en_US.IBM-1047>

parameters in effect:

TEMP_DIRECTORY	/tmp
WAR_FILENAME	localhost.war
VIRTUAL_HOST_NAME	default_host
WEBAPP_NAME	localhost
WEBAPP_DESTINATION	/web/fish/servlets/
WEBAPP_AUTO_RELOAD_INTERVAL	0
WEBAPP_PATH	/servlets/hellowar
WAS_HOME	/usr/lpp/was35/AppServer
LOCAL_FILE_ENCODING	en_US.IBM-1047

localhost/servlet/
/web

NOTE:
Have Java in
your \$PATH



www.redbooks.ibm.com

war2web

```
unpack.war:
[unzip] Expanding: /web/fish/servlets/war/localhost.war into /tmp/localhost
copyto.webapp:
[mkdir] Created dir: /web/fish/servlets/localhost
[mkdir] Created dir: /web/fish/servlets/localhost/web
[mkdir] Created dir: /web/fish/servlets/localhost/web/WEB-INF
[mkdir] Created dir: /web/fish/servlets/localhost/servlets
[copydir] Copying 1 files to /web/fish/servlets/localhost/web
[copydir] Copying 1 files to /web/fish/servlets/localhost/web/WEB-INF
copy.war.classes:
[copydir] Copying 1 files to /web/fish/servlets/localhost/servlets
copy.war.lib:
copy.war.tld:
transform.to.webapp:
[deltree] Deleting: /tmp/localhost
BUILD SUCCESSFUL

Total time: 7 seconds

iconv -f ISO8859-1 -t IBM-1047 /web/fish/servlets/localhost/servlets/localhost.webapp >
/tmp/wartowebapp-convert-work
sed -n -f /tmp/wartowebapp-escape-work /tmp/wartowebapp-convert-work >
/web/fish/servlets/localhost/servlets/localhost.webapp
```



www.redbooks.ibm.com

war2web

```
created '/web/fish/servlets/localhost/was.conf.updates' containing:

#
## webapp: localhost
#
deployedwebapp.localhost.host=default_host
deployedwebapp.localhost.rooturi=/servlets/hellowar
deployedwebapp.localhost.classpath=/web/fish/servlets/localhost/servlets
deployedwebapp.localhost.documentroot=/web/fish/servlets/localhost/web
deployedwebapp.localhost.autoreloadinterval=0

please merge the contents of
'/web/fish/servlets/localhost/was.conf.updates'
into '/usr/lpp/was35/AppServer/properties/was.conf' to deploy the web
application: localhost
```



www.redbooks.ibm.com

.war

Servlet and XML description are placed into HFS

```
/web/fish/servlets/localhost/servlets/
Select one or more files with / or action codes.

Type Perm Changed (GMT) Owner Size Filename
_ Dir 755 07/10/2001 18:55 STC 8192 .
_ Dir 755 07/10/2001 18:55 STC 8192 ..
_ File 644 07/10/2001 18:55 STC 1082 HelloWorldServlet.class
_ File 644 07/10/2001 18:55 STC 1063 localhost.webapp
```

Now merge

/web/fish/servlets/localhost/was.conf.updates
with your was.conf and restart the server



www.redbooks.ibm.com

DD, Directory Structure, Result

```
EDIT      localhost.webapp
*****
000001    <?xml version="1.0"?>
000002    <webapp>
000003        <name>localhost</name>
000004        <servlet>
000005            <name>HelloWorldServlet</name>
000006            <code>HelloWorldServlet</code>
000007            <servlet-path>/</servlet-path>
000008        </servlet>
000009    </webapp>
*****
```

check WebApp
name



www.redbooks.ibm.com

JDBCsample.webapp

```
<?xml version="1.0"?>
<webapp>
  <name>JDBCsample</name>
  <servlet>
    <name>dbtest.DbServlet</name>
    <code>dbtest.DbServlet</code>
    <servlet-path>/DBTestServlet</servlet-path>
  </servlet>
  <servlet>
    <name>jsp11</name>
    <description>JSP 1.1 support servlet</description>
    <code>org.apache.jasper.runtime.JspServlet</code>
    <servlet-path>*.jsp</servlet-path>
    <servlet-path>*.jspx</servlet-path>
    <servlet-path>*.jsw</servlet-path>
    <autostart>true</autostart>
  </servlet>
  <servlet>
    <name>file</name>
    <description>File Serving servlet</description>
    <code>com.ibm.servlet.engine.webapp.SimpleFileServlet</code>
    <servlet-path>/</servlet-path>
    <autostart>true</autostart>
  </servlet>
  <servlet>
    <name>ErrorReporter</name>
    <description>Default error reporter servlet</description>
    <code>com.ibm.servlet.engine.webapp.DefaultErrorReporter</code>
    <servlet-path>/ErrorReporter</servlet-path>
    <autostart>true</autostart>
  </servlet>
</webapp>
```

After making changes to the .webapp
configuration file you have to restart
the Application Server.



www.redbooks.ibm.com

weird messages in NCF.LOG

EJS3017E IBM WebSphere Application Server for OS390 native plugin initialization failed :-(

Check NCF Log:

Oct 16, 2001 16:20:24.633 PM Thread-1 WebGroup

X Servlet Exception: Missing Resource: {0}

"/JDBCSample.webapp"

Oct 16, 2001 16:20:24.635 PM Thread-1 WebGroup

X Servlet Exception: Could not load Web Application {0}

"JDBCSample"

javax.servlet.ServletException: Servlet Exception: Missing Resource:
/JDBCSample.webapp

Check Again the WebApp Name in .webapp !



www.redbooks.ibm.com



IBM ITSO Poughkeepsie - the zSeries Redbooks people

WebSphere software

Controlling WebApplications with OS/390 Security Server



Holger Wunderlich
wunderl@us.ibm.com

www.redbooks.ibm.com

Copyright IBM Corp 2001



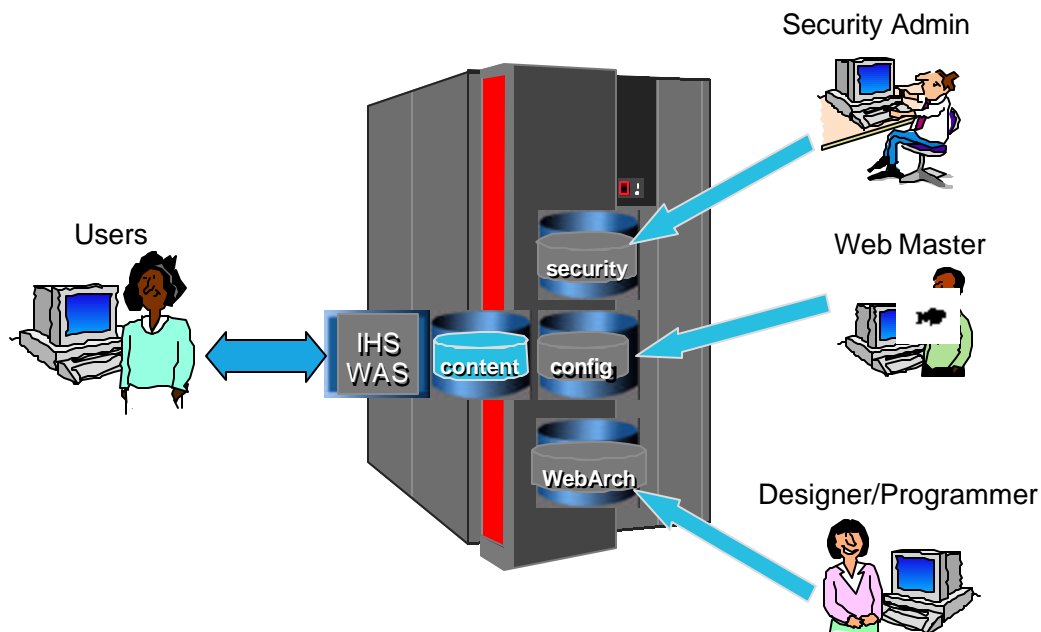
what is SOMDOBJs

- Resource class created to control the client's ability to invoke a method in a class. With WebSphere AS SE 3.02 you can control the access to WebApps.
- Objects (WebApplications) can be grouped in GSOMDOB
- For good performance SOMDOBJs should be racelisted
- SOMDOBJs will be superseded by EJBROLES for WebApps in WAS 4.0 and higher
- The new eBusiness Cookbook (1Q 2002) will describe the migration of WebApps from WAS SE to WAS 4 WebContainer
- Check also the WAS 4.01 Migration Guide



www.redbooks.ibm.com

Clear Roles



www.redbooks.ibm.com

define protection in was.conf 3.02

```
=====
#   protecting the world when in fishpool (using RACF)
#   =====
host.FishProtHost.alias=www.fish.com:9876
deployedwebapp.FishProt.host=FishProtHost

deployedwebapp.FishProtAppl.authresource.FishProtMapping=/HeWos
deployedwebapp.FishProtAppl.authresource.FishProtMapping=/HeWos/*
deployedwebapp.FishProtAppl.rooturi=/servlet
deployedwebapp.FishProtAppl.classpath=/web/fish/servlets
deployedwebapp.FishProtAppl.documentroot=/web/fish/samples
webapp.FishProtAppl.servlet.HelloWorld.code=HelloWorldServlet
webapp.FishProtAppl.servlet.HelloWorld.servletmapping=/HeWos
```

WAS 3.02

WAS 3.5

The resulting RACF profile will be:

```
<virtual-hostname>.<webapp-name>.<resource-name>
FISHPROTHOST.FISHPROTAPPL.FISHPROTMAPPING
```



www.redbooks.ibm.com

define SOMDOBJs

```
setr classact (sombobj)
setr raclist (sombobj)
setr generic (sombobj)
rdef sombobj
(FISHPROTHOST.FISHPROTAPPL.FISHPROTMAPPING)
    owner(sys1) uacc(none)
setr raclist (sombobj) refresh
setr generic (*) refresh

rdef sombobj (default_host.FISHPROTAPPL.*) uacc(none)
```



www.redbooks.ibm.com

grant access

```
PERMIT  
FISHPROTHOST.FISHPROTAPPL.FISHPROTMAPPING +  
CL(SOMDOBJs) ACC(R) ID(WUNDERL) +
```

```
SETR RACLISr (SOMDOBJs) REFRESH  
SETR GENERIC (*) REFRESH
```

<virtual-hostname>.<webapp-name>.<resource-name>



www.redbooks.ibm.com

Access rights to SOMDOBJs

grants access to http methods !

access(read)	-	http	get
access(update)	-	httpd	put
access(alter)	-	httpd	delete



www.redbooks.ibm.com

Enforce authentication using protection setup in httpd.conf

```
Protection ProtFish {  
    ServerId          RACFPLEX  
    AuthType          Basic  
    PasswdFile        %%SAF%%  
    GET-Mask          anybody  
}  
Protect /servlet/* ProtFish %%CLIENT%% WWW.FISH.COM  
Service /servlet/*  
/usr/lpp/was302a/AppServer/bin/was302plugin.so:service_exit
```

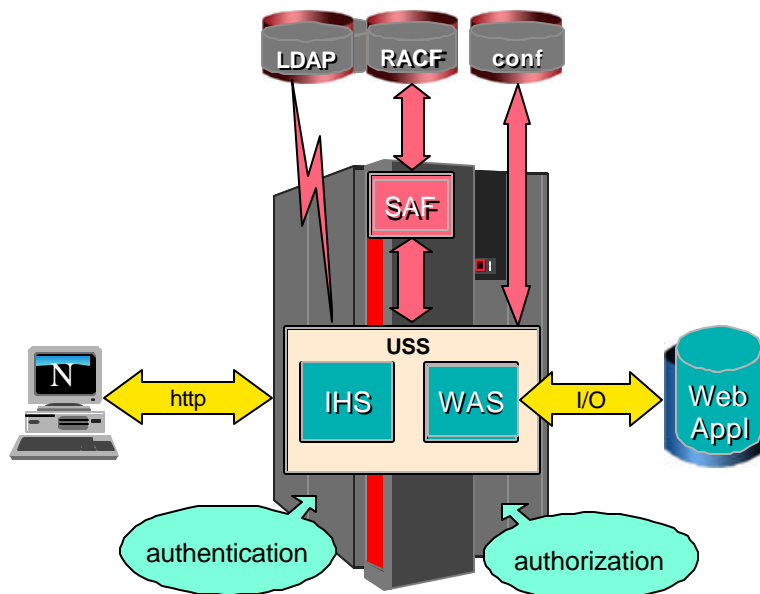
Now restart the server and access the application using another hostname (same IP)
eg:

<http://www.fish.com:9876/servlet/HeWos>



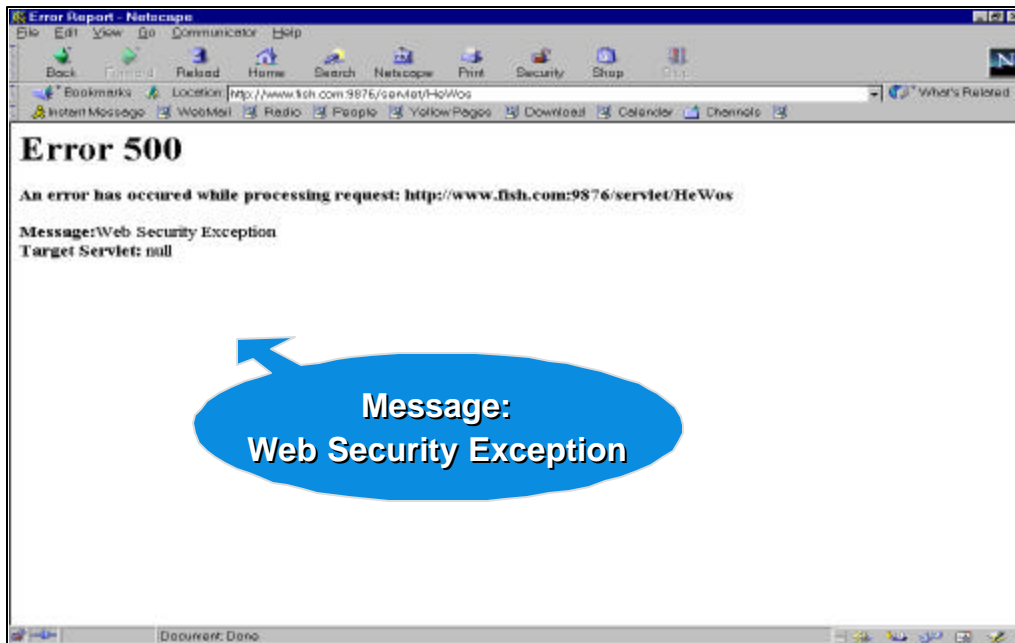
www.redbooks.ibm.com

WebApplication Security



www.redbooks.ibm.com

not permitted ?



What's in the log ?

```
ICH408I USER(PUBLIC) GROUP(OMVSGRP) NAME(WEBSRV PUBLIC)
FISHPROTHOST.FISHPROTAPPL.FISHPROTMAPPING CL(SOMDOBJs)
INSUFFICIENT ACCESS AUTHORITY
FROM *.* (G)
ACCESS INTENT(READ ) ACCESS ALLOWED(NONE )
```



WebSphere[®] software

Appendix

- Converting J2EE DDs to .webapp
- wartoweb considerations

Holger Wunderlich
wunderl@us.ibm.com

www.redbooks.ibm.com

Copyright IBM Corp 2001



Converting J2EE WEB.XML to WebSphere .WEBAPP

VisualAge for Java's (VAJ) WebSphere Test Environment (WTE) has an application descriptor strategy that varies from the web.xml file of J2EE Servlet 2.2 API's web.xml.

There is a way, however, to convert web.xml files to WTE's .webapp file. What you need is an Extensible Stylesheet Language (XSL) file that knows how to output the WTE format from web.xml. That XSL file is available under your WTE properties directory:

D:\IBM\Java\ide\project_resources\IBM WebSphere Test Environment\properties\webapp.xsl



Converting J2EE WEB.XML to WebSphere .WEBAPP

You'll need a style sheet processor such as Apache's Xalan from <http://jakarta.apache.org> . To perform the conversion, run Xalan's Process class and qualify the XSL file and a temporary directory for the .webapp file:

```
java
-cp D:\where\ever\xalan.jar;D:\where\ever\xerces.jar org.apache.xalan.xslt.Process
-IN D:\where\ever\web.xml
-xsl "D:\IBM\Java\ide\project_resources\IBM WebSphere Test Environment\properties\webapp.xsl"
-out D:\temp\struts-example.webapp
The resulting .webapp file still needs to be modified slightly. After the servlet and name tag, add
the following:
```

```
<servlet><name>jsp11</name>
<init-parameter>
  <name>jspemEnabled</name>
  <value>true</value>
</init-parameter>
```

Once you've modified the .webapp file, put it your Web application's servlet test directory:

D:\IBM\Java\ide\project_resources\IBM WebSphere Test Environment
\hosts\default_hosts\YourWebApp\servlet



www.redbooks.ibm.com

war2web considerations

note: there must be an index.html. this file has to be in ebcdic.

Note: DO NOT run the wartowebapp.sh program against .war files containing JSP 0.91 or 1.0 files.

Note: With the exception of the .webapp file and .servlet files, XML content in the Web Application generated by

\$server_root\$/AppServer/bin/wartowebapp.sh is NOT converted to the file encoding of the local OS/390 machine. This is likely to be a problem since most XML content found in a .war file is probably encoded using codepage ISO8859-1 and the WebSphere Application Server Version 3.5 expects XML content to be encoded in the native file encoding of the OS/390 machine. The following three step process can be used to convert all XML content

from codepage ISO8859-1 to codepage IBM-1047. From the Unix System Services command line, enter the following 3 commands:

```
echo "iconv -f ISO8859-1 -t IBM-1047 \"$*">/tmp/convert-work;
cat /tmp/convert-work >\"$*">/tmp/convert-script
chmod 755 /tmp/convert-script
find /u/joe/webapps/MyWebApp -name '*.xml'-exec /tmp/convert-script {};
```



www.redbooks.ibm.com