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**WebSphere** software

# Practical Hints & Tips for WebSphere SE on z/OS

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## Objectives

- WebSphere Application Server Overview
- Many hints & tips
  - Quick migrate from WAS 3.02 to WAS 3.5
  - Compiling Servlets for WAS 3.5
  - ...
- Microsoft Active Server Pages
- Linux & WAS



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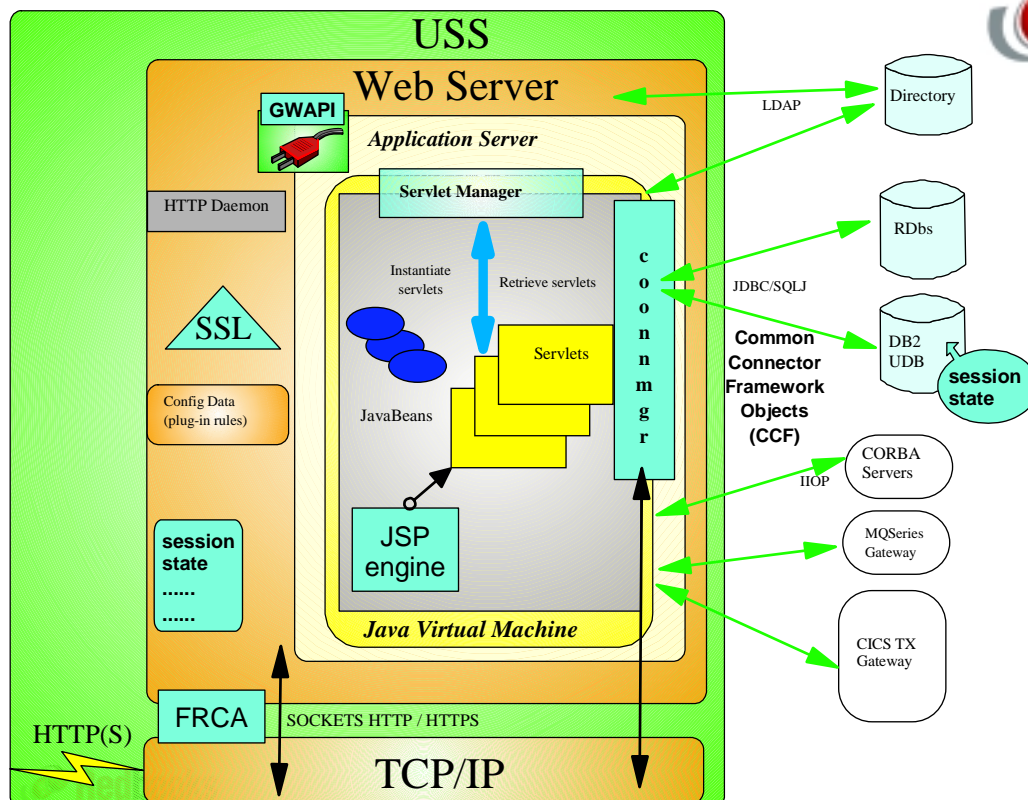
## WebSphere zSeries Specs & availability

WAS Version	Servlet	JSP	EJB	Java	Comment
WAS 1.2	2.01	0.91	-	1.1.8	download until march 2001 - support ends march 2002
WAS 3.02 SE	2.1	0.91&1.0	-	1.1.8	fee feature until march 2001 - support ends march 2002
WAS 3.02 EE	2.1	0.91&1.0	1.0	1.1.8	fee feature until march 2001 - support ends march 2002
WAS 3.5 SE	2.1	0.91&1.0	-	1.3	Available, tentative EOS 4Q 2002
WAS 3.5 SE FP 2.2		1.1	-	1.3	Available, tentative EOS 4Q 2002
WAS 3.5 AE	2.1.1	1.1	1.0	1.2.2	Available
WAS 4	2.2	1.1	1.1	1.3	Available
WAS 4.01	2.2	1.1	1.1	1.3	10/2001



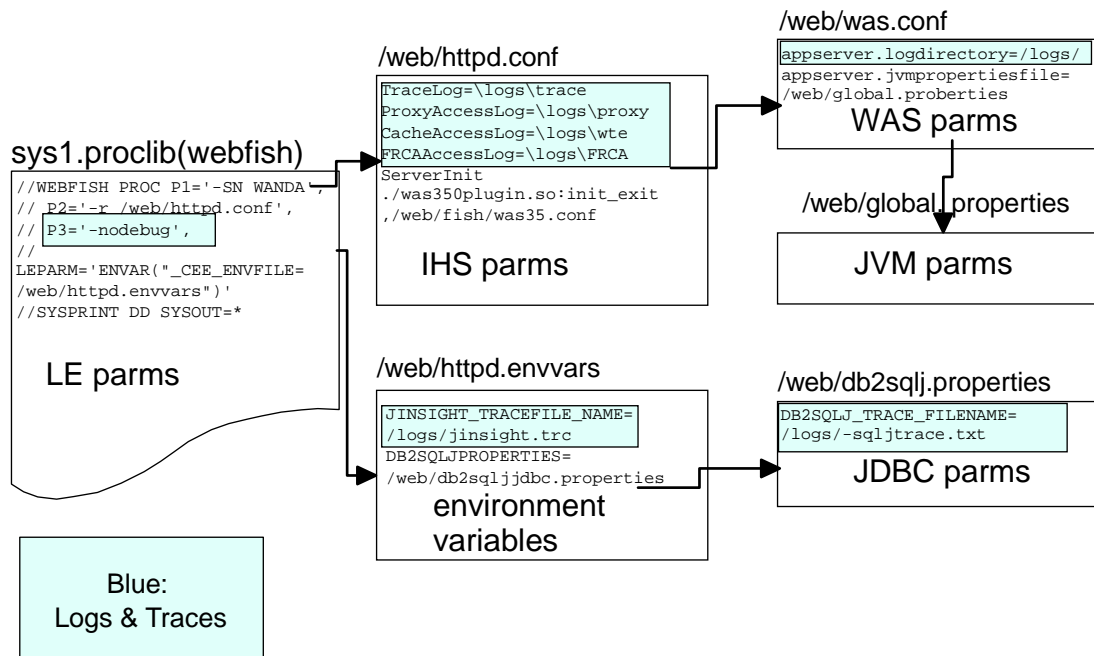
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## Overview WAS 3.n SE z/OS





# Configuration Overview WAS 3.5 Standard Edition



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## The little hints

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## Application Server Migration WAS 3.02 -> 3.5

- install was 3.5 under /usr/lpp/was35
- Change Path in
  - ▶ ServerInit /usr/lpp/was35/AppServer/bin/...
  - ▶ ServerTerm /usr/lpp/was35/AppServer/bin/...
  - ▶ Service /webapp/examples/.jsp /usr/lpp/...
- Change plugin name
  - ▶ was302plugin to was350plugin.so
- edit was.conf (best to copy sample was.conf)
  - ▶ appserver.version=3.50
  - ▶ appserver.usesystemclasspath=false
- edit httpd.envvars
  - ▶ update JAVAHOME to /usr/lpp/java2/lib
  - ▶ add NLSPATH /usr/lpp/was35/AppServer/msg/%L/%N
  - ▶ comment CLASSPATH
- JDBC, rebind, check PQ36011, JDBC Type 2 usually not a problem, old APIs mapped
- Restart WebServer and test your applications

Migration:  
WAS 3.02 and WAS  
3.5 can coexist !  
For application  
migration issues check:  
*WebSphere Application  
Server 3.5 Planning,  
Installation & Usage*



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## compiling servlets for WAS 3.5

echo \$CLASSPATH

```
./:  
/usr/lpp/java/IBM/J1.3/lib/tools.jar:  
/usr/lpp/WebSphere/AppServer/lib/servlet.jar:  
/usr/lpp/db2/db2510/classes/db2jdbcclasses.zip:  
/usr/lpp/WebSphere/AppServer/lib/ibmwebas.jar
```

**javac HelloWorldServlet.java**

Additional classes that are commonly used:

Data access beans	<b>databeans.jar</b>
XML and XSL APIs	<b>xml4j.jar</b> and <b>lotusxsl.jar</b>



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## WAS 3.5 does not start

NullPointerException .at  
java.util.TimeZone.getTimeZone(TimeZone.java:322).

Wrong:

httpd.envvars: USS like TZ=MEZ-1MESZ,3.5.0

Right:

TZ=ECT or CET

(no java syntax, will be converted automatically into  
MEZ... MEZ isn't a valid TZ)



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## Get rid of another superuser

**PQ41777:** Customers would like to run the WebServer without using USS user ID 0, but many WebServer functions require user ID 0 to operate correctly. This APAR explains the SAF (RACF or other security facility) requirements for running without user ID 0, both before and after application of this APAR, and modifies code to allow all the capabilities of the WebServer even when not using user ID 0. Modifications include creation of inter process communications, shared memory, and setting of resource limits (CPU time, address space size, and number of files). Capabilities affected by this APAR are FRCA, scalable mode, and FCGL. MVS APAR OW45077 also changes RACF requirements for the WebServer.

z/OS security even if somebody gets  
access to your httpd.conf (%SERVER%) !



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## Now really running PUBLIC

- ▶ create an non 0 UID or change WEBSRV's OMVS segment
- ▶ permit to BPX.SERVER and BPX.DAEMON daemon
- ▶ permit to BPX.SRV.PUBLIC, WEBADM ...
- ▶ permit to BPX.WLMSEVER
- ▶ permit to BPX.SMF
- ▶ change the ownership / access rights of
  - httpd.conf
  - httpd.envvars
  - httpd.pid
  - content directories

restart & run

(sometimes problems with IPCS in USS  
when in scalable mode, just cleanup)



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## Support for the newest XML APIs

WebSphere Application Server Version 3.5 officially supports XML4J API 2.0.15.

Current Apache Xerces and Xalan versions of the APIs

IBM XML4J and LotusXSL API can be downloaded from the Apache website.

- ▶ Class files have to be exchanged
- ▶ Compatible and usually works
- ▶ **No IBM support !**
- ▶ Use in a test environment only ! (What happens when a PTF 'upgrades' WAS ?)

Lotusxsl-j version 2.2 and XML4J 3.2.1 are available in the new version (1.3) of the XML Toolkit for z/OS and OS/390.  
[www.ibm.com/servers/eserver/zseries/software/xml](http://www.ibm.com/servers/eserver/zseries/software/xml)



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## Global Application Properties

The syntax used for setting system properties in the WAS is  
`appserver.java.system.property=<propertyname>=<propertyvalue>`

For example:

To set MODE we have the following entries in was.conf

```
appserver.java.system.property=MODE=PROD
```

```
appserver.java.system.property=MODE=TEST
```

This can be accessed from Java using the following syntax:

```
System.getProperty("MODE");
```



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## The ClassLoader

- ▶ The ClassLoader for WAS 3.02 and higher finds automatically all classes hidden in .jar and .zip files
  - ▶ Avoids typing and errors
  - ▶ You don't have to define them explicitly
- `deployedwebapp.localhost.classpath=/web/myjarfiles`**

### Note:

The according JVM parameter for this function would be:

**`-Djava.ext.dirs=<DIRECTORY>`**

resulting that all JAVA archives placed in <DIRECTORY> are to be searched.



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# Sharing httpd.conf without shared HFS

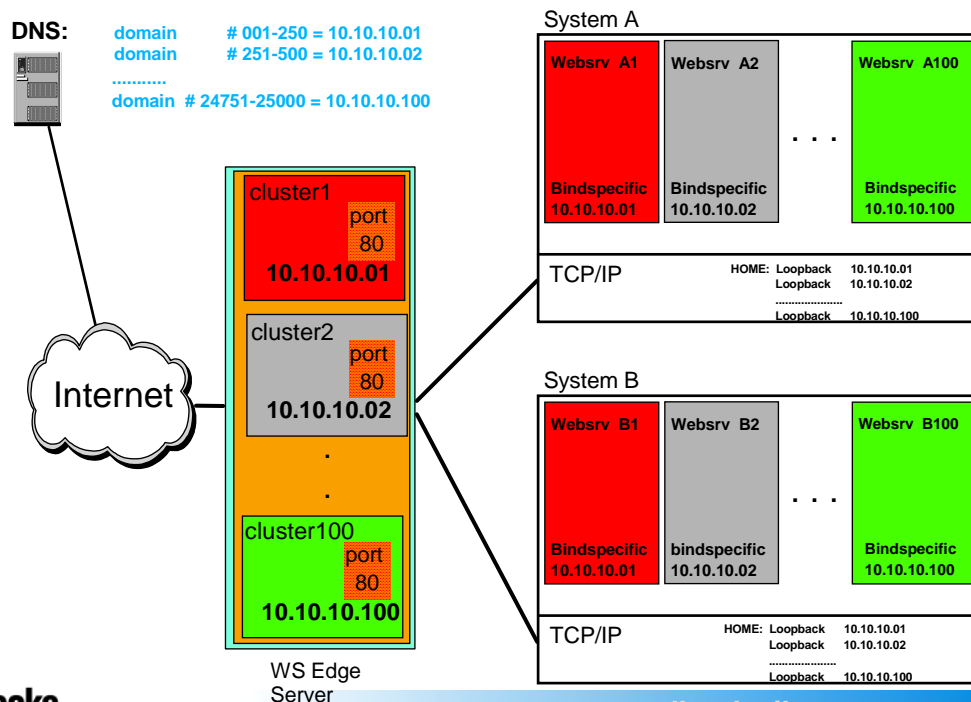
```
//WWQM01 PROC LEPARM='ENVAR("_CEE_ENVFILE=DD:WENV")',  
//      ICS Parm='-SN QM01 -B -r //DD:WCONF'  
//      SET QM='WWQM01'  
//-----  
//*      QUEUE MANAGER  
//-----  
//WEBSRV EXEC PGM=IMWHTTPD,REGION=0K,TIME=NOLIMIT,  
//      PARM=('&LEPARM/&ICS Parm')  
//WENV DD DISP=SHR,DSN=SYS1.WEB.HTTPD.ENNVARS(&QM)  
//WCONF DD DISP=SHR,DSN=SYS1.WEB.HTTPD.CONFALL(&QM)  
//      DD DISP=SHR,DSN=SYS1.WEB.HTTPD.CONFSRV(&QM)  
//OUTDSC DD SYSOUT=*...  
...
```

- Management, security, concatenation...
- Trigger reporting (htlogrep) manually
- Be aware of the pidfile and (maybe) IP bindings
- IBM support ?



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## multiple Servers and EdgeServer



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## Much-toooo-much tracing

WAS.CONF

WebSphere trace-options

"appserver.tracelevel=\*all=enabled" and

"Service.plugin.tracelevel=MOST".

```
{ appserver.tracelevel=*debug=enabled
  appserver.tracelevel=com.ibm.servlet.jsp.*all=enabled
  appserver.tracelevel=com.sun.jsp.*all=enabled
  appserver.tracelevel=javax.servlet.jsp.*all=enabled }
```



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## Can you read this ?

```
"/docs/asp/samples/vbscript/general/helloworld/helloworld.asp"
Oct 24, 2001 20:50:32.227 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] SRTSessionAPI D decodeURL :
requested url = /docs/asp/samples/vbscript/general/helloworld/helloworld.asp
Oct 24, 2001 20:50:32.228 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] SessionContext > SessionContext.getSessionCookieName
Oct 24, 2001 20:50:32.229 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] SRTSessionAPI D decodeURL : encoded URL cookie name = ;FishCake=
Oct 24, 2001 20:50:32.230 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] SRTSessionAPI D decodeURL : target url was not encoded
Oct 24, 2001 20:50:32.230 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] SRTSessionAPI < decodeURL
Oct 24, 2001 20:50:32.287 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] NLS > NLS, com.ibm.servlet.resources.ServletEngineNLS
Oct 24, 2001 20:50:32.287 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] NLS E Using cached bundle for com.ibm.servlet.resources.ServletEngineNLS
Oct 24, 2001 20:50:32.291 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] NLS E NLS using Locale en_US
Oct 24, 2001 20:50:32.308 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] WebAppRequest > WebAppRequestDispatcherInfo.calculateInfo()
String Matcher Table:
=====
/IBMDDefaultErrorReporter/* --> ErrorReporter
*.asp --> halcyonBasic Rules Regular Exp Pool:
=====
Regexp pool:
Suffix machine: psa.
Prefix machine: /IBMDDefaultErrorReporter/
Oct 24, 2001 20:50:32.345 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] ServletManage > isLoadedServlet
"halcyon"
Oct 24, 2001 20:50:32.346 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] ServletManage < isLoadedServlet - false
Oct 24, 2001 20:50:32.347 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] ServletManage > isLoadedServlet
"halcyon"
Oct 24, 2001 20:50:32.349 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] ServletManage < isLoadedServlet - false
Oct 24, 2001 20:50:32.350 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] WebAppServlet > loadServlet
"halcyon"
Oct 24, 2001 20:50:32.351 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] WebAppServlet E Instantiating Servlet Class: {}
"Dispatcher.DispatcherServlet"
Oct 24, 2001 20:50:32.357 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] ClassLoaderTe > getResourceAsStream
"Dispatcher/DispatcherServlet.ser"
Oct 24, 2001 20:50:32.362 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] DynamicClassL > getNonSystemResourceAsStream
"Dispatcher/DispatcherServlet.ser"
ad-3.5 getResource
"Dispatcher/DispatcherServlet.ser"
Oct 24, 2001 20:50:32.382 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] JarFileClassP > hasResource
"Dispatcher/DispatcherServlet.ser"
Oct 24, 2001 20:50:32.383 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] JarFileClassP < hasResource
Oct 24, 2001 20:50:32.384 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] JarFileClassP < getResource - null
Oct 24, 2001 20:50:32.385 PM 2f02b318:2:290001:3:Thread[Thread-3,5,main] JarFileClassP > getResource
```



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## Activation of MS ASP support on WebSphere 3.02 & 3.5

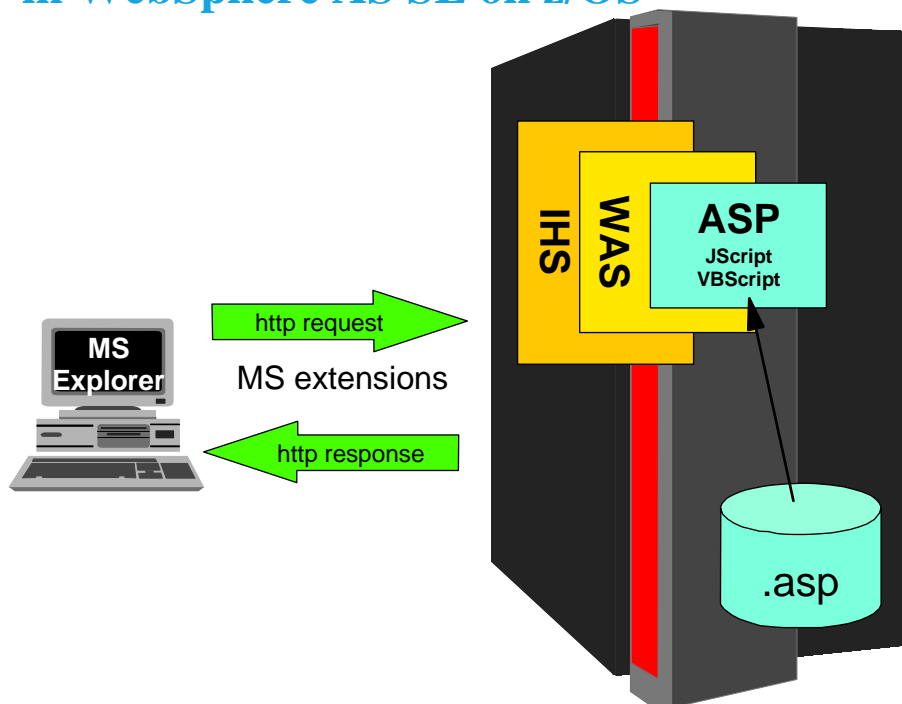
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### Microsoft Active Server Pages in WebSphere AS SE on z/OS





## Install iASP 2.0

- get code from
- <http://www.halcyonsoft.com/> , register,
- generate license key on the WebSite using the IP Address of your server
- [ftp://www.halcyonsoft.com/iasp/downloads/20/iASP\\_2.0\\_Unix.tar.gz](ftp://www.halcyonsoft.com/iasp/downloads/20/iASP_2.0_Unix.tar.gz)
- Use winzip on the pc to generate .tar, .sh & README
- xfer iasp20.tar in binary, the rest in text mode into your hfs
- unwind it: ***tar -xzvf iasp\****
- adjust ownership ***chown -R admin:admgrp /web/fish/iasp/iasp20***
- allow install script to run: ***chmod 111 install.sh***
- run install script: ***install.sh*** in superuser mode
  - ▶ point to your current 1.2 JVM /usr/lpp/java213/IBM/J1.3/bin/
  - ▶ point to the asp runtime directory (eg /web/fish/iasp20)
  - ▶ Dont run the automatic webserver configuration
- adjust ownership ***chown -R public:pubgrp /web/fish/iasp20***



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## install iASP 2.0

- Add the following lines to httpd.conf

```
# serves htm in binary
AddType .html text/html ebcdic 1.0 # HTML
AddType .htm text/html binary 1.0 # HTML
# Route ASP request to WebSphere
Service /*.asp
    /usr/lpp/was302a/AppServer/bin/was350plugin.so:service_exit
# Make iASP samples accessible via virtual directory /iasp/
Pass /iasp/* /web/fish/iasp20/*
```

- Edit WAS.CONF

```
appserver.libpath=...:/web/fish/iasp20/lib
appserver.classpath=...:/web/fish/iasp20/lib
deployedwebapp.asp.host=default_host
deployedwebapp.asp.rooturi=/iasp
deployedwebapp.asp.documentroot=/web/fish/iasp20p
deployedwebapp.asp.classpath=/web/fish/iasp20/lib
webapp.asp.servlet.halcyon.code=Dispatcher.DispatcherServlet
webapp.asp.servlet.halcyon.servletmapping=*.asp
```

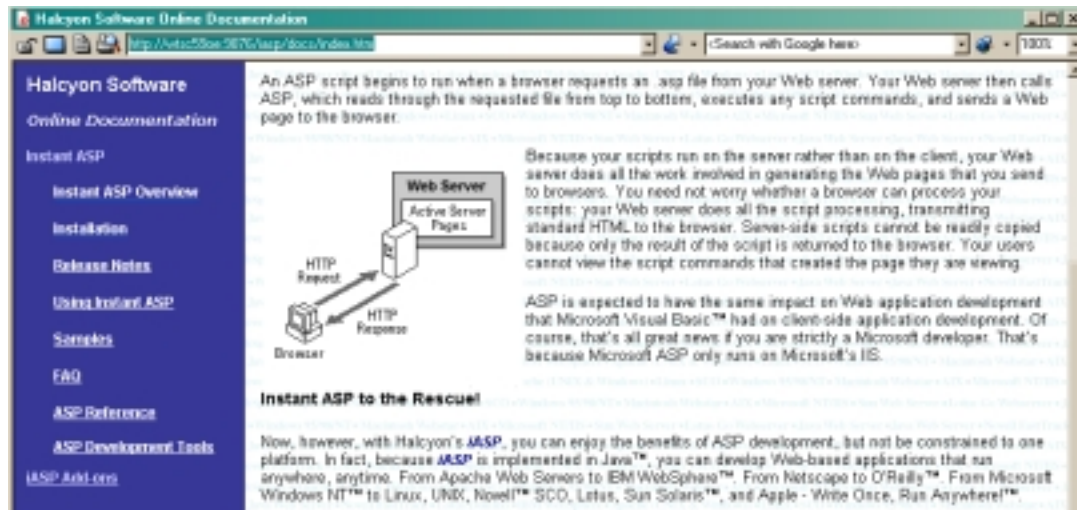


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# Accessing the online docu & samples

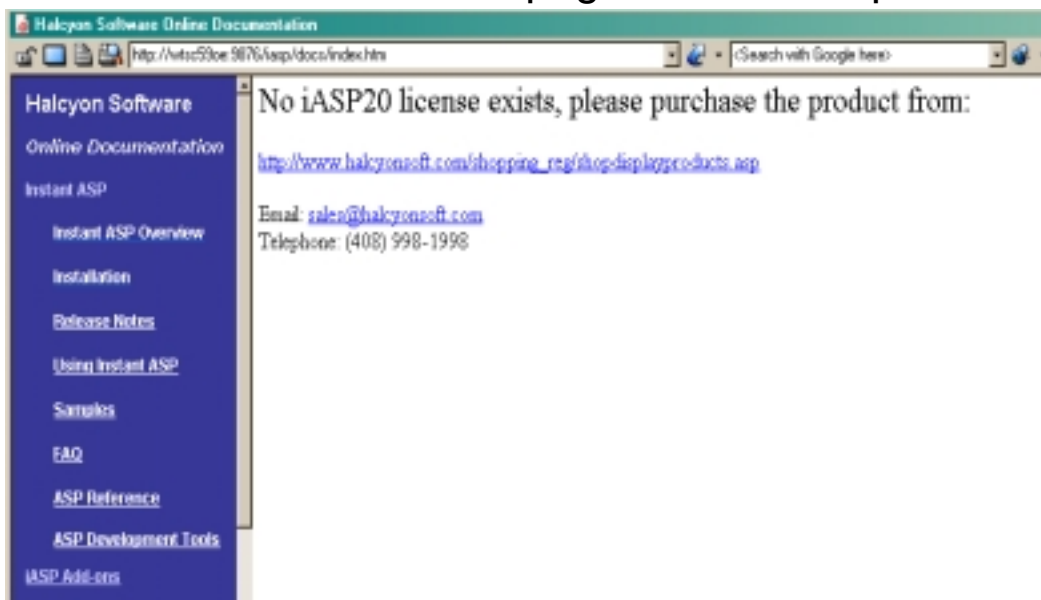
<http://server:port/iasp/docs/index.htm>



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## No License...

from the documentation page run the samples



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## Registration, activation of license key

During registration a license key will be generated and sent to you mail address.

You should copy that into an file called license on your workstation and transfer it binary into the /asp20/properties directory. You need to restart the WebServer.

For our installation we did not use the license key registration.



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**Linux**



## Why should I run WAS 3.5 on Linux zSeries ?

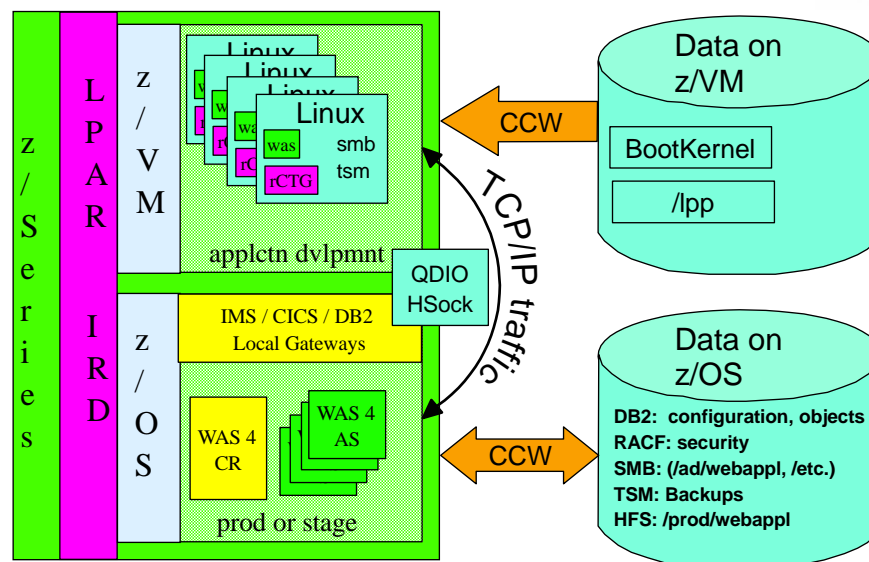


- It's a easy EJB server implementation
- It's inexpensive
- Its very compatible
- zVM offers the capability to run an manage various WebSphere Environments at one time
  - ▶ Cloning
  - ▶ Versioning
- WAS on Linux is clearly targeting development environments



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## Linux Architecture: AplDvlpmnt on Linux



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# Linux

## Adjusting expectations...



- Linux on z/Series is not the solution if you are looking for highest single system throughput !
- Linux on z/Series is the solution if you have management problems with many (low-med utilized) Linux systems
- WebSphere needs Memory
- Might be a good solution for 'some' application development images
- Linux/390 is perfect for ISP environments



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## Rules of Thumb



- **CPU**
  - ▶ Amount of consolidation dependent upon...
    - Vintage of hardware being consolidated
    - Number of idle backup hardware and software servers
    - Utilization across active servers
  - ▶ LSPR "mixed workload" ratio is good place to start for planning within architecture
- **Storage**
  - ▶ LPAR Linux images are minimum of 64 MBs
  - ▶ VM or allocations should be at least 128 MBs central plus expanded
  - ▶ Lightly used guest can be trimmed down to less than 4-6 MBs
  - ▶ Active guest dependent upon application
    - Highly active webserver up to 150 MBs
    - WebSphere gets ~ 512 extra
- **I/O**
  - ▶ Heavily dependent upon application characteristics
  - ▶ Idle guest execute 1-2 I/Os per second for housekeeping



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## WebSphere software

# Appendix ASP with WAS 3.02

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## install

### ■ Add the following lines to httpd.conf

```
# Route ASP request to WebSphere
Service /*.asp
/usr/lpp/was302a/AppServer/bin/was302plugin.so:service_exit
# Make iASP samples accessible via virtual directory /iasp/
Pass /iasp/* /web/fish/iasp/servlet/*
```

### ■ Edit WAS.CONF

```
appserver.classpath=...
/web/fish/iasp/iasp/lib:/web/fish/iasp/iasp/lib/classes

deployedwebapp.asp.host=default_host
deployedwebapp.asp.rooturi=/iasp
deployedwebapp.asp.documentroot=/web/fish/iasp/iasp
deployedwebapp.asp.classpath=/dummy
webapp.asp.servlet.halcyon.code=Dispatcher.DispatcherServlet
webapp.asp.servlet.halcyon.servletmapping=/samples
```





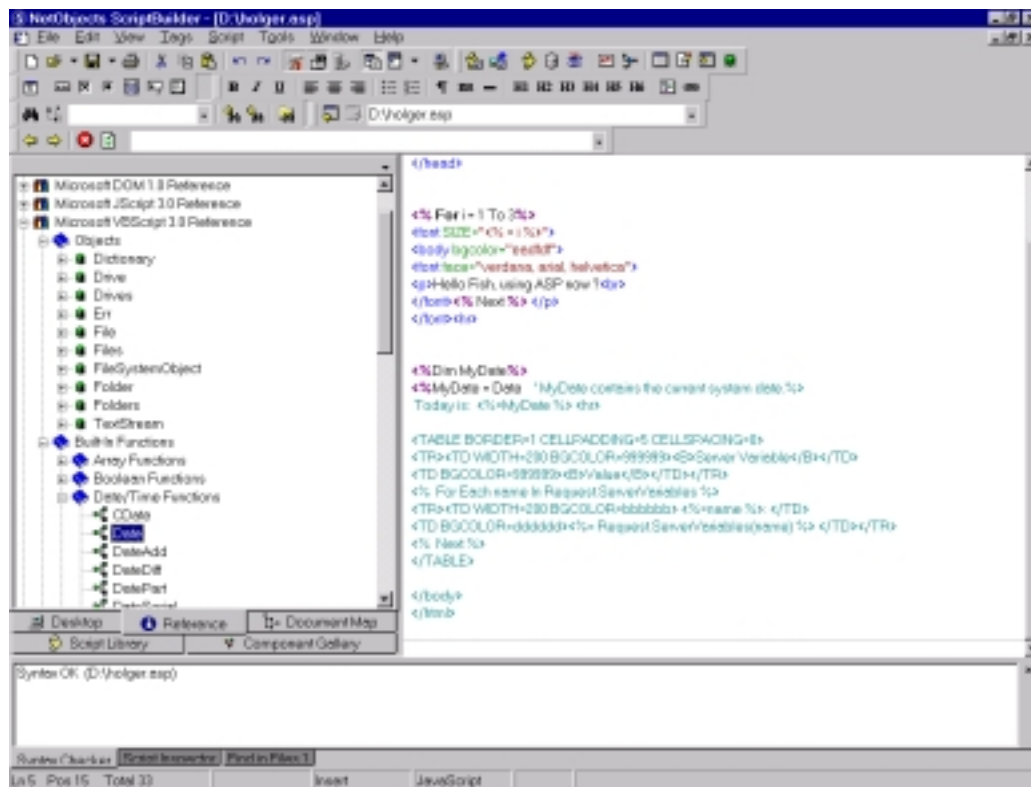
# install

- get code from  
<http://www.halcyonsoft.com/> , register, generate license key  
[ftp://www.halcyonsoft.com/iasp/downloads/20/iASP\\_2.0\\_Unix.tar.gz](ftp://www.halcyonsoft.com/iasp/downloads/20/iASP_2.0_Unix.tar.gz)
- Website is useless:  
[http://www.halcyonsoft.com/docs/iasp/config/websphere\\_s390.htm](http://www.halcyonsoft.com/docs/iasp/config/websphere_s390.htm)
- xfer iasp\*.tar.Z binary into your hfs install directory (eg /web/fish/iasp)
- unwind it: tar -xzvf iasp\*
- run install script: setup.sh  
point to your current 1.1.8 JVM /usr/lpp/java18g/J1.1/bin/  
point to the asp runtime directory (eg /web/fish/iasp/servlet)
- Dont run the automatic webserver configuration

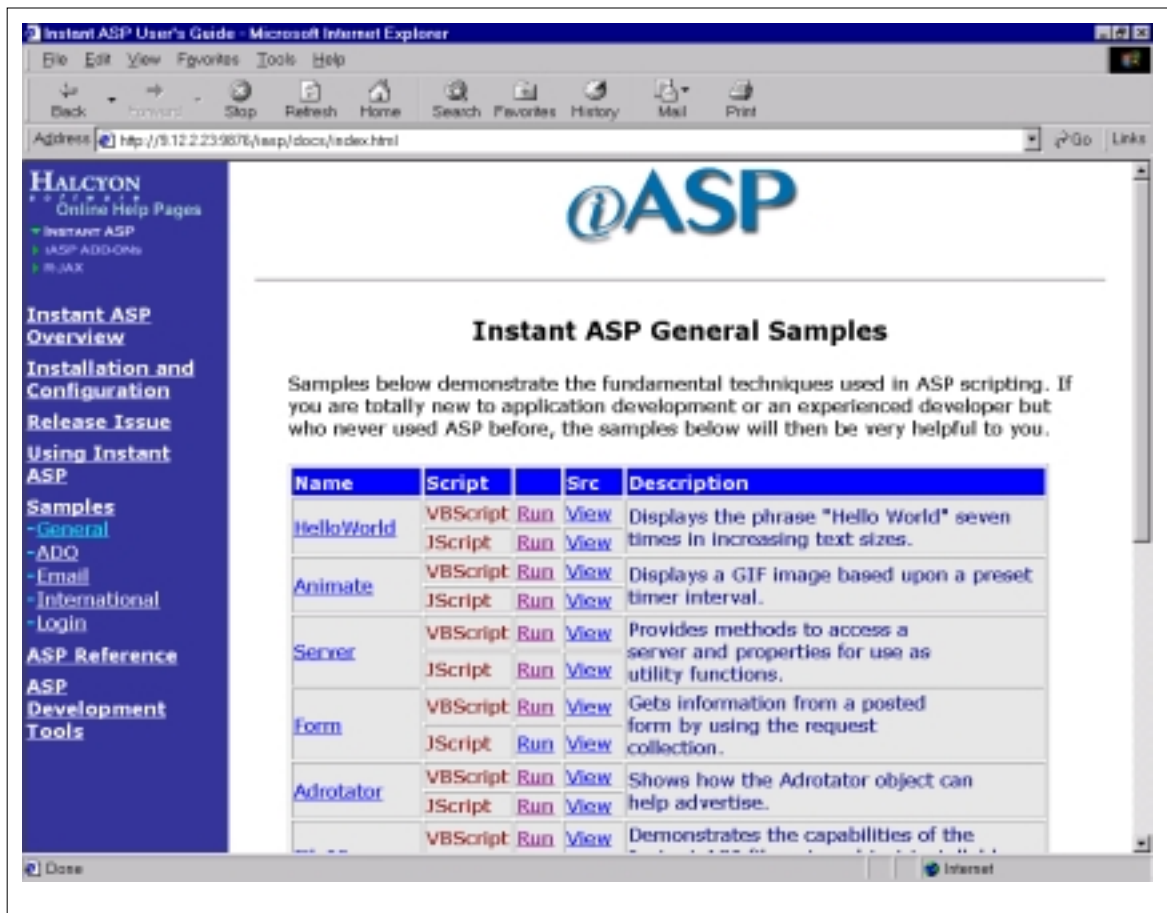


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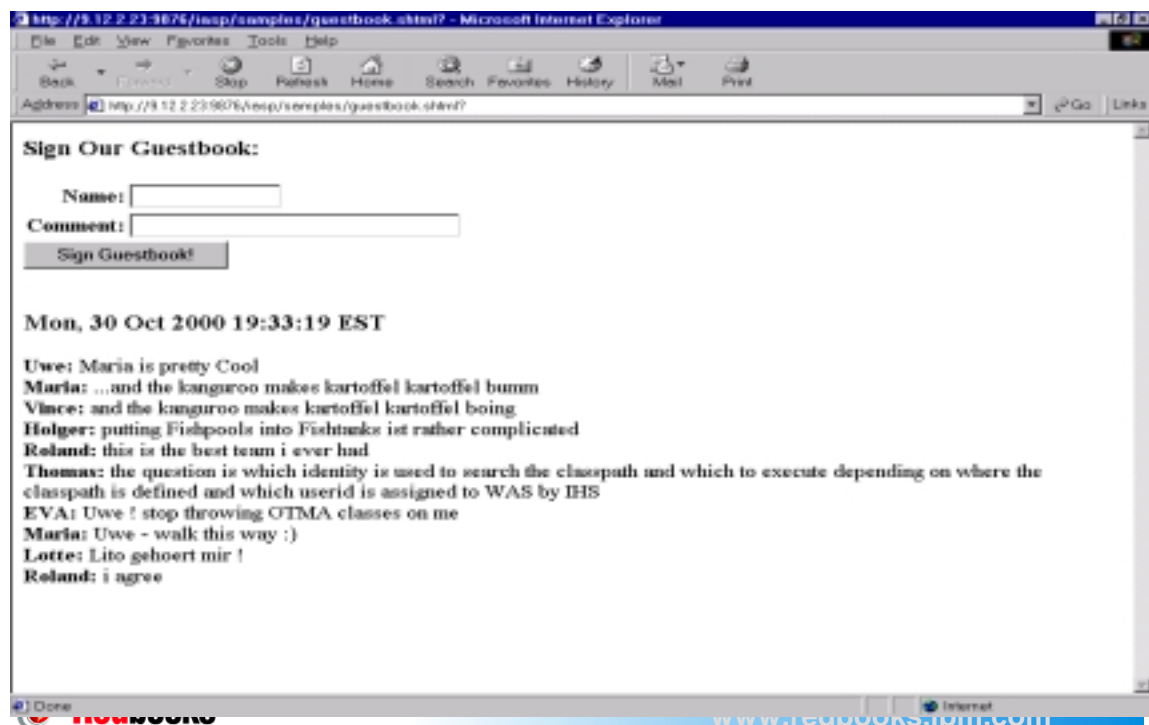
## Tools: Netobjects ScriptBuilder





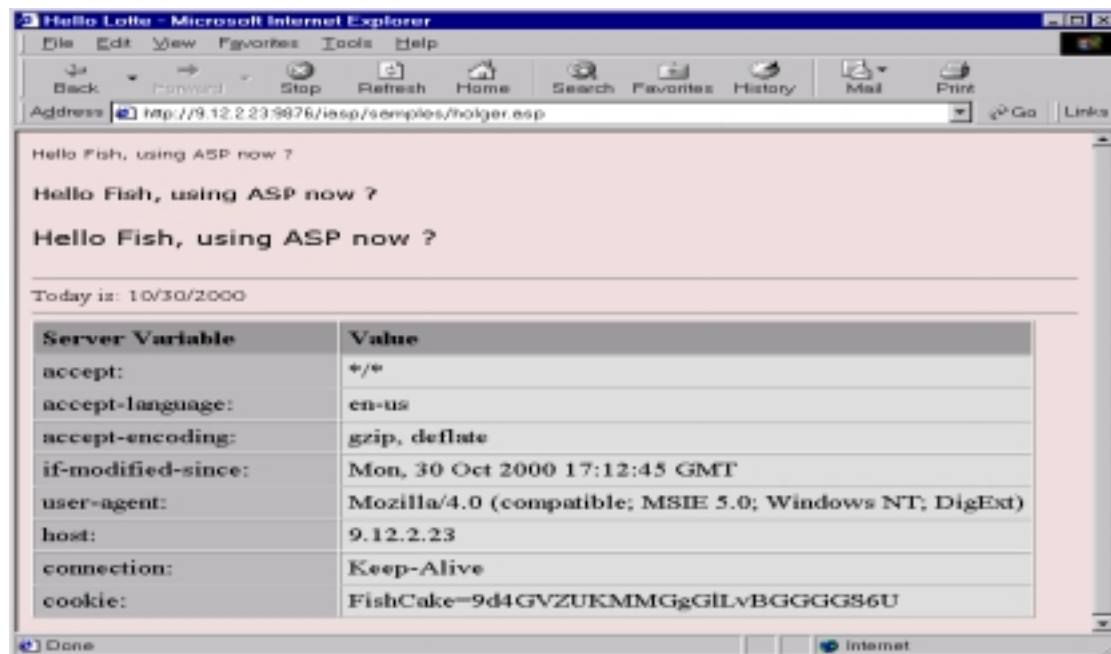


## Open Source Sample Guestbook





# Sample List Server Environment



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