



Agile Technology Architects, LLC

**Achieving Business Results from the Edge of Chaos**

Jim Oberholtzer

CEO/Chief Technical Architect

Securely Deploying Websites in PHP  
on IBM i

Zend Webinar – October 5, 2011

# Jim Oberholtzer, MSE, CCBCP

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## Agile Technology Architects, LLC

- ▶ 31 years experience rising to VP/CIO
- ▶ IBM Subject Matter Expert, IBM I
- ▶ **Agile provides services:**
  - ▶ IBM POWER Systems infrastructure and performance
    - ▶ Architect configurations and provide second opinion services
    - ▶ Installation and implementation
    - ▶ Performance and system management services
  - ▶ Agile development techniques
    - ▶ Get your IT department moving as fast as the business
    - ▶ Mix hierarchical management techniques with Agile techniques



# Agenda

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- ▶ IBM i web serving
  - ▶ Configuring the IBM i Apache Server
  - ▶ IBM i Work Management for Web Serving
  - ▶ Networking
  - ▶ Wrap up
- 
- ▶ Note: We will not discuss PHP security/Networking since that is covered in other webinars etc.



# IBM i Web Serving

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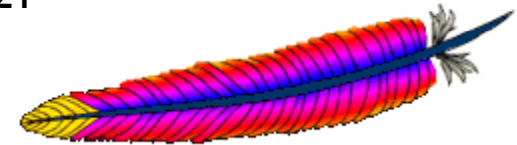
- ▶ **Two web servers for IBM i**
  - ▶ **WebSphere Application Server**
    - ▶ Express edition ships with every IBM i instance
    - ▶ Full server is a chargeable feature
    - ▶ Main servers for Java 2 and Enterprise Edition Java environments
  - ▶ **Apache Web server**
    - ▶ Tomcat removed as of 6.1
    - ▶ Integrated Web Application Server (IAS) replaced it
    - ▶ IAS includes most of the Java function that might be needed.
- ▶ **Zend Server Utilizes the Apache Server**



# IBM i Web Serving

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- ▶ Primary Web server is Apache
  - ▶ Licensed Program product xxxx-DGI
    - ▶ 5770-DGI at V7R1
    - ▶ Apache level 2.2.11 at V6 (V5R4 at 2.0.63, another reason to upgrade)
      - Apache Software Foundation Server project at 2.2.21
      - Apache 2.3.14 beta is out
      - IBM very carefully tests apache updates
  - ▶ Free Additional Software with the OS
  - ▶ PTF groups
    - ▶ V7: SF99368 / Level 10 (10/3/11)
    - ▶ V6: SF99115 / Level 22 (10/3/11)
    - ▶ Tend to come out about every other month
    - ▶ Order the Java PTF Group at same time (comes with HTTP group)
      - V7: SF99572 / 6 (10/3/11)
      - V6: SF99562 / 17 (10/3/11)



# IBM i Web Serving

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- ▶ Odds are fairly strong xxxx-DGI is installed
  - ▶ V7: 5770-DGI \*BASE
    - ▶ Located on media: B\_GROUPx\_04
    - ▶ English 2924 is in Group 1, 2, and 3
  - ▶ V6R1: 5761-DGI \*BASE and option 1
    - ▶ \*BASE is IBM HTTP Server for i5/OS
    - ▶ Option 1 is Triggered Cache Manager
    - ▶ Located on media B29xx\_02:
      - B2924\_02 for US English (2924)
- ▶ Java is required along with Apache
  - ▶ V7: 5761-JV1: \*BASE, options 8, 9, 11, 12, 13
  - ▶ Located on B\_GROUPx\_05
  - ▶ Group rules same as DGI
  - ▶ Option 8 is the 32 bit J2SE (it's really the one you want)



# IBM i Web Serving

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- ▶ Of course the Zend Server requires DGI and:

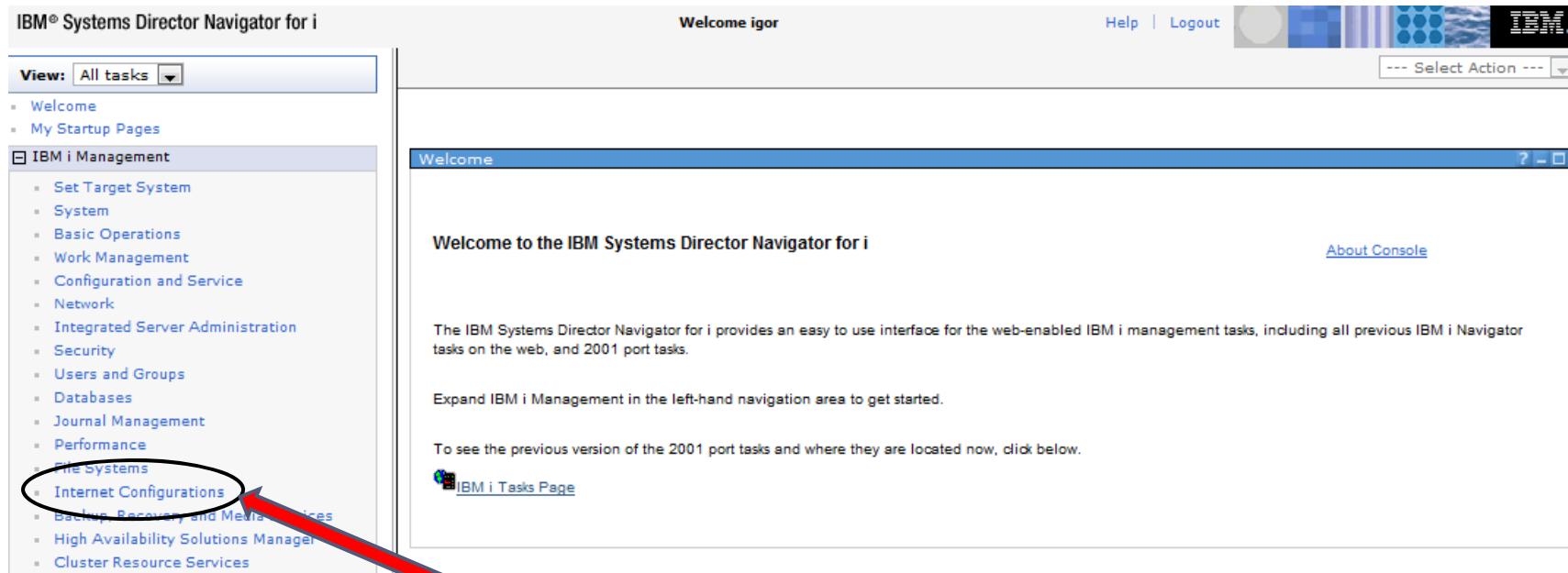
		-V6R1--	-V7R1--
▶ Portable App Solutions Environment	33	5761SS1	5770SS1
▶ Qshell	30	5761SS1	5770SS1
▶ IBM Portable Utilities for I5/OS	*base	5733SC1	5733SC1
▶ OpenSSH, OpenSST, Zlib	1	5733SC1	5733SC1

- ▶ It's rare to find installations without all of these
- ▶ There are no PTF groups available for these products
  - ▶ PTFs come with the other groups
  - ▶ A search of the registered knowledge base did not reveal any PTFs issued specifically for these products



# IBM i Web Configuration

- ▶ The default IBM i Admin web instance is at port 2001
  - ▶ <http://your.serveraddress.com:2001>



IBM® Systems Director Navigator for i

Welcome igor

Help | Logout

View: All tasks

- Welcome
- My Startup Pages
- ▣ IBM i Management
  - Set Target System
  - System
  - Basic Operations
  - Work Management
  - Configuration and Service
  - Network
  - Integrated Server Administration
  - Security
  - Users and Groups
  - Databases
  - Journal Management
  - Performance
  - File Systems
  - **Internet Configurations**
  - Backup, Recovery and Media Services
  - High Availability Solutions Manager
  - Cluster Resource Services

Welcome

Welcome to the IBM Systems Director Navigator for i

[About Console](#)

The IBM Systems Director Navigator for i provides an easy to use interface for the web-enabled IBM i management tasks, including all previous IBM i Navigator tasks on the web, and 2001 port tasks.

Expand IBM i Management in the left-hand navigation area to get started.

To see the previous version of the 2001 port tasks and where they are located now, click below.

[IBM i Tasks Page](#)

Click here to get to the HTTP Configuration options



# IBM i Web Configuration

- ▶ Web administration is found in the first link on this page

View: All tasks ▾

- Welcome
- My Startup Pages
- ▣ IBM i Management
  - Set Target System
  - System
  - Basic Operations
  - Work Management
  - Configuration and Service
  - Network
  - Integrated Server Administration
  - Security
  - Users and Groups
  - Databases
  - Journal Management
  - Performance
  - File Systems
  - Internet Configurations
  - Backup, Recovery and Media Services
  - High Availability Solutions Manager
  - Cluster Resource Services
- ▣ Settings



Internet Co... X

Internet Configurations - V7r1prod.idevcloud.com


IBM i Internet Configurations allows you to perform internet configuration tasks.

[IBM Web Administration for i](#)  
Allows you to manage and configure HTTP servers and application servers.

[IBM i Navigator URL Advisor](#)  
Allows you to add IBM i administration tasks into your web applications.

[Digital Certificate Manager](#)  
Allows you to create, distribute, and manage Digital Certificates.

[IBM IPP Server for i](#)  
Allows you to configure the IBM IPP Server.

 [Internet Setup Wizard](#)  
Allows you to use the internet setup wizard to configure your internet environment.

Close



# IBM i Web Configuration

- ▶ An alternative method of getting to the web administration panels

IBM® Systems Director Navigator for i

Welcome igor

Help | Logout

View: All tasks

- Welcome
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- ▣ IBM i Management
  - Set Target System
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Click here to get to the HTTP Configuration options



# IBM i Web Configuration

▶ The default IBM i Admin web instance is at port 2001

▶ <http://your.server:2001>

IBM® Systems Director Navigator for i

View: All tasks ▾

- Welcome
- My Startup Pages

IBM i Management

- Set Target System
- System
- Basic Operations
- Work Management
- Configuration and Service
- Network
- Integrated Server Administration
- Security
- Users and Groups
- Databases
- Journal Management
- Performance
- File Systems
- Internet Configurations
- Backup, Recovery and Media Services
- High Availability Solutions Manager
- Cluster Resource Services

IBM i Tasks - V7r1prod.idevcloud.com

IBM i Tasks allows you to access the tasks that were previously displayed on the IBM i Tasks web page.



[IBM Web Administration for i](#)

Allows you to manage and configure HTTP servers and application servers (Located in Internet Configurations)



[IBM i Navigator URL Advisor](#)

Allows you to add IBM i administration tasks into your web applications (Located in Internet Configurations)



[Digital Certificate Manager](#)

Allows you to create, distribute, and manage Digital Certificates (Located in Internet Configurations)



[IBM Tivoli Directory Server Web Administration Tool](#)

Allows you to administer the IBM Tivoli Directory Server for i (Located in Network)



[IBM IPP Server for i](#)

Allows you to configure the IBM IPP Server (Located in Internet Configurations)



[Cryptographic Coprocessor](#)

Allows you to configure the cryptographic coprocessor (Located in Security)

Close



# IBM i Web Configuration

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- ▶ Web Administration for i
- ▶ Select the “Manage” tab



The screenshot displays the IBM Web Administration for i interface. At the top, there is a blue header with the title "IBM Web Administration for i" and a navigation bar with tabs for "Setup", "Manage", "Advanced", and "Related Links". The "Manage" tab is selected. On the left side, there is a sidebar with a dropdown menu titled "Common Tasks and Wizards" containing four items: "Create Web Services Server", "Create HTTP Server", "Create Application Server", and "Create WebSphere Portal". The main content area on the right is titled "IBM Web Administration for i" and contains a sub-header "Getting started - Create and learn about the servers needed to run". Below this, there are four links, each with an icon and a brief description:

- Create a New Web Services Server**: Create Web Services Server Wizard provides a convenient way services from the Internet or intranet using Web service based
- Create a New HTTP Server** ⓘ: Create a new HTTP Server (powered by Apache) to run your HT
- Create a New Application Server** ⓘ: Create a new application server to run dynamic Web applicatio
- Create a New WebSphere Portal** ⓘ: Create a new application server to run powerful and compelling; configuring database and LDAP as necessary.



# IBM i Web Configuration

The screenshot shows the 'Manage All Servers' interface. It has two tabs: 'All HTTP Servers' and 'All Application Servers'. An arrow points from the 'All Application Servers' tab in the left panel to the right panel. Below the tabs, it says 'Data current as of Oct 3, 2011 1:44:21 PM.' and displays a table of servers. The right panel shows 'Data current as of Oct 3, 2011 1:47:44 PM.' and a zoomed-in view of the 'AJSPPervasive' server entry.

Server	Version	Status	Address:Port	Description
<input type="radio"/> ADMIN	Apache/2.2.11 (i5)	Running	*:2001	
<input type="radio"/> AJSPP	Apache/2.2.11 (i5)	Stopped	*:8210	
<input type="radio"/> APACHEDFT	Apache/2.2.11 (i5)	Stopped	*:80	None
<input checked="" type="radio"/> IDEVCLLOUD	Apache/2.2.11 (i5)	Running	*:80	None
<input type="radio"/> IWADFT	Apache/2.2.11 (i5)	Stopped	*:2020	None
<input type="radio"/> OLDCLOUD	Apache/2.2.11 (i5)	Stopped	*:80	None
<input type="radio"/> WEBSMART	Apache/2.2.11 (i5)	Stopped	*:10050	None
<input type="radio"/> WQLW17	Apache/2.2.11 (i5)	Stopped	*:80	None
<input type="radio"/> ZENDSVR	Apache/2.2.11 (i5)	Stopped	*:10088	None

Server startup parameters:

## ▶ Manage all HTTP servers

- ▶ The panel will remember you and where you were last
- ▶ Each server is hyperlink to its configuration
- ▶ Notice I have only one server running at port 80



# IBM i Web C

- ▶ Here's the main page to administer the site
- ▶ Notice Tools near bottom.
  - ▶ Config Editor
  - ▶ Statistics
  - ▶ Web Log monitor
- ▶ If you have SSHD running
  - ▶ Install VIM in PASE
  - ▶ Use PuTTY

The screenshot displays the IBM Web Administration for i interface. The top navigation bar includes 'Setup', 'Manage', and 'Advanced | Related Links'. Below this, there are tabs for 'All Servers', 'HTTP Servers', and 'Application Servers'. The 'HTTP Servers' tab is active, showing a 'Server: IDEVCLLOUD - Apache' and 'Server area: Global configuration'. The main content area is titled 'IDEVCLLOUD > General Server Configuration' and contains a 'General Server Configuration' section with sub-tabs for 'General Settings', 'Welcome Pages', 'Configuration Includes', and 'Advanced'. The 'General Settings' sub-tab is selected, showing fields for 'Autostart' (set to 'Global'), 'Server root directory' (set to '/usr/local/devcloud'), 'Configuration file' (set to 'conf/httpd.conf'), 'Document root' (set to '/usr/local/iDevCloud/htdocs/devcloud/public'), and 'Server name'. There is a table for 'Server IP addresses and ports to listen on' with columns for 'IP address', 'Port', and 'Protocol'. The table contains one row with 'All IP addresses', '80', and 'http'. Below the table is an 'Add' button. Other fields include 'Number of threads to process requests' and 'DNS hostname lookups for logging, CGI, and SSI' (set to 'Do not perform DNS lookups'). At the bottom, there are 'Follow symbolic links' and 'Follow symbolic links when target has same owner as the link' options, both set to 'Disabled'. The interface concludes with 'OK', 'Apply', and 'Cancel' buttons.



# IBM i Web Configuration

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- ▶ Default location for Zend Server is /www/zendsvr
- ▶ Directories for configuration, htdocs (the web site) and logs default here
- ▶ This is fine for production
  - ▶ What about Dev?
  - ▶ I like /home/userprofile

```
Directory . . . . : /www/zendsvr

Type options, press Enter.
 2=Edit   3=Copy   4=Remove   5=Disp
11=Change current directory ...

Opt  Object link      Type
---  -
.    .                DIR
..   ..              DIR
conf conf              DIR
htdocs htdocs             DIR
logs  logs            DIR
save  save            DIR
```



# Create Development Web Site...

---

## ▶ Premise:

- ▶ Each developer will have a library, directory, and web address
- ▶ Security is your call, but separating the developers makes sense
- ▶ Production runs on Port 80/443 as a Virtual Host
- ▶ A test version of the instance runs on port 10088
  - ▶ Notes:
    - Zend does not as yet support running multiple copies of the Zend Server on one system. Reasons are valid, but way beyond the scope of this session
    - I have tested and made it work, but in a very lightly loaded system
- ▶ The site at port 10088 will be integration testing
- ▶ URL, DNS, etc are up to date
- ▶ Firewalls are set up properly



# Development Web Site...

- ▶ Step one: Create the base configuration
  - ▶ Each developer needs a home directory
    - ▶ /home/iusr0001
    - ▶ Authority looks like:
      - ▶ QTMHHTPI
      - ▶ QTMHHTTP
        - ❑ Too much authority production system
        - ❑ Integration should look like production does
    - ▶ \*PUBLIC could be \*USE

```
Work with Authority
Object . . . . . : /home/iusr0007
Type . . . . . : DIR
Owner . . . . . : IUSR0007
Primary group . . . . . : *NONE
Authorization list . . . . . : *NONE

Type options, press Enter.
  1=Add user  2=Change user authority  4=Remove user

Opt  User          Data          --Object Authorities--
     User          Authority  Exist  Mgt  Alter  Ref
-----
=    *PUBLIC       *EXCLUDE
-    IUSR0007     *RWX        X     X   X     X
-    QTMHHTP1     *RWX        X     X   X     X
-    QTMHHTTP     *RWX        X     X   X     X

Parameters or command
===>

F3=Exit  F4=Prompt  F5=Refresh  F9=Retrieve
F11=Display detail data authorities  F12=Cancel  F24=More keys
(C) COPYRIGHT IBM CORP. 1980, 2009.
```



# Development Web Site...

---

- ▶ Copy the htdocs directory from the Zend Install
  - ▶ We modified this to have a couple of examples in it
    - ▶ DB2 SQL example
    - ▶ Phpinfo.php etc.....
  - ▶ The hidden file **.htaccess** (note the “.” in the first position)
    - ▶ Required for Zend Routing to work

```
*****Beginning of data*****  
SetEnv APPLICATION_ENV development  
RewriteEngine On  
RewriteCond %{REQUEST_FILENAME} -s [OR]  
RewriteCond %{REQUEST_FILENAME} -l [OR]  
RewriteCond %{REQUEST_FILENAME} -d  
RewriteRule ^.*$ - [NC,L]  
RewriteRule ^.*$ index.php [NC,L]  
*****End of Data*****
```

← This is important for the Zend Framework!

- ▶ Unless specified, forces all the pathnames “-s”, Symbolic Links “-l” and Directories “-d” into one place.
- ▶ This is really part of Apache rewrite rules. See web for too much information.....



# Development Web Site...

---

## ▶ Now a CLP that creates each users web container:

```
CHGVAR &NEWPRF      VALUE('iusr' *CAT &USRNBR)
CHGVAR &USRDIR      VALUE('/home/' *TCAT &NEWPRF)
CHGVAR &USRDIR1     VALUE(&USRDIR *TCAT '/htdocs')
CRTLIB LIB(&NEWPRF) TYPE(*TEST) TEXT(&USRTEXT) AUT(*EXCLUDE)
MKDIR  DIR(&USRDIR)  DTAAUT(*EXCLUDE) OBJAUT(*NONE)
CHGVAR &USRDIR1     VALUE(&USRDIR *TCAT '*')
CPY    OBJ('/home/iusr0000/htdocs/') TODIR(&USRDIR) SUBTREE(*ALL)          +
      REPLACE(*YES) OWNER(*KEEP)
CHGAUT OBJ(&USRDIR1) USER(QTMHHTP1) DTAAUT(*RWX)      OBJAUT(*ALL) SUBTREE(*ALL)
CHGAUT OBJ(&USRDIR1) USER(QTMHHTP) DTAAUT(*RWX)      OBJAUT(*ALL) SUBTREE(*ALL)
CHGAUT OBJ(&USRDIR1) USER(*PUBLIC) DTAAUT(*EXCLUDE)  OBJAUT(*NONE) SUBTREE(*ALL)

CRTUSRPRF  USRPRF(&NEWPRF)  PASSWORD(PASSWORD)          +
          PWDEXP(*YES)      USRCLS(*PGMR)                +
          CURLIB(&NEWPRF)  TEXT(&USRTEXT)                +
          SPCAUT(*NONE)    PWDEXPITV(30)                 +
          GRPPRF(IUSR)     HOMEDIR(&USRDIR)               +
          MAXSTG(1024000)  GRPAUTTYP(*PGP)

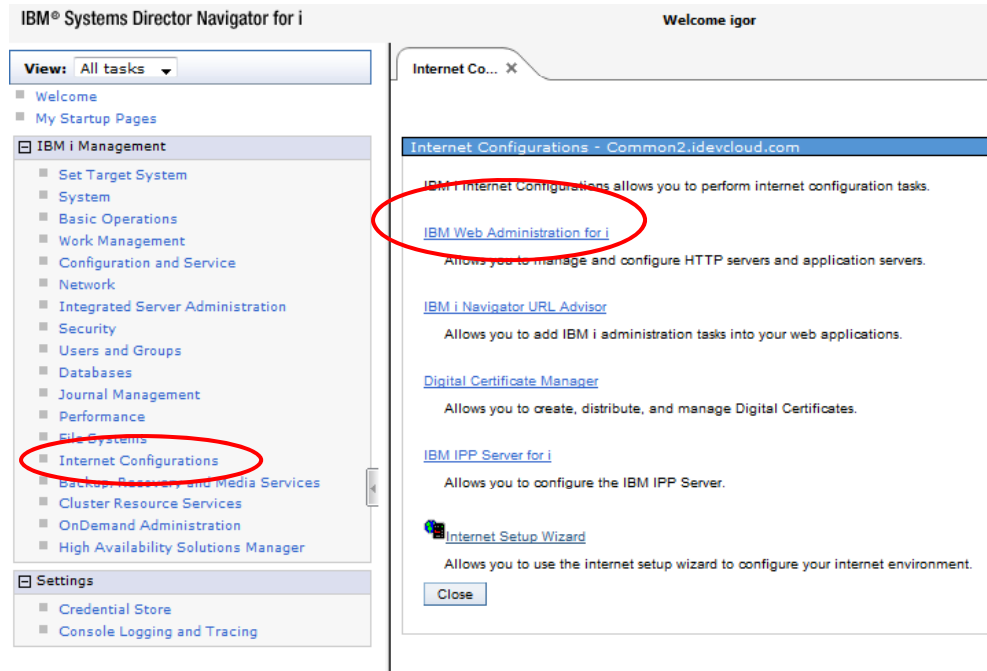
CHGOWN     OBJ(&USRDIR) NEWOWN(&NEWPRF) SUBTREE(*ALL)
CHGOBJOWN  OBJ(&NEWPRF) OBJTYPE(*LIB)  NEWOWN(&NEWPRF)
```

- ▶ Only the executable code shown.
- ▶ Contact me if you want the full program with error handling



# Development Web Site...

- ▶ Now the APACHE set up
  - ▶ httpd.conf holds the Apache configuration
  - ▶ You can use Systems Director Navigator for IBM i



The screenshot shows the IBM Systems Director Navigator for i interface. The left-hand navigation pane is expanded to show the 'Internet Configurations' menu item, which is circled in red. The right-hand pane displays a list of configuration tasks, including 'IBM Web Administration for i', which is also circled in red. The interface includes a 'View: All tasks' dropdown, a 'Welcome igor' header, and a 'Close' button at the bottom of the right-hand pane.

- ▶ You could also use:
  - ▶ <http://yoursystemaddress:2001/HTTPAdmin>



# Development Web Site...

- ▶ Click on: Manage, then, HTTP Servers, and in the drop down, Zendsvr – Apache

- ▶ This is where you manage the server instance
- ▶ Set up virtual hosts for:
  - ▶ Developers
  - ▶ Test sites
  - ▶ Different applications
- ▶ Go to General Server Configuration
- ▶ Open up tools
- ▶ Edit Configuration File


The screenshot shows the IBM Web Administration for i console. The top navigation bar includes 'Setup', 'Manage', 'Advanced', and 'Related Links'. Below this, there are tabs for 'All Servers', 'HTTP Servers', and 'Application Servers'. The 'HTTP Servers' tab is active, and a dropdown menu shows 'ZENDSVR - Apache' selected. The 'Server area' is set to 'Global configuration'. The left sidebar contains a tree view with categories: 'Common Tasks and Wizards' (Create Web Services Server, Create HTTP Server, Create Application Server, Create WebSphere Portal), 'HTTP Tasks and Wizards' (Add a Directory to the Web, LDAP Configuration), 'Server Properties', and 'Tools' (Display Configuration File, Edit Configuration File, Directive Index, Real Time Server Statistics). A red arrow points from the 'Edit Configuration File' tool to the main content area. The main content area displays the 'General Server Configuration' page for 'ZENDSVR > General Server Configuration'. It has tabs for 'General Settings', 'Welcome Pages', 'Configuration Includes', and 'Advanced'. The 'General Settings' tab is active. Fields include: 'Autostart' (Global), 'Server root directory' (/www/zendsvr), 'Configuration file' (conf/httpd.conf), 'Document root' (/www/zendsvr/htdocs) with a 'Browse' button, 'Server name' (empty), 'Fully qualified server host name' (empty), 'Port' (empty), and 'Server IP addresses and ports to listen on' (a table with columns for IP address, Port, and Protocol). The table has one row with 'All IP addresses', '80', and 'http'. Below the table is an 'Add' button and 'OK', 'Apply', and 'Cancel' buttons.

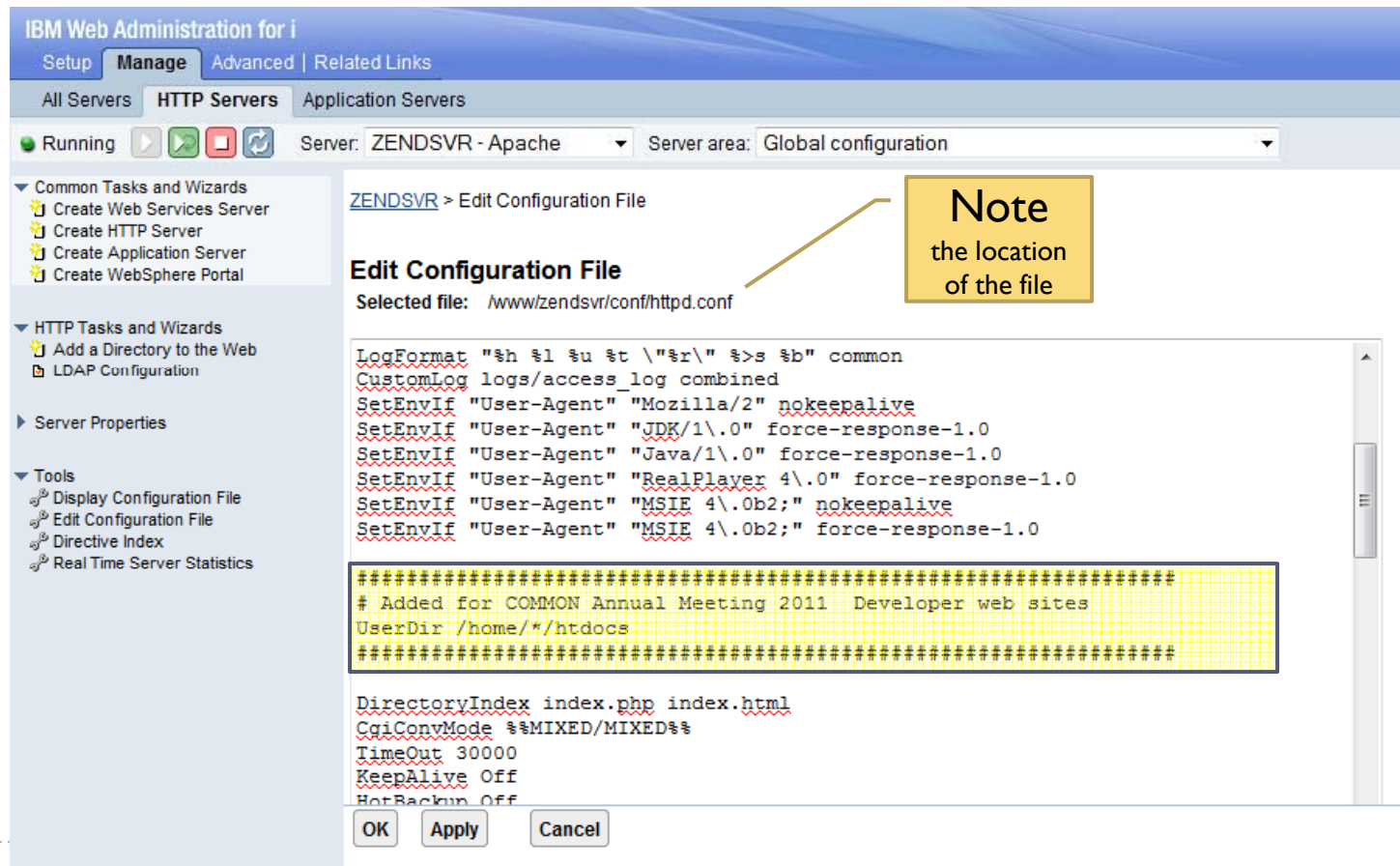
	IP address	Port	Protocol
Example	All IP addresses	80	http
<input type="radio"/>	*	10088	



# Development Web Site...

See This!!!!

- ▶ The directive: “UserDir /home/\*/htdocs” is what you need
- ▶ Apache then uses: http://common1.idevcloud.com:10088/~userprofile
- ▶ Once you press “apply”, then “OK”
- ▶ Restart the server by using the  button
- ▶ You can of course use any editor you wish



The screenshot shows the IBM Web Administration console for an Apache server. The main window displays the configuration file editor for `httpd.conf`. A yellow box highlights the following configuration lines:

```
#####  
# Added for COMMON Annual Meeting 2011 Developer web sites  
UserDir /home/*/htdocs  
#####
```

A note box points to the file path `/www/zendsvr/conf/httpd.conf` in the "Selected file:" field. The console also shows various other configuration directives like `LogFormat`, `CustomLog`, and `SetEnvIf`.



# Virtual Host set up

---

- ▶ Apache can do virtual web sites by name or IP address
- ▶ Here I set up two virtual sites both on port 80
  - ▶ One is for the public web site, one for a customer interface

```
Edit Configuration File  
Selected file: /usr/local/devcloud/conf/httpd.conf  
  
NameVirtualHost *:80  
  
<VirtualHost *:80>  
    DocumentRoot /usr/local/mysite/htdocs/mypublicsite/public  
    ServerName myservername.com  
</VirtualHost>  
  
<VirtualHost *:80>  
    DocumentRoot /usr/local/mysite/htdocs/customersite  
    ServerName www.customer.mysite.com  
    ServerAlias customer.mysite.com  
</VirtualHost>
```



# Development Web Site..

---

- ▶ Lets consider some other APACHE directives
  - ▶ Why does this work?  
<http://commonl.idevcloud.com:10088/phpmyadmin>
  - ▶ And:  
<http://commonl.idevcloud.com:10088/editor>
  - ▶ does not? (hint, if you add the .php suffix it will....)



# Development Web Site

---

- ▶ Lets consider some other APACHE directives
  - ▶ Why does this work?  
<http://commonl.idevcloud.com:10088/phpmyadmin>
  - ▶ And:  
<http://commonl.idevcloud.com:10088/adminer>
  - ▶ does not? (hint, if you add the .php suffix it will....)
  - ▶ Answer: alias directives.

```
Alias /phpmyadmin /usr/local/zendsvr/phpMyAdmin
```

```
.....
```

```
<Directory /usr/local/zendsvr/phpMyAdmin>
```

```
Options FollowSymLinks
```

```
AllowOverride None
```

```
Order allow,deny
```

```
Allow from 127.0.0.1
```

```
</Directory>
```



# Work Management

---

- ▶ Often forgotten portion of managing a web site
- ▶ Zend has at least two, sets of distinct jobs that run
  - ▶ Subsystem QHTTPSVR shipped with \*BASE
    - ▶ Add a second memory pool to the subsystem
    - ▶ Change the routing entry to point to the new memory
    - ▶ Consider a bit of tuning in the shared pools
  - ▶ Zendsvr subsystem also shipped with \*BASE
- ▶ MySQL has a subsystem and may also use QUSRWRK
  - ▶ Depends on how started
    - ▶ Menu ZSMENU will start in ZMYSQL subsystem
    - ▶ MySQL started manually (shown earlier) will start in QUSRWRK
  - ▶ Memory management critical for performance



# Work Management

---

- ▶ Three portions of performance to consider
  - ▶ Zend Server Settings
    - ▶ Several parameters in the server can directly affect Zend Performance
    - ▶ Zend Server Performance is not MySQL or DB/2 performance
    - ▶ Beyond the scope of this presentation
  - ▶ DB/2 Performance
    - ▶ Index strategy / QAQQINI settings extremely important
    - ▶ Know which query Engine your query is using CQE/SQE
    - ▶ Index advisor / Job Watcher
    - ▶ Beyond scope of this presentation
  - ▶ Work management of several objects
    - ▶ Zend Server subsystem
    - ▶ Zend Apache Instance (subsystem QHTTPSVR)
    - ▶ Data Access jobs (QZDASOINIT and QSQSRVR)



# Work Management

---

- ▶ **Change QHTTPSVR subsystem to have 2<sup>nd</sup> memory pool**
  - ▶ Change Shared Pool to reflect change
  - ▶ Add storage pool to subsystem
  - ▶ Change routing entry on subsystem
  - ▶ Restart subsystem jobs
- ▶ **Change Zend Subsystem**
  - ▶ Same procedure as QHTTPSVR
- ▶ **After changes, watch it for a day or so**
  - ▶ Make sure active/wait transitions are zero
  - ▶ Watch faulting
    - ▶ May have to add memory
    - ▶ Activity Level critical since multi threaded jobs are running



## Work with Shared Pools

Main storage size (M) . : 996.62

Type changes (if allowed), press Enter.

- ▶ WRKSHRPOOL
- ▶ Size depends
- ▶ Activity needs to be high enough for LOTS of threads
- ▶ Smart Paging

Pool	Defined Size (M)	Max Active	Allocated Size (M)	Pool ID	-Paging Defined
*MACHINE	190.01	+++++	190.01	1	*FIXED
*BASE	539.07	87	539.07	2	*FIXED
*INTERACT	267.28	25	267.28	3	*FIXED
*SPOOL	.25	5	.25	4	*FIXED
*SHRPOOL1	20.00	50			*calc
*SHRPOOL2	.00	0			*FIXED

Pool	Text
*MACHINE	Used by internal machine functions
*BASE	Default system pool
*INTERACT	Used for interactive work
*SPOOL	Used for printing
*SHRPOOL1	QHTTSPVR jobs

- ▶ Use F11 to change text
- ▶ Most under used part of Shared pools
- ▶ Leave tuning alone for now



# Work Management

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- ▶ Change the subsystem description

**CHGSBSD SBSD(QHTTPSVR/QHTTPSVR) POOLS((2 \*SHRPOOLI))**

- ▶ Change the Routing Entry on the subsystem

- ▶ Routing entry determine which pool of memory will be used

Opt	Seq Nbr	Program	Library	Compare Value	Start Pos
_	10	QCMD	QSYS	'HTTPWWW'	1

- ▶ Use:

**CHGRTGE SBSD(QHTTPSVR) SEQNBR(10) POOLID(2)**

- ▶ Need to restart all of the jobs in the subsystem

- ▶ Use:

**STRTCPSVR SERVER(\*HTTP) RESTART(\*HTTP) HTTPSVR(ZENDSVR)**



# Work Management

- ▶ Zend Subsystem gets same treatment as QHTTPSVR
  - ▶ Determine which memory to use
    - ▶ Is there already a shared pool set up that's usable
    - ▶ Like jobs go in like memory
  - ▶ Change the subsystem description to add memory pool  
**CHGSBSD SBSD(ZENDSVR/ZENDSVR) POOLS((2 \*SHRPOOLI))**
  - ▶ Change routing entry

Opt	Seq Nbr	Program	Library	Compare Value	Start Pos
—	10	QCMD	QSYS	'I5_COMCLS'	1
—	20	QCMD	QSYS	'QCMDB'	1
—	100	QCMD	QSYS	'ZENDSVR'	1
—	9999	QCMD	QSYS	*ANY	1

Communications

Server Jobs

Default

- ▶ Note that Multiple changes are needed....
- ▶ Two different classes are used



# IBM i Web Serving Networks

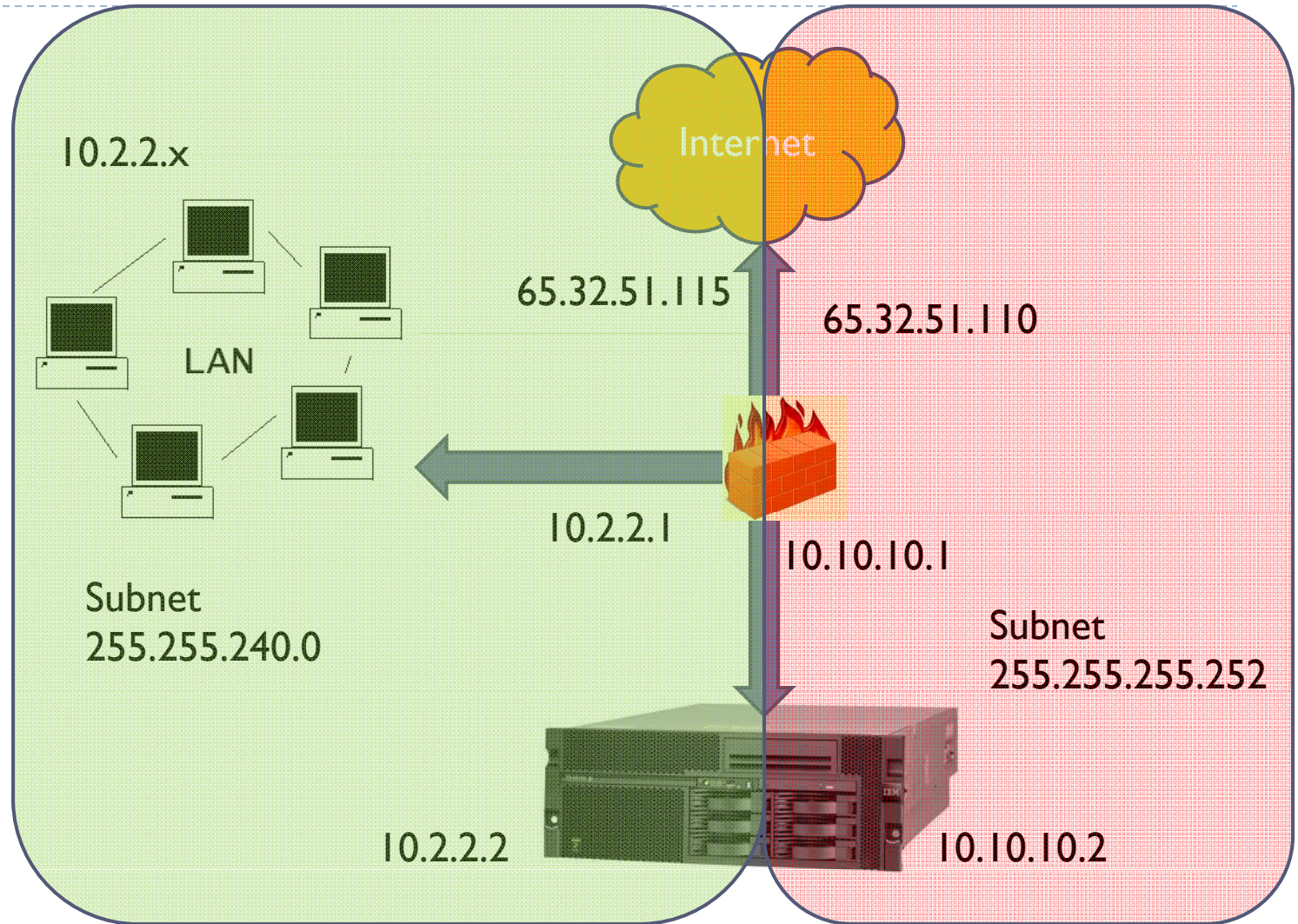
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- ▶ TCP/IP Magic can be used to separate the LANs
- ▶ Even on the one network cable
  - ▶ Can be used to manage TCP/IP traffic from/to the production web server
    - ▶ Keeps web serving traffic away from the internal LAN
    - ▶ Example:
      - Web traffic from firewall comes in on 10.10.10.2 / 255.255.255.252
        - Allows Two addresses: 10.10.10.1, 10.10.10.2
        - Subnet: 10.10.10.0 Broadcast: 10.10.10.3
        - The Web Server is 10.10.10.2
        - The firewall is 10.10.10.1
      - Corporate LAN is 10.2.2.x Subnet is 255.255.240.0
        - There could be as many as 4094 computers/printers/etc on the network
        - From 10.2.2.1 to 10.2.15.254
    - ▶ Traffic on the 10.10.10.x network will not cross over to 10.2.2.x without a router



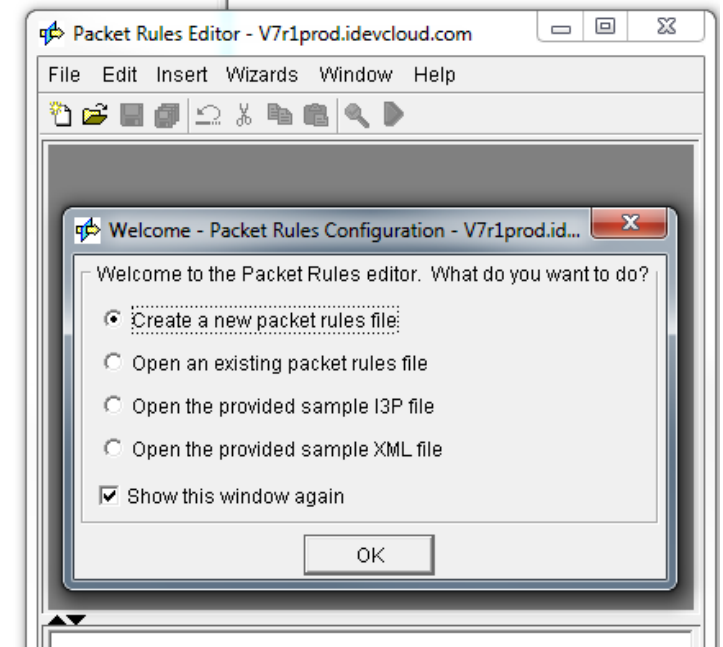
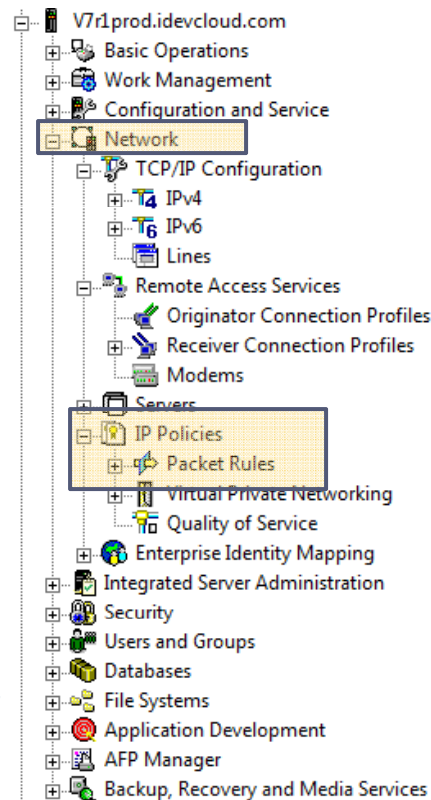
# IBM i Web Serving Network

- ▶ Firewall uses NAT to translate internet to internal address
- ▶ IBM I is set to ***not*** route between networks
- ▶ Networking purists would have two firewalls and two interface cards



# IBM i Web Serving Networking

- ▶ Setting up packet filter rules
  - ▶ Need to use System I Navigator
  - ▶ Found at Network / IP Policies / Packet Rules
  - ▶ Right click and bring up Packet Rules Configuration:



# IBM i Web Serving Network

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- ▶ **Set the interfaces alias names:**

```
ADDRESS MyInternalIPAddress IP = 10.10.10.1 TYPE = TRUSTED
```

```
ADDRESS MyProdIPAdress IP = 10.2.2.1 TYPE=TRUSTED
```

```
ADDRESS MyPublicIPAddress IP = 65.32.51.110 TYPE = BORDER
```

- ▶ **Now set the filter rule to allow any outbound but only port 80 inbound**

```
FILTER SET Set4InternalInterface ACTION = PERMIT DIRECTION = OUTBOUND SRCADDR =  
MyInternalIPAddress DSTADDR = * PROTOCOL = * DSTPORT = * SRCPORT = * JRN = OFF
```

```
FILTER SET Set4InternalInterface ACTION = PERMIT DIRECTION = INBOUND SRCADDR = *  
DSTADDR = MyInternalIPAddress PROTOCOL = TCP DSTPORT = 80 SRCPORT = * JRN = OFF
```

- ▶ **If you wanted to assign line names to an interface names, do it like this:**

```
FILTER_INTERFACE LINE = MYWEBLINE SET = Set4InternalInterface
```

```
FILTER_INTERFACE LINE = MYETHLINE SET = Set4InternalInterface
```



# IBM i Web Serving Network

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- ▶ To stop FTP at the packet level:
  - ▶ Define the service, create the filter, assign it to an interface

```
SERVICE FTPControl PROTOCOL = TCP DSTPORT = 21 SRCPORT = *
SERVICE FTPData PROTOCOL = TCP DSTPORT = 20 SRCPORT = *

#
FILTER SET DenyFTP ACTION = DENY DIRECTION = OUTBOUND SRCADDR = * DSTADDR = * SERVICE = FTPControl
JRN = OFF
FILTER SET AllowMeFTP ACTION = DENY DIRECTION = OUTBOUND SRCADDR = 10.2.2.110 DSTADDR = * SERVICE =
FTPControl JRN = OFF

#
FILTER_INTERFACE LINE = MYETHLINE SET = AllowMeFTP
FILTER_INTERFACE LINE = MYWEBLINE SET = DenyFTP
FILTER_INTERFACE LINE = MYETHLINE SET = DenyFTP
```

- ▶ Now you have allowed yourself FTP from your workstation (10.2.2.110) and denied everyone else
- ▶ You have stopped FTP on both the internal and web interface



# IBM i Web Serving

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- ▶ Whew!! That was a lot of information in a short time
- ▶ We:
  - ▶ Made sure we had all the parts installed
  - ▶ Set up individual developers web sites
  - ▶ Set up some work management
  - ▶ Put some security on the network



# Where do you find me?

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