Tip or Technique

Managing Apache WebServer

Product(s): IBM Cognos 8, Series 7

Area of Interest: Infrastructure
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1 Introduction

1.1 Purpose
The reader is assumed to be rudimentarily familiar with the configuration and operation of Apache HTTP Server. Specific guidance is provided on the operation and configuration of the Apache WebServer for use with IBM Cognos Web products.

1.2 Applicability
The Apache Software Foundation [http://www.apache.org/](http://www.apache.org/) is a community of Open Source Developers who now develop many tools other than the world's most popular WebServer. This document focuses solely on the Apache HTTP Server v2.0.x, and its configuration on IBM Cognos-supported platforms for use with

- IBM Cognos 8
- IBM Cognos Series 7

1.3 Exclusions and Exceptions
Does not include performance and scalability recommendations in the Web Tier. Furthermore, does not discuss SSL enabling the WebServer as this is documented elsewhere on the Proven Practices / TechTalkInsider website. More detail on Integration with Application Servers is also documented elsewhere on the Proven Practices / TechTalkInsider website.

1.4 Modification History

- 25-Jan-2007  further detail for Directory Browsing
- 20-Feb-2007  added MIME-type requirements for IBM Cognos GO! Mobile.
2 IBM Cognos Requirements

2.1 IBM Cognos 8

Two aliases are required by IBM Cognos 8. These resolve to the static content (javascript, graphics, stylesheets, documentation, samples) and to the executable content (cgi-bin).

```
/cognos8  ➔ <c8 install location>/webcontent
/cgi-bin   ➔ <c8 install location>/cgi-bin
```

If using the Apache Module then this must be explicitly loaded, and then mapped to a URI using the `<Location>` element.

If the Module has been correctly loaded, then it should be visible in the output of the Server Info Module [http://webserver:80/server-info](http://webserver:80/server-info)

```
LoadModule cognos_module D:/Apps/Cognos/c8/cgi-bin/mod2_cognos.dll

<IfModule mod_cognos.c>

    # [http://webserver:80/cognos8/cgi-bin/cognos.dso](http://webserver:80/cognos8/cgi-bin/cognos.dso)

    <Location /cognos8/cgi-bin/cognos.dso>
        SetHandler cognos-handler
        CGIBinDir D:/Apps/Cognos/c8/cgi-bin
    </Location>

</IfModule>
```

If the Cognos Gateway is prefixed with "diag_" then additional diagnostic functionality is available. Copy "cgi-bin\cognos.cgi" to "cgi-bin\diag_cognos.cgi" then access as [http://webserver:80/cognos8/cgi-bin/diag_cognos.cgi?gateway_diagnostics](http://webserver:80/cognos8/cgi-bin/diag_cognos.cgi?gateway_diagnostics)

To use this diagnostic functionality, it is necessary to disable the Cognos Application Firewall, so this should only be used during investigations. You can visit the diagnostic URL to determine if Cookies and other HTTP Headers are correctly visible to Cognos for purpose of Single Signon.

The Installation Guide also recommends that Content Expiry is managed for the Portal Images so that the Browser caches them for up to an hour.

When using IBM Cognos GO!Mobile to enable mobile connectivity to IBM Cognos 8, two MIME types may need to be added to the WebServer. These should be indicated using the AddType directive.

When IBM Cognos GO!Search is integrated with an Enterprise Search Engine (eg Google OneBox, IBM OmniFind) then "cards" must be periodically published from the Search Service to a website that the Search Engine can access. The alias "/cognos8/cards" is suggested (below) for the published Index.
Copy the fragment below into `conf.d\cognos8.conf`

The **bolded** section indicates the requisite alias definitions. The rest are optional.

```
# # Cognos 8
#
LoadModule cognos_module D:/Apps/Cognos/c8/cgi-bin/mod2_cognos.dll
<IfModule mod_cognos.c>
  # http://webserver:80/cognos8/cgi-bin/cognos.dso
  <Location /cognos8/cgi-bin/cognos.dso>
    SetHandler cognos-handler
    CGIBinDir D:/Apps/Cognos/c8/cgi-bin
  </Location>

  # http://webserver:80/cognos8/cgi-bin/diag_cognos.dso?gateway_diagnostics
  <Location /cognos8/cgi-bin/diag_cognos.dso>
    SetHandler cognos-handler
    CGIBinDir D:/Apps/Cognos/c8/cgi-bin
  </Location>

  # http://webserver:80/cognos8/cgi-bin/cognosisapi.dll
  <Location /cognos8/cgi-bin/cognosisapi.dll>
    SetHandler cognos-handler
    CGIBinDir D:/Apps/Cognos/c8/cgi-bin
  </Location>
</IfModule>

# Refer Installation Guide "Configure the WebServer"
<IfModule mod_expires.c>
  <Location /cognos8/pat/images>
    ExpiresActive on
    ExpiresDefault "access plus 1 hour"
  </Location>
</IfModule>

# Indexes published from Cognos GO!Search Service
Alias /cognos8/cards D:/Apps/Cognos/c8/indexes/cards
<Location /cognos8/cards>
  Options Indexes FollowSymLinks
</Location>

# OPTIONAL: enable remote access to the Logs folder
Alias /cognos8/logs D:/Apps/Cognos/c8/logs
<Location /cognos8/logs>
```
2.2 Series 7

Three aliases are required by Cognos Series 7. These resolve to the static content (javascript, graphics, stylesheets), documentation (pdf) and to the executable content (cgi-bin).

/cognos  ➔ <cerX install location>/webcontent
/cgi-bin  ➔ <cerX install location>/cgi-bin
/help  ➔ <cerX install location>/documentation

Copy the fragment below into conf.d\series7.conf
Note that the order these aliases are defined in is important. The "/cognos" must be the last of the three.
2.3 Custom Content, Images, DAV

Cognos recommend that Customers do NOT add tailored content into the locations resolved by Cognos aliases. During any software upgrade that tailored content could be easily forgotten and destroyed.

Customers should establish a "/custom" alias and folder that contains site-specific web content.

For convenience, we recommend that you DAV-enable the Custom location. This will allow you to maintain the content without needing direct access to the host.

DAV is Web-based Distributed Authoring and Versioning. It provides FTP-like functionality from a Browser but operates over HTTP or HTTPS. This allows you to conveniently upload an Image to the WebServer.

Refer:
- http://httpd.apache.org/docs/2.0/mod/mod_dav.html
- http://www.webdav.org/

Internet Explorer even allows you to Map a Network Drive to a "Web Folder" as though it was UNC. This is a very useful tool for accessing folders on a Unix host via HTTP instead of SMB.

Ensure the two DAV modules have been loaded in httpd.conf

```
LoadModule dav_module modules/mod_dav.so
LoadModule dav_fs_module modules/mod_dav_fs.so

<IfModule mod_dav_fs.c>
  DAVLockDB logs/DAVLock.db
</IfModule>
```

Copy fragment below to conf.d/custom.conf

```
# WebDAV enabled Custom content
#
# Embed images as "../../custom/logo.gif" in Cognos8 Reports
Alias /custom D:/Apps/Cognos/custom
<Location /custom>
  Options Indexes
  <IfModule mod_dav.c>
    DAV on
  </IfModule>
</Location>
```
Using Internet Explorer, use the File > Open menu to open a DAV enabled location as a Web Folder. If successful then you'll be shown that content using the Windows Explorer interface, and can even Drag'n'Drop files.

Custom images (eg Corporate Logo) that will be embedded in Reports should be placed in the "/custom" location above.

These could be referenced as Image or HTML items in Reports in several forms:

1. Explicit Path
   
   "http://webserver:80/custom/logo.gif"

2. Unqualified Path
   
   "/custom/logo.gif"

3. Relative Path
   
   ".../../custom/logo.gif"

The first Explicit Path form will work reliably in all Reports, but if the Report is migrated from a Development Environment to a Production Environment then the Production Report will continue to reference Images from the Development WebServer. This may be acceptable if there is a company-wide webserver used for all images but could be a problem for Extranet users or others with restricted access to that WebServer.

The Unqualified Path approach works well, but does compel PDF generation to attempt to locate the content from the root of the filesystem or drive that Cognos is running on.

Relative Path works best. PDF generation can also use the Relative Path to locate the images [relative to the Cognos 8 "bin" folder] for embedding in Reports.
3 Apache WebServer

3.1 Diagram

Diagram of Apache WebServer configuration and interaction.
3.2 Components

3.2.1 Files and Folders

When installed, the Apache Webserver includes the following folders:

- bin\
  - Apache.exe – [Windows] this is the multi-threaded WebServer
  - ApacheMonitor.exe – [Windows] a Taskbar program for stopping / starting the Apache WebServer service
  - httpd – [Unix] the multi-process, multi-threaded WebServer
  - apachectl – [Unix] startup/shutdown/validation tool
- cgi-bin\ - sample CGI programs
- conf\n  - httpd.conf – the main configuration file
  - magic – rules used to determine document type from file content rather than from file extension
  - mime.types – these are the descriptive strings sent to the Browser to indicate what the content type is, and used by the Browser to open a corresponding "helper" application (eg Excel, Adobe).
- conf.d\ - fragments of httpd.conf
- htdocs\ - default DocumentRoot
- icons\ - images displayed when Browsing a folder
- logs\ - Access and Error logs
- modules – Apache Modules (Dynamically Shared Objects) these are libraries that extend the functionality of the core Apache webserver

The file httpd.conf contains all the directives for configuring Apache. It is maintained with a Text Editor (notepad or vi), and changes are not reflected until Apache is restarted. Large parts of the initial file are Documentation on lines starting with #. Many sections of the configuration are XML-like.

The configuration can be validated using the following command:

Windows: Apache.exe -t
Unix: apachectl -configtest

Fragments of the configuration can be placed in files in the conf.d folder, and are read by Apache using the following directive in httpd.conf:

Include conf.d/*.conf
The Core of Apache contains elements for server identification, logging, tuning and loads all the Modules that extend functionality. Some Modules may be compiled and linked into the Apache.exe or httpd executables. Others may be loaded at runtime as specified by the LoadModule directive.

3.2.2 Common Gateway Interface (CGI)

The default configuration of Cognos web products uses CGI (Common Gateway Interface) as almost every webserver supports the CGI standard, CGI is widely understood and easily configured. It is also easy to diagnose CGI operation. Apache supports CGI v1.1 and can be used for almost all Websites. CGI is an inefficient use of the host resources though, as every click causes Apache to start that CGI program as a child process. Use of CGI may also create a security vulnerability because if a malevolent user replaced the CGI program with a Trojan then the next user to navigate to that URL would cause the Trojan to be executed.

When the WebServer invokes a CGI program to handle a User Request, the parameters in the URL are exposed to the CGI program in Environment Variables. The CGI writes HTML to StdOut which the WebServer captures and forwards to the Browser.

You can confirm that a CGI program is operational by invoking it at a command-line. The HTTP Headers and HTML should be displayed on your workstation.

When a Cognos CGI gateway attempts to connect to a Dispatcher, it must attempt each of the Dispatchers [known in the Server Group] until it succeeds or has no more Dispatchers. A subsequent click causes the CGI program to be loaded into memory, determine its configuration, then try all Dispatchers again.

3.2.3 Dynamically Shared Objects (DSO)

Each loaded Module may extend the syntax supported in httpd.conf. Just as Microsoft's IIS WebServer supports ISAPI plugins which are loaded into memory when the WebServer starts or first accesses them, Apache also supports Dynamically Shared Objects or "Apache Modules". These Modules are loaded into memory and configure themselves once at startup, and consequently perform much better than CGI.

When a Cognos DSO gateway (aka "Apache Module") is loaded into Apache, it determines it's configuration only during WebServer startup. Changes to the Configuration will require that Apache is restarted. The DSO also maintains a Thread which polls each of the Dispatchers [known in the Server Group] so that Failover to an alternate Dispatcher can be performed very quickly.

A Module provides a "Handler" which must be associated with a Location (URL) in order to access it. For example, the "/server-info" Location can be associated with the Apache Info Module via the "server-info" handler:
LoadModule info_module modules/mod_info.so
<IfModule mod_info.c>
  <Location /server-info>
    SetHandler server-info
  </Location>
</IfModule>

In the example above, the subroutine "info_module" has been loaded from "mod_info.so" library or DLL in the "modules" folder. Apache tests if the Info Module has been loaded [using its source name], and associates the "/server-info" URL with the Server-Info Handler. Apache will process all requests to "/server-info" in memory using a call to subroutine in the "mod_info.so" library.

3.2.4 Virtual Directories

Virtual Directories are either static content alias or executable script alias. Additional properties (eg Authentication & Authorisation, WebDAV, Browsing) can be assigned to a Virtual Directory. The properties can be assigned to the virtual Location or to the underlying Directory (folder).

An alias may have additional properties associated with it, for example Authentication & Authorisation, or may be a URL that is processed by a particular "handler" (as above in "/server-info").

Alias /cognos8 D:/Apps/Cognos/c8/webcontent
<Directory D:/Apps/Cognos/c8/webcontent>
  Options None
</Directory>

The syntax below is functionally equivalent to the example above:

Alias /cognos8 D:/Apps/Cognos/c8/webcontent
<Location /cognos8>
  Options None
</Location>

The <Directory> tag can only be associated with a physical folder, but the <Location> tag can be used with an Apache Module or "Handler".

Note the use of the forward slash (/) in the folder location above. Apache belies its origins on Unix, and prefers the Unix conventions. Folders with spaces in them must be delimited by quotes, eg:

Alias /cognos8 "C:/Program Files/Cognos/c8/webcontent"

In the simplest configuration, you will merely append your Virtual Directories to the bottom of the configuration file. You might choose to put application-specific collections of Aliases in a fragment of httpd.conf in the conf.d subfolder.
3.2.5 Virtual Hosts

Imagine you’re an Internet Service Provider. You host 120 WebSites. Do you have 120 copies of Apache installed and running on your Servers? No. You have one WebServer that responds to 120 DNS names. You use Virtual Hosts in httpd.conf to distinguish the configuration for each WebSite. Apache will match the incoming request to a Virtual Host using the hostname part of the URL. A <VirtualHost> tag is used to encapsulate Aliases for each website. Many websites could all have the "/custom" alias resolving to distinct content.

You do not have to use the <VirtualHost> tag. In its absence, all Aliases are declared for the Default WebSite. See [http://httpd.apache.org/docs/2.0/vhosts/](http://httpd.apache.org/docs/2.0/vhosts/)

Virtual Hosts may be useful if you are hosting the Cognos website for multiple environments (Development, UAT and Production) using one instance of Apache. Note that you may only use one version of any Dynamically Shared Object for each instance of Apache.

3.2.6 Resolving Locations

When Apache receives a request for a URL, it parses the <Location>, Alias and ScriptAlias directives sequentially to find a substring-match with the URL. The order that these aliases are defined in is important.

The example below is erroneous, and used to illustrate the point:

<table>
<thead>
<tr>
<th>Alias</th>
<th>D:/Apps/Cognos/cer5/webcontent</th>
</tr>
</thead>
<tbody>
<tr>
<td>/cognos</td>
<td></td>
</tr>
<tr>
<td>&lt;Location /cognos&gt;</td>
<td>Options None</td>
</tr>
<tr>
<td></td>
<td>&lt;/Location&gt;</td>
</tr>
<tr>
<td>ScriptAlias /cognos/cgi-bin</td>
<td>D:/Apps/Cognos/cer5/cgi-bin</td>
</tr>
<tr>
<td>&lt;Location /cognos/cgi-bin&gt;</td>
<td>Options ExecCGI</td>
</tr>
<tr>
<td></td>
<td>&lt;/Location&gt;</td>
</tr>
<tr>
<td>Alias /cognos/help</td>
<td>D:/Apps/Cognos/cer5/documentation</td>
</tr>
<tr>
<td>&lt;Location /cognos/help&gt;</td>
<td>Options None</td>
</tr>
<tr>
<td></td>
<td>&lt;/Location&gt;</td>
</tr>
</tbody>
</table>
If I browse to http://webserver/cognos/cgi-bin/upfcgi.exe then Apache will find that the location "/cognos" matches the first part of "/cognos/cgi-bin/upfcgi.exe". Apache will then attempt to suffix "/cgi-bin/upfcgi.exe" on to the "D:/Apps/Cognos/ce5/webcontent" folder to deliver this as static content. The file "D:/Apps/Cognos/ce5/webcontent/cgi-bin/upfcgi.exe" does not exist, so Apache will deliver a "File not found" error (404). Even if you copied the cgi-bin folder into the webcontent you would still get an error because Apache would try to deliver upfcgi.exe instead of executing it.

Rules:

1. Specify Locations associated with Handlers before CGI
2. Specify the least qualification ("/cognos") last (after "/cognos/cgi-bin").

The settings below are correct:

```apache
ScriptAlias /cognos/cgi-bin D:/Apps/Cognos/ce5/cgi-bin
<Location /cognos/cgi-bin>
  Options ExecCGI
</Location>

Alias /cognos/help D:/Apps/Cognos/ce5/documentation
<Location /cognos/help>
  Options None
</Location>

# LAST
Alias /cognos D:/Apps/Cognos/ce5/webcontent
<Location /cognos>
  Options None
</Location>
```

### 3.2.7 Permissions

The WebServer runs on the Operating System as a specific Account. That account must have sufficient rights to access the content being aliased. It should not have more rights than necessary to deliver that static or dynamic content otherwise a hacker could leverage those rights to manipulate the host via the WebServer.

On Windows, Apache.exe often runs as "LocalSystem". This internal account has no specific rights or identity, so the NTFS locations of the Aliased content must grant Read,List to the Everyone group. ScriptAlias locations must allow the Everyone account Execute rights.
On Unix, the WebServer will be started as root if listening on a port <1024. One httpd process will run as root, and accepts incoming HTTP requests. It will forward these requests to child httpd processes that typically run as nobody. The nobody account must have Read, Traverse access to Aliased folders, Read access to the files in those folders, and Read, Execute rights to ScriptAliased folders and files. You can test this by becoming nobody (su - nobody) and attempting to navigate to, and access the content.
3.3 Important Directives

Refer [http://httpd.apache.org/docs/2.0/mod/quickreference.html](http://httpd.apache.org/docs/2.0/mod/quickreference.html)

3.3.1 UseCanonicalName

If UseCanonicalName is On then the Browser will be coerced to the website identified by the ServerName setting. When Off, then the Browser continues to use whatever Address the User has entered.

Cognos recommends specifying a fully qualified ServerName, and setting UseCanonicalName OFF.

```apache
# ServerName gives the name and port that the server uses to identify itself. This can often be determined automatically, but we recommend you specify it explicitly to prevent problems during startup.
#
# If this is not set to valid DNS name for your host, server-generated redirections will not work. See also the UseCanonicalName directive.
#
# If your host doesn't have a registered DNS name, enter its IP address here. You will have to access it by its address anyway, and this will make redirections work in a sensible way.
#
ServerName WebServer.YourDomain.com:80

# UseCanonicalName: Determines how Apache constructs self-referencing URLs and the SERVER_NAME and SERVER_PORT variables.
# When set "Off", Apache will use the Hostname and Port supplied by the client. When set "On", Apache will use the value of the ServerName directive.
#
UseCanonicalName Off
```

When UseCanonicalName is OFF you can use any value for the Hostname portion of your URLs that correctly resolves to the webserver, eg: Hostname, DNS Alias, IP Address. This is very flexible, and allows operation regardless of the DNS.

When UseCanonicalName is ON the webserver will compel the end user to use the ServerName in all URLs. This may be more secure.

3.3.2 Directory Index

When a User browses to a Virtual Directory (Alias) without specifying a document, then the WebServer tries to access a document by each of the names listed in the DirectoryIndex setting.
3.3.3 Hostname Lookups

Whenever a Browser accesses content from the WebServer, that attempt will be logged. The log may contain the Browser’s IP Address or can attempt to resolve this to a Name using DNS. Name resolution is expensive and can impede performance of the WebServer. Cognos recommend suppressing Hostname Lookups.

```
# HostnameLookups: Log the names of clients or just their IP addresses
# e.g., www.apache.org (on) or 204.62.129.132 (off).
# The default is off because it'd be overall better for the net if people
# had to knowingly turn this feature on, since enabling it means that
# each client request will result in AT LEAST one lookup request to the
# nameserver.

HostnameLookups Off
```

3.3.4 Status Module

The Status Module can display portions of the Access Logs, and displays the Load on the WebServer. Not particularly useful, but may be interesting.

```
LoadModule status_module modules/mod_status.so
<IfModule mod_status.c>
  # ExtendedStatus controls whether Apache will generate "full" status
  # information (ExtendedStatus On) or just basic information
  # The default is Off.
  
  ExtendedStatus On

  # Allow server status reports generated by mod_status,
  # with the URL of http://servername/server-status
  # Change the ".YourDomain.com" to match your domain to enable.
  
  <Location /server-status>
    SetHandler server-status
    # Order deny,allow
    # Deny from all
```
3.3.5 Information Module

Probably the most useful of the Apache modules! This allows you to view the entire configuration of the Apache WebServer from a Browser. The supported syntax of every loaded Module is also indicated.

Obviously, any Location associated to this module's Handler should be secured to prevent snooping by unauthorised or malicious users as this information could be used to inform a Hacker about the capabilities of the WebServer and thus any vulnerabilities it may have.

```
LoadModule info_module modules/mod_info.so
<IfModule mod_info.c>
    # Allow remote server configuration reports, with the URL of
    # http://servername/server-info (requires that mod_info.c be loaded).
    # Change the ".YourDomain.com" to match your domain to enable.
    
    <Location /server-info>
        SetHandler server-info
        # Order deny,allow
        # Deny from all
        # Allow from .YourDomain.com
    </Location>
</IfModule>
```
Apache Server Information

Server Settings: mod_jk.c, mod_cognos.c, mod_mod_mdb ldap.c, mod_userdir.c, mod_status.c, mod_setenvfile, mod_negotiation.c, proxy_ftp.c, proxy_http.c, proxy_connect.c, mod_proxy.c, mod_name.c, mod_log_config.c, mod隘apa.c, mod_info.c, mod_include.c, mod_map.c, mod_expires.c, mod_env.c, mod_dir.c, mod_dav_fs.c, mod_dav.c, mod cripple.c, mod_autoindex.c, mod_rewrite.c, mod_alias.c, mod_seexec.c, mod_access.c, mod_so.c, http_core.c, http_mungi.c, mod_win32.c, core.c

Server Version: Apache/2.0.59 (Win32) DAV/2 mod_jk/1.2.10
Server Built: Jul 27 2006 15:55:03
API Version: 20020901c12
Hostname/port: localhost:80
Timeouts: connection: 300 keep-alive: 300
MPM Name: WinNT
MPM Information: Max Demons: 64 Threaded: yes Forked: no
Server Root: C:/Apps/Apache Group/Apache2
Config File: C:/Apps/Apache Group/Apache2/conf/httpd.conf

Module Name: mod_jk.c
Content handlers: yes
Configuration Phase Participation: Create, Server, Config, Merge, Server, Config
Request Phase Participation: Translate, Path
Module Directives:
JkWorkersFile - the name of a worker file for the Tomcat servlet container
### Document Root

This identifies the Folder that Apache delivers content from when you haven't specified any particular alias in your URL.

```bash
# DocumentRoot: The directory out of which you will serve your
# documents. By default, all requests are taken from this directory, but
# symbolic links and aliases may be used to point to other locations.

#DocumentRoot "D:/Apps/Apache Group/Apache2/htdocs"
DocumentRoot "E:/Data/www"
```

You may wish to amend the default to resolve to your own WebSite, or could put an `index.html` page there which redirects users to your preferred content:

```html
<html>
<head>
  <script language="javascript">
    function init()
    {
      document.navigate.submit();
    }
  </script>
</head>
<body bgcolor="#ffffff" link="#000099" vlink="#000099" alink="#ff9900" onLoad="init()">
<p>
  <font face="Arial" size="1">
    <form name="navigate" method="post" action="/cognos8/cgi-bin/cognos.cgi">
  </form>
    <a href="javascript:document.navigate.submit()">Loading Cognos 8 ...</a>
  </font>
</p>
</body>
</html>
```
3.3.7 MIME Types

When the WebServer delivers content to the Browser, it includes a header `Content-type` that is not visible to the end-user. This header indicates what the content is, and is used by the Browser to determine whether to display the content itself, or invoke a Helper Application (eg Adobe Reader, Microsoft Excel). This is more universal than the way Windows Explorer uses File Extensions to determine what Application to use to open a document.

The Directive `TypesConfig` identifies the MIME types file, and typically identifies the `mime.types` file in the Apache configuration folder.

```plaintext
# TypesConfig describes where the mime.types file (or equivalent) is # to be found.
#
TypesConfig conf/mime.types
```

Rather than amending the `mime.types` file, Apache recommend new MIME types be added using the `AddType` directive.

The `AddType` directive maps the given filename extensions onto the specified content type. `MIME-type` is the MIME type to use for filenames containing `extension`. This mapping is added to any already in force, overriding any mappings that already exist for the same `extension`. This directive can be used to add mappings not listed in the MIME types file.

The `extension` argument is case-insensitive, and can be specified with or without a leading dot.

Cognos GO! Mobile requires two additional MIME types for correct delivery of content to mobile device browsers (eg Blackberry).

```plaintext
AddType .cod application/vnd.rim.cod
AddType .jad text/vnd.sun.j2me.app-descriptor
```

If the mime types are not set correctly, the client will display the HTTP 406 "Not Acceptable" error when attempting to download the Cognos GO!Mobile client to the Mobile Device.
## 3.4 Useful Directives

### 3.4.1 Directory Browsing

If the Auto Index Module has been loaded, and the Alias includes the "Indexes" option, and none of the documents listed in the "DirectoryIndex" directive are found, then the browser will display a list of all the content in the target location.

This is modified by the following directives:

```plaintext
LoadModule autoindex_module modules/mod_autoindex.so
<IfModule mod_autoindex.c>
  # IndexOptions: Controls the appearance of server-generated directory listings.
  IndexOptions FancyIndexing VersionSort FoldersFirst

  # ReadmeName is the name of the README file the server will look for by default, and append to directory listings.
  # HeaderName is the name of a file which should be prepended to directory indexes.
  ReadmeName README.html
  HeaderName /HEADER.html

  # IndexIgnore is a set of filenames which directory indexing should ignore and not include in the listing.
  # Shell-style wildcarding is permitted.
  IndexIgnore .??* *~ *# HEADER* README* RCS CVS *,v *,t Thumbs.db
</IfModule>
```

The IndexOptions directive is used to affect the appearance of the Index. IndexIgnore can be used to hide some documents from the listing.

The HTML document identified by ReadMeName will be shown below the list of files in the aliased location. You could place any informative text in this file, and an example is shown below. Note that you do not need the `<HTML>` and `<BODY>` tags because this is only part of the whole page.

```html
<!-- begin README.html -->
<table cols="2" border="0">
</table>
</html>
```
This location has been DAV enabled.
You can maintain content in this folder by accessing it as a Web Folder from Internet Explorer's File>Open dialog.

The HTML document identified by HeaderName will be shown at the top of the page. You can enable user-manipulation of the Index output using the following example HEADER.html
Refer [http://httpd.apache.org/docs/2.0/mod/mod_autoindex.html](http://httpd.apache.org/docs/2.0/mod/mod_autoindex.html)
Example:

This location has been DAV enabled.
You can maintain content in this folder by accessing it as a Web Folder from Internet Explorer’s File-Open dialog.
4 Operating Systems

Apache WebServer is now frequently embedded or supplied with Unix Operating Systems. You may choose to use or replace the embedded version, as it is usually an old build prior to v2.0.40.

The Windows instructions below show how to Install Apache.

For Unix platforms, we show the common customisations for locating the configuration file "httpd.conf" and the startup script.

On AIX, the special case of the IBM HTTP Server is described. IBM is redistributing a tailored build of Apache that includes a Web-based Admin UI. This Admin UI is not very useful, as it may mis-order Alias definitions, and is clumsy for an Administrator who is familiar with Apache configuration.

The Apache WebServer is generally available as Source Code which can be tailored and compiled locally. Most site administrators prefer to use well proven Binary Installers. You can navigate to the Download Mirrors via http://httpd.apache.org/download.cgi. Select a nearby Mirror Server and click "Update" to ensure the Links [lower in the page] resolve to your chosen Mirror.

Take care to navigate to the appropriate version (2.0.x), and Platform before downloading the installation media.

**Downloading the Apache HTTP Server**

Use the links below to download the Apache HTTP Server from one of our mirrors. You must verify the integrity of the downloaded files using signatures downloaded from our main distribution directory.

Only current recommended releases are available on the main distribution site and its mirrors. Older releases are available from the archive download site.

If you are downloading the Win32 distribution, please read these important notes.

**Mirror**

The currently selected mirror is http://apache.mirror.pacific.net.au. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are backup mirrors (at the end of the mirrors list) that should be available.

For Windows the product has been packaged as an MSI. On Unix a TAR file is sufficient, and can be expanded wherever you choose; there may be no further installation required. You can navigate to the media for your Platform by selecting the "Other Files" link.

**Apache HTTP Server 2.0.59 is also available**

Apache 2.0.59 is the current stable version of the 2.0 series, and is recommended over any previous 2.0 release. This release fixes an "important" security flaw in mod_rewrite.

For details see the [Official Announcement](http://www.apache.org) and the [CHANGES 2.0 list](http://www.apache.org).

Apache 2.0 add-in modules are not compatible with Apache 1.3 nor 2.2 modules. If you are running third party add-in modules, you will need to obtain modules compiled for or compatible with Apache 2.0 from that third party, before you attempt to use this specific release.

- Unix Source: [httpd-2.0.59.tar.gz](http://www.apache.org) [PGP] [MD5]
- Unix Source: [httpd-2.0.59.tar.bz2](http://www.apache.org) [PGP] [MD5]
- Win32 Source: [httpd-2.0.59-win32-src.zip](http://www.apache.org) [PGP] [MD5]
- Win32 Binary (MSI Installer): [apache_2.0.59-win32-x86-no_ssl.msi](http://www.apache.org) [PGP] [MD5]
- Other files

---

**Index of /httpd/binaries**

<table>
<thead>
<tr>
<th>Name</th>
<th>Last modified</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>parent</td>
<td></td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>aix/</td>
<td>10-Sep-2003 01:51</td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>cygwin/</td>
<td>19-Aug-2003 01:45</td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>darwin/</td>
<td>03-Jul-2004 03:08</td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>freebsd/</td>
<td>15-Mar-2005 06:21</td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>hpux/</td>
<td>15-Aug-2003 03:12</td>
<td></td>
<td>HTTP Server project</td>
</tr>
<tr>
<td>linux/</td>
<td>16-May-2006 03:41</td>
<td></td>
<td>HTTP Server project</td>
</tr>
</tbody>
</table>
Beware that Apache 1.3.x is now legacy, and that the Cognos-supplied "mod2_cognos" is not supported on Apache 2.2.x.

4.1 Windows

We assume you've downloaded Apache 2.0.59. The Installation will attempt to install Apache and start it on port 80. If you have another WebServer (eg IIS) running on your host then stop it now (eg: `NET STOP IISADMIN /Y`
The Network Domain will be determined from your current TCP settings, and the Server Name will default to your current Hostname. You can revise these now, or amend them later when configuring "httpd.conf".

If you specify a ServerName then it must be resolvable from DNS using "nslookup".

The Administrator's Email Address may only be displayed in Error Messages, and should be whoever will be responsible for investigating problems on this WebServer.
Choose an alternate installation location if you want. We choose "D:\Apps\Apache Group\".
Managing Apache WebServer

**Apache HTTP Server 2.0 - Installation Wizard**

**Ready to Install the Program**

The wizard is ready to begin installation.

Click Install to begin the installation.

If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.

**Apache HTTP Server 2.0 - Installation Wizard**

**Installing Apache HTTP Server 2.0.59**

The program features you selected are being installed.

Please wait while the Installation Wizard installs Apache HTTP Server 2.0.59. This may take several minutes.

Status:

```
------------------------------------------------------
```

**COGNOS**

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Cognos Proprietary Information
If you didn't stop IIS before installing Apache, then the installer may not have created the Apache Service. You can do this manually by invoking

```
apache -k install
```
Next you'll inspect the new items on the Start Menu, and proceed to test Apache and configure your Aliases.

4.2 AIX

If you're using AIX, then we assume you'll use the IBM branded & supported distribution of Apache called "IBM HTTP Server".

Refer:
- IBM HTTP Server

The Installation Program is a JAR file and requires that Java is already installed on your host. Invoke `java -jar setup.jar -console` to start the Installer without a GUI, or modify `silent.res` and perform a silent installation using

```
java -jar setup.jar -silent
```

This would install Apache into `/usr/IBMIHS` (the default location).

You should then proceed to tailor `/usr/IBMIHS/conf/httpd.conf` and establish startup scripts for the WebServer and [optionally] Admin Server too.

Copy the following into `/etc/rc.d/init.d/apache.httpd`

```
#!/bin/ksh
#ident "@(#)apache.httpd v2 06/03/05 MR"
#
# Start/Stop IBM HTTP Server
#
APACHE=/usr/IBMIHS
APACHECONF=/etc/ibmihs/conf/httpd.conf
```
```bash
case "$1" in
  start_msg)
    echo "Starting Apache WebServer"
    ;;
  stop_msg)
    echo "Stopping Apache WebServer"
    ;;
  start|stop|restart|configtest)
    cd $APACHE/bin
    ./apachectl $1
    ;;
  *)
    echo "Usage: $0 { start | stop | restart | config test }"
    ;;
esac
exit 0
```

Then grant appropriate permissions and symlink from the RunLevels at which the WebServer should be started:

```bash
chmod 755 /etc/rc.d/init.d/apache.httpd
chown root:sys /etc/rc.d/init.d/apache.httpd
ln -s /etc/rc.d/init.d/apache.httpd /etc/rc.d/rc2.d/S99httpd
ln -s /etc/rc.d/init.d/apache.httpd /etc/rc.d/rc1.d/K10httpd
```

You can confirm where Apache expects it’s ServerRoot and configuration files to be by invoking

```bash
cd /usr/IBMIHS/bin
./apachectl -V
```

The Apache control script `apachectl` tests for existence of `envvars`, and invokes this to set non-Apache environment variables.

Amend `/usr/IBMIHS/bin/envvars`, append the following to support the Cognos Module gateway:

```bash
## Begin Cognos customization ##
COG_ROOT=${COG_ROOT:-/opt/cognos/c8}
```

```bash
case `uname` in
  Linux)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin$LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH
```
export LD_LIBRARY_PATH

; ;
AIX)
    LIBPATH=${COG_ROOT}/cgi-bin${LIBPATH:+:$LIBPATH}
    export LIBPATH
    ; ;
SunOS)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin${LD_LIBRARY_PATH:+:${LD_LIBRARY_PATH}}
    export LD_LIBRARY_PATH
    ; ;
HP-UX)
    SHLIB_PATH=${COG_ROOT}/cgi-bin${SHLIB_PATH:+:${SHLIB_PATH}}
    export SHLIB_PATH
    ; ;
esac

## End Cognos customization ##

Next proceed to test Apache and configure your Aliases.

### 4.3 Solaris 9 ###

Solaris 9 may include an instance of Apache 1.3.x in /usr/apache, with corresponding startup script /etc/init.d/rc3.d/S50apache and configuration file /etc/apache/httpd.conf

This is sufficient for Cognos CGI aliases, but not for Apache Modules. We recommend you disable this instance (rename S50apache to s50apache) of Apache and install a later version.

Download and install a Binary Image of Apache 2.0.x into /usr/local/apache2

Copy the following into /etc/rc.d/init.d/apache.httpd

```bash
#!/bin/ksh
#ident "@(#)apache.httpd v2 06/03/05 MR"
#
# Start/Stop Apache WebServer
#
APACHE=/usr/local/apache2
APACHECONF=$APACHE/conf/httpd.conf

case "$1" in
    start_msg)
        echo "Starting Apache WebServer"
```
stop_msg
    echo "Stopping Apache WebServer"

start|stop|restart|configtest)
    cd $APACHE/bin
    ./apachectl $1

*)
    echo "Usage: $0 { start | stop | restart | config test }"

esac
exit 0

Then grant appropriate permissions and symlink from the RunLevels at which the WebServer should be started:

chmod  755       /etc/init.d/apache.httpd
chown  root:sys /etc/init.d/apache.httpd
ln  -s  ../init.d/apache.httpd  /etc/rc.d/rc3.d/S99httpd
ln  -s  ../init.d/apache.httpd  /etc/rc.d/rc1.d/K10httpd

You can confirm where Apache expects it's ServerRoot and configuration files to be by invoking

cd  /usr/local/apache2/bin
./apachectl  -V

Amend /usr/local/apache2/bin/envvars, append the following to support the Cognos Module gateway:

```bash
## Begin Cognos customization ##
COG_ROOT=${COG_ROOT:-/opt/cognos/c8}
case `uname` in
    Linux)
        LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin:${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}
        export LD_LIBRARY_PATH
    ;;
    AIX)
        LIBPATH=${COG_ROOT}/cgi-bin:${LIBPATH:+:$LIBPATH}
        export LIBPATH
    ;;
```
Next proceed to test Apache and configure your Aliases.

4.4 Solaris 10

Solaris 10 may include an instance of Apache 1.3.33 in /usr/apache with configuration file is at /etc/apache/httpd.conf, and a startup script at /etc/init.d/apache symlinked by /etc/rc3.d/S50apache

The absence of the configuration file /etc/apache/httpd.conf prevents this instance from starting automatically, and it is insufficient for Cognos requirements anyway.

Solaris 10 may also include an instance of Apache 2.0.55 in /usr/apache2 with configuration file at /etc/apache2/httpd.conf. Solaris 10 SMF is used to manage the Apache Service; the startup "method" is at /lib/svc/method/http-apache2 and the service definition can be viewed using the Solaris svcs and svccfg commands:

    svcs -l http

This instance is sufficient for Cognos CGI requirements but fails to deliver content for the Cognos-supplied DSO or Apache Module. You may prefer to install another build of Apache WebServer or IBM HTTP Server.

Amend /usr/apache2/bin/envvars, append the following to support the Cognos Module gateway:

```bash
## Begin Cognos customization ##
COG_ROOT=${COG_ROOT:-/opt/cognos/c8}

case 'uname' in
    Linux)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin:${LD_LIBRARY_PATH:+:${LD_LIBRARY_PATH}}
    export LD_LIBRARY_PATH
    ;;
    esac

## End Cognos customization ##
```

SunOS)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin:${LD_LIBRARY_PATH:+:${LD_LIBRARY_PATH}}
    export LD_LIBRARY_PATH
    ;;
HP-UX)
    SHLIB_PATH=${COG_ROOT}/cgi-bin:${SHLIB_PATH:+:${SHLIB_PATH}}
    export SHLIB_PATH
    ;;
esac
Next proceed to test Apache and configure your Aliases.
4.5 HP-UX

HP-UX is supplied with Apache v2.0.49 installed to /opt/hpws/apache
The configuration file is at /opt/hpws/apache/conf/httpd.conf,
and a startup script is at /sbin/init.d/hpws_apache
symlinked by /sbin/init.d/rc3.d/S823hpws_apache

This installation is sufficient for Cognos and does not need to be replaced.
Refer:
- HP-UX 11i Apache-based Web Server
  http://www.hp.com/go/webserver/

Note that the HP-supplied startup script contains these fragments:

```bash
# source the system configuration variables
if [ -f /etc/rc.config ]; then
  . /etc/rc.config
else
  echo "ERROR: /etc/rc.config defaults file MISSING"
fi

and

'start')
  # Check to see if apache is allowed to start...
  if [ $HPWS_APACHE_START -ne 1 ]; then
    if [ $rval -ne 0 ]; then
      rval=2
    fi
  else
    # Execute the commands to start apache
    $HPWS_APACHE_HOME/bin/apachectl start 1>/dev/null 2>&1

The WebServer will not start unless the following modification has been made to
/etc/rc.config.d/hpws_apacheconf
# Apache Web Server configuration file

# Set HPWS_APACHE_START to 1 to have the Apache web-server started by the init process.
HPWS_APACHE_START=1

# Set HPWS_APACHE_HOME to the location of the Apache web-server. # Default is /opt/hpws/apache
HPWS_APACHE_HOME=/opt/hpws/apache

Amend /opt/hpws/apache/bin/envvars, append the following to support the Cognos Module gateway:

```bash
## Begin Cognos customization ##
COG_ROOT=${COG_ROOT:-/opt/cognos/c8}
case `uname` in
  Linux)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}
    export LD_LIBRARY_PATH
  ;;
  AIX)
    LIBPATH=${COG_ROOT}/cgi-bin${LIBPATH:+:$LIBPATH}
    export LIBPATH
  ;;
  SunOS)
    LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}
    export LD_LIBRARY_PATH
  ;;
  HP-UX)
    SHLIB_PATH=${COG_ROOT}/cgi-bin${SHLIB_PATH:+:$SHLIB_PATH}
    export SHLIB_PATH
  ;;
esac
## End Cognos customization ##
```

Next proceed to test Apache and configure your Aliases.
4.6 Linux

The Redhat Linux v2.4.21-4 distribution inspected by the author reveals that Linux is supplied with Apache v2.0.46 preinstalled. The embedded installation is unusual as it places binaries in /usr/sbin, Modules in /usr/lib/httpd, logs in /var/log/httpd, and the configuration file is at /etc/httpd/conf/httpd.conf. A startup script is at /etc/init.d/httpd symlinked by /etc/rc5.d/S85httpd.
The DocumentRoot is also /var/www/html

This installation is sufficient for Cognos and does not need to be replaced.

You can confirm where Apache expects it’s ServerRoot and configuration files to be by invoking
cd /usr/sbin
./apachectl -V

Use of the Cognos Modules in Apache may also require that the \texttt{LD\_LIBRARY\_PATH} is modified in the Apache startup script to include the Cognos 8 \texttt{cgi-bin} folder.

Amend /etc/sysconfig/httpd, append the following to support the Cognos Module gateway:

```
## Begin Cognos customization ##
COG_ROOT=${COG_ROOT:-/opt/cognos/c8}

case `uname` in
    Linux)
        LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}
        export LD_LIBRARY_PATH
        ;;
    AIX)
        LIBPATH=${COG_ROOT}/cgi-bin${LIBPATH:+:$LIBPATH}
        export LIBPATH
        ;;
    SunOS)
        LD_LIBRARY_PATH=${COG_ROOT}/cgi-bin${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}
        export LD_LIBRARY_PATH
        ;;
    HP-UX)
        SHLIB_PATH=${COG_ROOT}/cgi-bin${SHLIB_PATH:+:$SHLIB_PATH}
        export SHLIB_PATH
        ;;
```
Next proceed to test Apache and configure your Aliases.
5 Integration

5.1 HTTP Compression

Content can be compressed by the WebServer before delivery to the Browser. This may reduce bandwidth utilisation, but like SSL, it will slightly increase CPU utilisation on both the Browser and WebServer.

Static text such as HTML, Stylesheets and Javascript may compress well. Some files such as JPEG and PDF have an internal compression already, and further attempts at compression by the WebServer may be counterproductive.

Refer:

- [http://httpd.apache.org/docs/2.0/mod/mod_deflate.html](http://httpd.apache.org/docs/2.0/mod/mod_deflate.html)

```xml
LoadModule deflate_module modules/mod_deflate.so
<IfModule mod_deflate.c>
    DeflateBufferSize 8096
    DeflateCompressionLevel 9
    DeflateMemLevel 9
    DeflateWindowSize 15
    DeflateFilterNote Input instream
    DeflateFilterNote Output outstream
    DeflateFilterNote Ratio ratio

    # Report the usefulness of deflation
    <IfModule mod_log_config.c>
        LogFormat '%>s %b "%r" %{outstream}n/%{instream}n  %{ratio}n%%) deflate
        CustomLog logs/deflate.log deflate
    </IfModule>

    <Location />
        # Compress HTML, StyleSheets, Javascript
        AddOutputFilterByType DEFLATE text/html
        AddOutputFilterByType DEFLATE text/css
        AddOutputFilterByType DEFLATE application/x-javas cript

        # Input filter is applied for uploaded WebDAV content
        SetInputFilter DEFLATE

        # Output filter is applied for delivery to Browser
        SetOutputFilter DEFLATE

        # Don't compress images or PDF because there's not much benefit
```
5.2 Mod Proxy

Apache's "mod_proxy" may be used to expose a remote WebServer or Application Server as though it is local.

The fragment below illustrates how a Tomcat-hosted Servlet Gateway, WebDAV enabled Tomcat v5.5.17, and a Barcode-generator can be exposed to an End-User as though they are running on the WebServer.

Refer:
- [http://httpd.apache.org/docs/2.0/mod/mod_proxy.html](http://httpd.apache.org/docs/2.0/mod/mod_proxy.html)

When multiple versions of an Apache Module are required, or they conflict with each other then they must be loaded into distinct instances of Apache (not merely into Virtual Hosts). They can then be Proxied so that only one Firewall Port needs to opened for access to them all.

```c
<IfModule mod_proxy.c>
 #
 # Cognos 8 Dispatcher
 #
 # http://webserver:80/p2pd/servlet/gc
 ProxyPass /p2pd http://AppServer:9300/p2pd
 ProxyPassReverse /p2pd http://AppServer:9300/p2pd
 #
 # http://webserver:80/samples
 ProxyPass /samples http://AppServer:9300/samples
 ProxyPassReverse /samples http://AppServer:9300/samples
 #
 # Cognos Servlet Gateway on generic Tomcat 5.5.17
 # http://webserver:80/ServletGateway/servlet/Gateway
 #
 ProxyPass /ServletGateway http://Gateway:8080/ServletGateway
 #
 # Barcode Servlet from IDautomation
 # http://www.idautomation.com/java/
 #
 ProxyPass /barcode http://Gateway:8080/barcode
</IfModule>
```
```conf
ProxyPassReverse /barcode http://Gateway:8080/barcode

#
# Proxy access to WebDAV on the Servlet Gateway
# http://jakarta.apache.org/slide/
#
ProxyPass /webdav http://Gateway:8080/webdav
ProxyPassReverse /webdav http://Gateway:8080/webdav

#
# Admin UI for generic Tomcat 5.5.17
#
ProxyPass /manager http://Gateway:8080/manager
ProxyPassReverse /manager http://Gateway:8080/manager
</IfModule>
```

### 5.3 IBM WebSphere

IBM supply a Module that allows Apache to proxy interaction between a Browser and the WebSphere server. This may be useful where direct interaction with the WebSphere instances is not permitted, or one URL is used to access an application delivered by several load balanced WebSphere instances.

The web server plugin configuration file controls what content is transferred from the web server to an application server. This file must be regenerated [using the WebSphere Admin console] when server, cluster, HTTP transport, or virtual host alias configurations are changed. The generated plugin-cfg.xml file is placed in the config directory of the WebSphere installation. If your web server is located on a remote machine, you must manually move this file to that machine.

Changes to the list of Context Roots in the "plugin-cfg.xml" will not be read until Apache is restarted.

```conf
LoadModule was_ap20_module
/opt/IBM/WebSphere/AppServer/bin/mod_was_ap20_http.so
#
# IBM WebSphere Plugin
#
<IfModule mod_was_ap20_http.c>
  WebSpherePluginConfig /opt/IBM/WebSphere/AppServer/config/cells/plugin-cfg.xml
</IfModule>
```

If using the plugin to balance load amongst Cognos 8 Dispatchers, then you should disable the Load Balancing feature of the Dispatchers.
5.4 BEA WebLogic

BEA supply a Module that allows Apache to proxy interaction between a Browser and the WebLogic server. This may be useful where direct interaction with the WebLogic services is not permitted.

The Context Roots of the target applications must be identified as Locations which are processed ("handled") by the BEA Module.

Copy "mod_wl_20.so" from the WebLogic "bin" folder to the "modules" folder of Apache, then add the following fragment to Apache's "httpd.conf" and restart Apache.

Refer:

- WebLogic 8.1.x [http://e-docs.bea.com/wls/docs81/plugins/apache.html]
- WebLogic 9.1.x [http://e-docs.bea.com/wls/docs91/plugins/apache.html]

```
LoadModule weblogic_module modules/mod_wl_20.so
#
#    BEA WebLogic
#
# Allows access to http://webserver:80/console as well as
# to http://AppServer:7001/console
<Location /console>
  SetHandler weblogic-handler
  WebLogicHost AppServer
  WebLogicPort 7001
</Location>

# Allows access to http://webserver:80/p2pd as well
# as to http://AppServer:7021/p2pd
<Location /p2pd>
  SetHandler weblogic-handler
  WebLogicHost AppServer
  WebLogicPort 7021
</Location>

# Allows access to http://webserver:80/ServletGateway as well
# as to http://Gateway:7022/ServletGateway
<Location /ServletGateway>
  SetHandler weblogic-handler
  WebLogicHost Gateway
  WebLogicPort 7022
</Location>
```

If using the plugin to balance load amongst Cognos 8 Dispatchers, then you should disable the Load Balancing feature of the Dispatchers.
5.5 Jakarta

In addition to supporting HTTP Proxy (as above), Tomcat includes a connector that forwards connections from the WebServer to the Tomcat instance.

This is superior to the "mod_proxy" above as it includes Load Balancing web requests amongst several Tomcat instances and a status page is available.

Configuration requires that the AJP13 interface is enabled in Tomcat's "server.xml" file as per fragment below (from Tomcat 4.1.27):

```xml
<!-- Define an AJP 1.3 Connector on port 9306 -->
<Connector className="org.apache.ajp.tomcat4.Ajp13Connector"
    port="9306" minProcessors="5" maxProcessors="500"
    acceptCount="200" debug="0"/>
```

(from Tomcat 5.5.17):

```xml
<!-- Define an AJP 1.3 Connector on port 8009 -->
<Connector
    port="8009"
    redirectPort="8443"
    connectionTimeout="-1"
    protocol="AJP/1.3">
</Connector>
```

The JK Connector requires a control file "workers.properties" to identify the "Workers" or destinations to which requests should be forwarded:

```properties
# workers.properties -
# The workers that jk should create and work with
# worker.list=wlb,jkstatus,cog8
#
# Defining a worker named ajp13w and of type ajp13
# Note that the name and the type do not have to match.
worker.ajp13w.type=ajp13
worker.ajp13w.host=localhost
worker.ajp13w.port=8009

# Defining a load balancer
worker.wlb.type=lb
worker.wlb.balance_workers=ajp13w

# Define status worker
worker.jkstatus.type=status
worker.cog8.type=ajp13
worker.cog8.host=AppServer
worker.cog8.port=9306
```
The ContextRoots that should be associated or forwarded to which worker are recorded in "uriworkermap.properties":

```
# uriworkermap.properties -
# This file provides mappings for the workers
defined in workermap.properties
# The general syntax for this file is:
# [URL]=[Worker name]

/p2pd*=cog8
/ServletGateway*=wlb
/probe*=wlb
/admin/*/wlb
/manager/*/wlb
/jsp-examples/*/wlb
/servlets-examples/*/wlb

# Optionally filter out all .jpeg files inside that context
# For no-mapping the url has to start with exclamation (!)
!/servlets-examples/*.jpeg=wlb

# Mount jkstatus to /jkmanager
# For production servers you will want to
# secure the access to the /jkmanager url
#
/jkmanager=jkstatus
```

Then load the Apache Module and configure with your file locations:

```
LoadModule jk_module modules/mod_jk.so
<IfModule mod_jk.c>
    # Where to find workers.properties
    JkWorkersFile /etc/httpd/conf/workers.properties

    # Associate Context Roots with Workers
    JkMountFile /etc/httpd/conf/uriworkermap.properties

    # Where to put jk logs
    JkLogFile /var/log/httpd/mod_jk.log

    # Set the jk log level [debug/error/info]
    JkLogLevel info

    # Select the log format
    JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "
</IfModule>
```
6 Single Signon

Single Signon into Cognos products is performed if the WebServer has been able to determine the Browser User's Identity.

**Single Signon into Cognos Applications requires that the AUTH_TYPE and REMOTE_USER http headers have been populated. Cognos is not responsible for configuring the WebServer to populate REMOTE_USER in any way. The customer must engage the WebServer Vendor to perform that integration.**

Several Apache Modules are available that perform HTTP Basic Authentication. These cause the user to enter a Username and Password in a dialog window, which are then transmitted to the WebServer. The transmission of these credentials can only be protected if using SSL. Apache then typically validates the credentials against Flatfiles or LDAP.

Kerberos integration provides a Seamless Single Signon so that the End User is not asked to enter credentials. Apache WebServer has no inbuilt capability to perform Kerberos authentication even if running on a Windows platform.

### 6.1 LDAP

6.1.1 `mod_ibm_ldap`

IBM HTTP Server includes the "mod_ibm_ldap" module that can be used to perform HTTP Basic authentication against an LDAP instance.


```apache
LoadModule ibm_ldap_module modules/mod_ibm_ldap.so
<Location /cognos8/cgi-bin>
  Options ExecCGI
</Location>
<IfModule mod_ibm_ldap.c>
  AuthType Basic
  AuthName "Enter LDAP credentials for access to Cognos8"
</IfModule>
```
require valid-user

LdapConfigFile /usr/IBMIHS/conf/ldap.prop.AD
</IfModule>
</Location>

The module uses the LdapConfigFile directive to locate connectivity and search information about the LDAP repository:

```
ldap.realm=Active Directory
ldap.URL=ldap://10.67.11.76:389/OU=Americas,OU=Users,OU=Accounts,DC=ent,D=ad,DC=cognos,DC=com
# The LDAP Search Scope does not appear to include SubTrees, so
# set the ldap.URL to the particular container the Users are in.

ldap.transport=TCP
ldap.version=3

ldap.application.authType=Basic
ldap.application.DN=username@domain
ldap.application.password.stashFile=/usr/IBMIHS/conf/ldap.sth

ldap.user.authType=Basic
ldap.user.name.filter={(&(sAMAccountName=%v1)(objectClass=person))

ldap.group.name.filter={(&cn=%v1)(objectclass=groupOfNames))
ldap.group.memberAttributes=member uniqueMember

ldap.idleConnection.timeout=600
ldap.waitToRetryConnection.interval=300
ldap.search.timeout=10
ldap.cache.timeout=600
```

The password for the ldap.application.DN user is recorded in the stashFile using the following command:

```
ldapstash password /usr/IBMIHS/conf/ldap.sth
```

A popup window will appear in the browser when the user accesses any URL in the "/cognos8/cgi-bin" location:
REMOTE_USER will be populated with the successfully authenticated User name.

6.1.2 mm_auth_ldap_module

The "mm_auth_ldap_module" LDAP Authentication from http://muquit.com/muquit/software/mod_auth_ldap/mod_auth_ldap_apache2.html has been successfully used to perform LDAP authentication. This could be used to populate REMOTE_USER from eg Novell, OpenLDAP, SunONE, Active Directory or any other LDAP v3 compliant repository of identities.

```c
LoadModule mm_auth_ldap_module modules/mm_mod_auth_ldap.dll
<Location /cognos8/cgi-bin>
Options ExecCGI

<IfModule mm_mod_auth_ldap.c>
  AuthLDAPAuthoritative on
  LDAP_Debug on
  LDAP_Server 10.67.11.76
  LDAP_Port 389
  LDAP_Protocol_Version 3
  Base_DN dc=ent,dc=ad,dc=cognos,dc=com
  Bind_DN username@domain
  Bind_Pass password
  UID_Attr sAMAccountName
  UID_Attr_Alt displayName

  AuthType Basic
  AuthName "Enter LDAP credentials for access to Cognos8"
require valid-user
```
6.1.3 Other

Other LDAP Modules are also viable, eg:

- [http://httpd.apache.org/docs/2.0/mod/mod_auth_ldap.html](http://httpd.apache.org/docs/2.0/mod/mod_auth_ldap.html)
- [http://authzldap.othello.ch/](http://authzldap.othello.ch/)
6.2 Kerberos / SPNEGO

Kerberos authentication is provided by SPNEGO extensions to Apache. This is implicit within Microsoft's Internet Information Server (IIS) WebServer. SPNEGO stands for Simple and Protected GSSAPI Negotiation Mechanism. It encompasses both Kerberos and NTLM, and is a popular means to provide seamless exchange of identity between Browser and WebServer.

There are several Apache Modules which may implement SPNEGO:

Refer:

- [http://sourceforge.net/projects/modgssapache/](http://sourceforge.net/projects/modgssapache/)

The reader is strongly advised to study the guidance at


Prerequisites include Clock accuracy (configured using Simple Network Time Protocol), fully configured Kerberos Client libraries, and registration of the WebServer host into the Active Directory.

6.3 NTLM

An Apache Module which performs NTLM Authentication is also available when operating Apache on Windows. NTLM is to be demised by Microsoft, so this is a non-strategic choice for Single Signon.

7 Troubleshooting

7.1 HTTP Status Codes
Also http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html

7.2 Order of Aliases
Note that the order the Aliases are defined in is very important. Apache will parse the "httpd.conf" configuration sequentially to match the requested URL to the available aliases.
If the "/cognos8" alias is defined before "/cognos8/cgi-bin" then Apache would attempt to read "/cognos8/cgi-bin/cognos.cgi" from the non-existent "webcontent\cgi-bin" folder and a "404" error will occur.

7.3 Open or Save cognos.cgi ?
If prompted for an application to open "cognos.cgi" with, then the WebServer is delivering the CGI program to the Browser instead of executing it.
Ensure that the "/cognos8/cgi-bin" alias is defined as a ScriptAlias.

7.4 HTTP 500 Errors
If a User attempts to access an Apache Module directly via the "cgi-bin" alias ["/cognos8/cgi-bin/mod2_cognos.dll"] without using the mapped Location "/cognos8/cgi-bin/cognos.dso"] then Apache will attempt to invoke the DLL as an executable. This will fail and a 500 error will be delivered to the Browser.

7.5 Permissions errors
The WebServer will operate as a particular Operating System account. On Windows that may be "LocalSystem", and so the "Everyone" group must have access to the locations specified by the Aliases.
On Unix, although "root" starts the WebServer, the requests are processed by child processes that are typically running as "nobody". The Unix "Other" permissions must grant "nobody" the ability to traverse into Aliased folders, and Read [and Execute (as necessary)] on the files there.
If in doubt about the ability of the WebServer to access the Aliased content, then "su – nobody" and navigate into the aliased locations. Confirm that you can "ls" and "wc" all files. "nobody" will also execute the CGI programs, so you should confirm that you can invoke these and you are delivered HTML output.

cd  cgi-bin
./cognos.cgi  | more
7.6 Can't load API Structure

This error may be reported when Apache validates its configuration files and you have attempted to load a Module but have an incorrect label. For example:

```
LoadModule Xcognos_module D:/Apps/Cognos/c8/cgi-bin/mod2_cognos.dll
```

We know that Xcognos_module is incorrect. The following error is reported:

```
D:\Apps\Apache Group\Apache2\bin>apache -t
Syntax error on line 5 of D:\Apps\Apache Group\Apache2\conf.d\cognos8.conf:
Can't locate API module structure `Xcognos_module' in file
D:/Apps/Cognos/c8/cgi-bin/mod2_cognos.dll: No error
```

If you don't know the name of the Module within the Library (DLL) then you should inspect the documentation from the Module Vendor. You can also discern this information using depends.exe from the Microsoft Resource Kit or from [http://www.dependencywalker.com/](http://www.dependencywalker.com/)

You can see below that the correct module name is cognos_module.

![Dependency Walker](image)

In the example above, you can ignore the errors relating to libhttpd.dll and libapr.dll because they do exist but are not in the current directory or PATH.

On Unix you may be able to achieve comparable output using elfdump and ldd.
To determine the name to use in an `<IfModule>` block, inspect the output of "http://webserver/server-info" (produced by mod_info).
7.7 Logging

The Cognos 8 web gateways [including Apache Mod] may be configured to Log activity into the Cognos 8 "logs" folder. This will require that the "nobody" account has write permission in that location.

Logging may be further configured using the "cgi-bin\cognos\cgi.conf" file.

```bash
# The format of the logging configuration properties are like so:
#       "logFileName level implementation append"
# where:
#   logFileName: base name (name.ext) of log file.
#   path to log directory will be added automatically
#   level: 1 - fatal, 2 - error, 3 - warn, 4 - info, 5 - debug
#   implementation: one of the class names:
#   GWTrivialLogger
#   Simple implementation that keeps a file open, flushes output after each operation. There is no synchronization or locking, so this is useable only when one process/thread is active at a time.
#   GWSiMTLogger
#   Implementation that keeps a file open, but has mutex around the writes to the file. Suitable for single instance multithreaded gateways like ISAPI and Apache module.
#   GWMiSTDeferredLogger
#   This one buffers output until it reaches a certain size (4K) or until the logger is destroyed (end of request for CGI), and then opens the file, writes, and closes. This logger is intended for use with CGI when there is more than one request in progress at a time.
#   GWNullLogger
#   log nothing.
#   append: 0 for false, non-0 for true

# CGI, one request at a time, good during development
gwCGILoggingConfig=gwcgi.log 5 GWTrivialLogger 0

# CGI, single file, output deferred until request is done
# this is better for a production environment, where more that one CGI may be alive at a time.
gwCGILoggingConfig=gwcgi.log 5 GWMiSTDeferredLogger 0

# ISAPI cognosisapi.dll - single instance, multithreaded
gwISAPILoggingConfig=gwisapi.log 5 GWSiMTLogger 0
```

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# Apache module mod_cognos.dll - single instance, multithreaded
# gwMODLoggingConfig=gwmod.log 5 GWSiMTLogger 0

# Apache2 module mod2_cognos.dll - single instance, multithreaded
# gwMOD2LoggingConfig=gwmod2.log 5 GWSiMTLogger 0

# No logging at all:
# =xxx 0 GWNullLogger 0
8 Useful CGI Scripts

8.1 headers.cgi

Copy this Shell Script into a custom CGI location on your Unix WebServer as "headers.cgi". It can be used to expose all HTTP Headers including Cookies that are delivered from the Browser to the WebServer. This can useful when establishing Single Signon, to confirm that REMOTE_USER or other Headers are validly exposed to the Cognos Gateway(s).

http://webserver:80/cgi-bin/headers.cgi?a=b&c=d

```bash
#!/usr/bin/ksh
#ident "@(#)headers.cgi v2 06/02/01 MR"
#
# Show all HTTP Headers
#
echo "Content-type: text/html"
echo ""
echo "<HTML>"
echo "<TITLE>HTTP Headers</TITLE>"
echo "<BODY>"
echo "<B><FONT face=Verdana color=#cc0000 size=5>HTTP Headers</FONT></B>"
echo """"""""""""""
echo "<TABLE border=1 cols=2>"
set | sort | grep -v ":=" | while read LINE
do
  if [ "$LINE" != "" ] ; then
    LINE1=`echo $LINE | sed 's|<|\&lt|g'`
    LINE2=`echo $LINE1 | sed 's|>|\&gt|g'`
    LINE3=`echo $LINE2 | sed 's|=|</TD><TD>|'`
    LINE4=`echo $LINE3 | sed "s|'||g"`
    echo "<TR><TD>$LINE4</TD><TR>"
  fi
done
echo "</TABLE>"
echo """"""""""""""
echo "</BODY>"
echo """""""""""""
echo """"""""""""""""""""""""""""""""""
ex 0
```
8.2 csv.cgi

Copy this Shell Script into a custom CGI location on your Unix WebServer as "csv.cgi". It can be used to expose a file of Comma Separated Values to Cognos 8 as an XML document that is accessible to Framework Manager and the Report Servers as an XML datasource delivered by a URL.

http://webserver:80/cgi-bin/csv.cgi?locations.csv

See also KB 1016855.

#!/usr/bin/ksh
#
# Read CSV and output Cognos XML
#
# This example casts all columns as Strings when generating
# the metadata from the first row of Column Headings.
#
# The document to represent as XML may be passed as a
# parameter to the script in the URL.
#
# As a security constraint, the document to read must be
# in a specific directory otherwise this script could read
# any file that the WebServer ('nobody') can read.
#
# ----------------------------------------------------------
DIRECTORY=/opt/cognos/csv
DELIMITER=,;
# ----------------------------------------------------------
# If QueryString is null then FILENAME=/dev/null
FILENAME=${QUERY_STRING:-/dev/null}
FILENAME=${QUERY_STRING:+$DIRECTORY/$QUERY_STRING}
# If FILENAME is not readable then revert to /dev/null
if [ ! -r $FILENAME ]; then
FILENAME=/dev/null
fi
# ----------------------------------------------------------
#
# Mime Type
#
echo "content-type: text/xml"
echo ""
#
# XML Heading

```bash
echo "<?xml version="1.0" encoding="utf-8" ?>"
echo "<dataset xmlns="http://developer.cognos.com/schemas/xmldata/1/
xmlns:xs="http://www.w3.org/2001/XMLSchema-instance">"
```

# Metadata formed from Column Headings
#
```bash
echo "<metadata>
head -1 $FILENAME | awk -F$DELIMITER '  
  for (i=1; i<=NF; i++) {  
    print "<item name="\"" $i "\" type="xs:string"/>";
  }
}
'
echo "</metadata>"
```

# Data
#
```bash
echo "<data>
cat $FILENAME | awk -F$DELIMITER '  
BEGIN {  
  ROW = 0;
}
{  
  ROW += 1;
  if ( ROW == 1 ) {  
    # Column Headings
    # getline
  }
  # Data
  #
  print "<row>"
  for (i=1; i<=NF; i++) {  
    print "<value>" $i "</value>"
  }
  print "</row>"
}
END {
}
'
```
echo "</data>"

# XML Footer
#
echo "</dataset>"
## END OF SCRIPT ##
9 Useful HTML pages

These sample pages can be delivered by the WebServer, to enable the User to view their Microsoft Exchange content inside a Browser frame.

The ActiveX component runs locally on the desktop, and interacts with Outlook locally [without passing anything to/from the webserver] to display content.

9.1 Inbox

Copy this to into the folder at the "/custom" alias as "inbox.htm"

```html
<html>
<head>
<script type="text/javascript">
function detectBrowser()
{
 var browser=navigator.appName
 var b_version=navigator.appVersion
 var version=parseFloat(b_version)

document.writeln("<BODY> ");
if (((browser="Microsoft Internet Explorer") && (version>=4))
{
   document.writeln("<OBJECT id="ViewCtl12" classid=CLSID:0006F063-0000-0000-C000-000000000046 width="100%" height="470" ");
   document.writeln(" <PARAM NAME="Folder" VALUE="Inbox" > ");
   document.writeln("</OBJECT> ");
}
else
{
   document.writeln("This <a href="http://activex.microsoft.com/activex/activex/">ActiveX</a> Control is only supported on <a href="http://www.microsoft.com/windows/ie/default.mspx">Microsoft Internet Explorer</a>.";
}
}
document.writeln("</BODY> ");

</script>
</head>
<body onload="detectBrowser()">
```

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9.2 Calendar

Same as Inbox above, but replace "Inbox" with "Calendar" in the Folder Parameter to the ActiveX Object.

9.3 Contacts

Same as Inbox above, but replace "Inbox" with "Contacts" in the Folder Parameter to the ActiveX Object.
10 References

10.1 Common Gateway Interface (CGI)
- [http://www.w3.org/CGI/](http://www.w3.org/CGI/)
- [http://httpd.apache.org/docs/2.0/howto/cgi.html](http://httpd.apache.org/docs/2.0/howto/cgi.html)

10.2 Apache WebServer
- Download  [http://httpd.apache.org/download.cgi](http://httpd.apache.org/download.cgi)
- Documentation  [http://httpd.apache.org/docs/2.0/](http://httpd.apache.org/docs/2.0/)

10.3 IBM HTTP Server

10.4 Web DAV
- [http://httpd.apache.org/docs/2.0/mod/mod_dav.html](http://httpd.apache.org/docs/2.0/mod/mod_dav.html)
- [http://www.webdav.org/](http://www.webdav.org/)

10.5 Single Signon
- Kerberos
    section 6.3 "Authenticating users via Kerberos"
  - [http://www.quest.com/Vintela_Authentication_Services/](http://www.quest.com/Vintela_Authentication_Services/)
    and [http://rc.vintela.com/topics/mod_auth_vas/](http://rc.vintela.com/topics/mod_auth_vas/)
  - [http://sourceforge.net/projects/modgssapache/](http://sourceforge.net/projects/modgssapache/)
- LDAP
  - [http://authzldap.othello.ch/](http://authzldap.othello.ch/)
- http://httpd.apache.org/docs/2.0/mod/mod_auth_ldap.html