



ORACLE[®]

Oracle Web Tier 11gR1



Agenda

- What's New
 - What's New in Oracle Web Cache and OHS
 - Oracle Web Cache and OHS Bundling
- Web Tier Installation Concepts and Options
 - Separation of Config from Binaries
 - Oracle Web Cache and OHS Directory Structure
 - Provisioning Using opmnctl
- Management Tools for Web Tier
 - Fusion Middleware Control
 - Opmnctl
 - Web Cache Manager
- Verifying Ports in Use



What is Oracle Web Tier

- The web tier is:
 - Responsible for interacting with the end user
 - Primarily in the forms of HTTP requests and responses
 - The outermost tier in the application server
- Oracle Web Tier comprises of two components:
 - Oracle Web Cache
 - A content-aware server accelerator, secure reverse proxy server that improves the performance, scalability, and availability of web sites
 - Oracle HTTP Server
 - Apache based web server that provides a HTTP listener for Oracle WebLogic Server and the framework for hosting static pages, dynamic pages, and applications over the web



What's New in Oracle Web Cache 11gR1

- Request filtering
 - Prevent malicious code from exploiting software vulnerabilities
 - Take actions on incoming requests based on request attributes
- Invalidation using response headers
 - Invalidate cached content through an HTTP response header
- Request-based logging
 - Writes requests in bulk after the request to the event logs
- ODL format for event logs
 - Uses ODL format for all diagnostic messages and log files
- Audit logging
 - Supports the Common Audit Framework for administering audits across FMW components
- Secure caching
 - Supports caching contents that are secured by OSSO authentication
- Can be configured using MBeans



What's New in Oracle HTTP Server 11gR1

- Now based on Apache v2.2
- Comes integrated with WLS Plug-in for routing to WLS
 - Tested with WLS 10.3.1 but should work with any version
- Can be configured using MBeans
- ODL format for event logs
 - Uses ODL format for all diagnostic messages and log files
- Audit logging
 - Supports the Common Audit Framework for administering audits across FMW components
- Does not support routing to OC4J
 - Mod_oc4j is no longer shipped and supported
- Does not come with PHP anymore
 - Mod_php is still support but is not bundled with OHS
 - Instructions to integrate PHP with OHS available here:
 - http://www.oracle.com/technology/products/ias/ohs/htdocs/php_ohs.htm



Oracle Web Cache and OHS Bundling

- Oracle Web Cache and OHS 11gR1 available from two FMW packages
- Oracle Fusion Middleware Web Tier and Utilities DVD
 - Primary source to obtain OHS and Web Cache
 - Installed and configured independent of other components
 - Choice of associating (for mgmt via EM) with any WLS domain
 - mod_plsql and mod_osso are disabled OOTB (can be enabled)
- Oracle Portal, Forms, Reports and Discoverer DVD
 - Some of these components have dependency on WC and OHS
 - Installed and configured automatically
 - Auto associated (for mgmt via EM) with WLS domain configured for this package
 - Can not install just WC or OHS out of this package
 - Can create additional WC and OHS components post install
 - mod_plsql and mod_osso are enabled and configured OOTB



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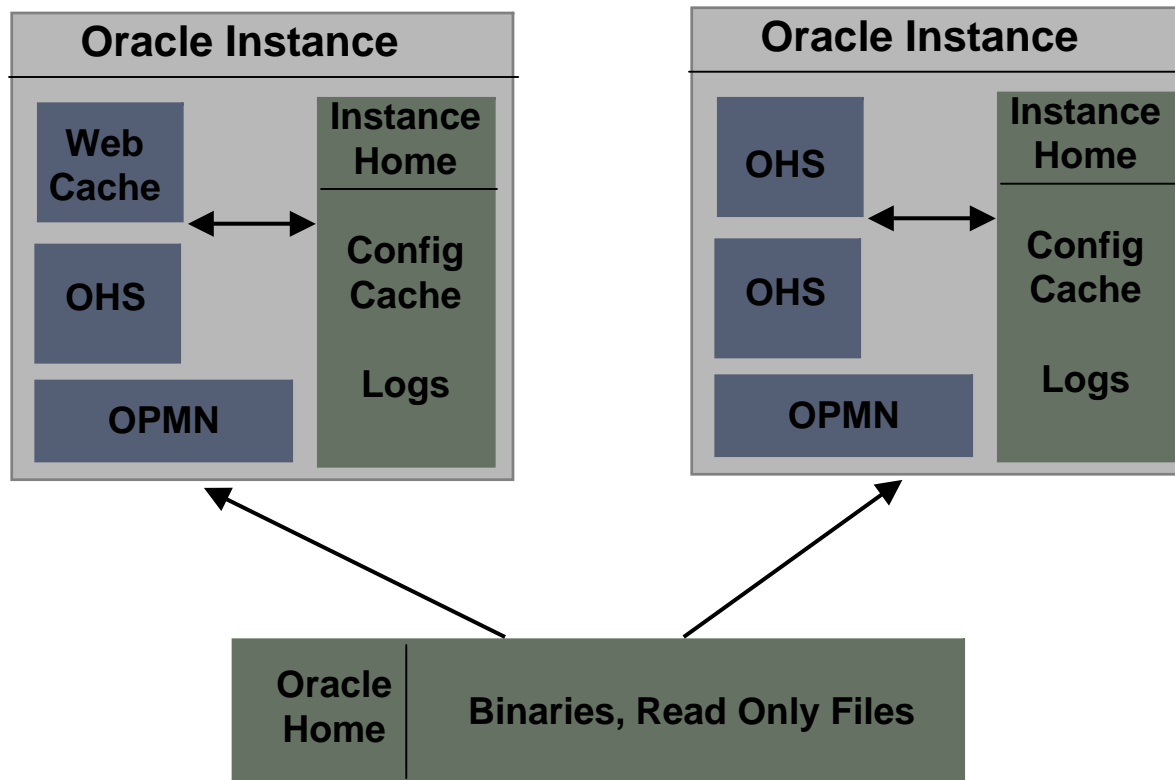


Separation of Config from Binaries

- Separation of Config from Binaries
 - Unlike prior releases where binaries and config stayed together
- Two key terms:
 - Oracle Home (read only files)
 - Binaries and other files created at install time and never changes
 - Location represented by ORACLE_HOME env. variable
 - Oracle Instance (updateable files)
 - A collection of system components managed by OPMN
 - Contains configuration files, log files, static contents, temp files
 - Location represented by ORACLE_INSTANCE env. variable

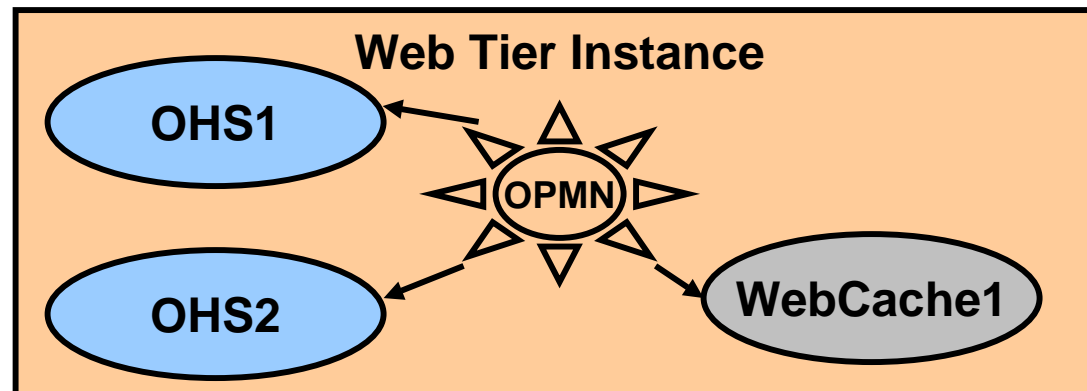
Multiple Oracle Instances per Oracle Home

- Can create multiple Oracle Instances per Oracle Home



Web Tier Oracle Instance

- A web tier Oracle Instance contains
 - One OPMN
 - 0 or more system components (such as OHS and Web Cache)
- OPMN manages all system components of an Oracle Instance





Web Tier Installation Options

- Installation and configuration can be done separately
 - Install Only (DVD/Disk1/runInstaller)
 - Installs the product binaries in an Oracle Home
 - All component binaries from the package are installed
 - Install and Configure (DVD/Disk1/runInstaller)
 - Installs the product binaries in an Oracle Home
 - All component binaries from the package are installed
 - Creates and configures an instance in an Oracle Instance
 - Choose what components get configured
 - Configure Only (\$ORACLE_HOME/bin/config.sh)
 - Creates and configures an instance in an Oracle Instance
 - Choose what components get configured



Web Tier Installation Options Cont.

- Associating Oracle Instance with WLS domain
 - Two options to configure a web tier Oracle Instance
 - Associate with WLS domain
 - Allows system components to be managed via EM
 - A (JRF enabled) WLS domain needs to be pre-configured
 - Deploys system components' MBeans in Admin Server
 - Also loosely referred as “EM managed” mode
 - Does NOT configure OHS to route requests to that WLS domain
 - Do not associate with WLS domain
 - Can not manage system components via EM
 - Components can still be managed via CLI (opmnctl)
 - Also loosely referred as “non-EM managed” mode



General Web Tier Install Flow

- Go directly to step #5 if:
 - If you already have a JRF-enabled WLS domain configured, or
 - Do not want to manage web tier instance via FMW Control
- 1. Install WLS:
 - Create a new MW Home
 - Choose "Typical" install option
- 2. Install SOA or Web Center Suite:
 - Run /Disk1/runInstaller.sh
 - For JDK location you could provide JDK from above WLS install (<MW_HOME>/jdk160_11)
- 3. Configure WLS Domain and EM (from SOA or Web Center Oracle Home):
 - Run <soa_OH>/common/bin/config.sh
 - Create a new domain (choose "Create a new Weblogic Domain")
 - Select only EM and JRF to configure



General Web Tier Install Flow Cont.

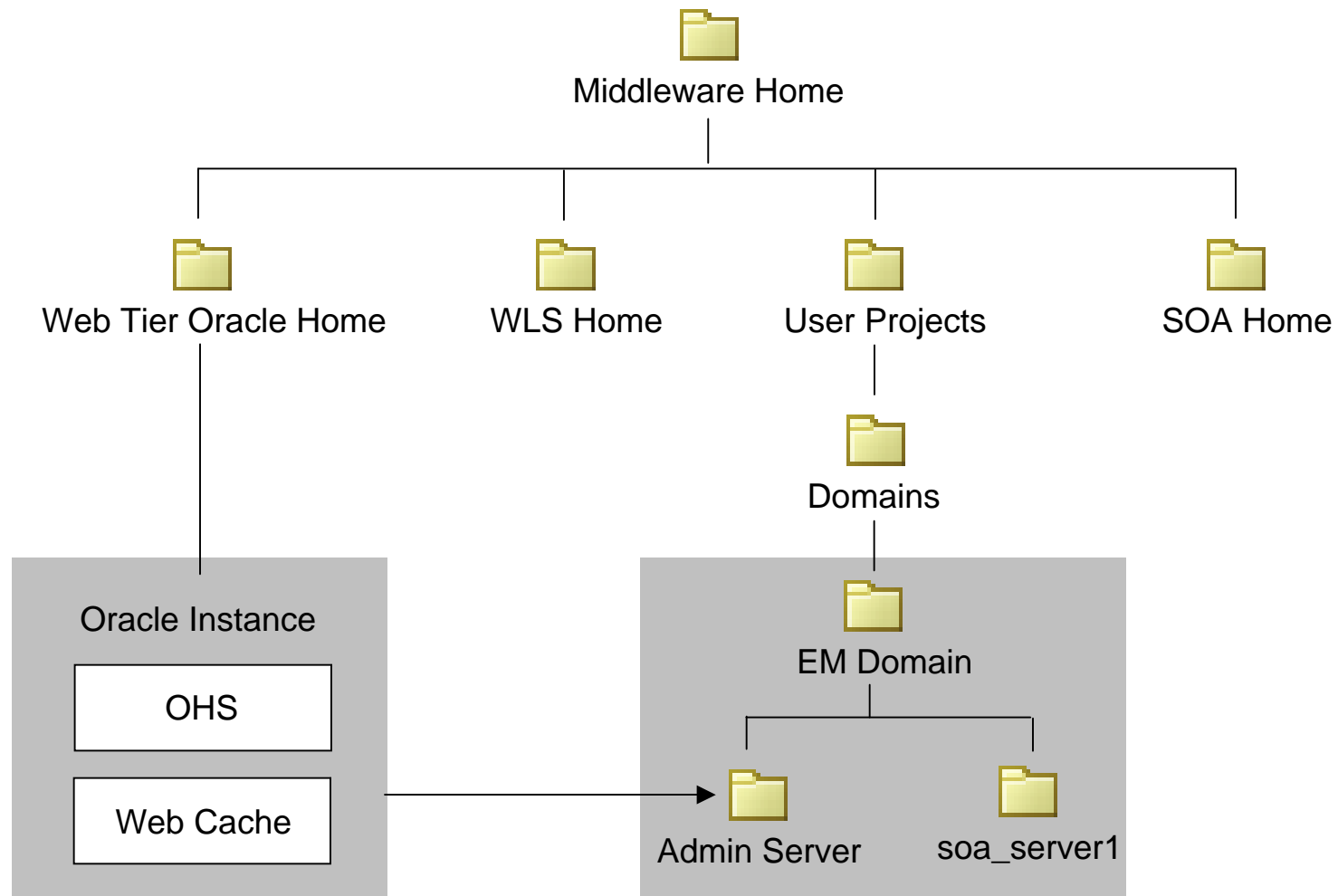
4. Start WLS Admin Server

- Run `<domain_home>/bin/startWebLogic.sh`

5. Install and Configure WebTier

- Run `/Disk1/runInstaller.sh`
- Choose Install and Configure option
- Select both OHS and Web Cache components
- If configuring instance to be managed via FMW Control:
 - Select "Associate Selected Components with WebLogic Domain"
 - Provide WLS Admin Server details (domain that you created in #3 above)

Middleware Home Directory Structure



* This is one of the many possible combinations for MW home directory structure



Web Cache Directory Structure - Oracle Home

Directory	Contents
webcache/bin	<ul style="list-style-type: none">• Web Cache binary files• For example, webcached and webcachea
webcache/tem plates	<ul style="list-style-type: none">• Web Cache template configuration files• For example, webcache.xml, auditconfig.xml etc.• Get provisioned to an Oracle instance at WC creation• These files should only be edited by advanced users
webcache/files	<ul style="list-style-type: none">• Web Cache template static files• For example, error pages• Get provisioned to an Oracle instance at WC creation• These files should only be edited by advanced users



Web Cache Directory Structure - Oracle Instance

Directory	Contents
bin	<ul style="list-style-type: none">• opmnctl executable for the instance
config/WebCache/<webcache_name>	<ul style="list-style-type: none">• Web Cache configuration files• For webcache.xml, auditconfig.xml etc.
config/WebCache/<webcache_name>/files	<ul style="list-style-type: none">• Static content• For example, error pages
diagnostics/logs/WebCache/<webcache_name>	<ul style="list-style-type: none">• Log files• For example, event log, access log and console log



OHS Directory Structure - Oracle Home

Directory	Contents
ohs/bin	<ul style="list-style-type: none">• OHS binary files• For example, apachectl, rotatelog, httpd, apxs etc.
ohs/conf	<ul style="list-style-type: none">• OHS template configuration files• For example, httpd.conf, ssl.conf, mod_wl_ohs.conf etc.• Get provisioned to an Oracle instance at OHS creation• These files should only be edited by advanced users
ohs/htdocs	<ul style="list-style-type: none">• OHS template static files• For example, welcome pages, error docs etc.• Get provisioned to an Oracle instance at OHS creation• These files should only be edited by advanced users
ohs/modules	<ul style="list-style-type: none">• Modules .so files• For example, mod_wl_ohs.so, mod_osso.so etc.



OHS Directory Structure - Oracle Instance

Directory	Contents
bin	<ul style="list-style-type: none">• opmnctl executable for the instance
config/OHS/<ohs_name>	<ul style="list-style-type: none">• OHS configuration files• For example, httpd.conf, mod_wl_ohs.conf, ssl.conf etc.
config/OHS/<ohs_name>/htdocs	<ul style="list-style-type: none">• Static content and CGI scripts• For example, welcome pages, error docs etc.
config/OHS/<ohs_name>/moduleconf	<ul style="list-style-type: none">• Configuration files that get automatically included• Don't put any files with a .conf extension here that shouldn't be included
diagnostics/logs/OHS/<ohs_name>	<ul style="list-style-type: none">• Log files• For example, error log, access log and console log



Provisioning Using opmnctl

- Use opmnctl to provision Oracle Instances and system components

- Create a new Oracle Instance

```
$ opmnctl createinstance -oracleInstance /oracle/inst1  
-adminHost myahostname -adminPort 7001 -  
adminRegistration ON
```

- Register and unregister an Oracle instance with a WebLogic domain

```
$ opmnctl registerinstance -adminHost myhostname  
-adminPort 7001
```

- Create and delete a system component

```
$ opmnctl createcomponent -componentType OHS -  
componentName ohs2
```

```
$ opmnctl deletecomponent -componentName ohs2
```



Provisioning Using opmnctl Cont.

- Ports are automatically assigned at create time
 - Define your own ports using additional parameters:
 - For OHS
 - listenPort: HTTP listening port
 - sslPort: HTTPS (SSL) listening port
 - proxyPort: Proxy MBean (admin) port
 - For Web Cache
 - listenPort: HTTP listening port
 - sslPort: HTTPS (SSL) listening port
 - wcAdminPort: admin listening port
 - invPort: invalidation listening port
 - statPort: statistics listening port
 - Update an Oracle instance or component registration with the WebLogic domain
 - Needed when e.g. OHS's Admin/Proxy MBean port is changed
- ```
$ opmnctl updatecomponentregistration -componentName ohs1 -
proxyPort 8989
```



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- Verifying Ports in Use



## Management Tools for Web Tier

- Two primary management tools
  - Fusion Middleware Control (EM), a GUI tool
    - Main tool for process management, configuration and monitoring
    - Manageable when instance is registered with WLS domain
    - Communicates with components via Proxy MBean port
  - opmnctl, a command-line tool
    - Provides process management and provisioning operations
    - Located at two places
      - \$ORACLE\_HOME/opmn/bin and \$ORACLE\_INSTANCE/bin
    - Recommended to be used from the \$OI/bin directory
      - Same ORACLE\_INSTANCE that component is running in

# Web Tier in Fusion Middleware Control

The screenshot displays the Oracle Enterprise Manager 11g Fusion Middleware Control interface. The left-hand navigation pane shows a tree view with the following items: Farm, Topology, Farm\_webtier\_domain, Application Deployments, webLogic Domain, Web Tier, ohs1, and webcache1. The 'Web Tier' folder and its sub-items are circled in red. The main content area is titled 'Farm\_webtier\_domain' and shows a 'Deployments' section with a green 3D pie chart indicating 100% completion and a status of 'Up (5)'. Below this is a table with columns 'Name', 'Status', and 'Target'. The 'Fusion Middleware' section also features a green 3D pie chart for 100% completion and a status of 'Up (3)'. A table below it lists components with columns 'Name', 'Status', 'Host', and 'CPU Usage (%)'. The 'Web Tier' folder and its sub-items are circled in red. The 'Farm Resource Center' section at the bottom provides links for 'Before You Begin' and 'Typical Administration Tasks'.

ORACLE Enterprise Manager 11g Fusion Middleware Control

Setup Help Log Out

Farm Topology

Farm\_webtier\_domain

Logged in as weblogic

Page Refreshed May 11, 2009 2:06:48 PM PDT

**Deployments**

100% Up (5)

| Name                    | Status | Target |
|-------------------------|--------|--------|
| Application Deployments |        |        |
| Internal Applications   |        |        |

**Fusion Middleware**

100% Up (3)

| Name            | Status | Host                  | CPU Usage (%) |
|-----------------|--------|-----------------------|---------------|
| WebLogic Domain |        |                       |               |
| webtier_domain  |        |                       |               |
| AdminServer     |        | stadk58.us.oracle.com | 0.19          |
| Web Tier        |        |                       |               |
| ohs1            |        | stadk58.us.oracle.com | 0.00          |
| webcache1       |        | stadk58.us.oracle.com | 0.00          |

**Farm Resource Center**

**Before You Begin**

- Introduction to Oracle Fusion Middleware
- Understanding Key Oracle Fusion Middleware Farm Concepts
- Overview of Oracle Fusion Middleware Administration Tools

**Typical Administration Tasks**

- Getting Started Using Oracle Enterprise Manager Fusion Middleware Control
- Navigating Within Fusion Middleware Control
- Starting and Stopping Oracle Fusion Middleware



# Oracle Web Cache in Fusion Middleware Control

webcache1 ⓘ Logged in as **weblogic** | Host: stadk58.us. | Page Refreshed Jun 17, 2009 1:17:27 PM

Web Cache ▾

### Response and Load

01:17:06 PM 01:22:06 PM

- Request Processing Time (milli seconds)
- Request Throughput (per second)

[\[Table View\]](#)

### CPU and Memory Usage

01:17:06 PM 01:22:06 PM

- CPU Usage (%)
- Memory Usage (MB)

[\[Table View\]](#)

### Performance

| Site                       | Open Connections | Requests Served | Hit Rate (%) | Cached Objects | Cache Size | Requests Denied by Request Filtering | By... |
|----------------------------|------------------|-----------------|--------------|----------------|------------|--------------------------------------|-------|
| All Sites                  | 0                | 0               | 0            | 0              | 0          | 0                                    | 0     |
| stadk58.us.oracle.com:7785 | 0                | 0               | 0            | 0              | 0          | 0                                    | 0     |
| Undefined Sites            | 0                | 0               | 0            | 0              | 0          | 0                                    | 0     |

[\[Table View\]](#)

### Origin Servers

| Server                     | Availability   |             | Requests |        |                       | Capacity     |          |
|----------------------------|----------------|-------------|----------|--------|-----------------------|--------------|----------|
|                            | Current Status | Up Time (%) | Total    | Errors | Average Response Time | Current Load | Max Load |
| stadk58.us.oracle.com:7782 | ↑              | 100.00      | 0        | 0      | 0                     | 0            | 0        |
| stadk58.us.oracle.com:4443 | ↑              | 100.00      | 0        | 0      | 0                     | 0            | 0        |

[\[Table View\]](#)

### Resource Center

**Before You Begin**

- Introduction to Oracle Web Cache

# OHS in Fusion Middleware Control

ohs1 Logged in as **weblogic** | Host stadk58.us.oracle.com

Oracle HTTP Server Page Refreshed May 12, 2009 11:13:52 AM PDT

### Response and Load

11:10 AM 11:14 11:18 11:22  
12 May 2009

10:05:18 AM 11:24:18 AM

- Request Processing Time (milli seconds)
- Request Throughput (requests per second)

### CPU and Memory Usage

11:10 AM 11:14 11:18 11:22  
12 May 2009

10:05:18 AM 11:24:18 AM

- CPU Usage (%)
- Memory Usage (MB)

### Virtual Hosts

| Name                       | Request Throughput | Response Size (KB) | Por |
|----------------------------|--------------------|--------------------|-----|
| stadk58.us.oracle.com:4443 | 0.00               | 0.00               | 444 |
| stadk58.us.oracle.com:9999 | 0.00               | 0.00               | 999 |

### Module Request Statistics

| Name             | Throughput | Processed | Pro |
|------------------|------------|-----------|-----|
| mod_log_config.c | 0.00       | 0         |     |
| mod_authz_host.c | 0.00       | 0         |     |
| mod_actions.c    | 0.00       | 0         |     |
| mod_authn_dbm.c  | 0.00       | 0         |     |
| mod_status.c     | 0.00       | 0         |     |
| mod_dir.c        | 0.00       | 0         |     |
| mod_expires.c    | 0.00       | 0         |     |
| mod_auth_basic.c | 0.00       | 0         |     |
| mod_mime.c       | 0.00       | 0         |     |
| mod_speling.c    | 0.00       | 0         |     |

### Resource Center

**Before You Begin**

- Introduction to Oracle HTTP Server
- Getting Started with Managing Oracle HTTP Server with Oracle Enterprise Manager
- Typical Administration Tasks

## Process Management Using opmnctl

- Opmnctl can manage local instance only
  - As in prior releases, can not manage remote components
- To start Oracle Instance (OPMN), run:  
`$ opmnctl start`
- To start Oracle Instance and all components, run:  
`$ opmnctl startall`
- To check status using opmnctl, run:  
`$ ./opmnctl status`

Processes in Instance: inst1

| ias-component | process-type   | pid  | status |
|---------------|----------------|------|--------|
| webcache1     | WebCache-admin | 7273 | Alive  |
| webcache1     | WebCache       | 7272 | Alive  |
| ohs1          | OHS            | 7105 | Alive  |



## Process Management Using opmnctl Cont.

- Starting components using opmnctl:
  - To start all components of an Oracle Instance  
`$ opmnctl startproc`
  - To start all Web Cache components in an Oracle Instance  
`$ opmnctl startproc process-type=WebCache`
  - To start a specific OHS component in an Oracle Instance  
`$ opmnctl startproc ias-component=ohs1`
- Stopping components using opmnctl:
  - To stop all components of an Oracle Instance  
`$ opmnctl stopproc`
  - To stop all OHS components in an Oracle Instance  
`$ opmnctl stopproc process-type=OHS`
  - To stop a specific Web Cache component in an Oracle Instance  
`$ opmnctl stopproc ias-component=webcache1`
- To restart a specific OHS component  
`$ opmnctl restartproc ias-component=ohs1`



## Web Cache Manager

- FMW Control doesn't provide configuration capabilities for all of Oracle Web Cache
- Web Cache Manager is to be used for following configuration:
  - Invalidation
  - Learned rules for request filters
  - Resource-limit thresholds for Oracle Web Cache
  - Advanced security options
  - Invalidation
  - Event and access logging
  - Diagnostics features
  - Error pages to be served by Oracle Web Cache

# Web Cache Manager Cont.

Oracle Fusion Middleware

Web Cache

[Home](#) [Content Frame](#)

Apply Changes

Cancel Changes

Web Cache running with current configuration.

[Help](#)

## Cache Operations

Auto Refresh:

| Select                | Cache Name                     | Uptime       | Operation Needed |
|-----------------------|--------------------------------|--------------|------------------|
| <input type="radio"/> | stadc58.us.oracle.com-WebCache | 19d 01:05:24 |                  |

### Operations

- Cache Operations
- Basic Content Invalidation
- Advanced Content Invalidation
- On-Demand Log File Rollover

### Monitoring

- Web Cache Statistics
- Popular Requests
- Origin Server Statistics
- Health Monitor

### Filtering

- Request Filters

### Properties

- Security
- Process Identity
- Auto-Restart
- Network Timeouts
- Resource Limits
- Clustering

### Logging and Diagnostics

- Event Logs
- Access Logs
- Diagnostics



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## Verifying Ports in Use

- Oracle Web Cache comes with five listen ports configured:
  - A HTTP listening port for client requests, defaults to 7785
  - A HTTPS listening port for client requests, defaults to 7789
  - A HTTP listening port for the admin server process, defaults to 7786
  - A HTTP listening port for statistics monitoring requests, defaults to 7787
  - A HTTP listening port for invalidation requests, defaults to 7788
- OHS comes with three listen ports configured:
  - A HTTP listening port, defaults to 7777
  - A HTTPS listening port, defaults to 4443
  - An additional HTTPS listening, defaults to 9999
    - Proxy Mbean/Admin port, used internally by OHS to communicate with FMW Control



# Verifying Ports in Use Cont.

- Look at Port Usage or Port Config Page in FMW Control

ORACLE Enterprise Manager 11g Fusion Middleware Control

Setup Help Log Out

Farm Topology

ojs Farm\_webtier\_domain

- Application Deployments
- WebLogic Domain
- Web Tier
  - ojs ohs1
  - webcache1

ojs ohs1

Logged in as **weblogic** | Host stadk58.us.oracle.com

Oracle HTTP Server

Page Refreshed May 12, 2009 11:27:22 AM PDT

### Port Usage

| Port in Use | IP Address | Component | Protocol |
|-------------|------------|-----------|----------|
| 9999        | ALL        | ohs1      | https    |
| 4443        | ALL        | ohs1      | https    |
| 7782        | ALL        | ohs1      | http     |

ORACLE Enterprise Manager 11g Fusion Middleware Control

Setup Help Log Out

Farm Topology

ojs Farm\_webtier\_domain

- Application Deployments
- WebLogic Domain
- Web Tier
  - ojs ohs1
  - ojs webcache1

ojs webcache1

Logged in as **weblogic** | Host stadk58.us.oracle.com

Web Cache

Page Refreshed Jun 17, 2009 1:47:22 PM PDT

### Ports Configuration

All ports configured for this system component are shown. SSL can be configured for a port during edit operation.

View Create... Edit... Delete...

| Port | Port Type      | Host Name | IP Address | SSL Enabled ? | SSL Attributes |
|------|----------------|-----------|------------|---------------|----------------|
| 7785 | NORM           | localhost | ANY        |               |                |
| 7789 | NORM           | localhost | ANY        | ✓             | ?              |
| 7786 | ADMINISTRATION | localhost | ANY        |               |                |
| 7788 | INVALIDATION   | localhost | ANY        |               |                |
| 7787 | STATISTICS     | localhost | ANY        |               |                |

## Verifying Ports in Use Cont.

- Verify the allocated ports from ports.prop file in \$ORACLE\_INSTANCE/config/OPMN/opmn directory
- Use opmnctl status cmd with -l option:

```
$ opmnctl status -l
```

```
Processes in Instance: inst1
```

```
-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+
ias-component | process-type | pid | status |
 uid | memused | uptime | ports |
-----+-----+-----+-----+-----+
webcache1 | WebCache-admin | 7273 | Alive | 103
0298449 | 45256 | 456:48:23 | http_admin:7786
webcache1 | WebCache | 7272 | Alive | 103
0298448 | 69776 | 456:48:23 | http_stat:7787,http_invalidation:7788,https_listen:7789,http_listen:7785
ohs1 | OHS | 7105 | Alive | 103
0298447 | 51256 | 456:48:36 | https:9999,https:4443,http:7782
```



## References

- **FMW Installation Planning Guide**
  - [http://fmwdocs.us.oracle.com/doclibs/fmw/E10285\\_01/install.1111/b32474/toc.htm](http://fmwdocs.us.oracle.com/doclibs/fmw/E10285_01/install.1111/b32474/toc.htm)
- **Oracle Web Tier Installation Guide**
  - [http://fmwdocs.us.oracle.com/doclibs/fmw/E10285\\_01/doc.1111/e14260/toc.htm](http://fmwdocs.us.oracle.com/doclibs/fmw/E10285_01/doc.1111/e14260/toc.htm)
- **Oracle Web Cache Admin Guide**
  - [http://fmwdocs.us.oracle.com/doclibs/fmw/E10285\\_01/web.1111/e10143/toc.htm](http://fmwdocs.us.oracle.com/doclibs/fmw/E10285_01/web.1111/e10143/toc.htm)
- **Oracle HTTP Server Admin Guide**
  - [http://fmwdocs.us.oracle.com/doclibs/fmw/E10285\\_01/web.1111/e10144/toc.htm](http://fmwdocs.us.oracle.com/doclibs/fmw/E10285_01/web.1111/e10144/toc.htm)
- **OPMN Admin Guide**
  - [http://fmwdocs.us.oracle.com/doclibs/fmw/E10285\\_01/doc.1111/e14007/toc.htm](http://fmwdocs.us.oracle.com/doclibs/fmw/E10285_01/doc.1111/e14007/toc.htm)