

OPERA

Media Naming Server (MNS)

User Guide

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A. Installation

System Requirement

OS Platform

The beta version 2.0 of the Media Name Server is for Solaris 2.6(7) OS running on SUN SPARC machine.
Other version of other platforms, Windows NT and Linux, will be available in next beta version.

Memory and Disk Space

The typical memory requirement is 64MB. For each Virtual Host configuration, it is about 20Kbytes. For each UMRL configuration, it is about 5KB.
The disk space is around 5Mbytes for a typical installation, including compilation and run-time needs.

Software Requirement

The Media Name Server is solely developed in C program language. In order to compile the binary image, the GCC C compiler is recommended. If the binary distribution image is used than no other software is needed for running the MNS.

The distribution package

The package is a compress and archived by tar command. The package contain the following files and directories,

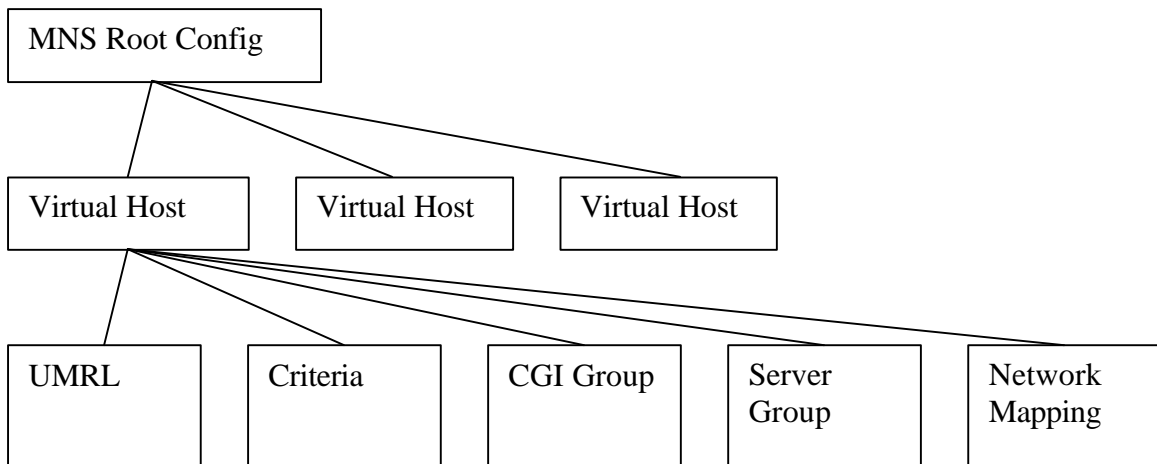
`./INSTALL` the quick reference for compilation and last minute notes
`./LICENSE` the OPERA software agreement
`./mns` the binary image of the MNS executable
`./conf/` the configuration file directory
`./log/` the log file directory
`./src/` the source code directory

Compilation

In general, re-compilation is not necessary. In order to do so, a Makefile is provided in the source code directory. Just change the current directory to the `./src`, and use the 'make' command. The new compiled binary image would replace the one from the distribution package. Beware that the current beta version 2.0 is for SUN Solaris 2.6(7) only.

B. MNS Configuration

Overview



MNS Root Configuration

In general, the UMRL, Criteria and CGI Group Configuration are handled by CMA.

The MNS root configuration tag should be the first tag in the MNS configuration file (default location `./conf/mns_config_file`)

System Log File Tag

All the MNS system message will be written to the specified file.

Format: `sys_file = <path and name of the system log file>`
 Example: `sys_file = ./mns.sys`

MNS Network Port Number Tag

Specify the MNS network port number

Format: `port = <port number>`
 Example: `port = 8008`

CMS Network Port Number Tag

Specify the CMS update network port number

Format: `cms_port = <port number>`
 Example: `cms_port = 8888`

Virtual Host

Virtual Host Tag

This tag must be the first tag in virtual host section in the MNS configuration file (default `./conf/mns_config_file`). Specify the virtual host name, which will be referenced in the UMRL.

Format: `host = <host name with domain>`

Example: `host = beta2.hkcl.org`

Virtual Domain Tag

Specify the virtual domain, this would also be used in the cookie for the browser to send back the OPERA user criteria information to MNS. The domain name should contain the leading dot as it would be used in the cookie.

Format: `domain = <domain name>`

Example: `domain = .hkcl.org`

Refresh Delay Tag

Specify the refresh delay for the setup and callback information web windows.

Format: `refresh_delay = <number of 1/1000 second>`

Example: `refresh_delay = 3000`

Cookie Expires Tag

Specify the cookie expires values for the OPERA user criteria information.

Format: `cookie_expires = <unix date time format>`

Example: `cookie_expires = Wed, 31-Jan-2001 23:23:59 GMT`

Username Tag

Specify the user name for the CMS update connection authentication.

Format: `username = <login id>`

Example: `username = opera`

Password Tag

Specify the password for the CMS update connection authentication.

Format: `password = <password>`

Example: `password = 123456`

Server Group Configuration File Tag

Specify the location and filename of the server group configuration file relative to the MNS working directory.

Format : server_group_file = <path and filename of server group configuration file>

Example : server_group_file = ./conf/hkcl/server.opr

Network Mapping Configuration File Tag

Specify the location and filename of the network mapping configuration file relative to the MNS working directory.

Format : netmap_file = <path and filename of network mapping configuration file>

Example : netmap_file = ./conf/hkcl/netmap.opr

Criteria Configuration File Tag

Specify the location and filename of the criteria configuration file relative to the MNS working directory.

Format : criteria_file = <path and filename of criteria configuration file>

Example : criteria_file = ./conf/hkcl/criteria.opr

CGI Group Configuration File Tag

Specify the location and filename of the CGI group configuration file relative to the MNS working directory.

Format : cgi_config_file = <path and filename of CGI group configuration file>

Example : cgi_config_file = ./conf/hkcl/cgi_config.opr

Virtual Host Log File Tag

Specify the location and filename of the virtual host log file relative to the MNS working directory.

Format : log_file = <path and filename of virtual host log file>

Example : log_file = ./log/hkcl.log

UMRL Directory Tag

Specify the location and filename of the UMRL directory relative to the MNS working directory.

Format : log_file = <directory name of UMRL directory>

Example : log_file = ./conf/hkcl/umrl_db

Server Group Configuration File

The purpose of the server group configuration is to associate each server to one or more server group. For the same server group, server will be equally share the loading and in general with the same properties.

Server Name Tag

Specify the server name for each multimedia server. This tag should be the first tag for each server.

Format: server_name = <server full hostname>

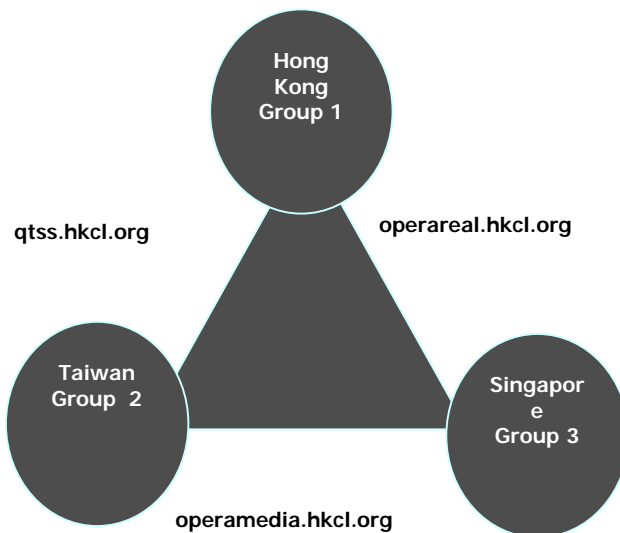
Example: server_name = real.hkcl.org

Server Group Tag

Specify the server group, which the multimedia server is associated. The group number 0 is the default group, if no other group is found to be suitable to server the request, the request will be passed to the default group 0.

Format: server_group = <number 0 – 255>

Example: server_group = 0



```
server_name = operareal.hkcl.org
server_group = 0
server_group = 1
server_group = 2
```

```
server_name = operamedia.hkcl.org
server_group = 0
server_group = 2
server_group = 3
```

```
server_name = qtss.hkcl.org
server_group = 0
server_group = 1
server_group = 3
```

Network Mapping Configuration File

The purpose of defining the network-mapping group is for the ISP to re-direct the users request to the nearest multimedia server according to the network topology.

For each network group, which is equal to the server group, would be associated with a list of network ID specified in the CIDR format (xxx.xxx.xxx.xxx/yy). In short, if the client' s IP fall into the network ID of a network group, then the server associated to that group would be used to serve the request.

Please visit <http://www.hkcl.org> for the update of the network list.

Network Group Tag

Specify the network group number, this should be the first tag for a group. Network group number 0 is special. When the client' s IP is not matched for any group then the server group 0 will be used to server the request.

Format: group = <number 0 -255>
Example: *group = 0*

Network ID Tag

Specify the network ID (IP range) for matching.

Format: ip = <xxx.xxx.xxx.xxx/yy>
Example: *ip = 202.45.189.0/24*

“Route” :
IP Address/Bitmask
+
Client IP Address
||
Server Group Number

Hong Kong
group = 1
ip = 202.0.77.0/24
ip = 202.0.78.0/24
...

Taiwan
group = 2
ip = 202.2.52.0/22
ip = 202.5.224.0/19
...

Singapore
group = 3
ip = 202.0.71.0/24
ip = 202.0.88.0/23
...

group 0 is special
If no match for IP
The default group
number is 0

CGI Group Configuration File

For each UMRL user may require having different output style such as, using invoking external player or display the information popup box. To ease the workload, user may group the same output style as a group and later specifying it per UMRL configuration. Totally up to 256 CGI group are allowed.

CGI Group Tag

Specify the CGI group number and should be the first tag for each CGI group. CGI group 0 is special. If the required CGI group is not found when specified in UMRL configuration, then CGI group 0 would be used.

Format: `cgi_group = <number 0 – 255>`

Example: `cgi_group = 0`

Content Return Mode Tag

Specify invoking user' s external player or using browser embedded player.

External Player



Embedded Player



Format: `content_return_mode = <external_player | embed_player >`

Example: `content_return_mode = external_player`

Setup CGI Tag

Specify the URL of the setup CGI (OPERAscript)

Format: `setup_cgi = <url>`

Example: `setup_cgi = http://beta2.hkcl.org/hkcl/setup.html`

Setup CGI Width Tag

Specify the width of the setup CGI display when popup is used.

Format: `setup_width = <number>`

Example: `setup_width = 500`

Setup CGI Height Tag

Specify the height of the setup CGI display when popup is used.

Format: `setup_height = <number>`

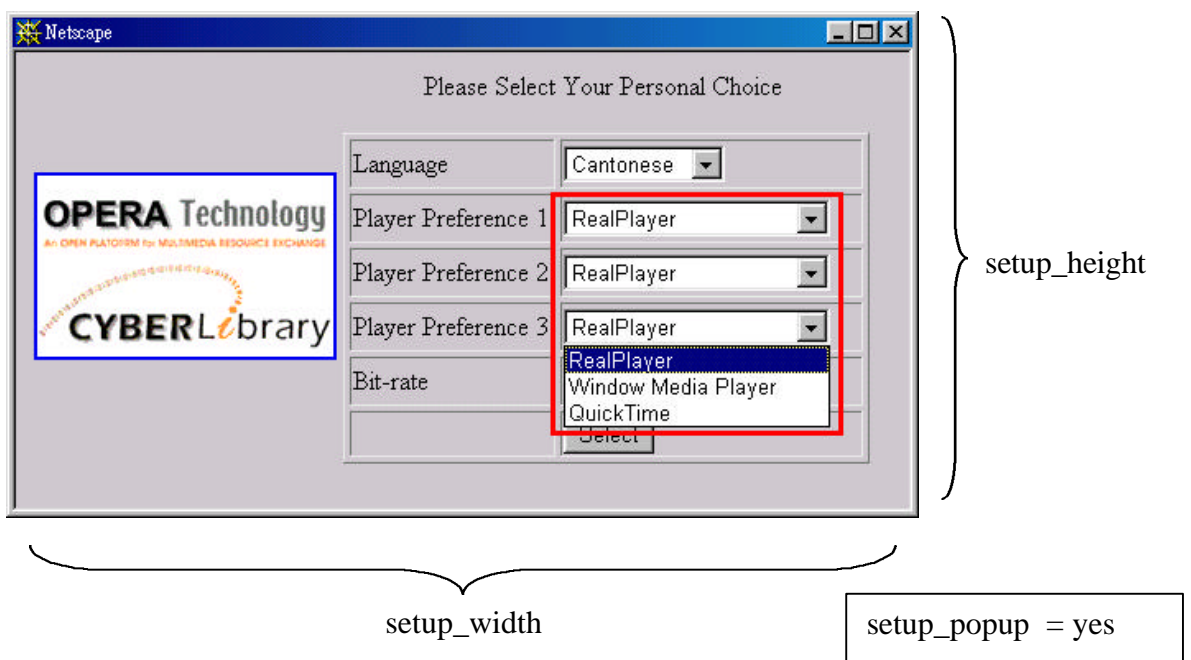
Example: `setup_height = 500`

Setup CGI Popup Tag

Specify setup CGI to be popup or not

Format: `setup_popup = <yes | no>`

Example: `setup_height = yes`



Callback CGI Tag

Specify the URL of the callback CGI (OPERAscript). For content_return_mode = external_player, the OPERAscript external_player.html template should be used. For content_return_mode = embed_player, the OPERAscript embed_player.html template should be used.

Format: callback_cgi = <url>

Example: callback_cgi = http://beta2.hkcl.org/hkcl/external_player.html

Callback CGI Width Tag

Specify the width of the callback CGI display when popup is used.

Format: callback_width = <number>

Example: callback_width = 500

Callback CGI Height Tag

Specify the height of the callback CGI display when popup is used.

Format: callback_height = <number>

Example: callback_height = 500

Callback CGI Popup Tag

Specify callback CGI to be popup or not

Format: callback_popup = <yes | no>

Example: callback_height = yes



callback_height

Content_return_mode =
embed_player, using OPERAscript
embed_player.html template

callback_width

Notfound CGI Tag

Specify the URL of the notfound CGI (OPERAscript), used when UMRL cannot be resolved by MNS.

Format: `notfound_cgi = <url>`

Example: `notfound_cgi = http://beta2.hkcl.org/hkcl/notfound.html`

Notfound CGI Width Tag

Specify the width of the notfound CGI display when popup is used.

Format: `notfound_width = <number>`

Example: `notfound_width = 500`

Notfound CGI Height Tag

Specify the height of the notfound CGI display when popup is used.

Format: `notfound_height = <number>`

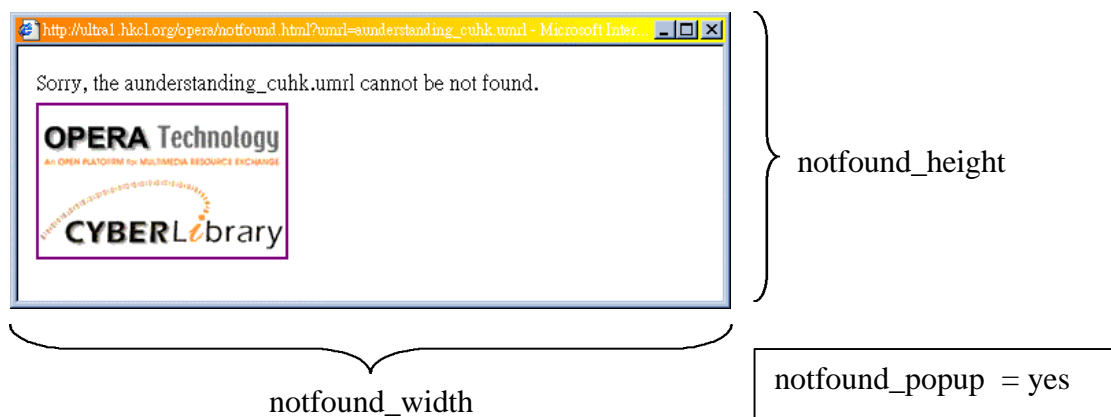
Example: `notfound_height = 500`

Notfound CGI Popup Tag

Specify notfound CGI to be popup or not

Format: `notfound_popup = <yes | no>`

Example: `notfound_height = yes`



UMRL Configuration Directory

For each UMRL to be used, it corresponds to a single UMRL configuration file. The name of the configuration file specifies the UMRL name.

UMRL CGI Group Tag

This should be the first tag appear in the UMRL configuration file which specify the CGI group to be used as the output webpage and player display mode.

Format: `cgi_group = <number 0 -255>`

Example: `cgi_group = 1`

Server Host Tag

Specify the multimedia server that having the physical multimedia file.

Format: `server = <full hostname>`

Example: `server = real.hkcl.org`

Server Path and File Name Tag

Specify the location path when the player needs to play the multimedia files.

Format: `path = <path and file name>`

Example: `path = cuhk/cuhk.sif.can.220.rm`

Criteria Name and Value Tag

Specify the criteria and values associated with the physical multimedia files. Depends on the site criteria configuration, any valid criteria name and value is allowed.

Format: `<criteria name> = <criteria value>`

Example: `Player = Real`

Running and Testing

How to start the MNS ?

First, change the current directory to distribution directory. MNS can be started with two options.

Using the default MNS configuration file name “./conf/mns_config_file”, by just enter the command ‘mns’.

Or supply the custom MNS configuration file name; by enter the command ‘mns -f <path and file name>’ where the path and file name is relative to the location of the MNS binary image.

After entering, command should return immediately. The MNS is running as a daemon process. If everything runs smoothly, you should get the following message in the MNS log file.

2000/7/7 15:18:25 - MNS Started process id 16152

You can modify the configuration of MNS when it is running. By sending the UNIX Hang Up Signal to the MNS process. It would read again the configuration files. The file mns.pid in the distribution directory would record the current process id of the MNS running. Also you can check the process id recorded in the MNS log file or even by issuing a ‘ps’ command.

If the configuration file is complex or there are many UMRL links, then it may take a little bit longer time for MNS to process the configuration files. The following messages would be logged in the MNS log file for reference.

2000/7/7 15:19:58 - Receiving HUP signal

2000/7/7 15:19:58 - Reading MNS configuration from ./conf/mns_config_file

2000/7/7 15:20:10 - Configuration update finished

Terminate the MNS

There are two ways to terminate the MNS.

- i) by sending the USR1 signal to the MNS daemon process,
- ii) by killing the MNS daemon process using ‘kill’ command.

Log File Message

2000/7/7 15:20:10 - User Aborted

Logged when user sending USR1 signal to terminate the MNS.

2000/7/7 15:20:10 - Socket already closed, unable to write to socket

Logged when client network connection is abnormally closed.

2000/7/7 15:20:10 - Bus or Seg. Error Received

Logged when MNS internal error.

2000/7/7 15:20:10 - Unable to create network connection

Logged during MNS starting up if network connection fail.

2000/7/7 15:20:10 - Unable to bind the network port 8001

Logged during MNS starting up if network connection fail.

2000/7/7 15:20:10 - Unable to listen to the network port 8001

Logged during MNS starting up if network connection fail.

2000/7/7 15:20:10 - Unable to allocate memory for worker order

Logged when not enough memory to start the worker threads.

2000/7/7 15:20:10 - Unable to create worker thread

Logged when worker threads cannot be connected.

Appendix A

Sample Configuration File

MNS Configuration File (./conf/mns_config_file)

```
#####  
# MNS System value  
sys_file = ./mns.sys  
port = 8008  
cms_port = 8888  
#####  
# Virtual Host I  
# host tag must be the first tag in the virtual host section  
host = beta2.hkcl.org  
domain = .hkcl.org  
#  
refresh_delay = 3000  
cookie_expires=Wed, 31-Jan-2001 23:23:59 GMT  
set_cookie_path = cgi-bin/set_cookie.cgi  
#  
username = opera  
password = *****  
#  
server_group_file = ./conf/hkcl/server.opr  
netmap_file = ./conf/hkcl/netmap.opr  
criteria_file = ./conf/hkcl/criteria.opr  
cgi_config_file = ./conf/hkcl/cgi_config.opr  
log_file = ./log/hkcl.log  
# umrl directory ( include the last stroke "/" )  
umrl_db_dir = ./conf/hkcl/umrl_db/
```

Server Group Configuration File (./conf/hkcl/server.opr)

```
# server name tag must be the first tag
# group 0 default
server_name = real.hkcl.org
server_group = 0
server_group = 1
server_group = 2
server_group = 3
#
server_name = operareal.hkcl.org
server_group = 0
server_group = 1
server_group = 2
server_group = 3
#
server_name = operamedia.hkcl.org
server_group = 0
server_group = 1
server_group = 2
server_group = 3
#
server_name = qtss.hkcl.org
server_group = 0
server_group = 1
server_group = 2
server_group = 3
```

Network Mapping Configuration File (./conf/hkcl/netmap.opr)

```
# Please visit www.hkcl.org for the update of the network list
# group tag should be the first tag for each group
# Hong Kong
group = 1
ip = 202.0.77.0/24
ip = 202.0.78.0/24
ip = 202.0.100.0/24
ip = 202.0.104.0/24
ip = 202.0.112.0/24
ip = 202.0.122.0/23
ip = 202.0.128.0/20
ip = 202.0.144.0/22
ip = 202.0.180.0/22
ip = 202.1.6.0/23
ip = 202.2.32.0/20
ip = 202.2.48.0/22
ip = 202.2.64.0/19
ip = 202.4.192.0/19
ip = 202.7.128.0/19
ip = 202.12.4.0/22
ip = 202.14.67.0/24
ip = 202.14.68.0/24
ip = 202.14.80.0/24
ip = 202.14.222.0/24
ip = 202.20.66.0/24
ip = 202.20.88.0/23
ip = 202.20.94.0/23
ip = 202.20.98.0/24
ip = 202.20.100.0/23
ip = 202.20.111.0/24
ip = 202.20.117.0/24
ip = 202.20.118.0/24
ip = 202.20.125.0/24
ip = 202.20.126.0/23
ip = 202.21.128.0/24
ip = 202.40.0.0/16
ip = 202.45.0.0/16
ip = 202.52.128.0/19
ip = 202.53.128.0/19
ip = 202.57.224.0/19
ip = 202.60.224.0/19
ip = 202.63.0.0/19
ip = 202.63.128.0/19
ip = 202.64.0.0/16
ip = 202.65.0.0/19
ip = 202.65.224.0/19
ip = 202.66.0.0/15
ip = 202.68.0.0/14
ip = 202.72.0.0/15
ip = 202.74.0.0/19
ip = 202.74.224.0/19
ip = 202.75.0.0/18
ip = 202.75.64.0/19
ip = 202.75.224.0/19
ip = 202.76.0.0/17
ip = 202.76.224.0/19
ip = 202.77.0.0/16
ip = 202.78.0.0/19
```

ip = 202.78.224.0/19
ip = 202.79.0.0/19
ip = 202.79.224.0/19
ip = 202.80.0.0/19
ip = 202.81.0.0/16
ip = 202.82.0.0/15
ip = 202.84.0.0/14
ip = 202.88.0.0/15
ip = 202.130.64.0/18
ip = 202.130.128.0/19
ip = 202.140.96.0/19
ip = 202.144.224.0/19
ip = 202.146.96.0/19
ip = 202.161.224.0/19
ip = 202.163.0.0/19
ip = 202.169.0.0/19
ip = 202.170.0.0/19
ip = 202.177.0.0/19
ip = 202.181.224.0/19
ip = 202.182.224.0/19
ip = 203.80.0.0/14
ip = 203.84.0.0/15
ip = 203.86.0.0/16
ip = 203.90.224.0/19
ip = 203.105.0.0/18
ip = 203.131.224.0/19
ip = 203.184.192.0/18
ip = 203.198.0.0/19
ip = 210.87.248.0/21
ip = 210.176.0.0/16
ip = 210.184.0.0/18
ip = 210.184.64.0/19

Taiwan

group = 2

ip = 202.2.52.0/22
ip = 202.5.224.0/19
ip = 202.14.8.0/21
ip = 202.39.0.0/16
ip = 202.43.64.0/19
ip = 202.52.64.0/18
ip = 202.60.64.0/19
ip = 202.61.32.0/19
ip = 202.80.128.0/19
ip = 202.145.32.0/19
ip = 202.145.64.0/18
ip = 202.145.128.0/17
ip = 202.160.64.0/19
ip = 202.162.64.0/19
ip = 202.166.192.0/18
ip = 202.178.224.0/19
ip = 203.64.0.0/13
ip = 203.72.0.0/14
ip = 203.77.0.0/17
ip = 203.78.0.0/19
ip = 203.79.0.0/16
ip = 203.95.128.0/17
ip = 203.107.0.0/18
ip = 203.133.0.0/18
ip = 203.135.224.0/19

ip = 203.160.224.0/19
ip = 210.17.0.0/17
ip = 210.59.0.0/16
ip = 210.60.0.0/14
ip = 210.64.0.0/13
ip = 210.200.0.0/18
ip = 210.200.64.0/19
ip = 210.208.0.0/16
ip = 210.209.0.0/18
ip = 210.240.0.0/13

Singapore

group = 3

ip = 202.0.71.0/24
ip = 202.0.88.0/23
ip = 202.0.127.0/24
ip = 202.0.149.0/24
ip = 202.0.150.0/24
ip = 202.0.152.0/24
ip = 202.1.64.0/18
ip = 202.1.128.0/19
ip = 202.6.102.0/24
ip = 202.8.0.0/22
ip = 202.8.4.0/23
ip = 202.8.94.0/23
ip = 202.12.2.0/24
ip = 202.12.94.0/23
ip = 202.14.153.0/24
ip = 202.14.154.0/24
ip = 202.20.114.0/23
ip = 202.20.116.0/24
ip = 202.21.145.0/24
ip = 202.21.146.0/24
ip = 202.21.154.0/24
ip = 202.21.192.0/18
ip = 202.27.16.0/20
ip = 202.42.0.0/16
ip = 202.160.224.0/19
ip = 202.166.0.0/18
ip = 202.169.224.0/19
ip = 202.176.0.0/27
ip = 203.112.0.0/19
ip = 203.116.0.0/14
ip = 203.120.0.0/13
ip = 210.23.128.0/19
ip = 210.24.0.0/16

Criteria Configuration File (./conf/hkcl/criteria.opr)

```
# Please check against with the local definition of the OPERAscript
# criteria should be the first tag for each criteria
# maximum criteria value is [0-9] for each criteria
criteria=Player
0=Real
1=WindowsMedia
2=QuickTime
criteria=Language
0=Cantonese
1=Putonghua
2=English
3=Japanese
criteria=BandWidth
0=45Mbps
1=1.5Mbps
2=512Kbps
3=256Kbps
4=128Kbps
5=56Kbps
6=28.8Kbps
```

CGI Group Configuration File (./conf/hkcl/cgi_config.opr)

```
# Maximum Number of CGI group is 256
# cgi_group tag should be the first tag for each group
cgi_group=0
content_return_mode=external_player
setup_cgi=http://beta2.hkcl.org/hkcl/setup.html
setup_width=500
setup_height=500
setup_popup=yes
callback_cgi=http://beta2.hkcl.org/hkcl/external_player.html
callback_width=500
callback_height=500
callback_popup=yes
notfound_cgi=http://beta2.hkcl.org/hkcl/notfound.html
notfound_width=200
notfound_height=50
notfound_popup=yes
```

```
cgi_group=1
content_return_mode=embed_player
setup_cgi=http://beta2.hkcl.org/hkcl/setup.html
setup_width=500
setup_height=500
setup_popup=yes
callback_cgi=http://beta2.hkcl.org/hkcl/embed_player.html
callback_width=500
callback_height=500
callback_popup=yes
notfound_cgi=http://beta2.hkcl.org/hkcl/notfound.html
notfound_width=200
notfound_height=50
notfound_popup=yes
```

```
cgi_group=2
content_return_mode=external_player
setup_cgi=http://beta2.hkcl.org/hkcl/setup.html
setup_width=500
setup_height=500
setup_popup=no
callback_cgi=http://beta2.hkcl.org/hkcl/external_player.html
callback_width=500
callback_height=500
callback_popup=no
notfound_cgi=http://beta2.hkcl.org/hkcl/notfound.html
notfound_width=200
notfound_height=50
notfound_popup=no
```

**UMRL Detail Configuration File
(./conf/hkcl/umrl_db/undestanding_cuhkumrl)**

```
# cgi_group tag should be the first tag for each UMRL
#
cgi_group = 1
#
# server tag should be the first tag for each Media Clip
#
server = operareal.hkcl.org
path = cuhk/cuhk.sif.can.220.rm
Language = Cantonese
Bandwidth = 256Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.sif.put.220.rm
Language = Putonghua
Bandwidth = 256Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.sif.eng.220.rm
Language = English
Bandwidth = 256Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.can.56.rm
Language = Cantonese
Bandwidth = 56Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.put.56.rm
Language = Putonghua
Bandwidth = 56Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.eng.56.rm
Language = English
Bandwidth = 56Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.can.28.rm
Language = Cantonese
Bandwidth = 28.8Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.put.28.rm
Language = Putonghua
Bandwidth = 28.8Kbps
Player = Real
#
server = operareal.hkcl.org
path = cuhk/cuhk.qsif.eng.28.rm
Language = English
```

Bandwidth = 28.8Kbps
Player = Real

server = operamedia.hkcl.org
path = cuhk.sif.can.3000.asf
Language = English
Bandwidth = 45Mbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.eng.1024.asf
Language = English
Bandwidth = 1.5Mbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.can.lan.asf
Language = Cantonese
Bandwidth = 256Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.eng.lan.asf
Language = English
Bandwidth = 256Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.put.lan.asf
Language = Putonghua
Bandwidth = 256Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.can.100.asf
Language = Cantonese
Bandwidth = 128Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.eng.100.asf
Language = English
Bandwidth = 128Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.sif.put.100.asf
Language = Putonghua
Bandwidth = 128Kbps
Player = WindowsMedia

server = operamedia.hkcl.org
path = cuhk.qsif.can.56.asf
Language = Cantonese
Bandwidth = 56Kbps
Player = WindowsMedia
#