Release Control 9.20 Deployment Sizing Guide

Introduction

This document provides general guidelines for Release Control 9.20 deployment to support different levels of user workloads. All configurations and recommendations in this document are based on Release Control out-of-the-box (OOTB) system. It is strongly recommended that the customers conduct load/stress tests to ensure their deployments can accommodate expected daily system usage.

The contents in this document mainly focus on the following three aspects:

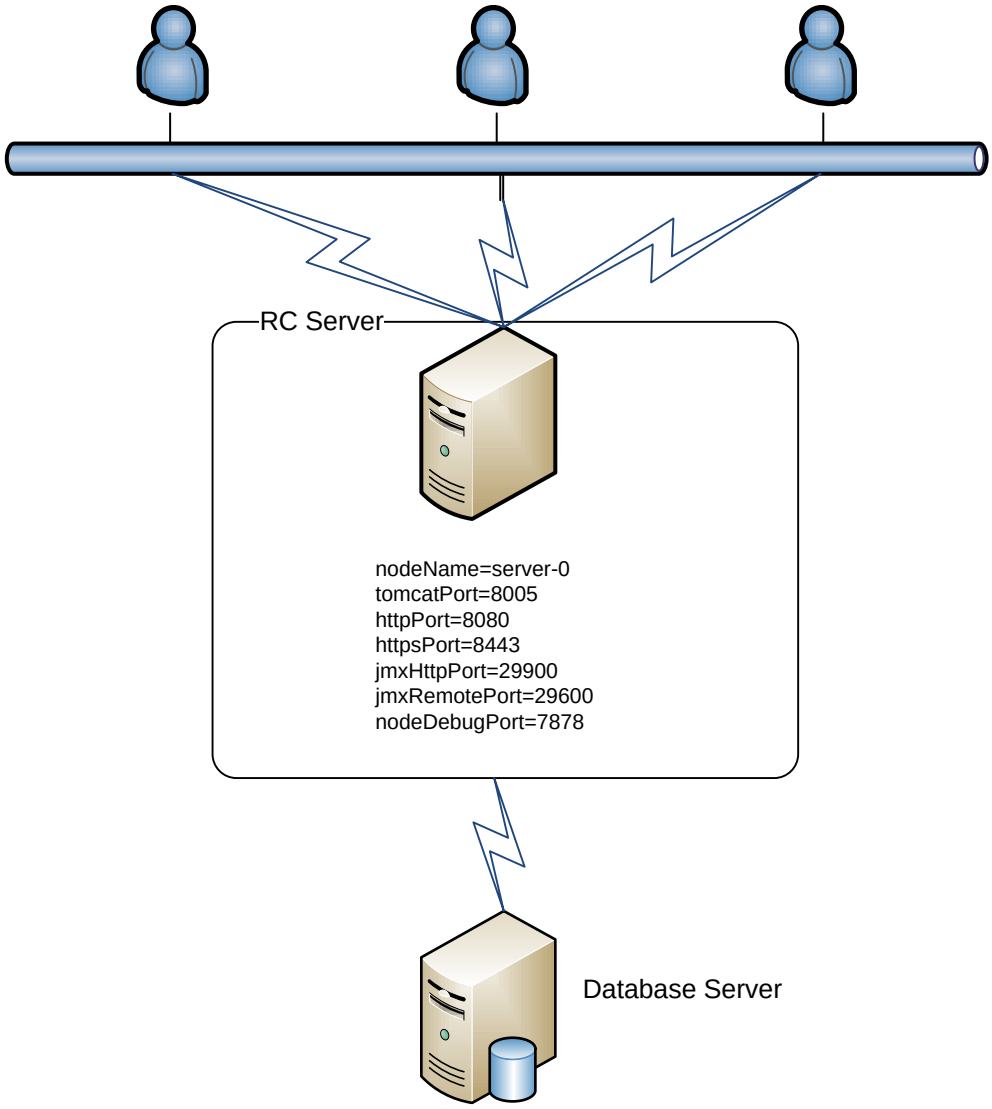
- Present three deployment models that Release Control 9.20 supports, including the standalone model, the vertical scaling model and the horizontal scaling model.
- Provide guidelines on how to determine hardware configurations based on the following two factors. Also some sizing-related parameters are discussed to obtain additional system capability.
    - Online users load
    - Throughput (hits per second)
- Provide Release Control deployment examples on Windows so as to leverage the flexibility of Release Control scaling.

Release Control 9.20 Deployment Models

Currently Release Control supports three deployment models: standalone, vertical scaling and horizontal scaling. From the simplest model (only one Release Control node) to the largest model (multiple Release Control nodes on different computers with hardware or software load balancer as the front-end server), customers can choose their deployments flexibly.

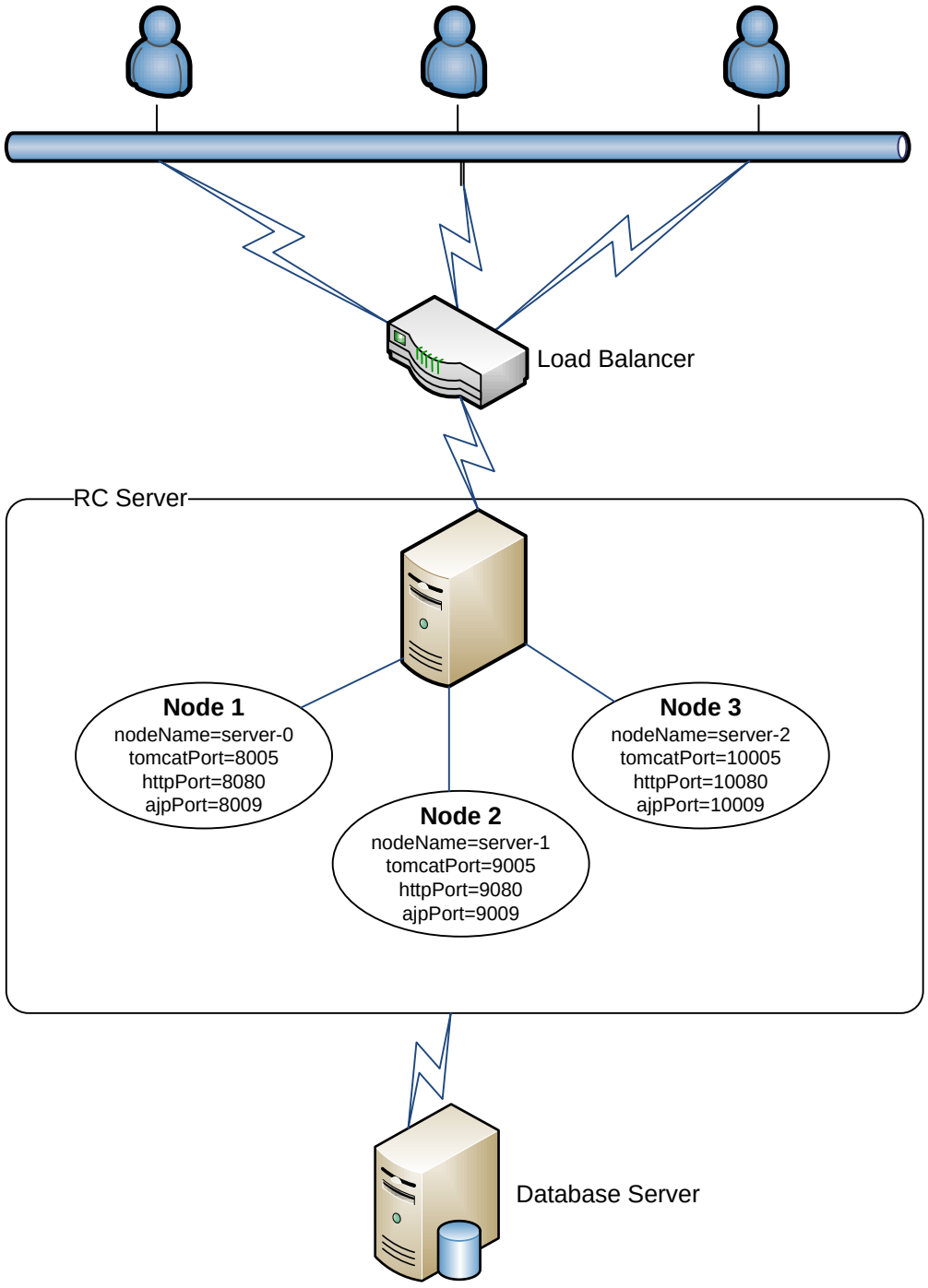
Standalone Mode

This is the default mode after installing Release Control. It includes only one Release Control instance to process the user's requests.



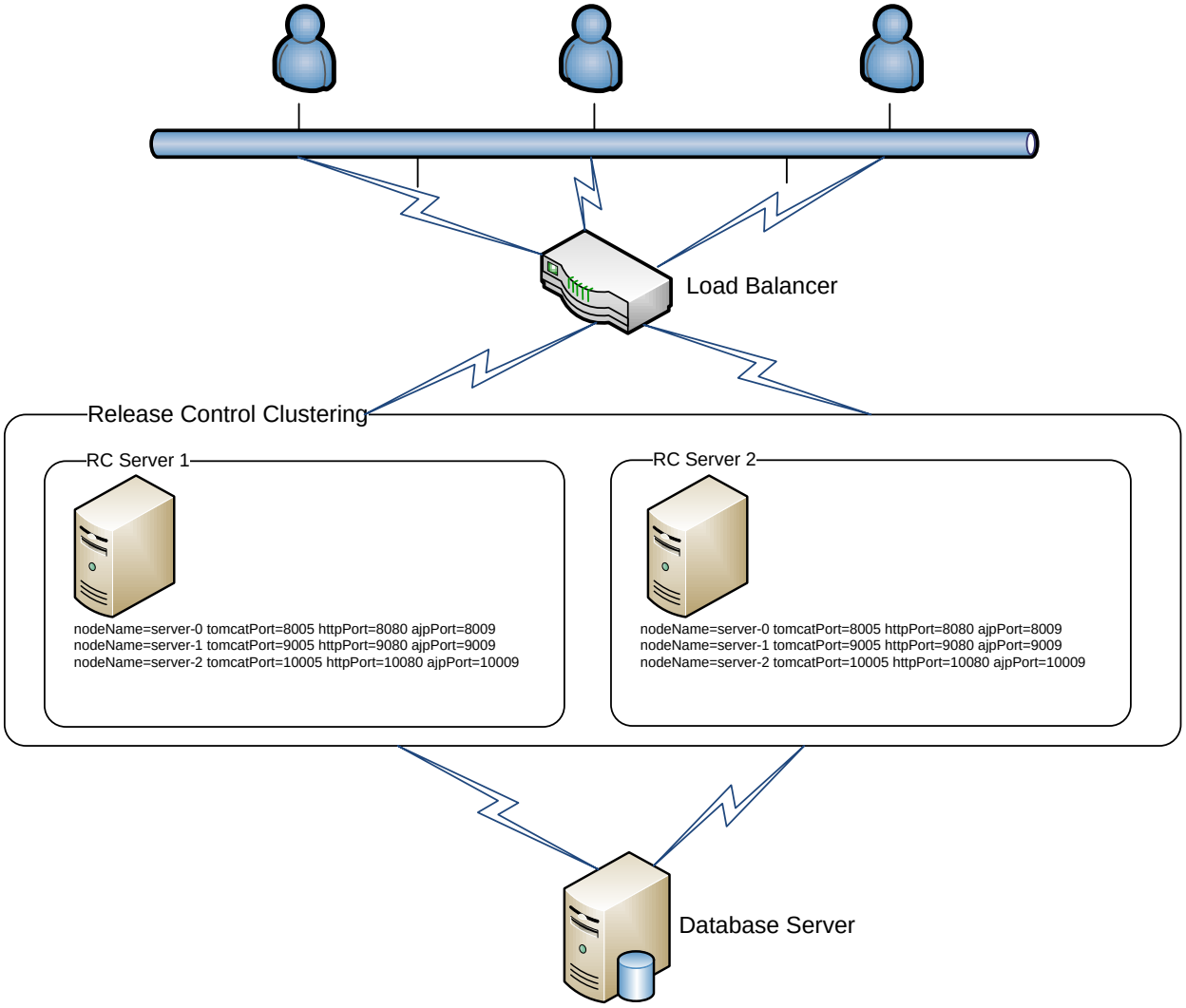
Vertical Scaling Mode

To support medium user workloads, Release Control can be easily extended by using CreateNode utility under the `< HP Release Control installation Directory >/ bin` directory on the server. That is, if possible, customers can add one more Release Control nodes on the server to process increased users' requests. For this mode, customers need to adopt hardware or software load balancer to route requests to different Release Control nodes.



Horizontal Scaling Mode

The horizontal scaling mode is intended to support large user workloads. That is, utilizing one more Release Control computer to reside multiple Release Control applications, while putting a hardware or software load balancer as the front-end server to route users' requests.

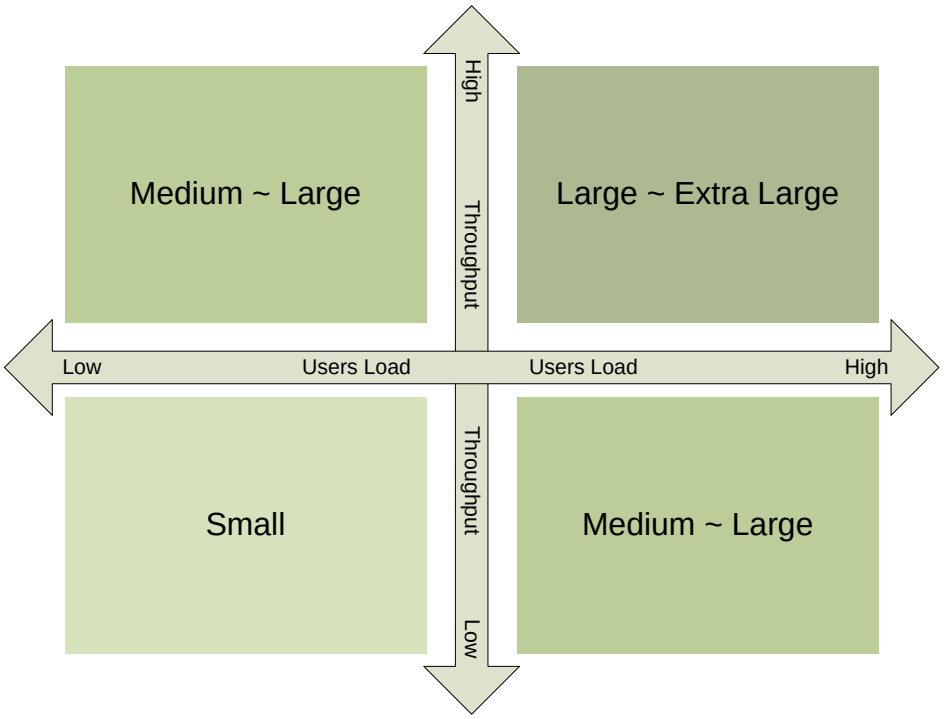


Release Control 9.20 Deployment Guideline

The current version of deployment guideline is based on two typical factors which will impact system's capacity requirements:

- Online users load
- Throughput (Hits per Second)

The following figure demonstrates how these two factors determine system's deployment.



For each deployment, the following deployment mode is defined by default.

- Small deployment – standalone mode.
- Medium deployment – vertical scaling mode or horizontal scaling mode.
- Large deployment – horizontal scaling mode (hardware load balancer is preferred).
- Extra-large deployment – horizontal scaling mode (hardware load balancer is preferred).

Note: Any hardware configuration (for example, CPU cores and Memory size) suggested in this part should be considered as a common guideline to run Release Control effectively. It is not a recommendation for any specific customer scenarios. We strongly suggest customers to conduct load/stress tests to make sure their deployments are not undersized.

Small Deployment

If your online users load is below 200 or the throughput is between 30 and 70, consider small deployment.

Criteria

- Online users load (1 - 200 users)
- Throughput (Hits per Second: 30 - 70)

Hardware Configuration

- Release Control: 4 CPU, 4 GB, such as HP DL360.
- RDBMS: 4 CPU, 8 GB, such as HP DL360.

Deployment Model

- Standalone mode

Medium Deployment

If your online users load is between 201 and 1000 or the throughput is between 71 and 190, consider medium deployment.

Criteria

- Online users load (201 - 1000 users)
- Throughput (Hits per Second: 71 - 190)

Hardware Configuration

- Release Control: 4 - 8 CPU Cores, 16 GB, such as HP BL460c.
- Software Load Balancer: 4 CPU Cores, 4 GB, such as HP DL360.
- RDBMS: 8 CPU Cores, 16 GB, such as HP DL585.

Deployment Model

- Vertical scaling mode or horizontal scaling mode, 3 x RELEASE CONTROL nodes

Large Deployment

If your online users load is between 1001 and 2000 or the throughput is between 191 and 320, consider large deployment. Although the software load balancer is listed in this part, hardware load balancer is preferred.

Criteria

- Online users load (1001 - 2000 concurrent users)
- Throughput (Hits per Second: 191 - 320)

Hardware Configuration

- Release Control: 8 CPU Cores, 16 GB, such as HP BL460c.
- Software Load Balancer: 4 CPU Cores, 4 GB, such as HP DL360.
- RDBMS: 16 CPU Cores, 32 GB RAM, such as HP DL585.

Deployment Model

- Horizontal scaling mode, 2 Release Control physical computers, while configuring 3 x Release Control nodes for each computer.

Extra-Large Deployment

If your online users load is above 2001 or the throughput is above 321, consider extra-large deployment.

Criteria

- Online users load (>2001 concurrent users)
- Throughput (Hits per Second: >321)

Hardware Configuration

- Release Control: consider adding more CPU cores and RAM to the existing Release Control servers, or adopt additional new Release Control servers to the current environment.
- Load Balancer: hardware load balancer is preferred.
- RDBMS: extend as required.

Deployment Model

- Horizontal scaling mode

Sizing Parameters Reference

This part describes several sizing related parameters which will impact the system's throughput. By tuning these parameters, you can easily obtain additional system capacity, or avoid performance bottlenecks arising from undersized configuration.

These parameters include:

- Parameters on Apache httpd server, if you are using an Apache server as software load balancer.
- Parameters on Release Control server.
- Parameters on Oracle server, if you are choosing Oracle as your database server.

Apache Httpd Server

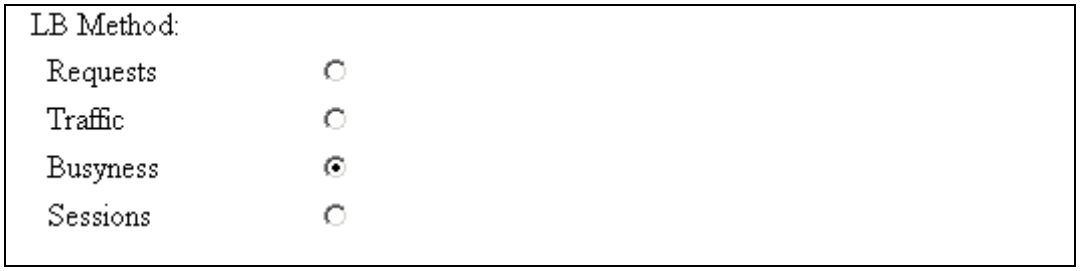
1. To avoid long connection time, limit the following two parameters' values in `<APACHE_HOME>/conf/extra/httpd-default.conf` for Apache 2.2.x and later versions.

```
# Timeout 30 is just an example.

Timeout 30

# KeepAliveTimeout 20 is just an example.

KeepAliveTimeout 20
```

2. When using the mod_jk module to act as the bridge between Apache and Tomcat, to make sure Apache httpd server can handle peak users load, try tuning mod_jk related parameters in `<APACHE_HOME>/conf/extra/httpd-mpm.conf` for Apache 2.2.x and later versions.

```
# Following is just an example for WinNT platform.

<IfModule mpm_winnt_module>
    ThreadLimit    3500
    ThreadsPerChild      3000
    MaxRequestsPerChild    0
</IfModule>
```

3. When using the mod_jk module to act as the bridge between Apache and Tomcat, use **Busyness** as the load balancer method.



Release Control Server

1. For Windows 2008 64-bit Release Control server with 8 CPU Cores and 16 GB RAM, create 3-4 Release Control nodes in maximum.

2. For Windows 2008 64-bit Release Control server, set the optimum JVM heap size to between 1 GB (by default) and 1.3 GB for each Release Control node.

   There are two ways to set the JVM heap size, depending on which kind of startup method you choose.

a. Start Release Control server from command line.

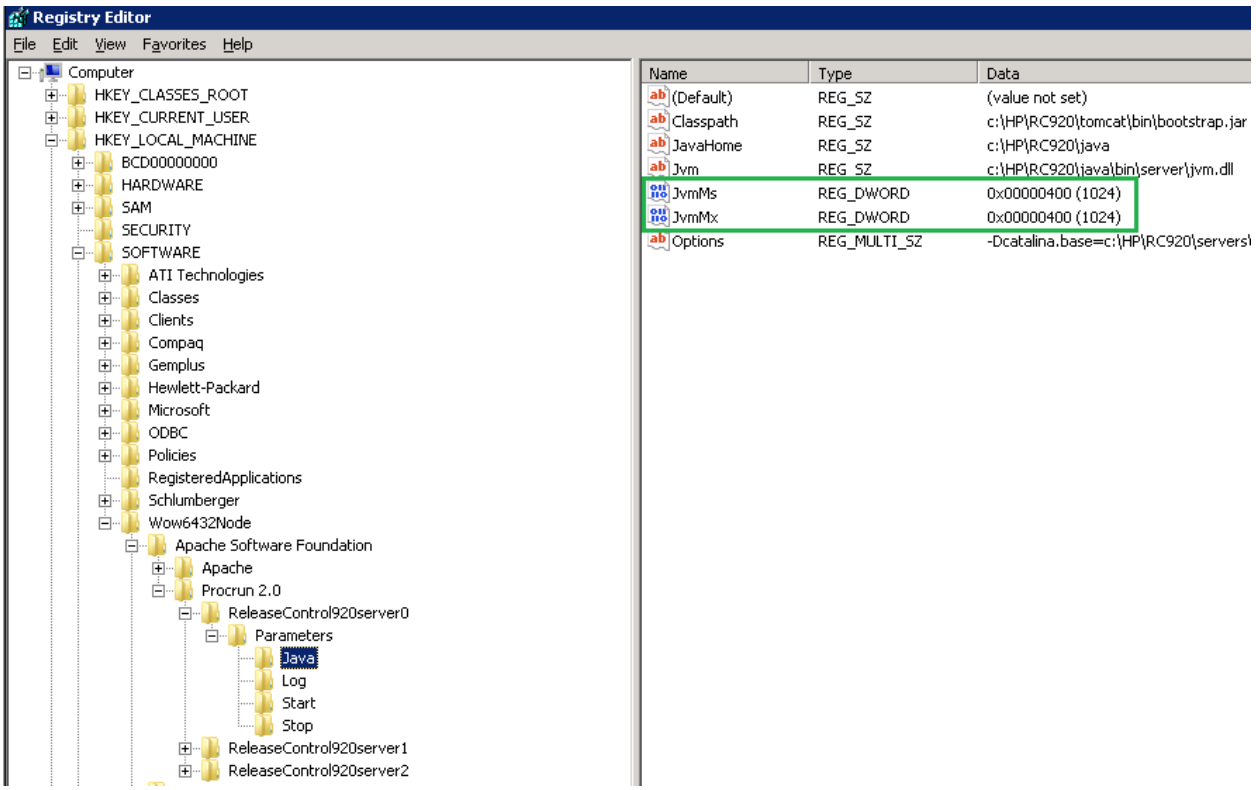
   Edit `StartCcm-server-0.bat` or `StartCcm-server-0.sh` under `<HP Release Control installation Directory>` by configuring the JVM heap size setting parameters, such as `-Xms1024m -Xmx1024m`.

b. Start Release Control server from Windows Services Control Panel.

   i. Go to Windows Start Menu and click **Run...**

   ii. Type `regedit` and press Enter. The Windows Registry Editor opens.

   iii. Locate the JVM parameters of Release Control server and configure them as illustrated in the following screenshot:



3. Install Release Control on Linux instead of on Windows if customers have large requirements on heap size.

4. Extend Release Control node's capacity by configuring the connection parameters in `<HP Release Control installation Directory>/servers/server-0/conf/server.xml`. Refer to the following examples:

```
# Following is just an example for standalone mode.

 <Connector port="8080" protocol="HTTP/1.1" maxThreads="300"
minSpareThreads="100" maxSpareThreads="200" acceptCount="300"
maxKeepAliveRequests="500" connectionTimeout="20000"
redirectPort="8443" URIEncoding="UTF-8"/>
```

```
# Following is just an example for using apache as the load
balancer.

<Connector port="8009" protocol="AJP/1.3" maxThreads="300"
minSpareThreads="100" maxSpareThreads="200" acceptCount="300"
maxKeepAliveRequests="500" connectionTimeout="20000"
redirectPort="8443"/>
```

5. Adjust the database connection pool parameters in `<HP Release Control installation Directory>/conf/database.properties` properly when necessary.

```
# Following is the default configuration after installing Release
Control.

db.pool.maxPoolSize=20
passwordEncrypted=false
db.pool.minPoolSize=3
db.pool.idleConnectionTestPeriod=600
db.pool.maxIdleTime=3600
db.pool.acquireIncrement=3
db.pool.maxStatements=0
```

Oracle Database Server

Adjust Release Control Oracle database server connection/memory/session/cursor related parameters only when necessary.

```
# Following is just an example.

dispatchers='(protocol=TCP)(disp=15)(con=1000)'
max_dispatchers=20

shared_servers=100
max_shared_servers=500
memory_target=32212254720
open_cursors=5000
processes=7500
session_cached_cursors=100
sessions=8255
```

Examples - Release Control 9.20 Deployment

Following the Release Control deployment guidelines, this part presents real examples on small, medium and large deployment in the lab, including detailed steps on how to set up Apache and Release Control clustering environment. Note the following limitations:

- All these examples are based on Windows 2008 64-bit Release Control, Oracle 11.1 x 64-bit database server.
- Large volume dataset is not covered. For verification, only 1000 changes in total are simulated, while 100 changes for each day.
- No network latency is simulated between Apache load balancer and Release Control server. The network speed is 1 Gbps.
- Only the user scenarios in Appendix A are covered.

Criteria

The examples demonstrate three levels of deployments on the Release Control 9.20 out-of-the-box (OOTB) environment.

Users Load	Deployment Type	Deployment Mode
200 users load	Small deployment	Standalone mode
1000 users load	Medium deployment	Vertical scaling mode
2000 users load	Large deployment	Horizontal scaling mode

Success criteria for all the examples are described as follow:

Parameter	Single / Multiple RELEASE CONTROL Node	Comment
Average Client Response Time	<=2.0 sec	For users login.
	<=3.0 sec	For heavy transactions.
	<=2.0 sec	All other transactions.
90th% Client Response Time	<=3.0 sec	For users login.
	<=4.0 sec	For heavy transactions.
	<=3.0 sec	All other transactions.
Throughput (Hits per Second)	Small - 40 hits per second	For 200 users load scenario.
	Medium - 120 hits per second	For 1000 users load scenario.
	Large - 210 hits per second	For 2000 users load scenario.
Duration of Peak Load	1.5 hours	
Transaction Failures	< 3%	The failure here means non-critical errors which will not lead Release Control server to hang or crash.

Standalone - 200 users

To support 200 users load with 40 hits per second, the environment is defined as follow:

- One Release Control server which is configured with 4 CPU Cores, 4 GB RAM.
- One Release Control node (by default) is enough to support 200 users load.
- One Oracle database server with 4 CPU Cores, 8 GB RAM configured.

Deploy Standalone Release Control Server

Refer to *HP Release Control 9.20 Deployment Guide*.

Vertical Scaling - 1000 users

To support 1000 users load with 120 hits per second, the environment is defined as follow:

- Put Apache as the software load balancer on a separated computer from Release Control server with 4 CPU Cores, 4 GB RAM configured.
- One Release Control server which is configured with 8 CPU Cores, 16 GB RAM.
- Create 3 Release Control nodes on each Release Control server to support 1000 users load.
- One Oracle database server with 8 CPU Cores, 16 GB RAM configured.

Deploy Apache Load Balancer

Note: The following steps assume that the Apache httpd server is installed on another computer from the Release Control server. You can also install the Apache httpd server and Release Control on the same computer. See *Configuring Web Server* in *HP Release Control 9.20 Deployment Guide* for more information.

1. Download Apache HTTP Server 2.2.22 MSI Installer from http://mirror.cc.columbia.edu/pub/software/apache/httpd/binaries/win32/httpd-2.2.22-win32-x86-no_ssl.msi.
2. Double-click the MSI Installer to install the Apache HTTP Server.
3. Check whether `mod_jk.so` exists or not in the `<APACHE_HOME>/module` directory. If not, copy it from `<HP Release Control installation Directory>/utilities/webServeRelease Control onfigurer/mod_jk` after installing the Release Control server. You can also download `mod_jk.so` and copy it to `<APACHE_HOME>/module`. It is one of the core components and works as the conduit between Apache HTTP Server and Tomcat.
4. Create a new directory named `conf.d` under `<APACHE_HOME>`.
5. Create the `releasecontrol.conf` file under `<APACHE_HOME>/conf.d` folder, type worker-related information as displayed in the following sample:

```
LoadModule    jk_module  modules/mod_jk.so
```

```
JkLogLevel    info
JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "
JkLogFile     logs/mod_jk.log

JkWorkerProperty worker.list=router,jkstatus

JkWorkerProperty worker.worker1.type=ajp13
JkWorkerProperty worker.worker1.host=<Release Control Server
Name>
JkWorkerProperty worker.worker1.port=8009

JkWorkerProperty worker.worker2.type=ajp13
JkWorkerProperty worker.worker2.host=<Release Control Server
Name>
JkWorkerProperty worker.worker2.port=9009

JkWorkerProperty worker.worker3.type=ajp13
JkWorkerProperty worker.worker3.host=<Release Control Server
Name>
JkWorkerProperty worker.worker3.port=10009

JkWorkerProperty worker.router.type=lb
JkWorkerProperty
worker.router.balance_workers=worker1,worker2,worker3

JkMount /* router

#JkUnMount /*.jpg worker1
#JkUnMount /*.gif worker1
#JkUnMount /assets/*.png worker1
#JkUnMount /Help/*.png worker1
#JkUnMount /*.html worker1
#JkUnMount /*.htm worker1
#JkUnMount /*.css worker1
#JkUnMount /*.pdf worker1
#JkUnMount /*.swc worker1
#JkUnMount /*.swf worker1

JkWorkerProperty worker.jkstatus.type=status
JkMount /jkmanager/* jkstatus

<Location /jkmanager/>
  JkMount jkstatus
  Order deny,allow
  Deny from all
  Allow from 127.0.0.1
</Location>
Redirect /Release Control  /ccm
```

6. Edit <APACHE_HOME>/conf/httpd.conf as displayed in the following example:

```
# Uncomment this line because we need to override the default
thread limit setting.
Include conf/extra/httpd-mpm.conf

# Uncomment this line because we need to monitor apache status.
Include conf/extra/httpd-info.conf

# Uncomment this line because we need to override the default
timeout setting.
```

```
Include conf/extra/httpd-default.conf

# Add in this line to let apache load releasecontrol.conf
configuration file.
Include conf.d/*.conf
```

7. Edit <APACHE_HOME>/conf/extra/httpd-mpm.conf to increase thread limit:

```
# Following is just an example for WinNT platform.
<IfModule mpm_winnt_module>
    ThreadLimit   3500
    ThreadsPeRelease Control hild      3000
    MaxRequestsPeRelease Control hild    0
</IfModule>
```

8. Edit <APACHE_HOME>/conf/extra/httpd-default.conf to override default timeout settings:

```
# Timeout 30 is just an example.
Timeout 30
# KeepAliveTimeout 20 is just an example.
KeepAliveTimeout 20
```

Deploy Multiple Release Control Nodes

1. Follow the Standalone - 200 users example to set up the first Release Control server node.
2. Edit <HP Release Control installation Directory>/servers/server-0/conf/server.xml as displayed in the following example:

```
<Engine name="Catalina" defaultHost="localhost" jvmRoute="
worker1">
```

3. To create the second Release Control server node, open the command window and browse to <HP Release Control installation Directory >/bin directory. Run the following command:

```
createNode create -DnodeName=server-1 -DtomcatPort=9005 -
DhttpPort=9090 -DhttpsPort=9443 -DajpPort=9009 -
DjmxHttpPort=29901 -DjmxRemotePort=29601 -DnodeDebugPort=7879
```

4. Edit <HP Release Control installation Directory>/servers/server-1/conf/server.xml as displayed in the following example:

```
<Engine name="Catalina" defaultHost="localhost" jvmRoute="
worker2">
```

5. Follow step 3, run the following command to create the third Release Control server node:

```
createNode create -DnodeName=server-2 -DtomcatPort=10005 -
DhttpPort=10090 -DhttpsPort=10443 -DajpPort=10009 -
DjmxHttpPort=29902 -DjmxRemotePort=29602 -DnodeDebugPort=7880
```

6. Edit `<HP Release Control installation Directory>/servers/server-2/conf/server.xml` as displayed in the following example:

```
<Engine name="Catalina" defaultHost="localhost" jvmRoute="
worker3">
```

Configure the Cluster Transport

The cluster supports two transports: multicast and unicast.

Configuring Multicast Transport

1. Start node 1 and go to the Configuration tab. Select Server -> Cluster. Select "multicast" from the cluster transport select box. Go to "Multicast Cluster" under the Cluster configuration and enter the multicast IP address and the port. If you do not have an IP address you can "invent" one - be sure not to hit an existing cluster IP address. Valid IP addresses for a multicast address are in the class D range (see Multicast definition in wikipedia for details). We recommend using an address in the range 239.0.0.0/8, for example 239.0.0.1. Choose a port at random between 1025 and 65000. For example 45566.
2. Save and activate the configuration set.

Configuring Unicast Transport

1. Start node 1 and go to the Configuration tab. Select Server -> Cluster. Select "unicast" from the cluster transport select box. Go to "Unicast Cluster" under the cluster configuration and enter the static IP addresses of all nodes in the cluster. For example if node 1 is on 10.0.0.1 and node 2 is on 10.0.0.2 both on port 7800, enter the following string to the Static address field:

   `10.0.0.1[7800],10.0.0.2[7800].`
2. Save and activate the configuration set.

Horizontal Scaling - 2000 users

To support 2000 users load with 210 hits per second, define the environment as following:

- Put Apache as the software load balancer on a separated computer from Release Control server, with 4 CPU Cores, 4 GB RAM configured.
- Two Release Control servers while each one is configured with 8 CPU Cores, 16 GB RAM.
- Create 3 Release Control nodes on each Release Control server to support 2000 users load.
- One Oracle database server with 8 CPU Cores, 32 GB RAM configured.

Deploy Apache Load Balancer

Refer to Deploy Apache Load Balancer in Vertical Scaling - 1000 users. Remember to add in additional workers information in the `releasecontrol.conf` file.

Deploy Multiple Release Control Nodes

To deploy multiple Release Control nodes on each computer, refer to Deploy Multiple Release Control Nodes in Vertical Scaling - 1000 users. Make sure the database connection configuration on each computer is identical, and your new Release Control nodes' AJP ports and worker names are the same as those defined in the `releasecontrol.conf` file.

Appendix A – User Scenarios in Examples

User Scenario for Change Assessment

Step Number	Step Description
1	Open the link: http://<Web_server>:<Web_port>/ccm/assess.html?hideRELEASE CONTROL Header=true&locale=en_US&timezone=US/Mountain&refId=<Change_ID>&serviceDesk=<Adapter_name>
2	Log in with the user name **admin** and password **admin**.
3	Click Open Graph Window.
4	Close Open Graph Window.
5	Click Collisions tab.
6	Click Time Period Conflicts tab.
7	Click Risk tab.
8	Click Similar Changes tab.
9	Log out.

User Scenario for Change Calendar

Step Number	Step Description
1	Open the link: http://<Web_server>:<Web_port>/ccm/?requestOrigin=EXTERNAL&filterName=any&perspective=calendar&hide RELEASE CONTROL Header=true&locale=en_US&timezone=US/Mountain
2	Log in with the user name **admin** and password **admin**.
3	Click Month tab in Change Calendar, switch from Week View to Month View.
4	Choose a date that includes our changes, click the changes number.
5	Click a change number.
6	Click another change number.
7	Log out.

For More Information

Visit the HP Software Support Online web site at:

http://www.hp.com/go/hpsoftwaresupport

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support web site to:

- SeaRelease Control h for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- ReseaRelease Control h and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To register for an HP Passport ID, go to:

http://h20229.www2.hp.com/passport-registration.html

To find more information about access levels, go to:

http://h20230.www2.hp.com/new_access_levels.jsp

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