

HCLSoftware

HCL Workload Automation
Best practices
Version 10.2.7



Note

Before using this information and the product it supports, read the information in [Notices on page xiii](#).

This edition applies to version 10, release 2, modification level 7 of HCL Workload Automation (program number 5698-T09) and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Chapter 1. Configuring the dynamic domain manager after installing or upgrading	5
LDAP user authentication	5
Verification of dynamic domain manager settings.....	5
Pool creation - Checking values in the database.....	7
Chapter 2. Database recommendations	9
Oracle RAC (active-active or multi-node) configuration.....	9
Db2 HADR (active-passive with automatic client reroute) configuration.....	9
MSSQL Server (Always On availability groups) configuration.....	10
PostgreSQL (Patroni, HAProxy, or external load balancer) configuration.....	10
Chapter 3. Resource usage settings for UNIX workstations - ulimit parameter	12
Notices.....	xiii
Index.....	17

Chapter 1. Configuring the dynamic domain manager after installing or upgrading

Ensure your dynamic domain manager is correctly configured after completing an installation or an upgrade.

About this task

After setting up a new master domain manager, update specific configuration files and database tables to ensure that dynamic agents and pools can authenticate and communicate using the new hostnames and IP addresses.

LDAP user authentication

About this task

When connecting from the Dynamic Workload Console to the master domain manager using an LDAP user, you might not be able to access the views in the dynamic domain manager database.

1. Stop WebSphere Application Server Liberty on the master domain manager, as described in the topic about starting and stopping the application server in *Administration Guide*.
2. Open the `broker_role_mapping.xml` file on the master domain manager. The file path varies depending on the operating system:

On Windows operating systems

```
<MDM_installation_directory>\usr\servers\engineServer\configDropins\defaults
```

On UNIX operating systems

```
<MDM_installation_directory>/usr/servers/engineServer/configDropins/defaults/
```

3. Uncomment the `<special-subject type="ALL_AUTHENTICATED_USERS" />` line for all roles: `Operator`, `Submitter`, and `Configurator`. This modification grants access to **all authenticated users**. For tighter security, administrators can map specific LDAP groups to these roles. The uncommented section looks like this:

Example

```
<security-role id="operatorRole" name="Operator">
<special-subject type="ALL_AUTHENTICATED_USERS"/>
</security-role>
<security-role id="submitterRole" name="Submitter">
<special-subject type="ALL_AUTHENTICATED_USERS"/>
</security-role>
<security-role id="configuratorRole" name="Configurator">
<special-subject type="ALL_AUTHENTICATED_USERS"/>
</security-role>
```

4. Restart WebSphere Application Server Liberty, as described in the topic about starting and stopping the application server in *Administration Guide*.

Verification of dynamic domain manager settings

About this task

Run the following steps to verify your dynamic domain manager settings after upgrading:

1. Update the URLs of the Resource Advisor on the master domain manager, as follows:

a. Browse to `<MDM_installation_dir>/TDWB/bin`.

b. Export the list of dynamic domain manager instances by running the following command:

```
./exportserverdata.sh -dbUsr <database_user> -dbPwd <database_password>
```

For more information about this command, see the topic about `exportserverdata` in *User's Guide and Reference*.

c. Review the generated `server.properties` file. Ensure the IP address or hostname for both the master domain manager and the backup master domain manager are correct.

d. If the information is not correct, update the `server.properties` file as necessary.

e. Apply the updates by running the following command:

```
./importserverdata.sh -dbUsr <database_user> -dbPwd <database_password>
```

For more information about this utility, see the topic about `importserverdata` in *User's Guide and Reference*.

2. Align the data in the `BrokerWorkstation.properties` file.

During a parallel upgrade, the new master domain manager is first installed as a backup master domain manager and only later promoted to the role of master domain manager. Because it is initially configured as a backup, the `BrokerWorkstation.properties` file is created with incomplete information. This file is not automatically updated when the backup master domain manager is promoted to master, which results in missing or outdated configuration details. In addition, this behavior causes the dynamic domain manager—which is installed by default on every master domain manager and backup—to use the incorrect information stored in the `BrokerWorkstation.properties` file.

To prevent this problem, copy the `BrokerWorkstation.properties` file from the master domain manager and modify it with the information related to the new master domain manager. Ensure the following properties are correct and up-to-date:

- all hostnames
- **MasterDomainManager.Name**
- **MasterDomainManager.HostName**
- **DomainManager.Workstation.Name**
- **DomainManager.Workstation.Address**

Also add the following line, if not already present: **Broker.CertificateExpirationInterval**.

The file is available in the following path, depending on your operating system:

On Windows systems

```
<TWA_home>\broker\config
```

On UNIX systems

```
<TWA_DATA_DIR>/broker/config
```

For more information about this file, see the topic about the `BrokerWorkstation.properties` file in *Administration Guide*.

- Restart WebSphere Application Server Liberty, as described in the topic about starting and stopping the application server in *Administration Guide*. The database tables are automatically updated based on the information in the `BrokerWorkstation.properties` file.

Pool creation - Checking values in the database

Before you begin

Before creating pools, ensure data in the following database tables is correct:

dynamic domain manager

DWB.PPS_PRODUCT_PROPERTIES

master domain manager

mdl.OPR_OBJ_PROPERTIES

About this task

To check current values for the dynamic domain manager, run the following query on the database of the dynamic domain manager:

```
db2 "select PPS_PROPERTY_NAME,PPS_PROPERTY_VALUE from DWB.PPS_PRODUCT_PROPERTIES"
```

This example applies to Db2, but you can apply it to any supported database by using the appropriate syntax.

The expected values are as follows:

DomainManager.Workstation.Name [https://domainmanager.workstation.name/]

This is the workstation name of the new dynamic domain manager. Verify the current value is the expected one. You can obtain this value using the `conman` command line or from the **MDL.WKS_WORKSTATIONS** table on the master domain manager.

MasterDomainManager.HostName

This is the full qualified host name or the IP of the new master domain manager. Verify the current value is the expected one. You can obtain this value using the `conman` command line or from the **MDL.WKS_WORKSTATIONS** table on the master domain manager.

MasterDomainManager.Name [https://masterdomainmanager.name/]

This is the workstation name of the new master domain manager. Verify the current value is the expected one. You can obtain this value using the `conman` command line or from the **MDL.WKS_WORKSTATIONS** table on the master domain manager.

MasterDomainManager.URIs

This is the list of the master domain managers to be contacted by the dynamic domain manager. The list must contain in the first position the new master domain manager and in second position the new backup master domain manager, for example

```
https://wa-server.example.com:31116/JobManagerRESTWeb/JobScheduler/resource.
```

DomainManager.Workstation.Address

This is the full qualified host name or the IP address of the new dynamic domain manager.

To check current values for the master domain manager, run the following query on the database of the master domain manager:

```
db2 "select * from mdl.OPR_OBJ_PROPERTIES where OPR_OBJECT_TYPE='W'"
```

This example applies to Db2, but you can apply it to any supported database.

The relevant part is column **OPR_VALUE**. The format of the URI should be similar to the following example, containing the hostname or IP address of master domain manager and backup master domain manager.

```
https://wa-server.example.com:31116/JobManagerRESTWeb/JobScheduler  
[https://wa-server.example.com:31116/JobManagerRESTWeb/JobScheduler];  
https://127.0.0.1:31116/JobManagerRESTWeb/JobScheduler  
[https://127.0.0.1:31116/JobManagerRESTWeb/JobScheduler]
```



Note: The whole address must be on a single line.

Chapter 2. Database recommendations

This chapter contains a list of recommended practices for database usage.

Oracle RAC (active-active or multi-node) configuration

Scenario

Multiple nodes share the same storage. Connections must be spread across nodes, and if one fails, the client must instantly move to another node.

Best practice

Use the Single Client Access Name (SCAN) address. The following example shows the XML configuration:

```
<dataSource id="twsdb" jndiName="jdbc/twsdb">
  <connectionManager
    minPoolSize="10"
    maxPoolSize="100"
    preTestConnection="true"
    validationTimeout="5s"
    agedTimeout="30m"/>
  <properties.oracle
    URL="jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)
      (HOST=my-scan-address.example.com) (PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=myHwaService) (FAILOVER_MODE=
        (TYPE=SELECT) (METHOD=BASIC) (RETRIES=20) (DELAY=5)))))"
    user="YOUR_USER"
    password="your_password"/>
  </dataSource>
```



Note: The `preTestConnection="true"` property ensures that HCL Workload Automation checks if the connection to the RAC node is still active before sending a job command.

Db2 HADR (active-passive with automatic client reroute) configuration

Scenario

The configuration consists of two nodes: a primary read/write node and a standby node. If the primary node fails, the standby node takes over.

Best practice

Define the alternate server directly in the properties. The following example shows the XML configuration:

```
<dataSource id="twsdb" jndiName="jdbc/twsdb">
  <connectionManager
    minPoolSize="5"
    maxPoolSize="80"
    connectionTimeout="180s"/>
  <properties.db2.jcc
```

```

databaseName="TWS"
serverName="primary-node.example.com"
portNumber="50000"
clientRerouteAlternateServerName="standby-node.example.com"
clientRerouteAlternatePortNumber="50000"
enableSeamlessFailover="1"
maxRetriesForClientReroute="10"
retryIntervalForClientReroute="5"/>
</dataSource>

```



Note: The `enableSeamlessFailover="1"` property sets the Db2 driver to attempt to replay the transaction on the standby node without returning an exception to HCL Workload Automation.

MSSQL Server (Always On availability groups) configuration

Scenario

A listener sits in front of multiple SQL nodes.

Best practice

Point HCL Workload Automation to the Availability Group Listener and enable the `multiSubnetFailover` property if the nodes are located in different data centers. The following example shows the XML configuration:

```

<dataSource id="twadb" jndiName="jdbc/twadb">
  <connectionManager maxPoolSize="100"/>
  <properties.microsoft.sqlserver
    serverName="ag-listener.example.com"
    portNumber="1433"
    databaseName="TWS"
    multiSubnetFailover="true"
    loginTimeout="30"/>
</dataSource>

```



Note: The `multiSubnetFailover="true"` property is vital if your SQL nodes are located in different IP subnets (disaster recovery scenarios), because it allows the driver to try all IP addresses associated with the listener simultaneously.

PostgreSQL (Patroni, HAProxy, or external load balancer) configuration

Scenario

A cluster of PostgreSQL nodes is managed by Patroni, and is typically accessed through a load balancer (LB) or a virtual IP (VIP).

Best practice

Use a validation query to ensure that the connection has not been silently interrupted by the load balancer. The following example shows the XML configuration:

```
<dataSource id="twsdb" jndiName="jdbc/twsdb">
  <connectionManager
    minPoolSize="5"
    maxPoolSize="50"
    preTestConnection="true"/>
  <properties.postgresql
    serverName="pg-load-balancer.example.com"
    portNumber="5432"
    databaseName="TWS"/>
</dataSource>
```



Note: For PostgreSQL databases accessed by using a load balancer, always set the `agedTimeout` property in the `connectionManager` element to a value lower than the idle timeout of the load balancer. For example, if the load balancer timeout is 30 minutes, set `agedTimeout="25m"`.

Chapter 3. Resource usage settings for UNIX workstations - ulimit parameter

In UNIX operating systems, the **ulimit** parameter defines and controls the amount of resources that processes are allowed to consume. It acts as a safety mechanism to prevent any single process from exhausting system resources such as memory, CPU time, or the number of open files.

Before installing or upgrading on UNIX workstations, apply the following minimum values. For high-volume environments, setting these to `unlimited` is recommended.

- data segment process (option **-d**) = `unlimited`
- file size (option **-f**) = `unlimited`
- max user processes (option **-u**) = `>260000 up to unlimited`
- open files (option **-n**) = `>100000 up to unlimited`
- max memory size (option **-m**) = `unlimited`
- stack size (option **-s**) = `>33000 up to unlimited`

Changes made directly in a shell are temporary. You can make these settings permanent at the operating system level by editing the `limits` file. For more information about the file, see the documentation of the operating system.

Notices

This document provides information about copyright, trademarks, terms and conditions for product documentation.

© Copyright IBM Corporation 1993, 2016 / © Copyright HCL Technologies Limited 2016, 2026

This information was developed for products and services offered in the US. This material might be available from HCL in other languages. However, you may be required to own a copy of the product or product version in that language in order to access it.

HCL may not offer the products, services, or features discussed in this document in other countries. Consult your local HCL representative for information on the products and services currently available in your area. Any reference to an HCL product, program, or service is not intended to state or imply that only that HCL product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any HCL intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-HCL product, program, or service.

HCL may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

For license inquiries regarding double-byte character set (DBCS) information, contact the HCL Intellectual Property Department in your country or send inquiries, in writing, to:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

HCL TECHNOLOGIES LTD. PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. HCL may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-HCL websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this HCL product and use of those websites is at your own risk.

HCL may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by HCL under terms of the HCL Customer Agreement, HCL International Program License Agreement or any equivalent agreement between us.

The performance data discussed herein is presented as derived under specific operating conditions. Actual results may vary.

Information concerning non-HCL products was obtained from the suppliers of those products, their published announcements or other publicly available sources. HCL has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-HCL products. Questions on the capabilities of non-HCL products should be addressed to the suppliers of those products.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to HCL, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. HCL, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. HCL shall not be liable for any damages arising out of your use of the sample programs.

© (HCL Technologies Limited) (2026).

Portions of this code are derived from Sample Programs.

© Copyright 2016

Trademarks

HCL®, and other HCL graphics, logos, and service names including "hcltech.com" are trademarks of HCL. Except as specifically permitted herein, these Trademarks may not be used without the prior written permission from HCL. All other trademarks not owned by HCL that appear on this website are the property of their respective owners, who may or may not be affiliated with, connected to, or sponsored by HCL.

Adobe™, the Adobe™ logo, PostScript™, and the PostScript™ logo are either registered trademarks or trademarks of Adobe™ Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library™ is a Registered Trade Mark of AXELOS Limited.

Linear Tape-Open™, LTO™, the LTO™ Logo, Ultrium™, and the Ultrium™ logo are trademarks of HP, IBM® Corp. and Quantum in the U.S. and other countries.

Intel™, Intel™ logo, Intel Inside™, Intel Inside™ logo, Intel Centrino™, Intel Centrino™ logo, Celeron™, Intel Xeon™, Intel SpeedStep™, Itanium™, and Pentium™ are trademarks or registered trademarks of Intel™ Corporation or its subsidiaries in the United States and other countries.

Linux™ is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft™, Windows™, Windows NT™, and the Windows™ logo are trademarks of Microsoft™ Corporation in the United States, other countries, or both.



Java™ and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine™ is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

ITIL™ is a Registered Trade Mark of AXELOS Limited.

UNIX™ is a registered trademark of The Open Group in the United States and other countries.

Terms and conditions for product documentation

Permissions for the use of these publications are granted subject to the following terms and conditions.

Applicability

These terms and conditions are in addition to any terms of use for the HCL website.

Personal use

You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative work of these publications, or any portion thereof, without the express consent of HCL.

Commercial use

You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of HCL.

Rights

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

HCL reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by HCL, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

HCL MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

Index

A

- Always On availability groups 10
- automatic client reroute 9

B

- broker database views
 - access denied 5
- broker queries
 - not running 5

D

- Db2 HADR 9
- DDM database views
 - access denied 5
- DDM queries
 - not running 5
- dynamic domain manager database views
 - access denied 5
- dynamic domain manager queries
 - not running 5

H

- HAProxy 10

L

- load balancer 10

M

- MSSQL Server 10
- multiple Oracle nodes 9

P

- Patroni 10
- PostgreSQL 10