

HP Network Automation

Software Version: 9.00 Patch 3 (9.00.03)

Administration Guide

Document Release Date: October 2011
Software Release Date: October 2011



Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notices

© Copyright 2011 Hewlett-Packard Development Company, L.P.

Trademark Notices

Adobe® is a trademark of Adobe Systems Incorporated.

Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation.

Oracle and Java are registered trademarks of Oracle and/or its affiliates.

UNIX® is a registered trademark of The Open Group.

Acknowledgements

ANTLR, Apache, Bouncy Castle, GNU, Jaxen, Jython, Netaphor, MetaStuff, Radius, Sleepcat, TanukiSoftware

Documentation Updates

This guide's title page contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

To check for recent updates, or to verify that you are using the most recent edition of a document, go to:

<http://h20230.www2.hp.com/selfsolve/manuals>

This site requires that you register for an HP Passport and sign-in. To register for an HP Passport ID, go to:

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

Or click the **New users - please register** link on the HP Passport login page.

You will also receive updated or new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

Support

You can 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 Support Online 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 HP Software Support web site to:

- Search 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
- Research 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 find more information about access levels, go to:

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

To register for an HP Passport ID, go to:

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

Contents

1 About This Guide	7
Revision History.....	7
2 Full Text Search of Configuration Text	9
Enabling Full Text Search of Configuration Text	10
Standalone NA Core Environment	10
Horizontal Scalability Environment	10
Multimaster Distributed System Environment	11
Enabling Full Text Search on Oracle.....	11
Enabling Full Text Search on Microsoft SQL Server	12
Enabling the Contains (Full Text) Search Operator.....	14
Using the Contains (Full Text) Search Operator	14
Disabling the Contains (Full Text) Search Operator	15
Disabling Full Text Search	16
Command Line Reference	17
Analyze the NA Database in Preparation for Index Generation	17
Check the Status of the NA Database Index.....	18
Generate an Index of the NA Database.....	18
Remove the NA Database Index	18
Reindex the NA Database	18
3 Reclaiming Unused Space (Oracle Database)	19
We appreciate your feedback!	21

1 About This Guide

This guide contains a collection of information and best practices for administering HP Network Automation Software (NA). This guide is for an expert system administrator, network engineer, or HP support engineer with experience deploying and managing networks in large installations.

This guide assumes that you have already installed NA and that you are familiar with start-up configuration tasks. To learn more about these tasks, see the *NA Upgrade and Installation Guide* and the NA help.

HP updates this guide between product releases as new information becomes available. For information about retrieving an updated version of this document, see [Documentation Updates](#) on page 2.

Revision History

[Table 1](#) lists the major changes for each new release of this document.

Table 1 Document Changes

Document Release Date	Description of Major Changes
October 2011 (9.00 Patch 3)	First publication.

2 Full Text Search of Configuration Text

As of version 9.00.02, HP Network Automation Software (NA) supports a “contains (full text)” search of Configuration Text. After full text search is enabled, faster configuration text search is available for the following report options:

- Reports > Search For > Devices > Configuration Text > contains (full text)
- Reports > Search For > Configurations > Configuration Text > contains (full text)
- Reports > Search For > Device Templates > Configuration Text > contains (full text)
- Reports > Advanced Search > Search Criteria > Configuration Text > contains (full text)

Additionally, you can create a dynamic group based on the results of a Search Criteria > Configuration Text > contains (full text) search.

Similarly, these searches also support searching for configuration text that “does not contain (full text).” The search is case insensitive for the “contains (full text)” and “does not contain (full text)” operators.

The “contains (full text)” search is an indexed search and requires that the database is enabled for full text search.

Because the “contains (full text)” search is indexed, it returns results faster than does the “contains” search. However, the “contains (full text)” search supports fewer options than does the “contains” search.

➤ This feature is not supported on MySQL.

This topic contains the following sections:

- [Enabling Full Text Search of Configuration Text](#) on page 10
- [Using the Contains \(Full Text\) Search Operator](#) on page 14
- [Disabling the Contains \(Full Text\) Search Operator](#) on page 15
- [Disabling Full Text Search](#) on page 16
- [Command Line Reference](#) on page 17

➤ The commands in this documentation are available as of NA 9.00.03.

Enabling Full Text Search of Configuration Text

The procedure for enabling full text search of NA configuration text depends on the NA environment.

Standalone NA Core Environment

In a standalone NA Core environment, do the following:

- 1 On the NA application server, enable full text search of the database. Follow the steps appropriate to the database type:
 - [Enabling Full Text Search on Oracle](#) on page 11
 - [Enabling Full Text Search on Microsoft SQL Server](#) on page 12
- 2 On the NA application server, enable the “contains (full text)” search operator as described in [Enabling the Contains \(Full Text\) Search Operator](#) on page 14.

Horizontal Scalability Environment

In a Horizontal Scalability environment, do the following:

- 1 On *one* NA application server, enable full text search of the database. Follow the steps appropriate to the database type:
 - [Enabling Full Text Search on Oracle](#) on page 11
 - [Enabling Full Text Search on Microsoft SQL Server](#) on page 12
- 2 On *one* NA application server, enable the “contains (full text)” search operator as described in [Enabling the Contains \(Full Text\) Search Operator](#) on page 14.

Use the `reload server options` command to reload the `.rcx` settings. This command pushes the change to the other NA application servers in the Horizontal Scalability environment.

- ▶ Restarting the NA management engine does *not* push the change to the other NA application servers in the Horizontal Scalability environment. If you use this approach to reload the `.rcx` settings, also modify the `.rcx` file on each of the other NA application servers.



Use a similar approach for disabling full text search of NA configuration text.

Multimaster Distributed System Environment

In a Multimaster Distributed System environment, do the following:

- 1 On *each* NA application server, enable full text search of the database.

Run the enablement procedures in parallel. That is, complete step 1 on each NA application server before initiating step 2 on any NA application server, and so forth.

Follow the steps appropriate to the database type:

- [Enabling Full Text Search on Oracle](#) on page 11
- [Enabling Full Text Search on Microsoft SQL Server](#) on page 12

- 2 On *one* NA application server, enable the “contains (full text)” search operator as described in [Enabling the Contains \(Full Text\) Search Operator](#) on page 14.

Use the `reload server options` command to reload the `.rcx` settings. This command pushes the change to the other NA application servers in the Multimaster Distributed System environment.

- ▶ Restarting the NA management engine does *not* push the change to the other NA application servers in the Multimaster Distributed System environment. If you use this approach to reload the `.rcx` settings, also modify the `.rcx` file on each of the other NA application servers.

- ▶ Use a similar approach for disabling full text search of NA configuration text.

Enabling Full Text Search on Oracle

Full-text search accesses an index of the text records in the database. The initial index generation requires available time and disk space.

- ▶ If Oracle Text is not yet enabled, also plan for database downtime.

NA maintains the full text index by incrementally indexing new configurations added during snapshot tasks and by removing the index entries of deleted configurations.

- ▶ Note the following:

- Because index generation is CPU-intensive, NA tasks might run slower than normal during the process of enabling full text search.
- Do not restart the NA management engine while index generation is in progress.

To enable full text search on an Oracle database, follow these steps:

- 1 Verify that Oracle Text is enabled and has the required privileges and space:
 - a Log on to the NA proxy with the credentials used to install NA.
 - b Run the following command:

```
run checkdb -resolver analyzesearchindex -verbose
```

- c Examine the output of the `analyzesearchindex` command.
 - If Oracle Text is not enabled, see [Analyze the NA Database in Preparation for Index Generation](#) on page 17 for suggested Oracle resources.
 - If Oracle Text is enabled, verify that the approximate additional space required for the index generation process is available on the database server.
- 2 In the NA console, delay any Take Snapshot tasks that are scheduled to start before the end of the approximate time required for index generation to complete.
- 3 Generate the full text index:

- a From the NA proxy, run the following command:

```
run checkdb -resolver addsearchindex -verbose
```

- b Examine the output of the `addsearchindex` command.

- The expected status is COMPLETE & VALID.
- If the status is IN PROGRESS, wait for index generation to complete.
- If the status is INVALID, remove the index with the `run checkdb -resolver removesearchindex -verbose` command, and then repeat [step a](#).



You can close the command prompt window during index generation. In this case, run the following command to determine the status of the index generation:

```
run checkdb -resolver statusindex -verbose
```

- 4 Edit the `adjustable_options.rcx` file as described in [Enabling the Contains \(Full Text\) Search Operator](#) on page 14.
- 5 In the NA console, examine the status of recent Take Snapshot tasks. Rerun any that failed.



On an Oracle database, the log file contains the following error for any Take Snapshot tasks that were running during the generation of the full text index. You can ignore this error:

```
java.sql.SQLException: ORA-29861: domain index is marked LOADING/  
FAILED/UNUSABLE
```

Enabling Full Text Search on Microsoft SQL Server

Full-text search accesses an index of the text records in the database. The initial index generation requires available time and disk space.



If the SQL Server Full Text Search service is not installed and enabled, also plan for database downtime.

NA maintains the full text index by incrementally indexing new configurations added during snapshot tasks and by removing the index entries of deleted configurations.



Note the following:

- Because index generation is CPU-intensive, NA tasks might run slower than normal during the process of enabling full text search.
- Do not restart the NA management engine while index generation is in progress.

To enable full text search on a Microsoft SQL Server database, follow these steps:

- 1 Verify that the SQL Server Full Text Search service is installed and enabled by using one of the following approaches:

- Using the SQL Server configuration manager, determine whether the SQL Server Full Text Search service is installed and started.
- Using SQL Management Studio, run the following select statement:

```
SELECT fulltextserviceproperty('IsFulltextInstalled');
```

This statement returns 1 if the database is full-text enabled and 0 if not.

- 2 On SQL Server 2005, remove the SQL Server noise words as follows:

- a Change to the `SQL_Server_Install_Path\Microsoft SQL Server\MSSQL.1\MSSQL\FTDATA\` directory.
- b Back up the `noiseENU.txt` file.
- c Delete all entries in the `noiseENU.txt` file to leave an empty file.

For more information about editing noise words, see the “Noise Words” topic in the MSDN library:

<http://msdn.microsoft.com/en-us/library/ms142551%28SQL.90%29.aspx>



On SQL Server 2008, by default no noise words are enabled.

- 3 Generate the full text index:

- a Log on to the NA proxy with the credentials used to install NA.
- b Run the following command:

```
run checkdb -resolver addsearchindex -verbose
```



On SQL Server, this command returns immediately and starts full-text indexing. Wait some time before you start using the new search. In the verbose output, verify that this run did not generate any SQL exceptions.

- 4 Determine the status of the index generation by running the following command:

```
run checkdb -resolver statusindex -verbose
```

- The expected status is COMPLETE & VALID.
- If the status is IN PROGRESS, wait for index generation to complete.
- If the status is INVALID, remove the index with the `run checkdb -resolver removesearchindex -verbose` command, and then repeat [step 3](#).

- 5 Edit the `adjustable_options.rcx` file as described in [Enabling the Contains \(Full Text\) Search Operator](#) on page 14.

Enabling the Contains (Full Text) Search Operator

After the NA database is enabled for full text search, enable the “contains (full text)” search operator in the NA console as follows:


- 1 Back up the `adjustable_options.rcx` file to a location outside the `<NA_HOME>` directory.
- 2 In the `adjustable_options.rcx` file, add the following line:

```
<option name="fulltextsearch/enabled">true</option>
```
- 3 Save the `adjustable_options.rcx` file.
- 4 Reload the `.rcx` settings by doing one of the following:
 - Run the `reload server options` command from the NA proxy.
 - Restart the NA management engine.

Using the Contains (Full Text) Search Operator

The “contains (full text)” operator supports the following search types:

- Search for a single word (a sequence of characters containing no spaces).
Valid examples:
 - interface
 - telnet
 - snmp
- Search for a single word using the wildcard.
 - The asterisk character (*) is the only supported wildcard; this wildcard must be at the end of the search phrase.
 - Valid examples:
 - interf*
 - tel*
- Search for an IP address (same as searching for a single word).
The asterisk character (*) is the only supported wildcard; this wildcard must be at the end of the search phrase.
- Search for an IPv4 address is supported and treated as single word.
Valid examples:
 - 10.11.12.13 results in exact match
 - 10.11.12.* results in all addresses that start with 10.11.12
 - 10.11.* results in all addresses that start with 10.11

- Search for a phrase (a sequence of characters containing one or more white spaces):
Valid examples:
 - set vlan
 - set vpn name
 - Search for a phrase using the wildcard.
 - The asterisk character (*) is the only supported wildcard; this wildcard must represent one or more complete words within of the search phrase.
 - The * must NOT be at the end of the search phrase.
 - Use white space on either side of the *. If white space is absent, NA treats the search as a word using the wildcard.
 - Valid examples:
 - set * name
 - telnet * table * settings
-  Logical operators (AND, OR, NOT, ACCUM, EQUIV) are not supported nor considered as part of search string.

Disabling the Contains (Full Text) Search Operator

To temporarily disable the “contains (full text)” search operator in the NA console, follow these steps:

- 1 If any dynamic groups are configured to use the “contains (full text)” or “does not contain (full text)” operator, edit or delete these dynamic group configurations.
- 2 Back up the `adjustable_options.rcx` file to a location outside the `<NA_HOME>` directory.
- 3 In the `adjustable_options.rcx` file, locate the following line:


```
<option name="fulltextsearch/enabled">true</option>
```
- 4 Edit the located line to set the `fulltextsearch/enabled` option to `false`:


```
<option name="fulltextsearch/enabled">>false</option>
```

Alternatively, delete this option from the file.
- 5 Save the `adjustable_options.rcx` file.
- 6 Reload the `.rcx` settings by doing one of the following:
 - Run the `reload server options` command from the NA proxy.
 - Restart the NA management engine.

Disabling Full Text Search

To permanently disable the “contains (full text)” search operator in the NA console and to remove the full text index from the database, follow these steps:

- 1 If any dynamic groups are configured to use the “contains (full text)” or “does not contain (full text)” operator, edit or delete these dynamic group configurations.
- 2 Disable the feature in NA:
 - a Back up the `adjustable_options.rcx` file to a location outside of the `<NA_HOME>` directory.
 - b In the `adjustable_options.rcx` file, locate the following line:

```
<option name="fulltextsearch/enabled">true</option>
```
 - c Edit the located line to set the `fulltextsearch/enabled` option to false:

```
<option name="fulltextsearch/enabled">false</option>
```

Alternatively, delete this option from the file.
 - d Save the `adjustable_options.rcx` file.
 - e Reload the `.rcx` settings by doing one of the following:
 - Run the `reload server options` command from the NA proxy.
 - Restart the NA management engine.
- 3 Remove the full text index:
 - a Log on to the NA proxy with the credentials used to install NA.
 - b Run the following command:

```
run checkdb -resolver removesearchindex -verbose
```


Command Line Reference

This section describes the NA-provided commands available for working with a full text search index on an Oracle database. Run these commands from the NA proxy.

This content is the complete documentation for these commands. No command-line help is available for them.

Analyze the NA Database in Preparation for Index Generation

To analyze the NA database in preparation for full-text index generation, run the following command:

```
run checkdb -resolver analyzesearchindex -verbose
```

If Oracle Text is enabled and no full-text index is present, this command determines the total configuration text present in the NA database. It then outputs the following estimates related to full-text index generation:

- Approximate additional space required for the index generation process
- Approximate time required for index generation to complete

Ensure that the database enough space for index as estimated by this CLI command.

If Oracle Text is not enabled, engage the Oracle database administrator to change the configuration. For information about enabling Oracle Text, see “Administering Oracle Text” in the *Oracle Text Application Developer’s Guide*.



Another information source is the Oracle MetaLink document collection, for which you must have a MetaLink account with Oracle. Documents of interest include the following:

- 280713.1: Manual installation, deinstallation of Oracle Text 10gR1
- 579601.1: Manual installation, deinstallation and verification of Oracle Text 11gR1
- 970473.1: Manual installation, deinstallation and verification of Oracle Text 11gR2

The index configuration process requires available disk space of 50% to 200% of the configuration text size. Actual space requirements depend on the database contents.

The index configuration process is resource-intensive. Actual time depends on database hardware and configuration as well as the volume of text to be indexed.

For more information, see “Frequently Asked Questions About Indexing Performance” in the *Oracle Text Application Developer’s Guide*.

Check the Status of the NA Database Index

To determine the status of the NA database full-text index, run the following command:

```
run checkdb -resolver statusindex -verbose
```

This command returns the current status of the full-text index for the NA database. Possible values are:

- **COMPLETE & VALID:** Indexing has completed. The index is valid.
- **IN PROGRESS:** Indexing is in progress.
- **NOT PRESENT:** No full-text index is present. Searches based on the “contains (full text)” or “does not contain (full text)” search operator will fail.
- **INVALID:** The full-text index is corrupted. Remove the index, and then add it again.

Generate an Index of the NA Database

To generate a full-text index (if no index exists) for the NA database, run the following command:

```
run checkdb -resolver addsearchindex -verbose
```

Follow the recommendations from the `run checkdb -resolver analyzesearchindex -verbose` command to understand the disk space and time required for this index generation process.

To track the status of the index generation, do one of the following:

- Run the `run checkdb -resolver statusindex -verbose` command.
- Watch the NA logs with the troubleshooting option `feature/proxy` set to debug.

Remove the NA Database Index

To remove the full-text index (if present) from the NA database, run the following command:

```
run checkdb -resolver removesearchindex -verbose
```

Searches based on the “contains (full text)” or “does not contain (full text)” search operator will fail.

Reindex the NA Database

If search queries are very slow, the full-text index might be fragmented. To regenerate the full-text index of the NA database, run the following command:

```
run checkdb -resolver reindex -verbose
```

3 Reclaiming Unused Space (Oracle Database)

Database maintenance often involves deleting data chunks within a database table, which results in free space inside the table. New records added after this maintenance populates the free space inside the table first, so the new records can be spread across several physical locations within the table. This fragmentation degrades database performance by extending data access times.

HP Network Automation Software (NA) pruning tasks can cause database table fragmentation. This section identifies one way to defragment an Oracle database tablespace. This procedure can be performed while the database is online.



This documentation describes one approach to this database administration task. Read the prerequisites to determine whether this approach applies to your situation. For other approaches and more detailed information, see the documentation for your database type and version.

Tablespace defragmentation can be run against all tables in the NA schema. [Table 2](#) lists the NA database tables and the associated LOB columns that are most frequently affected by fragmentation.

Table 2 NA Database Tables Frequently Affected by Fragmentation

Table Name	Target LOB Columns
RN_DEVICE_ACCESS_LOG	<ul style="list-style-type: none"> • ChangeEventData • Comments
RN_DEVICE_DATA	<ul style="list-style-type: none"> • DataBlock • Comments
RN_DEVICE_TOPOLOGY_DATA	
RN_DIAGNOSTIC_DATA	<ul style="list-style-type: none"> • DataBlock • Comments
RN_EVENT	<ul style="list-style-type: none"> • EventText • EventData
RN_EVENT_MESSAGE	<ul style="list-style-type: none"> • MessageBody
RN_SCHEDULE_TASK	<ul style="list-style-type: none"> • Comments • Result • TaskData

To defragment an Oracle database tablespace, follow these steps:

- 1 Verify that the tablespace meets the following prerequisites:
 - The tablespace must be set with automatic segment space management (ASSM).
 - The disk space available to the redo log must be sufficiently large relative to the size of the tablespace.
- 2 Enter the SQL*Plus command-line interface as the SYSDBA user.
- 3 Use the Oracle Segment Advisor to determine whether defragmentation is needed. Either check the results of the Automatic Segment Advisor or run the Segment Advisor manually.

For more information, see “Using the Segment Advisor” in the *Oracle Database Administrator’s Guide*.

- 4 For each table that requires defragmentation, do the following:
 - a Enable row movement by running the following command:

```
ALTER TABLE <table_name> ROW MOVEMENT;
```
 - b Reclaim unused rows by running the following command:

```
ALTER TABLE <table_name> SHRINK SPACE;
```
 - c Reclaim unused LOB columns by running the following command:

```
ALTER TABLE <table_name> MODIFY LOB (<lob_column_name>) (SHRINK SPACE);
```



Alternatively, reclaim unused rows and columns with one command as follows:

```
ALTER TABLE <table_name> SHRINK SPACE CASCADE;
```

This CASCADE command replaces [step b](#) and [step c](#).

We appreciate your feedback!

If an email client is configured on this system, by default an email window opens when you click *here*.

If no email client is available, copy the information below to a new message in a web mail client, and then send this message to **ovdoc-nsm@hp.com**.

Product name and version: NA 9.00 Patch 3

Document title: *NA Administration Guide*

Feedback: