Hewlett Packard Enterprise

HPE Backup Navigator

Software Version: 9.50

HPE Backup Navigator User's guide

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Contents

Chapter 1: Introduction

HPE Backup Navigator is a web-based application that provides an additional reporting functionality for your HPE Data Protector backup environment. It is a comprehensive and scalable tool, which enables you to create, generate, and deliver a wide range of reports for the web browser-based presentation and user-defined exploration.

In the web user interface you can generate numerous predefined reports on different aspects of the HPE Data Protector cells, create the reports of your choice, and export them to various formats. Predefined reports provide information on the HPE Data Protector cell infrastructure, IDB, media management, devices, sessions, capacity, and performance. For example, you can monitor active backup sessions, get a list of most unreliable media, track the backup volume growth, check the transfer rate during the restore sessions, analyze trends in backup capacity changes, make future predictions, and so on.

HPE Backup Navigator supports multitenant HPE Data Protector environment and can provide reports also for tenants, if you define them. A tenant is a group of users, usually related to one customer or department, who share HPE Data Protector resources. Each tenant is represented by the dedicated HPE Data Protector elements, such as cells, backup specification groups, backup specifications, or clients.

The key tasks of HPE Backup Navigator are:

- Recognizing the HPE Data Protector Cell Manager systems that provide input data for your reports.
- Collecting data from the HPE Data Protector Internal Database (IDB).
- Generating reports from the collected data considering user-defined scope and parameters.
- Recognizing problems in the monitored environment and issuing alerts and notifications.

HPE Backup Navigator benefits

- Central monitoring of multiple Cell Managers
- Simplified tracking of infrastructure changes across the entire HPE Data Protector environment
- Overview of backup resources
- Performance, capacity trending, and future planning
- Simplified error analysis
- Customizable reporting and dashboard
- Notifications and alerts on specified events
- Multitenant environments support

HPE Backup Navigator features

You can benefit from the following HPE Backup Navigator features:

- Select the HPE Data Protector cells or tenants[1], from which you want to receive the input data for your reports.

- Use a remote agent to collect data from the HPE Data Protector cells that cannot be directly accessed from HPE Backup Navigator.

- Create reports of your choice with the same available options as predefined reports.

- Configure the dashboard to display the reports in the way which is convenient for you to view them.

- Switch between the chart and table presentation of the report.

- Examine report data in more detail by using the drill-down functionality.

- Add a report to your favorites to access it quicker.

- Subscribe to your favorite report to receive it regularly by email.

- Export the reports output to various formats.

- Navigate from the selected report to other reports with the related content and the same scope.

- Customize report charts by sorting data according to different available parameters.

- Monitor your HPE Data Protector environment by using predefined and custom HPE Backup Navigatormonitors.

- Get alerts or event notifications on the events in HPE Data Protector, including error states and failures.

- HPE Backup Navigator retrieves only the data, which is needed for a report presentation at the time. This enhances performance by saving the time and the resources that would be needed to load all available data.

[1]For some reports, selecting tenants is not applicable.

HPE Backup Navigator web user interface

Figure 1: HPE Backup Navigator web user interface
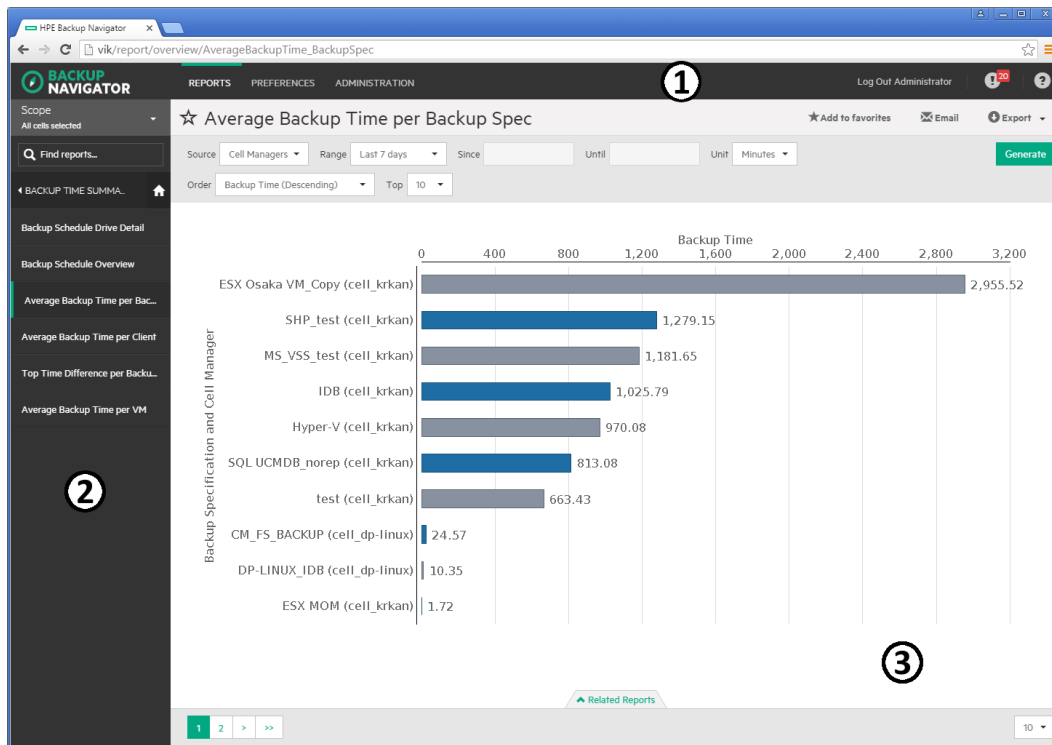
1   Menu Bar

2   Navigation Pane

3   Results Area

The elements of the HPE Backup Navigator web user interface are:

- **Menu Bar**

  The Menu Bar is an upper bar of the HPE Backup Navigator web user interface. Depending on your user rights, you can access all or only some of the following contexts:

  Reports

  The predefined reports are logically grouped in four report categories (Overview, Monitoring, Capacity, Performance). You can generate reports, add reports to your favorites, subscribe for reports, and export a report to various formats.

  Preferences

  You can configure your personal settings, specify input data filters, and manage your subscriptions.

  Administration (available for users with the administrator's user rights):

  You can specify from which HPE Data Protector cells you want to collect input data for your reports. Manage your input data by adding new HPE Data Protector Cell Managers to the data collection,

starting or stopping input data collection on the specific Cell Managers, detaching the specific Cell Managers from or attaching them back to the HPE Backup Navigator. You can also create and manage your custom reports, perform licensing related tasks, view events and configure event monitors, configure your mail server and logging settings, view your database settings, and manage your users, tenants, and tenant groups (discover, import, and maintain them).

Notification

Access and view the HPE Backup Navigator events. If monitors are specified for the events of a higher severity and such events occur, alarms are raised and displayed next to the icon.

Help

Access the *HPE Backup Navigator User's Guide* with introduction to HPE Backup Navigator and instructions on how to use it. The About dialog provides information on the HPE Backup Navigator current version.

- **Navigation Pane**

  The Navigation Pane is a left side panel of the HPE Backup Navigator web user interface. You can switch between different items to view them or to change them in the Results Area. When you select an item in the Navigation Pane, the corresponding information is displayed in the Results Area.

  The content of the Navigation Pane is context specific. For example, the Reports context provides scope settings, search report functionality, a list of report categories and subcategories, and favorite reports. In the Preferences and Administration contexts, you can select an item to specify or change the corresponding configuration settings, such as user profile or logging settings.

- **Results Area**

  The Results Area is a central area of the HPE Backup Navigator web user interface. It displays information that corresponds to the item selected in the Navigation Pane.

  In the Reports context, the Results Area is represented as a dashboard with a configurable layout, or as a report output, when a specific report is selected. You can view the selected report, generate it with different parameters, switch to the table presentation of the report, see the related reports, export the report to different formats, send it by email, and subscribe to the report.

  In other contexts, you can specify or change the configuration settings of the item selected in the Navigation Pane.

Chapter 2: Installation and Configuration

The HPE Backup Navigator environment is a set of systems that obtain, manage, and analyze the specified data from the HPE Data Protector cell, and present it as reports in the web-based application. The environment consists of the following parts:

- **HPE Backup Navigator system**

  A system where HPE Backup Navigator resides. HPE Backup Navigator processes the data collected in the HPE Data Protector environment and presents it as specific reports in the web user interface. A database that contains the HPE Backup Navigator functionality related data, the data collected from the HPE Data Protector sessions, and the HPE Data Protector cell infrastructure related data also resides on the HPE Backup Navigator system.

- **HPE Backup Navigator remote agent system**

  If you want to collect data from the HPE Data Protector cells, which you cannot or due to any reasons do not want to access from HPE Backup Navigator, you can use a HPE Backup Navigator remote agent to access such cells. You can install as many remote agents, as you need. HPE Backup Navigator remote agent collects data from the HPE Data Protector cells and provides it to HPE Backup Navigator through HTTP protocol.

- **HPE Backup Navigator web user interface**

  A system with a web browser, from which you access HPE Backup Navigator. The web user interface also provides administration tools to adjust the environment to your needs. HPE Backup Navigator web user interface has an established connection to the HPE Backup Navigator system.

- **HPE Data Protector environment**

  A backup environment, from which you collect data for your reports.

This diagram shows the HPE Backup Navigator environment and its elements as well as how HPE Backup Navigator interacts with HPE Data Protector:

Figure 2: HPE Backup Navigator environment
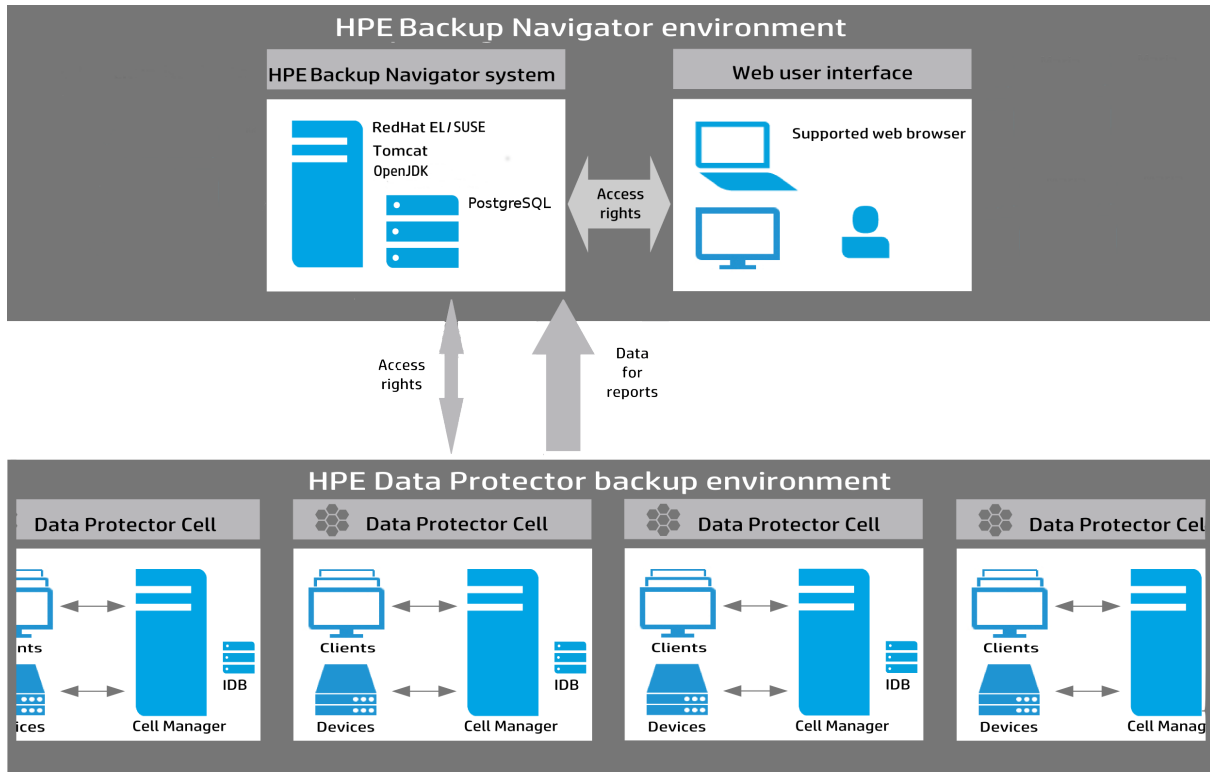
Prerequisites

Before installing HPE Backup Navigator, consider the following:

HPE Backup Navigator system prerequisites

- One of the supported operating systems. For a list of the supported operating systems, see *HPE Backup Navigator Support Matrix.*
- System requirements

  System requirements depend on the HPE Data Protector you monitor with HPE Backup Navigator:

Size	HPE Data Protector environment	Minimum system requirements
Small	**1-3** Cell Managers **100** sessions per Cell Manager per day **100-500** objects per Cell Manager per day	**Processor:** 64-bit two-core **RAM:** 8 GB **Hard disk:** 100 GB
Medium	**4-6** Cell Managers	**Processor:** 64-bit four-core

Size	HPE Data Protector environment	Minimum system requirements
	100 1000 sessions per Cell Manager per day **1000-5000** objects per Cell Manager per day	**RAM:** 16 GB **Hard disk:** 160 GB
Large	**6 and more** Cell Managers **1000 and more** sessions per Cell Manager per day **10000 and more** objects per Cell Manager per day	**Processor:** 64-bit four+ -core **RAM:** 32 GB **Hard disk:** 320 GB

- JDK 1.8

  JDK is installed and configured on the system automatically when running the HPE Backup Navigator installation script.

- Apache Tomcat 8.5.x

  Apache Tomcat is installed and configured on the system automatically when running the HPE Backup Navigator installation script.

  It is recommended to configure Tomcat to support Transport Layer Security (TLS) versions 1.1 or 1.2 and to restrict support for TLS 1.0 to take advantage of improved secure sockets.

- PostgreSQL 9.5

  PostgreSQL server can be installed and configured on the same system with HPE Backup Navigator automatically when running the HPE Backup Navigator installation script.

HPE Backup Navigator web user interface

The HPE Backup Navigator web user interface supports the following web browsers:

- Internet Explorer 10, 11
- Mozilla Firefox 26 and later versions

  If you want to use Kerberos authentication, perform the following configuration steps in the browser:

  a. In the address bar, type: `about:config`

  b. In the Search text box, type: `negotiate`

  c. Double-click the `network.negotiate-auth.trusted-uris` string, enter the domain name of the HPE Backup Navigator system in the pop-up text box (for example, `company.com`), and then click **OK**.

  When you log in to the HPE Backup Navigator system, specify the fully qualified domain name in the address string (for example, `computer.company.com:8080`).

- Google Chrome 30 and later versions

HPE Backup Navigator remote agent

- One of the supported operating systems. For a list of the supported operating systems, see *HPE Backup Navigator Support Matrix.*
- JRE 1.8

HPE Data Protector environment

For more information and detailed instructions, see the HPE Data Protector documentation at the HPE Support web site at: http://support.openview.hp.com/selfsolve/manuals

- HPE Backup Navigator can be used with HPE Data Protector versions 7.xx, 8.00-8.14, 9.00-9.08.

- You need an `admin` user account to access the HPE Data Protector Cell Manager. When creating a new user account, make sure to specify the following:

  User: `root`

  Group: `Admin`

  Type: `UNIX`

  Client: `HPE Backup Navigator FQDN`

- If the encrypted control communication (ECC) is enabled on the Cell Manager, you can allow non-encrypted communication with HPE Backup Navigator or configure ECC for HPE Backup Navigator.

  - To allow non-encrypted communication, add your HPE Backup Navigator system to the Security Exceptions list on the respective Cell Manager.

  - To provide encrypted communication with HPE Backup Navigator, see "Configuring encrypted control communication" on page 25.

- To enable data collection for the Cell Manager Services, IDB Health, and Licenses related reports from the UNIX and Linux Cell Managers, create the following softlinks on such Cell Managers:

  `ln –s /opt/omni/sbin/omnisv /opt/omni/lbin/omnisv`
  `ln –s /opt/omni/sbin/omnidbcheck /opt/omni/lbin/omnidbcheck`
  `ln –s /opt/omni/bin/omnicc /opt/omni/lbin/omnicc`
  `ln –s /opt/omni/bin/omnidownload /opt/omni/lbin/omnidownload`
  `ln –s /opt/omni/bin/omnirpt /opt/omni/lbin/omnirpt`

- To be able to collect data for the HPE Data Protector virtual environment, make sure, that the HPE Data Protector `Virtual Environment Integration` component is installed on the Cell Manager.

- To be able to collect restore information for the reports, in the HPE Data Protector global options file, set the variable `EnableRestoreReportStats=1`. The global options file is located at:

  Windows: *Data_Protector_program_data*`\Config\Server\Options\global`

  UNIX: `/etc/opt/omni/server/options/global`

Recommendations

Before installing and configuring HPE Backup Navigator, you should consider the factors that affect performance of the application. HPE Backup Navigator performance mainly depends on the number of the HPE Data Protector objects collected from the Cell Managers for various reports. One HPE Backup Navigator system can collect up to 1 million objects from the HPE Data Protector environment. To calculate how many objects reside on a Cell Manager system, see "Calculating the number of objects on a HPE Data Protector Cell Manager" on the next page.

If you have multiple Cell Managers and more than 1 million objects in your backup environment, determine how many HPE Backup Navigator applications you need to install and from which Cell Managers each of the HPE Backup Navigator will collect data. When planning which Cell Managers will be dedicated to a specific HPE Backup Navigator system, consider the following:

- The number of objects residing on these Cell Managers should not exceed 1 million.
- The Cell Managers should be grouped according to their geographical location to avoid connectivity and network problems.

Calculating the number of objects on a HPE Data Protector Cell Manager

Steps

1. On a HPE Data Protector Cell Manager system, run the following command as an administrator:

   Windows: `omnidbutil -info > <filename>.txt`

   Linux: `/opt/omni/sbin/omnidbutil -info > <filename>.txt`

2. Open the generated TXT file and search for the number of objects under the `Catalog Database space usage` section > `Items Used` column > `Objects`.

Installation procedure

The HPE Backup Navigator installation procedure consists of the following phases:

1. "Running the HPE Backup Navigator installation script" below.
2. "Configuring HPE Backup Navigator" on page 17.

If you want to enable Windows sessions credentials authentication, configure Kerberos on the system where you installed HPE Backup Navigator. See "Configuring Kerberos authentication" on page 20.

Running the HPE Backup Navigator installation script

You can use the HPE Backup Navigator installation script to install HPE Backup Navigator with all prerequisites (PostgreSQL, Apache Tomcat, and JDK). The installation script simplifies the installation process and provides all necessary configuration specific to HPE Backup Navigator. It is recommended to use this installation approach.

Prerequisites

- Red Hat Enterprise Linux, CentOS Linux, or SUSE Enterprise Linux operating system is installed and configured.
- If you do not have access to the internet on the HPE Backup Navigator system, make sure, that you prepare the following packages on this system.

  You can download the prerequisite packages automatically by using the HPE Backup Navigator installation script:

  `# hpe-backup-navigator-install.sh --download`

The script downloads all prerequisite packages and compresses them to the $filename$.tar.gz file. It is recommended that these packages are saved in a temporary directory with write permissions, for example, \tmp.

The following packages are required:

JRE 1.8:

Download the jre-8u101-linux-x64.rpm installation package from:
http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html

Apache Tomcat:

Download Tomcat from the Core Binary distribution (tar.gz file) from:
https://tomcat.apache.org/download-80.cgi

PostgreSQL:

- On RHEL and CentOS 6.x:

  Download the following packages to your system from http://yum.postgresql.org/9.5/redhat/rhel-6-x86_64/repoview/postgresqldbserver95.group.html:

  postgresql95
  postgresql95-contrib
  postgresql95-libs
  postgresql95-server

  Download the uuid-1.6.1-10.el6.x86_64.rpm package to your system from:
  http://mirror.centos.org/centos/6/os/x86_64/Packages/

- On RHEL and CentOS 6.4, download the openssl package to your system from:
  http://mirror.centos.org/centos/6/os/x86_64/Packages/

- On SUSE, download the following packages to your system:

  libpq5 from http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

  postgresql-init from
  http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/noarch/

  postgresql95 from
  http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

  postgresql95-contrib from
  http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

  postgresql95-server from
  http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

Steps

1. Insert and mount the HPE Backup Navigator installation DVD-ROM or mount the ISO image directly.

   Note: If you want to verify the rpm signature of the HPE Backup Navigator installation package, run the following command:

   ```
   # sh hpe-backup-navigator-install.sh -sc
   ```

2. In the command-line console, run the following command:

   # sudo sh hpe-backup-navigator-install.sh

3. The script starts the installation and configuration of HPE Backup Navigator and prerequisite software, such as, JDK, Tomcat, and PostgreSQL as well as firewall and network configuration. In case of the PostgreSQL installation, the database user with appropriate permissions is created.

4. You are provided with the user name (admin) and password (randomized, unique) for the *first* login to the HPE Backup Navigator web application.

   > **Important:** Ensure that you save, write down, or memorize this password, because it is required for the configuration tasks. You will need these credentials for the initial configuration

   > **Note:** You will need these credentials only for the HPE Backup Navigator initial configuration and later, if you decide to apply any changes to the initial configuration. For logging in to the HPE Backup Navigator, you will create a user when configuring the application.

Configuring HPE Backup Navigator

Make sure that Tomcat is up and running.

Steps

1. Start the web browser and connect to the system where you installed HPE Backup Navigator (type *hostname*).

   > **Note:** If you use Kerberos authentication in the Firefox, specify the fully qualified domain name in the address string (for example, computer.company.com).

2. Log in to the web application with the user name and password provided in the installation script. The Welcome to Configuration wizard opens. Click **Next**.

3. In the Database setup window, the hostname of the system where the HPE Backup Navigator database resides (HPE Backup Navigator system) and the port (by default, 5432) are specified. Enter the following information:

   - the user name and the password of the PostgreSQL user created by the installation script

   - the database name of your choice

Figure 3: Database setup page

For more information on the database, see the PostgreSQL documentation.

4. Click **Next** to establish the connection to the existing database or create a new database.

   The following occurs depending on your environment:

   • If the connection to the database server is successful and the specified database is valid, the database is configured successfully.

   • If the connection to the database server is successful, but the database does not exist on this host, the database will be created automatically.

   • If the connection to the database server is successful and the specified database was configured earlier, the existing database is attached.
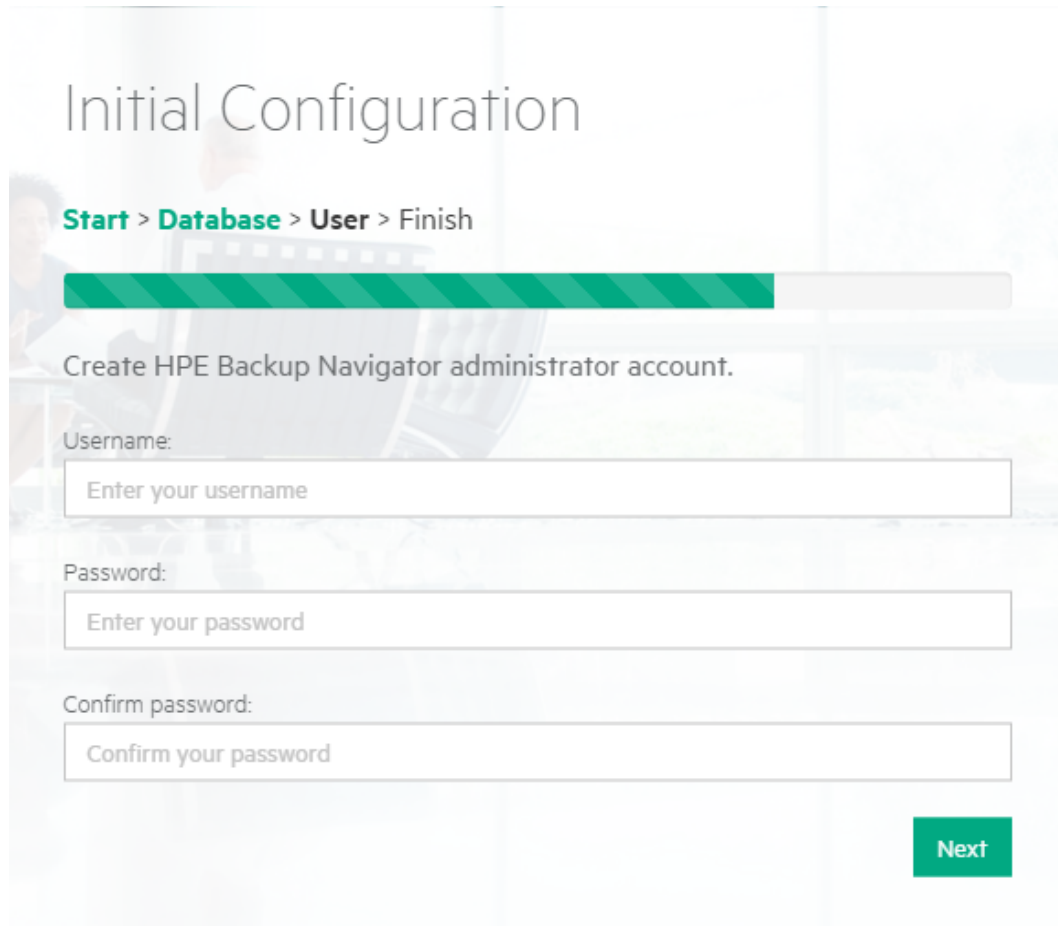
   Errors may occur due to the following reasons:

   • The connection to the database server is successful, but the specified database is not valid for HPE Backup Navigator. Ensure that you specify a database that meets the HPE Backup

Navigator requirements, and then test the connection again.

- The connection to the database server fails. Check that the information you provided is correct and then test the connection again.

5. In the User setup window, create a new administrator's account. Enter the new user name and password and then click **Next**. The newly created user account will be the HPE Backup Navigator administrator.

Figure 4: User setup page

Initial Configuration

Start > **Database** > **User** > Finish

Create HPE Backup Navigator administrator account.

Username:

Enter your username

Password:

Enter your password

Confirm password:

Confirm your password

Next

6. The **HPE Backup Navigator initial configuration completed successfully** displays. Click **Finish**.

7. Log in to the HPE Backup Navigator web user interface with the new user account.

Note: You can install HPE Data Protector on the system where HPE Backup Navigator is already installed. Stop Tomcat on the HPE Backup Navigator system before the HPE Data Protector installation and start it again after the HPE Data Protector installation.

Configuring Kerberos authentication

To enable Windows sessions credentials authentication, configure Kerberos on the system where you installed HPE Backup Navigator.

Prerequisite

Make sure that the time on the system where you want to install HPE Backup Navigator is synchronized with NTP of your network.

Steps

1. Set up the `/etc/krb5.conf` file as follows:

```
# cat /etc/krb5.conf
[logging]
default = FILE:/var/log/krb5libs.log
kdc = FILE:/var/log/krb5kdc.log
admin_server = FILE:/var/log/kadmind.log

[libdefaults]
default_tkt_enctypes = aes128-cts rc4-hmac des3–cbc–sha1 des–cbc–md5 des–cbc–crc
default_tgs_enctypes = aes128-cts rc4-hmac des3–cbc–sha1 des–cbc–md5 des–cbc–crc
permitted_enctypes = aes128-cts rc4-hmac des3–cbc–sha1 des–cbc–md5 des–cbc–crc
default_realm = COMPANY.COM
dns_lookup_realm = true
dns_lookup_kdc = true
ticket_lifetime = 24h
forwardable = yes

[realms]
COMPANY.COM = {
kdc = dc_computer.company.com
admin_server = dc_computer.company.com
default_domain = company.com
}

[domain_realm]
.company.com = COMPANY.COM
company.com = COMPANY.COM

[appdefaults]
pam = {
debug = false
ticket_lifetime = 36000
renew_lifetime = 36000
forwardable = true
krb4_convert = false
}
```

   where:

   dc_computer.company.com is the company Key distribution center host.
   company.com is the company domain name.

2. Test the Kerberos configuration as follows:

 # kinit *user@COMPANY.COM*
Password for *user@COMPANY.COM*:

 # klist
Ticket cache: FILE:/tmp/krb5cc_0
Default principal: *user@COMPANY.COM*

Valid starting Expires Service principal
03/18/14 11:10:19 03/18/14 21:10:23 krbtgt/*COMPANY.COM@COMPANY.COM*
renew until 03/19/14 11:10:19

where:

user@COMPANY.COM is your user account, which is already in AD and has permissions to add a system to AD.
company.com is the domain name of the system, where you want to install HPE Backup Navigator.

3. Make sure that the Samba server is installed:

 # rpm -qa | grep -i samba-
samba-3.6.9-167.el6_5.x86_64
samba-winbind-clients-3.6.9-167.el6_5.x86_64
samba-winbind-3.6.9-167.el6_5.x86_64
samba-client-3.6.9-167.el6_5.x86_64
samba-common-3.6.9-167.el6_5.x86_64

4. Stop the Samba services (smb, nmb, and winbind):

 # service smb stop
 # service nmb stop
 # service winbind stop

5. Configure the Samba server as follows:

 # cat /etc/samba/smb.conf
[global]
workgroup = *WORKGROUP*
security = ads
realm = *COMPANY.COM*
kerberos method = dedicated keytab
create krb5 conf = no
dedicated keytab file = /etc/krb5.keytab

wins support = no
preferred master = no
local master = no
domain master = no

where:

workgroup is the name of your workgroup.
company.com is the domain name of the system, where you want to install HPE Backup Navigator.

6. Join Samba to the Active Directory (AD). Make sure that:

- Your Kerberos ticket is valid or initialize it again.

- No old Kerberos keytab is specified by the Samba config.

- You have the root user permissions.

- The hostname of the system is not joined in domain. If it is joined, ensure that it is removed from domain.

Run the following commands:

 # rm -f /etc/krb5.keytab

 # kinit *user@COMPANY.COM*
Password for *USER@COMPANY.COM***:**

 # klist
Ticket cache: FILE:/tmp/krb5cc_0
Default principal: *user@COMPANY.COM*

Valid starting Expires Service principal
03/18/14 11:21:37 03/18/14 21:21:40 krbtgt/*COMPANY.COM@COMPANY.COM*
renew until 03/19/14 11:21:37

 # net ads join -k *COMPANY.COM*
Using short domain name -- *NAME*
Joined '*computer*' to dns domain '*company.com*'

 # net ads testjoin
Join is OK

where:

user@COMPANY.COM is your user account, which is already in AD and has permissions to add a system to AD.
company.com is the domain name of the system, where you want to install HPE Backup Navigator.
NAME is a shortened form of the domain name.

7. Start Samba services (smb, nmb, and winbind):

 # service smb start
 # service nmb start
 # service winbind start

8. Create the Kerberos Keytab HTTP Principal to communicate through the security channel, as follows:

 # net ads keytab create
 # net ads keytab add HTTP
 # net ads keytab list | grep -i http
4 DES cbc mode with CRC-32 HTTP/*computer.company.com@COMPANY.COM*
4 DES cbc mode with RSA-MD5 HTTP/*computer.company.com@COMPANY.COM*
4 ArcFour with HMAC/md5 HTTP/*computer.company.com@COMPANY.COM*
4 AES-128 CTS mode with 96-bit SHA-1 HMAC HTTP/*computer.company.com@COMPANY.COM*
4 AES-256 CTS mode with 96-bit SHA-1 HMAC HTTP/*computer.company.com@COMPANY.COM*

where:

computer.company.com is the hostname of the system, where you want to install HPE Backup Navigator.
company.com is the domain name of the system, where you want to install HPE Backup Navigator.

9. Create a dedicated group for accessing the Kerberos keytab and set up permissions accordingly:

```
# grep 200 /etc/group
# groupadd -g 200 krb5keytab
# chgrp krb5keytab /etc/krb5.keytab
# chmod g+r /etc/krb5.keytab
```

10. In /opt/dpa-ext/conf create the kerberos.properties file with the following content:

```
grails.plugin.springsecurity.kerberos.ticketValidator.servicePrincipal =
'HTTP/computer.company.com@COMPANY.COM'
grails.plugin.springsecurity.kerberos.ticketValidator.keyTabLocation =
'file:///etc/krb5.keytab'
```

where:

computer.company.com is the hostname of the system, where you want to install HPE Backup Navigator.
company.com is the domain name of the system, where you want to install HPE Backup Navigator.
pathname is the path to the keytab location.

11. Restart Tomcat on the HPE Backup Navigator system

```
# service tomcat restart
```

Configuring SSL communication and LDAP authentication

Configure SSL communication on the system where you installed HPE Backup Navigator.

- If you use the HPE Backup Navigator remote agent, you should perform additional steps on the system where the remote agent resides, see "Configuring SSL communication on the remote agent" on the next page.

- If you want to use LDAP authentication, you can configure it on the HPE Backup Navigator with the configured SSL communication. The LDAP authentication configuration is needed only, if you *do not* have any certificate signed by official CA to access LDAP server. See "Configuring LDAP authentication" on page 25.

Steps

1. Create a keystore file to store the server private key:

```
# $JAVA_HOME/bin/keytool -genkey -alias tomcat -keyalg RSA -keystore <keystore_
filename>
```

2. You are prompted for password (default is changeit) and general information about the certificate. Enter the fully qualified domain name (FQDN) of the HPE Backup Navigator server as the first and

the last name.

3. If you acquired a certificate for this host earlier, proceed to step 6 and import it. Otherwise, create a Certificate Signing Request (CSR):

 # $JAVA_HOME/bin/keytool -certreq -keyalg RSA -alias tomcat -file tomcat_cert_request.csr -keystore <keystore_filename>

4. Submit the created tomcat_cert_request.csr file to the Certificate Authority (CA). For instructions, see the CA documentation.

5. The CA issues a certificate and sends it to you.

6. Import the acquired certificate to your keystore:

 # $JAVA_HOME/bin/keytool -import -alias tomcat -keystore <keystore_filename> -file <certificate_filename>

7. Configure Apache Tomcat webserver config file to start using the SSL connector:

 # vi /opt/apache-tomcat/conf/server.xml

> **Note:** An example of the connector element for an SSL connector is included in the Apache Tomcat web server config file.

8. Remove the comments and edit the connector element as follows:

```
<Connector port="443"
protocol="org.apache.coyote.http11.Http11Protocol"
maxThreads="200"
SSLEnabled="true"
scheme="https"
secure="true"
clientAuth="false"
sslProtocol="TLS"
keystoreFile="<keystore_filename>"
keystorePass="<keystore_password>" />
```

The port attribute is the TCP/IP port number, on which Tomcat will listen for secure communication. The default port for https is 443, but you can change it.

9. Comment the old connector element which is not configured for SSL (by default, the port is 80 or 8080).

10. Make sure that the newly specified connector port is open in the firewall. Check, which ports are open in your firewall:

On RHEL and CentOS: service iptables status

On SUSE: cat /etc/sysconfig/scripts/SuSEfirewall2-custom

11. Restart Apache Tomcat:

 # service tomcat restart

Configuring SSL communication on the remote agent

When the HPE Backup Navigator server is configured to use SSL for secure communication, ensure that the CA of the certificate installed on the HPE Backup Navigator server is also trusted on the

remote agent. Perform this procedure on the system where the HPE Backup Navigator remote agent resides.

Prerequisite

The root certificate (public certificate) of the same CA issuer that is registered in the certificate installed on the HPE Backup Navigator server.

Step

Import the root certificate into the Java trusted keystore (usually located under `$JAVA_HOME\lib\security\cacerts`) using the `keytool` command. The default password required by the Java keystore tool is `changeit`. During the import, mark the certificate as trusted.

Example

```
keytool -import -keystore <JAVA_HOME>\jre\lib\security\cacerts -file <certificate_filename>
```

After the certificate is properly imported the remote agent can connect to the HPE Backup Navigator server using a secure communication channel.

Configuring LDAP authentication

Configure LDAP authentication on the HPE Backup Navigator with the configured SSL communication.

> **Important:** If you have any certificate signed by official CA to access LDAP server, you do not need to perform this configuration task. The certificates assigned to your system will be used by HPE Backup Navigator server.

Steps

1. On the HPE Backup Navigator server, import a CA certificate into the `cacerts` file that you use for SSL:

   ```
   keytool -import -alias <alias_description> -keystore <JAVA_HOME>\jre\lib\security\cacerts -file <certificate_filename>
   ```

   > **Example:**
   >
   > ```
   > keytool -import -alias BN_PEM -keystore "C:\program files\java\jdk1.8.0_51\jre\lib\security\cacerts" -file "C:\BN-CA.PEM.crt"
   > ```

2. When prompted, enter the keystore password (`changeit`, by default).
3. Type **yes** to add a new certificate.

Configuring encrypted control communication

If the encrypted control communication (ECC) is enabled on the HPE Data Protector Cell Manager you can provide encrypted communication for HPE Backup Navigator.

- You can configure HPE Backup Navigator to use ECC with the single Cell Manager or the Cell Managers, members of the MoM environment, if MoM ECC was enabled in HPE Data Protector 9.03 and newer versions (with the `omnicc -encryption -enable_mom -all` command). See "Configuring ECC for single Cell Manager and for MoM server" below.

- You can configure HPE Backup Navigator to use ECCfor multiple Cell Managers, see "Configuring ECC for multiple Cell Managers" on the next page.

Prerequisite

Ensure that the following OpenSSL libraries reside on the HPE Backup Navigator server:

```
libgcc_s.so.1
libomnicrypto.so.1.0.0
libomnissl.so.1.0.0
```

You can copy them from any HPE Data Protector Linux client or Cell Manager copy the following files to `/opt/omni/lib64` on the HPE Backup Navigator server.

Configuring ECC for single Cell Manager and for MoM server

Configure HPE Backup Navigator to use ECC with the single Cell Manager or the Cell Managers, members of the MoM environment, if MoM ECC was enabled in HPE Data Protector 9.03 and newer versions.

Steps

1. On the Cell Manager, create the certificates for HPE Backup Navigator server by using the Certificate Generation Utility. The utility is available at the following location:

   On Windows: *Data_Protector_home*\bin

   On HP-UX and Linux: /opt/omni/sbin

   To generate the certificates for HPE Backup Navigator, run the following command:

   # perl omnigencert.pl -pem_client -user_id *BN_hostname*

   Certificates are generated at the following location:

   On Windows: *Data_Protector_program_data*\Config\Server\certificates

   On HP-UX and Linux: /etc/opt/omni/server/certificates

   For information on the utility, see the *HPE Data Protector documentation*.

   The Cell Manager uses three certificate files for ECC:

   *BN_hostname*_cert.pem -certificate for the HPE Backup Navigator server

   *BN_hostname*_key.pem - private key for the HPE Backup Navigator server

   *CM_hostname*_cacert.pem -trusted certificate list, containing CA certificate of the cell

2. Copy three certificate files from the HPE Data Protector Cell Manager to /etc/opt/omni/client/certificates on the HPE Backup Navigator server.

3. Create the /etc/opt/omni/client/config file with the following content:

```
encryption={
enabled=1;
certificate_chain_file='/etc/omni/client/certificates/BN_hostname_cert.pem';
private_key_file='/etc/omni/client/certificates/BN_hostname_key.pem';
trusted_certificates_file='/etc/omni/client/certificates/Cell_Manager_hostname_
cacert.pem';
};
```

Configuring ECC for multiple Cell Managers

You can configure HPE Backup Navigator to use ECC with multiple HPE Data Protector Cell Managers.

Steps

1. On HPE Backup Navigator, create the OpenSSL config file (for example, myopenssl.cnf) with the following content:

```
[req]
default_bits = 4096
encrypt_key = no
default_md = sha256
distinguished_name = dn
req_extensions = san
[dn]
[san]
```

2. Create the self-signed certificate and key, by running the following command:

```
# openssl req -x509 -newkey rsa:4096 -keyout BN_hostname_key.pem -out BN_
hostname_cert.pem -days 3650 -nodes -config myopenssl.cnf -subj
"/CN=bn/O=HEWLETT PACKARD ENTERPRISE/C=US/ST=CA"
```

3. Copy the generated *BN_hostname*_cert.pem and *BN_hostname*_key.pem to /etc/opt/omni/client/certificates (creat the directory, if missing).

4. Create the /etc/opt/omni/client/config file with the following content:

   encryption={
   enabled=1;
   certificate_chain_file='/etc/opt/omni/client/certificates/*BN_hostname_*
   cert.pem';
   private_key_file='/etc/opt/omni/client/certificates/*BN_hostname*_key.pem';
   trusted_certificates_file='/etc/opt/omni/client/certificates/*BN_hostname_*
   cert.pem';
   };

5. Update *every* HPE Data Protector Cell Manager to establish ECC with HPE Backup Navigator as follows:

   a. Copy *BN_hostname*_cert.pem to the Cell Manager.

   b. Join the trusted certificate file residing on the Cell Manager with *BN_hostname*_cert.pem. The trusted certificate file resides on the Cell Manager at:

      On Windows: *Data_Protector_program_data*\Config\Server\certificates

      On HP-UX and Linux: /etc/opt/omni/server/certificates

      Run the following command:

      On Windows:

      ```
      # type CM_hostname_cacert.pem BN_hostname_cert.pem 2> nul > CM_BN_hostname_
      cacerts.pem
      ```

      On HP-UX and Linux:

      ```
      # cat CM_hostname_cacert.pem BN_hostname_cert.pem > CM_BN_hostname_
      cacerts.pem
      ```

   c. In the Cell Manager local config file (located at *Data_Protector_program_data*\Config\client\config on Windows and /etc/opt/omni/client/config on HP-UX and Linux), in the line trusted_certificates_file, replace the name of the trusted certificate file as follows:

      Change *CM_hostname*_cacert.pem to *CM_hostname_BN_hostname*_cacert.pem.

6. Update the HPE Backup Navigator configuration to establish ECC with the HPE Data Protector Cell Managers as follows:

   a. Copy the Cell Managers trusted certificate files (*CM_hostname*_cacert.pem) to the HPE Backup Navigator server to the /etc/opt/omni/client/certificates directory.

   b. In the /etc/opt/omni/client/certificates directory, join the (*CM_hostname*_cacert.pem files with *BN_hostname*_cert.pem. For example:

      ```
      # cat CM1_hostname_cacert.pem CM2_hostname_cacert.pem CM3_hostname_
      cacert.pem bn_cert.pem > All_CM_BN_hostname_cacerts.pem
      ```

When you add more Cell Managers, make sure that you join their (*CM_hostname*`_cacert.pem`
files with the cumulative trusted certificate file on the HPE Backup Navigator server (`All_CM_`
BN_hostname`_cacerts.pem`).

c. In the `/etc/opt/omni/client/config` file, in the line `trusted_certificates_file`,
replace the name of the trusted certificate file as follows:

Change *BN_hostname*`_cert.pem` to `All_CM_`*BN_hostname*`_cacerts.pem`.

Chapter 3: Upgrading HPE Backup Navigator

You can upgrade HPE Backup Navigator from earlier versions.

If you upgrade from version 8.xx and want to migrate your MariaDB database to PostgreSQL, you first need to upgrade it to HPE Backup Navigator 9.30 and then to the current version.

> **Important:** After upgrading HPE Backup Navigator from version 9.10 and earlier, you also need to upgrade your HPE Backup Navigator licenses to the new format. See "Upgrading licenses to the new format" on page 37.

Prerequisites

If you do not have access to the internet on the HPE Backup Navigator system, make sure, that you prepare the following packages on this system.

You can download the prerequisite packages automatically by using the HPE Backup Navigator installation script:

 # hpe-backup-navigator-install.sh --download

The script downloads all prerequisite packages and compresses them to the *filename*`.tar.gz` file. It is recommended that these packages are saved in a temporary directory with write permissions, for example, `\tmp`.

The following packages are required:

JRE 1.8:

Download the `jre-8u101-linux-x64.rpm` installation package from:
http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html

Apache Tomcat:

Download Tomcat from the Core Binary distribution (`tar.gz` file) from: https://tomcat.apache.org/download-80.cgi

PostgreSQL 9.5:

- On RHEL and CentOS 6.x:

  Download the following packages to your system from http://yum.postgresql.org/9.5/redhat/rhel-6-x86_64/repoview/postgresqldbserver95.group.html:

  ```
  postgresql95
  postgresql95-contrib
  postgresql95-libs
  postgresql95-server
  ```

  Download the `uuid-1.6.1-10.el6.x86_64.rpm` package to your system from:
  http://mirror.centos.org/centos/6/os/x86_64/Packages/

- On RHEL and CentOS 6.4, download the 64-bit `openssl` package to your system from:
  http://mirror.centos.org/centos/6/os/x86_64/Packages/

- On SUSE, download the following packages to your system:

`libpq5` from http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

`postgresql-init` from
http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/noarch/

`postgresql95` from http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

`postgresql95-contrib` from
http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

`postgresql95-server` from
http://download.opensuse.org/repositories/server:/database:/postgresql/SLE_12_SP1/x86_64/

Limitation

If you upgrade from versions earlier than 9.40, the custom reports are not migrated to the new database during the upgrade.

Steps

1. Insert and mount the HPE Backup Navigator installation DVD-ROM or mount the ISO image directly.

2. In the command-line console, run the following command:

   # sudo sh hpe-backup-navigator-install.sh

3. The script starts and checks all the prerequisite software.It prompts you to update to a newer version, when it discovers the respective installation packages in a local directory or on the internet. If you want to upgrade the software and have the installation packages, type **y** and follow the instructions.

4. The script discovers that HPE Backup Navigator is already installed. When the script prompts you to upgrade the existing version, type **y** and follow the instructions.

As soon as the upgrade procedure is completed successfully, upgrade your HPE Backup Navigator licenses to the new format in the following cases:

- If you upgraded from the version 9.10 and earlier. See "Upgrading licenses to the new format" on page 37. Then, you can start using the application.

- If you are using the Lite HPE Backup Navigator licenses, contact HPE Backup Navigator support, because this license type is not supported with HPE Backup Navigator 9.50. In the meantime, HPE Backup Navigator treats the Lite license as the the Standard 10 TB.

Chapter 4: Removing HPE Backup Navigator

To remove HPE Backup Navigator, run the following command:

```
# rpm -e `rpm -qa | grep backup-navigator`
```

To remove the HPE Backup Navigator remote agent, do the following:

On Windows:

In Windows Control Panel -> Programs and Features, right-click **HPE Backup Navigator Remote Agent**, and then select **Uninstall**.

On Linux:

Run the following command:

```
# rpm -e `rpm -qa | grep remote-agent`
```

Chapter 5: Licensing

After you instal and configure HPE Backup Navigator, you can start using it immediately. An Instant-On password is built in to the product when first installed. You can use the software for 60 days and buy the permanent license within this period. If you don't buy a permanent license, new data will not be collected after 60 days.

The following types of HPE Backup Navigator licenses exist:

- **Standard HPE Backup Navigator licenses**

  Standard HPE Backup Navigator licenses are capacity based. You should estimate the capacity of your backup environment to purchase an appropriate number of licenses. The Capacity Based License (CBL) product structure is based on the volume of primary data protected by HPE Data Protector. The capacity is measured in Front End Terabytes. The total amount of Front End Terabytes is defined as the aggregate amount of source data being backed up from all systems. Per system it is measured as the largest full backup. That is, the total amount of source data backed up. The licensing in this product structure is perpetual and covers existing or new infrastructure and applications.

  Capacity calculation details:

  - For a full and incremental backup concept, only full is considered.

  - For an incremental forever, a synthetic full is used.

  - Only objects with a status of `Completed` or `Completed with errors` are included in the calculation.

  - Only objects which are still under protection are included in the calculation.

  - The capacity per system is calculated as an aggregation of the largest size of each unique object for that system still under protection.

  Limitations:
  - Backup of the same database with multiple agents will be counted multiple times. Some examples of scenarios where capacity will be counted multiple times:
    - A filesystem backup of a database using VSS and an application integration agent of the same database.
    - A virtual environment integration backup of a virtual machine and a file system backup of the same data within that virtual machine.

  - When an Oracle backup object name format is externally reconfigured in such a way that HPE Data Protector is not be able to resolve the Oracle database name from the object name, the unique capacity will be counted multiple times. To avoid this the reconfigured object name must include the Oracle database name and be in the format `<DBID_*.dbf`.

  The source data should reside on the Cell Managers monitored by HPE Backup Navigator. If the capacity of your backup environment grows, you should buy additional licenses.

- **Traditional HPE Backup Navigator licenses**

  Traditional HPE Backup Navigator license is dependent on your HPE Data Protector environment, specifically, on the amount and types of HPE Data Protector licenses installed on the Cell Managers for

which HPE Backup Navigator is collecting data.

The calculation of the HPE Backup Navigator price is incorporated in the product licensing functionality. HPE Data Protector licenses are represented as the HPE Backup Navigator tokens using an in-built algorithm. You purchase the number of license tokens required by HPE Backup Navigator.

How licensing works

Use the HPE Backup Navigator web user interface to request and manage licenses for your environment.

Perform the following licensing tasks:

1. Buy a needed number of HPE Backup Navigator licenses. For information on the needed number, contact your Sells Representative. You can also view the needed number of Standard and Traditional licenses in the Licensing context of the HPE Backup Navigator web user interface after you added all the Cell Managers for which HPE Backup Navigator is collecting data.

2. Configure a license request. See "Configuring license requests" below.

3. Request and obtain licenses from the web licensing portal. See "Requesting and retrieving licenses" on the next page.

4. Activate the licenses to start using HPE Backup Navigator. See "Activating licenses" on page 36.

5. When the protected data capacity of your backup environment grows, you can purchase additional licenses to cover your new needs. See "Adding new licenses" on page 36.

6. If you want to migrate all or part of your HPE Backup Navigator licenses to another system, first deactivate them on the original system. See "Deactivating licenses" on page 37.

7. If you upgraded HPE Backup Navigator from an earlier release, upgrade your licenses to a new format. For instructions, see "Upgrading licenses to the new format" on page 37.

8. You can always verify the licensing related information. See "Verifying licenses" on page 38.

Configuring license requests

To obtain your HPE Backup Navigator licenses, you should submit a request form to the web licensing portal.
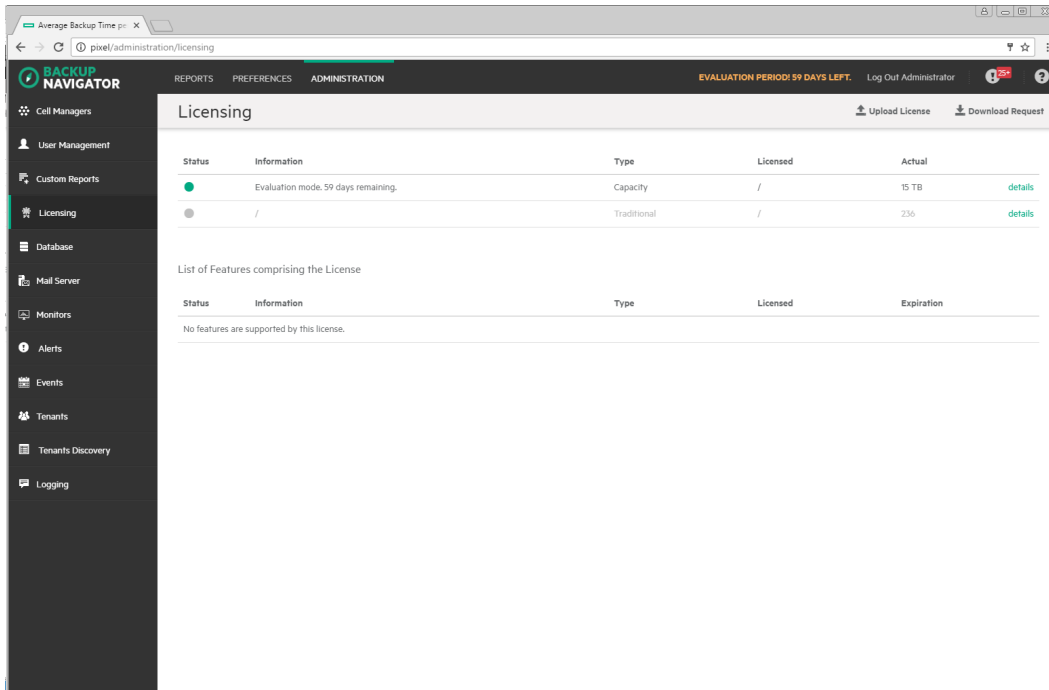
Prerequisite

You have already bought a needed number of HPE Backup Navigator licenses and have an entitlement order number.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Licensing**.

Figure 5: Configuring a license request

3. In the Results Area, click **Download Request** to save the license request file to the specified location.

> Example of the `request.dat` license request file:
>
> VER=2.0
> CN= myCompany
> PID=dpnavigator
> ND=computer.company.com

Requesting and retrieving licenses

After you create a license request file, you can obtain the licenses from the licensing portal.

Steps

1. Connect to the web licensing portal at: http://hp-licensing.comtrade.com

2. If you already have a licensing portal account, click **Sign in**, enter your user name and password, and then click **Login**. Otherwise, create an account and then sign in with a newly created user account.

3. Click the **License Activation** link and then enter the entitlement order number in the text box. Click **Next**.

4. Perform the following:

a. Select **HPE Backup Navigator**.

b. Select **Standard**, or **Traditional** license type. Specify the number of licenses you want to request:

   ○ For the Standard license type, one license covers 1 TB of protected data in your backup environment.

   ○ For the Traditional license type, one license represents one HPE Backup Navigator token.

c. Browse for the license request file and then click **Request License**.

Within a few minutes, you should receive an email with a license file `dpnavigator_licact_new.dat` attached.

Example of the `dpnavigator_licact_new.dat` license file:

```
VER=2.0
CN=myCompany
PID=dpnavigator
ND=computer.company.com
BEGINBLOCK
TYP=standardlicense
EXP=0.0.0
NL=5
ENDBLOCK
SIG=A5357DE94EE9734
```

5. Save the license file locally.

Activating licenses

After you submit your license request for the HPE Backup Navigator licenses to the web licensing portal, you get an email with a product license file attached. Activate the licenses.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Licensing**.

3. Click **Upload License**, browse for the license file received by email, and then click **Upload**.

   After the licenses are activated, the licensing related information is updated.

Adding new licenses

Add new licenses for your grown backup environment.

Prerequisite

You use licenses introduced with HPE Backup Navigator 9.20. If you upgraded HPE Backup Navigator from an earlier release, also upgrade your licenses. For instructions, see "Upgrading licenses to the new format" on the next page.

Steps

1. Buy as many HPE Backup Navigator licenses as you need in addition to the licenses you already use.

2. Perform the licensing procedures to obtain and activate the HPE Backup Navigator licenses you bought in addition to the existing ones. Perform the following tasks:

   a. "Configuring license requests" on page 34.

   b. "Requesting and retrieving licenses" on page 35.

   c. "Activating licenses" on the previous page.

Deactivating licenses

You can deactivate all or some of your licenses, if you want to activate and use them on other systems. For example, you migrate HPE Backup Navigator to another system and consequently migrate the related licenses. Or, if you use more than one HPE Backup Navigator server and want to change the license distribution between them (migrate some of the licenses from one system to another).

> **Note:** Product Entitlement Order Number (delivered with the product) will be requested during the license deactivation.

Limitation

You can deactivate licenses of one type (standard or lite) and from one HPE Backup Navigator system only.

Steps

1. Connect to the web licensing portal at: http://hp-licensing.comtrade.com

2. Sign in to the web licensing portal.

3. Click the **License Deactivation** link and follow the instructions to complete the procedure. During the deactivation procedure, you select whether you want to deactivate all licenses from one node or only a part of your licenses.

   The system will automatically process your request and send you the updated licensing information by email.

4. In the HPE Backup Navigator web user interface, update the licensing related information, as described in the following procedure: "Activating licenses" on the previous page.

   The licenses are kept in the license pool until you decide to activate and use them.

Upgrading licenses to the new format

If you upgraded HPE Backup Navigator from an earlier version, you also need to upgrade your old HPE Backup Navigator licenses to the new format.

> **Note:** Product Entitlement Order Number (delivered with the product) will be requested during the license deactivation.

Steps

1. Deactivate all the HPE Backup Navigator licenses you currently use. See "Deactivating licenses" on the previous page.

2. Perform the licensing procedures to obtain and activate the HPE Backup Navigator licenses in the new format. Perform the following tasks:

   a. "Configuring license requests" on page 34.

   b. "Requesting and retrieving licenses" on page 35.

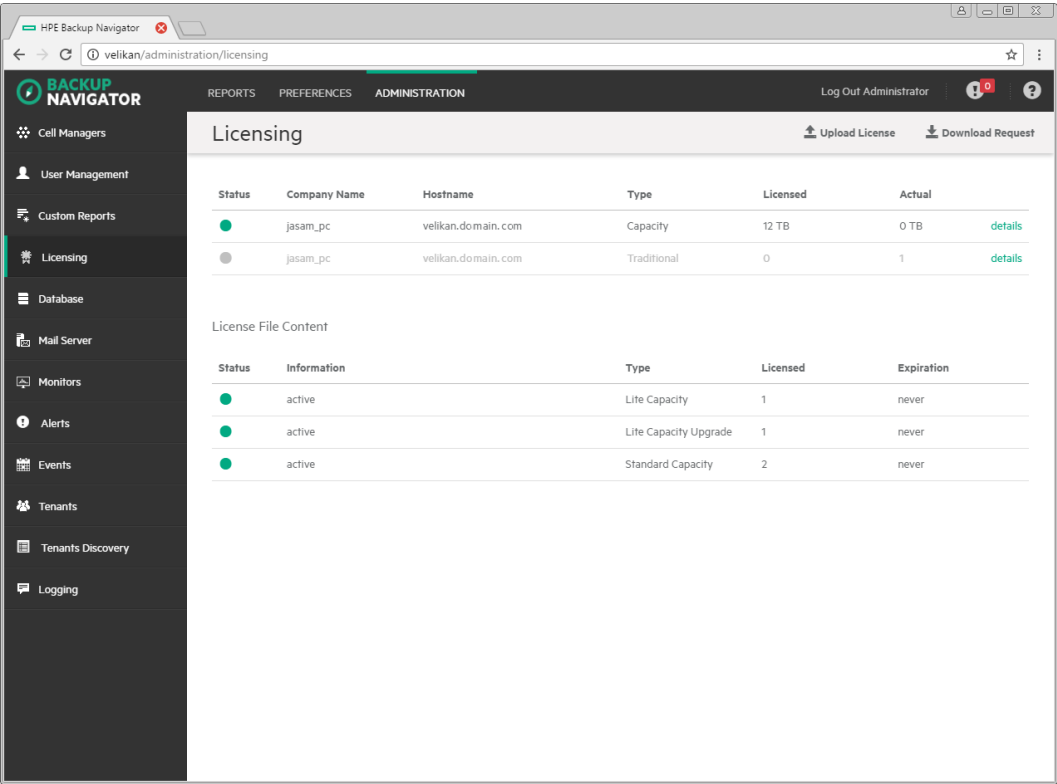   c. "Activating licenses" on page 36.

Verifying licenses

You can check the licensing related information at any time.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Licensing**.

   Figure 6: Licensing information

The current licensing related information is displayed:

- company name

- hostname

- status

- licensed volume (capacity or token based)

- actual volume (capacity or token based)

- number of Cell Managers covered by the current licensing

- list of all purchased licenses with their properties

Chapter 6: Administration Tasks

This chapter is intended for HPE Backup Navigator administrators.

Before you can start using the HPE Backup Navigator functionality, perform the following administration and configuration tasks in the web user interface:

- To start collecting input data from HPE Data Protector cells, add these cells to the HPE Backup Navigator list. For a detailed procedure, see "Selecting cells" on the next page.

- After you select the HPE Data Protector cells to collect data for your reports, you can update the cell settings and perform other related tasks. For more information, see "Administering cells" on page 43.

- Start the remote agent to collect data from the remote Cell Managers (Cell Managers that cannot be directly accessed from HPE Backup Navigator). See "Installing remote agent" on page 45.

- You can perform the following configuration tasks to better adjust HPE Backup Navigator functionality to your environment's needs.

  - To create new users with different permissions as well as edit and delete the existing user accounts in HPE Backup Navigator, see "Managing users and user roles" on page 46.

  - See the recommendations on the database maintenance in "Maintaining database" on page 49.

  - To be able to receive emails from the HPE Backup Navigator, configure the mail server. See "Configuring mail server" on page 52.

- To create and handle the custom reports, perform the following tasks:

  - "Creating custom reports" on page 53.

  - "Downloading custom reports" on page 54.

  - "Uploading custom reports" on page 55.

- You can monitor different aspects of the HPE Data Protector environment by using the predefined HPE Backup Navigator monitors or configuring custom monitors to trigger alerts or to log events for the specified conditions:

  - To monitor your HPE Data Protector environment with the predefined HPE Backup Navigator monitors, see "Predefined monitors" on page 56.

  - To trigger notifications on specific events, configure the related monitors, see "Creating and using monitors" on page 59.

  - To handle the problems reported in the triggered alerts, see "Handling alerts" on page 60.

  - To view the event log, see "Viewing events" on page 61.

- To be able to generate reports based on the tenant related data, see "Managing tenants and tenant groups" on page 62.

- To analyze and troubleshoot potential problems and provide an appropriate input to HPE Support, see "HPE Backup Navigator logging" on page 70.

Selecting cells

Select a new HPE Data Protector cell to collect the input data for your reports from it.

Prerequisites

- Ensure that the hostnames of your HPE Backup Navigator system and remote agent systems, are defined as a fully qualified domain name (FQDN). For details, see the operating system documentation.

- To access and collect data from the newly selected HPE Data Protector cell, add the HPE Backup Navigator user to the HPE Data Protector Admin user group on the Cell Manager. For detailed instructions on how to add a user, see the HPE Data Protector online help. When adding this user to the HPE Data Protector Admin user group, provide the following information:

  - **Name:** The logon name under which HPE Backup Navigator is running on the HPE Backup Navigator server or HPE Backup Navigator remote agent system.

  - **Group/Domain or UNIX Group:** The Windows domain or UNIX group to which the HPE Backup Navigator user belongs.

  - **Client:** The HPE Backup Navigator server or remote agent system name (FQDN or IP address).

- Export the OB2PORTRANGE variable by adding the export line in the ob2portrange.sh file on your HPE Backup Navigator system and remote agent systems, and then run the ob2portrange.sh file:

  # vi /etc/profile.d/ob2portrange.sh
  # export OB2PORTRANGE="*start_port-end_port*"
 **# source /etc/profile.d/ob2portrange.sh**

  where *start_port:end_port* is a port range available for communication with the HPE Data Protector Cell Managers.

  If the firewall is enabled in a different location than a Cell Manager (for example, router), make sure, that the ports specified in the OB2PORTRANGE variable are open in both directions to allow communication between the Cell Manager and the HPE Backup Navigator.

- Make sure that your network is configured so that the Cell Manager and HPE Backup Navigator are visible to each other.
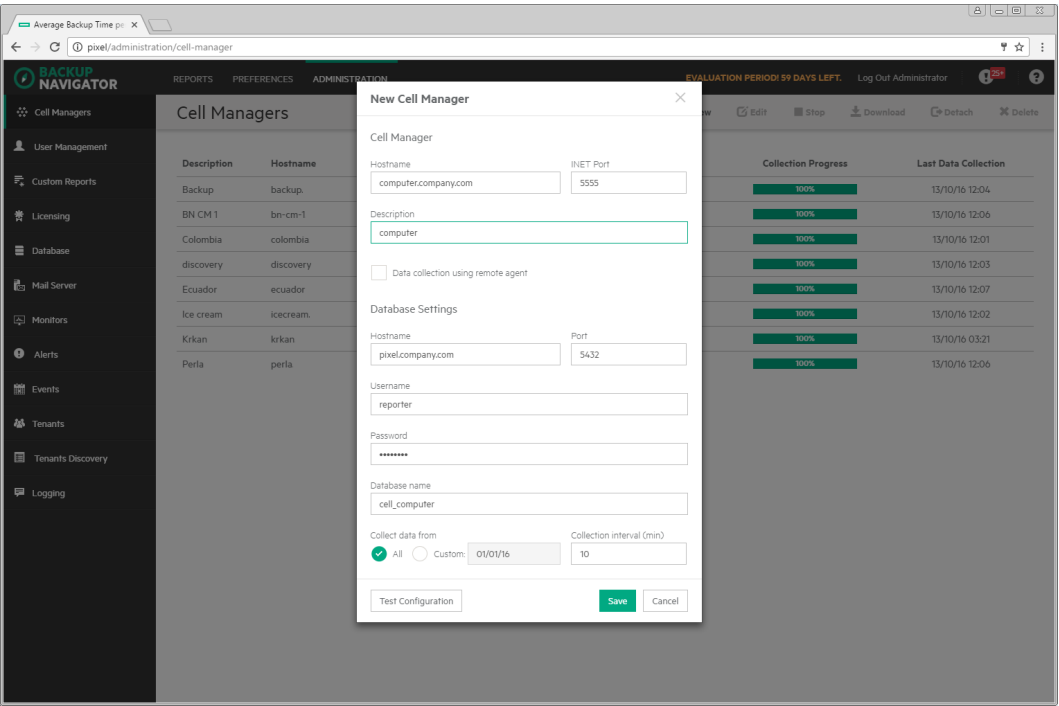
Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Cell Managers**.

Figure 7: Adding new Cell Managers
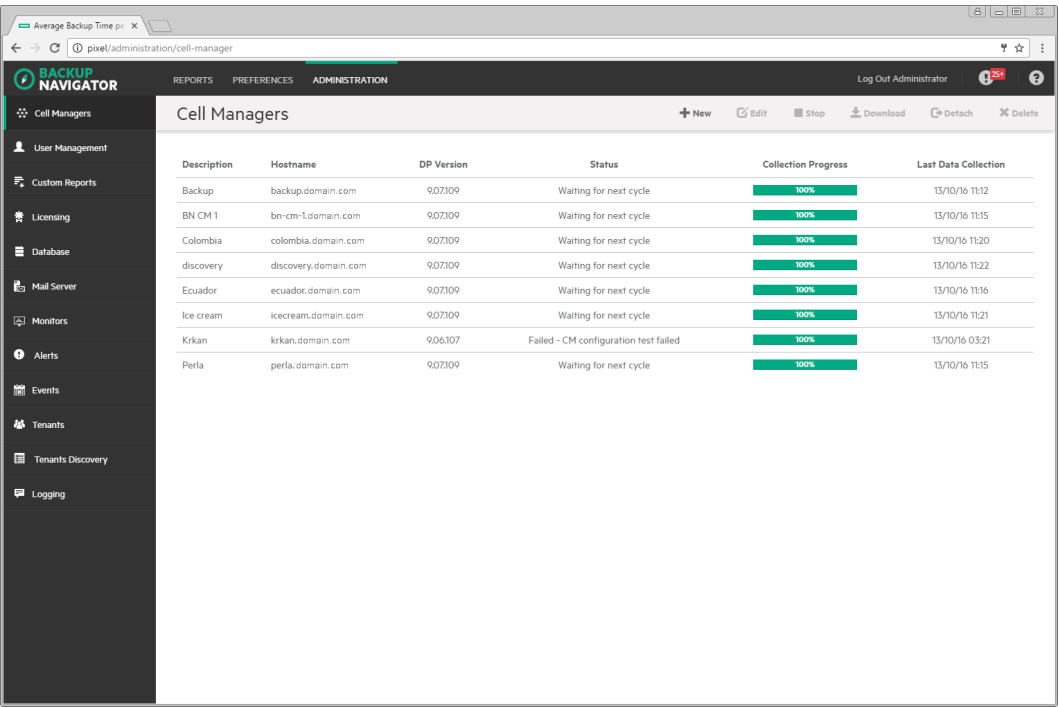
3. In the Tool bar of the Results Area, click **New**. The New Cell Manager configuration window opens.

Figure 8: New Cell Manager Configuration window

4. In the New Cell Manager window, enter a Cell Manager hostname or its IP address, INET port (by default, 5555) and a description.

If this Cell Manager cannot be directly accessed from HPE Backup Navigator, select the **Data collection using remote agent** option.

Configure the database of the new cell by specifying the following:

- the hostname of the system where the database resides (by default, the system where you installed HPE Backup Navigator)

- the port of the system where the database resides (by default, `5432`)

- the user name and the password of the PostgreSQL admin user with the `SUPERUSER` permissions.

- the database name of your choice

   The maximum number of characters for the database name is 25. The default name is `cell_<description>`, which you can change to another one.

- the period for which you want to collect data for your reports (you can select the custom starting date or all existing data)

- the time interval in which you want to collect the changed input data for your reports (for example, every 10 minutes)

5. Click **Test Configuration** to verify that the Cell Manager is configured appropriately.
6. Click **Save**. A new cell is added to Scope settings and is visible in the Navigation Pane.

You can always update your settings later.

Administering cells

After you selected the HPE Data Protector cells to collect data for your reports, they are listed in the Cell Managers window of the Administration context.

Figure 9: Administering cells

You can change the Cell Manager's settings or status by clicking on it and selecting one of the following actions:

- **Edit**: Change the Cell Manager and database settings.

> **Important:** If you moved the database to a new server or performed any other database configuration changes that affect the HPE Backup Navigator functionality, make the necessary database setting updates on every related Cell Manager.

- **Stop/Start**: Pause data collection from the selected cell by stopping it, when you temporarily do not need to include its data to your reports. When stopped, the cell is still present in the scope and to the reports. Start data collection from the selected cell, when you need this data for your reports.

- **Download**: Download package for the HPE Backup Navigator remote agent installation. Applicable for the remote Cell Managers.

- **Detach/Attach**: Pause data collection from the selected cell by detaching it, when you want to have access to the collected data in the database, but do not need to include this data in your reports. When detached, the cell is not visible in the scope and in the reports. Attach the selected cell and then start data collection from it, when you need its data for your reports.

- **Delete**: Delete the selected cell from the HPE Backup Navigator list. The database of this cell with all previously collected data is deleted. You can always add this cell to the list later. Note, that a filter that contains only this cell, will be also deleted.
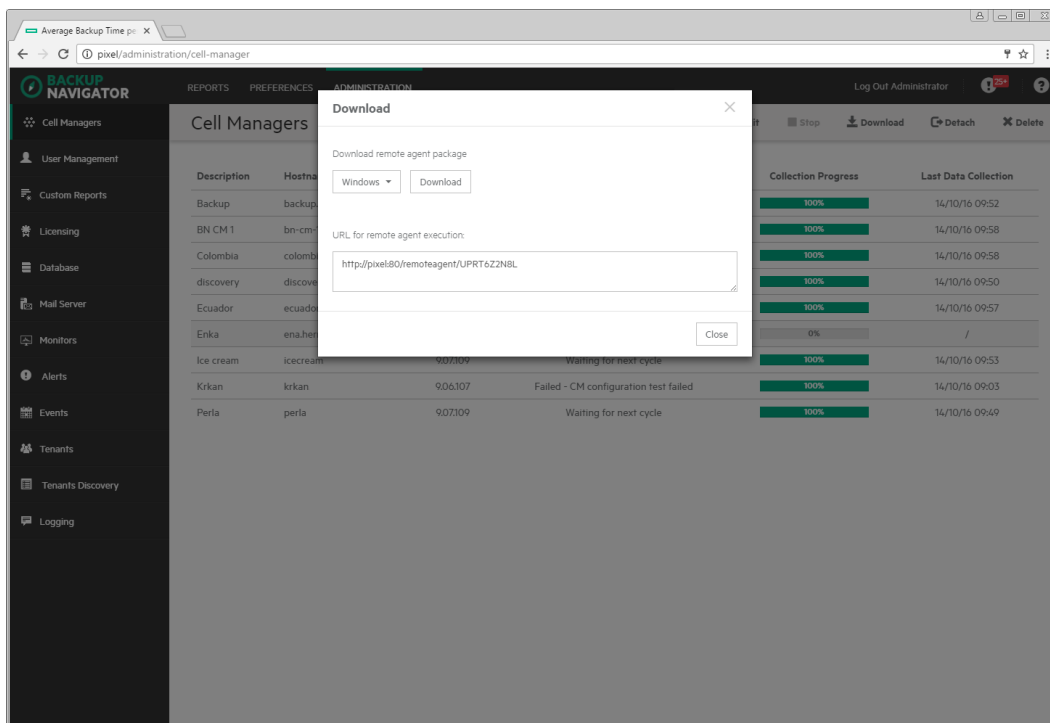
Installing remote agent

You need to install a remote agent only if you want to collect data from the remote Cell Managers (the Cell Managers that cannot be directly accessed from HPE Backup Navigator).

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Cell Managers**.

3. From the list of the Cell Managers, select the remote Cell Managers, from which you will collect data using the remote agent. In the Tool bar of the Results Area, click **Download**.

4. In the Download Remote Agent window, select **Windows** or **Linux** depending on the operating system you want to install the remote agent and then click **Download** to download the remote agent package.

   > **Note:** The URL provided in this window will be used on a remote system to start the remote agent.

Figure 10: Download Remote Agent Window

5. Transfer the remote agent installation package to the remote Cell Manager or another system, from which you can access the remote Cell Manager.

6. On the target system, install the remote agent.

On Windows:

a. Start the `bn-remote-agent-9.50.exe` file. When the installation wizard starts, click **Next**.

b. In the Java `HOME` directory text box, specify the path to the Java `HOME` directory. In the URL to HPE Backup Navigator, specify the URL from step 4. Click **Next**.

Figure 11: Remote Agent Installation
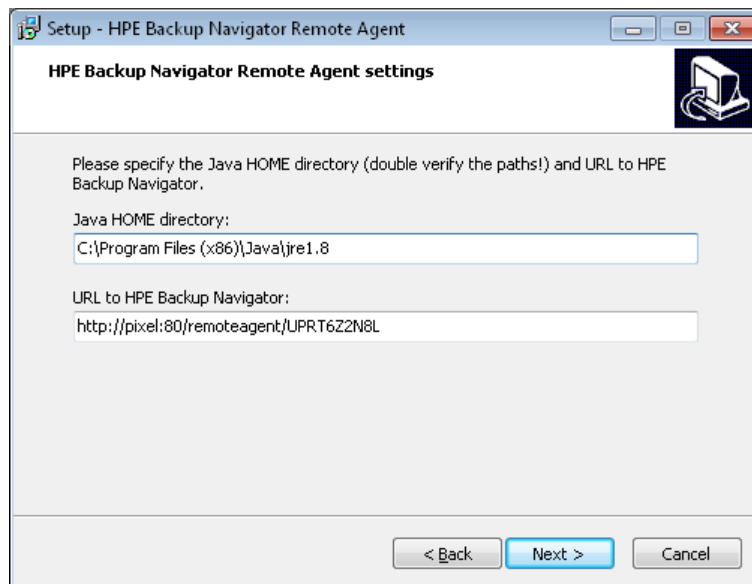
c. Specify the location where you want to install the remote agent and then click **Next**.

d. Review the settings and click **Install** to start installation. After the installation process is complete, click **Finish**.

After the installation is complete, the `BNAgentService` process is running. You can start and stop it from the Services page of the Windows Task Manager.

On Linux:

a. Run the installation of the `bn-remote-agent-9.50.rpm` file:

   `# rpm -ivh bn-remote-agent-9.50.rpm`

b. Edit the remote agent configuration file with the URL provided in step 4:

   `# vi /opt/remote-agent/agent_cfg.properties`

After the installation is complete, you can use the following commands on the Linux remote agent:

- To start data collection on remote agent: `# service remote-agent start`

- To stop data collection on remote agent: `# service remote-agent stop`

- To check if any remote agent is running: `# service remote-agent status`

Managing users and user roles

Depending on their role, users have different permissions. HPE Backup Navigator supports the following user roles:

- **Built-in Administrator**

  This user role is created in the installation wizard. There is only one Built-in Administrator in the HPE Backup Navigator environment and it cannot be deleted or changed. The Built-in Administrator has permissions to generate reports on all HPE Data Protector cells and to perform administration tasks in HPE Backup Navigator.

- **Administrator**

  The Administrator has permissions to generate reports on all HPE Data Protector cells and to perform administration tasks in HPE Backup Navigator. Administrator accounts can be created, edited, and deleted by the Built-in Administrator or Administrator.

- **Standard User**

  An Administrator can create, edit, and delete the Standard User account and grant it permissions for all or selected HPE Data Protector cells. The Standard User can change the profile, manage subscriptions and filters, and generate reports on the HPE Data Protector cells, for which the permissions were granted by the Administrator.

If you configured LDAP authentication (see "Configuring LDAP authentication" on page 25), you can specify users that can be authenticated with the LDAP server. Before you can add LDAP users, you need to specify an LDAP server that will be used by HPE Backup Navigator. For detailed procedure, see "Adding LDAP Server" below.

To create a new user, see "Creating new users" on the next page.

Adding LDAP Server

Add LDAP server, if you want to create users with LDAP authentication.

Prerequisite

LDAP authentication is configured on the HPE Backup Navigator server.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **User Management**.
3. In the Tool bar of the Results Area, click **LDAP Server**.
4. In the LDAP Server properties window, specify the domain name that should be recognized by the LDAP server.

   You can also specify the hostname,if you want that the LDAP server recognizes the specific host.

Figure 12: Specifying LDAP server
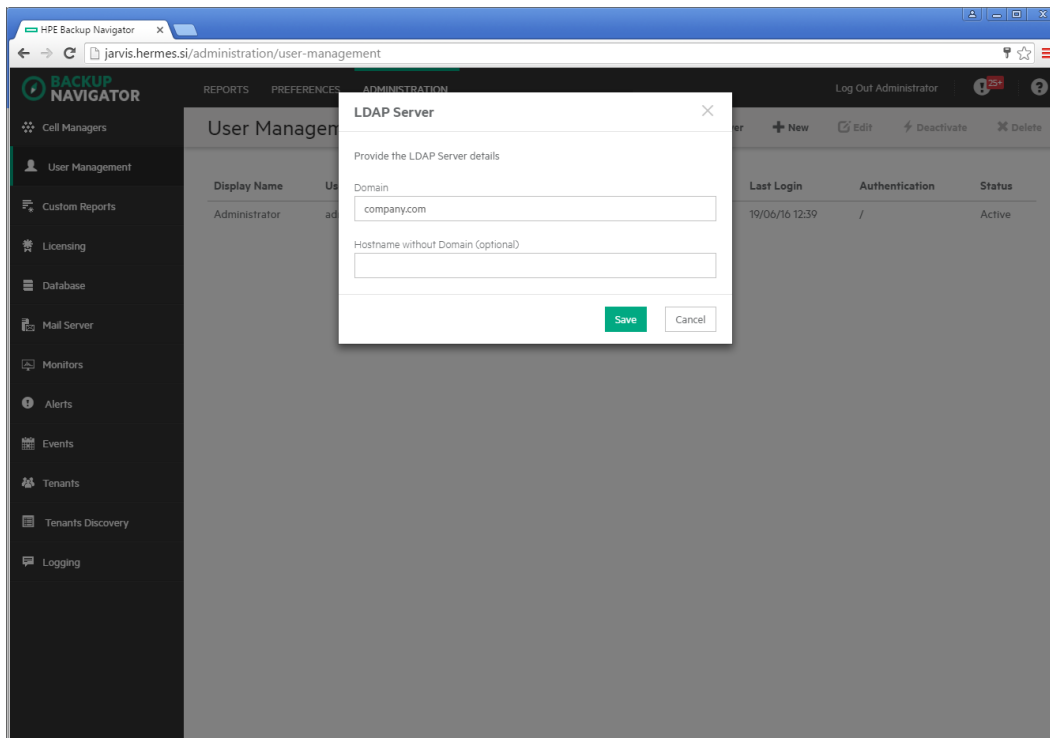
Click **Save**.

The LDAP server is added successfully.

Creating new users

Create new users with the specific user roles.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **User Management**.

3. In the Tool bar of the Results Area, click **New**. The Create New User wizard displays.

4. If you added an LDAP server, select the **LDAP User** option. Enter the user display name, username, and password (for the LDAP user, the password from the LDAP server is used) of the user that you add to HPE Backup Navigator and, optionally, the email. Click **Next**.

Figure 13: Creating a new user

5. Select **Administrator** or **Standard User** as a user role for this user account.

   If you selected `Administrator`, click **Finish**. If you selected `Standard User`, click **Next**.

6. For the Standard User, select the HPE Data Protector Cell Managers the user can access to generate reports. Click **Finish**.

A new user account is added to the User Management table. You can later edit, deactivate or delete it.

> **Important:** You cannot perform any actions on the account with which you are currently logged in to HPE Backup Navigator.

Maintaining database

Ensure regular backups, archiving, and clean-up of the HPE Backup Navigator database. Be prepared for a potential recovery. For the related procedures, see the PostgreSQL documentation.

You can use pgAdmin GUI to administer PostgreSQL. You can download this tool from: http://www.pgadmin.org/download/

To view the database settings in the web user interface, see "Viewing database settings" on the next page.

You can perform the following database maintenance tasks in HPE Backup Navigator:

- Purging the database. See "Purging database" below.
- Changing the database configuration settings. See "Changing configuration" on the next page.
- Performance tuning. See "Tuning database performance" on the next page.

Viewing database settings

You can view the database settings information.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Database**. The database settings information is displayed. To change these settings perform the procedure described in "Maintaining database" on the previous page.

Purging database

You can use the HPE Backup Navigator web user interface to clean up the database.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Database**. The database settings information is displayed. Under Database Purge, specify the date, up to which you want to purge the HPE Backup Navigator database and then click **Purge Database**.

Figure 14: Database settings

3. In the Purge Database window, select to purge all cells or specify the cells you want to purge. Click **Purge** and then click **Confirm**.

   During the database cleanup, the data older than the specified date is deleted.

Changing configuration

If you want to move the database to a new server or perform any other database configuration changes, make necessary updates to the database settings.

Steps

1. Log in to the HPE Backup Navigator system with the installation administrator's user account provided during the installation procedure. This account is saved in the `/opt/dpa-ext/conf/admin.properties` file. The database setup window opens.

2. Follow the setup wizard as described in "Installation procedure" on page 15.

If you moved the database to a new server or performed any other database configuration changes that could affect the HPE Backup Navigator functionality, make the necessary database settings updates on every related Cell Manager. See "Administering cells" on page 43.

Tuning database performance

When you install and configure HPE Backup Navigator, PostgreSQL database server is also configured. The provided default settings related to the database performance correspond to the

minimum system requirements and are as follows:

```
shared_buffers = 1000MB
effective_cache_size = 2000MB
work_mem = 64MB
maintenance_work_mem = 256MB
```

If the memory resources of your HPE Backup Navigator allow, you can allocate more memory resources to improve performance. If you consider that the HPE Backup Navigator performance is not sufficient, you can change the performance related settings to tune the performance to the needs of your specific environment. For the description of these settings and detailed procedures, see the PostgreSQL documentation.
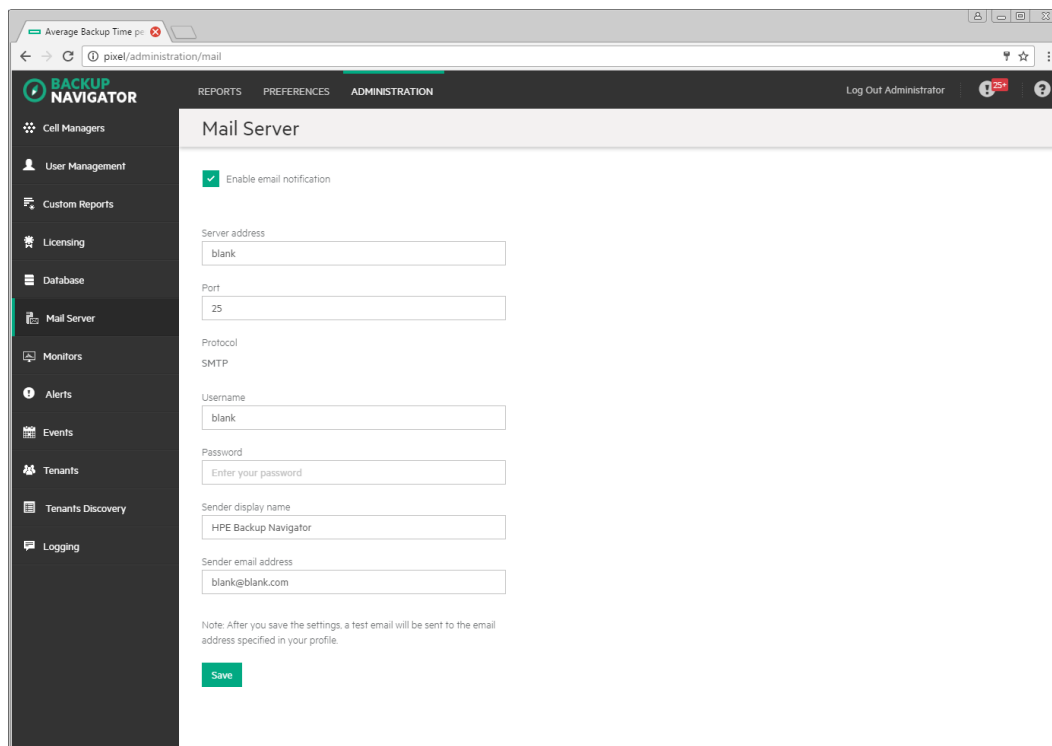
Configuring mail server

Configure your mail server to be able to receive emails.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Mail Server**.

   Figure 15: Configuring Mail Server

3. In the Results Area, select **Enable email notification**.
4. Enter the web address of the server, which you want to use for sending emails.
5. Enter the server port, username, and password.

6. Enter the sender's display name and email address (mandatory).

7. Click **Save**. A test email is sent to the specified email address.

You can always change these settings later.

Creating custom reports

Create a custom report to collect and analyze data of your choice.

Requirement

To create and manage custom reports, knowledge of the MS SQL Server is required. For more information, see the MS SQL Server documentation.

Limitation

You cannot specify the preferred unit values in the custom reports, the default HPE Data Protector values are used.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Custom Reports**.

3. In the Results Area, click **New**. The New Custom Report wizard opens.

4. In the Data Set window, specify the parameters for the input data that you want to see in your report. The parameters are grouped by a subject of the report: devices, clients, media, backup objects, and sessions. The input data is collected and arranged in the report tables, each column representing the specified parameter.

Figure 16: Configuring custom reports
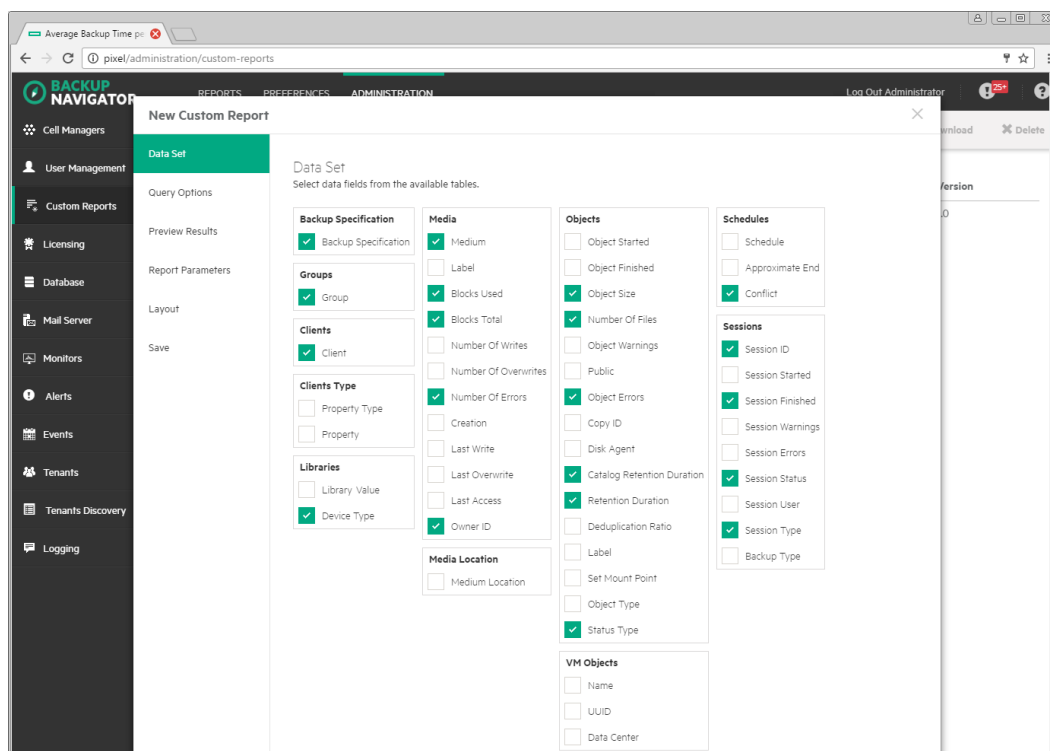
Click **Next**.

5. In the Query Options window, specify the Aggregate and Group By options for each column selected in step 4. Specify the sorting, limit, and other options for your report. Click **Next**.

6. In the Preview Result window, verify whether the query you specified meets your requirements and click **Run** to preview the report.

7. In the Layout window, select a presentation type of your report. Select **Table**, if you want to view your report as a table. Select **Chart**, if you want to view your report in graphical presentation *and* a table.

   Specify X and Y axis for a chart. Click **Next**.

8. Name your report and optionally add a description. Select the report category and the report subcategory where you want to place your report. Click **Finish**.

The report is added to the selected report subcategory in the Navigation Pane.

> **Note:** You cannot edit a custom report. If you want to change any parameters of the custom report, you need to create a new one.

Downloading custom reports

Save a custom report to a preferred location to be able to upload it later to another server. You can share the saved custom reports between different HPE Backup Navigator environments later.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Custom Reports**.

3. In the Results Area, select the custom report that you want to download.

4. In the Tool bar of the Results Area, click **Download**.

5. Save the report as a ZIP file in a specified location.

Uploading custom reports

Upload a report created on a different HPE Backup Navigator server.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Custom Reports**.

3. In the Tool bar of the Results Area, click **Upload**.

4. In the Upload Custom Report window, name your report and browse for the report file that you want to upload. select the report category and subcategory where you want to place the uploaded report.

5. Click **Upload**.

6. When the upload process is finished, close the dialog box. The report is added to the selected report subcategory.

Monitoring the HPE Data Protector environment

You can use the data collected for reports from the HPE Data Protector cells to monitor different aspects of the HPE Data Protector environment. Use the HPE Backup Navigator monitoring functionality to be notified about the specified events and conditions in the HPE Data Protector environment.

HPE Backup Navigator provides predefined monitors for the data protection basic functionality, such as backup success, device utilization, media quality, and so on. For the complete list and description of the predefined monitors, see "Predefined monitors" on the next page.

You can use the predefined monitors and create the monitors that cover your needs. For the detailed procedure, see "Creating and using monitors" on page 59

You get notified about the conditions and events specified in the monitors by alerts or event notifications. Use alerts to ensure the priority handling of the detected problem. An alert requires user acknowledgment and resolution. Alert messages contain a potential cause of the event or condition and offer a resolution. For more information on handling the triggered alerts and logged events, see "Handling alerts" on page 60 and "Viewing events" on page 61.

Predefined monitors

HPE Backup Navigator provides the predefined monitors for your HPE Data Protector environment. You can view this monitors in the HPE Backup Navigator, enable, disable, and edit them. You can edit the scope of the monitored entities as well as parameters, values, and action types.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Monitors**.

A list of the following default monitors displays:

Session success rate	
Description	Monitors backup session success rate and issues notification, when the success rate is 98 % or lower.
Monitored category	Cell
Metric Type	Success rate
Parameters	Time range = Last 24h; Session type = ALL; Type = Backup
Actions	Trigger EVENT metric value >= 98% Event level: Normal 98% > metric value >= 96% Event level: Warning metric value < 96% Event level: Critical

Backup session without objects	
Description	Monitors the backup session. When a backup session has no specified objects, issues a critical alert.
Monitored category	Session
Metric Type	Object count
Parameters	Session type = Backup; Backup Type = All
Actions	Trigger ALERT Alert level: Critical **Cause:** Can indicate that the backed up client or application instance is not available. **Resolution:** Check the client or instance availability.

Session queuing time too long	
Description	Monitors the duration of backup session queuing time. Issues an alert, if a session is in the queue for more than 30 minutes.
Monitored category	Session
Metric Type	Queuing time
Parameters	Session type = `Backup`; Backup Type = `All`
Actions	Trigger `ALERT` metric value > 30 min Alert level: `Warning` metric value > 30 min Alert level: `Warning` **Cause:** Can indicate that the resources, devices, or application required by session are not available. **Resolution:** If this is a scheduled operation, check schedule conflicts.

Backup specification expected session duration exceeded	
Description	Monitors the duration of a backup session. Issues an alert, when the expected duration for this backup session is exceeded.
Monitored category	Backup specification
Metric Type	Estimated percentage session duration change
Parameters	Session type = `Backup`
Actions	Trigger `ALERT` 20% < metric value < 40 % Alert level: `Warning` 40 % < metric value Alert level: `Critical` **Cause:** Can be caused by recent backup specification changes. **Resolution:** Check if there are any recent changes for the backup specification.

Backup session failure after backup specification modification	
Description	Monitors backup session after the backup specification modification. Issues an event notification, if the backup session fails.
Monitored category	Backup specification
Metric Type	Session failure count after modification
Parameters	n/a
Actions	Trigger `EVENT`

Backup session failure after backup specification modification	
	metric value > 0 Event level: Warning
	metric value > 1 Event level: Critical

Device daily utilization too low	
Description	Monitors device utilization in the last 7 days. Issues an event notification, if the device utilization is lower than 90%.
Monitored category	Device
Metric Type	Daily utilization
Parameters	Time range = Last 7 days
Actions	Trigger EVENT
	80% < metric value < 90% Event level: Warning
	metric value < 80% Event level: Critical

Media pool quality	
Description	Monitors the media pools quality. Issues an event notification if less than 10% of media in the pool is of a Good condition.
Monitored category	Media
Metric Type	Quality
Parameters	n/a
Actions	Trigger EVENT
	5% < metric value < 10% Event level: Warning
	metric value < 5% Event level: Critical

Application without retention	
Description	Monitors applications and detects those not protected with backup.
Monitored category	Application
Metric Type	Retention
Parameters	n/a
Actions	Trigger EVENT
	metric value = 0 Event level: Critical

HPE Data Protector IDB RPO	
Description	Monitors time since the last successful backup of the HPE Data Protector internal database. Issues alert, when the last IDB backup was performed more than the specified number of days or hours.
Monitored category	Cell
Metric Type	Data Protector IDB RPO
Parameters	n/a
Actions	Trigger ALERT metric value > X days|hours Alert level: Warning **Cause:** Cannot find a successful HPE Data Protector internal database backup for cell within the specified period of time. **Resolution:** Perform a successful HPE Data Protector internal database backup. metric value > Y days|hours Alert level: Critical **Cause:** Cannot find a successful HPE Data Protector internal database backup for cell within the specified period of time. **Resolution:** Perform a successful HPE Data Protector internal database backup.

Creating and using monitors

To get notifications on the specific events or alerts, you can create HPE Backup Navigator monitors.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Monitors**.

3. In the Results Area, click **New**. The New Monitor wizard opens.

4. In the General info window, specify the monitor name and description. Click **Next**.

5. In the Scope window, select a category you want to monitor. You can select one of the following categories: application, backup specification, cell, device,media, session. Select a scope of entities related to the specified category. Click **Next**.

6. In the Metrics window, select the metric type available for the specified category and parameters, if applicable. Click **Next**.

Figure 17: Creating monitors
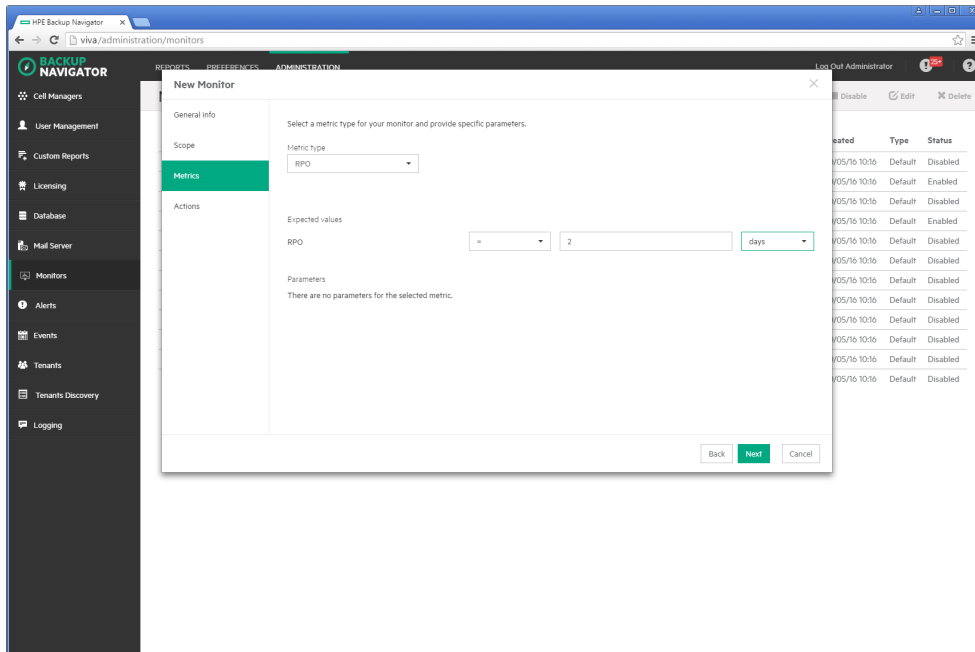
7. In the Actions window, specify one or more conditions by selecting parameters, operators, and setting values. If you want to specify more than one condition, click **Add condition**.

    Select **Alert** or **Event** as an Action type and the severity level. You can specify both action types in the same monitor for different conditions or values. To specify the more action types, click **Add action**.

    To be notified about the occurred event by email, select **Send email notification**.

    Click **Finish**.

The newly created monitor appears on the monitors list. You can enable or disable monitors.

Handling alerts

You can view the alerts triggered in HPE Backup Navigator. An alert is logged when the conditions specified in the monitors are met.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Alerts**. A table with the HPE Backup Navigator alerts displays. You can filter and sort the table by name, severity level, and timeframe. To apply the specified filter, click **Filter**.

3. To view the specific alert details, double-click it. Alert provides a description of a potential cause and offers a resolution.

4. Select the alert and then click **Acknowledge**. By acknowledging an alert, you confirm that you are notified about the event or specified conditions, and start troubleshooting actions.

5. After you handle the reported problem appropriately, select the alert and then click **Resolve**. You can add your resolution comments, click **Resolve**.

Figure 18: Resolving alerts
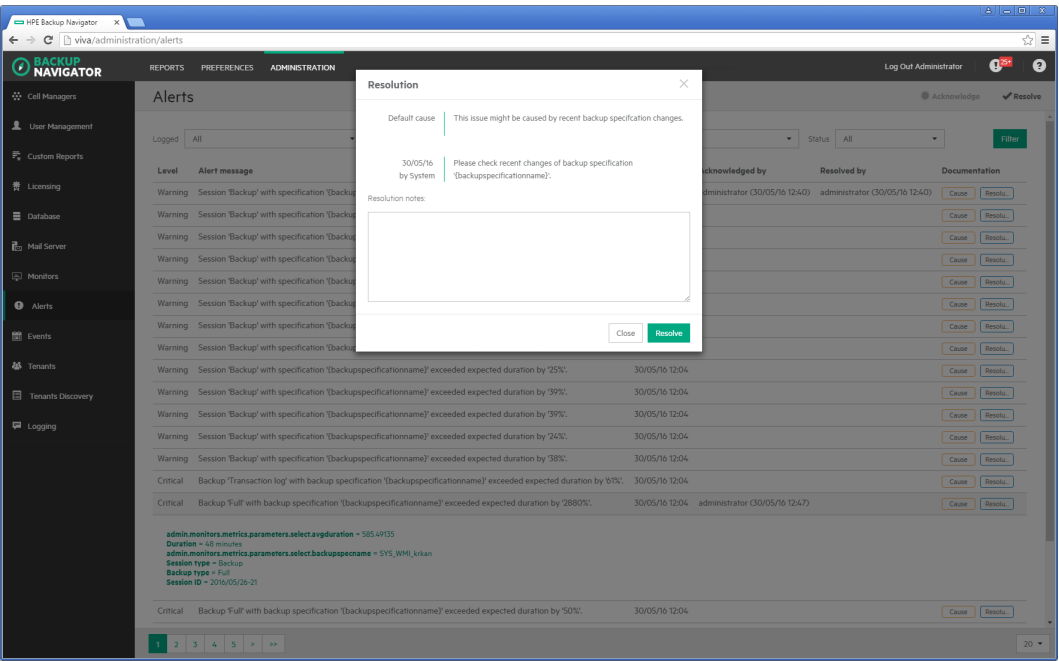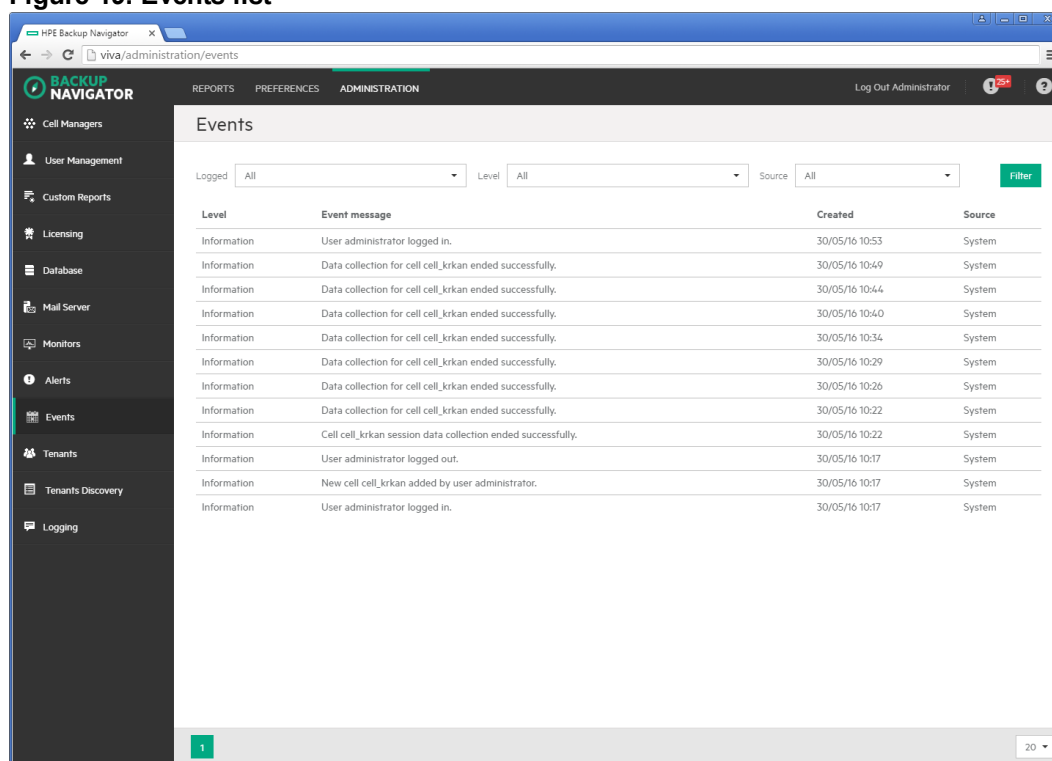
Viewing events

You can view the events occurred in HPE Backup Navigator. An event is logged, when the conditions specified in the monitors are met.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Events**. A table with the HPE Backup Navigator events displays. You can filter and sort table by name, severity level, and timeframe. To apply the specified filter, click **Filter**.

3. To view the specific event details, double-click it.

Figure 19: Events list

Managing tenants and tenant groups

A tenant is a group of users, usually related to one customer or department, who share HPE Data Protector resources. Each tenant is represented by the dedicated HPE Data Protector elements, such as cells, backup specification groups, backup specifications, or clients.

Tenants are logical organizational structures and they cannot be specifically defined in the HPE Data Protector environment. However, a good practice is to follow naming conventions to structure your backup environment in logical order. You can use certain tenant related prefixes or postfixes with tenant names in the names of backup groups, backup specifications, or clients to easily recognize to which tenant these elements belong. For recommendations on naming conventions, see "Tenant naming conventions" on the next page.

Before you can generate reports based on tenants related data, you should discover which tenants already exist in the HPE Data Protector environment, and add them to the HPE Backup Navigator. Perform the following tasks:

- Define one or more rules (depending on the approach you use to identify your tenants) to be able to discover tenants in the HPE Data Protector environment. See "Discovering tenants" on the next page.

- Import tenants from the HPE Data Protector environment using the created discovery rules. See "Importing tenants" on page 67.

- You can add new tenants and tenant groups, and add tenants to tenant groups. See "Creating tenants" on page 68 and "Creating tenant groups" on page 69.

Tenant naming conventions

You can use the following approach to name the elements of your backup environment to be able to discover tenants:

- If you allocate one or more cells per tenant, you can discover such tenants without using naming conventions.

- If you use one or more backup groups per tenant:

  - For a backup group per tenant configuration, use the tenant ID (tenant name) as a backup group name. For example, if you have tenants Customer1, Customer2, and Customer3, name backup groups as follows: `customer1`, `customer2`, and `customer3`. Ensure, that names of the backup specifications from such groups contain the parent backup group name.

  - For multiple backup groups per tenant configuration, use the tenant ID (tenant name) as a part of the backup group name delimited with one of the supported characters (for example, "_" (underscore)). If a tenant owns backup groups in different cells, ensure that the tenant ID is unique across the related cells.

    For example, if you have tenants Customer1 and Customer2, name your backup groups as follows: `customer1_backupgroup1`, `customer1_backupgroup2`, `customer1_backupgroup3`, `customer2_backupgroup1`, and `customer2_backupgroup2`.

- If you use several backup specifications per tenant:

  Ensure, that the backup specification names contain the tenant ID (tenant name) and the backup group name delimited with one of the supported characters (for example, "_" (underscore)). If a tenant owns backup specifications in different cells, ensure that the tenant ID is unique across the related cells.

  For example, if you have tenants Customer1 and Customer2, name your backup specifications as follows: `customer1_backupgroup1_full`, `customer1_backupgroup1_incr`, `customer1_backupgroup1_sap`, `customer2_backupgroup1_full`, and `customer2_backupgroup1_incr`.

- If you allocate one or more clients per tenant:

  Use the tenant ID (tenant name) as a part of the client name or as a prefix of the client delimited with one of the supported characters (for example, "_" (underscore)). If tenants own clients in different cells, ensure that the tenant ID is unique across the related cells. For example, if you have tenants Customer1 and Customer2 with two clients each, name the clients as follows: `customer1_host1.com`, `customer1_host2.com`, `customer2_host3.com`, and `customer2_host4.com`.

Note: Using delimiters in the tenant makes the tenant discovery easier. Without delimiters, you need to create regular expressions to identify tenant IDs.

Discovering tenants

Before you can generate reports for specific tenants, you should first create a tenant discovery rule for discovering tenants in your HPE Data Protector backup environment.

Prerequisites

- You use tenant naming conventions in your HPE Data Protector backup environment.
- You added the HPE Data Protector cells that you want to use for tenant discovery to the HPE Backup Navigator environment.

Considerations

- You can use one discovery rule to discover multiple tenants, if you use the same approach to identify them.
- You can use a HPE Data Protector cell in one discovery rule only. If multiple tenants share one cell, you can use one discovery rule for them and then use this rule to import different tenants.
- When you add a new HPE Data Protector cell to the HPE Backup Navigator environment and you want to collect tenant related reports from it, add this cell to an existing discovery rule, or create a new discovery rule for this cell.
- You cannot use the same tenant ID in different rules and for different tenant types (backup specification, backup groups, or clients).

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Tenants Discovery**.
3. In the Tool bar of the Results Area, click **New**.
4. In the New Discovery Rule wizard, enter a tenant discovery rule name and description. Click **Next**.
5. Select the cells you want to use for this tenant discovery rule. Click **Next**.
6. Specify the discovery rule you want to use for this tenant discovery. In the Tenant elements drop-down list, select the HPE Data Protector element you allocate for the tenants you want to discover. In the Expression type drop-down list, select **Split** (if you use characters to delimit a tenant ID in the respective element name) or **Regular expression**. In the Expression input text box, specify one of the following:

   - For the **Split** expression type, specify the character you use as a tenant ID delimiter (for example. "_", underscore).

     If you do not specify any delimiter, all the elements specified in the Group drop-down list will be discovered.

Figure 20: Creating discovery rule using Split expression type

- For the **Regular expression** expression type, specify the regular expression using Java syntax.

> **Example of the regular expression**
>
> To specify the first three characters as a tenant ID, use the expression: (^.{0,3}).

Figure 21: Creating discovery rule using Regular expression
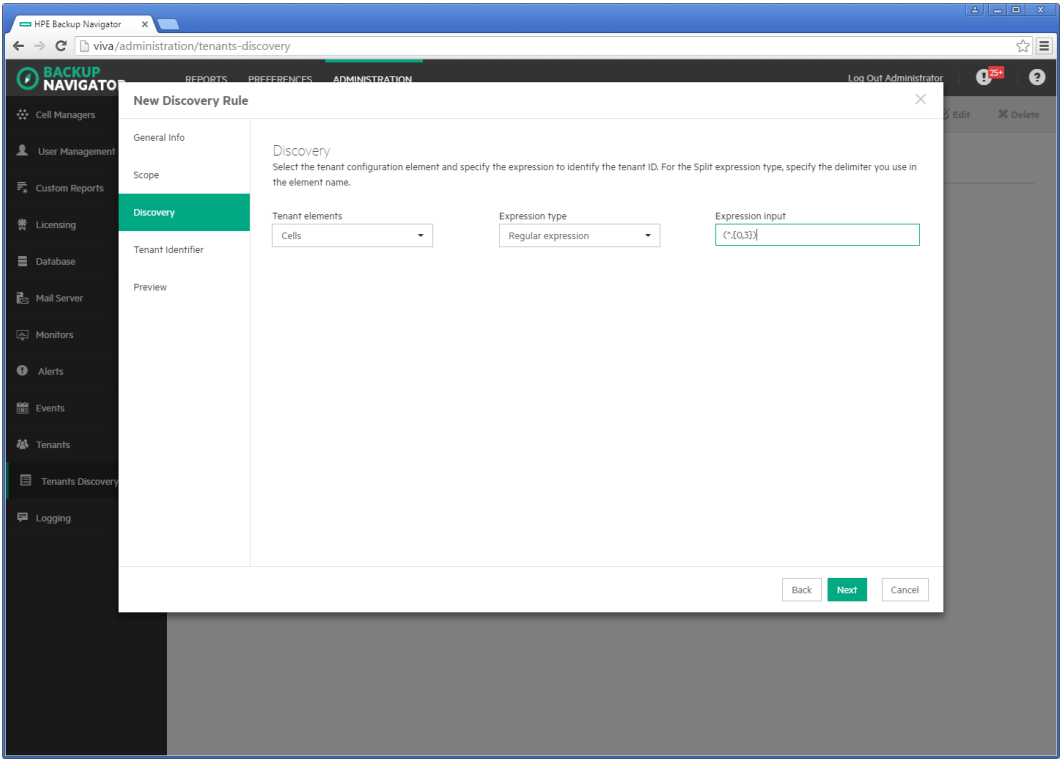
Click **Next**.

7. In the Tenant Identifier page, a list of the discovered tenant elements displays. If you split the elements names and more than one potential tenant ID is recognized, a table lists all potential tenant IDs. Select the column with the tenant ID you specified and in the column header drop-down list, select **Tenant ID**, other column headers will contain `Ignore`. Click **Next**.

Figure 22: Selecting Tenant identifier in the tenant name
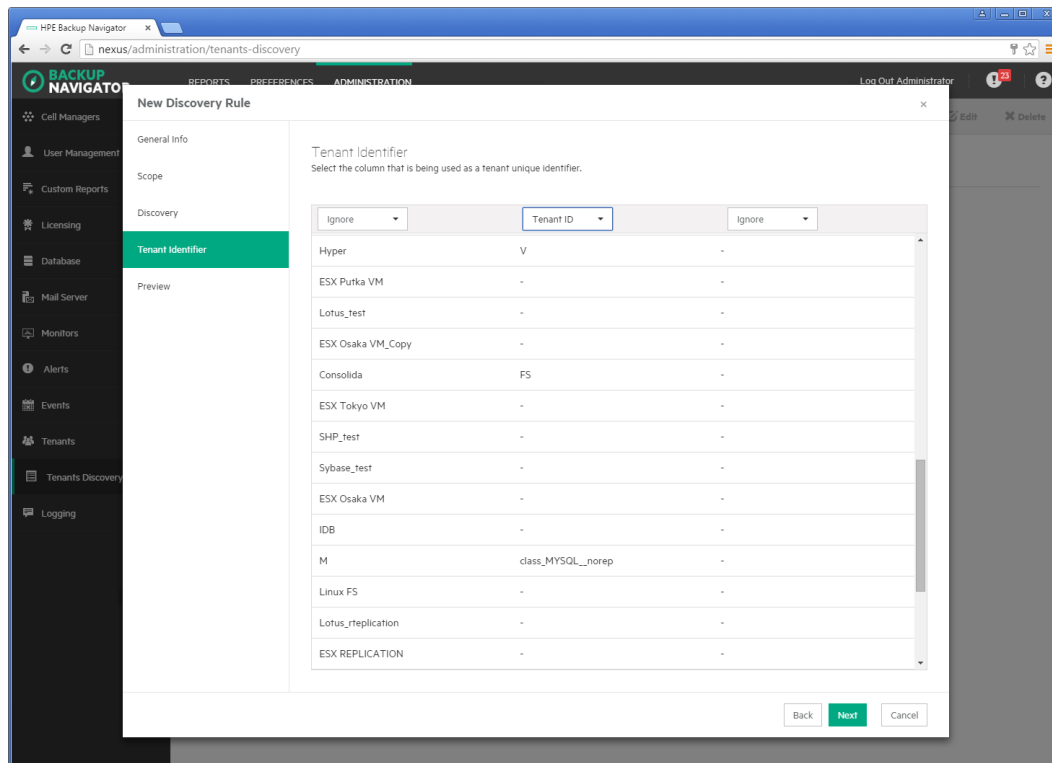
8. The Preview page lists the discovered tenants. You can preview the list of tenants and the content of each tenant by clicking **Preview** while hovering over it. Click **Finish** to save the tenant discovery rule.

   A newly created tenant discovery rule is added to the discovery rules list in the Tenants Discovery page.

Importing tenants

After you create a rule for the tenants discovery and discover tenants, you can add them to the HPE Backup Navigator environment. Use the import functionality when you add the tenants for the first time and when you add a great number of tenants. If you want to add one or a small number of tenants, see "Creating tenants" on the next page.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Tenants**.

3. In the Tool bar of the Results Area, click **Import**.

4. In the Import tenant wizard, select a tenant discovery rule. Click **Next**.

5. In the Preview page, view a list of tenants you will import. Click **Download CSV** to download a `tenants.csv` file with a list of tenants you want to import and save it on your system. Fill in the tenants related information (organization, location, e-mail, and so on) and then upload the updated file to the HPE Backup Navigator by clicking **Upload**. Then click **Finish**.

Figure 23: Importing tenants
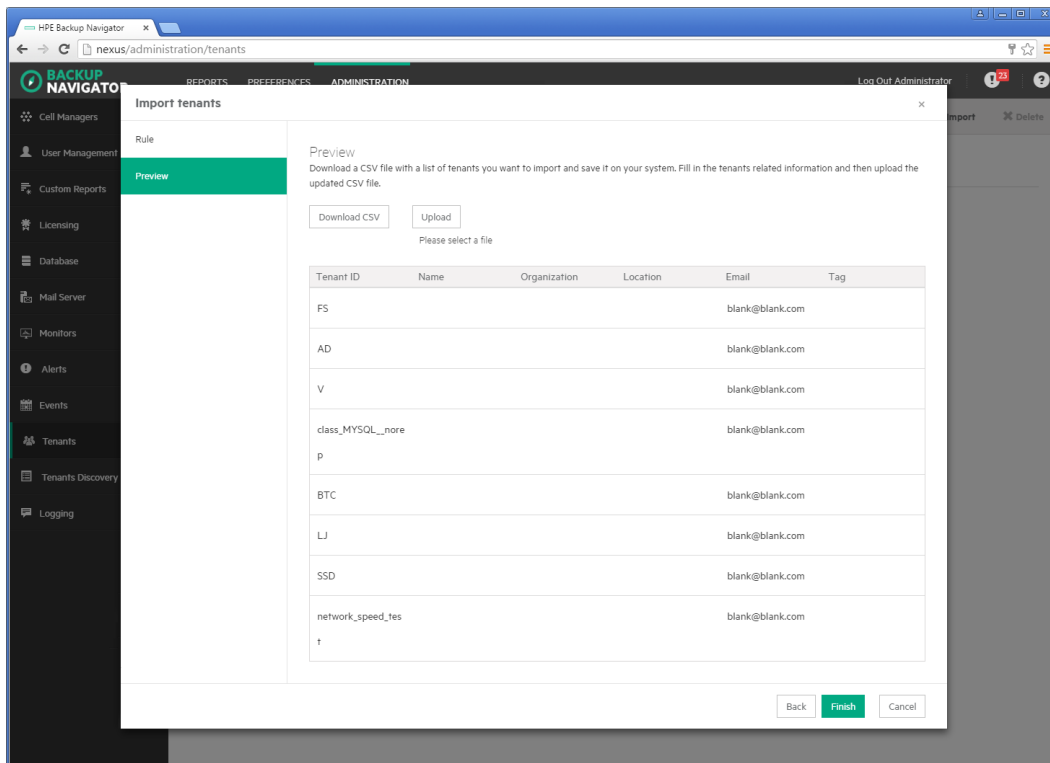
> **Note:** You can delete the `tenants.csv` file from your system after uploading it to HPE Backup Navigator.

Creating tenants

You can add one or more tenants using the existing tenants discovery rule or your custom definition.

Steps

1. Select the **Administration** context.
2. In the Navigation Pane, click **Tenants**.
3. In the Tool bar of the Results Area, click **New**.
4. In the New tenant wizard, select **New tenant**. Click **Next**.
5. In the Discovery rule page, select **Discovery rule** and the existing tenants discovery rule from the drop-down list, if you want to use the existing rule for creating a tenant. If you want to use your custom definition to create a new tenant, select **Custom definition**. Click **Next**.

Figure 24: Creating new tenants with custom definition
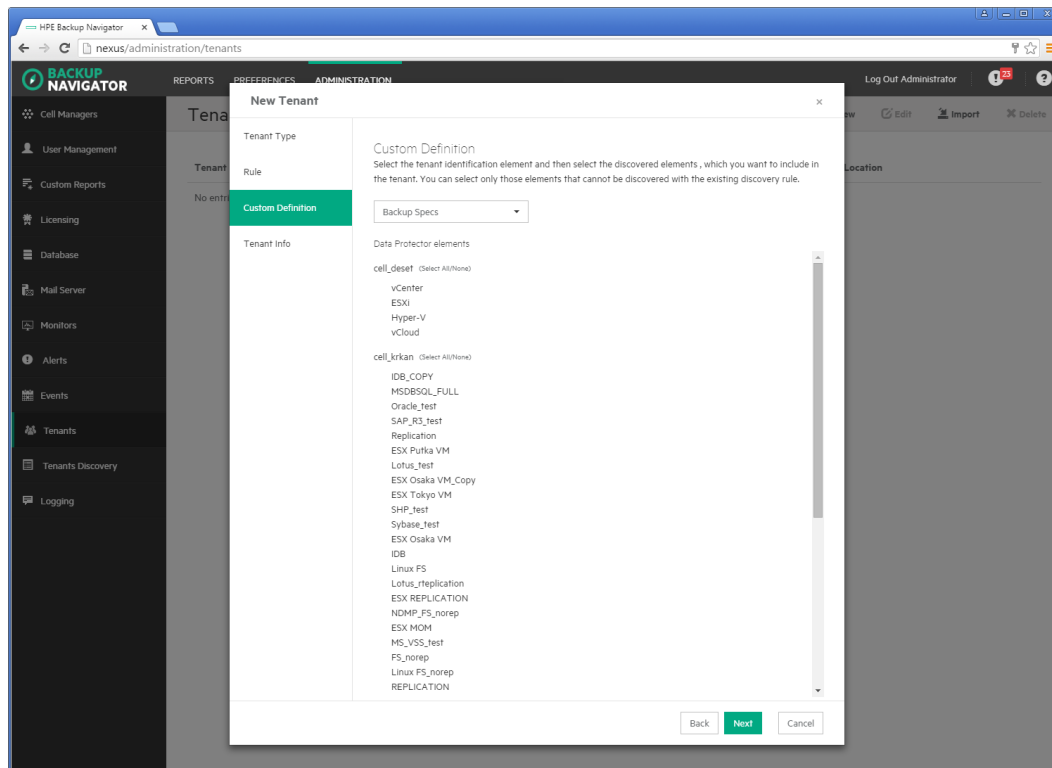
6. If you select custom definition, the Custom Definition page displays.Select the HPE Data Protector element identifying a new tenant, then select the discovered elements that you want to include in the tenant.

> **Note:** The list includes only those elements that cannot be discovered with the existing discovery rules.

   Click **Next**.

7. In the Tenant Info page, provide the tenant related information in the input text boxes. You can add a new tenant to an existing tenant group by selecting a tenant group name from the Tenant group drop-down list. Click **Finish**.

   The newly created tenant is added to the tenants list. It is also added to the Scope settings and is visible in the Navigation Pane. You can later add it to a tenant group, edit its properties, or delete it.

Creating tenant groups

You can group multiple tenants that share some common characteristics (for example, location) by creating a tenant group.

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Tenants**.

3. In the Tool bar of the Results Area, click **New**.

4. In the New tenant wizard, select **Tenant group**. Click **Next**.

Figure 25: Creating tenant group
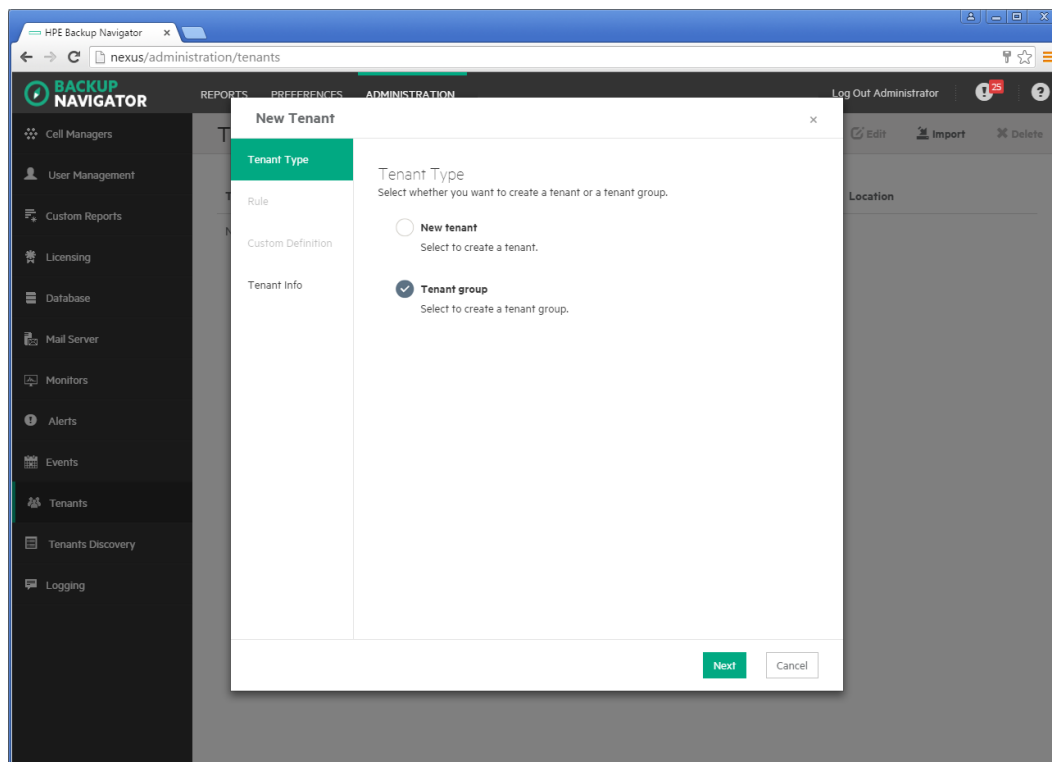
5. In the Tenant Info page, provide the tenant group related information in the input text boxes. Select the tenants that will be the members of the group. Click **Finish**.

The newly created tenant group is added to the tenants list. It is also added to the Scope settings and is visible in the Navigation Pane. You can later add it to a parent tenant group, add new tenants to it, edit its properties, or delete it.

HPE Backup Navigator logging

Configure logging to analyze and troubleshoot the entire HPE Backup Navigator operation and the reporting functionality.

- To configure logging on the HPE Backup Navigator system, see "Configuring logging on HPE Backup Navigator" on the next page.
- To configure logging on the HPE Backup Navigator remote agent system, see "Configuring logging on the remote agent" on the next page.

Configuring logging on HPE Backup Navigator

Steps

1. Select the **Administration** context.

2. In the Navigation Pane, click **Logging**.

3. Select **Enable logging**.

   Figure 26: Logging settings
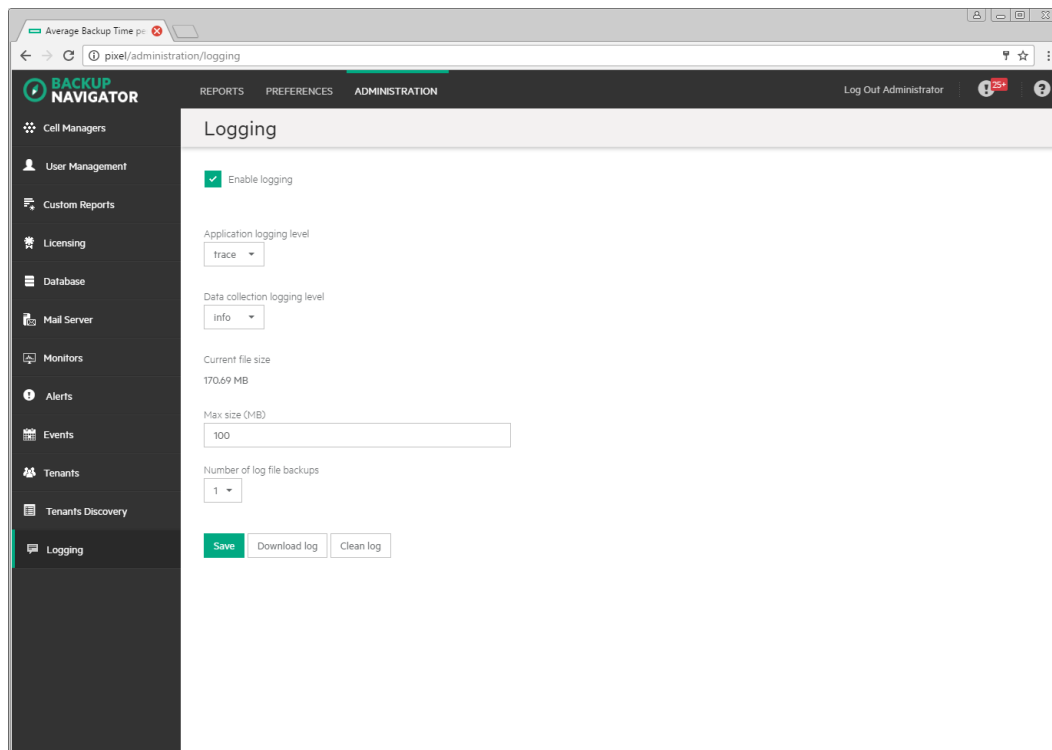
4. Set logging levels for application related operations and data collection operations. Modify other fields according to your needs.

5. Click **Save**.

6. If you want to view the log file, click **Download log**. If you do not need data from the current log file, click **Clean log**.

You can always change these settings later.

Configuring logging on the remote agent

On the HPE Backup Navigator remote agent, the logging is enabled automatically. By default, the logging level is set to INFO. The available logging levels are:

- TRACE

- DEBUG

- INFO
- WARN
- ERROR
- FATAL

You can change the default logging level.

Steps

1. Stop the HPE Backup Navigator Remote Agent service.

   On Windows:

   In the Windows Task Manager->Services, locate and right-click **BNAgentService**, and then click **Stop**.

   On RedHat, CentOS, and SUSE 11.x: Run the following command:

   `# service remote-agent stop`

   On SUSE 12.x: Run the following command:

   `# systemctl stop remote-agent`

2. Change the `level` parameter in the `logger` tag to the desired level. The variables are located at:

   On Windows: `<BN_installation_directory>`\HPE Backup Navigator `Remote Agent\logback.xml`

   On Linux: `/opt/remote-agent/logback.xml`

   > **Example of setting logging level to ERROR**
   >
   > For agent core: <logger name="agent.core" additivity="true" level="ERROR">
   > For agent util_cmd:<logger name="agent.util_cmd" additivity="true" level="ERROR">

3. Start the HPE Backup Navigator Remote Agent service.

   On Windows:

   In the Windows Task Manager->Services, locate and right-click **BNAgentService**, and then click **Start**.

   On Linux: Run the following command:

   `# service remote-agent start`

Chapter 7: About Reports

The key HPE Backup Navigator feature is a visual presentation of complex data. To achieve a comprehensive and precise input data presentation and visualization, and to deliver the desired information clearly and effectively, HPE Backup Navigator provides a set of predefined reports and tools that help to tailor the reports to meet your needs.

Report visualization and delivery

All reports can be viewed in a dashboard area of the HPE Backup Navigator user interface. Reports can be presented as a table with access to all input data or as a chart to visualize this data. The following report chart types are used to visualize the selected reports: column chart, bar chart, pie chart, line chart, or area chart.

Besides viewing reports in the web browser, HPE Backup Navigator enables you to subscribe to reports to receive them automatically by email at a specified time, as well as to export them to a wide variety of formats, including PDF, XLSX, CSV, DOCX, PPTX, and HTML. You can choose the format that provides you with the most convenient way of exploring reports.

Report exploration

To easily gain insight into the data used for a specific report, and to enhance reporting and analysis capabilities, the following is available:

Table view: You have an option to view all the data used for generating a report as a table. In the table, you can sort values in the columns according to the available parameters.

Related reports: A majority of the reports contain references to other reports with related content. A related report is a logical report in the sequence and is presented on the same scope as the original report.

Drill-down functionality: You can examine report data in more detail by using the drill-down functionality. Navigate from the report of your interest to the connected reports, each time with deeper insight into the data, and discover the data you need.

Scope: To ensure that your reports contain only the data that you currently require for your specific purposes, you can limit the scope of your reports only to certain HPE Data Protector cells, or tenants, or to certain groups of the IDB data (for example, devices, device pools, media, media pools, clients).

Reports and report categories

The predefined set of reports covers all aspects of the HPE Data Protector functionality. Reports are logically divided into four main categories, each containing subcategories. Depending on the information about your backup environment that you want to retrieve, you can choose a report from the following report categories:

- "Overview" on the next page.
- "Monitoring" on page 78.

- "Capacity" on page 78.
- "Performance" on page 81.

Each report can be adjusted to your needs by specifying additional parameters, which are specific for each report, such as a time interval, sorting order, units, and similar. You can set a report as your favorite to access it quicker later on and to be able to subscribe to it. Administrators can create custom reports that are based on the collected data. If you set filters for the input data, only the data from the selected cells and specified data groups is considered.

Some reports cannot be accessed from the Navigation Pane, they are dependent on other reports and can be accessed only when using the drill-down functionality:

"Drill-down reports" on page 81.

Overview

Overview reports summarize data on your backup environment.

Infrastructure Summary	
Cell Manager Status	Shows health statuses that can be retrieved from a Cell Manager for the following objects: Cell Manager services, IDB, licenses (whether HPE Data Protector licenses are available on the Cell Manager), agent status (whether data can be collected from the Cell Manager), Cell Manager mode.
Operating Systems Overview	Shows which operating systems exist and the number of clients running on these operating systems.
DP Components	Shows a list and a number of the installed HPE Data Protector components.
List of Backup Specs	Shows all backup specifications and their properties.
Backup Spec Overview	Shows a number of the backup specifications of a particular object type (Filesystem, IDB, client backup, and so on).
Clients Without Backup Spec	Shows a number of clients for which no backup specification is created and consequently they are not being backed up.
Application Overview	Shows applications running on particular PostgreSQLs (database PostgreSQLs, storage volumes, or virtual machines) and clients. The report includes application type (Filesystem, Oracle, Exchange, VEAgent, and so on), retention value, time since the last successful backup (RPO), and the estimated restore time objective (RTO). Application type Unknown refers to the clients that are not not protected with HPE Data Protector backup.

Sessions Summary	
List of Sessions	Shows all finished sessions, their statuses and properties.
Sessions per Session Status	Shows a number of the performed sessions and their statuses.
Sessions per Time and Status	Shows a number of sessions performed on a particular day and their statuses.
Sessions per Session Type	Shows a number of the performed sessions and the session type, such as, backup, consolidation, copy, media management, replication, and restore.
Sessions per Backup Object	Shows a number of sessions and their statuses for all backup object types (for example, Filesystem, IDB, Oracle, MS SQL, and so on).
Sessions per Client	Shows a number of sessions performed on a particular client and their statuses.
Session Flow per Client	Shows the backup sessions duration for all clients.
Session Flow per Backup Spec	Shows the backup sessions duration and statuses for all backup specifications.
Sessions per Data Location	Shows the backup sessions for the selected data source (Backup specification, Hostname, Session ID) and the selected data location (Device, Media, Media Location, Media Pool).

Data Protection Summary	
Session Success	Shows the percentage of successful (completed without errors) and unsuccessful backup sessions.
Number of Backup Versions	Shows a number of performed backups of a particular backup type (Full, Incremental, Differential, and Transaction Log backup) for all backup specifications.
Time Since Last Successful Backup	Shows the time passed since the last successful backup for all backup specifications.

Devices Summary	
List of Devices	Shows all devices that are configured for use with HPE Data Protector. The report includes information on libraries that are configured to be used with HPE Data Protector, but are not used so far (Library Utilization). The report can be generated for libraries and drives.
Device Utilization	Shows the changing percentage of the device utilization for all devices.

Devices Summary	
Session Flow per Device	Shows the backup sessions duration for all devices (libraries and drives).

Media Summary	
Media Summary per Pool	Shows a number of media and their quality (Good, Fair, and Poor) in all media pools.
Media Quality Summary	Shows a number of errors and overwrites on all media.

Backup Time Summary	
Backup Schedule Drive Detail	Shows the backup schedule for drives specified for the scheduled backup sessions and the related backup specifications. If a conflict in the drive usage is recognized (the same drive is specified for the simultaneous backup sessions), an additional bar shows such conflict.[1]
Backup Schedule Overview	Shows the backup schedule for the configured backup specifications and the eventual conflicting backup sessions.[2]
Average Backup Time per Backup Spec	Shows an average duration of the backup session for a particular backup specification.
Average Backup Time per Client	Shows an average duration of the backup session on a particular client.
Top Time Difference per Backup Spec	Shows the biggest time difference that occurs when running backups using the same backup specification.
Average Backup Time per VM	Shows an average duration of the backup session on a particular virtual machine. It can help you to figure out, on which virtual machines a backup takes more time.

Errors Summary	
Most Unreliable Clients	Shows a number of errors and warnings that occurred on a particular client. Most unreliable clients are those with the highest number of errors.
Most Unreliable Devices	Shows a number of errors and warnings that occurred on a particular device. Most unreliable devices are those with the highest number of errors.
Most Unreliable Backup Specs	Shows a number of errors and warnings that occurred for a particular backup specification. Most unreliable backup specifications are those with the highest number of errors.

[1]Information on sessions scheduled with the HPE Data Protector Advanced Scheduler is not included.
[2]Information on sessions scheduled with the HPE Data Protector Advanced Scheduler is not included.

Errors Summary	
Most Unreliable Media	Shows a number of errors that occurred on a particular medium. Most unreliable media are those with the highest number of errors.
Backup Spec Errors Timeline	Shows a number of errors and warnings that occurred using a particular backup specification in a timeline.
Device Errors Timeline	Shows a number of errors and warnings that occurred on a particular device in a timeline.
Client Errors Timeline	Shows a number of errors and warnings that occurred on a particular client in a timeline.
Media Errors Timeline	Shows a number of errors and warnings that occurred on a particular medium in a timeline.
Most Unreliable VMs	Shows a number of unsuccessful sessions that occurred on a particular virtual machine. Most unreliable virtual machines are those with the highest number of the failed sessions.

VM Infrastructure	
VMs Vs Physical Clients	Shows the percentage of the physical clients and virtual machines in your backup environment, both protected and not protected.
Virtual Vs Physical Environment	Shows how the number of physical clients and virtual machines changes in your backup environment.
VMs per Hypervisor Type	Shows the percentage of virtual machines distribution between the hypervisor types (VMware and Hyper-V).
VMs in Time Period	Shows how the number of virtual machines of different hypervisor types (VMware and Hyper-V) changes in your backup environment.
VMs per Datacenter	Shows the distribution of the VMware virtual machines between datacenters.
VMs per Hypervisor Host	Shows the distribution of virtual machines between host machines.

VM Session Summary	
VM Backup Status Overview	Shows a number of sessions performed on virtual machines and their statuses.
VM Backup Session Success	Shows the percentage of successful (completed without errors) and unsuccessful backup sessions for the virtual environment.

VM Session Summary	
VMs Without Backup	Shows a number of virtual machines that are not being backed up.

Monitoring

Monitoring reports display data on currently running sessions and active devices.

Monitoring Reports	
Sessions in Progress	Shows the currently running sessions, the sessions start time, estimated finish time, and statuses.
Active Devices	Shows the backup devices that are currently used for the running sessions, the sessions start time, estimated finish time, and statuses.
Devices Overview	Shows a list of backup devices that are used for sessions.

Capacity

Capacity reports provide information on the amount of the backed up data, available space on media and in the IDB, and compression rates when using the deduplication technology. This helps you to diagnose capacity trends and improve future planning.

Backup Capacity	
Transfer Size per Backup Spec	Shows an amount of the transferred data for a particular backup specification.
Transfer Size Prediction	Shows a growth of the transferred data. It also provides an estimated amount of the transferred data for the future.
Transfer Size per Device	Shows a size of the transferred data for a particular device.
Transfer Size per Media Pool	Shows an amount of the data transferred to a particular media pool.
Transfer Size per Application Type	Shows an amount of the transferred data depending on the application type (for example, Filesystem, IDB, Oracle, SQL, Virtual Environment, and so on).
Top Backup Transfer Size Changes	Shows the biggest growth of transfer size for the same backup specification for full and incremental backups.
Transfer Size	Shows a transfer size of the data that was backed up from or restored to a particular source (cell, tenant, client, or application) within a specified timeframe.

Media Capacity	
Media Pool Capacity	Shows the amount of space available for storing the backed up data in all media pools. The amount of used and free space is indicated.
Protected Capacity	Shows the amount of space on the media that are protected from being overwritten on the specified date.
Data Protection Expiration	Shows the amount of space on the media that are protected from being overwritten. It also provides information, whether the data protection is permanent or will expire after a period of time.

Dedupe Capacity	
Dedupe Rate per Backup Spec	Shows the amount of data that is backed up and compressed using a deduplication technology and the original size of this data for all backup specifications.
Dedupe Savings per Backup Spec	Shows the amount of space on media that was saved by using a deduplication technology during backup for all backup specifications.
Dedupe Rate Timeline per Backup Spec	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data for all backup specifications in a timeline.
Dedupe Rate per Client	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data on all clients.
Dedupe Savings per Client	Shows the amount of space on media that was saved by using a deduplication technology during backup on all clients.
Dedupe Rate Timeline per Client	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data on all clients in a timeline.
Dedupe Rate per Device	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data on all backup devices.
Dedupe Savings per Device	Shows the amount of space on media that was saved by using a deduplication technology during backup for all backup devices.
Dedupe Rate Timeline per Device	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data on all backup devices in a timeline.

Dedupe Capacity	
Dedupe Rate Prediction	Shows the amount of the data that is backed up and compressed using a deduplication technology and the original size of this data for all backup specifications as well as an estimated amount of the backed up data within the future timeframe. It also provides information on the device capacity[1].

IDB Capacity	
IDB Capacity Summary	Shows the current size of the HPE Data Protector IDB and the size of each of the IDB parts, such as Media Management Database (MMDB), Catalog Database (CDB), Detail Catalog Binary Files (DCBF), Serverless Integrations Binary Files (SIBF), and Session Messages Binary Files (SMBF).
CDB Capacity Summary	Shows the current size of the HPE Data Protector CDB and of the records it contains, such as sessions (backup, restore, object copy, object consolidation, object verification, and media management), backed up objects, their versions and object copies, positions of backed up objects on media, and filenames of the backed up files.
MMDB Capacity Summary	Shows the current size of the HPE Data Protector MMDB and of the records it contains, such as, devices, stores, cartridges, compounds, pools, and media.
IDB Capacity Growth	Shows the size changes of the HPE Data Protector IDB and each of its parts, such as MMDB, CDB, DCDB, SIBF, and SMBF.
CDB Capacity Growth	Shows the size changes of the HPE Data Protector CDB and of the records it contains.
MMDB Capacity Growth	Shows the size changes of the HPE Data Protector MMDB and of the records it contains.

VM Capacity	
Transfer Size of VMs Vs Physical Clients	Shows the percentage of the transfer size in the virtual environment and in the physical environment.
Transfer Size per Hypervisor Type	Shows the percentage of hypervisor types (VMware and Hyper-V) in the virtual environment transfer size.
Transfer Size per Datacenter	Shows the distribution of the VMware virtual clients transfer size between datacenters.

[1]Information on the StoreOnce device capacity is available with HPE Data Protector 9.02 and newer versions.

VM Capacity	
Transfer Size per Hypervisor Host	Shows the distribution of virtual clients transfer size between the host machines featuring the host machine hypervisor type and location.
Transfer Size per VM	Shows an amount of the transferred data on a particular virtual machine.
VM Backup Capacity	Shows an amount of the data backed up in the virtual environment.
VM Backup Capacity per Hypervisor Type	Shows volume changes of the data backed up in the virtual environment for each hypervisor type (VMware and Hyper-V).
VM Backup Capacity per Datacenter	Shows volume changes of the data backed up in the VMware virtual environment for each datacenter.

Performance

Performance reports provide information on device and media performance as well as on different aspects of the data transfer rate during the sessions.

Client Performance	
Backup Transfer Rate per Backup Spec	Shows a data transfer rate during the backup sessions for all backup specifications.
Backup Transfer Rate per Client	Shows a data transfer rate during the backup sessions on all clients.
Copy Transfer Rate	Shows a data transfer rate during the copy sessions on all clients.

Device Performance	
Device Transfer Rate	Shows a minimum, maximum, and average data transfer rate on all devices.
Media Transfer Rate	Shows a data transfer rate during the backup sessions on all media.

Drill-down reports

These reports can be accessed only when you use the drill-down functionality. Therefore, they provide only information related to the selection in the parent report. The reports are available only in a tabular view.

Lists	
Cell Manager Services	Shows a list of the HPE Data Protector services running on the Cell Manager and their health statuses.
Agent Status	Shows health status for collecting data from the Cell Manager (agent status) and the following information on this Cell Manager: HPE Data Protector version, Cell Manager mode, capacity, and other properties.
IDB Health	Shows health status for the HPE Data Protector IBD.
Licenses	Shows health status for the HPE Data Protector licenses availability on the Cell Manager.
List of Backup Spec Objects	Shows all backup objects specified in a particular backup specification and their properties.
Backup Spec Changes	Shows a list of all versions of the selected backup specification.
Backup Specification	Shows the content of the selected version of the changed backup specification.
List of Objects	Shows all backed up objects and their properties.
Session Output	Shows a report on a particular session. It contains messages on session flow, statistics, status, and results. In case of errors, it also provides error messages.
Single Session Report	Shows statistics and properties on a particular session.
List of Clients	Shows all clients and their properties.
List of Media Pools	Shows all media pools and their properties.
List of Media	Shows all media and their properties.
List of VMs	Shows all virtual machines and their properties.
Application RPO	Shows a list of backup sessions with the protected backup data and their RPO[1] status. The RPO breach and warning issue values are specified in the RPO monitor.
Application RTO	Shows a list of backup sessions with the protected backup data and their RTO[2] status. The RTO breach and warning issue values are specified in the RTO monitor.
Session Flow per Backup Specification	Shows the backup sessions duration and statuses for all backup specifications.

[1]Recovery Point Object (RPO) refers to the amount of time since the last successful backup.
[2]Recovery Time Object (RTO) refers to the amount of time required to restore (recover) the backed up data.

Lists	
Drive Properties	Shows the drive an library properties.
Library Properties	Shows the device properties.

How to manage reports

This chapter provides short instructions on how to use the predefined reports and how to adjust their presentation.

You can log in to the HPE Backup Navigator system with your Windows session credentials. You can use the HPE Backup Navigator functionality if your account is recognized as a HPE Data Protector administrator. The available reports contain data collected from the Cell Managers, where your user account is added to the Admin user group. You can perform the following tasks:

- "Configuring dashboard layout" below.
- "Creating and editing filters" on page 85.
- "Generating reports" on page 86.
- "Adding reports to favorites" on page 87.
- "Subscribing to reports" on page 88.
- "Exporting reports" on page 89.
- "Sending reports by email" on page 89.
- "Using drill-down functionality" on page 89.

You can update your HPE Backup Navigator profile, as described in "Configuring user profiles" on page 91. If you want to set your region or specify the date format, see "Configuring region settings" on page 91.

Configuring dashboard layout

Adjust the dashboard layout for each report category to your needs.

Prerequisite

The report you want to add to dashboard, is added to your favorites. This report has the same scope and parameters as the favorite report.

Steps

1. Select the **Reports** context.
2. In the Navigation Pane, select the report category (**Overview, Monitoring, Capacity, Performance**), for which you want to configure the dashboard layout.
3. In the Results Area, the default dashboard layout is displayed.

Figure 27: Default dashboard layout
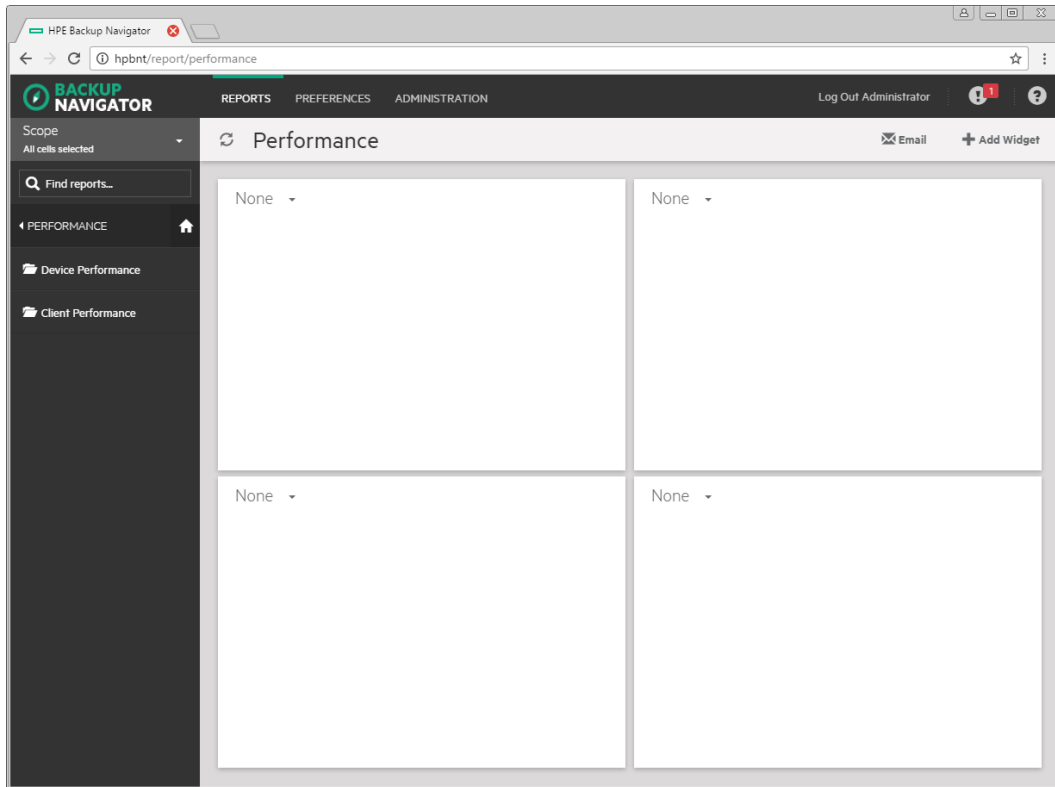
4. In the empty widget, click the arrow and select the available report, which you want to be displayed in this widget. You can later change this report or delete it.

5. To add new more widgets to your dashboard (up to 16), click **Add Widget** in the Tool bar. You can change the size and position of the widget, and delete it from the dashboard.

Figure 28: Configuring dashboard layout
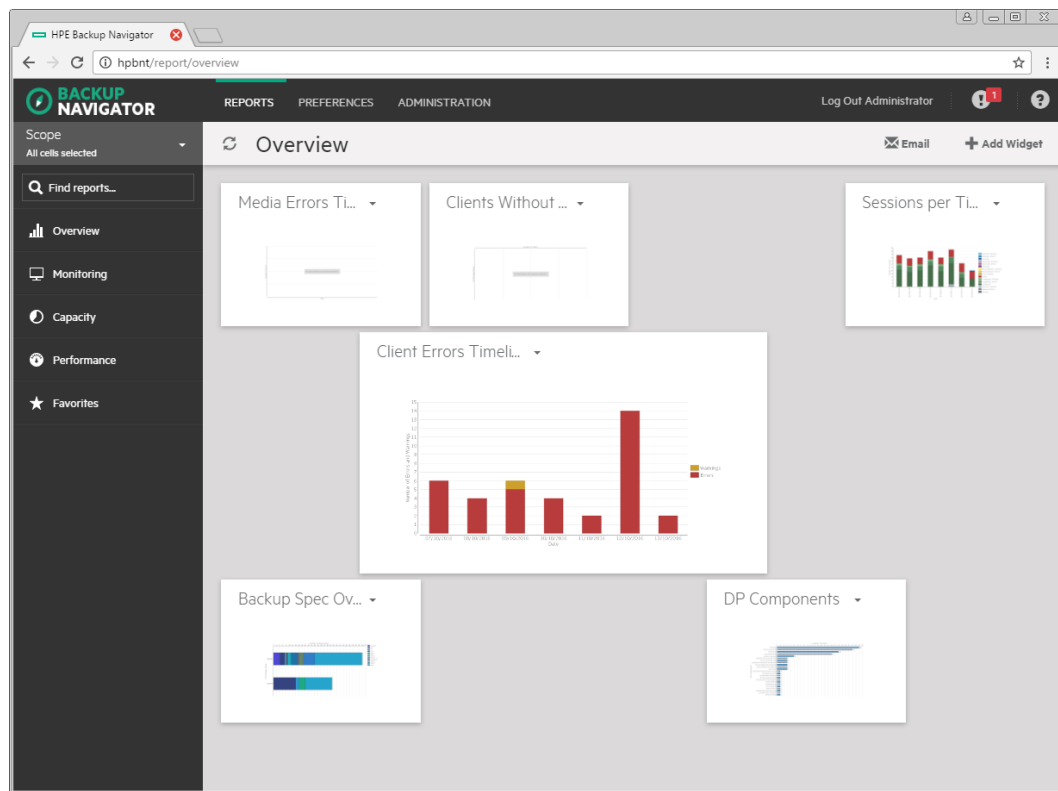
The dashboard layout is save automatically.

Creating and editing filters

Create a filter to limit the input data for your reports. The input data is information on your HPE Data Protector backup environment received from the HPE Data Protector IDB and stored in the HPE Backup Navigator database in a similar way.

Steps

1. Select the **Preferences** context.

2. In the Navigation Pane, click **Filters**.

3. In the Tool bar of the Results Area, click **New**.

4. In the New filter dialog box, name your filter and enter its description.

   From the available HPE Data Protector cells, select the input data for your reports. You can select the entire cell to collect all data stored in the IDB or only a specific group of the IDB data (for example, devices, device pools, media, and so on). Any number of cells and groups of the IDB data can be selected. The selection represents your new filter.

Figure 29: Configuring filters
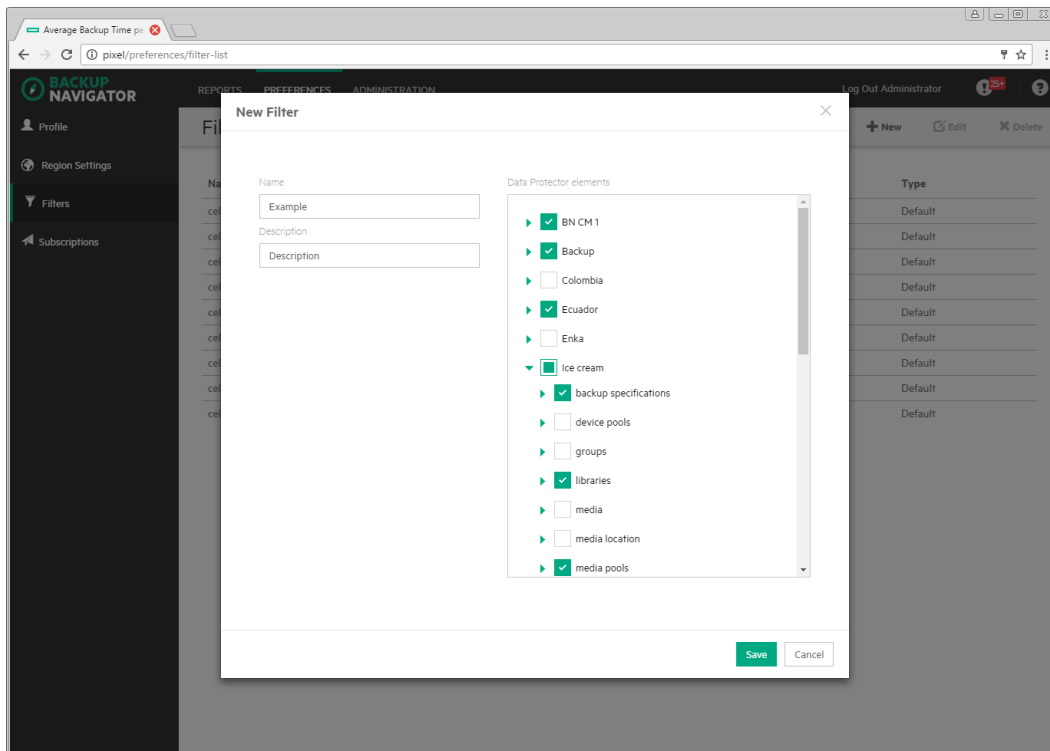
5. Click **Create filter**. The new filter is visible in the Navigation Pane.

To edit a filter, click the desired filter, change the filter selection and apply your changes.

Generating reports

Update a report with the current data from the HPE Backup Navigator database.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, click **Scope**, and the select **Cells**, **Filters**, or **Tenants**.

3. Select cells or filters to limit your input data, and then click **Apply**.

4. In the Navigation Pane, select the report category and then navigate to the report that you want to generate. You can also search for it by using **Find reports**. The selected report is displayed in the Results Area.

5. In the Tool Bar of the Results Area, specify available parameters according to your needs and then click **Generate**.
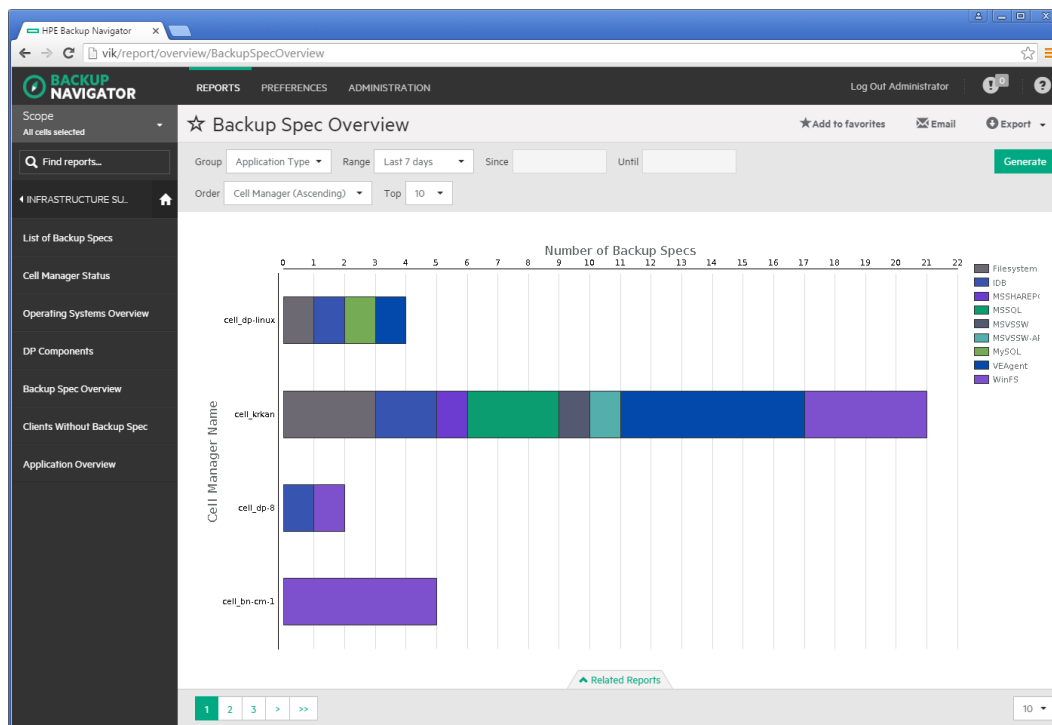
You can view the report in a chart or in a table format:

- Use the **Related Reports** tab to see references to the reports that are related to the current one.

- Use numbers and arrows in the bottom left corner of the report to switch between the report related pages. For example, between a graphical and tabular report presentation or between pages of a table.

- Use the drop-down list in the bottom right corner of the report to specify the number of table rows you want to display on one page.

Adding reports to favorites

Add a report to your favorites to access it quicker next time when you need it, to be able to subscribe to it, and to view it within the specified scope and parameters set.

Steps

1. Select the **Reports** context.
2. In the Navigation Pane, select the report category and then the report that you want to add as your favorite. The selected report is displayed in the Results Area.
3. Change the report parameters according to your interest and click **Generate**.
4. In the Tool Bar, click **Add to favorites**.
5. In the Favorites dialog box, you can enter a name for your favorite report or leave its predefined name.
6. Click **Save favorite**. The report is added to Favorites in the Navigation Pane.

A report is saved with the parameters that were defined when you saved it to favorites. You can edit or remove your favorite report later.

Subscribing to reports

Subscribe to a report to receive it regularly by email.

Prerequisite

The report you want to subscribe to, is added to your favorites. This report has the same scope and parameters as the favorite report.

Steps

1. Select the **Reports** context.
2. In the Navigation Pane, under Favorites, select the report, to which you want to subscribe. The selected report is displayed in the Results Area.
3. In the Tool Bar, click **Subscribe**.

   Figure 30: Subscribing to reports
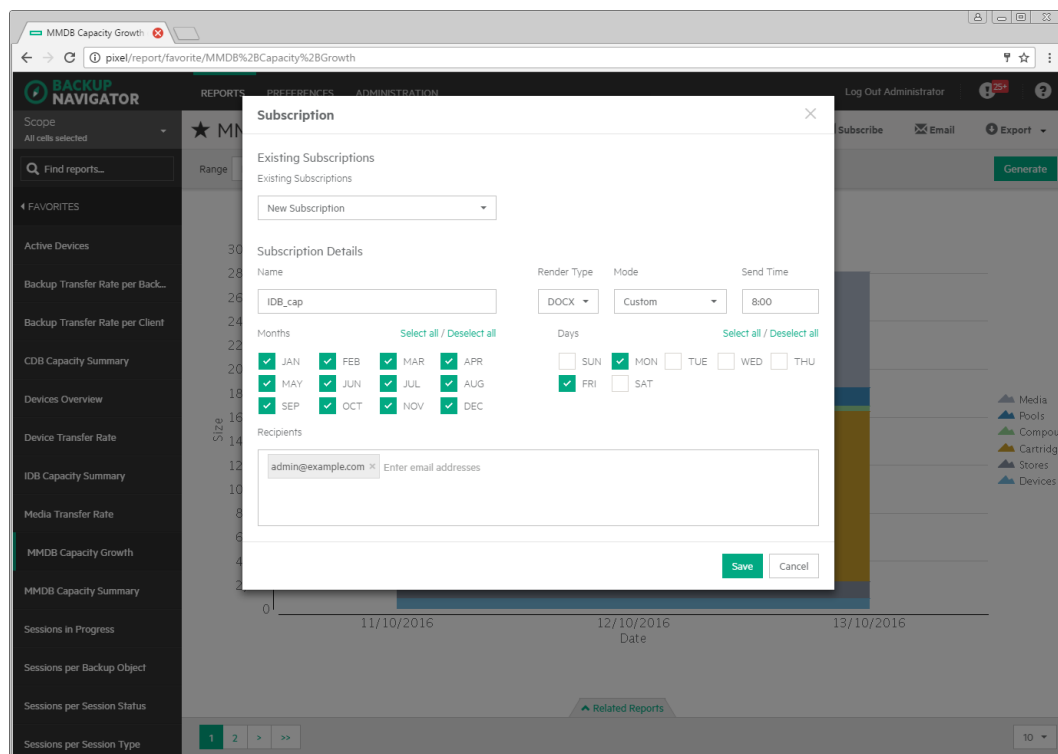
   - Enter a subscription name.

   - Specify time, select months of a year, and days of a week.

   - Enter one or more email addresses, or a mailing list.

4. Click **Save**. Your subscription is added. To review it, select the **Preferences** context and then click **Subscriptions** in the Navigation Pane.

You can always update your subscriptions later.

Exporting reports

Export a report to various formats.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, select the report that you want to export to one of the available formats. The selected report is displayed in the Results Area.

3. In the Tool Bar, click **Export**.

4. Select the desired format (**PDF, XLSX, CSV, DOCX, PPTX, HTML**) to download and view the report.

Sending reports by email

Send a report by email to one or more recipients.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, select the report that you want to send by email. The selected report is displayed in the Results Area.

3. In the Tool Bar, click **Email**.

4. Enter a subject and recipients email addresses.

5. Click **Send**.

You can also send all reports displayed in the dashboard.

Using drill-down functionality

Examine your report data in a more detail by using the drill-down functionality. You can find out the reason for deviated or error behavior in your environment.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, select the report category and then the report that you want to examine. The selected report is displayed in the Results Area.

3. Click an item of your interest inside the graphical report view.

Figure 31: Drill-down reports
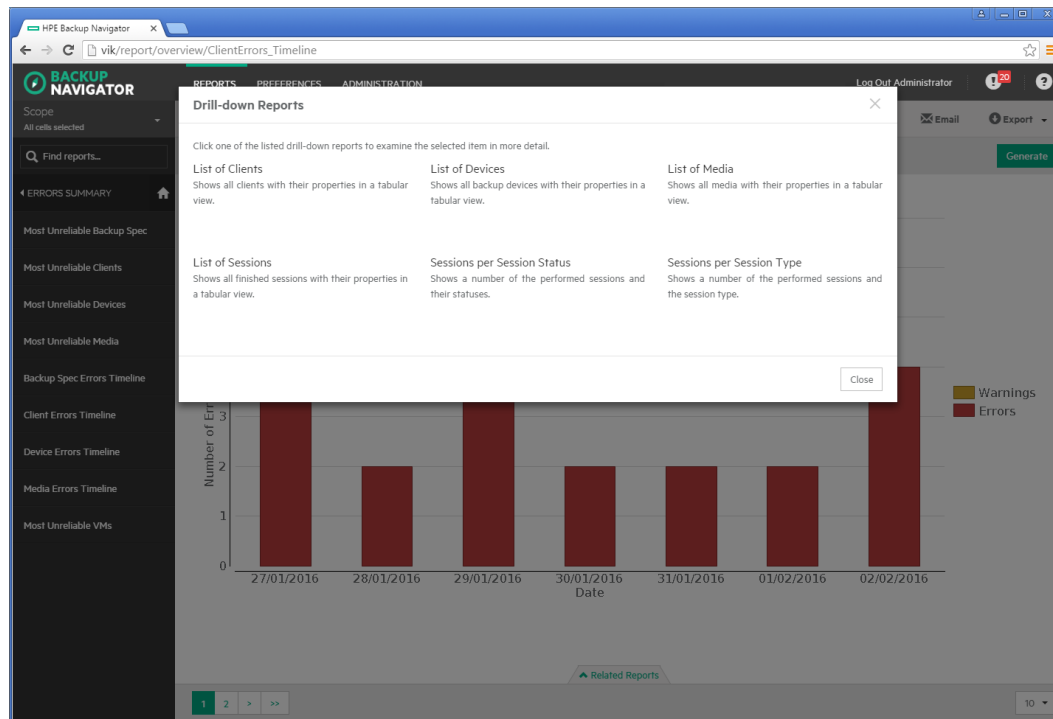
4. In the pop-up window, click one of the available drill-down reports to examine your report data in more detail.

5. Continue to drill down the subsequent reports.

Example of using drill down 1

This example describes how to find the reasons for the failed sessions.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, select **Overview > Sessions Summary > Sessions by Session Status**.

3. In the Results Area, click on the pie chart sector, which represents failed session. A window with links to the available drill-down reports pops up.

4. In the pop-up window, click **Most Unreliable Backup Spec**.

5. Select a backup specification with the highest number of errors and click on the bar area of this backup specification, which represent errors.

6. In the pop-up window, click **List of Sessions**.

7. Select the backup session that you want to examine and click on it.

8. In the pop-up window, click **Session Output**. A session report opens.

9. Examine the messages in the session report to find out the reason of the session failure.

Example of using drill down 2

This example describes how to identify the location of the most unreliable medium that will soon be released from protection and available for writing data again.

Steps

1. Select the **Reports** context.

2. In the Navigation Pane, select **Capacity > Media Capacity > Data Protection Expiration**.

3. In the Results Area, click on the bar, which represents the media where data protection will expire soon. A window with links to the available drill-down reports pops up.

4. In the pop-up window, click **Media Summary per Pool**.

5. Select the media pool that contains media of poor quality and click on the part of the bar that represents media pools of the poorest quality.

6. In the pop-up window, click **Media Quality Summary**.

7. Select the medium with the highest number of errors, overwrites, or both and click on the corresponding bar.

8. In the pop-up window, click **Most Unreliable Media**.

9. Select the medium with the highest number of errors and click on the corresponding bar.

10. In the pop-up window, click **List of Media**.

11. Examine the media properties to identify the location.

Configuring user profiles

Configure your profile as an HPE Backup Navigator user.

Steps

1. Select the **Preferences** context.

2. In the Navigation Pane, click **Profile**.

3. Modify the desired fields.

4. Click **Save**.

You can always change these settings later.

Configuring region settings

You can specify your region settings and or change the date format.

Steps

1. Select the **Preferences** context.

2. In the Navigation Pane, click **Region settings**.

3. Select your region and date format.

4. Click **Save**.

You can always change these settings later.

Chapter 8: Troubleshooting

If you encounter problems when using HPE Backup Navigator, you can often solve them yourself. This chapter is intended to help you.

Before you report the problem to the HPE Customer Support Service, ensure that:

- You are not running into known limitations that cannot currently be overcome. For specific information on HPE Backup Navigator limitations and recommendations, as well as known problems, see the *HPE Backup Navigator Release Notes*.

- Your problem is not related to third-party hardware or software. In this case, contact the respective vendor for support.

- You have appropriate prerequisite software installed and configured according to the instructions provided in this guide.

- The system is not running low in space.

How to troubleshoot

When a problem occurs, you can try to solve it by yourself. If you do not succeed in eliminating a problem, prepare all the relevant information for HPE Customer Support Service, and send this data to them.

- On how to recognize a problem, see "How to recognize a problem" below.

- On how to perform general checks to determine the cause of a problem and try to resolve it, see "General checks" on the next page and "Log files" on page 96.

- On how to collect necessary data to send to HPE Customer Support Service, see "Collecting data for HPE Customer Support" on page 97.

How to recognize a problem

You usually recognize a problem in HPE Backup Navigator, when you cannot perform some tasks or encounter errors. You can also get information on possible errors from the following sources:

- HPE Backup Navigator event log

  Errors on HPE Backup Navigator related operations are reported to the event log. To view the event log, see "Viewing events" on page 61.

- Cell Manager properties

  For some problems, the error messages are issued and can be seen in the Cell Manager property page as Agent messages. The following error messages are available:

  - `Networking issue`: HPE Backup Navigator cannot connect to the Cell Manager. Usually occurs when network is not properly configured, or during the configuration, the following networks specific configuration was not considered: firewall port range, enabled security on the Cell

Manager, use of encrypted mode on the Cell Manager. Ensure, that all network-related prerequisites are met. If the problem persists, perform the network related checks described in "General checks" below.

- `CM connection issue`: HPE Backup Navigator cannot communicate with the Cell Manager. Ensure, that the hostname and INET port of the Cell Manager errors are correct. If they are not, delete this Cell Manager from the list and then add it with the correct values. For instructions, see "Administration Tasks" on page 40. Otherwise, perform the communication related checks described in "General checks" below.

- `Database problem`: HPE Backup Navigator database is not available. Ensure that the specified database settings are correct. To view and change the database settings, click **Administration -> Cell Managers -> Edit**.

- `General exception`: The error occurred at an unexpected time. Check the `agent_core.log` file and search logs marked `FATAL` and then find this problem details in `agent_util_cmd.log`. For information on log files, see "Log files" on page 96.

General checks

Perform the following checks to determine and resolve the problem:

1. Verify installation

   If you installed HPE Backup Navigator using the automatic installation script, check, if any errors were reported in the `/var/log/hpe-backup-navigator/hpe-backup-navigator-install.log` file. If you used manual installation, you should manually verify if all HPE Backup Navigator prerequisites were installed and configured correctly.

2. Verify configuration

   Check, if any errors occurred during the database or user configuration were reported to the HPE Backup Navigator log files. Depending on whether you installed or upgraded HPE Backup Navigator, the errors are reported to the `install.log` or `upgrade.log` file located in the `/opt/dpa-ext/logs` directory.

3. Verify HPE Backup Navigator functionality

   If you have problems with using HPE Backup Navigator, check the following:

   - The database server is up and running and the connection to the database server is established properly.

   - The scope of the cells selected for reports is not empty. Check this by clicking **Reports -> Scope**. If there is no cell selected for reports or the scope is empty, select the cells you want to get reports for or add the cells to the scope respectively. See "Selecting cells" on page 41.

   - The initial data collection is finished. Check this by clicking **Administration -> Cell Managers**. In the Cell Managers settings table, check, if the Agent messages column contains the `Initial data collection` message. Wait until the initial data collection is finished.

4. Verify network configuration

- Hostname resolution

  For successful communication, HPE Backup Navigatorand HPE Data Protector Cell Managers must resolve each others hosts by the fully qualified domain names (FQDN). Resolving a host means that one host can interpret the FQDN of another host and determine its IP address. Use the `ping` command with the FQDN to verify the hostname resolution on the Cell Manager (to this Cell Manager and to the HPE Backup Navigator system) and on the HPE Backup Navigator system (to the Cell Manager and to this HPE Backup Navigator system).

  To check, whether HPE Backup Navigator resolves the HPE Data Protector Cell Manager hostname, run the following command on the HPE Backup Navigator host:

  # wget *hostname***:***port*

  Where *hostname* is the Cell Manager name, as it is specified in HPE Backup Navigator; *port* is the Cell Manager port (by default, 5555).

- Firewall

  To verify, whether the firewall causes problems, turn it off and wait for the next data collection. If the problem persists, turn on the firewall and continue with your investigation. If the problem is eliminated, ensure, that the firewall port range is the same as in the `omnirc` file on the Cell Manager. For example:

  i. On the HPE Backup Navigator system, run:

     # iptables -L INPUT -n -v

  ii. Ensure that the entry with a specified port range is as follows:

     `0 0 ACCEPT tcp -- * * 0.0.0.0/0 0.0.0.0/0 state NEW tcp dpts:`*XXXX*`:`*YYYY*

     where *XXXX*:*YYYY* is a port range.

- Port range

  On the HPE Backup Navigator system, verify that the `OB2PORTRANGE` environment variable value is the same as in the `omnirc` file on the Cell Manager:

  # echo $OB2PORTRANGE

  If the value is different, update it:

  # echo "export OB2PORTRANGE=\"*XXXXX-YYYYY***\"" >>**
  /etc/profile.d/ob2portrange.sh
  # source /etc/profile.d/ob2portrange.sh

5. Verify communication with the HPE Data Protector Cell Manager

   - Check the connection from HPE Backup Navigator to the HPE Data Protector Cell Manager. On HPE Backup Navigator, run:

     # ping *CellManager_hostname*

   - Check the connection from the HPE Data Protector Cell Manager to HPE Backup Navigator. On the Cell Manager, run:

     # ping *BN_hostname*

   - Check that HPE Data Protector Cell Manager is up and running:

     # omnisv –status

If any of the services is not active, restart the HPE Data Protector services:

 # omnisv –stop

 # omnisv –start

- If `allow_hosts` and `deny_hosts` lists are enabled on the Cell Manager, add HPE Backup Navigator to the `allow_hosts` list. For detailed instructions, see the HPE Data Protector documentation.

- If the Cell Manager is running in an encrypted mode, add the HPE Backup Navigator system to the Security Exceptions list on the respective Cell Manager to allow non-encrypted communication. For instructions, see the HPE Data Protector documentation.

Log files

Inspecting HPE Backup Navigator log files can help you determine the problem.

Most of the HPE Backup Navigator log files are located at `/opt/dpa-ext/logs`, the log file created during the automatic installation is located at `/var/log/`.

The table below describes the HPE Data Protector log files:

Log file	Description
agent_core.log	Contains high-level overview of the data collection operations.
agent_util_cmd.log	Contains detailed information on the data collection operations.
cron_logs.log	Contains information on data calculation, subscription, and dashboard refresh related operations.
event.log	Contains information on the events in HPE Backup Navigator.
full_app.log	Contains all operations performed in HPE Backup Navigator besides those written to event.log, cron_logs.log, and the agent related logs.
report.log	Contains information on the generated HPE Backup Navigator reports.
sts.log	Contains operating system related information collected during initial installation. This information is mainly intended for the support organization.
install.log	Contains information on the initial configuration of the database and user accounts after the HPE Backup Navigator installation.
upgrade.log	Contains information on the initial configuration of the

	database and user accounts after the HPE Backup Navigator upgrade.
`hpe-backup-navigator-install.log`	Contains information on the HPE Backup Navigator installation and upgrade, when using the installation script.
`hpe-backup-navigator-download.log`	Contains information on the prerequisite software packages download during the HPE Backup Navigator installation and upgrade, when using the installation script.

Collecting data for HPE Customer Support

Collect the relevant data about the problem and send it to HPE Customer Support Service:

- Description of your problem and environment.
- Collected log files. See "HPE Backup Navigator logging" on page 70.
- Information about the Cell Managers you collect data from: operating system and HPE Data Protector version.
- Debug logs from the Cell Manager. For instructions on collecting the debug logs, see the HPE Data Protector documentation.

Appendix A: Command Line Reference

HPE Backup Navigator provides commands and scripts to perform some installation and configuration tasks.

hpe-backup-navigator-install.sh

Installation script runs installation and upgrade of HPE Backup Navigator. It also downloads prerequisites packages , compresses installation logs, and checks signature of the HPE Backup Navigator installation packages.

Synopsis

```
hpe-backup-navigator-install.sh

hpe-backup-navigator-install.sh --version | -v

 hpe-backup-navigator-install.sh --help | -h

hpe-backup-navigator-install.sh --download | -d

hpe-backup-navigator-install.sh --compress-logs | -cl

hpe-backup-navigator-install.sh --signature-check | -sc
```

Description

The `hpe-backup-navigator-install.sh` is the HPE Backup Navigator installation script. When used without options, installs or upgrades HPE Backup Navigator.

Options

`--version`

Displays the version of the installation script.

`--help`

Displays the usage synopsis of the installation script.

`--download`

Downloads all prerequisite packages and compresses them to the $filename$`.tar.gz` file.

`--compress-logs`

Compresses all installation logs to the $filename$`.tar.gz` file.

`--signature-check`

Checks signature of the HPE Backup Navigator `.rpm` packages located in the current directory.

service remote-agent

The `service remote-agent` command starts, stops and checks status of the the remote agent processes. Start of the remote agent processes also starts data collection on the HPE Backup Navigator remote agent. When you stop the remote agent processes, data collection also stops.

Synopsis

On RedHat 6.x, CentOS 6.x, SUSE 11.x, the synopsis is as follows:

`service remote-agent start`

`service remote-agent stop`

`service remote-agent status`

On SUSE 12.x, the synopsis is as follows:

`systemctl start remote-agent`

`systemctl stop remote-agent`

`systemctl status remote-agent`

Options

`start`

Starts the remote agent processes and subsiquently data collection on the remote agent.

`stop`

Stops the remote agent processes and subsiquently data collection on the remote agent.

`status`

Checks status of the remote agents.

service tomcat

The `service tomcat` command starts, stops, restarts, and checks status of the `tomcat` service.

Synopsis

On RedHat 6.x, CentOS 6.x, SUSE 11.x, the synopsis is as follows:

`service tomcat start`

```
service tomcat stop
 service tomcat status
```

On SUSE 12.x, the synopsis is as follows:

```
systemctl start tomcat
systemctl stop tomcat
systemctl status tomcat
```

Options

start

Starts the tomcat service.

stop

Stops the tomcat service.

status

Checks status of the tomcat service.

Glossary

D

drill down
You can examine report data in more detail by using the drill-down functionality. Navigate from the report of your interest to the connected reports, each time with deeper insight into the data, and discover the data you need.

F

filter
You can limit the data received from the Data Protector environment by selecting the entire cell to collect all data stored in the IDB or only a specific group of the IDB data (for example, devices, device pools, media, and so on). Any number of cells and groups of the IDB data can be selected.

H

HPE Backup Navigator database
A standalone database that contains the HPE Backup Navigator functionality related data, the data collected from the Data Protector sessions, and the Data Protector cell infrastructure related data. HPE Backup Navigator has an established connection to the database.

HPE Backup Navigator remote agent
A service that enables data collection from the Data Protector cells, which you cannot or due to any reasons do not want to access. You can install as many remote agents, as you need.

HPE Backup Navigator system
A system where HPE Backup Navigator resides. HPE Backup Navigator processes the data collected in the Data Protector environment and presents it as specific reports in the web user interface.

HPE Backup Navigator web user interface
A system with a web browser, from which you access HPE Backup Navigator. The web user interface also provides administration tools to adjust the environment to your needs. HPE Backup Navigator web user interface has an established connection to the HPE Backup Navigator system.

I

input data
Information on your Data Protector backup environment received from the Data Protector IDB and stored in the HPE Backup Navigator database in a similar way.

S

scope
To ensure that your reports contain only the data that you currently require for your specific purposes, you can limit a scope of your reports only to certain cells or to certain groups of the IDB data (for example, devices, device pools, media, media pools, clients).

T

tenant
A tenant is a group of users, usually related to one customer or department, who share Data Protector resources. Each tenant is represented by the dedicated Data Protector elements, such as cells, backup specification groups, backup specifications, or clients.

Send Documentation Feedback

If you have comments about this document, you can contact the documentation team by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on HPE Backup Navigator User's guide (Backup Navigator 9.50)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to AutonomyTPFeedback@hpe.com.

We appreciate your feedback!