

# System Backup and Restore

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## DESCRIPTION

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# 1 Introduction

This document provides an overview of the management model and concepts associated with the Backup and Restore managed area.

A managed area is represented by a group of Managed Object Classes (MOCs) within the Managed Object Model (MOM).





## 2 Functions and Concepts

Backup and Restore Management (BRM) provides a management interface for backup and restore of the Managed Element (ME).

BRM supports one predefined backup type, named System Data.

A System Data backup contains the entire software and configuration of the ME.

These backups are to be performed at least weekly. They are recommended after initial installation, before upgrade, and after successful upgrade. In these three situations, the backup files are to be manually exported to an external data repository to avoid unintentional deletion during preventive maintenance.

BRM does not support partial backups that can back up and restore only parts of the ME.

Backups can be created manually, automatically scheduled, and triggered by software management upgrades.

Manual and scheduled backups are subject to different and separately configured preventive maintenance policies. Manual backups and upgrade triggered backups are subject to the same preventive maintenance policies. The default value for the maximum number of scheduled backups is 5. The default value for the maximum number of manual backups is 100.

Backups can be exported to and imported from an external storage system.

**Note:** Automatic export of scheduled backups is not supported yet.

The following backups are automatically labeled by the ME so they can easily be found by the user:

- Last created backup
- Last imported backup
- Last exported backup
- Last restored backup
- Last backup restored or created on the ME

### 2.1 Types of Operation

BRM supports the following operations for System Data backups:

- Create a backup



This operation creates a backup with the specified name on the local persistent storage media. BRM provides an option for automated preventive maintenance of such manual backups by setting a quota on the maximum number of manual backups to be stored on the persistent storage media of the ME. The procedure in *Create Backup* provides further details on how to perform this operation.

- Restore a backup

This operation restores the ME using a backup stored on the local persistent media of the ME. Restoring the ME using a System Data backup is automatically followed by an ME reboot. After reboot, the operation progress information is lost. The procedure in *Restore Backup* provides further details on how to perform this operation.

- Delete a backup

This operation deletes the backup specified by its name from the persistent storage media. The procedure in *Delete Backup* provides further details on how to perform this operation.

- Schedule backups

Schedules can be configured to trigger creation of backups automatically. Such schedules can be single (one-shot) events or periodic, either defined according to fixed time intervals or calendar-defined intervals. There is also support for automated preventive maintenance of scheduled backups based on a configurable quota on the maximum number of scheduled backups to store. The scheduler can be locked to disable periodic backups during maintenance windows. A scheduled event can be deleted when no longer needed. The procedures in *Schedule Single Backup*, *Schedule Backups Based on Calendar Event*, and *Schedule Backups Based on Periodic Event* provide further details on how to perform these operations. The ME raises the alarm *BRM, Scheduled Backup Failed* when a scheduled backup is failed.

- Export a backup

This operation exports a backup file specified by its name to an external storage system.

Export is used to store the important ME backups in a safe place. It therefore limits the impact of unintentional local deletion of backup files on the ME. Export can indirectly be used to free up space on the ME since all exported backups are not always needed to be present locally on the ME. The procedure in *Export Backup* provides further details on how to perform this operation.

- Import a backup

This operation imports a backup file specified by its name from an external storage system.



Import is used to make a backup locally available on the ME after the backup has previously been exported and deleted from the ME. Import can be done before a coming backup restore operation or as preventive maintenance to ensure that important backups are locally available. The procedure in *Import Backup* provides further details on how to perform this operation.

- Cancel a backup and restore operation

Since the following operations are typically long-lasting, this operation can be used to cancel an ongoing operation:

- Create a backup
- Restore a backup
- Delete a backup
- Export a backup
- Import a backup

The procedure in *Cancel Backup and Restore Operation* provides further details on how to perform this operation.

- Change prefix for exported backup names

This operation is used to specify a prefix for the label that is generated for all backup export packages. This can be used to identify the ME from which the exported backup originated. The procedure in *Change Prefix for Exported Backup Names* provides further details on how to perform this operation.

- View available backups

Backups available on the local storage media of the ME, including the labeled backups, can be viewed through BRM. Each backup contains basic information such as the time the backup was created and its status (complete, incomplete, or corrupt). The procedure in *List Backups* provides further details on how to perform this operation.

- Upgrade triggered backups and backup restores

Upgrades automatically trigger a backup for a software management activation operation and a backup restore for an upgrade failure.

One long-running operation at a time is supported among create backup, scheduled backup, upgrade triggered backup and restore, delete backup, and restore backup. If a long-running backup operation is in progress, any scheduled backup event that is triggered is suppressed.

- Automated deletion of manual backups



The automated deletion of manual backups is triggered in either of the following situations:

- When setting attribute `autoDelete=ENABLED` if the number of existing manual backups is already above the value of attribute `maxStoredManualBackups`.
- When changing `maxStoredManualBackups` to a value below the number of existing manual backups while `autoDelete=ENABLED`.
- A backup creation operation is started while the maximum allowed number of manual backups defined by `maxStoredManualBackups` is already reached and `autoDelete=ENABLED`.

The procedures in *Enable Automatic Deletion of Manual Backups* and *Change Maximum Number of Manual Backups* provide further details on how to perform these operations.

- Automated deletion of scheduled backups

The automated deletion of scheduled backups is triggered in either of the following situations:

- A scheduled backup creation operation is started while the maximum allowed number of scheduled backups defined by `maxStoredScheduledBackups` is already reached.
- When changing `maxStoredScheduledBackups` to a value below the number of existing scheduled backups.

Automated deletion of backups always deletes the oldest backups. The procedure in *Set Maximum Number of Scheduled Backups* provides further details on how to perform this operation.



### 3 Managed Object Model

The Backup and Restore managed area is represented in the *Managed Object Model (MOM)* as follows:

```
ManagedElement
+-SystemFunctions
+-BrM
+-BrmBackupManager
+-BrmBackup
+-BrmBackupHousekeeping
+-BrmBackupLabelStore
+-BrmBackupScheduler
+-BrmCalendarBasedPeriodicEvent
+-BrmPeriodicEvent
+-BrmSingleEvent
```

For general information about the MOM, MOCs, Managed Object (MOs), cardinality, and related concepts, refer to *Managed Object Model User Guide*.

The BRM MOCs are described in Table 1.

**Table 1** BRM Managed Object Class Descriptions

Managed Object Class	Description
<i>BrM</i>	The root of the BRM model.
<i>BrmBackupManager</i>	Handles backups of System Data. Provides actions for creating new backups and deleting backups of the corresponding type.
<i>BrmBackup</i>	Describes a backup of the type specified by the <i>BrmBackupManager</i> MO.
<i>BrmBackupHousekeeping</i>	Handles preventive maintenance of manually created backups.
<i>BrmBackupLabelStore</i>	Describes labeled backups for the type specified by MO <i>BrmBackupManager</i> .
<i>BrmBackupScheduler</i>	Handles scheduling of a backup.
<i>BrmCalendarBasedPeriodicEvent</i>	Handles periodic scheduled backup events using a calendar-based interval.
<i>BrmPeriodicEvent</i>	Handles periodic scheduled backup events.
<i>BrmSingleEvent</i>	Handles single scheduled backup events.





## 4 Configuration Management

BRM is accessed using NETCONF or the Ericsson Command-Line Interface (ECLI) to manipulate the Management Information Base (MIB).

The following operations can be performed by the user and are described in Operating Instructions using the ECLI:

### **Basic Backup Operations**

- *Create Backup*
- *Restore Backup*
- *Delete Backup*
- *Cancel Backup and Restore Operation*
- *List Backups*
- *View Progress Report*

### **Schedule Backups**

- *Schedule Single Backup*
- *Schedule Backups Based on Calendar Event*
- *Schedule Backups Based on Periodic Event*

### **Manage Scheduled Backups**

- *Change Scheduled Backup Name*
- *Delete Scheduled Event*
- *Set Maximum Number of Scheduled Backups*
- *Lock Backup Scheduler*
- *Unlock Backup Scheduler*

### **Manage Manual Backups**

- *Change Maximum Number of Manual Backups*
- *Enable Automatic Deletion of Manual Backups*
- *Disable Automatic Deletion of Manual Backups*



### **Import and Export Backups**

- *Export Backup*
- *Import Backup*
- *Change Prefix for Exported Backup Names*



## 5 Fault Management

The BRM alarms are described in Table 2.

*Table 2 BRM Alarms*

<b>Alarm</b>	<b>Description</b>
<i>BRM, Scheduled Backup Failed</i>	Issued when a scheduled backup fails.





## 6 Security Management

BRM access is managed by an authentication and authorization mechanism. For each BRM role, specific rules are applied to determine the scope of what is accessible.

Two BRM roles are defined, named System Administrator and Application Administrator.

Once authenticated as a System Administrator or an Application Administrator, full access is granted to MO *BrM* and its attributes.

For more information on authentication and authorization, refer to *Security Management for ECLI, NETCONF, and SFTP Users*.