

License Management

Virtual Multimedia Resource Function

User Guide

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2 Introduction

This document provides an overview of the management model and concepts associated with the License Management (LM) managed area.

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

The Network License Server (NeLS) is a centralized license control server that is located inside the customer network. NeLS provides services to the License Manager on one or more Managed Elements (MEs). The product supports shared capacity between Managed Elements and allows a dynamic capacity distribution among the nodes that need it.

NeLS acts as a central repository for application license keys. When LM is deployed in NeLS mode, new license key files ordered from the Ericsson software supply organization must be installed on NeLS before the corresponding licenses can be used.



3 Functions and Concepts

LM provides a management interface for the ME license keys.

License keys grant the use of purchased functionality or capacity. License keys are generated by the Ericsson software supply organization based on the application licensing model. Licenses are made available in NeLS and do not need to be installed locally. Each license is identified by a license name and version number. All licenses include a start date and an expiration date in addition to other information specified by the application's licensing model.

The ME licenses have the following categories:

Capacity licenses

Control the number of licensed objects that can be active or used at the same time.

Feature licenses

Control access to the optional features in an application.

A licensed feature or capacity can no longer be used or granted after the license key expiry. When the expiration date for a reserved license is reached, all affected application instances are notified that the license has expired. An expired license is retained by LM until it has been released by all application instances.

3.1 Modes of Operation

LM operates in the following modes:

- [Autonomous Mode](#) on page 3
- [Emergency Unlock Mode](#) on page 4
- [Integration Unlock](#) on page 4
- [Locked Mode](#) on page 6
- [Normal Mode](#) on page 6

3.1.1 Autonomous Mode

The License Manager automatically transitions from Normal mode to Autonomous mode when the connection between LM and NeLS is lost. The ME raises the alarm License Management, Autonomous Mode Activated to indicate this mode. During Autonomous mode, licenses that are already reserved by the client application continue to function normally. However, new licenses cannot be requested. Licenses that were not reserved before LM



entered Autonomous mode remain unavailable until communication with NeLS is restored.

Applications can release licenses during Autonomous mode. When a license has been released by all application instances, that license becomes unavailable.

While in Autonomous mode, LM denies any application request for a license that is not already reserved. Application capacity can be restricted during Autonomous mode, as applications cannot increase or decrease the number of capacity tokens and must use what is currently available.

LM can operate in Autonomous mode for a maximum of 24 hours. If communication with NeLS cannot be re-established within this 24-hour window, LM enters Locked mode.

When the NeLS connection goes down, LM waits 3 to 5 minutes before attempting to reconnect for the first time. LM tries to reconnect to NeLS at regular intervals as specified by the `NeLSConfiguration.retryInterval` attribute. After reestablishing the NeLS connection, LM automatically reverts to Normal mode.

3.1.2 Emergency Unlock Mode

Emergency Unlock mode authorizes access to all licensed features and objects independent of valid licenses. Emergency Unlock is intended to provide or restore system functionality in extraordinary situations temporarily where an essential license cannot be renewed before it expires, or connectivity with NeLS is expected to remain unavailable for an extended period of time.

The Emergency Unlock mode window cannot exceed seven days. During this seven-day window, all application license requests are authorized. All licenses used during Emergency Unlock mode are set to expire at the end of the Emergency Unlock window.

When Emergency Unlock ends, LM automatically attempts to synchronize the granted licenses with NeLS. If synchronization is successful, LM begins operating in Integration Unlock Mode or Normal mode. If the synchronization fails, LM returns to the previous operating mode. These transitions are illustrated in [Figure 2](#) and [Figure 1](#).

3.1.3 Integration Unlock

LM runs in Integration Unlock mode after installation. While in this mode, LM can function without access to official licenses. This mode allows use of the system when access to valid licenses is unavailable.

LM can enter Emergency Unlock mode during the Integration Unlock window, as shown in [Figure 1](#).

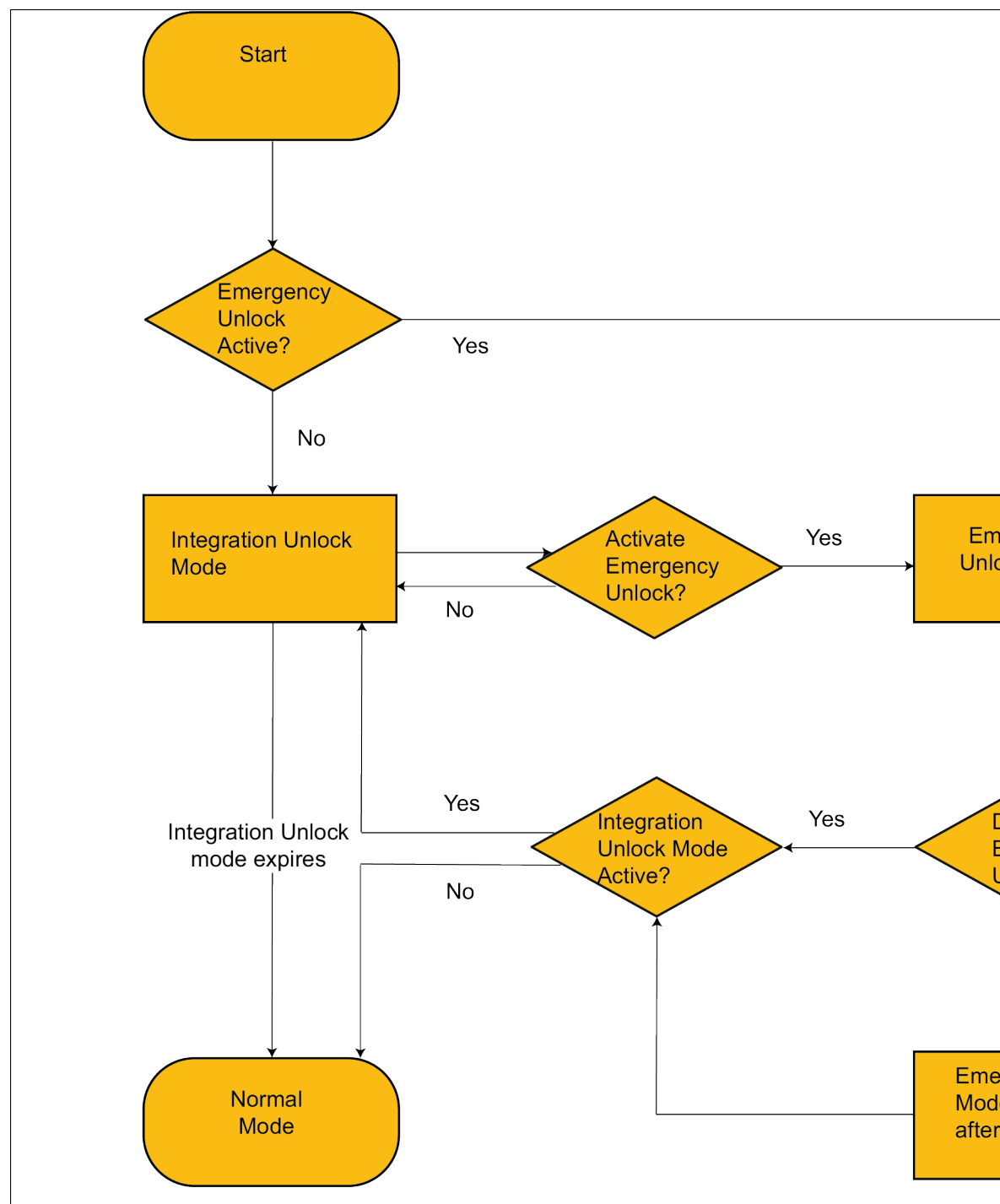


Figure 1 License Management State Transitions in Integration Unlock Mode

LM automatically transitions to Normal mode when the Integration Unlock window has expired, recorded by attribute expiration. Any license that was used during Integration Unlock mode for which no valid license key was found expires.



3.1.4 **Locked Mode**

The License Manager transitions from Autonomous mode to Locked mode if access to the NeLS license repository has not been restored by the end of the 24-hour Autonomous mode window. The ME raises the alarm *License Management, Key File Fault* to indicate this mode.

While in Locked mode, LM answers all application license requests with a failure. Reserved licenses remain unmodified, but cannot be accessed by the application. During Locked mode, LM tries to reconnect to NeLS at regular intervals. After reestablishing the NeLS connection, LM automatically reverts to Normal mode.

3.1.5 **Normal Mode**

Normal mode is the default operational state of the LM. During normal operation, the system authorizes only those feature sets and capacity levels that have a valid license in NeLS.

From Normal mode, LM can transition to other operational states, as shown in [Figure 2](#).

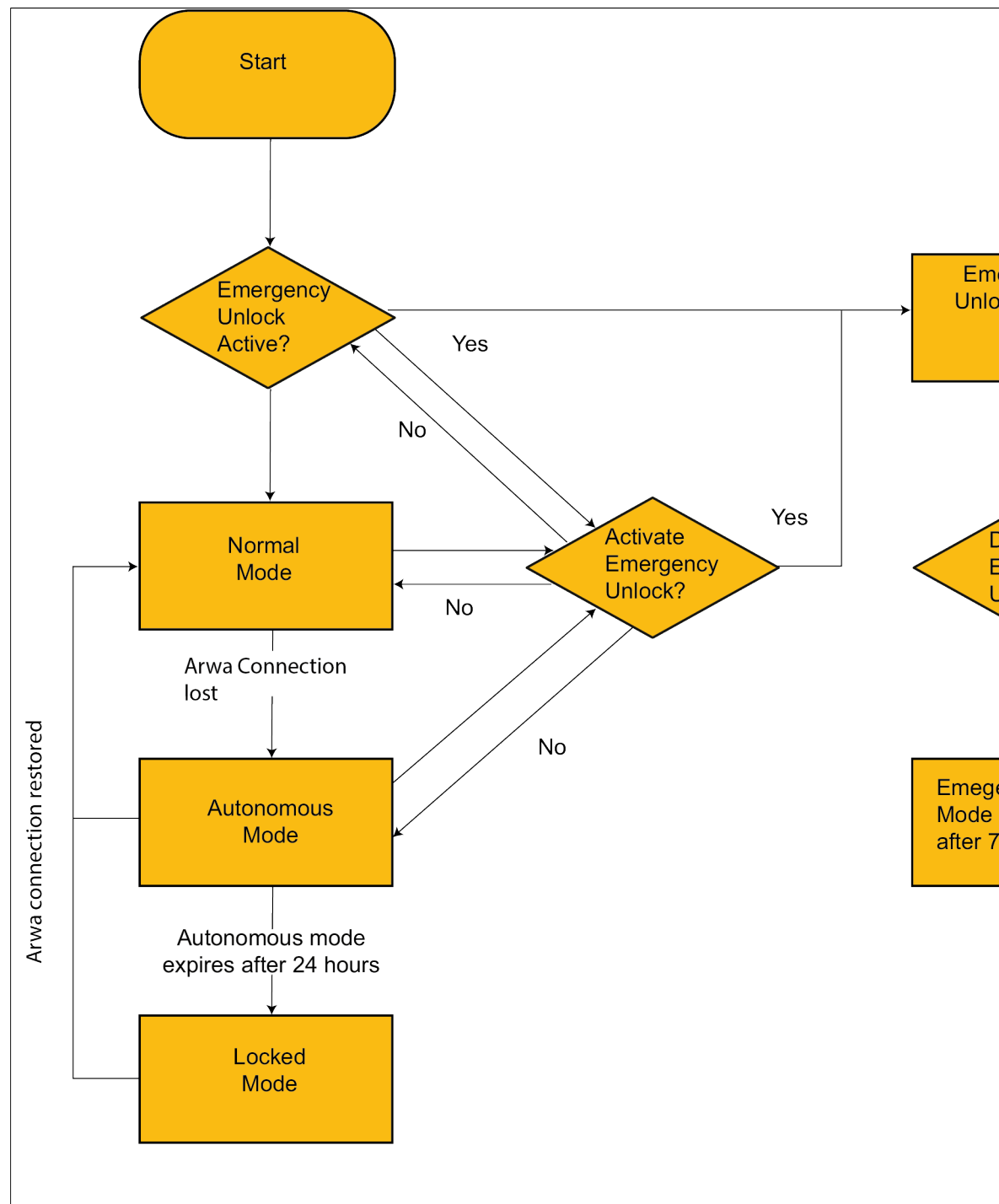


Figure 2 License Management State Transitions



4 LM Managed Object Model

For general information about the MOM, MOCs, Managed Objects (MOs), cardinality, and related concepts, refer to Managed Object Model User Guide. The LM MOs are described in [Table 1](#).

Table 1 License Management Managed Object Descriptions

MO	Description
<i>Lm</i>	The root of the LM model, supports activities and describes information related to LM.
<i>AutonomousMode</i>	Autonomous Mode state information.
<i>CapacityKey</i>	Key of a licensed capacity that is available for the Managed Element. The root of the LM model, supports activities and describes information related to LM.
<i>EmergencyUnlock</i>	Emergency Unlock state information.
<i>FeatureKey</i>	The root of the LM model, supports activities and describesKey of a licensed feature that is available for the Managed Element.
<i>IntegrationUnlock</i>	Integration Unlock state information.
<i>NeLSConfiguration</i>	NeLS configuration parameters.



5 Configuration Management

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

- Manage License Information
 - *Update NeLS Connection*
- Manage Emergency Unlock Mode
 - *Activate Emergency Unlock Mode*
 - *Deactivate Emergency Unlock Mode*
 - *Replenish Emergency Unlock Activations*



6 Fault Management

The LM-related alarms are described in [Table 2](#).

Table 2 License Management Alarms

Alarm Name	Description
<i>License Management, Autonomous Mode Activated</i>	Raised in Autonomous mode after LM losing its connection to the license repository.
<i>License Management, Emergency Unlock Reset Key Required</i>	Raised in Emergency Unlock mode when counter <code>activationsLeft</code> is decremented. The severity increases as the counter is decremented. Cleared after a replenishment followed by a refresh of the license inventory.
<i>License Management, Key File Fault</i>	Raised in Locked mode when the license repository used by LM is unavailable. An unavailable license repository prevents the ME from using licensed features and functionality.