

License Management

DESCRIPTION

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1 Understanding License Management

1.1 Key License Management Concepts

LM provides a management interface for the Managed Element (ME) license keys.

License keys grant the use of purchased functionality or capacity. These keys are ordered from the Ericsson software supply organization and are delivered as license key files. Each license is identified by a license name and version number. A valid license is one that is included in an installed license key file and is not expired or future dated.

A license key is locked to a specific ME based on a fingerprint value, which is an operator-defined unique logical name or an ME predefined value. A manual fingerprint value is usually set at ME deployment time and can no longer be changed once the first license key file has been successfully installed on the ME. The ME fingerprint value must always be provided when ordering a new license key from the Ericsson software supply organization.

The ME licenses have the following categories:

- Feature licenses

Control access to the optional features in a managed function.

- Capacity licenses

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

- Throughput capacity licenses

Control the rate that licensed objects can be used.

Perpetual license keys have no expiration date or an expiry date that is far into the future (for example, 2099-12-31). All other license keys have an expiry date.

Before expiring, license keys enter a license expiry warning period. The user is notified of the start of this warning period and license key expiration by alarms. The ME raises the alarm `License Management, License Key Not Available` with severity `minor` during the warning period, then `major` when expired.

Installed license key files can include future dated licenses. These license keys only become valid as of their start date.

Note: The `Lm` Managed Object Classes (MOCs) can be found in the Managed Object Model (MOM). For general information about the MOM, MOCs, cardinality, and related concepts, refer to [Managed Object Model User Guide](#).



1.2 Modes of Operation

LM operates in the following modes:

- Integration Unlock mode
- Normal mode
- Emergency Unlock mode
- Autonomous mode
- Locked mode

1.3 Integration Unlock Mode

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

LM can enter Emergency Unlock mode during the Integration Unlock window, as shown in Figure 1.

LM automatically transitions to Normal mode when the Integration Unlock window has expired, recorded by the `expiration` attribute of the `IntegrationUnlock` MO. When Integration Unlock ends, LM attempts to synchronize the granted licenses with the associated license key file. Any license that was used during Integration Unlock mode that is not present in a license key file is marked as not found.

1.4 Normal Mode

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

From Normal mode, LM can transition to other modes, as shown in Figure 1.

1.5 Emergency Unlock Mode

Emergency Unlock mode authorizes access to all licensed features and objects independent of official license keys. The ME raises the alarm `License Management, Emergency Unlock Reset Key Required` to indicate this mode. Emergency Unlock is intended to temporarily provide or restore system functionality in extraordinary situations where an essential license cannot be renewed before it expires, or a valid license key file is expected to remain unavailable for an extended period.



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

When the Emergency Unlock mode ends, LM automatically tries to synchronize the granted licenses with the available license key files. If all used licenses are included in these files, LM begins operating in Normal mode. If at least one used license is not present in the available license files, LM returns to the previous operating mode, as shown in Figure 1.

1.6 Autonomous Mode

LM automatically transitions from Normal mode to Autonomous mode when any installed license key file is missing or corrupted. It can take up to 60 seconds for LM to transition to Autonomous mode after file access is lost.

The ME raises the alarm `License Management, Autonomous Mode Activated` to indicate this change. During Autonomous mode, licenses that were in use continue to function normally. However, new licenses cannot be requested.

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 the number of capacity tokens above the level that was granted at the time of the transition to Autonomous mode.

LM can operate in Autonomous mode for a predefined duration, recorded by the expiration attribute of the `AutonomousMode MO`. If the license key file cannot be re-established within the Autonomous mode window, LM enters Locked mode.

While operating in Autonomous mode, LM tries to access the license key files at regular intervals. As soon as LM can access all of the installed license key files, it automatically reverts to Normal mode.

LM does not transition into Autonomous mode if a license key file has never been installed.

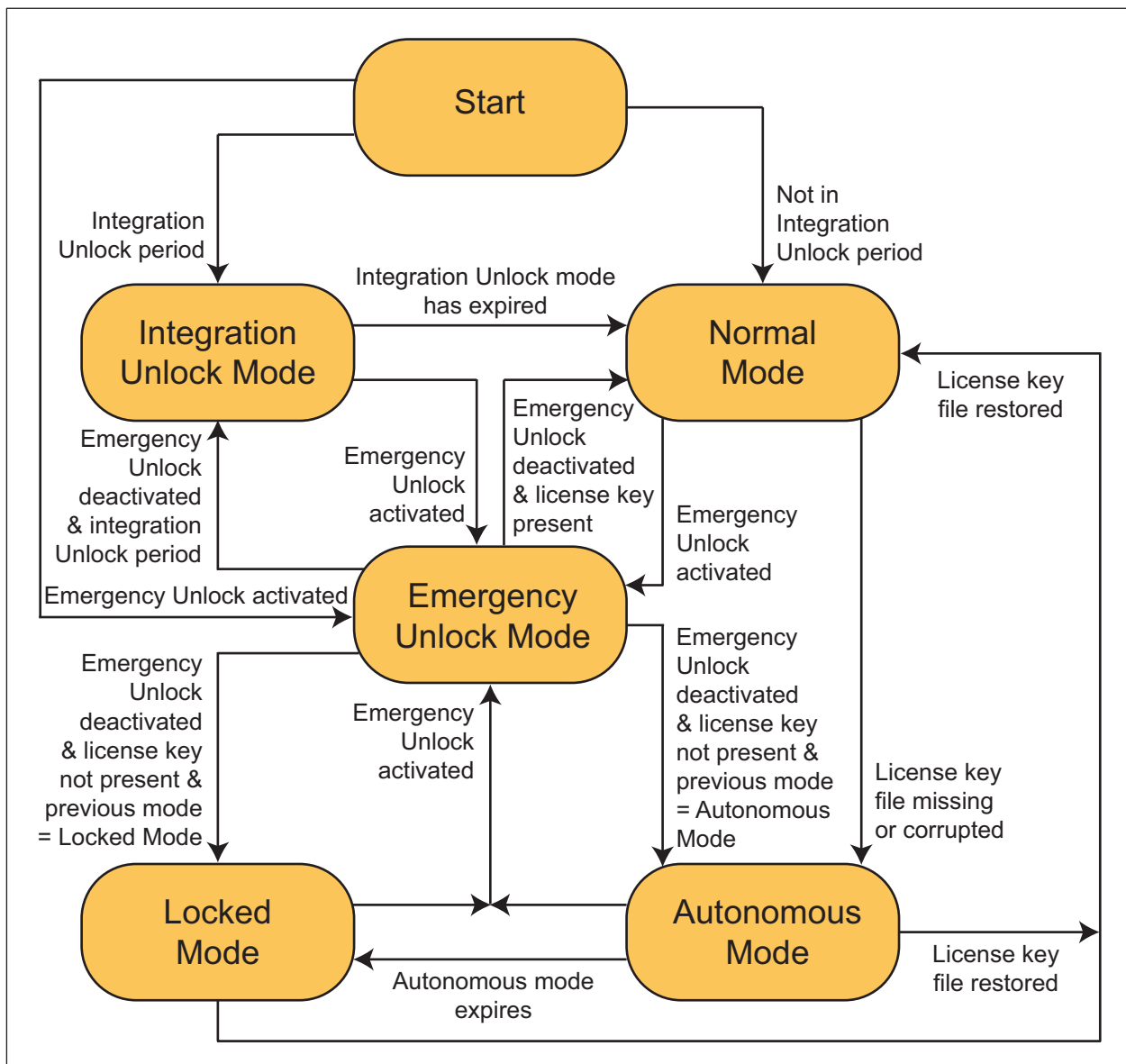


Figure 1 License Management State Transitions

1.7 Locked Mode

LM transitions from Autonomous mode to Locked mode if any installed license key file is not available at the end of the Autonomous mode window. The ME raises the alarm License Management, Key File Fault to indicate this change.

While in Locked mode, licensed features cannot be used on the ME and features with licensed capacity are no longer granted the required capacity. This leads to service downtime and degraded service performance. During locked mode, LM attempts to access the license key files at regular intervals. When all the installed license key files are detected, LM automatically reverts to Normal mode.



2 Basic License Management Procedures

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

— View license information

Information about available licenses and their use is published to the Management Information Base (MIB). This read-only information is automatically updated every 30 minutes. The user can manually update the license information out-of-band, and check the license inventory available on the ME for preventive maintenance and problem resolution purposes. For more details on how to perform this operation, refer to [View License Information](#).

— Activation/deactivation of Emergency Unlock mode

Emergency Unlock mode is activated by the user to temporarily restore system functionality in extraordinary situations. The user can deactivate Emergency Unlock mode before it automatically ends to check that the ME transitions to the expected LM operation mode. For more details on how to perform these operations, refer to [Activate Emergency Unlock Mode](#) and [Deactivate Emergency Unlock Mode](#).

— Replenishment of Emergency Unlock activations

The number of Emergency Unlock activations is restricted. By default, Emergency Unlock mode can only be activated twice. To replenish the number of possible Emergency Unlock activations, an Emergency Unlock reset key must be ordered from the Ericsson software supply organization. The corresponding key file must then be installed on the ME to reset the number of Emergency Unlock activations to two, preferably before the both activations have been used. For more details on how to perform this operation, refer to [Replenish Emergency Unlock Activations](#).

3 License Management-Related Alarms

Table 1 License Management-Related Alarms

Alarm	Description
License Management, Autonomous Mode Activated	Raised in Autonomous mode after an installed license key file is missing or becomes corrupted.



Table 1 License Management-Related Alarms

Alarm	Description
License Management, Capacity Usage Threshold Reached	<p>Applies to capacity and throughput capacity licenses.</p> <p>Raised with severity warning if the <code>grantedCapacityLevel</code> attribute for a given capacity license exceeds the alarm threshold set by the <code>capacityAlarmThreshold</code> attribute, but is still below <code>licensedCapacityLimit</code>. If the reservation level reaches <code>licensedCapacityLimit</code>, the severity increases to major.</p>
License Management, Emergency Unlock Reset Key Required	<p>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.</p>
License Management, Key File Fault	<p>Raised in Locked mode when the license key file used by LM is unavailable. A missing license key file prevents the ME from using licensed features and functionality.</p>
License Management, License Key Not Available	<p>Raised in Normal mode with severity warning when a license key enters the expiration warning period before it expires.</p> <p>When the expiry date is reached, the severity is raised to major.</p>