System Release 7.17
ASTRO® 25
INTEGRATED VOICE AND DATA

License Manager

MAY 2017

MN003322A01-B

Copyrights

The Motorola Solutions products described in this document may include copyrighted Motorola Solutions computer programs. Laws in the United States and other countries preserve for Motorola Solutions certain exclusive rights for copyrighted computer programs. Accordingly, any copyrighted Motorola Solutions computer programs contained in the Motorola Solutions products described in this document may not be copied or reproduced in any manner without the express written permission of Motorola Solutions.

No part of this document may be reproduced, transmitted, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without the prior written permission of Motorola Solutions, Inc.

Furthermore, the purchase of Motorola Solutions products shall not be deemed to grant either directly or by implication, estoppel or otherwise, any license under the copyrights, patents or patent applications of Motorola Solutions, except for the normal non-exclusive, royalty-free license to use that arises by operation of law in the sale of a product.

Disclaimer

Please note that certain features, facilities, and capabilities described in this document may not be applicable to or licensed for use on a specific system, or may be dependent upon the characteristics of a specific mobile subscriber unit or configuration of certain parameters. Please refer to your Motorola Solutions contact for further information.

Trademarks

MOTOROLA, MOTO, MOTOROLA SOLUTIONS, and the Stylized M Logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners.

European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) directive

The European Union's WEEE directive requires that products sold into EU countries must have the crossed out trash bin label on the product (or the package in some cases).

As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service centre for information about the waste collection system in their country.

This page intentionally left blank.

Contact Us

Motorola Solutions Support Center

The Solutions Support Center (SSC) is the primary Motorola Solutions support contact. Call:

- Before any software reload.
- To confirm troubleshooting results and analysis before removing and replacing a Field Replaceable Unit (FRU) and Field Replaceable Entity (FRE) to repair the system.

For...	Phone
United States Calls	**800-221-7144**
International Calls	**302-444-9800**

North America Parts Organization

For assistance in ordering replacement parts or identifying a part number, contact the Motorola Solutions Parts organization. Your first response when troubleshooting your system is to call the Motorola Solutions SSC.

For...	Phone
Phone Orders	**800-422-4210** (US and Canada Orders) For help identifying an item or part number, select choice 3 from the menu.
	302-444-9842 (International Orders) Includes help for identifying an item or part number and for translation as needed.
Fax Orders	**800-622-6210** (US and Canada Orders)

Comments

Send questions and comments regarding user documentation to documentation@motorolasolutions.com.

Provide the following information when reporting a documentation error:

- The document title and part number
- The page number with the error
- A description of the error

We welcome your feedback on this and other Motorola Solutions manuals. To take a short, confidential survey on Motorola Solutions Customer Documentation, go to docsurvey.motorolasolutions.com or scan the following QR code with your mobile device to access the survey.

This page intentionally left blank.

Document History

Version	Description	Date
MN003322A01-A	Original release of the *License Manager* manual.	November 2016
MN003322A01-B	This version includes the following updates: • A note was added in the following sections: - Viewing Licenses on page 44 - Viewing Sessions on page 44 • A step to apply the platform patch was added in the following processes: - Installing the License Manager on page 47 - Recovering the License Manager on page 65 • New procedure: Applying the Platform Patch on page 60	May 2017

This page intentionally left blank.

Contents

List of Figures

This page intentionally left blank.

List of Processes

This page intentionally left blank.

List of Procedures

This page intentionally left blank.

About License Manager

The *License Manager* manual provides information about the use of licenses to gain access to features and functions in the ASTRO® 25 system. It describes the installation of the License Manager in the system and explains how to use the web-based License Manager user interface (UI) to load, view, and manage licenses in the system.

What Is Covered in This Manual

This manual contains the following chapters:

- License Management Description on page 19 introduces the concept of licensing in the ASTRO® 25 system and describes the licensed options.
- License Manager Theory of Operations on page 27 This chapter provides information about license management and operation in the ASTRO® 25 system. It describes license types and control models, provides common scenarios for license use, and briefly outlines the License Manager deployment, operation, and disaster recovery.
- License Manager User Interface on page 37 describes the web-based user interface for License Manager used to load and manage licenses in the ASTRO® 25 system.
- License Manager Installation on page 47 provides information about the installation of the License Manager in an ASTRO® 25 system. The License Manager is installed in the zone core as a standalone virtual machine on an ESXi-based Virtual Management Server (VMS).
- License Manager Configuration on page 63 provides information related to the configuration of the License Manager in the ASTRO® system.
- License Manager Disaster Recovery on page 65 provides disaster recovery procedures for the License Manager.
- License Manager Reference on page 69 provides reference information related to the License Manager in the ASTRO® 25 system.

Helpful Background Information

Motorola Solutions offers various courses designed to assist in learning about the system. For information, go to http://www.motorolasolutions.com/training to view the current course offerings and technology paths.

Related Information

Refer to the following documents for associated information about the radio system.

Related Information	Purpose
Standards and Guidelines for Communication Sites	Provides standards and guidelines that should be followed when setting up a Motorola Solutions communications site. Also known as R56 manual. This manual may be purchased by calling the North America Parts Organization at 800-422-4210 (or the international number: 302-444-9842).
System Overview and Documentation	Provides an overview of the ASTRO® 25 new system features, documentation set, technical illustrations, and

Table continued…

Related Information	Purpose
	system-level disaster recovery that support the ASTRO® 25 radio communication system.
Backup and Restore Services	Provides information relating to the implementation and management of centralized backup and restore services for supported devices in ASTRO® 25 systems. This manual addresses server and client functions required for these services.
Unix Supplemental Configuration	Provides additional procedures for Solaris-based and Linux-based devices, including password management, welcome banners configuration, and general administration.
Virtual Management Server Hardware	Provides information for implementing, maintaining, and replacing common Hewlett-Packard hardware for servers in an ASTRO® 25 system.
Virtual Management Server Software	Provides procedures for implementing and managing VMware ESXi-based virtual server hosts on the common Hewlett-Packard hardware platform in ASTRO® 25 systems.

Chapter 1

License Management Description

This chapter introduces the concept of licensing in the ASTRO® 25 system and describes the licensed options.

1.1 Licensing of Features in the ASTRO 25 System

You need to purchase licenses to enable and use selected applications and features in the ASTRO® 25 system. Licenses provide access to certain services, allow you to run a specified number of sessions for the licensed applications, and configure them for specific capacities.

After you place an order, license files are generated for the License Manager in each zone where you want to use the licensed options. License files must be downloaded from the portal, and then uploaded to the appropriate License Managers.

1.2 Licensed Options

The License Manager user interface (UI) shows the following options licensed in the ASTRO® 25 system.

Affiliation Display
Order the appropriate number of licenses based on the needed number of simultaneous Affiliation Display application user sessions in the zone. Affiliation Display brings you tools to observe selected real-time affiliations in the zone for sites, talkgroups, or individual radio users. It also provides graphing capabilities. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

CAD Interface
Provides access to radio traffic information and some control functions in the zone. This feature requires a zone level, enforce, perpetual, session license. A session for this option cannot be force released.

Channel Partitioning
Allows you to configure the system so that agencies or a subset of agencies have exclusive use of specific RF channels in the system. Channel Partitioning is a system level option, but if desired, it must be ordered per each zone. This feature requires a zone level, enforce, perpetual, feature license.

Classic Data – P25 Trunking Site
Each license corresponds to a single P25 trunking site enabled for integrated voice and classic data operation on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

Comparator Expanded Site Capacity – P25 Trunking
Each license corresponds to a comparator enabled to vote one additional site above the standard 15 site capacity, up to the maximum supported capacity of 32 sites on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

Conventional Port
Order the appropriate number of licenses based on the number of required conventional analog and digital ports on CCGW, Enhanced CCGW, or GGM 8000 in the zone. This option only applies to systems with all conventional resources without any trunking resources. The Conventional Port feature requires a zone level, trust, perpetual, capacity license.

Conventional Talkgroups via ISSI/CSSI

This option enables Conventional Talkgroup operation over the Inter-RF Subsystem Interface 8000 (ISSI 8000)/Console Subsystem Interface 8000 (CSSI 8000). A configuration flag is provided by the Network Manager. The license is required to turn on the flag. If the flag is not enabled, the Zone Controller prevents any call with a Conventional Talkgroup via ISSI/CSSI. The system needs this license if the following types of operation are desired:

- External Console operation on Conventional Talkgroups
- External Conventional Talkgroup Channel Operation

This feature requires a system level, enforce (RNMS), perpetual, feature license.

Dispatch Console Group Text

Order the appropriate number of licenses based on the number of dispatch consoles enabled for Group Text. This feature requires a system level, audit (RNMS), perpetual, capacity license.

DSR Capability

Provides the configuration of Dynamic System Resilience (DSR) for the zone. DSR applies to Trunking voice and data and Conventional voice and data capabilities. This feature requires a zone level, trust, perpetual, feature license.

Dynamic Frequency Blocking

Allows the system to be operated with minimal inter-channel interference between RF Sites. Prevents interfering channel pairs from operating at the same time by blocking use on one channel while the other channel is in operation. This feature requires a zone level, enforce, perpetual, feature license.

Dynamic Reports

Order the appropriate number of licenses based on the needed number of simultaneous Dynamic Reports application user sessions in the zone. Dynamic Reports lets you generate near real-time graphical reports showing the total system utilization for talkgroup, private, and interconnect calls. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

Dynamic Shared Services

Allows sharing of voice channels between dispatch and interconnect service based on real-time calculations of current loading. Controls both the maximum number of simultaneous interconnect calls and the maximum length of an interconnect call in the zone. This feature requires a zone level, trust, perpetual, feature license.

Edge Availability with Wireline Console

When normal system-wide area communication is not possible, a Trunking Subsystem (Tsub) provides dispatch and mobility services within a local area. This option requires a system level, trust, perpetual, feature license. This license is automatically generated for every Edge Controller that is ordered.

Enhanced CADI

Allows multiple, simultaneous access to radio traffic information and some control functions in the zone. This option requires a zone level, enforce (STM), perpetual, session license.

Enhanced Data – P25 Trunking Site

Each license corresponds to a single P25 trunking site enabled for integrated voice and classic and enhanced data operation on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

Flexible Air Traffic Information Access (ATIA)

Allows an external computer to access non-buffered air traffic information. When you order this zone level option, order it for every zone where access to air traffic information is required. This feature requires a zone level, enforce, feature, and perpetual license.

Group Text on Voice Talkgroup

Order the appropriate number of licenses based on the number of trunking talkgroups enabled for Group Text (this count only applies to trunking talkgroups). Group Text is not supported on Multigroups, Agency Groups, Conventional Talkgroups, Foreign Talkgroups, or Talkgroups Regrouped into an MSEL Supergroup. This option requires a system level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – Analog Conventional

Each license corresponds to an analog conventional G-Series Base Radio enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – Analog Conventional – IP

Each license corresponds to an analog conventional IP voting/simulcast G-Series Base Radio enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – HPD

Each license corresponds to an HPD G-Series Base Radio enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – P25 Digital Conventional

Each license corresponds to a P25 digital conventional G-Series Base Radio enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – P25 Trunking Multisite – Circuit

Each license corresponds to a P25 trunking multisite G-Series Base Radio with circuit connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – P25 Trunking Multisite – IP

Each license corresponds to a P25 trunking multisite G-Series Base Radio with IP connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Base Radio – P25 Trunking Site Repeater

Each license corresponds to a P25 trunking site repeater G-Series Base Radio enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Comparator – Analog Conventional

Each license corresponds to an analog conventional G-Series Comparator with IP connectivity to a GSLC/IP GTR subsystem. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Comparator – P25 Digital Conventional – IP

Each license corresponds to a P25 digital conventional G-Series Comparator with IP connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Comparator – P25 Trunking – IP

Each license corresponds to a P25 trunking G-Series Comparator with IP connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Receiver – Analog Conventional

Each license corresponds to an analog conventional G-Series Receiver enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Receiver – Analog Conventional – IP
Each license corresponds to an analog conventional IP voting G-Series Receiver enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Receiver – P25 Digital Conventional
Each license corresponds to a P25 digital conventional G-Series Receiver enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Receiver – P25 Trunking Multisite – Circuit
Each license corresponds to a P25 trunking multisite G-Series Receiver with circuit connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Receiver – P25 Trunking Multisite – IP
Each license corresponds to a P25 trunking multisite G-Series Receiver with IP connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Reference Distribution Module
Each license corresponds to a G-Series Reference Distribution Module enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Site Controller – Conventional
Each license corresponds to a conventional G-Series Site Controller enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Site Controller – HPD
Each license corresponds to an HPD G-Series Site Controller enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Site Controller – P25 Trunking Multisite – Circuit
Each license corresponds to a P25 trunking multisite G-Series Site Controller with circuit connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Site Controller – P25 Trunking Multisite – IP
Each license corresponds to a P25 trunking multisite G-Series Site Controller with IP connectivity enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

G-Series Site Controller – P25 Trunking Site Repeater
Each license corresponds to a P25 trunking site repeater G-Series Site Controller enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

HPD Radio User
Order the appropriate number of licenses based on the number of High Performance Data (HPD) equipped radios in the system. This feature requires a system level, audit, perpetual, capacity license.

HPD Site
Order the appropriate number of licenses based on the number of HPD sites in the zone. This feature requires a zone level, audit, perpetual, capacity license.

Interference Locator
Enables the Interference Location feature. This feature requires a system level, enforce (RNMS), perpetual or trial, feature license.

Intersystem Data – Connected CEN

Allows configuration of Intersystem Data in the system. The Intersystem Data – Connected CEN feature provides packet data access ability across ASTRO® 25 systems. This feature requires a system level, enforce, perpetual, feature license.

Location on PTT User

Order the appropriate number of licenses based on the number of radios configured with Location on PTT in the system. This feature requires a system level, trust, perpetual, capacity license.

Main/Alt Comparator Operation – Analog Conv

Each license corresponds to a Main and an Alt analog conventional G-Series Comparators enabled to operate on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

MCC7500/MCC7100 Console

Order the appropriate number of licenses based on the number of MCC 7500/MCC7100 console positions configured in the zone. This feature requires a zone level, audit, perpetual, capacity license.

Northbound Interface

Allows forwarding events from the Unified Event Manager (UEM) application to a customer-provided higher-level Manager of Managers utilizing an industry standard protocol (SNMP). MIB CD and Development Guide are included with this option. This feature requires a zone level, enforce, perpetual, feature license.

P25 FDMA Trunking Operation Site

Order the appropriate number of licenses based on the number of ASTRO® 25 FDMA Voice Sites configured with FDMA Only or Dynamic Dual Mode access in the zone. All subsites and ISR sites configured in the system are counted as part of this license. This feature requires a zone level, audit, perpetual, capacity license.

P25 TDMA Dynamic Channel Assignment SW Base Radio

Order the appropriate number of licenses based on the number of Dynamic Dual Mode RF channels in the zone. This feature requires a zone level, audit, perpetual, capacity license.

P25 TDMA Dynamic Talkgroup Assignment Site

If Dynamic Dual Mode Talkgroups are used in the system, order the appropriate number of licenses based on the number of TDMA-capable RF sites in the system. TDMA-capable represents channel Access Type set to Dynamic Dual Mode or TDMA Only. Theoretically, the maximum value should be 14938 [(64 prime sites x 32 subsites + 86 ISR) x 7]. However, for practical needs, this limit is kept lower. This feature requires a system level, audit, perpetual, capacity license.

P25 TDMA Trunking Comparator Software

Each license corresponds to a single comparator enabled for TDMA operation on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

P25 TDMA Trunking Operation Site

Order the appropriate number of licenses based on the number of TDMA-capable RF sites in the zone. TDMA-capable represents channel Access Type set to Dynamic Dual Mode or TDMA Only. This feature requires a zone level, audit, perpetual, capacity license.

P25 TDMA Trunking Operation Zone

Order this option for a zone that requires Phase 2 TDMA operation. If the Phase 2 TDMA option for any sites in this zone is ordered, this zone level option must also be ordered. This feature requires a zone level, trust, perpetual, feature license.

P25 TDMA Trunking SW Base Radio

Order the appropriate number of licenses based on the number of TDMA-capable RF channels in the zone. TDMA-capable represents channel Access Type set to Dynamic Dual Mode or TDMA Only. The Radio Network Management Subsystem shall provide the capability to license a zone with a count of stations for TDMA-capable channels. This feature requires a zone level, audit, perpetual, capacity license.

Personnel Accountability
Enables EVAC functionality over CADI Interface to the Air Traffic Router (ATR). This option requires a zone level, enforce (STM), perpetual, feature license.

Provisioning Manager
Order the appropriate number of licenses based on the needed number of simultaneous Provisioning Manager application user sessions in the system. Provisioning Manager allows entry and management of all configuration information for system objects such as radios or talkgroups. Both Network Management (NM) client and PMI sessions count towards this license. Provisioning Manager is a critical application so at least one license for this application is required. This feature requires a system level, enforce, perpetual or trial, session license. A session for this option can be force released.

Provisioning Manager Interface
Provides an interface to the Provisioning Manager application for third-party clients. This feature requires a system level, enforce, perpetual, feature license.

Radio Alias Update
Order the appropriate number of licenses based on the number of radio users enabled for Alias Downloads over the air. This option requires a system level, audit (RNMS), perpetual, capacity license.

Radio Authentication
Provides the radio authentication capability in the system. This feature requires a system level, trust, perpetual, feature license.

Radio Authentication User
Order the appropriate number of licenses based on the number of radios configured with subscriber authentication in the system. This feature requires a system level, audit, perpetual, capacity license.

Radio Control Manager
Order the appropriate number of licenses based on the needed number of simultaneous Radio Control Manager (RCM) application user sessions in the zone. RCM is a tool to control radios. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

Redundant Comparator Operation – P25 Trunking
Each license corresponds to redundant failover operation enabled on a pair of comparators on the ASTRO® 25 system. This option requires a zone level, audit (RNMS), perpetual, capacity license.

Security Partitioning
Allows the creation of security groups to limit access to selected system level database records. Security Partitioning is a system level feature, but if desired, it must be ordered per each zone. This feature requires a zone level, enforce, perpetual, feature license.

System Historical Reports
Order the appropriate number of licenses based on the needed number of simultaneous System Historical Reports application user sessions in the system. With System Historical Reports, you can manually or automatically generate historical performance reports by using standard templates. This feature requires a system level, enforce, perpetual or trial, session license. A session for this option can be force released.

Transcoded Simultaneous Calls
Specifies the number of simultaneous transcoded calls in a zone. This feature requires a zone level, audit, perpetual, capacity license.

Trunked Radio User
Order the appropriate number of licenses based on the number of Integrated Voice and Data (IV&D) trunking radios in the system. This feature requires a system level, audit, perpetual, capacity license.

UEM Email Alarm Notifications

Allows you to configure e-mail notifications for events and alarms in the Unified Event Manager (UEM) application. This feature requires a zone level, enforce, perpetual, feature license.

UEM Enhanced Navigation

Enhanced functionality of the Unified Event Manager (UEM) application. This option enables additional user interface components and management functions:

- UEM Enhanced Navigation
- Geographical Maps
- Network Element View
- Site View
- UEM Microwave Map
- System Map
- Enhanced representation of MOSCAD RTU data

This option is dedicated for L core and M core systems. This feature requires a zone level, enforce, perpetual, feature license.

UEM Microwave Map and Segment View

Enables additional Unified Event Manager (UEM) Client User Interface components displaying the Microwave Map and Geographical Maps. This option is dedicated for L core and M core systems. This feature requires a zone level, enforce, perpetual, feature license.

UEM SNMP Element Management Toolkit

The number of the toolkit defined devices that the Unified Event Manager (UEM) application manages. This feature requires a system level, enforce, perpetual, capacity license.

Unified Event Manager (UEM)

Order the appropriate number of licenses based on the needed number of simultaneous Unified Event Manager (UEM) application sessions in the zone. UEM is a critical network fault management application, so at least one license for this application is required. In an M core system configuration, depending on the licenses, you can simultaneously manage 16 UEM client sessions, including 2 dedicated sessions for the **sscadmin** user. In an L and K core system configuration, depending on the licenses, you can simultaneously manage 5 UEM client sessions. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

Unified Network Configurator (UNC)

Order the appropriate number of licenses based on the needed number of simultaneous Unified Network Configurator (UNC) Voyence application user sessions in the system. This option does not apply to UNC Wizard user sessions. UNC allows entry and management of all configuration information for infrastructure and transport objects. UNC is a critical application, so at least one license for this application is required. This feature requires a system level, trust, perpetual, session license. A session for this option cannot be force released.

Zone Historical Reports

Order the appropriate number of licenses based on the needed number of simultaneous Zone Historical Reports application user sessions in the zone. With Zone Historical Reports, you can manually or automatically generate historical performance reports by using standard templates. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

ZoneWatch

Order the appropriate number of licenses based on the needed number of simultaneous ZoneWatch application user sessions in the zone. ZoneWatch provides a graphical display of channel activity for an entire zone by channel. This feature requires a zone level, enforce, perpetual or trial, session license. A session for this option can be force released.

Related Links

Viewing Licenses on page 44
Viewing Sessions on page 44

Chapter 2

License Manager Theory of Operations

This chapter provides information about license management and operation in the ASTRO® 25 system. It describes license types and control models, provides common scenarios for license use, and briefly outlines the License Manager deployment, operation, and disaster recovery.

2.1 Licenses

Licenses provide permissions and authorization for usage of features and functions within an ASTRO® 25 system.

Based on the features and functions ordered, licenses are appropriately issued for the ASTRO® 25 system. Depending on the system configuration (L core, M1/M2 or M3 core), an order is placed with desired license options identified by the option number and desired quantity. The customer license entitlements are generated based on the submitted order. Features and functions that are operational at the zone level have licenses at the zone level (each zone must have licenses). Features and functions operational at the system level have licenses at the system level.

In the ASTRO® 25 system, licenses are generated on a per zone basis. Each zone has licenses to enable features and functions within that zone.

A license file generated for a system and a zone in that system is specific to that system and zone. The combination of system ID and zone ID specified in the order uniquely identifies a customer system and the zone. A new system extension ID has been introduced in the ordering system to address the rare case where a customer has intentionally chosen to use the same system ID across multiple systems. For such rare cases, customers or account teams inputting the order shall provide unique system extension IDs across the systems that have same system ID. This system extension ID has no operational impact and is specific to uniquely identify a customer system for licensing purposes.

During an add-on or expansion order entry, the right system ID, zone ID, and system extension ID (the same IDs as the original new order entry) must be used to accurately generate the licenses for that system with the new additions.

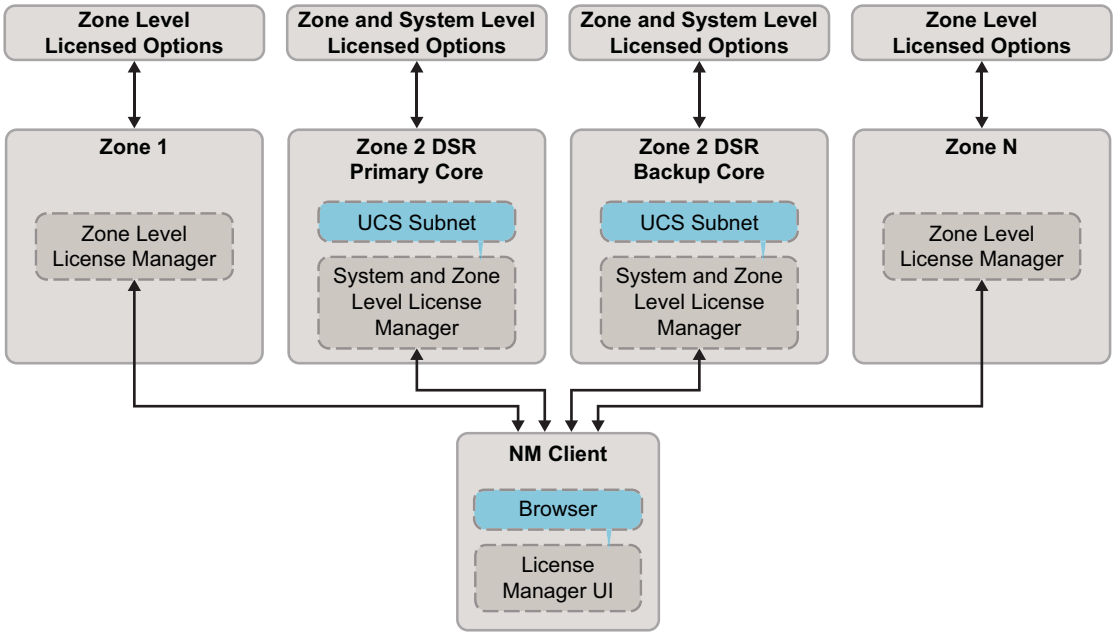
IMPORTANT: It is critical and highly recommended that the system ID, zone ID, and system extension ID are accurately specified during the order input because the licenses are generated for the specific system identified by the system ID, zone ID, and system extension ID.

2.2 License Manager Deployment

The License Manager hosts and serves licenses to enable usage of features and functions in the ASTRO® 25 system. One License Manager is deployed per zone to manage and serve licenses for that zone. The License Manager that resides in the zone where the User Configuration Server (UCS) is located contains the zone level licenses for that zone and the system level licenses. In a Dynamic System Resilience (DSR) configuration, a License Manager exists in each core. For a DSR zone, a license file for the primary core and a separate license file for the backup core are issued. Both files have the same licenses. The files have to be correctly loaded to the appropriate License Manager.

Figure 1: License Manager Deployment

The following diagram shows how the License Manager is deployed in each zone in the system. The licenses for zone and system level options are loaded to the appropriate License Managers. You can access each License Manager from the NM Client by using the web-based License Manager user interface (UI).



Licenses are tied to a specific License Manager in the system. The license file and its host License Manager are tightly tied using the Device Identifier (Device ID). License files generated for a specific zone (License Manager) have the Device ID of the License Manager. When you upload a license file to a specific License Manager, the Device ID in the license file must match the Device ID of the License Manager. This tight coupling ensures the license file for a specific system and zone cannot be used for a different zone of the same system or for another system. The License Manager Device ID is set during installation, and has the following format:

<SSSS><ZZZZ>-<AAAA>-<TTTT>-<RRRR-RRRRRRRRRRR>

where:

<SSSS> is the system ID (provided in order)

<ZZZZ> is the zone ID (provided in order, for example, 0002 is zone 2)

<AAAA> is the system extension ID to make the system ID unique. This ID is used to uniquely identify the systems that have the same system ID. Most ASTRO® 25 customers have unique system IDs and do not duplicate system IDs across systems. For such unique systems, the system extension ID can be set as 0000. For systems that have a reused system ID, the system extension ID must be specified with a value that makes the combination of system ID and system extension ID unique. System extension ID has no operational impact and exists solely for license purposes.

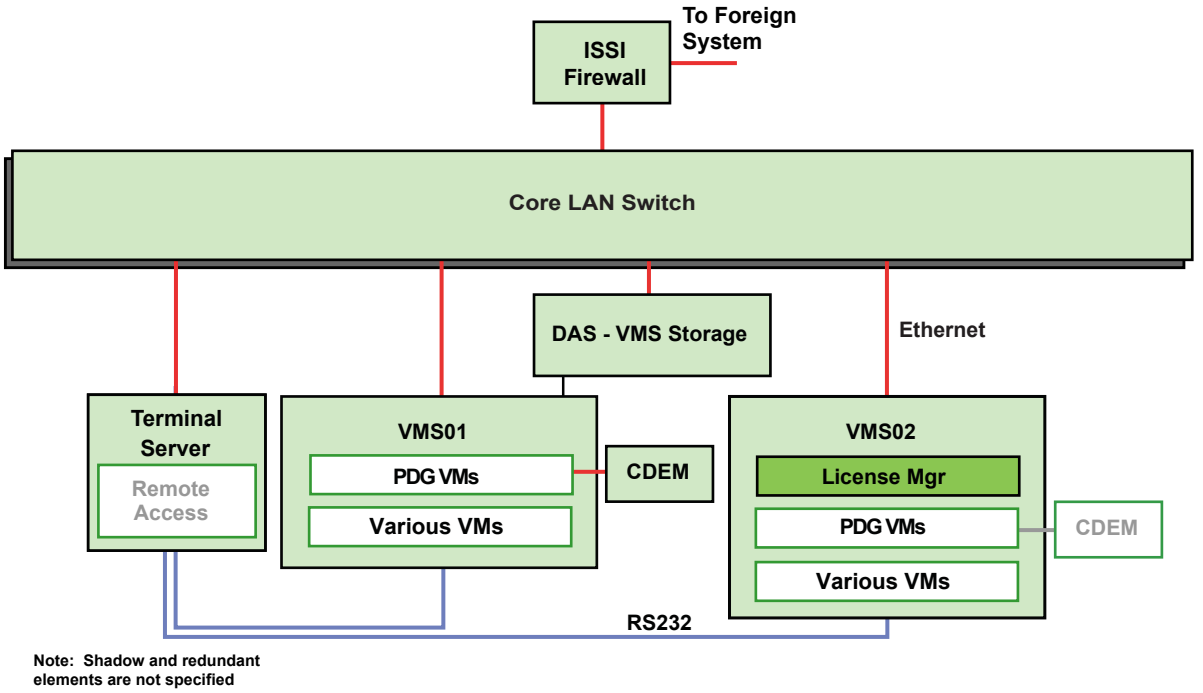
<TTTT> is the core type in DSR systems (0001 for the primary core or 0002 for the backup core)

<RRRR-RRRRRRRR> is a 16 hex long random number with uppercase alphabetical characters

Within each zone, the License Manager is installed as a Linux-based virtual machine on a Virtual Management Server (VMS) host.

Figure 2: License Manager in the ASTRO 25 System

The following diagram shows the License Manager on a VMS host in an M3 core system. This type of system can have multiple zones and features redundant components.



Related Links

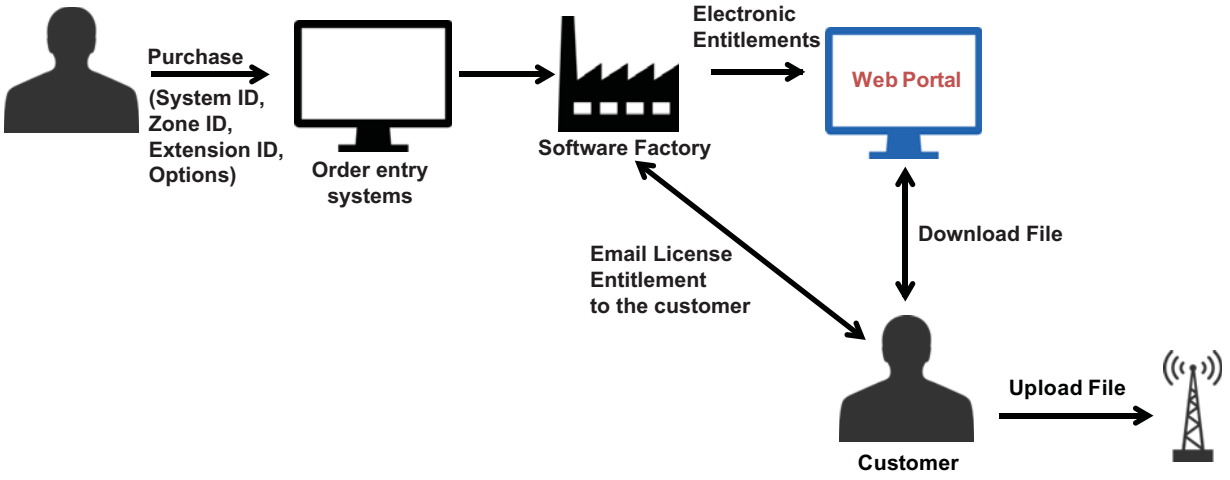
Installing the License Manager on page 47

2.3 License Acquisition

When an order containing license options and quantities is submitted and fulfilled successfully, an e-mail notification is sent to the e-mail address in the order with License Entitlement information.

Using the information in the License Entitlement e-mail, authorized users within Motorola Solutions can acquire or download the license from the internal portal. During first-time system deployment, Motorola Solutions service teams download the license file from the portal. For any add-on or expansion orders, customers can acquire or download the license, using information in the License Entitlement e-mail, from the Customer Portal at http://mysoftware.motorolasolutions.com and load the license file appropriately to the on-premise License Manager.

Figure 3: License Activation



2.4 License Levels: System and Zone

Features and capabilities in the ASTRO® 25 system that are controlled and served at zone level have zone level licenses. Features and capabilities that are controlled and served at system level have system level licenses.

System licenses

Licenses utilized at the system level. System licenses are loaded on the License Manager that is located in the same zone as the User Configuration Server (UCS).

Zone licenses

Licenses utilized at the zone level. Zone licenses designated for a particular zone are loaded on the License Manager located in that zone.

2.5 License Control Models: Enforce, Audit, Trust

Licenses in the ASTRO® 25 system are managed according to various control models: enforce, audit, and trust. Depending on the control model, the system verifies and monitors license usage differently, and provides or restricts access to licensed options.

Enforce

To configure and use a licensed option that is managed according to the enforce model, a license is always required. The system does not allow the configuration or use of the option unless a license is present. The enforce model applies to options that are auxiliary to system operations, and require more hardware or service planning.

Examples: Affiliation Display, Channel Partitioning, Unified Event Manager (UEM), ZoneWatch (ZW)

Audit

For a licensed option that is managed according to the audit model, the system verifies if a license is present, but allows configuration or usage without a license or when licensed capacity is exceeded. The audit model applies to options that may need to be deployed immediately in mission critical situations. If the number of licenses in use exceeds the number of licenses loaded on the License Manager, an alarm about license violation is reported to the Unified Event Manager (UEM), but the system is allowed to operate in a non-compliant state. The alarm means that in due time a system administrator needs to take action to bring the system back to compliance. Regularly check

compliance indicators and license usage in the License Manager user interface to see whether usage is well within compliance, approaching the licensed quantity, or is already out of license compliance.

Examples: High Performance Data (HPD) Radio User, MCC 7500 or MCC 7100 Dispatch Console, Association of Public Safety Communication Officials (APCO) Project 25 (P25) Frequency Division Multiple Access (FDMA) Trunking Operation Site, Trunked Radio User

Trust

For a licensed option that is managed according to the trust model, a license is purchased and loaded on the License Manager. However, the system does not validate license availability or make any decisions based on the license state.

Examples: Dynamic System Resilience (DSR) Capability, P25 TDMA Trunking Operation Zone, Radio Authentication, Unified Network Configurator (UNC)

2.6 License Types: Feature, Session, Capacity, Trial

Depending on the type of access that each license provides, the License Manager user interface displays the licenses grouped in the following categories.

Perpetual licenses

Licenses that do not expire and can be used for the lifetime of the system. Perpetual licenses belong to one of the following three types.

Feature (on/off) licenses

Feature licenses are necessary to enable and use a licensed option.

Examples: Dynamic System Resilience (DSR) Capability, Northbound Interface, Security Partitioning, Unified Event Manager (UEM) Email Alarm Notifications

Session (floating) licenses

Licenses used to manage the number of application client sessions. An active session uses a license from a pool of session licenses that you purchased.

Examples: Provisioning Manager, UEM, Unified Network Configurator (UNC), ZoneWatch (ZW)

Capacity licenses

Licenses used to manage the capacity or size of an ASTRO® 25 system. A larger system has more instances of radios, consoles, channels, and requires a greater number of licenses. Capacity licenses are typically managed through system configuration.

Examples: High Performance Data (HPD) Site, MCC 7500 or MCC 7100 Dispatch Console, Radio Authentication User, Trunked Radio User

Trial licenses

Licenses that are time bound. Trial licenses expire after a period of time. You can request trial licenses to evaluate a functionality through your Motorola Solutions representative. Selected feature and session licenses are available for trial. Capacity licenses are not used in trial mode.

Examples: Affiliation Display, Dynamic Reports, Radio Control Manager, ZW

2.7 License Management and Operations

With License Manager deployed in each zone core, licenses are provisioned and managed on each License Manager server. The License Manager provides an intuitive web-based user interface to manage and operate licenses. The License Manager user interface can be accessed through the web browser on the Network Management (NM) Client.

2.7.1
License Manager Naming and Access

To access the License Manager user interface for a particular zone, use a web address that includes the Domain Name Service (DNS) name of the License Manager server for that zone. The DNS names for License Managers in the system are consistent with the following naming convention.

License Manager DNS Names

License Managers that host system level licenses:

lm0<*Y*>.ucs

where **<*Y*>** is `1` for the primary core License Manager, `2` for the backup core License Manager in Dynamic System Resilience (DSR) systems.

License Managers that host zone level licenses:

lm0<*Y*>.zone<*X*>
z00<*X*>lm0<*Y*>.zone<*X*>

where:

<*X*> is the zone number.

<*Y*> is `1` for the primary core License Manager, `2` for the backup core License Manager in DSR systems.

Based on the License Manager DNS name, the log-in page of the License Manager application displays information about the location of the License Manager server that you want to access: its zone number and core type. After you log on, the License Manager shows this information in the top left corner.

License Manager URL

The Universal Resource Locator (URL) of a License Manager server starts with `https://` followed by its DNS name.

Related Links

Logging On to the License Manager UI on page 41

2.7.2
Provisioning Licenses

To gain access to licensed options, license files are procured and uploaded to the License Manager in each zone where the licensed options are to be used.

System level licenses are loaded to the License Manager in the zone where the User Configuration Server (UCS) is located. In a Dynamic System Resilience (DSR) configuration, a License Manager exists in both the primary and backup core. For a DSR zone, a license file for the primary core and a license file for the backup core are issued. Both files have the same licenses. The files have to be correctly loaded to the appropriate License Manager.

Licenses are tightly coupled to the License Manager through the Device ID. License files generated for a specific License Manager have the Device ID of the License Manager. When you upload a license file to a specific License Manager, the Device ID in the license file must match the Device ID of the License Manager. This tight coupling ensures that the license file for a specific system and zone cannot be used for a different zone of the same system or for another system.

Licenses are uploaded to the License Manager by using the License Manager user interface. To use the **Upload Licenses** option, log on to the License Manager with a user account that has administrative privileges. For regular users, this option is unavailable.

Related Links

Uploading Licenses to the License Manager on page 43

2.7.3

License Inventory

Use the License Manager web-based user interface to manage and monitor the licenses valid for each zone in your system. Log on to the License Manager for a particular zone by using the web address of the License Manager.

The user interface provides the list of licenses that are purchased and valid on the system.

Licenses

View this tab for information about all the licenses purchased and loaded on the License Manager in this zone and some licenses available for purchase. The licenses are grouped by type:

- **Capacity Licenses**
- **Feature Licenses**
- **Session Licenses**
- **Trial Licenses**

All licenses are identified by the license ID, descriptive option name, and their location in the system.

For capacity and session licenses, the user interface indicates the number of licenses purchased, currently used in the zone or system, and the maximum number of licenses that can be purchased or used in the system.

For feature licenses, the user interface indicates whether the licensed option is purchased or not.

Purchased options are marked with the clear icon:

For trial session licenses, the number of licenses available for trial, the number of licenses used, and the expiration date are specified.

For trial feature licenses, only the expiration date is displayed. The trial quantity and used quantity fields do not apply to these licenses. These fields do not show any values and are marked with minus signs (-).

Sessions

The License Manager provides information on the usage of session licenses in the system. The information includes the license option name currently being actively used, name of the host machine where the license is requested, the login name of the user requesting the session license, and how long the session license is in use.

Users with administrative privileges also have access to the **Release** option. This option lets you release a session license used by an active session for a licensed option. The released license returns to the pool of licenses available for use to other users. The session can remain active for 31 to 59 minutes. If a session license becomes available before that period expires, the session can continue as if the force release did not happen.

Related Links

Viewing Licenses on page 44
Viewing Sessions on page 44

2.7.4
License Usage and Compliance

Capacity licenses for mission critical options are managed according to the audit model, which means that the license usage can exceed the purchased capacity without you losing access to the licensed options.

Exceeding the purchased capacity results in a non-compliance alarm in the Unified Event Manager (UEM). The alarm means that in due time you need to take action to bring your system back to compliance: purchase more capacity or reduce license usage.

Ensure that your system is always in compliance in terms of capacity license usage. Regularly check compliance indicators and license usage in the License Manager user interface. In the **Licenses** tab, check the values in the relevant fields in the **Capacity Licenses** pane:

Status icons:

 indicates that the usage of a capacity license is in compliance.

 indicates that the usage of a capacity license exceeds the limit.

 indicates that the usage of a capacity license is not monitored by the system.

Quantity Purchased
This field indicates the number of capacity licenses purchased for the zone or system.

Quantity Used
This field indicates the number of capacity licenses currently in use in the zone or system.

2.7.5
Force Release of Session Licenses

Session licenses are floating licenses. Users can share the pool of licenses purchased. An active application session uses a license from a pool of session licenses that you purchased. On rare situations where there is a need to release a session license used by a particular user or host, an administrator can force release a session license. A released license becomes available for use to other users and machines.

You can force release a licensed session by using the **Release** option in the License Manager user interface. The **Release** option is only available for users with administrative privileges.

Session licenses for the following applications can be force released:

- Affiliation Display
- Dynamic Reports
- Provisioning Manager
- Radio Control Manager (RCM)
- System Historical Reports
- Unified Event Manager (UEM)
- Zone Historical Reports
- ZoneWatch

Related Links

Forcing Release of a Licensed Session on page 45

2.7.6
Exported Reports

The License Manager user interface enables you to export the information about the licenses used in your system. The **Export** option creates a report in a comma separated values (`.csv`) file that contains this information.

Licenses Tab Exported Report

If you click the **Export** button from the **Licenses** tab, the exported report contains the information about the licenses loaded on the License Manager and the licenses available for purchase, including the capacity, feature, session, and trial licenses. The report contains the current information retrieved from the License Manager that you are logged on to. The information in the report can differ from the information visible in the **Licenses** tab if the view of the tab has not been refreshed.

Sessions Tab Exported Report

If you click the **Export** button from the **Sessions** tab, the exported report contains the information about the session licenses loaded on the License Manager that are currently in use. The report contains the current information retrieved from the License Manager that you are logged on to. The information in the report can differ from the information visible in the **Sessions** tab if the view of the tab has not been refreshed.

In either case, the `.csv` file is generated with a default name that provides the following information:

- Name of the tab from which the information was retrieved
- Zone number and core type of the License Manager for which the report was generated
- Name of the user who generated the report while logged on to the License Manager

Related Links

Exporting License Information on page 45

2.7.7
Printable Reports

The License Manager user interface enables you to print the information about the licenses used in your system. When you use the **Print** option, a printable report is opened in a web browser.

Licenses Tab Printable Report

If you click the **Print** button from the **Licenses** tab, the report contains the current information about the licenses loaded on the License Manager and the licenses available for purchase, including the capacity, feature, session, and trial licenses. If the information in the report differs from the information visible in the **Licenses** tab, refresh the view of the tab to retrieve the current information from the License Manager.

Sessions Tab Printable Report

If you click the **Print** button from the **Sessions** tab, the report contains the current information about the session licenses loaded on the License Manager that are currently in use. If the information in the report differs from the information visible in the **Sessions** tab, refresh the view of the tab to retrieve the current information from the License Manager.

In either case, the report also provides the following information:

- Name of the tab from which the information was retrieved
- Zone number and core type of the License Manager for which the report was generated

- Name of the user who generated the report while logged on to the License Manager
- Date on which the report was generated

Related Links

Printing License Information on page 46

2.8

Disaster Recovery of the License Manager

The License Manager is a Backup and Restore (BAR) client, which means that the critical data for the License Manager is regularly backed up on the BAR server.

The License Manager can become unavailable when the Virtual Management Server (VMS) hosting the License Manager fails or when the Direct Attached Storage (DAS) connected to the VMS and used to store data for the virtual machines running on the VMS host fails.

When the VMS or DAS has been recovered, the License Manager can be restored through the disaster recovery process. See Recovering the License Manager on page 65.

Reinstalling the License Manager does not require setting the Device ID for the new License Manager. The backup data restored on the new License Manager contains the Device ID of the failed License Manager, the license files stored on the License Manager at the time of failure, certificates, passwords, application logs, and other information.

Dynamic System Resilience

In a Dynamic System Resilience (DSR) configuration, a License Manager is present in each core: primary and backup. For DSR zones, license files are issued for and loaded to both License Manager servers. When a switchover from the primary core to the backup core occurs, the backup core License Manager provides the same license capability to the servers in the backup core. The primary core License Manager that experienced a failure can be restored through the disaster recovery process described in this section.

Related Links

Recovering the License Manager on page 65

Chapter 3

License Manager User Interface

This chapter describes the web-based user interface for the License Manager in each zone. Use this application to load and manage licenses in the ASTRO® 25 system.

3.1 License Manager User Interface Options

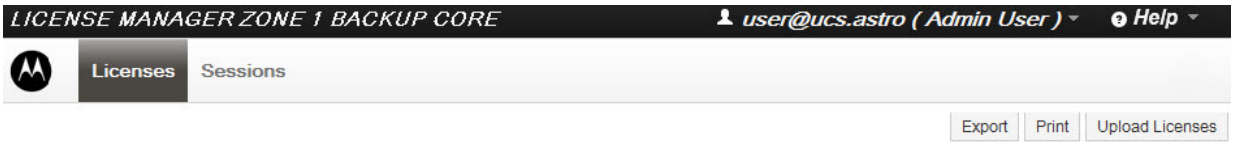
The License Manager user interface provides various features and options. This web-based interface enables you to monitor and manage the licenses in the system.

All active licenses are displayed in the appropriate sections. The expired licenses are automatically removed from the view.

3.1.1 License Manager Main Page

The main page of the License Manager user interface consists of elements arranged into sections.

Navigation Section



Located at the top of the page, this section includes the following elements.

Title
Displays the name of the application, zone ID, and core type. Located in the top left corner.

User menu
Shows the name of the user who is logged on to the License Manager UI. Located in the top right corner.
The drop-down menu includes the **Logout** option.

Licenses tab
Provides information about the licenses enabled and available for the system, sorted by category. This tab consists of the following panes:

- **Capacity Licenses**
- **Feature Licenses**
- **Session Licenses**
- **Trial Licenses**

Sessions tab
Provides information about the active sessions for the licenses enabled in the system.

Help menu

- The **About** option displays information about this version of the License Manager.
- The **Online Help** option displays the online help for the License Manager UI.

Export button

Enables you to export the information in the currently selected tab (**Licenses** or **Sessions**) into a comma separated values (`.csv`) file. The report provides information about the licenses loaded on the License Manager that you are logged on to and the licenses available for purchase. The printable report contains the current information retrieved from the License Manager that you are logged on to. The information in the report can differ from the information visible in the selected tab if the view of the tab has not been refreshed.

Print button

Allows you to print a summary of the information in the currently selected tab: **Licenses** or **Sessions**. The printable report provides information about the licenses loaded on the License Manager that you are logged on to and the licenses available for purchase. The report contains the current information retrieved from the License Manager that you are logged on to. The information in the report can differ from the information visible in the selected tab if the view of the tab has not been refreshed.

Upload Licenses button

Enables you to upload licenses to the License Manager that you are logged on to. This option is visible only to the users belonging to the **licadmin** group.

Content Section

Located in the middle of the page, this section displays the currently selected tab: **Licenses** or **Sessions**, as shown in the following examples.

Figure 4: Licenses Tab

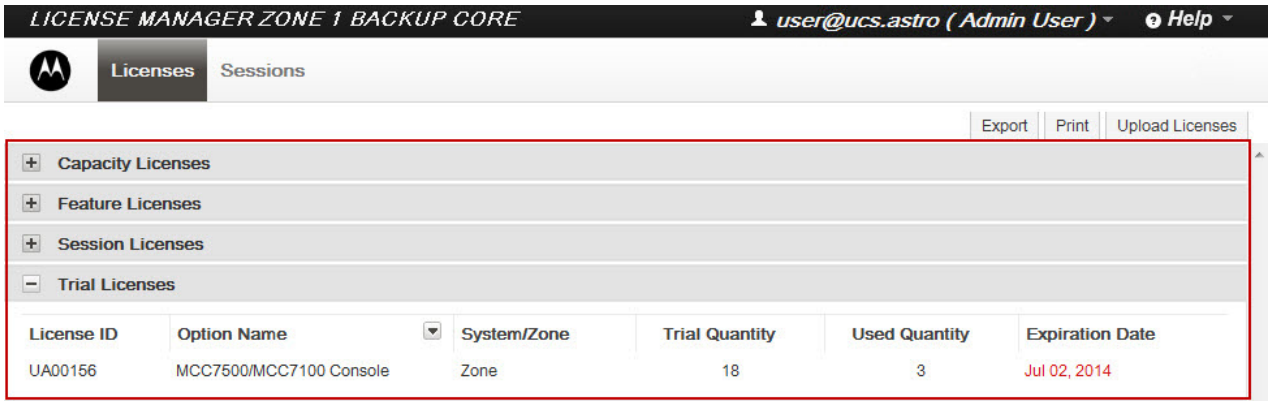


Figure 5: Sessions Tab

General Information Section

Located at the bottom of the page, this section includes the following elements.

Copyrights
Provides the copyright information for the License Manager application. Located in the bottom left corner.

Device ID
License files are tightly coupled to the License Manager using this Device ID. A license file can be uploaded only if the Device ID of the License Manager and Device ID in the license file match.

3.1.1.1
License Manager Licenses Tab

The **Licenses** tab displays the licenses enabled and available for the system.

This information is arranged by category into the following panes:

- **Capacity Licenses**
- **Feature Licenses**
- **Session Licenses**
- **Trial Licenses**

The information in each pane is displayed in columns in the form of text or icons.

Column Descriptions

Each pane in the **Licenses** tab contains all or some of the following columns. In each column, you can sort the licenses in ascending or descending order by clicking the column heading.

Capacity Licenses pane – status icons
The status icons indicate the use of a capacity license.

- The clear icon  indicates that the capacity use is within limit.
- The critical icon  indicates that the capacity use exceeds the limit. Visible in the **Capacity Licenses** pane.
- The N/A (not applicable) icon  indicates that a purchased license is managed according to the trust model. The trust model means that the system does not validate licenses availability or make any decisions based on the license state.

License ID
Provides the identifier used to place an order. Visible in all panes.

Option Name
Provides the name of the licensed option. Describes what is being licensed. Visible in all panes.

System/Zone
Indicates if the license is utilized at the system or zone level. Visible in all panes.

Purchased Quantity
Indicates the capacity or the number of sessions purchased. Visible in the **Capacity Licenses** and **Session Licenses** panes.

Purchased
Indicates if the licensed is purchased or not. The clear icon  indicates a purchased license. Visible in the **Feature Licenses** pane.

Trial Quantity
Indicates the number of sessions available for trial. For trial feature licenses, this field does not display any values. Visible in the **Trial Licenses** pane.

Used Quantity
Indicates the capacity or the number of sessions currently used in the system. Visible in the **Capacity Licenses**, **Session Licenses**, and **Trial Licenses** panes. For trial feature licenses, this field does not display any values.

Maximum Quantity
Indicates the maximum capacity or the number of sessions that can be purchased and used in the system. Visible in the **Capacity Licenses** and **Session Licenses** panes.

Expiration Date
Specifies the expiration date of a license. Visible in the **Trial Licenses** pane.

Related Links

Licensed Options on page 19
License Levels: System and Zone on page 30
License Types: Feature, Session, Capacity, Trial on page 31
License Control Models: Enforce, Audit, Trust on page 30
License Expiration

3.1.1.2
License Manager Sessions Tab

The **Sessions** tab displays the active sessions for all the licenses that are enabled in the system. The information is displayed in columns.

Column Descriptions

The **Sessions** tab consists of the following columns. The descriptions are provided in alphabetical order.

License ID
Provides the identifier used to place an order.

Option Name
Provides the name of the licensed option. Describes what is being licensed.

Host
Provides the name of the machine from which the session was initiated.

User name
Provides the account name of the user who started the session.

License In Use
Shows for how long the session has been active.

Release
Provides the option to release the license from an active session. If this option is available, the column includes the **Release** button.

Related Links

Licensed Options on page 19
License Levels: System and Zone on page 30
License Types: Feature, Session, Capacity, Trial on page 31
License Control Models: Enforce, Audit, Trust on page 30
License Expiration

3.2
License Manager UI Operations

The License Manager user interface enables users to perform operations related to license management. These operations include viewing the status of licenses in the system, loading and force releasing licenses, and exporting and printing license reports.

3.2.1
Logging On to the License Manager UI

The License Manager user interface supports two methods of logging on to the application.

- Single Sign-On (SSO) enables automatic access to all Network Management (NM) client applications with Windows user credentials.
- Password-based authentication provides the access to the License Manager UI with the credentials of any user registered in Active Directory.

NOTICE: For quick access to the License Manager log-in page, you can create desktop shortcuts on the client PC.

Procedure:

1. On the client PC, open the Internet Explorer web browser.
2. In the browser, perform one of the following actions:
   - To use SSO, enter one of the following addresses in the address field:
     - For License Managers that host zone level licenses:
       `z00<X>lm0<Y>.zone<X>/sso/login`

       `lm0<Y>.zone<X>/sso/login`
     - For License Managers that host system level licenses:
       `lm0<Y>.ucs/sso/login`

       where:

       <X> is the zone number.

       <Y> is `1` for the primary core, `2` for the backup core in Dynamic System Resilience (DSR) systems.

     The License Manager main page appears. Log-in is complete.
   - To use password-based authentication, enter one of the following addresses in the address field:
     - For License Managers that host zone level licenses:
       `z00<X>lm0<Y>.zone<X>/login`

       `lm0<Y>.zone<X>/login`
     - For License Managers that host system level licenses:
       `lm0<Y>.ucs/login`

       where:

       <X> is the zone number.

       <Y> is `1` for the primary core, `2` for the backup core in DSR systems.

     The License Manager log-in page appears. Go to step 3.
3. On the log-in page, enter the user name and password for the appropriate user account. Click **Login**.

Related Links

License Manager Naming and Access on page 32
Creating a Shortcut to the License Manager Login Page on page 42

3.2.2
Creating a Shortcut to the License Manager Login Page

For quick access to the License Manager user interface, you can create two desktop shortcuts to the License Manager log-in page on the client PC: one for Single Sign-On (SSO) and one for password-based authentication.

Procedure:

1. Select **New** → **Shortcut**.
2. In the **Create Shortcut** window, in the **Type the location of the item** field, enter the web addresses provided in the following format.

   IMPORTANT: Do not use the **Browse** button to locate the server.

   - To create a shortcut for SSO, enter one of the following addresses:
     - For License Managers that host zone level licenses:
       `https://z00<X>lm0<Y>.zone<X>/sso/login`

       `https://lm0<Y>.zone<X>/sso/login`
     - For License Managers that host system level licenses:
       `https://lm0<Y>.ucs/sso/login`

       where:

       <X> is the zone number.

       <Y> is `1` for the primary core, `2` for the backup core in Dynamic System Resilience (DSR) systems.
   - To create a shortcut for password-based authentication, enter one of the following addresses:
     - For License Managers that host zone level licenses:
       `https://z00<X>lm0<Y>.zone<X>/login`

       `https://lm0<Y>.zone<X>/login`
     - For License Managers that host system level licenses:
       `https://lm0<Y>.ucs/login`

       where:

       <X> is the zone number.

       <Y> is `1` for the primary core, `2` for the backup core in DSR systems.
3. Click **Next**.
4. In the **Type a name for this shortcut** field, enter a descriptive name for each shortcut.

   Remember that each zone has a unique web address, and each shortcut should be named appropriately.
5. Click **Finish**.

   The shortcut appears on the desktop. You can now access the License Manager log-in page by double-clicking the shortcut.

Related Links

Logging On to the License Manager UI on page 41

3.2.3
Uploading Licenses to the License Manager

In the ASTRO® 25 system, each zone has a License Manager server.

To enable a zone level or system level license, you need to upload the license to the appropriate License Manager.

- Load zone level licenses to the License Manager for the particular zone.
- Load system level licenses to the License Manager in the zone where the User Configuration Server (UCS) is located.

A separate file is generated for each License Manager in the system. Each License Manager has a unique Device ID. The Device ID encrypted in a license file issued for each License Manager must match the Device ID of the License Manager. The Device ID of the License Manager can be found in the bottom right corner of the License Manager user interface.

Prerequisites:
Obtain license files from the **My Software** portal: http://licensing.motorolasolutions.com

Ensure that:

- The License Manager is enabled and joined to the domain.
- The license file is generated for this License Manager.
- The license file is available from the client machine.
- Your user account belongs to the **licadmin** group.

Procedure:

1. Log on to the client machine, for example, a Network Management (NM) client or service laptop.
2. Verify that the license file name matches the name of its intended destination.
3. Using a web browser on the PC, connect to the License Manager.
   - If Single Sign-On (SSO) is enabled and available on your client machine, enter the address in the following format:
     `https://<hostname_of_License_Server>/sso/login`

     The License Manager main window appears. Go to step 5.
   - If not, enter the address in the following format: `https://<hostname_of_License_Server>/login`
     The **Login** page appears. Go to step 4.
4. **If SSO is not enabled or available:** On the **Login** page, log on to the License Manager using an account from the **licadmin** group.

   The License Manager main window appears.
5. Click the **Upload Licenses** button in the top right corner of the window.

   If the button is not visible, perform the following actions:

   1. In the top right corner, click the user name.
   2. From the drop-down menu, select **Logout**.
   3. Contact your system administrator to add your user account to the **licadmin** group.
   4. After the account is added, retry to log-in.

6 In the **License upload** window, click **Select file**.

7 In the **Choose File to Upload** window, select a license file for this License Manager, and click **Open**.

8 In the **License upload** window, click **Upload**.

If the upload operation is successful, a summary of changes appears in the **Change report** window.
In the following situations, the License Manager does not allow files to be loaded and displays an error message:

- If you choose to reload a license file that is already loaded on that License Manager.
- If you choose to upload a license file destined for another system or zone core. Such a license file does not have a matching Device ID.

9 Review the changes, then click **Close**.

The License Manager main window returns.

Related Links

Installing the License Manager on page 47
Logging On to the License Manager UI on page 41

3.2.4
Viewing Licenses

The License Manager user interface enables you to view all the licenses enabled and available for the ASTRO® 25 system.

Procedure:

1 From the License Manager main window, select the **Licenses** tab.

The license information is displayed in the following panes:

- **Capacity Licenses**
- **Feature Licenses**
- **Session Licenses**

IMPORTANT: The **Licenses** tab does **not** refresh automatically.

See Figure 4: Licenses Tab on page 38 for an example.

Related Links

Logging On to the License Manager UI on page 41
Licensed Options on page 19

3.2.5
Viewing Sessions

The License Manager user interface enables you to view the active sessions for the session licenses enabled in the ASTRO® 25 system.

Procedure:

1 From the License Manager main window, perform one of the following actions:

- To view the sessions for all the session licenses enabled in the system, select the **Sessions** tab.
- To view the sessions for a particular session license, perform the following actions:
  1. Select the **Licenses** tab.
  2. In the **Session Licenses** pane, click the row for that license.
     The **License Details** window appears.

IMPORTANT: The **Sessions** tab does **not** refresh automatically.

See Figure 5: Sessions Tab on page 38 for an example.

Related Links

Logging On to the License Manager UI on page 41
Licensed Options on page 19

3.2.6
Forcing Release of a Licensed Session

The License Manager user interface shows the active sessions for the licensed applications. An active session uses a license from a pool of session licenses that your organization purchased.

You can force release of a licensed session by using the **Release** option. A released license becomes available for use to other users and machines.

When and where to use: The **Release** option is available only for users with administrative privileges.

Procedure:

1. In the License Manager main window, perform one of the following actions:
   - To view the sessions for all the session licenses enabled in the system, select the **Sessions** tab.
   - To view the sessions for a particular session license, perform the following actions:
     1. Select the **Licenses** tab.
     2. In the **Session Licenses** pane, click the row for that license.
2. On the list of active sessions, find the session that you want to release and click **Release**.
3. In the confirmation window, click **Yes**.

   A message confirms that the selected license has been released.
   If the license cannot be released, an error message appears.

Related Links

Logging On to the License Manager UI on page 41
Force Release of Session Licenses on page 34

3.2.7
Exporting License Information

The License Manager user interface enables you to export the information displayed in the **Licenses** or **Sessions** tabs into a comma separated values (`.csv`) file.

- The report provides information about the licenses loaded on the License Manager that you are logged on to and the licenses available for purchase for the system. The report contains the current information retrieved from the License Manager.
- If the information in the report differs from the information visible in the **Licenses** or **Sessions** tab, refresh the view of the tab to retrieve the current information from the License Manager.

Procedure:

1. From the License Manager main window, select the **Licenses** or **Sessions** tab.
2. Click **Export**.
3. Save the file.
4. Optional: Change the name of the file to help you identify the report. The name can include information such as the date, time, zone ID, and core type.

Related Links

Exported Reports on page 35
Logging On to the License Manager UI on page 41

3.2.8
Printing License Information

The License Manager user interface enables you to print the information in the **Licenses** and **Sessions** tabs.

The **Print** option opens a printable report in a web browser. The printable report contains the current information retrieved from the License Manager that you are logged on to.

Procedure:

1. From the License Manager UI main window, select the **Licenses** or **Sessions** tab.
2. Click **Print**.

   A summary of the information in the selected tab appears in a new web browser window. The information in the report can differ from the information visible in the **Licenses** or **Sessions** tab if the view of the tab has not been refreshed.

3. To print the report, press CTRL + P, select the printing settings, and click **Print**.

Related Links

Printable Reports on page 35
Logging On to the License Manager UI on page 41

Chapter 4

License Manager Installation

This chapter provides information about the installation of the License Manager in an ASTRO® 25 system. The License Manager is installed in the zone core as a virtual machine on a Virtual Management Server (VMS) host.

4.1 Installing the License Manager

Perform the following process to install the License Manager application in an ASTRO® 25 system.

Process:

1. Log on to the Virtual Management Server (VMS) host.
   See Logging On to the VMS Host of the Virtual Machine on page 48.
2. Import the License Manager application.
   See Importing a Virtual Machine on page 48.
3. **Only for systems with vCenter installed:** Configure VMware vCenter for the License Manager virtual machine.
   See Configuring the vCenter for the Newly Deployed VM on page 50.
4. Set the startup and shutdown order for the License Manager virtual machine.
   See Setting the Virtual Machine Startup and Shutdown Order on page 51.
5. Configure the security settings for the License Manager virtual machine.
   See Applying Supplemental Configuration to Virtual Machines on page 52.
6. Set the License Manager Device ID.
   See Setting the License Manager Device ID on page 55.
7. Connect and power on the License Manager virtual machine.
   See Connecting and Powering On the License Manager on page 57.
8. Configure the time zone for the License Manager virtual machine.
   See Configuring the Time Zone on Linux Servers on page 57.
9. Set the identity for the License Manager virtual machine.
   See Setting Identity for the License Manager on page 58.
10. Join the License Manager virtual machine to the Active Directory domain.
    See Joining a Virtual Machine to the Domain on page 59.
11. Apply the platform patch to the License Manager virtual machine.
    See Applying the Platform Patch on page 60.
12. Enable the License Manager virtual machine.
    See Enabling the License Manager on page 61.
13. Upload license files to the License Manager.
    See Uploading Licenses to the License Manager on page 61.

14 If applicable, apply Linux operating system patches to the server. Installation procedures for the MOTOPATCH are available at: https://sites.google.com/a/motorolasolutions.com/sus-motopatch/

If you cannot open the link, this means that MOTOPATCH for RedHat Enterprise Linux version 7 (RHEL 7) is not available yet. Go to step 15.

IMPORTANT:
The Linux MOTOPATCH must be applied after all applications are installed.

Patches must be installed regularly and for each fresh installation.

15 Perform supplemental configuration procedures on the server, as required by your organization. See the *Unix Supplemental Configuration* manual.

Related Links

License Manager Deployment on page 27

4.1.1
Logging On to the VMS Host of the Virtual Machine

The virtual machine is installed on a Virtual Management Server (VMS) host. You can log on to the VMS host using the VMware vSphere Client application.

NOTICE: For Zone Controllers: If a vCenter Server manages the VMS hosts in the system, the Zone Controller must be deployed and installed from the vCenter Server, and a message indicating this condition appears when the vSphere Client is connected to the host. Otherwise, the Zone Controller is deployed and installed on the appropriate VMS host. A Zone Controller cannot be deployed from a host managed by a vCenter Server.

Prerequisites: Obtain the following information:

- IP address of the VMS host
- Password for the root user account

Procedure:

1 From a Windows-based device, launch the VMware vSphere Client.

2 Log on to the VMS as the root user:

a In the **IP address / Name** field, enter the IP address of the VMS host.

b In the **User name** field, enter: `root`

c In the **Password** field, enter the password for the root user account.

The **vSphere Client Inventory** window appears.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.2
Importing a Virtual Machine

Importing a Linux-based virtual machine may take approximately an hour, depending on network traffic and disk usage.

Prerequisites: Obtain the following media and information:

- *License Manager DVD*

- IP address of the Linux-based ESXi server (Virtual Management Server host)
- Root account password for the server
- Hostname for the device that you are importing
- Zone network for the virtual machine

Procedure:

1. From a Windows-based device, launch the VMware vSphere Client.

   A desktop shortcut was created during installation.
2. Log on to the server as `root`.
3. In the **vSphere Client Inventory** window, perform one of the following actions:
   - If you are installing from the DVD, insert the media listed in the prerequisites in the DVD drive of the device where the vSphere Client resides.
   - If you are not installing from the DVD, determine the location of the following file: ***<License_Manager>***`.ovf`
4. Select **File** → **Deploy OVF Template**.
5. In the **Deploy OVF Template – Source** window, click **Browse**.

   A window displays file directories.
6. Perform the following actions:
   a. Navigate to the file location.
   b. Select the file:

      <License_Manager>`.ovf`
   c. Open the file.
   d. Click **Next**.
7. In the **Deploy OVF Template – OVF Template Details** window, click **Next**.
8. In the **Deploy OVF Template – Name and Location** window, perform the following actions:
   a. In the **Name** field, enter the appropriate host name.
   b. Click **Next**.
9. Optional: If the **Resource Pool** window appears, click on the IP address of the server. Click **Next**.
10. If the **Deploy OVF Template – Storage** window appears, perform the following actions:
    a. Select a datastore to install the virtual machine upon.

       Always select: `z00`***<X>***`das`***<YY>***`_datastore1`

       where:

       <X> is the zone number. The possible values are: 1-7.

       <YY> is the instance of the Direct Attached Storage (DAS).
    b. Click **Next**.
11. In the **Deploy OVF Template – Disk Format** window, perform one of the following actions:
    - If the **Thick Provision Eager Zeroed** format is an available option, select it.
    - If that option is not available, select **Thick Provision**.
12. Click **Next**.

13 In the **Deploy OVF Template – Network Mapping** window, select the appropriate **Destination Network** for each **Network Source**.

14 Click **Next**.

15 In the **Deploy OVF Template – Ready to Complete** window, verify the deployment settings. Click **Finish**.

The import starts.

16 When the process is completed successfully, verify that the left pane of the **vSphere Client** main window displays the application virtual machine name. You may need to expand the list in the left pane to locate the virtual machine name.

17 In the **Deployment Completed Successful** window, click **Close**.

18 Optional: If you used the DVD, remove it from the DVD drive.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.3
Configuring the vCenter for the Newly Deployed VM

For newly deployed virtual machines to run properly in an existing vCenter environment, you must override the default High Availability (HA) cluster settings and modify the restart priority for the new virtual machines. After a Virtual Management Server (VMS) host fails, the virtual machines are restarted in the relative order determined by their restart priority.

When and where to use:

- This procedure applies only to systems where the vCenter application is installed.
- Perform this procedure only if an Open Virtualization Format (OVF) virtual machine was deployed after the vCenter was originally configured.

Procedure:

1 Launch the Internet Explorer from a Windows-based device, such as the Network Management (NM) Client, or a service computer or laptop.
   - In the address field of the browser, enter the address in the following format: `https://<vCenter_IP_address>/vsphere-client`
   - Ignore or accept any warnings about the connection security or self-signed certificates.

2 In the dialog box, perform the following actions:

   a Enter the user name in the following format:

   `administrator@z00<Z>vcs<H>.zone<Z>`
   `<Z>` is the zone number

   `<H>` is the vCenter instance number

   b Enter the password for the administrator account.

   c Click **Login**.

   The vSphere Web Client homepage appears.

3 In the left pane, click **Hosts and Clusters**.

4 Expand the tree and right-click the **Zone**`<X>` HA cluster

   where `<X>` is the zone number.

5 Select **Settings**.

6 In the **Settings** window, click **VM Overrides**.

7 Click **Add**.

8 Click the plus (**+**) button.

9 Select the check box for the virtual machine you are configuring. Click **OK**.

10 Depending on the virtual machine you are configuring, select the appropriate value for **VM Restart Priority**.

- For the vCenter virtual machine, select **Medium**.
- For virtual machines that are monitored under Fault Tolerance, select **High**.
- For virtual machines that are not monitored under Fault Tolerance or HA, select **Disabled**.

11 Click **OK**.

12 Optional: **If you are recovering the virtual machine after a failure and the virtual machine is not monitored under Fault Tolerance:** Perform the following actions:

a In the **Settings** window, click **VM/Host Groups**.

b Select the group for the VMS host where the virtual machine resides. Click **Edit**.

c Click **Add**.

d Select the check box next to the virtual machine. Click **OK**.

For information about the locations of virtual machines on the VMS and their configurations with regard to vCenter, see "Virtual Machine Locations for vCenter Configs" in the *ASTRO 25 vCenter Application Setup and Operations Guide*.

e Click **OK**.

The restart priority setting for the newly deployed virtual machine is configured.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.4
Setting the Virtual Machine Startup and Shutdown Order

In an ASTRO® 25 system, virtual machines hosted on a Virtual Management Server (VMS) host are configured to boot automatically with the system in a prescribed order. When you install a virtual machine on a VMS host, change the VMS settings to ensure that the new virtual machine boots in the correct order with respect to the other virtual machines hosted on the VMS.

Procedure:

1 From a Windows-based device, launch the VMware vSphere Client.

A desktop shortcut was created during installation.

2 Log on to the server as a user with root privileges.

3 On the upper left side of the **vSphere Client Inventory** window, select the ESXi server that serves as the VMS host.

4 On the right side of the window, select the **Configuration** tab.

The window displays information about the configuration of the selected server.

5 In the **Software** section, select **Virtual Machine Startup/Shutdown**.

6 On the right side of the main window, select **Properties**.

7 In the **System Settings** area, select **Allow virtual machines to start and stop automatically with the system**.

8 In the **Default Startup Delay** area, select **Continue immediately if the VMware Tools start**.

9 In the **Default Shutdown Delay** area, select **Shutdown Action** → **Guest Shutdown**.

10 Set the boot order for the virtual machines hosted on the server:

   a In the **Startup Order** area, from the **Automatic Startup** list, select a virtual machine.

   b Using the **Move Up** and **Move Down** buttons, move the virtual machine to the correct ordered slot.

   To determine the correct ordered slot for each virtual machine hosted on the server that you are configuring, see Zone Core Virtual Machine Boot Order on page 69.

   c Repeat step 10 a and step 10 b until the boot order for the virtual machines is correct.

11 Click **OK**.

   The **Properties** window closes.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.5

Applying Supplemental Configuration to Virtual Machines

Virtual machines hosted on the ESXi-based Virtual Management Server (VMS) may require supplemental configuration to improve their security settings, depending on the security requirements of your organization. Users apply the supplemental configuration by running a script stored on the configuration media listed in the Prerequisites to this procedure.

Prerequisites:

- Obtain the *VMware vSphere Configuration Media*.
- Install the VMware PowerCLI application on the Windows-based device. See Installing VMware PowerCLI on page 54.

When and where to use:
Perform this procedure on a Windows-based device, such as a Network Management (NM) client, dispatch console, or service computer or laptop.

During an upgrade, you must run the script specifically on the newly imported virtual machines if the virtual machines were imported after the VMS host was updated.

Procedure:

1 Insert the *VMware vSphere Configuration Media* into the optical drive of the Windows-based device.

2 Open the PowerShell command prompt as administrator, using the actions that apply to the Windows operating system version that is present on the device.

   - For Windows 7 or Windows Server 2008, perform the following actions:

     1 From **Start**, in the **Search programs and files** field, enter: `Command Prompt`

     2 Right-click **Command Prompt** and select **Run as administrator**.

     3 If the **User Account Control** window appears, click **Continue** or **Yes**, depending on the prompt you see.

4. If you are not logged on with an administrative account, enter the domain admin credentials.
5. At the command prompt, enter: `powershell`

- For Windows 10 or Windows Server 2012, perform the following actions:
  1. From **Start**, click **Search**.
  2. In the search field, type in `powershell`
  3. Right-click **Windows PowerShell**, and select **Run as administrator**.
     - If the **User Account Control** window appears, click **Yes**.
     - If you are not logged on with an administrative account, enter the domain admin credentials.

3. At the PowerShell prompt, enter the drive letter of the optical drive that contains the *VMware vSphere Configuration Media* disc followed by a colon.

   Step example: `E:`
   The directory is changed to the root directory of the *VMware vSphere Configuration Media* disc.

4. At the PowerShell prompt, enter: `cd common\bin`

   The directory is changed to the `common\bin` directory of the *VMware vSphere Configuration Media* disc.

5. At the PowerShell prompt, enter: `.\Configure-VMHardening.ps1`
6. At the ESXi host IP prompt, enter the IP address of the VMS host.
7. At the user name prompt, enter the user name for an administrative account on the VMS host.
8. At the password prompt, enter the password for the account used in step 7.
9. At the PowerShell, prompt, enter the name of the virtual machine for which you want to update the configuration. Ensure that the name matches the name of the virtual machine as it appears in the left pane of the vSphere Client inventory view when connected to the VMS host.
   - For a zone core IP Packet Capture virtual machine, the name is: `z00`***`<X>`***`ipcap0`***`<Y>`***`.zone`***`<X>`***
   - For a Tsub prime site IP Packet Capture virtual machine, the name is: `z00`***`<X>`***`s`***`<PPP>`***`ipcap01.site`***`<P>`***`.zone`***`<X>`***
   - For a zone core Zone Controller virtual machine, the name is: `zc0`***`<Y>`***`.zone`***`<X>`***
   - For a Tsub Zone Controller virtual machine, the name is: `z00`***`<X>`***`s`***`<PPP>`***`tzc01.site`***`<P>`***`.zone`***`<X>`***

   where:
   `<X>` is the number of the zone in which the VMS is located. The possible values range from `1` to `7`.

   `<Y>` is the IP Packet Capture instance number associated with the VMS number. The possible values are: `1` on VMS01, `2` on VMS02, `3` on VMS09, and `4` on VMS10.

   `<PPP>` is the three-digit zero-padded number of the prime site in which the IP Packet Capture virtual machine is located. The possible values range from `001` to `064`.

   `<P>` is the number of the Tsub prime site. The possible values range from `1` to `64`.

   - For an Integrated Voice and Data (IVD) Packet Data Gateway (PDG), enter: `pdr` ***`<X.>`***`zone`***`<Y>`***
   - For a High Performance Data (HPD) PDG, enter: `hpdpdr` ***`<X.>`***`zone`***`<Y>`***

where:
<X> represents the core type (`01` for a primary core or `02` for a backup core)

<Y> represents the zone number (ranging from `1` to `7`)

10 If the PowerShell prompt appears, perform one of the following actions:

- To apply supplemental configuration to all virtual machines on the VMS host, enter: `All`
- To apply supplemental configuration to a single virtual machine, enter the name of the particular virtual machine. Ensure that the name matches the name of the virtual machine as it appears in the left pane of the vSphere Client inventory view when connected to the VMS host.

11 When the script output appears, verify that no messages stating `[FAILED]` appear in the output of the script.

12 At the PowerShell prompt, enter: `exit`

13 At the Windows command prompt, enter: `exit`

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.5.1

Installing VMware PowerCLI

This procedure installs and configures the PowerCLI utility from the *VMware vSphere Configuration Media* disc onto a Network Management (NM) client, dispatch console, or service laptop.

Prerequisites:

- Log on as administrator.
- Ensure that any existing vSphere client instances are closed.
- Locate the *VMware vSphere Configuration Media*.

When and where to use: Perform this procedure only if **vSphere VMWare PowerCLI** does not appear in the Windows **Start** menu or does not have contents.

Procedure:

1 Insert the *VMware vSphere Configuration Media* into the optical drive of the Windows-based device that hosts the vSphere Client.

2 On the *VMware vSphere Configuration Media*, navigate to the `WMware vSphere PowerCLI` folder and launch `VMware-PowerCLI.exe`.

3 If a pop-up window appears, click **Continue** or **Yes**.

4 In the **VMware PowerCLI Installation Requirements** window, click **Install**.

5 In the **VMware Remote Console Plug-In** installation welcome screen, click **Next**.

6 In the **Ready to Insstall VMware Remote Console Plug-in** components window, click **Install**.

7 In the **Installation Wizard Completed** window, click **Finish**.

8 In the **VMware VIX** installation welcome window, click **Next**.

9 Follow the on-screen instructions to complete the installation.

10 In the **VMware VIX License Agreement** screen, select **I accept the terms in the license agreement**. Click **Next**.

11 In the **Destination Folder** window, click **Next**.

12 In the **Ready to Install the Program** window, click **Install**.

13 In the **Installer Completed** window, click **Finish**.

14 If a pop-up warning appears, click **Continue**.

The **VMware vSphere PowerCLI** installation welcome screen appears.

15 At the **Welcome to the InstallShield Wizard** window, click **Next**.

16 On the **License Agreement** window, select **I accept the terms in the license agreement**. Click **Next**.

17 On the **Custom Setup** window, click **Next**.

18 On the **Ready to Install the Program** window, click **Install**.

19 On the **InstallShield Wizard Completed** window, click **Finish**.

20 On the computer/laptop, select **Start**.

21 In the **Search programs and files**, enter: `command`.

The **Command Prompt** appears in the list of available programs and files.

22 Right-click **Command Prompt** and select **Run as administrator**.

23 At the command prompt, enter: `powershell`

24 At the PowerShell prompt, enter: `set-executionpolicy remotesigned`

25 At the PowerShell prompt, enter: `new-eventlog Application -Source esxiconfig`

If the following message appears, it can be safely ignored.
```
new-eventlog : The 'esxiconfig' source is already registered on the
"localhost" computer.
```

26 At the PowerShell prompt, enter the drive letter of the optical drive that contains the *VMware vSphere Configuration Media* followed by a colon. Press `Enter`.

Step example: `E:`

The directory changes to the root directory of the *VMware vSphere Configuration Media*.

27 At the PowerShell prompt, enter: `cd "VMware vSphere PowerCLI"`

The directory changes to the VMware vSphere PowerCLI directory.

28 At the PowerShell prompt, enter: `.\disableCeip.ps1`

The Customer Experience program is disabled, and installation is complete.

29 Close the **Command Prompt** window.

4.1.6
Setting the License Manager Device ID

During the installation of a License Manager, you need to run a script to set a Device ID for the License Manager. The license files destined for a particular License Manager must have the same Device ID as the License Manager. The Device ID is a 16-octet (128-bit) number used by the system to match a License Manager and the license files destined for that License Manager.

Prerequisites:

- Obtain the *VMware vSphere Configuration Media*.
- Ensure that:

- The License Manager virtual machine has not been powered on yet.
- The license file for the License Manager is available.
- VMware PowerCLI has been installed as part of the Virtual Management Server (VMS) software installation. See Installing VMware PowerCLI on page 54.

Procedure:

1. Insert the *VMware vSphere Configuration Media* into the optical drive of the network management (NM) Client.
2. From the Windows desktop, select **Start** → **Command Prompt**.
3. Right-click **Command Prompt**, and select **Run as administrator**.
4. In the **Command Prompt** window, enter: `powershell`
5. At the PowerShell prompt, enter the drive letter of the optical drive that contains the *VMware vSphere Configuration Media*, followed by a colon.

   Step example: `E:`
   The directory is changed to the root directory of the *VMware vSphere Configuration Media*.
6. At the PowerShell prompt, enter: `cd common\bin`

   The directory is changed to the `common\bin` directory of the *VMware vSphere Configuration Media*.
7. At the PowerShell prompt, enter: `.\Set-LMDeviceID.ps1`
8. When prompted to specify the device for which you want to set the Device ID, enter: `L` (for License Manager)
9. At the Dynamic System Resilience (DSR) prompt, perform one of the following actions:
   - If the system is configured for DSR, enter: `y`
   - Otherwise, enter: `n`
10. **DSR systems only:** When prompted for core type, enter the number for the core in which this License Manager is being installed: `1` for the primary core or `2` for the backup core.
11. When prompted for zone ID, enter the number corresponding to the zone in which this License Manager is being installed.
12. Browse to the location of the license file for the License Manager on the NM Client, select the file, and click **Open**.
13. If the system prompts you to accept a server certificate, enter: `p`
14. At the log-in prompt for the Virtual Management Server (VMS) host, enter the user name and password for the root account on the VMS host. Click **OK**.
15. If the script cannot automatically determine the virtual machine corresponding to the License Manager from the virtual machine name, and the system prompts you to specify the virtual machine, enter the number corresponding to the License Manager virtual machine.

    The License Manager Device ID is configured.
16. At the exit prompt, verify that the script output contains no messages stating that the operation failed. Press `Enter`.
17. At the PowerShell prompt, enter: `exit`
18. At the Windows command prompt, enter: `exit`

Related Links

Installing the License Manager on page 47

4.1.7

Connecting and Powering On the License Manager

Perform this procedure to connect and power on the License Manager virtual machine.

Prerequisites: From the system administrator, obtain the name of the appropriate zone network for the License Manager that you are setting up as a virtual machine.

Procedure:

1. In the navigation pane, right-click the License Manager virtual machine.
2. From the pop-up menu, select **Edit Settings**.
3. In the dialog box, select the first network adapter.
4. Select the **Connect at power on** check box.
5. Ensure the **Network Label** field displays the correct zone network connection.
6. Repeat step 3 through step 5 for each network adapter.
7. Click **OK**.
8. In the navigation pane, right-click the License Manager virtual machine.
9. From the pop-up menu, select **Power → Power On**.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.8

Configuring the Time Zone on Linux Servers

As a part of the installation, ensure that the virtual machine is set to the correct time zone.

Procedure:

1. From a Windows-based device, launch the VMware vSphere Client.

   A desktop shortcut was created during installation.
2. Log on to the ESXi server that serves as the Virtual Management Server (VMS) host as `root`.
3. In the **vSphere Client Inventory** window, verify that the virtual machine is powered on. .

   If the virtual machine is powered off, power it on by right-clicking the virtual machine in the navigation pane and selecting **Power → Power On**
4. From the navigation pane on the left, select the virtual machine. Click the **Console** tab for this virtual machine.
5. Wait until a prompt to log on console appears.
6. Click in the **Console** window and log on to the virtual machine as `root`.
7. At the prompt, enter: `admin_menu`

   The administrative menu for the server appears. To select a menu item, enter the number that corresponds to that menu item, then press ENTER.
8. Select **OS Administration**.

9 Select **Manage Platform Configuration**.

10 Select **Set Time Zone**.

A menu displays numbered options to change the time zone. The **Set Time Zone** option starts by prompting you for the region of the world.

11 You can specify the time zone using the **Posix TZ format**. Continue responding to the prompts until you see a message regarding `/usr/bin/tzselect`. Ignore the message.

12 To quit, enter: `q`

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.9

Setting Identity for the License Manager

Perform this procedure to set the identity for the License Manager virtual machine.

Procedure:

1 Launch the VMware vSphere Client from the Windows-based device where it resides.

A desktop shortcut was created during installation.

2 At the log-in prompt, perform the following actions:

a In the **IP address** field, type the IP address of the Virtual Management Server (VMS) host.

b In the **User name** field, enter: `root`

c In the **Password** field, enter the appropriate password.

d Click **Login**.

3 In the vSphere Client Inventory, in the left pane, click the entry for the License Manager virtual machine.

4 In the right pane, select the **Console** tab.

5 In the License Manager console, click in the right pane and log on to the virtual machine as the root user.

6 At the command prompt, enter: `admin_menu`

The administrative menu for the server appears. To select a menu item, enter the number that corresponds to that menu item, then press `Enter`.

7 Select **OS Administration**.

8 Select **Manage Platform Configuration**.

9 Select **Set Identity**.

10 When prompted to select the identity type, enter the number corresponding to **ASTRO**.

11 At the Dynamic System Resilience (DSR) prompt, perform one of the following actions:

- If the system is configured for DSR, enter: `y`
- Otherwise, enter: `n`

12 **DSR systems only:** When prompted for core type, enter the number for the core in which this License Manager is being installed: `1` for the primary core or `2` for the backup core.

13 When prompted for zone ID, enter the number corresponding to the zone in which this License Manager is being installed.

14 When prompted for application ID, enter: `1`

15 At the syslog prompt, perform one of the following actions:

- If one or more Centralized Event Logging Servers are present in your system, enter their IP addresses or hostnames. Separate multiple entries with a colon.
- Otherwise, press ENTER without entering a value.

16 At the confirmation prompt, verify if the input is correct and enter: `y`

The identity for the License Manager is applied. The virtual machine restarts.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.10

Joining a Virtual Machine to the Domain

Prerequisites:

- Set the identity of the application.
- Ensure that the application time is within five (5) minutes of the time of the domain controller.

When and where to use: This procedure is not applicable for a Unified Event Manager (UEM) in a K core system.

Procedure:

1 From a Windows-based device, launch the VMware vSphere Client.

A desktop shortcut was created during installation.

2 Log on to the Virtual Management Server (VMS) hosting the Linux-based virtual machine using the root account for that server.

3 In the **vSphere Client Inventory** window, from the navigation pane on the left, select the virtual machine and click the **Console** tab.

4 Click in the **Console** window and log on to the virtual machine as `root`.

5 At the prompt, enter: `admin_menu`

The administrative menu for the server appears. To select a menu item, enter the number that corresponds to the menu item, then press `Enter`.

6 Select **Services Administration**.

7 Select **Manage AAA Client Configuration**.

8 Select **Join Domain**.

The list of Active Directory domains appears.

9 Enter the number corresponding to the domain that you want to join.

10 At the domain account prompt, enter the name of the domain account used to join applications to the domain.

11 At the domain password prompt, enter the password of the domain account entered in the previous step.

The application is joined to the domain.

12 From the **Manage AAA Client Configuration** menu, enter: `q`

The command-line prompt for that application appears.

13 Enter: `exit`

You are logged out of the application.

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.11

Applying the Platform Patch

You must update the virtual machine by applying the platform patch.

Procedure:

1 From a Windows-based device, launch the VMware vSphere Client.

2 Log on to the ESXi server.

3 Verify whether the following path appears on the toolbar: **Home** → **Inventory** → **Inventory**.

4 In the left pane, navigate to the virtual machine that you want to update.

5 In the right pane, click the **Console** tab.

6 Connect the virtual machine to the local DVD drive or ISO:

If…	Then…
If you have the DVD,	perform the following actions: **a** Insert the DVD in the drive of the Windows-based device. **b** In the VMware vSphere Client, click the disc icon on the toolbar and select **CD/DVD drive 1** → **Connect to** ***<drive letter:>*** where ***<drive letter>*** represents the drive with the DVD.
If you have the ISO,	perform the following actions: **a** Upload the ISO image to the Windows-based device. **b** In the VMware vSphere Client, click the disc icon on the toolbar and select **CD/DVD drive 1** → **Connect to ISO image on local disk**.

7 Navigate to the location of the patch ISO and select it. Click **Open**.

8 Click anywhere in the **Console** tab and log on to the virtual machine as the root user.

9 Enter: `systemctl start autofs`

If messages appear about the autofs service already running, ignore them.

10 Enter: `ls /media/cdrom0/`

If the drive contains the updater script, the update directory appears.

11 If the update directory does not appear, enter: `ls /media/cdrom1/`

12 Enter one of the following commands:

- If the updater script is on cdrom0, enter: `/media/cdrom0/update/updater`
- If the updater script is on cdrom1, enter: `/media/cdrom1/update/updater`

13 Change the directory to root by entering: `cd /`

14 Enter: `admin_menu`

15 Select **OS Administration** → **Eject CD/DVD** → **Eject All**.

16 Remove the DVD or ISO:

- **a** Disengage the cursor from the console by pressing left CTRL + ALT.
- **b** In the VMware vSphere Client, click the disc icon on the top toolbar and disconnect the DVD or ISO from the virtual machine.
- **c** If prompted, confirm the operation.

17 Click anywhere in the **Console** tab.

18 Press ENTER.

19 Enter: `q`

20 Enter: `exit`

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.12
Enabling the License Manager

Perform this procedure to enable the License Manager virtual machine.

Procedure:

1 Log on to the server application using an Active Directory account.

2 At the command line prompt, enter: `admin_menu`

The administrative menu for the server appears. To select a menu item, enter the number that corresponds to that menu item, then press `Enter`.

3 Select **Application Administration**.

4 Select **Manage Application Status**.

5 Select **Enable Application**.

6 At the confirmation prompt, enter: `y` to continue.

7 At the menu prompt, enter: `q`

8 At the command line prompt, enter: `exit`

Related Links

Installing the License Manager on page 47
Recovering the License Manager on page 65

4.1.13
Uploading Licenses to the License Manager

In the ASTRO® 25 system, each zone has a License Manager server.

Prerequisites:
Obtain license files from the **My Software** portal: http://licensing.motorolasolutions.com

Ensure that:

- The License Manager is enabled and joined to the domain.
- The license file is generated for this License Manager.
- The license file is available from the client machine.
- Your user account belongs to the **licadmin** group.

Procedure:

1. Log on to the client machine, for example, a Network Management (NM) client or service laptop.
2. Verify that the license file name matches the name of its intended destination.
3. Using a web browser on the PC, connect to the License Manager.
   - If Single Sign-On (SSO) is enabled and available on your client machine, enter the address in the following format:
     `https://<hostname_of_License_Server>/sso/login`

     The License Manager main window appears. Go to step 5.
   - If not, enter the address in the following format: `https://<hostname_of_License_Server>/login`
     The **Login** page appears. Go to step 4.
4. **If SSO is not enabled or available:** On the **Login** page, log on to the License Manager using an account from the **licadmin** group.

   The License Manager main window appears.
5. Click the **Upload Licenses** button in the top right corner of the window.

   If the button is not visible, perform the following actions:

   1. In the top right corner, click the user name.
   2. From the drop-down menu, select **Logout**.
   3. Contact your system administrator to add your user account to the **licadmin** group.
   4. After the account is added, retry to log-in.
6. In the **License upload** window, click **Select file**.
7. In the **Choose File to Upload** window, select a license file for this License Manager, and click **Open**.
8. In the **License upload** window, click **Upload**.

   If the upload operation is successful, a summary of changes appears in the **Change report** window.
   In the following situations, the License Manager does not allow files to be loaded and displays an error message:
   - If you choose to reload a license file that is already loaded on that License Manager.
   - If you choose to upload a license file destined for another system or zone core. Such a license file does not have a matching Device ID.
9. Review the changes, then click **Close**.

The License Manager main window returns.

Related Links

Installing the License Manager on page 47

Chapter 5

License Manager Configuration

This chapter provides information related to the configuration of the License Manager in the ASTRO® system.

5.1 Configuring the License Manager for SNMPv3

The License Manager reports faults to the Unified Event Manager (UEM), which displays alarms for such events as capacity non-compliance, forced release of a session license, or application failure. Perform this procedure to configure communication between the License Manager and the UEM using Simple Network Management Protocol version 3 (SNMPv3).

Procedure:

1. From the Windows-based device where it resides, launch the VMware vSphere Client.
2. In the vSphere Client log-in window, perform the following actions:
   a. Enter the IP address of the Virtual Management Server (VMS) host.
   b. In the **User Name** field, enter: `root`.
   c. In the **Password** field, enter the password for the root user account on the VMS host.
   d. Click **Login**.
3. In the left pane of the **vSphere Client Inventory** window, select the License Manager virtual machine.
4. In the right pane, select the **Console** tab.
5. In the License Manager console, click in the right pane and log on to the virtual machine as `root`.
6. At the command prompt, enter: `admin_menu`

   The administrative menu appears. To select a menu item, enter the number corresponding to that menu item, then press `Enter`.
7. Select **OS Administration**.
8. Select **Security Provisioning**.
9. Select **Manage SNMP Passphrases**.
10. Select **Configure Agent SNMPv3**.
11. At the prompt, enter the authentication passphrase for the MotoAdmin user account.
12. At the prompt, enter the privilege passphrase for the MotoAdmin user account.
13. Select **Modify SNMP User Configuration**.
14. Select **MotoMaster**.
15. Select the security level for the MotoMaster user account.
    - If you select **AuthNoPriv**, perform the following actions at the corresponding prompts:
      1. Enter the authentication passphrase for the MotoMaster user account.
      2. To confirm, re-enter the authentication passphrase.
      3. Enter the authentication passphrase for the MotoAdmin user account.

4 Enter the privilege passphrase for the MotoAdmin user account.

- If you select **AuthPriv**, perform the following actions at the corresponding prompts:
  1 Enter the authentication passphrase for the new MotoMaster user account.
  2 To confirm, re-enter the authentication passphrase.
  3 Enter the privilege passphrase for the MotoMaster user account.
  4 To confirm, re-enter the privilege passphrase.
  5 Enter the authentication passphrase for the MotoAdmin user account.
  6 Enter the privilege passphrase for the MotoAdmin user account.

A message that the security level has been changed successfully appears. A list of user accounts available for configuration appears.

16 To return to the previous menu, enter: `q`

17 From the administrative menu, select **Modify SNMP Inform Configuration**.

18 For each MotoInform user account to be configured for SNMPv3 communication, select the security level.

- If you select **NoAuthNoPriv**, perform the following actions at the corresponding prompts:
  1 Enter the authentication passphrase for the MotoAdmin user account.
  2 Enter the privilege passphrase for the MotoAdmin user account.
- If you select **AuthNoPriv**, perform the following actions at the corresponding prompts:
  1 Enter the authentication passphrase for the MotoInform user account.
  2 To confirm, re-enter the authentication passphrase for the MotoInform user account.
  3 Enter the authentication passphrase for the MotoAdmin user account.
  4 At the prompt, type the appropriate MotoAdmin privacy passphrase. Press ENTER.
- If you select **AuthPriv**, perform the following actions at the corresponding prompts:
  1 Enter the authentication passphrase for the MotoInform user account.
  2 To confirm, re-enter the authentication passphrase for the MotoInform user account.
  3 Enter the privilege passphrase for the MotoAdmin user account.
  4 To confirm, re-enter the privilege passphrase for the MotoInform user account.
  5 Enter the authentication passphrase for the MotoAdmin user account.
  6 Enter the privilege passphrase for the MotoAdmin user account.

A message indicates that the security level has been changed successfully. A list of user accounts available for configuration appears.

19 To return to the previous menu, enter: `q`

20 To return to the previous menu, enter: `q`

21 To exit the administrative menu, enter: `q`

22 At the command prompt, enter: `exit`

Chapter 6

License Manager Disaster Recovery

This chapter provides disaster recovery procedures for the License Manager.

6.1 Recovering the License Manager

Perform this procedure to recover the License Manager after a failure of the Virtual Management Server (VMS) host or the Direct Attached Storage (DAS) device.

Prerequisites: Ensure that the VMS host has been restored. See the *Virtual Management Server Hardware* and *Virtual Management Server Software* manuals.

Process:

1. Log on to the VMS host.

   See Logging On to the VMS Host of the Virtual Machine on page 48.
2. Import the License Manager application.

   See Importing a Virtual Machine on page 48.
3. **Only for systems with vCenter installed:** Configure the VMware vCenter application for the License Manager virtual machine.

   See Configuring the vCenter for the Newly Deployed VM on page 50.
4. Set the startup and shutdown order for the License Manager virtual machine.

   See Setting the Virtual Machine Startup and Shutdown Order on page 51.
5. Configure the security settings for the License Manager virtual machine.

   See Applying Supplemental Configuration to Virtual Machines on page 52.
6. Connect and power on the License Manager virtual machine.

   See Connecting and Powering On the License Manager on page 57.
7. Configure the time zone for the License Manager virtual machine.

   See Configuring the Time Zone on Linux Servers on page 57.
8. Set the identity for the License Manager virtual machine.

   See Setting Identity for the License Manager on page 58.
9. Join the License Manager virtual machine to the domain.

   See Joining a Virtual Machine to the Domain on page 59.
10. Apply the platform patch to the License Manager virtual machine.

    See Applying the Platform Patch on page 60.
11. Restore the License Manager backup data from the Backup and Restore (BAR) server.

    See Executing a BAR Client Data Restore on page 66.
12. Restore the License Manager virtual machine.

    See Restoring the License Manager on page 67.
13. Enable the License Manager virtual machine.

See Enabling the License Manager on page 61.

14 If applicable, apply Linux operating system patches to the License Manager virtual machine. Installation procedures for MOTOPATCH are available at: https://sites.google.com/a/motorolasolutions.com/sus-motopatch/

If you cannot open the link, this means that MOTOPATCH for Red Hat Enterprise Linus version 7 (RHEL 7) is not available yet. Go to step 15.

IMPORTANT:
The Linux MOTOPATCH must be applied after all applications are installed.

Patches must be installed regularly and for each new installation.

15 Perform supplemental configuration procedures on the server, as required by your organization. See the *Unix Supplemental Configuration* manual.

Related Links

Disaster Recovery of the License Manager on page 36

6.1.1
Executing a BAR Client Data Restore

This procedure restores the Backup and Restore (BAR) client data to the staging directory on the BAR client.

The staging directory for Linux-based BAR clients is: `/restore`

Prerequisites: Provision Secure Shell (SSH) keys to the BAR client before initiating the restore. See procedures for SSH host key provisioning for the centralized Backup and Restore feature in the *Securing Protocols with SSH* manual.

Procedure:

1 Log on to the BAR server using your Active Directory account.

2 At the command prompt, enter: `admin_menu`

The administrative menu appears. To select menu items in the following steps, type the number that corresponds to each menu item, then press `Enter`.

3 Select **Application Administration**.

4 Select **Restore Administration**.

5 Select **Initiate Client Restore**.

6 When prompted to enter the client name or name prefix, perform one of the following actions:

- Press `Enter` for a list of all registered BAR clients.
- Enter the first few characters of the BAR client name. Press `Enter` for a list of BAR client names that start with those characters.

7 To select a BAR client, perform one of the following actions:

- If a list of BAR clients does not appear, press `Enter`. Only one BAR client matched your query, so the BAR client has already been selected for you.
- If a list of BAR clients appears, perform the following actions:
  1 Enter the menu number for the selected client.
  2 Press `Enter`.

- If more than 25 BAR clients appear, BAR clients scroll off the top of the screen. You can page up to see them by pressing SHIFT + PAGE UP, then return to the prompt by pressing SHIFT + PAGE DOWN.

A menu of backup dates and times appears for the selected BAR client.

8 Enter the number for the backup you want to restore.

The following prompt appears: `Restore operation in progress`. When the restore operation is complete, the **Restore Administration** menu returns.

Related Links

Recovering the License Manager on page 65

6.1.2
Restoring the License Manager

Prerequisites: Ensure that the License Manager backup data has been restored to the application from the BAR server. See Executing a BAR Client Data Restore on page 66.

Procedure:

1 Insert the *VMware vSphere Configuration Media* into the optical drive of the Network Management (NM) Client.

2 Open Windows PowerShell as administrator, using the actions that apply to the Windows operating system version present on the device.

- For Windows 7, perform the following actions:
  1 Click **Start**.
  2 In the **Search programs and files** field, enter: `Command Prompt`
  3 Right-click **Command Prompt** and select **Run as administrator**.
    - If the **User Account Control** window appears, click **Continue** or **Yes**, depending on the prompt you see.
    - If you are not logged on with an administrative account, enter the domain admin credentials.
  4 At the command prompt, enter: `powershell`
- For Windows 10, perform the following actions:
  1 From **Start**, click **Search**.
  2 In the search field, type in `powershell`
  3 Right-click **Windows PowerShell**, and select **Run as administrator**.
    - If the **User Account Control** window appears, click **Yes**.
    - If you are not logged on with an administrative account, enter the domain admin credentials.

3 At the PowerShell prompt, enter the drive letter of the optical drive that contains the *VMware vSphere Configuration Media*, followed by a colon.

Step example: `E:`

The directory is changed to the root directory of the *VMware vSphere Configuration Media*.

4 At the PowerShell prompt, enter: `cd common\bin`

   The directory is changed to the `common\bin` directory of the *VMware vSphere Configuration Media*.

5 At the PowerShell prompt, enter: `.\Restore-LM.ps1`

6 At the Dynamic System Resilience (DSR) prompt, perform one of the following actions:

   - If the system is configured for DSR, enter: `y`
   - Otherwise, enter: `n`

7 **DSR systems only:** When prompted for core type, enter the number for the core in which this License Manager is being restored: `1` for the primary core or `2` for the backup core.

8 When prompted for zone ID, enter the number corresponding to the zone in which this License Manager is being restored.

9 At the Virtual Management Server (VMS) log-in prompt, enter the user name and password for an account with root privileges on the VMS host. Click **OK**.

10 At the License Manager log-in prompt, enter the user name and password for an account with root privileges on the License Manager server. Click **OK**.

11 Verify that the script output contains no messages stating `[FAILED]` Press `Enter`.

12 At the PowerShell prompt, enter: `exit`

13 At the Windows command prompt, enter: `exit`

14 Eject the *VMware vSphere Configuration Media* from the optical drive.

Related Links

Recovering the License Manager on page 65

Chapter 7

License Manager Reference

This chapter provides reference information related to the License Manager in the ASTRO® 25 system.

7.1
Zone Core Virtual Machine Boot Order

NOTICE:
Up to two instances of the Graphical Master Computer (GMC) for MOSCAD Network Fault Management (NFM) can be on the server.

If the Unified Network Configurator Database Server (UNCDS is present, three instances of the UNCDS are on the server.

Table 1: Zone Core Virtual Machine Boot Order

Order		Virtual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay
Automatic Startup						
	1	ZC	Enabled	Use Default	Use Default	Use Default
	2	Transcoder	Enabled	Use Default	Use Default	Use Default
	3	ISGW	Enabled	Use Default	Use Default	Use Default
	4	PDG-Conv	Enabled	Use Default	Use Default	Use Default
	5	PDG-HPD	Enabled	Use Default	Use Default	Use Default
	6	PDG-IV&D	Enabled	Use Default	Use Default	Use Default
	7	License Manager	Enabled	Use Default	Use Default	Use Default
	8	ATR	Enabled	Use Default	Use Default	Use Default
	9	DC-System	Enabled	Use Default	Use Default	Use Default
	10	DC-Zone	Enabled	Use Default	Use Default	Use Default
	11	IPCAP	Enabled	Use Default	Use Default	Use Default
Any Order		AuC	Enabled	Use Default	Use Default	Use Default
		BAR	Enabled	Use Default	Use Default	Use Default
		CSMS	Enabled	Use Default	Use Default	Use Default
		InfoVista	Enabled	Use Default	Use Default	Use Default
		FMS – Fortinet	Enabled	Use Default	Use Default	Use Default
		GDG	Enabled	Use Default	Use Default	Use Default
		GMC	Enabled	Use Default	Use Default	Use Default
		NM Client	Enabled	Use Default	Use Default	Use Default
		UCS	Enabled	Use Default	Use Default	Use Default
		SSS	Enabled	Use Default	Use Default	Use Default

Table continued…

Order	Virtual Machine	Startup	Startup Delay	Shutdown	Shutdown Delay
	Syslog	Enabled	Use Default	Use Default	Use Default
	UEM	Enabled	Use Default	Use Default	Use Default
	UNC	Enabled	Use Default	Use Default	Use Default
	UNCDS	Enabled	Use Default	Use Default	Use Default
	vCenter App	Enabled	Use Default	Use Default	Use Default
	ZDS	Enabled	Use Default	Use Default	Use Default
	ZSS	Enabled	Use Default	Use Default	Use Default
Manual Startup	DESU Waypoint	Disabled	Use Default	Use Default	Use Default

Related Links

Setting the Virtual Machine Startup and Shutdown Order on page 51