Chassis Universal License Requirements

This appendix describes the requirements for "universal" licenses that support Management I/O Universal (UMIO) and Data Processing Universal (UDPC/UDPC2) card types. It also explores UMIO and UDPC/UDPC2 behavior in non-universal chassis or in chassis with a mix of non-universal MIOs and DPC/DPC2s, and UMIOs and UDPC/UDPC2s.

Important Contact your Cisco account representative for detailed information regarding ASR 5500 license requirements.

This appendix addresses the following topics:

License Types

A chassis software license that enables universal card support is required when UMIOs and/or UDPC/UDPC2s are installed. This license also specifies the maximum number of UDPC/UDPC2s that can run on the chassis at the same time. Both active and standby UDPC/UDPC2s are counted against the maximum UDPC/UDPC2 limit.

Important UDPCs and UDPC2s must never be mixed in the same chassis. Data processing cards must all be of the same type in a chassis. UDPC2s require StarOS Release 18.2+.

The system automatically prevents a UDPC/UDPC2 from running if the maximum number of UDPC/UDPC2s specified by the chassis license has been reached. If the maximum number of UDPC/UDPC2s are running and there are additional UDPC/UDPC2s in the system, the system will automatically run another UDPC/UDPC2 only when one of the currently running UDPC/UDPC2s goes offline or restarts. However, the system will not bring down currently active UDPC/UDPC2s due to an insufficient number of UDPC/UDPC2s specified in the license.

To add one or more UDPC/UDPC2 to an ASR 5500 chassis where the numbered of allowed UDPC/UDPC2s has been reached, you must update the chassis license to increase the number of supported cards. See Updating A Chassis License for Universal Cards, on page 3.

Universal cards and non-universal cards have the same capacity and can backup each other for redundancy. For example, a UMIO can be the standby of an MIO and will transition to active when the active MIO fails. Tasks running on a DPC or DPC2 can be migrated to a standby UDPC or UDPC2 and vice versa.

Different combinations of licenses for universal cards and non-universal cards are supported in an ASR 5500 chassis. Some combinations may cause the system to be only partially operational or entirely non-operational.

License types include:

- **Non-Universal –** support for universal cards is not enabled. Non-universal licenses include those issued before universal cards became available.
- **Universal –** support for UMIO or UDPC/UDPC2 is enabled.
- **Mix –** support for both universal and non-universal cards exists.
- **None –** the particular license type is missing from the system. No license is the same as having a universal license.
- **Any –** For MIO or DPC, this is all combinations of the above four license types: Non-Universal, Universal, Mix and None. For a chassis license this is either Universal, Non-Universal or None.

License changes or card changes may cause the system to change from one combination to another combination. The default chassis license supports universal cards. A chassis with no license will support universal cards without a limit for the maximum number of UDPC/UDPC2s.

StarOS License Support Matrices

The tables below describes system behavior based on license type, universal card type mix, and StarOS universal card support.

Table 1: License Support Matrix for StarOS Version with Universal Card Support

Chassis	MIO/UMIO	DPC/UDPC or DPC2/UDPC2	System Behavior
Universal, None	Any	Any	All cards are recognized and boot. The system will not be able to enable services when there is no license.
Non-Universal	Non-Universal	Non-Universal	All cards recognized and boot.
Non-Universal	Non-Universal	Non-Universal, Universal or None	UDPC/UDPC2s will fail to boot.
Non-Universal	Universal	Any	UMIO will be operational but its license will be marked as invalid or rejected. The system will not be able to enable services due to no license.

Chassis	MIO/UMIO	DPC/UDPC or DPC2/UDPC2	System Behavior
Non-Universal	Active UMIO, Standby MIO or empty	Any	Both Active MIO and Standby UMIO will be operational but their licenses will be marked as invalid or rejected. The system will not be able to enable services due to no license.
Non-Universal	Active MIO, Standby UMIO	Non-Universal, Mix or None	UDPC/UDPC2s will be shut down. The MIO and UMIO will run.

Table 2: License Support Matrix for StarOS Version without Universal Card Support

Chassis	MIO/UMIO	DPC/UDPC or DPC2/UDPC2	System Behavior
Any	Non-Universal	Non-Universal	All cards are recognized and run.
Any	Non-Universal	Universal or Mix	UDPC/UDPC2s will not boot.
Any	Universal	Non-Universal or Mix	UMIO will not boot and remains offline. The system will not be able to enable services due to the lack of an MIO.
Any	Active MIO, Standby UMIO	Any	UMIO and UDPC/UDPC2s will not boot and remain offline.
Any	Active UMIO, Standby MIO	Any	UMIO will not boot and the MIO will become Active.

Updating A Chassis License for Universal Cards

This section describes how to update the chassis license.

Important Do NOT install the additional UDPC/UDPC2s until the chassis license has been updated as described below.

You do not have to shut down or reboot the ASR 5500 to update the chassis license or install the additional UDPCs. However, if you install the additional UDPC/UDPC2s and they boot under the old chassis license, they will not come into service.

Step 1 Contact your CIsco account representative and purchase a license update key that supports the number of new UDPC/UDPC2s that will be supported.

Step 2 Download the update license key where it can be accessed by CLI commands from the ASR 5500.

Step 3 Refer to the *Managing License Keys* section in the *ASR 5500 System Administration Guide*. Follow the instructions for *Installing New License Keys*.

Step 4 Install the additional UDPC/UDPC2s in the chassis. Each card should successfully boot. Refer to the *Card Installation* chapter in this guide.

Step 5 Run the Exec mode **show card table** command and verify that the additional UDPC/UDPC2s are installed and recognized by StarOS.

Step 6 In the Global Configuration mode, run the **card** *slot_number* **mode active** command to make a UDPC/UDPC2 active in the system.