

License Server



Each SDX installation employs a single license server to hold and manage the license to a customer. The license server uses CORBA to communicate with its client SAEs.

Topic	Page
Overview	G-1
Location and Access	G-2
Alarms	G-2
License Requests	G-3
Lease Renewal	G-3
License Switching and Preferences	G-4
Failover Behavior	G-4
Configuring the License Server	G-5
Configuring the SAE Client	G-6

Overview

Pilot licenses restrict the number of concurrent active user sessions. Production licenses restrict the number of concurrent active value-added service sessions.

Current production licenses restrict the number of concurrent active value-added service sessions. We refer to these licenses as *service session licenses*.

The production license is managed by the SDX license server, which reads the license, leases a portion of the license on demand to each SAE client, monitors the consumption of the license, and raises alarms when

necessary. For service session licenses, the SAE client does not involve the directory for license management.

The production license includes a license key signature, customer name, expiration date, number of concurrent active service sessions, a CORBA reference for the license server, and several other attributes.

The CORBA reference enables the license server's SAE clients to locate the server to obtain a lease on a portion of the license. The SAE disregards who actually activates service sessions and simply monitors the number of active service sessions.

When the license server receives a request for a lease, it calculates the total license consumption (number of leases), including the portion requested, and compares that value with the limit specified in the production license. When the new total is below the limit, the license server grants the requested lease to the client. If the new total will exceed the limit, then the license server gives a grant for only up to the amount available. The license server denies all requests while the current total exceeds the limit.

Location and Access

Service session licenses are stored in the directory object *cn=@License, ou=licSvr, ou=Licenses, ou=Configuration, o=Management, <base>*. The authentication DN and password needed to access the license object is stored in the */opt/UMC/licsvr/etc/bootstrap.properties* file. The license server reads its configuration properties from the object *l=config, l=LICSVR, ou=staticConfiguration, ou=Configuration, o=Management, <base>*.

The license server reads the production license from the SDX directory only at start-up. If you wish to use a new license after start-up, you must explicitly load it because the server does not poll the directory for updated licenses.

Alarms

When the license total exceeds a user-defined threshold, the license server sends a minor warning SNMP trap to the SNMP agent. It sends a major warning SNMP trap when it reaches the license limit. The license server escalates the alarm level to critical if the major alarm state has remained for one week. You can optionally specify that the license server send alarm e-mails to an e-mail server that you define.

The license server does not shut down, no matter how long the critical alarm state remains. Instead, it simply denies all requests for grants while the major or critical state exists. The license server clears the alarms when the alarm states disappear.

The license server can generate the following warning event traps: `saeUserLicenseExpiry` (license expiration date), `saeServiceLicense` (number of services), and `saeServiceSessionLicense` (number of service sessions). The SAE SNMP agent takes no action when it receives any of these traps. You must determine appropriate measures to resolve these warning states. For more information on traps, see *SDX Administration Guide, Appendix A, Trap Tables*.

License Requests

When started, client SAEs search for a valid license in the LDAP object `cn=@License, ou=licSvr, ou=Licenses, o=Management, <base>`. If the SAE finds a valid license that includes a reference to the license server (`license.server.corbaloc` property), then before it activates new service sessions the SAE contacts the license server to lease a license unit. The grant specifies the number of active service sessions (often referred to as the chunk size), lease duration, allocation threshold, and release threshold.

The SAE request includes the name of a virtual router that it associates with service sessions. The license server stores the number of granted license units associated with each virtual router name in an internal table.

If the number of active service sessions on a particular virtual router reaches a value equal to the license chunk size plus the allocation threshold, the SAE will request an additional license lease. If the number of active service sessions drops below the license chunk size minus the release threshold, the SAE releases a license unit to make it available for other SAEs.

Lease Renewal

The SAE renews the lease every one-third of the lease duration even if the number of active service sessions stays in the same range. If the SAE cannot renew the lease for any reason (such as a network failure, for example) before the lease expires, the SAE releases the lease and does not accept new service sessions until it receives a new grant from the license server. While in this state, the SAE logs an error message for each request

and returns the same message through the API. The message includes the service name, user, and reason for rejection.

License Switching and Preferences

If the SAE fails to connect to the license server at start-up or the license does not include the CORBA reference, then the SAE goes into a fallback mode and looks for a production license of the type issued for earlier releases of the SDX software. Because these early licenses limited the capacity of the network managed by the SAE and/or the number of value-added services that were concurrently available to be activated by subscribers, we refer to these licenses as *capacity/service licenses*. Capacity/service licenses are no longer issued by Juniper Networks.

If the SAE cannot find any production licenses, then it looks for any pilot license associated in the directory with its host ID. If the SAE cannot obtain any license, it terminates itself.

The SAE polls the directory at hard-coded intervals to detect license upgrades or additions. Service session licenses are preferred over capacity/service licenses, which are preferred over pilot licenses. If the SAE detects a license with a higher preference than what it is currently using, it switches to that license.

For example, if the SAE is using a pilot license and detects a capacity/service license, it switches to that. If it detects both a capacity/service license and a service session license, it switches to the service session license.

If the current license is removed from the directory or if the directory becomes unavailable, the SAE goes into an idle mode and does not accept any further requests to activate a new service session.

Failover Behavior

When a primary SAE goes down, the secondary SAE issues a request to take over the service sessions from the primary SAE. Because the license server keeps track of granted license units by associating them with virtual routers, the secondary SAE is always granted license units for the same virtual routers that the primary SAE has been managing.

Configuring the License Server

Table G-1 lists the properties generated when you run the configuration tool for the license server. These properties are located in *l=POP-ID, l=LICSVR, ou=staticConfiguration, o=Management, o=UMC*. Modify these properties as needed for your installation.

Table G-1 License server configuration properties

Name	ConfGroupAlarm.LicenseServer.alarm.threshold
Description	Threshold in percent to generate minor alarms. The default value is 80 percent.
Name	ConfGroupAlarm.LicenseServer.alarm.report.server
Description	SNMP agent host. There is no default value.
Name	ConfGroupAlarm.LicenseServer.alarm.email.server
Description	Optional e-mail server to send alarms to. There is no default value.
Name	ConfGroupAlarm.LicenseServer.alarm.email.account
Description	E-mail account to send alarms to. There is no default value.
Name	ConfGroupClient.LicenseServer.corba.config
Description	ORB configuration property file. The default value is <i>etc/jacorb.properties</i> .
Name	ConfGroupLic.LicenseServer.lic ldap.server.address
Description	IP address of the license LDAP server. The default value is 127.0.0.1.
Name	ConfGroupLic.LicenseServer.lic ldap.server.port
Description	Port of the license LDAP server. The default value is 389.
Name	ConfGroupLic.LicenseServer.lic ldap.server.base.dir
Description	Base directory of the license LDAP server. The default value is <i>o=UMC</i> .
Name	ConfGroupLic.LicenseServer.lic ldap.server.authDN
Description	User ID to access the license LDAP server. The default value is <i>cn=licsvr,ou=Components,o=Operators,o=UMC</i> .
Name	ConfGroupLic.LicenseServer.lic ldap.server.password
Description	Password associated with user ID to access the license LDAP server. The default value is {BASE64}bGJlc3Zy.
Name	ConfGroupPersistent.LicenseServer.dir.root
Description	Root directory of the license server. The default value is <i>/opt/UMC/licsvr</i> .

Table G-1 License server configuration properties (continued)

Name	ConfGroupPersistent.LicenseServer.dir.var
Description	Work directory of the license server. The default value is var/run.
Name	ConfGroupPersistent.LicenseServer.ser.state.file
Description	Cache file for license server state information. The default value is state.
Name	ConfGroupEngine.LicenseServer.engine.unit-1.type
Description	Specifies a property included in licenses. The default value is 10, indicating license.val.servicesessions.
Name	ConfGroupEngine.LicenseServer.engine.unit- <i>n</i> .size
Description	Value associated with the license property specified by ConfGroupEngine.LicenseServer.engine.unit-1.type. The default value is 50.
Name	ConfGroupEngine.LicenseServer.engine.lease.period
Description	Lease period in seconds for the licenses that the SAE client receives. The default value is 604800 (one week).
Name	ConfGroupEngine.LicenseServer.engine.client.allocate.threshold
Description	Threshold for the SAE client to obtain more license (in %). The default value is 90.
Name	ConfGroupEngine.LicenseServer.engine.client.release.threshold
Description	Threshold for the SAE client to release one license unit (in %). The default value is 10.

Configuring the SAE Client

The SAE retrieves its licensing configuration properties from the SDX directory at start-up. Table G-2 lists these properties, which are located in *l=POP-ID, l=SAE, ou=staticConfiguration, o=Management, o=UMC*. Modify these properties as needed for your installation.

Table G-2 SAE configuration properties for licensing

Name	LicenseMgr.license.client.type
Description	SAE. The default value is SDX.
Name	LicenseMgr.repository.ldap.server.address
Description	IP address of the directory server. The default value is empty; the directory server defaults to the address of the configuration directory server.

Table G-2 SAE configuration properties for licensing (continued)

Name	LicenseMgr.repository.Idap.server.port
Description	Port of the directory server. The default value is 389.
Name	LicenseMgr.repository.Idap.server.base.dir
Description	Base directory to search directory objects. The default value is <i>ou=Licenses,o=Management,<base></i> .
Name	LicenseMgr.repository.Idap.server.password
Description	Password for the authDN. The default value is <i>cn=license-operator,o=Operators,<base></i> .
Name	LicenseMgr.admin.alarm.threshold
Description	Threshold in percent to generate minor alarms; used only for capacity/service license. The default value is 80.
Name	LicenseMgr.admin.alarm.email.server
Description	Optional e-mail server to send alarms to; used only for capacity/service license. There is no default value.
Name	LicenseMgr.admin.alarm.email.account
Description	E-mail account to send alarms to; used only for capacity/service license. There is no default value.

