Capacity pools licensing model

ONTAP Select

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Capacity pools licensing model

Operational details

The capacity pools licensing model is different from the capacity tiers model. Instead of a dedicating storage capacity to each individual node, the storage capacity is allocated to a pool and shared among many nodes. Additional components and processes have been created to support the capacity pools model.

License Manager

The License Manager is a software component introduced with ONTAP Select 9.5 using ONTAP Select Deploy 2.10. LM runs as a separate process within each instance of the Deploy administration utility. Some of the functions provided by LM include:

- Generate a unique twenty-digit serial number for each node based on the capacity pool license serial number
- Create leases for capacity from the shared capacity pools based on requests from the ONTAP Select nodes
- Report pool usage information through the Deploy user interface

Lease characteristics

The storage allocated for every data aggregate at a node using a capacity pool license must have an associated lease. The node requests a storage lease and if the capacity is available, the License Manager responds with a lease. Each lease has the following explicit or implicit attributes:

- License Manager
  Every ONTAP Select node is associated with one License Manager instance
- Capacity pool
  Every ONTAP Select node is associated with one capacity pool
- Storage allocation
  A specific capacity value is assigned in the lease
- Expiration date and time
  Leases have a duration of between one hour and seven days depending on the user configuration.

License Lock ID

Each instance of the License Manager, and therefore each corresponding Deploy utility instance, is identified with a unique 128-bit number. This number is combined with the nine-digit capacity pool license serial number to lock the pool to a specific License Manager instance (which is effectively a Deploy instance). You must provide both values at the NetApp support site as part of generating the

NetApp License File (NLF).

You can determine the License Lock ID for your Deploy instance using the web user interface in the following ways:

- Getting Started page
  This page is displayed when you first sign in to Deploy. You can also display the page by clicking the drop down box at the top right of the page and selecting Getting Started. The LLID is displayed in the Add Licenses section.
- Administration
  Click the **Administration** tab a the top of the page, then click **Systems** and **Settings**.

Basic lease operations

An ONTAP Select node must locate or request a valid capacity lease every time a data aggregate is created, expanded, or changed. A lease obtained from a previous request that is still valid can be used, or a new lease can be requested if needed. The following steps are taken by the ONTAP Select node to locate a capacity pool lease:

1. If an existing lease is located at the node, it is used as long as all of the following are true:
   - Lease has not expired
   - Storage request for the aggregate does not exceed the lease capacity
2. If an existing lease cannot be located, the node requests a new lease from the License Manager.

Returning storage capacity to a capacity pool

Storage capacity is allocated from a capacity pool as needed and each new request can reduce the available storage in the pool. Storage capacity is returned to the pool in several situations, including:

- Lease for a data aggregate expires and is not renewed by the node
- Data aggregate is deleted

If an ONTAP Select virtual machine is deleted, any active leases remain in effect until they expire. When this occurs, the capacity is returned to the pool.

Node serial numbers

With the capacity tiers licensing model, the nine-digit node serial number is the same as the license serial number assigned to the node. However, the serial numbers assigned to nodes using the capacity pools licensing model have a different format.

The serial number of a node using capacity pools licensing has the following format:

```
999 pppppppppp nnnnnnnn
```

Spaces have been added for clarity, but are not part of the actual serial number.

Each section of the node serial number is described in the following table, from left to right.

Section	Description
'999'	Constant three-digit value reserved by NetApp.
pppppppppp	Variable nine-digit license serial number assigned to the capacity pool by NetApp
nnnnnnnn	Variable eight-digit value generated by the License Manager for each node using the capacity pool

Attention: When opening a case with NetApp support involving a node that uses a capacity pool license, you cannot provide the full twenty-digit node serial number. Instead, you must provide the nine-digit capacity pool license serial number. You can derive the license serial number from the node serial number as shown above. Skip the first three digits of the node serial number ('999') and extract the next nine digits (pppppppppp).

Deployment restrictions for capacity pools licensing

The restrictions that apply when using the capacity pool licensing model are presented below.

Consistent licensing model per cluster

All of the nodes within a single ONTAP Select cluster must use the same licensing model, either capacity tiers or capacity pools. You cannot mix the licensing types for the nodes within a single cluster.

All nodes in a cluster use the same License Manager instance

All the nodes with a capacity pool license in an ONTAP Select cluster must use the same License Manager instance. Because there is one instance of License Manager within each Deploy instance, this restriction is a restatement of the existing requirement that all nodes in a cluster must be managed by the same Deploy instance.

One capacity pool per node

Each node can lease storage from exactly one capacity pool. A node cannot use two or more pools.

Same pool for nodes in an HA pair

Both nodes in a single HA pair must lease storage from the same capacity pool. However, different HA pairs within the same cluster can lease storage from different pools managed by the same License Manager.

Storage license duration

You must choose a license duration when acquiring the storage license from NetApp. For example, a license could be valid for one year.

Data aggregate lease duration

When an ONTAP Select node requests a storage lease for a data aggregate, the License Manager provides a lease for a specific duration based on the configuration of the capacity pool. You can configure the lease duration for each pool between one hour and seven days. The default lease duration is 24 hours.

Static IP address assigned to Deploy

You must assign a static IP address to the Deploy administration utility when capacity pools licensing is used.

Comparing capacity pools and capacity tiers licensing

The following table compares the two production licensing models supported by ONTAP Select.

	Capacity tiers	Capacity pools
License serial number	Nine digits generated by NetApp and assigned to a node	Nine digits generated by NetApp and assigned to a capacity pool
License lock	Locked to ONTAP Select node	Locked to License Manager instance
License duration	Perpetual (no renewal required)	Fixed duration based on purchase (renewed required)
Lease duration for data aggregate	Not applicable One hour to seven days	Node serial number

Summary of benefits

There are several benefits when using the capacity pools licensing model instead of the capacity tiers licensing model.

More efficient use of storage capacity

When using capacity tiers licensing, you allocate a fixed storage capacity to each node. Any unused space cannot be shared with the other nodes and is effectively wasted. With capacity pools licensing, each node only consumes the capacity it needs, based on the size of the data aggregates.

And because the capacity is anchored in a central pool, it can be shared among many nodes in your organization.

Significantly reduced administrative overhead resulting in lower cost

If you use capacity tier licenses, you must obtain and install a license for each node. When using capacity pools, there is one license for each shared pool. This can dramatically reduce the administrative overhead and result in lower cost.

Improved usage metrics

The Deploy web user interface provides enhanced usage information for the capacity pools. You can quickly determine how much storage is used and available in a capacity pool, which nodes are using storage from a pool, and what pools a cluster is allocating capacity from.

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