Monitor network ports

ONTAP 9

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Table of Contents

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Monitor the health of network ports

ONTAP management of network ports includes automatic health monitoring and a set of health monitors to help you identify network ports that might not be suitable for hosting LIFs.

About this task

If a health monitor determines that a network port is unhealthy, it warns administrators through an EMS message or marks the port as degraded. ONTAP avoids hosting LIFs on degraded network ports if there are healthy alternative failover targets for that LIF. A port can become degraded because of a soft failure event, such as link flapping (links bouncing quickly between up and down) or network partitioning:

- Network ports in the cluster IPspace are marked as degraded when they experience link flapping or loss of layer 2 (L2) reachability to other network ports in the broadcast domain.
- Network ports in non-cluster IPspaces are marked as degraded when they experience link flapping.

You must be aware of the following behaviors of a degraded port:

- A degraded port cannot be included in a VLAN or an interface group.

  If a member port of an interface group is marked as degraded, but the interface group is still marked as healthy, LIFs can be hosted on that interface group.

- LIFs are automatically migrated from degraded ports to healthy ports.
- During a failover event, a degraded port is not considered as the failover target. If no healthy ports are available, degraded ports host LIFs according to the normal failover policy.
- You cannot create, migrate, or revert a LIF to a degraded port.

  You can modify the `ignore-health-status` setting of the network port to `true`. You can then host a LIF on the healthy ports.

Steps

1. Log in to the advanced privilege mode:

   ```
   set -privilege advanced
   ```

2. Check which health monitors are enabled for monitoring network port health:

   ```
   network options port-health-monitor show
   ```

   The health status of a port is determined by the value of health monitors.

   The following health monitors are available and enabled by default in ONTAP:

   - Link-flapping health monitor: Monitors link flapping

If a port has link flapping more than once in five minutes, this port is marked as degraded.

- L2 reachability health monitor: Monitors whether all ports configured in the same broadcast domain have L2 reachability to each other

  This health monitor reports L2 reachability issues in all IPspaces; however, it marks only the ports in the cluster IPspace as degraded.

- CRC monitor: Monitors the CRC statistics on the ports

  This health monitor does not mark a port as degraded but generates an EMS message when a very high CRC failure rate is observed.

3. Enable or disable any of the health monitors for an IPspace as desired by using the `network options port-health-monitor modify` command.
4. View the detailed health of a port:

```
network port show -health
```

The command output displays the health status of the port, `ignore health status` setting, and list of reasons the port is marked as degraded.

A port health status can be `healthy` or `degraded`.

If the `ignore health status` setting is `true`, it indicates that the port health status has been modified from `degraded` to `healthy` by the administrator.

If the `ignore health status` setting is `false`, the port health status is determined automatically by the system.

Monitor the reachability of network ports (ONTAP 9.8 and later)

Reachability monitoring is built into ONTAP 9.8 and later. Use this monitoring to identify when the physical network topology does not match the ONTAP configuration. In some cases, ONTAP can repair port reachability. In other cases, additional steps are required.

About this task

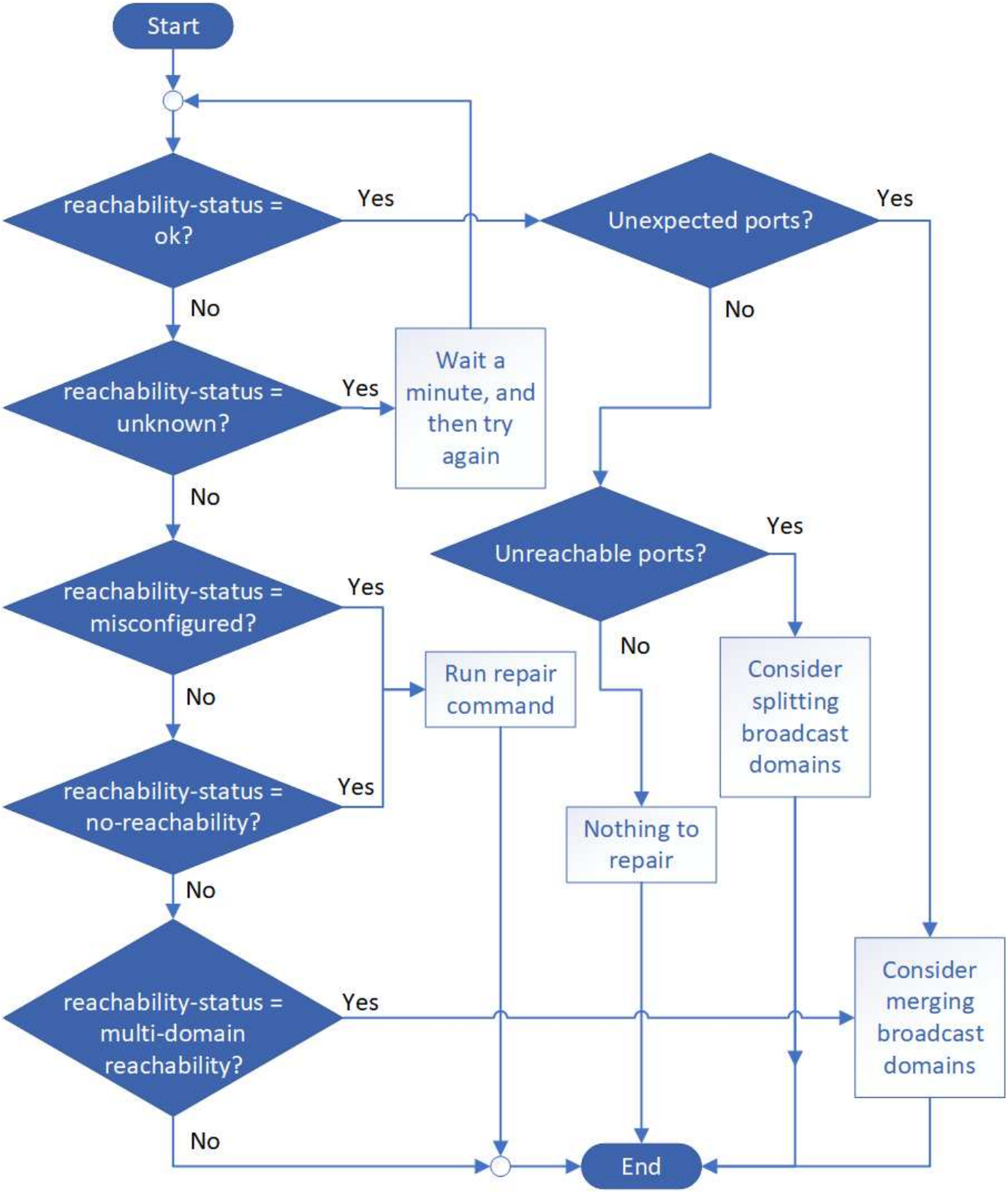
Use these commands to verify, diagnose, and repair network misconfigurations that stem from the ONTAP configuration not matching either the physical cabling or the network switch configuration.

Step

1. View port reachability:

```
network port reachability show
```

2. Use the following decision tree and table to determine the next step, if any.



Reachability-status	Description

ok	The port has layer 2 reachability to its assigned broadcast domain. If the reachability-status is "ok", but there are "unexpected ports", consider merging one or more broadcast domains. For more information, see the following *Unexpected ports* row. If the reachability-status is "ok", but there are "unreachable ports", consider splitting one or more broadcast domains. For more information, see the following *Unreachable ports* row. If the reachability-status is "ok", and there are no unexpected or unreachable ports, your configuration is correct.
Unexpected ports	The port has layer 2 reachability to its assigned broadcast domain; however, it also has layer 2 reachability to at least one other broadcast domain. Examine the physical connectivity and switch configuration to determine if it is incorrect or if the port's assigned broadcast domain needs to be merged with one or more broadcast domains. For more information, see Merge broadcast domains.
Unreachable ports	If a single broadcast domain has become partitioned into two different reachability sets, you can split a broadcast domain to synchronize the ONTAP configuration with the physical network topology. Typically, the list of unreachable ports defines the set of ports that should be split into another broadcast domain after you have verified that the physical and switch configuration is accurate. For more information, see Split broadcast domains.
misconfigured-reachability	The port does not have layer 2 reachability to its assigned broadcast domain; however, the port does have layer 2 reachability to a different broadcast domain. You can repair the port reachability. When you run the following command, the system will assign the port to the broadcast domain to which it has reachability: `network port reachability repair -node -port` For more information, see Repair port reachability.
no-reachability	The port does not have layer 2 reachability to any existing broadcast domain. You can repair the port reachability. When you run the following command, the system will assign the port to a new automatically created broadcast domain in the Default IPspace: `network port reachability repair -node -port` For more information, see Repair port reachability.

multi-domain-reachability	The port has layer 2 reachability to its assigned broadcast domain; however, it also has layer 2 reachability to at least one other broadcast domain. Examine the physical connectivity and switch configuration to determine if it is incorrect or if the port's assigned broadcast domain needs to be merged with one or more broadcast domains. For more information, see Merge broadcast domains or Repair port reachability.
unknown	If the reachability-status is "unknown", then wait a few minutes and try the command again.

After you repair a port, you need to check for and resolve displaced LIFs and VLANs. If the port was part of an interface group, you also need to understand what happened to that interface group. For more information, see Repair port reachability.

ONTAP ports overview

A number of well-known ports are reserved for ONTAP communications with specific services. Port conflicts will occur if a port value in your storage network environment is the same as on ONTAP port.

The following table lists the TCP ports and UDP ports that are used by ONTAP.

Service	Port/Protocol	Description
ssh	22/TCP	Secure shell login
telnet	23/TCP	Remote login
DNS	53/TCP	Load Balanced DNS
http	80/TCP	Hyper Text Transfer Protocol
rpcbind	111/TCP	Remote procedure call
rpcbind	111/UDP	Remote procedure call
ntp	123/UDP	Network Time Protocol
msrpc	135/UDP	MSRPC
netbios-ssn	139/TCP	NetBIOS service session
snmp	161/UDP	Simple network management protocol
https	443/TCP	HTTP over TLS
microsoft-ds	445/TCP	Microsoft-ds
mount	635/TCP	NFS mount
mount	635/UDP	NFS Mount
named	953/UDP	Name daemon
nfs	2049/UDP	NFS Server daemon

nfs	2049/TCP	NFS Server daemon
nrv	2050/TCP	NetApp Remote Volume protocol
iscsi	3260/TCP	iSCSI target port
lockd	4045/TCP	NFS lock daemon
lockd	4045/UDP	NFS lock daemon
NSM	4046/TCP	Network Status Monitor
NSM	4046/UDP	Network Status Monitor
rquotad	4049/UDP	NFS rquotad protocol
krb524	4444/UDP	Kerberos 524
mdns	5353/UDP	Multicast DNS
HTTPS	5986/UDP	HTTPS Port - Listening binary protocol
https	8443/TCP	7MTT GUI Tool through https
ndmp	10000/TCP	Network Data Management Protocol
Cluster peering	11104/TCP	Cluster peering, bi-directional
Cluster peering, bi-directional	11105/TCP	Cluster peering
NDMP	18600 - 18699/TCP	NDMP
NDMP	30000/TCP	accept control connections over secure sockets
cifs witness port	40001/TCP	cifs witness port
tls	50000/TCP	Transport layer security
iscsi	65200/TCP	ISCSI port

ONTAP internal ports

The following table lists the TCP ports and UDP ports that are used internally by ONTAP. These ports are used to establish intracluster LIF communication:

Port/Protocol	Description
514	Syslog
900	NetApp Cluster RPC
902	NetApp Cluster RPC
904	NetApp Cluster RPC
905	NetApp Cluster RPC
910	NetApp Cluster RPC
911	NetApp Cluster RPC
913	NetApp Cluster RPC

914	NetApp Cluster RPC
915	NetApp Cluster RPC
918	NetApp Cluster RPC
920	NetApp Cluster RPC
921	NetApp Cluster RPC
924	NetApp Cluster RPC
925	NetApp Cluster RPC
927	NetApp Cluster RPC
928	NetApp Cluster RPC
929	NetApp Cluster RPC
931	NetApp Cluster RPC
932	NetApp Cluster RPC
933	NetApp Cluster RPC
934	NetApp Cluster RPC
935	NetApp Cluster RPC
936	NetApp Cluster RPC
937	NetApp Cluster RPC
939	NetApp Cluster RPC
940	NetApp Cluster RPC
951	NetApp Cluster RPC
954	NetApp Cluster RPC
955	NetApp Cluster RPC
956	NetApp Cluster RPC
958	NetApp Cluster RPC
961	NetApp Cluster RPC
963	NetApp Cluster RPC
964	NetApp Cluster RPC
966	NetApp Cluster RPC
967	NetApp Cluster RPC
982	NetApp Cluster RPC
983	NetApp Cluster RPC
5125	Alternate Control Port for disk
5133	Alternate Control Port for disk
5144	Alternate Control Port for disk

65502	Node scope SSH
65503	LIF Sharing
7810	NetApp Cluster RPC
7811	NetApp Cluster RPC
7812	NetApp Cluster RPC
7813	NetApp Cluster RPC
7814	NetApp Cluster RPC
7815	NetApp Cluster RPC
7816	NetApp Cluster RPC
7817	NetApp Cluster RPC
7818	NetApp Cluster RPC
7819	NetApp Cluster RPC
7820	NetApp Cluster RPC
7821	NetApp Cluster RPC
7822	NetApp Cluster RPC
7823	NetApp Cluster RPC
7824	NetApp Cluster RPC
8023	Node Scope TELNET
8514	Node Scope RSH
9877	KMIP Client Port (Internal Local Host Only)

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