



CLUSTERLION TEST SCENARIOS

This document describes many test scenarios related to a MetroCluster setup with ClusterLion. The scenarios are basically differentiated in three categories:

- ClusterLion connection failures
- MetroCluster failures that do not cause switchover
- MetroCluster failures that result in a switchover

How the scenarios are structured:

Description of the scenario			
How to test: How can the scenario be achieved when testing?			
Affected Location	Other Location	Alarm	Status
Status values in the ClusterLion web portal at the affected location.	Status values in the ClusterLion web portal at the unaffected location.	Name of the alarm occurring at the ClusterLion.	Which status results from the perspective of the ClusterLion.
Note/Explanation: Additional comments or explanations to this scenario.			

The resulting status can basically take the following values, which are briefly described here:

- Operational:
The ClusterLion works normally and continues to react to all occurring situations.
- Actions-Disabled:
The ClusterLion cannot make any clear decisions and therefore deactivates all further actions as long as there is no clear status again.
- Split-condition:
The MetroCluster is in a split condition and therefore ClusterLion deactivates all further actions as long as there is no clear status again. This absolutely eliminates the possibility for Split-Brain.
- Switchover-mode:
The MetroCluster is in switchover mode and therefore ClusterLion deactivates all further actions as long as there is a normal status again.

In case of any questions please contact us at support@prolion.at or by phone at +43 650 470 43 23.
Thank you!

ClusterLion connection failures:

One AgentBox fails

How to test:

Disconnect PoE and/or press the Reset button on one AgentBox.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
One Device AGT: Warning or Error	-	agent-alarm	operational

Note/Explanation:

If one AgentBox has an error, ClusterLion will continue to work normally as they are redundant.

Both AgentBoxes fail

How to test:

Disconnect PoE and press the Reset button on both AgentBoxes.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
Both Devices AGT: Warning or Error All other values are hidden	-	location-offline	actions-disabled

Note/Explanation:

If both AgentBoxes have an error, the ClusterLion disables all actions after a short while because it can no longer make any legitimate decisions.

Serial connection fails

How to test:

Disconnect all serial console ports.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
PowerSafetyStatus: Warning	-	-	operational

Note/Explanation:

If the serial query fails, it is basically possible to perform a power-off. That's why the metric is called PowerSafetyStatus.

Ethernet connection fails

How to test:

Disconnect all ethernet ports.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
All storage metrics: Warning	-	controller-unreachable	actions-disabled

Note/Explanation:

If the ethernet queries fail, the ClusterLion disables all actions after a short while because it can no longer make any legitimate decisions.

Any, but not all power input fail

How to test:

Disconnect one to three power inputs.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
Power Input: Warning Power Output: Warning	-	input-alarm output-alarm	operational

Note/Explanation:

If a power input is not supplied with power, the equally numbered power output is also not supplied with power. A warning is displayed in the web portal.

MetroCluster failures that do not cause switchover:

Connection to local discs lost

How to test:

Turn off both ATTO bridges.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
Local Plexes: Error	Remote Plexes: Error	local-plex-warning-alarm	operational

Note/Explanation:

If one site of the MetroCluster loses the connection to the disks, the ClusterLion will alert, but will not initiate a switchover because each MetroCluster Location still has access to a disk backend.

All Network Interconnects fail

How to test:

Disconnect all Network Interconnects.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
Network Interconnect: Error	Network Interconnect: Warning	-	operational

Note/Explanation:

If status values of the MetroCluster queried by the ClusterLion are not OK, of course it will be display in the web portal. However, many of these situations do not trigger an alarm and will not cause a switchover to be initiated, because the problem is not severe. Such as it is the case in this situation.

Backend connection between MetroCluster sites lost

How to test:

Disconnect all Inter-Switch Links.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	isl-error-alarm	split-condition

Note/Explanation:

If the MetroCluster is in a split condition, that means that all ISL connections in the FC backend are broken, the ClusterLion will not initiate a switchover and will not do so until the situation is resolved. Each side of the MetroCluster works independently for itself.

MetroCluster failures that result in a switchover:

Both local FC-switches (backend) fail

How to test:

Turn off both MetroCluster Backend FC-switches.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
All storage metrics: Warning; PowerSafetyStatus: Warning	NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	controller-error-alarm	switchover-mode

Note/Explanation:

In this situation, NetApp panics after 30 seconds, ClusterLion detects the situation and initiates a switchover to the other site.

Both storage controllers fail

How to test:

Turn off both storage controllers.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
All storage metrics: Warning; PowerSafetyStatus: Warning	NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	controller-error-alarm	switchover-mode

Note/Explanation:

If both storage controllers fail on one site, ClusterLion detects the situation and initiates a switchover to the other site. Since in this special case also an AUSO (automatic unplanned switchover - see NetApp documentation) works, it cannot be exactly predicted whether the ClusterLion or the AUSO is faster when initiating the switchover. But that does not really matter, because in any case the switchover is performed. If you want the test to be executed in such a way that no AUSO becomes effective, the ATTO bridges can be switched off immediately before the storage controllers are switched off.

A power outage occurs at the data center

How to test:

Turn off the whole rack or at least simultaneously turn off the ATTO bridges and disconnect the 4 power inputs on your ClusterLion.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
All storage metrics: Warning PowerSafetyStatus: Warning Power Input: Error Power Output: Error UpsOnBattery: Error	NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	poweroutage-alarm usv-alarm	switchover-mode

Note/Explanation:

If a power outage occurs, ClusterLion detects the situation and initiates a switchover to the other site.

A site disaster occurs

How to test:

Simultaneously disconnect both PoE ports and turn off the whole rack or at least simultaneously disconnect both PoE ports and turn off the ATTO bridges and the storage controllers at the same time.

<i>Affected Location</i>	<i>Other Location</i>	<i>Alarm</i>	<i>Status</i>
Both Devices AGT: Warning or Error All other values are hidden	NVRAM Mirror: Error Fabric Interconnect: Error Remote Plexes: Error	sitedisaster-alarm siteoutage-alarm	switchover-mode

Note/Explanation:

If a site disaster occurs, ClusterLion detects the situation and initiates a switchover to the other site. A site disaster is a situation in which both, the MetroCluster and the ClusterLion on one site completely fail within a short time. This situation would be conceivable, for example, when an explosion takes place, a heavy earthquake occurs, etc.