```
===================================== CLUSTER ========================================================

action              pre-conditions                                            post-conditions
================    ==================================================        =============================================

------------------------------------------------------------------------------------------------------------------
1. create           no cluster present                                        cluster created
                    mars module not inserted                                  /mars mounted
                    /mars mounted

------------------------------------------------------------------------------------------------------------------
2. join             (1.) on primary host                                      cluster joined
                    cluster not joined                                        /mars mounted
                    mars module not inserted
                    /mars mounted

------------------------------------------------------------------------------------------------------------------
3. leave            (1.) or (2.)                                              no cluster present
                    no resources existent


===================================== RESOURCE =======================================================

The state of a resource comprises the states of 3 objects (role, disk, replication) taking the following values:

role: primary secondary
----

disk:
----
   detached    : underlying device may be used by other applications
   outdated    :     role = secondary
                 AND consistent
                 AND [    not all logfiles have been fetched from the primary
                       OR primary_unreachable ]
   uptodate    :     consistent
                 AND [ role = primary OR [     role = secondary
                                          AND no logfiles are to be fetched
                                          AND repl != primary_unreachable] ]
   inconsistent: none of the three states above (a sync, restore or similar action is necessary
                 to reach a consistent state)

repl:
----
   notjoined            : role = secondary AND resource exists on the primary only
   replaying            :     consistent disk
                          AND [    [ role = primary AND can "send" logfiles ]
                                OR [ role = secondary AND can receive logfiles ] ]
   primary_unreachable  : what the name means
```

```
   paused_sync          : interrupted while syncing
   syncing              : what the name means
   paused_replay        : able to replay, but interrupted
   disconnected         : not used until now, probably not necessary

For data consistence the states of the following objects are important too:

device (the "underlying" device):
------
   locked  : cannot be opened by other applications
   unlocked: usable as a normal block device by other applications
   unused  : not used by any application

mars_device:
-----------
    usable   : can be used in "normal" ways
    invisible: what the name means
    undef    : not existent

===========
    Hint: Of course the states are not independent, e.g.:

    disk != detached => device = locked
    repl = synching && role = secondary => disk inconsistent

    These action independent rules will not be regarded here and must be guaranteed by tests.
===========

In the following table the states which are of no interest in the specific
action are omitted or their values are marked with *.
The disk state "consistent" is an abreviation for outdated || uptodate


action         pre-conditions                                     post-conditions
=============  ==================================================  =================================================

---------------------------------------------------------------------------------------------------------------------
4. create
              (1.)
              mars module inserted                                 role        : primary
              device: unused                                       disk        : uptodate
                                                                   repl        : replaying
                                                                   mars_device : usable
                                                                   device      : locked

---------------------------------------------------------------------------------------------------------------------
5. join
              (4.) on primary host, (2.)                           role        : secondary
              mars module inserted                                 disk        : uptodate
```

```
             repl   : notjoined                                        repl        : replaying
             device : unused                                           mars_device : invisible
                                                                       device      : locked

------------------------------------------------------------------------------------------------------------------------
6. leave
             (4.) or (5.)                                              disk        : detached
             disk: uptodate                                            mars_device : undef
                   outdated                                            device      : unlocked
                       -> wait | force
             repl: disconnected

------------------------------------------------------------------------------------------------------------------------
7. switch primary  -> secondary
             (4.) or (5.)                                              role          : secondary
             role : primary                                            disk          : uptodate

------------------------------------------------------------------------------------------------------------------------
8. switch secondary -> primary
             (4.) or (5.)                                              role: primary
             no other primary host (evtl. locking (two mounts!))
             role : secondary
             disk : uptodate
                    outdated
                       -> wait | force

------------------------------------------------------------------------------------------------------------------------
9. pause_sync
            (4.) or (5.)                                               repl: paused_sync
            repl: synching
                  !synching
                       -> hint

------------------------------------------------------------------------------------------------------------------------
10. pause_replay
            (4.) or (5.)                                               repl: paused_replay
            repl: replaying
                  !replaying
                      -> hint

------------------------------------------------------------------------------------------------------------------------
11. invalidate
            (4.) or (5.)                                               disk: inconsistent

------------------------------------------------------------------------------------------------------------------------
12. logrotate
            (4.) or (5.)                                               log rotated

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```

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13. logdelete
             (4.) or (5.)                                      log deleted
             logfile closed
             AND logfile received from all secondaries



===================================== DEVICES ==============================================================

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14. attach
             (4.) or (5.)                                      disk: if no "out of mars changes" occured since deta
ch
             disk: detached                                              state = state before detach
                                                                     else
                                                                         state = inconsistent

-----------------------------------------------------------------------------------------------------------
15. detach
             (4.) or (5.)                                      disk: detached


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===================================== FURTHER INFOS NEEDED =================================================

1. all state infos from remote hosts are to be provided with a timestamp indicating their actuality

2. replication states like synching, replaying need a "progress bar"

3. useless actions (e.g. primary on a resource beeing already primary) should be handled as tolerant as possible
```