Cluster Server Agent for monitoring SAN Boot environment Installation and Configuration Guide

Linux

6.2

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VERITAS™

Cluster Server Agent for SANBootMonitor Installation and Configuration Guide

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Contents

Chapter 1

Introducing the agent for monitoring SAN Boot environment

This chapter includes the following topics:

About the Cluster Server Agent for monitoring SAN Boot environment

Cluster Server agents monitor specific resources within an enterprise application. They determine the status of resources and start or stop them according to external events.

The Cluster Server agent for SANBootMonitor monitors the boot disk connectivity in the SAN Boot environment. The SANBootMonitor utilizes the Busybox functionalities to perform various operations on the cluster node. The SANBootMonitor agent supports the Linux operating system.

The agent provides the following functionality:

- Detects when the root file system goes into the read-only mode.

- Initiates a system panic on the cluster node, if the SAN connectivity is lost for the root file system.

The SANBootMonitor agent enables you to configure Cluster Server (VCS) in the SAN Boot environment.

Supported software

For information on the software versions that the Cluster Server agent for SANBootMonitor supports, see the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

How the agent monitors the SANBoot environment

The SANBootMonitor agent continuously monitors the root file system in the SAN Boot environment to verify that the file system is in the read-write mode.

When the root file system becomes read-only, the SANBootMonitor agent detects this state, and panics the respective node in the cluster. In this case, the node leaves the cluster and the VCS on the other nodes is able to take the appropriate failover action.

Thus, the agent ensures high availability for the applications running in the SAN Boot environment.

About Busybox

Busybox provides several UNIX tools in a single executable file. This gives flexibility to execute any Linux command using the Busybox binary without any dependency of required libraries. To ensure this, Busybox must be installed at a location which is available even in case of root disk loss. For VCS, the Busybox is used from a temporary file system created during the agent configuration.

For more information on how to install and configure the Busybox, See “Installing and configuring the Busybox” on page 13.

Typical SANBootMonitor configuration in a VCS cluster

A typical SANBootMonitor configuration in a VCS cluster has the following characteristics:

- VCS is installed and configured in a two-node cluster.

- The Busybox package is installed and configured locally on both nodes.
- The Cluster Server SANBootMonitor agent is installed and configured on both nodes.

Chapter 2

Installing, configuring, and removing SANBootMonitor agent for high availability

This chapter includes the following topics:

About SANBootMonitor

When the root file system of the operating system lies on the SAN storage and there is loss of storage connectivity, the file system becomes read-only. This results in command execution errors while creating temporary files on the root file system. The VCS agents fail because they cannot spawn new processes or execute commands. This restricts the service groups to fail over on fault.

The SANBootMonitor agent detects this inaccessibility of the root file system and panics the cluster node to ensure that the node leaves the cluster and enables VCS on the other nodes to take appropriate failover action.

There are no resource dependencies for the SANBootMonitor agent.

SANBootMonitor agent functions

The agent consists of resource type declarations and agent executables. The agent executables are organized into online, offline, monitor, and clean functions.

Online

The online function creates a temporary state file on the temporary file system to mark the start of monitoring the file system.

Offline

The offline function removes the temporary state file from the temporary file system to mark the stop of monitoring the file system.

Monitor

The monitor function performs the following tasks:

- Attempts to create a file on the root file system.
- Initiates system halt.
- Returns ONLINE on success.

Clean

The clean function forcefully initiates a system halt using the Busybox `poweroff -nf` command.

State definition for the SANBootMonitor agent

ONLINE	Indicates that the root file system is accessible in the read-write mode.
OFFLINE	Indicates that the agent is not monitoring the root file system.
FAULTED	Indicates that the root file system is not in the read-write mode.
UNKNOWN	Indicates that the Busybox is not installed on the cluster node, or a configuration error exists, or the resource configuration is invalid.

SANBootMonitor agent attributes

Table 2-1 shows the required attributes for configuring a SANBootMonitor instance.

Table 2-1 Required attributes

Required attributes	Description
MountPoint	The location of the tmpfs file system, which contains the agent files. Type and dimension: string-scalar Default: `/VCStmpfs` **Note:** This attribute is for internal use only. Do not modify this attribute—modifying it can lead to significant problems for your cluster.
AgentDirectory	The absolute path of the directory where the agent binaries and scripts are located. Type and dimension: string-scalar Default: `/VCStmpfs/SANBootMonitor` **Note:** This attribute is for internal use only. Do not modify this attribute—modifying it can lead to significant problems for your cluster.
ToleranceLimit	Defines the number of times the monitor routine should return the status as offline, before declaring the resource as offline. For more information, refer to the *Cluster Server Administrator's Guide*. Type and dimension: integer-scalar Default: 1

Resource type definition for SANBootMonitor agent

The following is the resource type definition for the SANBootMonitor agent.

```
type SANBootMonitor (
        static str AgentDirectory = "/VCStmpfs/SANBootMonitor"
        static str AgentFile = "/opt/VRTSvcs/bin/Script51Agent"
        static int ToleranceLimit = 1
        static str ArgList[] = { MountPoint, State }
        str MountPoint
)
```

Installing and configuring the Busybox

Install and configure the Busybox on each system in the cluster that run the agent. Busybox can be installed using rpm or a tar file.

To install and configure Busybox using rpm

1. Download the platform-specific Busybox rpm from the repository and copy it to your local directory.
2. Install the rpm.

   ```
   # rpm -ivh Busybox_rpm_name
   ```

To install and configure Busybox from a tar file

1. Download the tar file from the Busybox Web site: http://www.busybox.net/. Extract it to your local directory.
2. Navigate to the directory where you have extracted the tar file and configure Busybox using a default or customized configuration. For example, for a default configuration, run the following command:

   ```
   # make defconfig
   ```

   For more information on how to customize a configuration, see the Busybox Web site: http://www.busybox.net/.
3. Compile the Busybox.

   ```
   # make
   ```

4. Install the Busybox.

   ```
   # make install
   ```

Installing the agent

You must install the SANBootMonitor agent on all the systems that will host SANBootMonitor service groups.

Ensure that you meet the following prerequisites to install the SANBootMonitor agent.

- Install and configure Cluster Server.
- Install and configure Busybox on each system in the cluster that runs the agent.

To install the agent in a VCS environment

1. Download the complete Agent Pack tar file from the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.
2. Log in as a superuser.

3 Navigate to the directory containing the package.

```
cd1/linux/generic/vcs/application/sanboot_agent/
6.0/6.0.0.0_agent/rpms
```

4 Install the package.

```
# rpm -ivh VRTSsanboot-6.0.0.0-GENERIC.noarch.rpm
```

Configuring the agent

Before you configure the SANBootMonitor agent, ensure that you have already configured the Busybox. For more information on how to configure Busybox, See "Installing and configuring the Busybox" on page 13.

To configure the agent in a VCS environment

1 Stop HAD on all cluster nodes.

```
# hastop -all
```

2 Stop fencing, if running.

```
# /etc/init.d/vxfen stop
```

3 Run the agent configuration script with the configure option.

```
# /opt/VRTSvcs/bin/hasanbootconfig --configure

[Verifying] Platform is Linux..                          Done
[Verifying] VCS is not running..                         Done
[Verifying] Fencing is not running..                     Done
[Verifying] Busybox is installed..                       Done
[Verifying] Busybox supports shell..                     Done
[Verifying] SANBootMonitor agent is present..            Done

[Verifying] Is Ramfs already mounted at /VCStmpfs..      Done
[Creating] VCS directories inside /VCStmpfs..            Done
[Creating] Symlinks inside /var/VRTSvcs..                Done
[Copying] SANBootMonitor agent files..                   Done
[Copying] Busybox binary..                               Done
[Copying] Init scripts to make setup boot persistent..   Done
[Verifying] main.cf on the node..                        Done

[Verifying] LLT is running on the node..                 Done
Starting Fencing on node SysA..                          Done
[Verifying] Fencing is running on the node..             Done
Starting VCS on node SysA..                              Done
[Verifying] Is Group sanboot_grp configured..            Done
NOTICE : sanboot_grp already in configuration.
[Verifying] Is Resource sanboot_res configured..         Done
NOTICE : sanboot_res already in configuration.
Attempting to online sanboot_grp on SysA..               Done
#
```

Perform the agent installation and configuration steps on each node in the cluster.

Unconfiguring the agent

You must uninstall the SANBootMonitor agent from a cluster while the cluster is not active.

To uninstall the agent in a VCS environment

1. Log in as a superuser.
2. Run the `hasanbootconfig` script with the unconfigure option.

```
# /opt/VRTSvcs/bin/hasanbootconfig --unconfigure

Unconfiguration will stop VCS, fencing and GAB on node.
Do you want to proceed? (yes/no):yes
Unconfiguring SANBootMonitor agent ...
[Removing] Group sanboot_grp from VCS configuration..  Done
[Stopping] VCS ...                                     Done
[Stopping] CmdServer ...                               Done
[Stopping] fencing on node sysA..                      Done
[Verifying] Fencing is not running on the node..       Done
[Stopping] GAB..                                       Done
[Unmounting] /VCStmpfs..                               Done
[Removing] vcssanboot init script..                    Done
Unconfiguration of SANBootMonitor agent completed
successfully
[Starting] GAB..                                       Done
[Starting] fencing on node sysA..                      Done
[Verifying] Fencing is running on the node..           Done
[Starting] VCS on node sysA..                          Done

NOTE: Run /opt/VRTSvcs/bin/hasanbootconfig --unconfigure
on all cluster node to unconfigure SANBootMonitor agent.
#
```

3. Remove package manually.

```
# rpm -e VRTSsanboot
```

Chapter 3

Troubleshooting the agent for SANBootMonitor

This chapter includes the following topics:

Preliminary troubleshooting checks

If you face problems with the Cluster Server SANBootMonitor agent, perform the following checks before further investigation:

- Use the correct software and operating system versions.
  Ensure that no issues arise due to incorrect software and operating system versions.
- Meet prerequisites.
  Before installing the SANBootMonitor agent, ensure that all the prerequisites are met. For example, you must install Busybox on each node in the cluster.
- Verify that all the required files are copied to the specified location.

```
ls /VCStmpfs/*
/VCStmpfs/busybox*

/VCStmpfs/SANBootMonitor:
clean*  monitor*  offline*  online*

/VCStmpfs/VRTSvcs:
ldf/  lock/  log/
```

Reviewing log files

If you face problems while using the SANBootMonitor agent, use the log files described in this section to investigate the problems.

- Cluster log files
  The engine log file is located at `/var/VRTSvcs/log/engine_A.log`. For a long running cluster, the log files are rotated as engine_B.log, engine_C.log, and so on. The most-recent engine logs are present in the engine_A.log file.
- SANBootMonitor agent log files
  The SANBootMonitor agent log file is located at `/var/VRTSvcs/log/SANBootMonitor_A.log`.

Note: By default, the VCS log location is `/var/VRTSvcs`. You can customize this log location; the engine logs and the agent logs will be located at your customized log location.

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in a cluster log file for individual resource. You can set this attribute to TRACE, which enables very detailed and verbose logging.

If you set the ResLogLevel attribute to TRACE, a very high volume of messages are produced. Symantec recommends that you localize the ResLogLevel attribute for a particular resource.

Warning: You may consider temporarily increasing the timeout values for resources for debugging purposes. After the debugging process is complete, you can revert back to the original timeout values.

The LogDbg attribute should be used to enable the debug logs for the ACCLib-based agents when the ACCLIB version is 6.2.0.0 or later and the VCS version is 6.2 or later.

To localize ResLogLevel attribute for a resource

1. Make the cluster writable.

   ```
   # haconf -makerw
   ```

2. Identify the resource for which you want to enable detailed logging.

3 Localize the ResLogLevel attribute for the identified resource:

```
# hares -local Resource_Name ResLogLevel
```

4 Set the ResLogLevel attribute to TRACE for the identified resource:

```
# hares -modify Resource_Name ResLogLevel TRACE -sys SysA
```

5 Note the time before you begin to operate the identified resource.

6 Test the identified resource. The function reproduces the problem that you are attempting to diagnose.

7 Note the time when the problem is reproduced.

8 Set the ResLogLevel attribute back to INFO for the identified resource:

```
# hares -modify Resource_Name ResLogLevel INFO -sys SysA
```

9 Save the configuration changes.

```
# haconf -dump
```

10 Review the contents of the log file. Use the time noted in Step 4 and Step 6 to diagnose the problem.

For more details, refer to the *Cluster Server Administrator's Guide*. You can also contact Symantec support for more help.

To enable debug logs for all resources of type SANBootMonitor

- Enable the debug log.

```
# hatype -modify SANBootMonitor LogDbg DBG_5
```

To override the LogDbg attribute at resource level

- Override the LogDbg attribute at the resource level and enable the debug logs for the specific resource.

```
# hares -override SANBootMonitor LogDbg
# hares -modify SANBootMonitor LogDbg DBG_5
```

Troubleshooting the agent

This release of the SANBootMonitor agent has the following issues:

- Agent is unable to panic the node in case of loss of root file system

In case of loss of root file system, the SANBootMonitor agent panics the system using the Busybox commands and initiates the service group failover. If the agent fails to panic the system, ensure that the Busybox commands work correctly.

- The `hasanbootconfig` utility fails to configure the SANBootMonitor agent
  The `hasanbootconfig` utility is used to configure VCS and the SANBootMonitor agent to monitor the SANBoot environment.
  If the utility fails to configure the agent, you must check for the following:
  - Busybox is installed on the system and its binary is located at `/sbin/busybox`.
  - The file system is not in the read-only mode.
  - Sufficient space is available on the disk.
  - VCS and VxFen are stopped on the node.
- The SANBootMonitor resource fails to come online on a node
  The SANBootMonitor resource may fail to come online on a node because the agent is not able to create the status file on the disk or resource configuration is invalid. You must ensure that the resource configuration is correct and the file system is not out of disk space.
- The `hasanbootconfig` utility fails to unconfigure the SANBootMonitor agent
  The `hasanbootconfig` utility may fail to unconfigure the SANBootMonitor agent because the utility may fail to stop VCS, VxFen, and GAB or unmount `/VCStmpfs`.
  You must manually stop VCS, VxFen, and GAB modules and try unconfiguration using the `hasanbootconfig --unconfigure` command.

Limitations of the agent

This release of the SANBootMonitor agent has the following limitations:

- The SANBootMonitor agent supports only RHEL6 operating system.
- The Man page is unavailable for the SANBootMonitor agent configuration script.
- The agent does not support custom log location.

Appendix A

Sample Configurations

This appendix includes the following topics:

About sample configurations for the SANBootMonitor agent

There are no resource dependencies for the SANBootMonitor agent.

Sample service group configuration for the SANBootMonitor agent

The service group configuration in a cluster depends on some common characteristics that must be a part of the configuration design. These characteristics include the following:

```
include "types.cf"
include "SANBootMonitorType.cf"

cluster vcs (
        )

system sysA (
        )

system sysB (
        )
```

```
group sanboot_grp (
        SystemList = { sysA = 0, sysB = 1 }
        Parallel = 1
        AutoStartList = { sysA, sysB }
        )

SANBootMonitor sanboot_res (
         MountPoint = "/VCStmpfs"
         ToleranceLimit = 2
         )
```

Index