CONTINUITY SOFTWARE

DR/HA Assurance Service

Demonstration of RecoverGuard
for NetApp

Nov 16, 2008

For:

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INTRODUCTION

The following report presented disaster recovery and high availability vulnerabilities as well as optimization opportunities for the NetApp storage environment. It was decided by ▮▮▮ and Continuity Software to examine the capabilities of RecoverGuard in the NetApp storage environment. As part of this effort, the filers were scanned in addition to two hosts which utilize NetApp storage volumes on Sep 23, 2008. The data was then analyzed by RecoverGuard and Continuity Software DR/HA experts, finally producing this report.

STRUCTURE OF THIS DOCUMENT

This document contains the following sections:

- Executive summary
- Detailed RecoverGuard ticket summary
- Optimization opportunities
- Appendix A: Comparison of "options" between NetApp filers
- Appendix B: NetApp environment documentation
- Appendix B: Coverage details

EXECUTIVE SUMMARY

- **Despite the low host coverage (two hosts), several threats have been identified**
- **For the complete data protection analysis, we recommend the scanning of any host which utilizes NetApp storage (SAN or NAS)**

TOP ISSUES

The following table summarizes urgent threats among all those detected.

Business Service	Summary	Potential Impact	Link
▮▮▮,	Partial replication to the DR site	Data loss	Ticket ID 1
▮▮▮, ▮▮▮, ▮▮▮, ▮▮	NetApp volumes with no up-to-date copies	Data loss	Ticket ID 2 Ticket ID 3 Ticket ID 6
Data warehouse	Suboptimal protection for Oracle database ▮▮▮	Data loss	Ticket ID 12
N/A	NetApp snapshots exceeding designed storage	Snapshot generation error	Ticket ID 8

DETAILED SUMMARY

OPEN TICKET SUMMARY

The following table shows a summary of open tickets. Open tickets representing gaps which exist in the system and were not resolved yet. A total of 16 tickets are open in the system.

ID	Summary	Severity	Area
1	Oracle instance ▆▆▆ is partially replicated with snapmirror	WARNING	Storage Administration
2	Several SnapVault backups on NetApp filer ▆▆▆ are not up-to-date	WARNING	Storage Administration
3	Several NetApp volumes on filers ▆▆▆ and ▆▆▆ do not have up-to-date snapshots	WARNING	Storage Administration
4	Potential retention SLA violation for volume pst on filer ▆▆▆	WARNING	Storage Administration
5	Inconsistency in configuration of Unicode support detected for several NetApp volumes	WARNING	Storage Administration
6	Several NetApp volumes do not have snapshot copies	WARNING	Storage Administration
7	Several NetApp LUNs are configured with no space reservation	WARNING	Storage Administration
8	Snapshots exceeding designed storage for several NetApp volumes	WARNING	Storage Administration
9	Virtual interfaces in bad state detected on filers ▆▆▆ and ▆▆▆	WARNING	Storage Administration
10	Aggregates on filers ▆▆▆, ▆▆▆ and ▆▆▆ are nearly out of space	WARNING	Storage Administration
11	The redo logs of Oracle instance ▆▆▆ on host ▆▆▆ are multiplexed on the same NetApp volume	WARNING	Database Administration
12	Suboptimal protection for Oracle instance ▆▆▆ on host ▆▆▆	WARNING	Storage Administration
13	Several licenses were found which are installed on some filers but not all	INFO	Storage Administration
14	Several differences detected between NetApp filers in terms of DNS information	INFO	Storage Administration
15	Several differences found between filer ▆▆▆ and other filers in terms of user and group definitions	INFO	Storage Administration
16	Several differences found between filers ▆▆▆, ▆▆▆ and other filers in terms of role definitions	INFO	Storage Administration

OPEN TICKET DETAILS

The following sections present detailed description and impact for open tickets.

TICKET ID 1

Oracle instance ███ is partially replicated with snapmirror

DESCRIPTION

- The data files of Oracle instance ███ reside on two mounts: ███1, ███2
- Mount ███1 is stored on NetApp volume ███1 on filer ███
- Mount ███2 is stored on NetApp volume ███2 on filer ███
- NetApp volume ███1 is replicated with snapmirror while ███2 is **not**
- In addition, volume ███1 is configured with additional snapshots other than the default while volume ███2 is not

IMPACT

This issue typically results in irrecoverable data loss in case of disaster.

TICKET ID 2

Several SnapVault backups on NetApp filer ▆▆ are not up-to-date

DESCRIPTION

- 91.6% of the SnapVault backups on NetApp filer ▆▆ were updated in the last 24 hours (Lag between 9h to 12h)
- Several SnapVault copies have been identified **with significantly larger lag**

SnapVault backups on filer drpnas not up-to-date

Source	Destination	State	Lag	Status
▆▆:C:\	▆▆:▆▆	Snapvaulted	107:49:48	Idle
▆▆:▆▆	▆▆:▆▆	Snapvaulted	23505:56:02	Idle
▆▆:D:\	▆▆:▆▆	Snapvaulted	7353:50:28	Idle
▆▆:C:\	▆▆:▆▆	Snapvaulted	7330:48:49	Idle
▆▆:▆▆	▆▆:▆▆	Snapvaulted	7330:50:36	Idle
▆▆:▆▆	▆▆:▆▆	Snapvaulted	7354:50:40	Idle

IMPACT

The impact of this ticket may be one of two:

1. A data protection issue:

   Backup is missing for several file systems

2. An optimization opportunity:

   These are obsolete backups or, backup is not required for these file systems. In this case, these backups can be removed and space can be reclaimed.

TICKET ID 3

Several NetApp volumes on filers ▓▓▓ and ▓▓▓ do not have up-to-date snapshots

DESCRIPTION

- All volumes on filer ▓▓▓ have up-to-date snapshots except volume ▓▓▓

Volume	Hourly from	Hourly to	Nightly from	Nightly to	Weekly from	Weekly to
Aggr1/▓▓▓	16-Apr	17-Apr	17-Apr	17-Apr	15-Sep	22-Sep
Other volumes (7)	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep

- All volumes on filer ▓▓▓ have up-to-date snapshots except volume ▓▓▓

Volume	Hourly from	Hourly to	Nightly from	Nightly to	Weekly from	Weekly to
Aggr2/▓▓▓	10-Aug	11-Aug	17-Sep	23-Sep	11-Aug	11-Aug
Other volumes (7)	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep*	22-Sep

*Except volume " ▓▓▓ "

IMPACT

If not by design, this issue may indicate an RPO SLA violation. Data might not be protected as planned. Recovery to planned point-in-time might not be possible in case of a disaster.

TICKET ID 4

Potential retention SLA violation for volume pst on filer █████

DESCRIPTION

- All volumes on filer █████ maintain 4 weekly snapshots, except volume pst which has only 2:

Volume	Hourly from	Hourly to	Nightly from	Nightly to	Weekly from	Weekly to
Aggr2/█████	10-Aug	11-Aug	17-Sep	23-Sep	11-Aug	11-Aug
Other volumes (6)	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep
pst	22-Sep	23-Sep	18-Sep	23-Sep	15-Sep	22-Sep

IMPACT

If not by design, this issue may indicate a retention SLA violation. Data might not be protected as planned. Recovery to planned point-in-time might not be possible in case of a disaster.

TICKET ID 5

Inconsistency in configuration of Unicode support detected for several NetApp volumes

DESCRIPTION

- Some volumes are not defined with "create_ucode=on" and/or "convert_ucode=on"
- About create_ucode and convert_ucode:

create_ucode on | off

Setting this option to on forces Unicode format directories to be created by default, both from NFS and CIFS. By default it is set to off, in which case all directories are created in pre-4.0 format and the first CIFS access will convert it to Unicode format.

convert_ucode on | off

Setting this option to on forces conversion of all directories to Unicode format when accessed from both NFS and CIFS. By default it is set to off, in which case access from CIFS causes conversion of pre-4.0 and 4.0 format directories; access from NFS causes conversion of 4.0 format directories.

Filer	Aggregate	Volume	Create_ucode	Convert_ucode
▇	N/A	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇_▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	N/A	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr1'	▇	on	off
▇	'aggr2'	▇	on	off
▇	N/A	▇	off	off
▇	'aggr1'	▇	on	on
▇	'aggr1'	▇_▇	on	on
▇	'aggr1'	▇	on	on
▇	'aggr1'	▇	off	off
▇	'aggr1'	▇_▇	off	off

Filer	Aggregate	Volume	Create_ucode	Convert_ucode
███	'aggr1'	███	off	off
███	'aggr1'	███	on	on
███	'aggr1'	███	on	on
███	'aggr1'	███	off	off
███	'aggr1'	███	on	on
███	'aggr1'	███	off	off
███	'aggr1'	███	on	on
███	'aggr1'	███	off	off
███	'aggr1'	███	off	off
███	'aggr1'	███	off	off
███	'aggr1'	███	off	off
███	'aggr1'	███	off	off
███	'aggr2'	███	on	on
███	'aggr2'	███	on	on
███	'aggr2'	███	on	on
███	'aggr2'	███	on	on
███	'aggr2'	███	off	off
███	'aggr2'	███	on	on
███	'aggr2'	███	off	off
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	on	on
███	'aggr3'	███	off	off
███	'aggr4'	███	on	on
███	'aggr4'	███	on	on
███	'aggr4'	███	on	on
███	'aggr4'	███	on	on
███	███	███	off	off
███	███	███	on	on
███	███	███	on	on
███	███	███	on	on
███	███	███	on	on
███	███	███	off	off
███	███	███	off	off
███	███	███	on	on
███	███	███	off	off

Filer	Aggregate	Volume	Create_ucode	Convert_ucode
▮▮	▮▮	▮▮	off	off
▮▮	N/A	▮▮	off	off
▮▮	'aggr5'	▮▮	off	off
▮▮	'aggr5'	▮▮	off	off
▮▮	N/A	▮▮	on	on
▮▮	▮▮	▮▮	off	off
▮▮	▮▮	▮▮	off	off
▮▮	▮▮	▮▮	off	off
▮▮	▮▮	▮▮	off	off
▮▮	▮▮	▮▮	on	on
▮▮	N/A	▮▮	off	off

IMPACT

If not by design, this may affect access to any directories stored on shares on the volume, especially if multiple protocols are used to access the volume.

TICKET ID 6

Several NetApp volumes do not have snapshot copies

DESCRIPTION

- The following table lists NetApp volumes which have no snapshots, or do not have all expected snapshot sets
- The list does not include volumes which are configured with "nosnap=on" (assumed by design)

Filer	Aggregate	Volume	Hourly	Nightly	Weekly
▇	N/A	▇	Yes	Yes	None
▇	'aggr1'	▇	None	None	None
▇	'aggr1'	▇	None	None	None
▇	'aggr1'	▇	Yes	Yes	None
▇	'aggr1'	▇	Yes	Yes	None
▇	'aggr1'	▇	None	None	None
▇	'aggr1'	▇	None	None	None
▇	'aggr1'	▇	Yes	Yes	None
▇	'aggr1'	▇	None	None	None
▇	'aggr1'	▇	Yes	Yes	None
▇	'aggr1'	▇	Yes	Yes	None
▇	'aggr2'	▇	None	None	None
▇	'aggr2'	▇	None	None	None
▇	'aggr2'	▇	None	None	None
▇	'aggr2'	▇	None	None	None
▇	'aggr2'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr3'	▇	None	None	None
▇	'aggr4'	▇	None	None	None
▇	'aggr4'	▇	None	Yes	None
▇	'aggr4'	▇	None	Yes	None
▇	'aggr4'	▇	None	Yes	None
▇	▇	▇	None	Yes	Yes
▇	▇	▇	None	None	None
▇	▇	▇	None	None	None
▇	▇	▇	None	None	Yes
▇	▇	▇	None	None	None
▇	▇	▇	Yes	Yes	None

Filer	Aggregate	Volume	Hourly	Nightly	Weekly
■■	■■	■■	Yes	Yes	None
■■	N/A	■■	Yes	Yes	None
■■	'aggr5'	■■	Yes	Yes	None
■■	'aggr5'	■■	None	Yes	Yes
■■	N/A	■■	Yes	Yes	None
■■	■■	■■	None	Yes	Yes
■■	■■	■■	Yes	Yes	None
■■	■■	■■	None	Yes	None
■■	N/A	■■	Yes	Yes	None

IMPACT

If not by design, this issue may indicate an RPO SLA violation. Data might not be protected as planned. Recovery to planned point-in-time might not be possible in case of a disaster.

TICKET ID 7

Several NetApp LUNs are configured with no space reservation

DESCRIPTION

- All NetApp LUNs are configured with enabled space reservation, except:

Filer	LUN	Size (GB)	Mapped?	Online?
▉	/vol/▉/lun1	200	Yes	Yes
▉	/vol▉/▉/lun1	190	Yes	Yes
▉	/vol▉/▉	200	Yes	Yes
▉	/vol/▉/▉/lun1	8	Yes	Yes

IMPACT

Space for these LUNs is not guaranteed. Hosts which utilize these LUN may experience write errors.

TICKET ID 8

Snapshots exceeding designed storage for several NetApp volumes

DESCRIPTION

- The following NetApp volumes have snapshot copies which significantly exceed allocated storage space:

Filer	Volume	Total	Used	Available	Capacity	Reserve
▉	/vol/▉/.snapshot	379GB	468GB	0GB	123%	15% or 397916088 k-bytes
▉	/vol/▉/.snapshot	100GB	276GB	0GB	276%	20% or 104857600 k-bytes
▉	/vol/▉_▉/.snapshot	409GB	578GB	0GB	141%	20% or 429496728
▉	/vol/▉/.snapshot	24GB	62GB	0GB	259%	20% or 25165824 k-bytes

IMPACT

Future snapshots may fail. Consider deleting snapshots for these volumes and reviewing autodelete policies, if such exist.

TICKET ID 9

Virtual interfaces in bad state detected on filers ▮▮▮▮ and ▮▮▮▮

DESCRIPTION

- The following table lists virtual interface in state "broken":

Filer	vif
▮▮▮▮	e6b
▮▮▮▮	e0d

IMPACT

The link is not receiving active status from its media access unit. This may affect the availability of the filers.

TICKET ID 10

Aggregates on filers ██, ██ and ██ are nearly out of space

DESCRIPTION

- The following table lists aggregates which soon will be out of space

Filer	Aggregate	Total	Used	Available	Capacity
██	██	11786224416	11458421816	327802600	97%
██	██	11429066100	11262605976	166460124	99%
██	██	11530787516	11314179564	216607952	98%
██	██	11530787516	11450599312	80188204	99%
██	██	5765393760	5754963496	10430264	100%
██	██	12241324092	11102721112	1138602980	91%

IMPACT

This may affect the generation of future snapshots, and availability of volumes or LUNs which their space is not guaranteed.

TICKET ID 11

The redo logs of Oracle instance ▇▇▇ on host ▇▇▇ are multiplexed on the same NetApp volume

DESCRIPTION

- Oracle database ▇▇▇ has 3 groups of redo logs (Two redo log files in each group)
- In each group:
    - The first redo log file is stored on NFS mount /▇▇▇/ora_13
    - The second redo log file is stored on NFS mount /▇▇▇/ora_14
- Both these NFS mounts reside on Qtrees of the same NetApp volume:
    - /▇▇▇/ora_13 mounts ▇▇▇:/vol/▇▇▇/▇▇▇t13
    - /▇▇▇/ora_14 mounts ▇▇▇:/vol/▇▇▇/▇▇▇14
- ▇▇▇ has a second volume which is used as storage space for Oracle database ▇▇▇ – ▇▇▇2
- ▇▇▇ is stored on aggr1
- ▇▇▇2 is stored on aggr2
- For achieving the goal behind redo log multiplexing, CS recommends moving the second redo log files of each group to a NFS mount which resides on ▇▇▇2
- A similar issue exists with the three control files – all eventually reside on the same aggregate

IMPACT

Redo log may be completely lost at a single aggregate failure. Also, moving some of the redo logs to a different aggregate may improve performance.

TICKET ID 12

Suboptimal protection for Oracle instance ▮▮▮ on host ▮▮▮

DESCRIPTION

- Oracle database ▮▮▮ is stored on NetApp volumes ▮▮▮, ▮▮▮2 on filer ▮▮▮3
- These volumes:
    - Are not replicated with snapmirror to the DR site
    - Do not have snapshots on a regular basis (configured with nosnap=on)
    - Are not backed up using SnapVault

IMPACT

Production data at is usually protected with more point-in-time copies (in numbers and frequency). This may indicate an RPO SLA violation. Data might not be protected as planned.

TICKET ID 13

Several licenses were found which are installed on some filers but not all

DESCRIPTION

- Generally, filers at ▮▮▮ have the same set of licenses
- The following licenses are not installed on all filers

License	Installed on
sv_windows_pri	▮▮▮
Smsql	▮▮1/2
sv_ontap_pri	▮▮1/2
Snapmanagerexchange	▮▮1/2/3
flex_clone	▮▮3/4, ▮▮▮, ▮▮2
Multistore	▮▮1/2/3/4
nearstore_option	▮▮3/4, ▮▮▮, ▮▮2
sv_ontap_sec	▮▮3/4, ▮▮▮, ▮▮2

IMPACT

If licenses are missing on DR filers, this may result in extended recover time in the event of a disaster.

TICKET ID 14

Several differences detected between NetApp filers in terms of DNS information

DESCRIPTION

- The following table presents DNS information per NetApp filer

Filer	Order	IP Address	State
██████	1	███.205	Up
██████	2	███.225	Down
██████	1	███.205	Up
██████	2	███.225	Up
██████	1	███.225	Up
██████	2	███.205	Up
██████	1	███.225	Up
██████	2	███.205	Down
██████	1	███.205	Up
██████	2	███.225	Up
██████	1	███.205	Up
	2	███.225	Up

IMPACT

If the secondary DNS server is unavailable, this means that name translation will be disrupted in case of DNS server failure (no redundancy).

If the order of DNS server is not configured correctly, DNS might not work at optimum or as planned.

TICKET ID 15

Several differences found between filer ▮▮▮ and other filers in terms of user and group definitions

DESCRIPTION

- All filers have identical user, role and group configuration, except ▮▮▮, which has
  - User ▮▮▮
  - Group ▮▮▮
- This user and group are not defined on the other filers

IMPACT

If this user is required on other filers as well, it will not be available.

TICKET ID 16

Several differences found between filers ███, ███ and other filers in terms of role definitions

DESCRIPTION

- All filers have the same capabilities configured for roles "████" and "████" except ████ and ████, which have an additional capability defined for these roles:
  - Role "████" -   api-system-api-*
  - Role "████" -   api-system-api-*

IMPACT

If this capability is required for the role, it is missing on some of the filers.

OPTIMIZATION OPPORTUNITIES

The following section summarizes snapshots, snapmirror and snapvault copies which are relatively old. Review of these sections may reveal copies that can be removed, thus freeing storage for other purposes.

OLD SNAPSHOTS

The following table lists old snapshots.

Filer	Volume	% / used	% / total	Date	Name
██	██	16% (13%)	12% (9%)	Jul 08 14:34	██
██	██	24% (10%)	20% (7%)	May 11 20:07	██
██	██	3% (0%)	3% (0%)	Apr 14 02:57	██
██	██	58% (37%)	43% (19%)	Apr 17 08:00	hourly.0
██	██	58% (2%)	44% (1%)	Apr 17 00:00	nightly.0
██	██	58% (1%)	44% (0%)	Apr 16 22:00	hourly.1
██	██	60% (10%)	48% (4%)	Apr 16 16:00	hourly.2
██	██	62% (12%)	52% (4%)	Apr 16 08:00	hourly.3
██	██	22% (20%)	19% (16%)	May 11 22:07	██
██	██	79% (33%)	0% (0%)	Aug 11 08:00	hourly.0
██	██	80% (14%)	0% (0%)	Aug 11 00:00	weekly.0
██	██	81% (31%)	0% (0%)	Aug 10 22:00	hourly.1
██	██	82% (21%)	0% (0%)	Aug 10 16:00	hourly.2
██	██	84% (31%)	0% (0%)	Aug 10 08:00	hourly.3
██	██	1% (1%)	0% (0%)	Jan 18 12:00	hourly.0
██	██	1% (0%)	0% (0%)	Jan 18 08:00	hourly.1
██	██	1% (0%)	0% (0%)	Jan 18 00:01	nightly.0
██	██	1% (0%)	0% (0%)	Jan 17 20:00	hourly.2
██	██	1% (0%)	0% (0%)	Jan 17 16:00	hourly.3
██	██	1% (0%)	0% (0%)	Jan 17 12:00	hourly.4
██	██	1% (0%)	0% (0%)	Jan 17 08:00	hourly.5
██	██	1% (0%)	0% (0%)	Jan 17 00:01	nightly.1
██	██	2% (1%)	0% (0%)	Mar 06 01:24	██
██	██	2% (0%)	1% (0%)	Nov 27 23:18	██
██	██	0% (0%)	0% (0%)	Aug 27 00:01	nightly.0
██	██	11% (4%)	7% (3%)	Aug 30 15:02	██
██	██	29% (4%)	10% (1%)	Aug 25 00:01	weekly.4
██	██	30% (3%)	11% (1%)	Aug 18 00:01	weekly.5
██	██	41% (21%)	17% (6%)	Aug 11 00:00	weekly.6
██	██	42% (3%)	18% (1%)	Aug 04 00:00	weekly.7
██	██	0% (0%)	0% (0%)	Jul 08 00:00	██
██	██	0% (0%)	0% (0%)	Mar 16 15:20	██
██	██	0% (0%)	0% (0%)	Mar 16 15:20	██
██	██	0% (0%)	0% (0%)	Mar 16 13:46	██
██	██	0% (0%)	0% (0%)	Mar 16 13:45	██
██	██	0% (0%)	0% (0%)	Mar 16 12:38	██
██	██	0% (0%)	0% (0%)	Mar 16 12:36	██
██	██	0% (0%)	0% (0%)	Mar 16 12:28	██

▮	▮	0% (0%)	0% (0%)	Mar 16 12:05	▮
▮	▮	0% (0%)	0% (0%)	Feb 26 16:18	▮
▮	▮	0% (0%)	0% (0%)	Feb 04 14:43	▮
▮	▮	0% (0%)	0% (0%)	Feb 03 11:39	▮
▮	▮	0% (0%)	0% (0%)	Feb 03 10:27	▮
▮	▮	0% (0%)	0% (0%)	Jan 30 15:37	▮
▮	▮	0% (0%)	0% (0%)	Jul 08 00:00	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 15:51	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 15:38	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 15:23	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 15:21	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 12:35	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 12:35	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 12:31	▮
▮	▮	0% (0%)	0% (0%)	Mar 16 12:29	▮
▮	▮	0% (0%)	0% (0%)	Jan 31 17:24	▮
▮	▮	0% (0%)	0% (0%)	Jan 23 17:52	▮
▮	▮	3% (1%)	2% (1%)	Aug 30 15:01	
▮	▮	84% (39%)	50% (6%)	Aug 25 00:00	weekly.4
▮	▮	86% (38%)	55% (6%)	Aug 18 00:00	weekly.5
▮	▮	10% (1%)	6% (1%)	Aug 25 00:01	weekly.4
▮	▮	11% (2%)	7% (1%)	Aug 18 00:01	weekly.5
▮	▮	12% (1%)	8% (1%)	Aug 11 00:01	weekly.6
▮	▮	13% (1%)	9% (1%)	Aug 04 00:00	weekly.7
▮	▮	14% (1%)	9% (0%)	Jun 24 23:56	▮
▮	▮	14% (0%)	9% (0%)	Jun 24 23:44	▮
▮	▮	16% (3%)	10% (1%)	Feb 11 23:15	▮
▮	▮	22% (6%)	0% (0%)	Jun 24 22:58	▮
▮	▮	23% (3%)	0% (0%)	Jun 24 22:57	▮
▮	▮	10% (1%)	6% (1%)	Aug 25 00:01	weekly.4
▮	▮	11% (2%)	7% (1%)	Aug 18 00:01	weekly.5
▮	▮	12% (1%)	8% (1%)	Aug 11 00:01	weekly.6
▮	▮	13% (1%)	9% (1%)	Aug 04 00:00	weekly.7
▮	▮	14% (1%)	9% (0%)	Jun 24 23:56	▮
▮	▮	14% (0%)	9% (0%)	Jun 24 23:44	▮
▮	▮	16% (3%)	10% (1%)	Feb 11 23:15	▮
▮	▮	36% (7%)	6% (1%)	Aug 29 23:05	▮
▮	▮	41% (13%)	7% (2%)	Aug 22 22:53	▮
▮	▮	47% (16%)	9% (2%)	Feb 11 00:53	▮
▮	▮	51% (14%)	11% (2%)	May 30 10:22	▮
▮	▮	52% (4%)	12% (0%)	May 27 17:56	▮
▮	▮	52% (0%)	12% (0%)	May 27 17:55	▮
▮	▮	52% (0%)	12% (0%)	May 27 17:55	▮
▮	▮	53% (5%)	12% (1%)	May 24 13:38	▮
▮	▮	53% (0%)	12% (0%)	May 24 13:38	▮
▮	▮	54% (2%)	12% (0%)	May 24 13:37	▮
▮	▮	54% (1%)	12% (0%)	May 24 13:37	▮
▮	▮	54% (0%)	12% (0%)	May 24 13:37	▮
▮	▮	54% (0%)	13% (0%)	May 24 13:37	▮

▆	▆	54% (0%)	13% (0%)	May 24 13:37	▆
▆	▆	54% (0%)	13% (0%)	May 24 13:37	▆
▆	▆	54% (0%)	13% (0%)	May 24 13:36	▆
▆	▆	54% (1%)	13% (0%)	Mar 18 00:01	▆
▆	▆	55% (3%)	13% (0%)	Mar 17 11:59	▆
▆	▆	56% (4%)	13% (0%)	Mar 16 00:13	▆
▆	▆	56% (1%)	13% (0%)	Mar 16 00:12	▆
▆	▆	56% (0%)	13% (0%)	Mar 16 00:12	▆
▆	▆	56% (0%)	14% (0%)	Mar 14 01:30	▆
▆	▆	57% (3%)	14% (0%)	Feb 12 22:35	▆
▆	▆	58% (6%)	15% (1%)	Jan 23 13:41	▆
▆	▆	58% (0%)	15% (0%)	Jan 23 13:41	▆
▆	▆	60% (9%)	16% (1%)	Nov 06 12:04	▆
▆	▆	60% (5%)	16% (1%)	Oct 31 18:18	▆
▆	▆	60% (0%)	16% (0%)	Oct 31 18:18	▆
▆	▆	61% (1%)	16% (0%)	Oct 31 18:17	▆
▆	▆	61% (0%)	16% (0%)	Oct 31 18:17	▆
▆	▆	61% (3%)	17% (0%)	Jul 27 00:57	▆
▆	▆	61% (2%)	17% (0%)	Jul 18 21:48	▆
▆	▆	62% (3%)	17% (0%)	Jan 26 11:34	▆
▆	▆	62% (0%)	17% (0%)	Jan 22 19:17	▆
▆	▆	62% (1%)	17% (0%)	Jan 20 23:11	▆
▆	▆	62% (3%)	18% (0%)	Jan 17 21:33	▆
▆	▆	14% (2%)	2% (0%)	Aug 29 19:09	▆
▆	▆	16% (4%)	2% (0%)	Aug 22 19:10	▆
▆	▆	29% (18%)	5% (3%)	Feb 11 01:04	▆
▆	▆	32% (6%)	6% (1%)	May 24 15:10	▆
▆	▆	33% (1%)	6% (0%)	May 24 15:08	▆
▆	▆	33% (1%)	6% (0%)	May 24 15:07	▆
▆	▆	43% (20%)	9% (3%)	May 24 13:53	▆
▆	▆	46% (10%)	10% (1%)	May 24 13:46	▆
▆	▆	46% (1%)	10% (0%)	Mar 18 00:08	▆
▆	▆	50% (12%)	12% (2%)	Feb 08 00:29	▆
▆	▆	55% (20%)	15% (3%)	Jan 23 11:16	▆
▆	▆	58% (10%)	16% (1%)	Nov 06 13:15	▆
▆	▆	60% (15%)	18% (2%)	Nov 06 11:54	▆
▆	▆	62% (10%)	20% (1%)	Nov 06 11:36	▆
▆	▆	63% (8%)	21% (1%)	Nov 06 11:26	▆
▆	▆	65% (9%)	22% (1%)	Nov 06 11:13	▆
▆	▆	65% (3%)	22% (0%)	Nov 06 11:00	▆
▆	▆	66% (5%)	23% (1%)	Nov 06 10:47	▆
▆	▆	68% (18%)	26% (3%)	Oct 29 21:28	▆
▆	▆	70% (3%)	27% (0%)	Jul 18 21:51	▆
▆	▆	70% (3%)	28% (0%)	Jan 20 23:11	▆
▆	▆	70% (3%)	28% (0%)	Dec 28 16:51	▆
▆	▆	0% (0%)	0% (0%)	Aug 27 00:01	nightly.0

OLD SNAPVAULT BACKUPS

The following table lists old snapvault copies.

Source	Destination	State	Lag	Status
███:C:\	███:███	Snapvaulted	107:49:48	Idle
███:███	███:███	Snapvaulted	23505:56:02	Idle
███:D:\	███:███	Snapvaulted	7353:50:28	Idle
███:C:\	███:███	Snapvaulted	7330:48:49	Idle
███:███	███:███	Snapvaulted	7330:50:36	Idle
███:███	███:███	Snapvaulted	7354:50:40	Idle

OLD SNAPMIRROR COPIES

The following table lists old snapmirror copies.

Source	Destination	State	Lag	Status
███:███	███:███	Broken-off	2169:50:36	Idle
███:███	███:███	Broken-off	2170:48:49	Idle

APPENDIX A – COMPARISON OF OPTIONS CONFIGURATION BETWEEN FILERS

The following sections compare netapp options configuration between the filers

COMPARISON BETWEEN FILERS AT ██

The following table presents coverage summary for storage arrays:

Option	███1	███2	███3	███4
autologout				
telnet.timeout	15	60	60	60
autosupport				
mailhost	███.120	███.120	███vip	███vip
nht_data.enable	off	off	on	on
support.proxy	*			
cf				
giveback.check.partner	on	on	off	on
takeover.detection.seconds	10	15	20	15
cifs				
audit.enable	on	on	on	off
audit.logon_events.enable	off	off	on	on
audit.nfs.filter.filename			███	
max_mpx	1124	1124	50	50
new_setup.enable			off	
nfs_root_ignore_acl	on	on	off	off
tcp_window_size	64240	64240		
universal_nested_groups.enable	off	off	off	on
wins_servers	███.225	███.7, ███.2		
cksum_offload				
gbeII	on	on	on	off
disk				
shm.enable	on	on	on	
ems				
autosuppress.enable	off	on	off	on
fcp				
enable	on	on	on	off
ftpd				
dir.restriction	off	off	on	off
max_connections	400	400	400	500
max_connections_threshold	75%	75%	75%	0%
tcp_window_size	32768	32768	32768	28960
ip				
fastpath.enable	off	off	on	on
match_any_ifaddr	off	off	off	on
ping_throttle.drop_level	10	10	10	150

iscsi				
isns.rev	18	18	22	22
iswt.max_ios_per_session	128	128		
iswt.tcp_window_size	131400	131400		
lun				
clone_restore	on	on	on	
ndmpd				
connectlog.enabled	off	off	on	off
nfs				
export.resolve.timeout	30	30	30	6
mountd.trace	on	on	off	off
per_client_stats.enable	off	on	on	off
tcp.xfersize	32768	32768	32768	
v4.acl.enable	off	on	off	off
v4.enable	on	on	off	off
v4.id.domain	■■■	■■■		■■■
raid				
aggr.undestroy.enable			on	
max_fill_holes.size	0	0		
rmc				
lan.smtp_ip	10.7.31.120	10.7.31.120		
snapmirror				
access	■■■	■■■	host=■■■, ■■■	host=■■■
enable	on	off	on	on
snapvault				
access	none	none	*	none
enable	on	off	on	off
ssh				
idle.timeout	600	600	600	0
ssl				
enable	off	off	off	
sslp				
enable	off	off	off	
timed				
sched	5m	5m	1m	5m
wafl				
maxdirsize	83886	83886	62914	83804
nt_admin_priv_map_to_root	on	on	off	off
root_only_chown	on	on	off	on
webdav				
enable	off	off	off	on

COMPARISON BETWEEN FILERS AT ▮▮▮▮

The following table presents coverage summary for hosts:

Option	▮▮▮▮	▮▮▮▮2
cf		
giveback.check.partner	off	on
cifs		
new_setup.enable	off	
wins_servers	▮▮▮.7, ▮▮▮.2	
cksum_offload		
gbell	on	off
disk		
auto_assign	off	on
defect_data_read_all	off	on
log_sense_read_all	off	on
shm.enable	on	
ems		
autosuppress.enable	off	on
ftpd		
dir.restriction	on	off
httpd		
rootdir	/vol/root/home/http	XXX
ip		
ping_throttle.drop_level	10	150
iscsi		
enable	on	off
lun		
clone_restore	on	
ndmpd		
enable	on	off
nfs		
export.resolve.timeout	30	6
v4.enable	on	off
raid		
aggr.undestroy.enable	on	
snapvault		
enable	off	on
ssh		
enable	on	off
idle.timeout	600	0
ssh2		
enable	on	off
wafl		
maxdirsize	62914	83804
nt_admin_priv_map_to_root	on	off

COMPARISON BETWEEN NETAPP SNAPMIRROR SOURCE AND TARGET FILERS

The following table presents coverage summary for databases:

Option	▮▮3	▮▮4	▮▮	▮▮2
Cf				
giveback.check.partner	off	on	Off	on
takeover.detection.seconds	20	15	15	15
Cifs				
audit.enable	on	off	Off	off
audit.nfs.filter.filename	/vol/▮▮			
new_setup.enable	off		Off	
universal_nested_groups.enable	off	on	On	on
wins_servers			▮▮.7, ▮▮.2	
cksum_offload				
gbeII	On	off	On	off
Disk				
auto_assign	on	on	Off	on
defect_data_read_all	off	off	Off	on
log_sense_read_all	off	off	Off	on
shm.enable	on		On	
Ems				
autosuppress.enable	off	on	Off	on
Fcp				
enable	on	off	On	on
Ftpd				
dir.restriction	on	off	On	off
max_connections	400	500	500	500
max_connections_threshold	75%	0%	0%	0%
tcp_window_size	32768	28960	28960	28960
httpd				
rootdir	XXX	XXX	/vol/root/home/http	XXX
ip				
match_any_ifaddr	off	on	on	on
ping_throttle.drop_level	10	150	10	150
iscsi				
enable	on	on	on	off
lun				
clone_restore	on		on	
ndmpd				
connectlog.enabled	on	off	off	off
enable	on	on	on	off
nfs				
export.resolve.timeout	30	6	30	6

per_client_stats.enable	on	off	off	off
tcp.xfersize	32768			
v4.enable	off	off	on	off
v4.id.domain		███	███	███
raid				
aggr.undestroy.enable	on		on	
snapmirror				
access	host=███, ███	host=███	███	███
snapvault				
access	*	none	*	*
enable	on	off	off	on
ssh				
enable	off	off	on	off
idle.timeout	600	0	600	0
ssh2				
enable	off	off	on	off
ssl				
enable	off			
sslp				
enable	off			
timed				
sched	1m	5m	10m	10m
wafl				
maxdirsize	62914	83804	62914	83804
nt_admin_priv_map_to_root	off	off	on	off
root_only_chown	off	on	on	on
webdav				
enable	off	on	on	on

APPENDIX B – ENVIRONMENT DOCUMENTATION

SNAPSHOTS

The following table presents a summary of snapshots.

Filer	Aggregate	Volume	Hourly from	Hourly to	Nightly from	Nightly to	Weekly from	Weekly to	Other snapshots	no snap	nosnapdir
■	N/A	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		on	off
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	16-Apr	17-Apr	17-Apr	17-Apr	15-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep	■	off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep	■	off	on
■	N/A	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		on	off
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep	■	off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	21-Sep	23-Sep	18-Sep	23-Sep	15-Sep	22-Sep		off	on
■	'aggr1'	■	22-Sep	23-Sep	18-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr2'	■	10-Aug	11-Aug	17-Sep	23-Sep	11-Aug	11-Aug		off	on
■	N/A	■	17-Jan	18-Jan	17-Jan	18-Jan	None	None	■	off	off
■	'aggr1'	■	None	None	None	None	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		on	on
■	'aggr1'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None		off	on
■	'aggr1'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		on	on
■	'aggr1'	■	None	None	None	None	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		on	on
■	'aggr1'	■	None	None	None	None	None	None	■	on	on
■	'aggr1'	■	None	None	None	None	None	None		off	on
■	'aggr1'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		on	on
■	'aggr1'	■	21-Sep	23-Sep	16-Sep	23-Sep	1-Sep	22-Sep		off	on
■	'aggr1'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None		off	on
■	'aggr1'	■	None	None	None	None	None	None		on	on
■	'aggr1'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None		off	on
■	'aggr2'	■	None	None	None	None	None	None		on	on
■	'aggr2'	■	None	None	None	None	None	None		off	on
■	'aggr2'	■	None	None	None	None	None	None		off	on

■	'aggr2'	■	None	None	None	None	None	None			off	on
■	'aggr2'	■	None	None	None	None	None	None	■		on	on
■	'aggr2'	■	None	None	None	None	None	None			off	on
■	'aggr2'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			on	on
■	'aggr3'	■	None	None	None	None	None	None			on	on
■	'aggr3'	■	None	None	None	None	None	None			on	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr3'	■	None	None	None	None	None	None			off	on
■	'aggr4'	■	None	None	None	None	None	None			off	on
■	'aggr4'	■	None	None	16-Sep	22-Sep	None	None	■		off	on
■	'aggr4'	■	None	None	23-Sep	23-Sep	None	None			off	on
■	'aggr4'	■	None	None	23-Sep	23-Sep	None	None			off	on
■	■	■	None	None	16-Sep	23-Sep	4-Aug	22-Sep			off	on
■	■	■	None	None	None	None	None	None			on	on
■	■	■	None	None	None	None	None	None			on	on
■	■	■	None	None	None	None	None	None			off	on
■	■	■	None	None	None	None	None	None			off	on
■	■	■	None	None	None	None	1-Sep	22-Sep			off	on
■	■	■	22-Sep	23-Sep	18-Sep	23-Sep	18-Aug	22-Sep			off	on
■	■	■	None	None	None	None	None	None			off	on
■	■	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None			off	on
■	■	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None			off	on
■	N/A	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None			off	off
■	'aggr5'	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None	■		off	on
■	'aggr5'	■	None	None	17-Sep	23-Sep	4-Aug	22-Sep	■		off	on
■	N/A	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None			on	on
■	■	■	21-Sep	23-Sep	12-Sep	23-Sep	22-Aug	19-Sep			off	on
■	■	■	21-Sep	23-Sep	12-Sep	23-Sep	22-Aug	19-Sep			off	on
■	■	■	None	None	17-Sep	23-Sep	4-Aug	22-Sep			off	on
■	■	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None			off	on
■	■	■	None	None	16-Sep	22-Sep	None	None	■		off	off
■	N/A	■	21-Sep	23-Sep	22-Sep	23-Sep	None	None				

SNAPMIRROR

The following table presents a summary of snapmirror.

Source	Destination	State	Lag	Status
▮▮:▮▮	▮▮:▮▮	Broken-off	2169:50:36	Idle
▮▮:▮▮	▮▮:▮▮	Broken-off	2170:48:49	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	00:05:59	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	11:06:01	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	10:05:54	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	08:54:23	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	13:12:32	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	11:01:09	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	09:37:23	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	14:56:21	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	22:00:51	Idle
▮▮:▮▮	▮▮:▮▮	Snapmirrored	12:59:52	Idle

SNAPVAULT

The following table presents a summary of snapvault.

Source	Destination	State	Lag	Status
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:35	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:39	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:37	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:30	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:39	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:35	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	7353:50:28	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:37	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:36	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:41	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:36	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:35	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:36	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:32	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:36	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:36	Idle
▮▮:▮▮	▮▮:▮▮	Snapvaulted	09:17:34	Idle

███:███	███:███	Snapvaulted	09:17:34	Idle
███:███	███:███	Snapvaulted	09:17:38	Idle
███:███	███:███	Snapvaulted	09:17:38	Idle
███:███	███:███	Snapvaulted	09:17:32	Idle
███:███	███:███	Snapvaulted	09:17:36	Idle
███:███	███:███	Snapvaulted	09:17:32	Idle
███:███	███:███	Snapvaulted	09:17:37	Idle
███:███	███:███	Snapvaulted	85:50:12	Idle
███:███	███:███	Snapvaulted	11:50:36	Idle
███:███	███:███	Snapvaulted	11:50:12	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:49:36	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:49:54	Idle
███:███	███:███	Snapvaulted	11:50:38	Idle
███:███	███:███	Snapvaulted	09:17:40	Idle
███:███	███:███	Snapvaulted	11:50:38	Idle
███:███	███:███	Snapvaulted	11:49:37	Idle
███:███	███:███	Snapvaulted	11:50:36	Idle
███:███	███:███	Snapvaulted	7330:48:49	Idle
███:███	███:███	Snapvaulted	7330:50:36	Idle
███:███	███:███	Snapvaulted	11:49:58	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:50:25	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	107:49:48	Idle
███:███	███:███	Snapvaulted	11:50:35	Idle
███:███	███:███	Snapvaulted	11:50:17	Idle
███:███	███:███	Snapvaulted	11:49:27	Idle
███:███	███:███	Snapvaulted	11:50:33	Idle
███:███	███:███	Snapvaulted	11:49:54	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:49:26	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:49:50	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:49:40	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	09:17:39	Idle
███:███	███:███	Snapvaulted	11:49:39	Idle
███:███	███:███	Snapvaulted	11:49:44	Idle
███:███	███:███	Snapvaulted	11:50:37	Idle
███:███	███:███	Snapvaulted	11:45:20	Idle
███:███	███:███	Snapvaulted	11:49:39	Idle
███:███	███:███	Snapvaulted	11:50:27	Idle

███:███		███:███	Snapvaulted	11:49:39	Idle
███:███		███:███	Snapvaulted	11:50:33	Idle
███:███		███:███	Snapvaulted	23505:56:02	Idle
███:███		███:███	Snapvaulted	11:49:47	Idle
███:███		███:███	Snapvaulted	11:50:37	Idle
███:███		███:███	Snapvaulted	11:45:05	Idle
███:███		███:███	Snapvaulted	11:44:22	Idle
███:███		███:███	Snapvaulted	11:49:23	Idle
███:███		███:███	Snapvaulted	11:50:36	Idle
███:███		███:███	Snapvaulted	7354:50:40	Idle

APPENDIX C – COVERAGE DETAILS

The following files and hosts were scanned on time during Sep 23 for the preparation of this report.

NetApp Filers:

- ████1
- ████2
- ████3
- ████4
- drp████
- drp████2

Hosts:

- ████
- ████