

HP 3PAR Healthcheck

Customer Name: Customer A

3PAR Name: 3PAR B

Healthcheck Date: September 25th 2012

Table of contents

About the HP 3PAR Healthcheck	2
About the Executive Summary	2
General Information	2
Executive Summary	3
Key Observations	3
Healthcheck Report	4
Array Capacity Overview	8
Healthcheck Report	9
Appendix A – General Recommendations	10

NOTE:

Through this doc there may be highlighted items such as this, these are for reference and should be deleted before providing document to the customer.



About the HP 3PAR Healthcheck

The HP 3PAR Healthcheck highlights common configuration rules to help you optimize your HP 3PAR arrays for availability, best practice and performance.

Healthchecks are an indicator of conformance to best practice standards and recommendations, and should not be mistaken as a complete in-depth review of the Array and its management or an in-depth performance analysis. This report will highlight observations that may require further diagnosis or resolution by you, that do not form part of this Healthcheck Service. Your HP Account team will be able to advise which appropriate service offering should be engaged as necessary.

About the Executive Summary

The Executive Summary is a synopsis of findings contained in the Healthcheck report.

The “traffic light” report will tabulate compliancy as well as informational details based on the Configuration, Availability, and Performance of the assessed Array.

For each item, there will be a section for a brief description and, if necessary it may contain evidence for the conditions detected and recommendation on how to fix them or other pertinent details.

The Executive Summary summarizes important findings and recommendations and helps you to focus attention on the most critical problem areas identified by the Healthcheck. The Executive Summary briefly explains how the customers 3PAR Array could be impacted by specific conditions detected.

General Information

The information contained herein is subject to change without notice and provided as is without any warranty or condition, express or implied, in fact or in law. HP shall not be liable for technical or editorial errors or omissions contained herein.

HP Technology Services are governed by the HP Single Order Terms for Support or the HP Care Pack Support Service Agreement or applicable HP Customer Agreement, or Customer's purchase agreement with HP.

Executive Summary

Key Observations

- **Capacity management**

As available physical capacity across the 3PAR InServ Storage Array is utilized by traditional Virtual Volumes (VVs) and/or TPVVs, multiple pre-configured alerts are generated which identify the used physical capacity as a percentage of total system capacity (50%, 75%, 85%, and 95%).

Monitoring of 3PAR Thin Provisioning alerts and available capacity by a storage administrator and business processes internal to the customer are a critical component of Thin Provisioning management/administration strategy.

Observations: Provide your observations

- **Array balance for capacity and availability**

Attempt to maintain a balanced system, i.e., ensuring that the performance load is balanced as evenly as possible across nodes, chassis, and disks.

Observations: Provide your observations

- **Platform Configuration Recommendations**

There are platform and configuration recommendations that are provided as an overview to compare against your current configuration. In addition, Implementation Guides are available for all specific OS's and provide the necessary guidelines to follow. In addition,

Observations: Provide your observations

- **Array Performance**

Understanding performance characteristics, values and what influences values is important in maintaining a high performing array. Overviews of high watermark values are included in this Healthcheck for your array for reference along with your array's compliance.

Observations: Provide your observations

- **Environmental**

Environmental aspects of the array, if not monitored, could cause outages, instability or the loss of vital system resources. Understanding any issues as they occur can assist in expeditious corrective action.

Observations: Provide your observations

Health Check Table Formatting

The items in the following Health Check Table have visible representation to make them stand out. There are three different colors you will see in the table and they represent the following:

Compliant – also may reflect current values	Non-compliant – should provide a brief description of the items not in compliance	Informational – For reference and discussion purposes
--	--	--

Healthcheck Report

Table 1: Healthcheck Report (Copy data from your workbook, either individual items or entire table)

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Serial Number: 1404935 Recommendation
1	Inform OS Version						Keep Inform OS updated	Information	HP continually improves the performance, reliability, and functionality of the 3PAR array through Inform OS updates. Installed version: 3.1.1.226;P06,P11 / 2.5.1.GA-15 Latest Version: 3.1.1 MU2 / 2.5.2 GA 15
2	Total capacity						Free capacity > 20% of total	32%	Ensure adequate purchasing and installation time for additional physical disk buffer. Allocated 148,246,528 MB (68%) Free 69,480,448 MB (32%) Total 217,726,976 MB
3	Raw capacity per node pair						Raw capacity per node pair balanced.	Not compliant	Balance of used/unused chunklets important for array capacity considerations. 0-1 - 240 - 131,227,648 4-5 - 160 - 86,499,328

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Recommendation
									Serial Number: 1404935
4	Balanced drives						Drives per node pair balanced (FC/NL/SSD)	Not compliant	Balance of physical disks across drive cages and node pairs important for array capacity, performance and availability considerations. 0-1 - 240 4-5 - 160 SSD=8 per node pair FC=Node 0&1 232 Node 4&5 152
5	Used capacity PD Balance						Data should be balanced across all like drive types	Not compliant	Balance of physical disks across drive cages and node pairs important for array capacity, performance and availability considerations. See Balance Chart
6	Thin provisioning conservation						Percentage of thin conservation	48.36%	3PAR Thin Provisioning allows a large Virtual Volume (VV) to be created and made available as a LUN on a host server without the need to dedicate physical storage until it is actually written. Proactively monitor consumption rates for TPVVs and CPGs.
7	Initiators per port						InForm OS Maximum Initiators per Port 2.2.1: 32 2.2.2: 64 2.2.3 and above: 64	Current maximum is 30	Please refer to individual Implementation Guides for your OS for more detailed information.

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Serial Number: 1404935 Recommendation
8	Initiators per system						InForm OS Model Nodes Max (SAN & Direct Connect) 2.2.1: F, T - 2 - 64 2.2.1: F, T - 4, 6, 8 - 128 2.2.2: F, T - 2, 4, 6, 8 - 512 2.2.3+: F, T - 2, 4, 6, 8 - 1024 3.1.1+: V - 2, 4, 6 - 1024 3.1.1+: V - 8 - 2048	Current maximum 208	Hard limit; the number of initiators configured on the InServ can be determined by running the showhost -d CLI command.
9	CPU utilization						CPU utilization < 75%	Compliant	CPU utilization is checked for greater than 75% (less than 25% CPU idle). The CPU idle percentage is checked based on performance files collected once every four hours. Non-compliant when one or more nodes have total CPU utilization greater than 75% idle in 3 out of 6 files collected (typically a rolling 24 hour period). * statcpu can be used to review CPU usage. As an example, 'statcpu -d 5 -iter 5' would run an on-screen statcpu 5 times, once every 5 seconds.

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Recommendation
									Serial Number: 1404935
10	Disk IOPS						NL < 75 IOPS FC10 < 150 IOPS FC15 < 200 IOPS	FC15 > 200 IOPS	<p>The disk I/O Operations Per Second (IOPS) is checked based on performance files collected once every four hours. Non-compliant when one or more disks have exceeded the disk IOPS threshold in 3 out of 6 files collected (typically a rolling 24 hour period).</p> <p>* statpd can be used to review PD IO. As an example, 'statpd -devinfo -d 10 -iter 5' would run an on-screen statpd 10 times, once every 5 seconds.</p>
11	Disk port bandwidth per node pair						Model: Threshold Value T-Series: 1600 MB/s F-Series: 1600 MB/s V-Series: 3200 MB/s	Compliant	<p>The Disk Port Bandwidth per Node Pair is checked based on performance files collected once every four hours. Non-compliant when the aggregate bandwidth of all disks ports on <u>a node pair</u> have exceeded the Disk Port Bandwidth threshold 3 out of 6 files collected. This relates to a rolling 24-hour period.</p> <p>* statport can be used to review PORT throughput. As an example, 'statport -disk -d 5 -iter 5' would run an on-screen statport for 'disk' ports only 5 times, once every 5 seconds.</p>
12	PCI bus bandwidth						F, T: PCI buses < 650 MB/s V: PCI buses < 3200 MB/s	Compliant	<p>The PCI Bus Bandwidth is checked based on performance files collected once every four hours. Non-compliant when one or more buses per node have exceeded the threshold in 3 out of 6 files collected (typically a rolling 24 hour period).</p>

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Recommendation
									Serial Number: 1404935
13	Port bandwidth						All ports per node under the threshold by port speed: 2 Gb/s < 160 MB/s 4 Gb/s < 340 MB/s 8 Gb/s < 700 MB/s	Compliant	The Port Bandwidth is checked based on performance files collected once every four hours. Non-compliant when one or more ports per node have exceeded the I/O utilization threshold (~80%) in 3 out of 6 files collected (typically a rolling 24 hour period). * statport can be used to review PORT throughput. Showport can be used to reference port speed, type and mode settings. As an example, 'statport -d 5 -iter 5' would run an on-screen statport for all ports 5 times, once every 5 seconds.
14	Host configuration						All hosts have at least two paths to storage	Compliant	The system cannot proceed with an online upgrade without a minimum of two paths. Hosts may lose access to storage during component failures
15	Volume limits						VVs < 8192 Base VVs < 4096 VLUNs < 32000 CPGs < 2048 TPVVs < 4095	VVs: 248 Base VVs: 248 VLUNs: 11888 CPGs: 12 TPVVs: 247	Hard limit; based on array model and Inform OS version.

#	Checklist Element	Best Practice	Availability	Performance	Capacity	Licenses	Condition	Status	Serial Number: 1404935 Recommendation
16	Licensing						List of Licensed software products	Adaptive Optimization Dynamic Optimization InForm Suite System Reporter System Tuner Thin Conversion Thin Copy Reclamation Thin Persistence Thin Provisioning (204800G) Virtual Copy	Additional benefits in Thin Suite, Dynamic/Adaptive Optimization, Peer Motion, Virtual Copy and Remote Copy licensing.
17	Host Explorer						Are Host Explorer Agents being used?	(Not)Being used	Provides access to host adapter information for use in planning version upgrades.
18	Environment check: power supplies						Operating state:	Normal	Ensure a normal operational state to maintain availability. Either power supply or battery problem. May lead to reduced cache availability.
19	Environment check: batteries						Operating state:	Normal	Ensure a normal operational state to maintain availability. Either power supply or battery problem. May lead to reduced cache availability.
20	Environment check: fans						Operating state:	Normal	Ensure a normal operational state to maintain availability.

Table 2: Array Physical Disk Balance (Copy chart from Config Analyzer - balance chart tab)

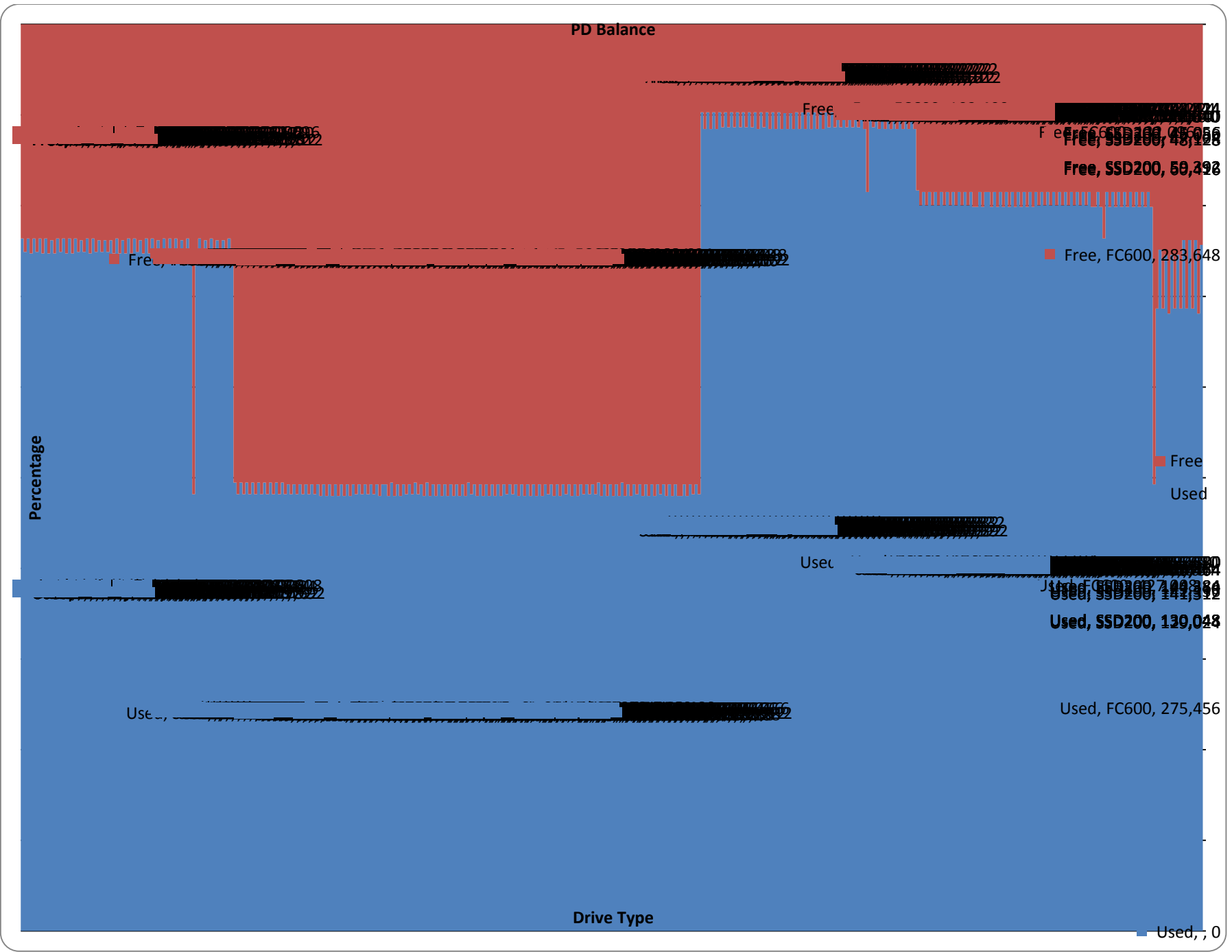
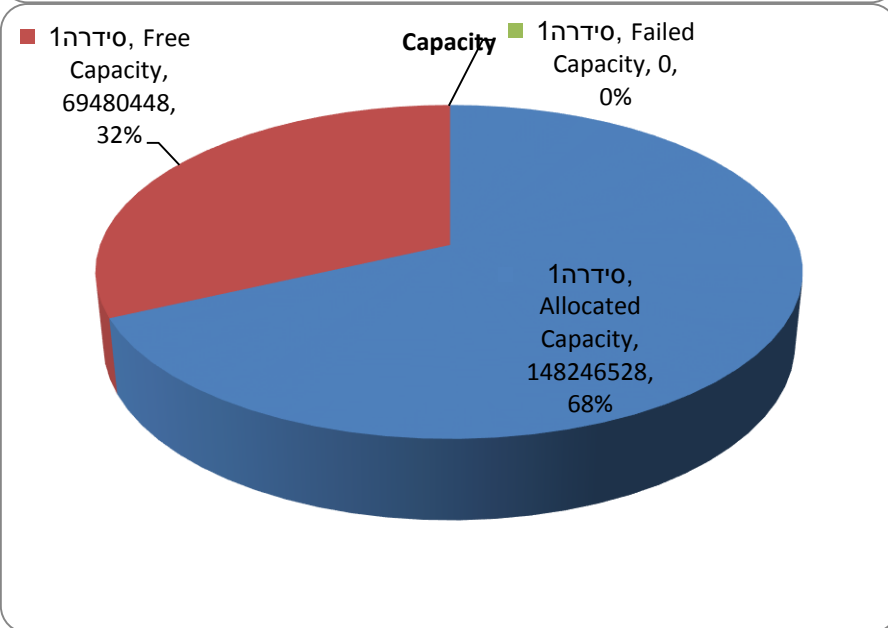
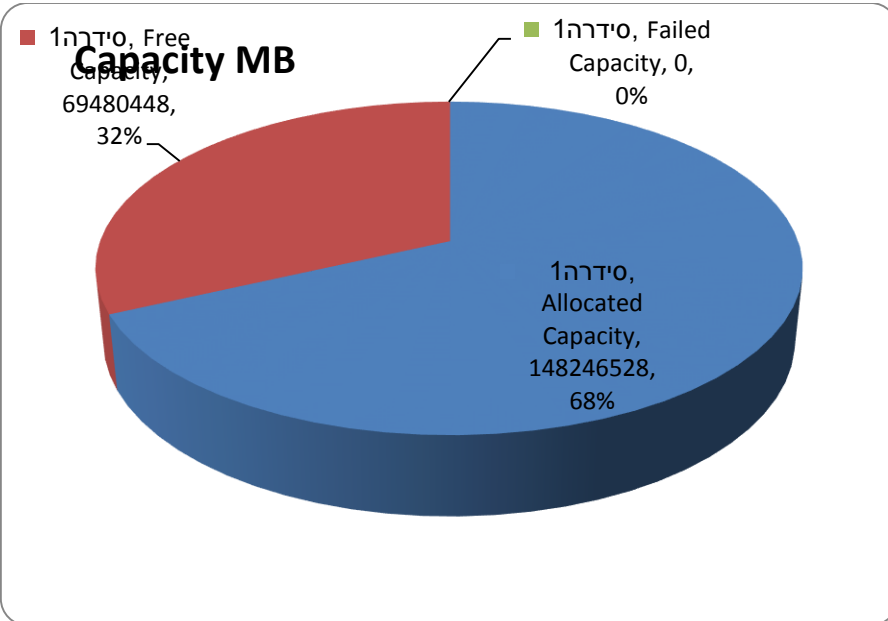


Table 3: Array Capacity Overview

(Copy chart from Config Analyzer – 'showsys -d' tab)



Appendix A – General Recommendations

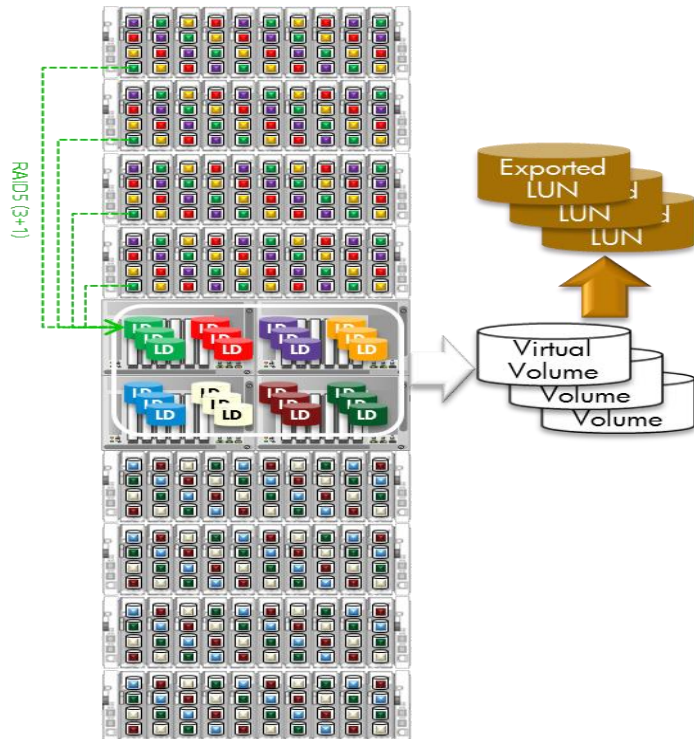
(Keep this content, replace it or add to it to add more discussion or reference)

- **Best practice to optimize availability.**

Best Practice configurations provide inherent Cage Level Availability, which is intended to ensure that a volume can continue operating without data loss in the event that an entire Drive Chassis is taken offline or otherwise becomes unavailable. Availability options relate to how the system allocates chunklets to the LDs to provide different redundancy options. Users have the ability to configure the type of availability but the Inserv will always try and use the highest redundancy level available. Cage-level availability is provided via such configuration by ensuring that there are never two members of the same RAID group in the same chassis.

Cage-Level availability requires a minimum number of Drive Chassis per node pair as follows:

RAID 1 (1+1)	2
RAID 5 (3+1)	4
RAID 5 (7+1)	8
RAID 6 (6+2)	4
RAID 6 (14+2)	8





Get connected
www.hp.com/go/getconnected

Current HP driver, support, and security alerts
delivered directly to your desktop

© Copyright 2012 Hewlett-Packard Development Company, L.P.
Version 1.1, September 2012

