IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

SEQUOIA TECHNOLOGY, LLC, Plaintiff, v. HEWLETT PACKARD ENTERPRISE COMPANY, Defendant.	C.A. No. _____ JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Plaintiff Sequoia Technology, LLC ("Sequoia") demands trial by jury and alleges the following against Defendant Hewlett Packard Enterprise Company ("HPE" or "Defendant"):

NATURE OF THE ACTION

1. This is a patent infringement action arising under the Patent Laws of the United States, 35 U.S.C. §§ 1, et seq. including without limitation, 35 U.S.C. §§ 271, 281.

PARTIES

2. Plaintiff Sequoia Technology, LLC is a Delaware Limited Liability Company.

3. Defendant Hewlett Packard Enterprise Company is a Delaware corporation. HPE's registered agent for service of process in Delaware is The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801.

JURISDICTION AND VENUE

4. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. This Court has personal jurisdiction over Defendant because, among other reasons, Defendant is incorporated under the laws of the State of Delaware, has done business in this District, has committed and continues to commit acts of patent infringement in this District, and has harmed and continues to harm Sequoia in this District, by, among other things, using, selling, offering for sale, and importing infringing products and services in this District.

6. Venue is proper in this District under 28 U.S.C. §§ 1391(b)-(c) and 1400(b) because, among other reasons, Defendant is incorporated in Delaware, and is subject to personal jurisdiction in this District, and has committed and continues to commit acts of patent infringement in this District. On information and belief, Defendant conducts substantial business directly and/or through third parties or agents in this judicial district by selling and/or offering to sell the infringing products and/or by conducting other business in this judicial district. Furthermore, Plaintiff has been harmed by Defendant's conduct, business transactions and sales in this district.

BACKGROUND

7. Sequoia Technology, LLC is the exclusive licensee of the United States Patent No. 6,718,436 (the "'436 Patent" or the "Patent-in-Suit") that issued on April 6, 2004 and is titled "Method for managing logical volume in order to support dynamic online resizing and software RAID and to minimize metadata and computer readable medium storing the same." A true and correct copy of the '436 Patent is attached as Exhibit A. Sequoia has all the substantial rights to sue for infringement and collect past and future damages for the infringement of the '436 Patent.

8. The '436 Patent was invented by Chang-Soo Kim, Gyoung Bae Kim and Bum Joo Shin of the Electronics and Telecommunications Research Institute ("ETRI"). ETRI is the

national leader in Korea in the research and development of information technologies. Since its inception in 1976, ETRI has developed new technologies in DRAM computer memory, CDMA and 4G LTE cellular phone communications, LCD displays, as well as large-scale computer storage, the technology at issue in this case. ETRI employs over 2,034 research/technical staff, of whom 94% hold a post-graduate degree and 50% have earned a doctoral degree in their technological field. Over the last five years, ETRI has applied for a total of 16,917 patents, has contributed 8,337 proposals that have been adopted by international and domestic standard organizations, and has published over 1,282 articles in peer-reviewed technology publications.

9. Defendant manufactures, provides, uses, sells, offers for sale, imports, and/or distributes infringing products and services ("Accused Products, Systems and/or Services"). HPE's Accused Products, Systems and/or Services include "Logical Volume Manager ("LVM") Dynamic Resizing Products, Systems and/or Services." For example, LVM Dynamic Resizing Products, Systems and/or Services include without limitation products and services with operating systems HP-UX version 3 and later, Red Hat Linux Operating Systems versions 4 and later, Ubuntu, Oracle Linux version 4 and later, SUSE Linux Enterprise Servers version 9 and later, and CentOS version 6 and later. For example, LVM Dynamic Resizing Products, Systems and/or Services include without limitation the list of products listed in Exhibit B. HPE supports and encourages others to use its products and services in an infringing manner, including its customers, as set forth herein.

10. Sequoia, as the exclusive licensee of the '436 Patent, seeks the damages owed for HPE's use of ETRI's pioneering technology.

11. The '436 Patent has been cited by at least 152 issued patents as relevant prior art.

COUNT I
(INFRINGEMENT OF U.S. PATENT NO. 6,718,436)

12. Sequoia incorporates and re-alleges every allegation set forth above, as though fully set forth herein.

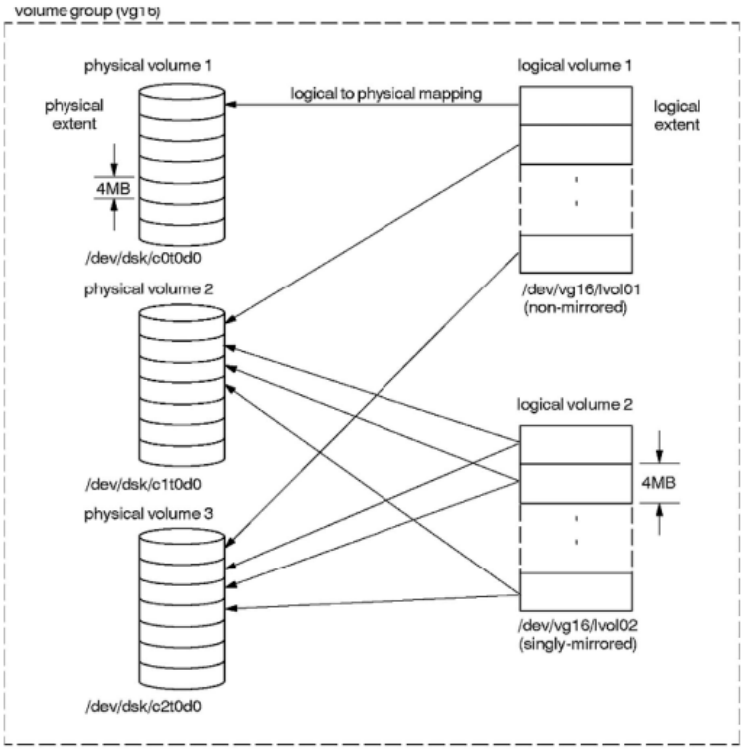
13. HPE has directly infringed, contributed to the infringement of, and/or has induced the infringement of one or more claims of the ’436 Patent in violation of 35 U.S.C. § 271 by, at least, making, using, supplying, distributing, importing, exporting, selling and/or offering for sale in the United States or by intending that others make, use, supply, distribute, import, export, sell, and/or offer for sale in the United States LVM Dynamic Resizing Products, Systems and/or Services (as exemplified, but not limited to, the Accused Products, Systems and/or Services in Paragraph 9 incorporated herein) that practice and/or are covered by one or more claims of the ’436 Patent.

14. HPE’s LVM Dynamic Resizing Products, Systems and/or Services infringe, either directly or under the doctrine of equivalents, at least claims 1-3 of the ’436 Patent. HPE makes, uses, sells, offers for sale, supplies and/or distributes within the United States and/or imports and/or exports the Accused Products, Systems and/or Services and thus directly infringes the ’436 Patent under 35 U.S.C. § 271(a).

15. As just one non-limiting example, set forth below (with claim language in italics) is a description of infringement of exemplary claim 1 of the ’436 Patent. Sequoia reserves the right to modify this description, including on the basis of information it obtains during discovery: “*1. a method for managing a logical volume in order to support dynamic online resizing and minimizing a size of metadata, said method comprising steps of:”* To the extent the preamble is limiting, the Accused Products, Systems and/or Services include a method for managing a logical volume in order to support dynamic online resizing and minimizing a size of meta data.

See, e.g., HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3, pp. 8, 10 with Figure 2, reproduced below:

Figure 2 Physical Extents and Logical Extents



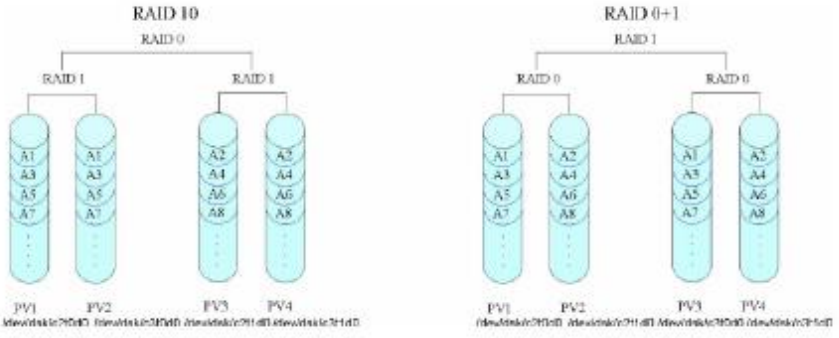
16. "*a) creating the logical volume by gathering disk partitions in response to a request for creating the logical volume in a physical storage space;*" The Accused Products, Systems and/or Services support the combining a plurality of disk partitions in physical storage space. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management at pp. 40, and 157-158, including Table 6 and Figure 6 reproduced below:

Table 6 Logical Volume Management Commands

Task	Command
Creating a logical volume	`lvcreate`
Modifying a logical volume	`lvchange`
Displaying information about logical volumes	`lvdisplay`
Increasing the size of a logical volume by allocating disk space	`lvextend`
Migrating a logical volume to new disks	`lvmove`
Decreasing the size of a logical volume	`lvreduce`
Removing the allocation of disk space for one or more logical volumes within a volume group	`lvremove`
Preparing a logical volume to be a root, primary swap, or dump volume; updating the boot information on the boot physical volume	`lvlnboot`[1]
Removing the link that makes a logical volume a root, primary swap, or dump volume	`lvrmboot`[1]
Splitting a mirrored logical volume into two logical volumes	`lvsplit`
Merging two logical volumes into one mirrored logical volume	`lvmerge`
Synchronizing mirror copies in a mirrored logical volume	`lvsync`

1 The `lvlnboot` and `lvrmboot` commands are not supported on Version 2.0 and 2.1 volume groups.

Figure 6 Hardware Configuration: Raid 10 and Raid 01



LVM Implementation of RAID Levels in HP-UX

LVM implementation of RAID management is different from the hardware based solutions because it does not nest the RAID levels, but processes them simultaneously. Typically with hardware solutions, you create a LUN with a RAID level and the RAID functions are stacked. LVM provides more flexibility on how logical volumes are created amongst a set of disks as compared to hardware solutions.

LVM allocates the physical extents for striped and mirrored logical volumes in sets of stripe width multiplied by the number of copies of the data. For example, if the logical volume is 1-way mirrored and striped across two disks, extents are allocated to the logical volume, four at a time. LVM enforces that the physical extents of a single set are from different physical volumes. Within this set, the logical extents are stripped and mirrored to obtain the data layout displayed in Figure 6 (page 157).

17. "*b) generating the metadata including information of the logical volume and the disk partitions forming the logical volume and storing the metadata to the disk partitions forming the logical volume;*" The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3, pp. 9, 16, 17, and 29:

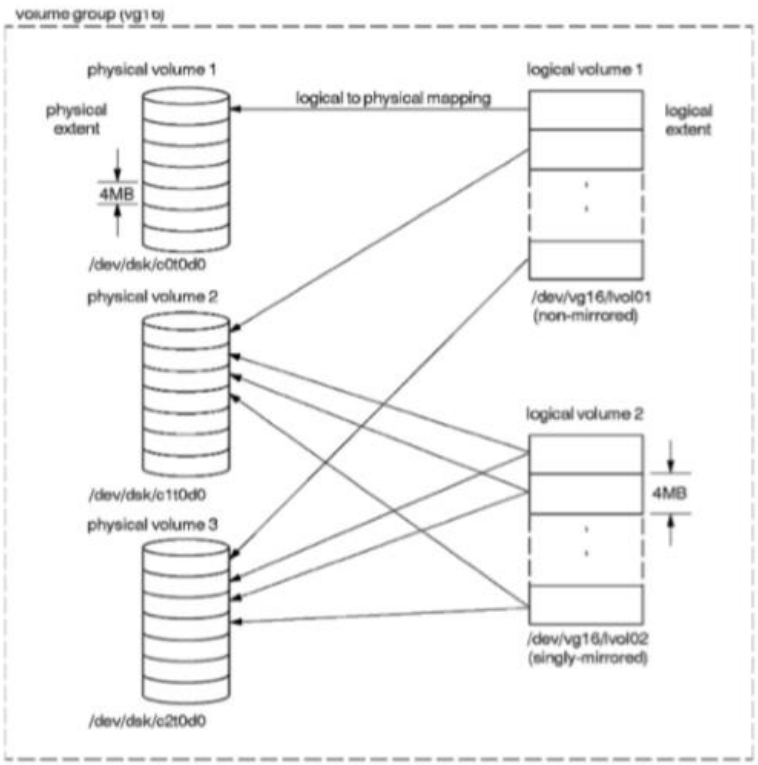
> LVM divides each physical volume into addressable units called physical extents (PEs). Starting after the LVM metadata at the beginning of the disk, extents are allocated sequentially, with an index starting at zero and incrementing by one for each unit. The physical extent size is configurable at the time you form a volume group and applies to all disks in the volume group. You can select a size from 1 MB to 256 MB.
>
> ### LVM Disk Layout
>
> **NOTE:** This information applies only to disks belonging to Version 1.0 and Version 2.2 (or higher) volume groups.
>
> There are two kinds of LVM disk layouts, one for boot disks and another for all other LVM disks. These differ in their data structures. Nonbootable disks have two reserved areas: the physical volume reserved area (PVRA) and the volume group reserved area (VGRA). Bootable disks have a PVRA and VGRA, and additional sectors reserved for the boot data reserved area (BDRA) and boot LIF.
>
> #### Physical Volume Reserved Area
>
> The physical volume reserved area (PVRA) contains information describing the physical volume, such as its unique identifier, physical extent information, and pointers to other LVM structures on the disk.
>
> #### Volume Group Reserved Area
>
> The volume group reserved area (VGRA) describes the volume group to which the disk belongs. The information is replicated on all of the physical volumes and updated whenever a configuration change is made. Among other data, it contains the following information:
>
> - A list of physical volumes in the volume group, including physical volume status and size, and a map of physical extents to logical volumes.
> - A list of logical volumes in the volume group (including the status and capabilities of each logical volume), its scheduling and allocation policies, and the number of mirror copies.
> - A volume group header containing the VGID and three configurable parameters:
>   - the number of physical volumes allowed in the volume group
>   - the maximum number of logical volumes allowed in the volume group
>   - the maximum number of physical extents allowed per physical volume

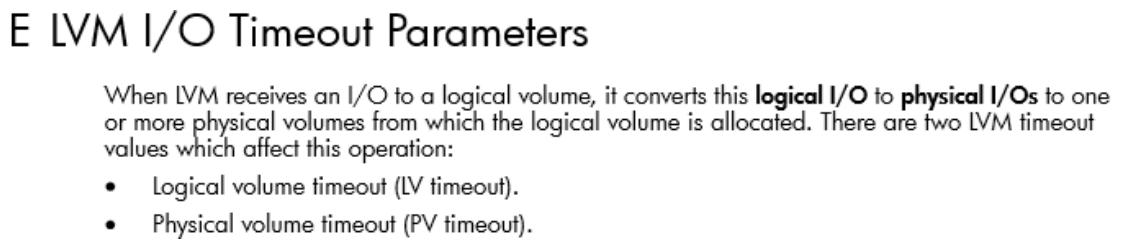
18. *"(c) dynamically resizing the logical volume in response to a request for resizing, and modifying the metadata on the disk partitions forming the logical volume;*" The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management UP-UX 11i Version 3 at pp. 17, 54 and 55:

"Extending a Logical Volume - Decide how much more disk space the logical volume needs. … Extend the logical volume. For example: # lvextend -L 332 /dev/vg00/lvol7. This increases the size of lvol7 volume to 332 MB" and "The volume group reserved area (VGRA) describes the volume group to which the disk belongs. The information is replicated on all of the physical volumes and updated whenever a configuration change is made."

19. "*(d) calculating and returning a physical address corresponding to a logical address of the logical volume by using mapping information of the metadata containing information of the physical address corresponding to the logical address;*" The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3 pp. 10, 11, 124, and 161 including Figure 2 reproduced below:

Figure 2 Physical Extents and Logical Extents





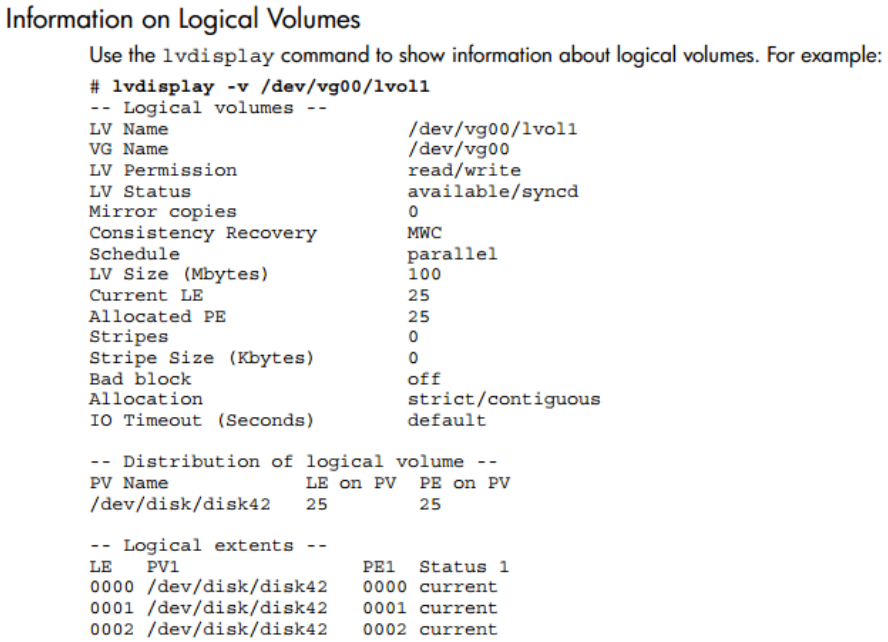
E LVM I/O Timeout Parameters

When LVM receives an I/O to a logical volume, it converts this **logical I/O** to **physical I/Os** to one or more physical volumes from which the logical volume is allocated. There are two LVM timeout values which affect this operation:

- Logical volume timeout (LV timeout).
- Physical volume timeout (PV timeout).

20. "*wherein the metadata includes a disk partition table containing information of a disk partition in which the metadata is stored;*" The Accused Products, Systems and/or Services include a disk partition table containing information of a disk partition in which the metadata is stored. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3. p. 17 stating that "Physical Volume Reserved Area - The physical volume reserved area (PVRA) contains information describing the physical volume, such as its unique identifier, physical extent information, and pointers to other LVM structures on the disk"

21. "*a logical volume table for maintaining the information of the logical volume by storing duplicated information of the logical volume onto all disk partitions of the logical volume;"* The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX lvdisplay command.



Information on Logical Volumes

Use the lvdisplay command to show information about logical volumes. For example:

```
# lvdisplay -v /dev/vg00/lvol1
-- Logical volumes --
LV Name                     /dev/vg00/lvol1
VG Name                     /dev/vg00
LV Permission               read/write
LV Status                   available/syncd
Mirror copies               0
Consistency Recovery        MWC
Schedule                    parallel
LV Size (Mbytes)            100
Current LE                  25
Allocated PE                25
Stripes                     0
Stripe Size (Kbytes)        0
Bad block                   off
Allocation                  strict/contiguous
IO Timeout (Seconds)        default

-- Distribution of logical volume --
PV Name            LE on PV  PE on PV
/dev/disk/disk42   25        25

-- Logical extents --
LE   PV1                PE1  Status 1
0000 /dev/disk/disk42   0000 current
0001 /dev/disk/disk42   0001 current
0002 /dev/disk/disk42   0002 current
```

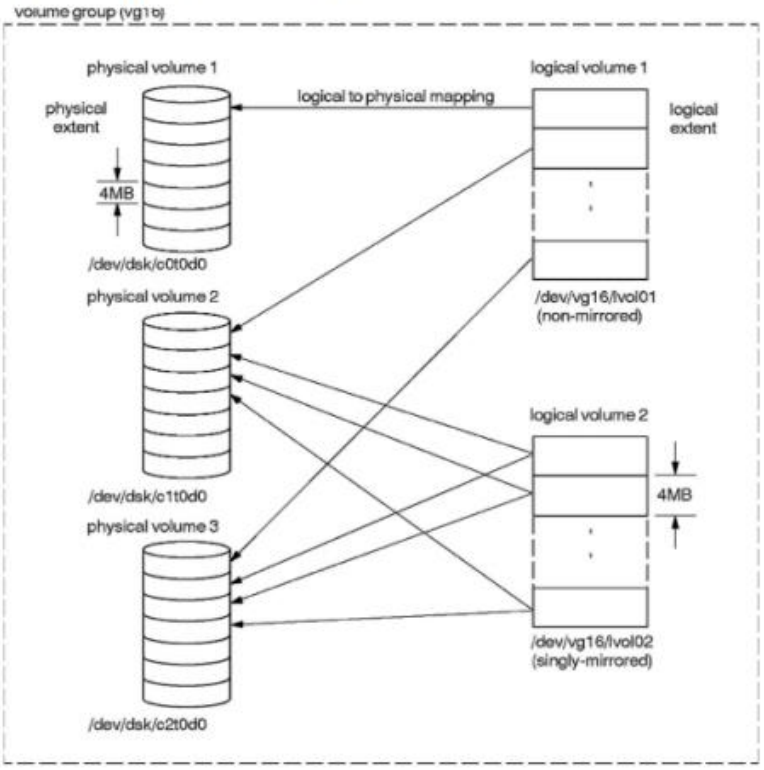
22. *"an extent allocation table for indicating whether each extent in the disk partition is used or not used;*" The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3. p. 17. Further, the pvdisplay command displays information about physical volumes. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3. pp. 41 and 42.

```
# pvdisplay -v /dev/disk/disk47
-- Physical volumes --
PV Name                     /dev/disk/disk47
VG Name                     /dev/vg00
PV Status                   available
Allocatable                 yes
VGDA                        2
Cur LV                      9
PE Size (Mbytes)            4
Total PE                    1023
Free PE                     494
Allocated PE                529
Stale PE                    0
IO Timeout (Seconds)        default
Autoswitch                  On
Proactive Polling           On

-- Distribution of physical volume --
LV Name            LE of LV  PE for LV
/dev/vg00/lvol1    25        25
/dev/vg00/lvol2    25        25
/dev/vg00/lvol3    50        50

--- Physical extents ---
PE   Status   LV                LE
0000 current  /dev/vg00/lvol1   0000
0001 current  /dev/vg00/lvol1   0001
0002 current  /dev/vg00/lvol1   0002
...
1021 free                       0000
1022 free                       0000
```

See, e.g., HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3. p. 42 (emphasis added).

23. "*a mapping table for maintaining a mapping information for a physical address space corresponding to a logical address space which is a continuous address space equal in size of storage space to an entirety of said logical volume*." The Accused Products, Systems and/or Services include this element. *See, e.g.*, HP-UX System Administrator's Guide: Logical Volume Management HP-UX 11i Version 3. pp. 10, 11, and 17 with Figure 2. Metadata stored in VGRA section of physical volume also holds an extent mapping table.

Figure 2 Physical Extents and Logical Extents



24. On information and belief, HPE had notice and/or knowledge of the '436 Patent since at least September 2012, when the Hewlett Packard Development Company (HPDC) cited the '436 Patent on an Information Disclosure Statement in its own patent application (Application No. 13/628,575) that led to issued U.S. Patent No. 8,914,578. *See* Exhibit C. Upon information and belief, HPDC is wholly owned by HP, Inc. which was formerly known as Hewlett-Packard Company, from which HPE spun off. There exist common employees from HPDC and HPE, from the former Hewlett-Packard Company. For example, an individual named Janice Nickel is listed as an inventor on a patent assigned to Hewlett-Packard Company (U.S. Patent No. 6,429,397); and on another patent assigned to HPDC (U.S. Patent No. 8,028,743); and on another patent assigned to HPE Development L.P. (U.S. Patent No. 9,230,611).

25. HPE has committed acts of infringement without license or authorization. On information and belief, HPE acted with objective recklessness by proceeding despite an objective high likelihood that its actions constituted infringement of a valid patent. HPE knew or should have known that its actions would cause direct and indirect infringement of the ’436 Patent.

26. HPE is also liable under 35 U.S.C. § 271(b) for actively inducing infringement and continuing to actively induce infringement. HPE actively induces and continues to induce its customers, distributors, end-users, vendors including customer-support and/or manufacturers to infringe the ’436 Patent. On information and belief, HPE possessed a specific intent to induce infringement, and in fact did induce infringement, by engaging in affirmative acts such as by selling and causing the accused products, systems and/or services to be manufactured, by providing user guides, installation or instruction manuals, and other training materials, by advertising and solicitation and otherwise providing sales-related materials, and by instructing and/or demonstrating to customers, distributers, end-users, vendors including customer-support and/or manufacturers the normal operation of the accused products, systems and/or services that infringe the ’436 Patent. HPE is aware and/or willfully blind that these affirmative acts infringe and/or would induce infringement of the ’436 Patent, of which it had knowledge.

27. HPE is also under 35 U.S.C. § 271(c) for contributing to and continuing to contribute to the infringement of the ’436 Patent by, among other things, providing LVM Dynamic Resizing capability in its Accused Products, Systems and/or Services and by encouraging, at a minimum, customers, distributors, end-users, vendors including customer-support and/or manufacturers in this District and elsewhere, to infringe the ’436 Patent. By importing, exporting, manufacturing, distributing, selling, and/or providing the accused products, systems and/or services for their intended use to customers, distributors, end-users, vendors

including customer-support and/or manufacturers, HPE has, in the past and continues to contribute to the infringement of one or more claims of the ’436 Patent. The Accused Products, Systems and/or Services, are material to the inventions claimed in the ’436 Patent, have no substantial non-infringing uses, and are known by HPE (on information and belief) to be especially made or especially adapted for use in infringing the ’436 Patent, and which are otherwise not staple articles of commerce suitable for substantial non-infringing use. HPE is aware and/or willfully blind that these affirmative acts infringe and/or constitute contributory infringement of the ’436 Patent, of which it had knowledge.

28. HPE is liable for indirect infringement, i.e. both inducement and contributory infringement, based on the direct infringement that is the result of activities performed by customers, distributors, end-users, vendors including customer-support and/or manufacturers who use all elements or perform all steps of one or more claims of the ’436 Patent. For example, end users of HPE’s Accused Products, Systems and/or Services infringe, either directly or under the doctrine of equivalents, one or more claims of the ’436 Patent (*e.g.*, claims 1-3) by configuring and dynamically resizing logical volumes. At a minimum, HPE is liable for the indirect infringement of claims 1-3 of the ’436 Patent.

29. As a result of HPE’s infringement of the ’436 Patent, Sequoia has suffered damages and will continue to suffer damages.

30. HPE will continue to infringe unless this Court enjoins HPE and its agents, servants, employees, representatives and all others acting in active concert with it from infringing the ’436 Patent.

31. Sequoia has been damaged as a result of HPE’s infringing conduct. HPE is, thus, liable to Sequoia in an amount that adequately compensates Sequoia for HPE’s infringement,

which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38(b), Sequoia Technology, LLC hereby demands trial by jury on all issues raised by the Complaint.

PRAYER FOR RELIEF

WHEREFORE, Sequoia respectfully requests the following relief:

a) A judgement that HPE has infringed the Patent-in-Suit;

b) An injunction barring HPE and its officers, directors, agents, servants, employees, affiliates, attorneys, and all others acting in privity or in concert with them, and their parents, subsidiaries, divisions, successors and assigns, from further acts of infringement of the Patent-in-Suit; alternatively, a judicial decree that HPE pay an ongoing royalty in an amount to be determined for continued infringement after the date of judgment;

c) An award of damages adequate to compensate for HPE's infringement of the Patent-in-Suit, and in no event less than a reasonable royalty for HPE's acts of infringement, including all pre-judgment and post-judgment interest at the maximum rate permitted by law;

d) An award of trebled damages under 35 U.S.C. § 284;

e) A declaration that this case is exceptional under 35 U.S.C. § 285;

f) An award of Sequoia's costs and attorney's fees under 35 U.S.C. § 285 and other applicable law; and

g) Any other remedy to which Sequoia may be entitled.

Dated: July 31, 2018

BAYARD, P.A.

/s/_Stephen B. Brauerman_____

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