

# Liquidware Labs Stratusphere™

## Solutions Brief for providing Usage, Capacity & Performance Metrics for NetApp VDI Sizing

### Background

NetApp provides an integrated solution that enables storage, delivery, and management of network data and content to achieve your business goals. Enabling efficient storage solutions for customers requires extensive knowledge and experience of user capacity and performance needs. Many storage solutions run into problems due to lack of information. Using rough estimates and guess work could lead to high price or low performance solutions that eventually lead to dissatisfied customers and loss of revenue. NetApp leverages Liquidware Labs Stratusphere FIT to provide the answer to this challenge.

### Solution

NetApp is partnering with Liquidware Labs, a leading desktop transformation solutions company, to provide visibility and eliminate guesswork in sizing and tiering storage for virtual desktop implementations. Liquidware Labs Stratusphere FIT™ software leads the market in gathering data and metrics of all integral infrastructure needed for HVD—from the desktop, to the network, to the data center, and storage. Stratusphere FIT features dozens of built-in reports to help you plan for your next generation desktops. Stratusphere FIT identifies ideal users and desktops for HVD, assesses ideal applications for application virtualization, and contains features to help you size storage appropriately. Stratusphere FIT also features specific custom written reports for NetApp environments that greatly assist in assessing and sizing the storage needed for HVD environments.

Stratusphere FIT can produce hundreds of capacity and performance metrics. However, determining which ones are essential for storage sizing and getting them in a format that can be understood by NetApp Consultants and consumed by the NetApp VDI Sizer are not easy tasks. To make the process easier, NetApp has collaborated with Liquidware Labs to create a NetApp custom report template. By running the NetApp template in Stratusphere, you can generate a report that contains all the key variables needed for properly sizing your NetApp storage.

### Methodology

Stratusphere is designed to collect important user experience metrics as well usage, capacity, and performance metrics. It collects this information on physical desktops and virtual desktops. Stratusphere CID Key software collects storage related metrics to understand the requirements needed to meet user experience expectations on virtual desktop platforms. This information can be utilized to create a good design of the storage infrastructure as well as right-size an existing overpriced or underperforming storage infrastructure.

The Stratusphere CID Key software can be deployed to desktops using any standard software distribution tool or with an included pre-configured group policy template to collect information for a period of time. This collection duration is dependent on the profile of the users using these desktops. If they are task workers doing essentially the same tasks with no variation in workloads, the collection period could be between 24 hours to less than five days. However, if they are knowledge workers or workers whose workload changes based on time of day/week/month/quarter, Liquidware Labs recommends capturing the usage metrics over their peak workloads for 15-30 days. Once this usage data is collected, the Liquidware Labs Stratusphere NetApp custom report template can be run to provide design and sizing specs that can be directly entered into the NetApp VDI Sizing module.

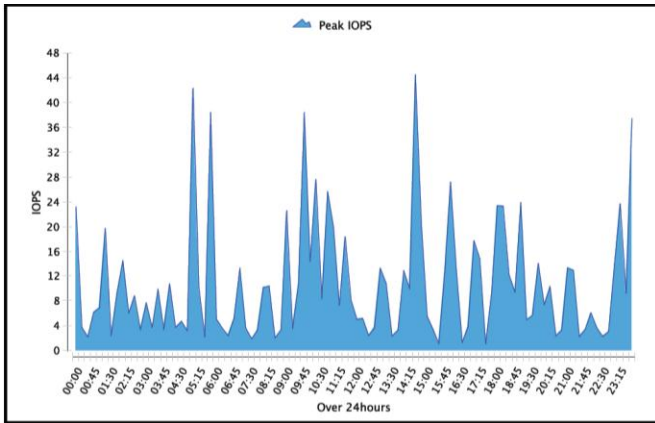
### Outputs

Stratusphere custom report groups machines based on criteria provided by NetApp that are most suited to size storage infrastructure to balance tradeoffs between performance, capacity and cost. It takes into consideration desktop OSs,

Machine Profile: 11						
Operating System	: Windows XP	Average IOPS	: <= 6 IOPS			
Read IOPS %	: 25-50%	Allocated Disk Size	: <= 20GB			
Machine Count	: 6					
Read IOPS %	Avg. Memory Used	Avg. Memory Allocated	Avg. Disk Allocated	'My Documents' Avg. Size	Max. Concurrent Logins	VDI Fit
40.77 %	0.18GB	0.51GB	8.87GB	n/a	1	Good = 6 Fair = 0 Poor = 0

Average IOPS ranges, Read Percent ranges, and allocated Disk Size ranges. Depending on these criteria, machines are grouped together and their overall metrics are reported as a group as shown.

The report provides key metrics for each machine profile such as Read IOPS %, Average Memory Allocated and Used, Disk Size Allocated and Used by 'My Documents' along with the maximum number of Concurrent Login sessions observed. These metrics can be used directly in the NetApp VDI Sizing module eliminating guesswork.



In addition to these key metrics, the Stratusphere™ custom report provides insight into the Peak IOPS observed on these machines. It provides a graph that plots Peak IOPS observed over a 24-hour period broken down to 15 min intervals to provide additional details on what to expect from this set of users and what design considerations need to be met for the backend storage.

To understand all the different types of users associated with the machine profile, the report also provides a listing of user groups the users belonged to that used these machines.

**Profile contains following User Groups:**

- All Employees
- Domain Users
- Info
- Leads
- LWL\_Sales
- Orders
- PAM Winbind
- ProfileUnity - Outlook Word Editor
- RegistrationDistribution
- Team Website
- US Gov
- VM SE
- VMware View Users
- VPN Clients
- Webex
- WIFI Clients
- Total User Groups: 16

Total Application I/O Average		Total Application I/O Peak			
283.64MB/s		288.02MB/s			
Applications Installed	Version	Avg. Size	Avg. IO Rate	Peak IO Rate	Machine Count
VMware View Agent	4.6.0	128.28MB	71.26KB/s	316.00KB/s	6
LSA Shell (Export Version)	5.1.2600	13.00KB	1.00KB/s	1.00KB/s	6
Generic Host Process for Win32 Services	5.1.2600	14.00KB	0.34KB/s	21.00KB/s	6
Services and Controller app	5.1.2600	108.00KB	0.26KB/s	11.00KB/s	6
Windows NT Logon Application	5.1.2600	496.00KB	0.00KB/s	20.00KB/s	6
System	Unknown	n/a	0.00KB/s	3.00KB/s	6
Windows Explorer	6.00.2900	1009.00KB	0.00KB/s	0.00KB/s	4
Application Layer Gateway Service	5.1.2600	43.00KB	0.00KB/s	0.00KB/s	6
Connector ID	4.8.0	3.11MB	0.00KB/s	0.00KB/s	6
Logon Screen Saver	5.1.2600	215.00KB	0.00KB/s	0.00KB/s	6
Windows Update	7.4.7600	52.00KB	0.00KB/s	0.00KB/s	5
Machine Debug Manager	7.00.9466	314.00KB	0.00KB/s	0.00KB/s	2
Connector ID	4.8.1	3.12MB	0.00KB/s	0.00KB/s	2
Client Server Runtime Process	5.1.2600	6.00KB	0.00KB/s	2.00KB/s	6
smss	Unknown	n/a	0.00KB/s	0.00KB/s	5
Spooler SubSystem App	5.1.2600	57.00KB	0.00KB/s	0.00KB/s	6
Microsoft Office Professional Edition 2003	11.0.8173	1.08GB	0.00KB/s	0.00KB/s	4

The report also lists all the applications that were observed in use by all the users in this machine profile. It lists each application by name, its version number, and the installation size. It also lists performance information such as Average IO Rate, Peak IO Rate and number of machines this application was observed on within this profile. This truly completes the picture in terms of understanding the needs of the users on these machines.

## Benefits

NetApp System Engineers and Consultants using this joint solution methodology can confidently assess, design, and manage NetApp Storage solutions as it is based on solid metrics and real world usage data. It eliminates the pitfalls of using rough estimates and guess work completely. Using Stratusphere™ provides the following benefits:

- Detailed, granular visibility into usage patterns, capacity, and performance needs of users.
- Designing storage infrastructure based on actual data leads to meeting cost, capacity and performance objectives.
- Meeting and beating user experience expectations and gaining satisfied customers.
- Enhance reputation and revenues.

For more information visit [www.LiquidwareLabs.com](http://www.LiquidwareLabs.com)