



# Troubleshooting Virtual Machine Performance

## Virtual Desktop Service

Toby vanRoojen  
January 05, 2021

This PDF was generated from [https://docs.netapp.com/us-en/virtual-desktop-service/Troubleshooting.general\\_vm\\_performance.html](https://docs.netapp.com/us-en/virtual-desktop-service/Troubleshooting.general_vm_performance.html) on July 20, 2021. Always check docs.netapp.com for the latest.

# Table of Contents

- Troubleshooting Virtual Machine Performance ..... 1
  - Overview ..... 1
  - Using nightly resource reports ..... 1
  - Viewing CPU/RAM resource consumption in real-time ..... 2
  - Considering storage performacne ..... 10
  - Considering storage consumption ..... 10

# Troubleshooting Virtual Machine Performance

NetApp offers customers insight into troubleshooting server performance for users/apps. All companies consume resources differently based on the number of end users logged in at once, application use, if SQL Standard is installed vs. SQL Express, etc. so it is important to be able to review what is happening when a user reports performance issues.

## Overview

Every app is different, and even the same software being run by the same number of users can have different resource consumption patterns. This is why it helps to understand the apps your users are running and what truly powers that app. Is it CPU, RAM or storage? These considerations will help focus your troubleshooting.

In our experience, these have proven to be generally true statements to help you begin:

CPU: this is usually the culprit/limiting factor if the app in question is home-grown and/or an Excel issue  
RAM: this is usually the culprit/limiting factor if SQL Standard is used  
Storage: this is usually a contributing factor if disk consumption is greater than 90%.



If SQL Express is used, it is likely a limiting factor – it limits RAM consumption to 1 GB, which will may be under the software vendor's required specs.

## Using nightly resource reports

VDS sends nightly reports with information about each VM. There is a lot of useful information in that report, including recommendations on whether to increase or decrease resources. Here are a few excerpts:

This image shows whether you should increase or decrease CPU/RAM on VMs for a given workspace.

Company Code	Pool	Run Date PDT	Allocation Type	# Servers	# Users	Max Active Users	Ram GB Per User	CPU Per User	Max Ram %	Max CPU %	Recommended Change RAM	Recommended Change CPU	Ram GB	CPUs
[REDACTED]	D1	2018-07-30 09:12 AM	Unknown	0	0	0	N/A	N/A	N/A	N/A	No Change	No Change	0	0
[REDACTED]	D1	2018-07-30 09:12 AM	Unknown	0	0	0	N/A	N/A	N/A	N/A	No Change	No Change	0	0
[REDACTED]	SHARED	2018-07-30 09:12 AM	Fixed	0	0	0	N/A	N/A	N/A	N/A	Need More Data	Need More Data	6	2

In the image below, we can see that there is a column that shows how long it has been since the server has been rebooted.

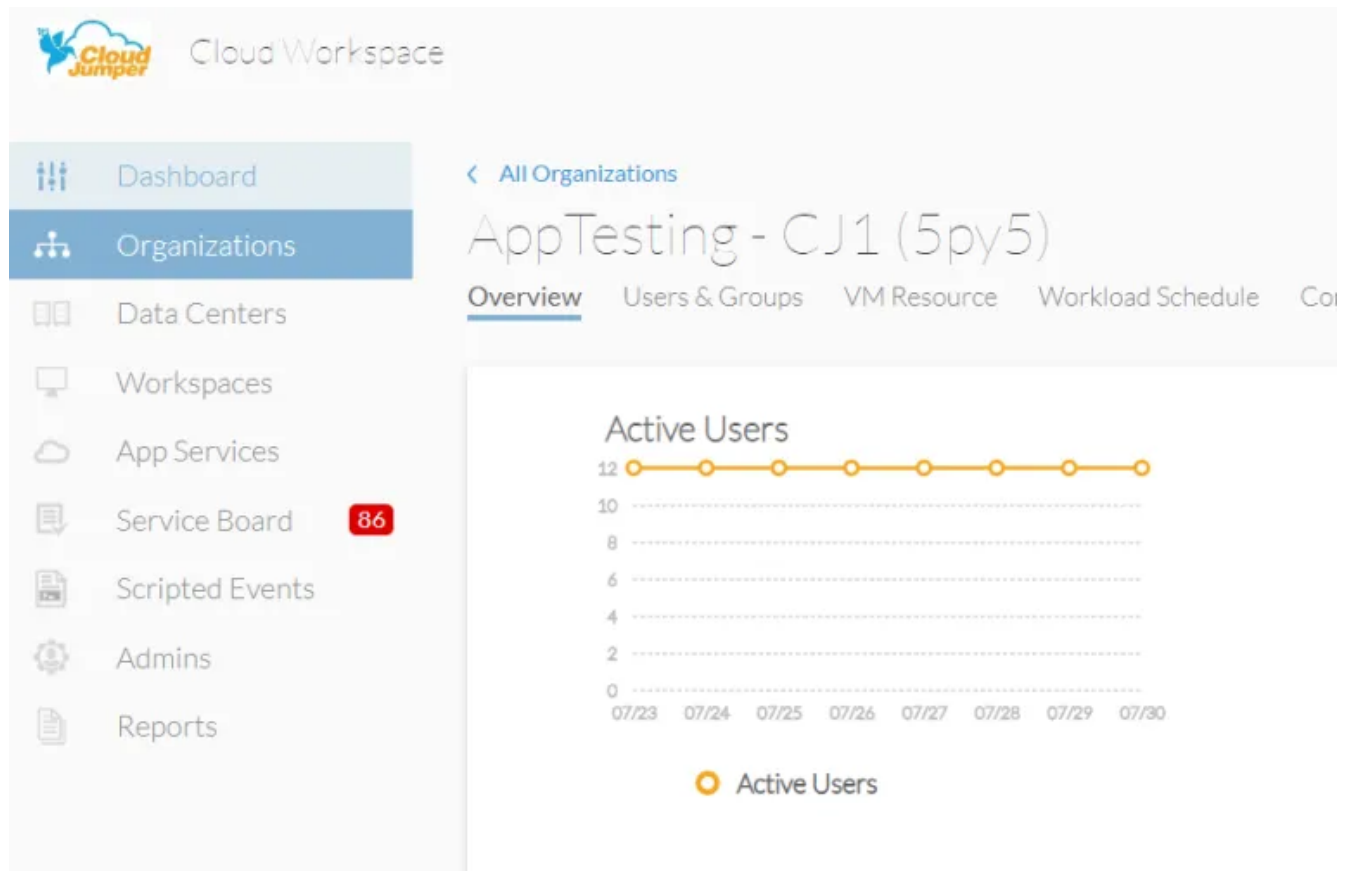
<b>Time Since Last Reboot (dd:hh:mm)</b>	<b>Time Zone</b>	<b>RAM GB</b>	<b>CPUs</b>
38:20:17	(UTC-08:00) Pacific Time (US & Canada)	4	2
146:00:46	(UTC-08:00) Pacific Time (US & Canada)	4	2

In this image we can see storage provisioned vs. consumed – this becomes a good topic to investigate briefly at first or once you have validated that CPU/RAM are not the issue.

<b>Drive Total Space GB</b>	<b>Drive Used Space GB</b>	<b>Drive Free Space GB</b>
63	15.63	47.82

## Viewing CPU/RAM resource consumption in real-time

1. Log into VDS, then click the Organizations module and select the organization in question.



2. You can locate what server the user is logged into by locating them in the users section.

All Organizations

Overview Users & Groups VM Resource Workload Schedule Contact Info

Delete Client

### Groups

Add

Filter by Keyword

Group	Users

### Users

Add/Import Refresh

Filter by Keyword

Name	Username	Status	Connection Status
		Active	Offline
		Active	Offline
		Active	Offline
		Active	Offline
		Active	Offline
Test Doug	TestDoug@CJ1...	Active	Offline
		Active	Offline

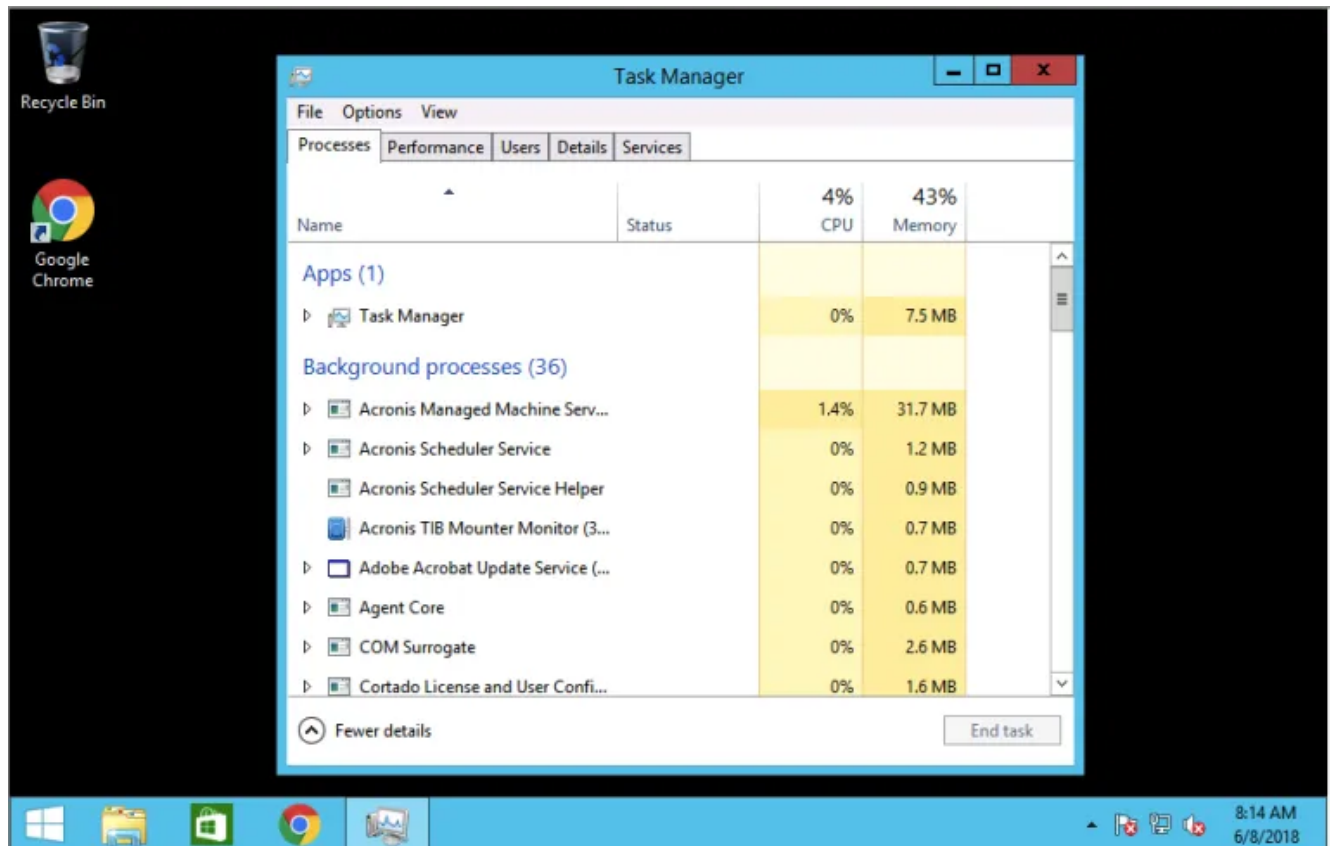
3. Next, scroll down until you see the Servers section – locate the server the user reporting the issue is logged into and click the settings wheel, then connect.

Servers						Add	Refresh
Filter by Keyword							
Name	Type	RAM	CPU	Online Status	Status		
SPYSTSD1	Shared	8 GB	2	Online	Available	Connect	

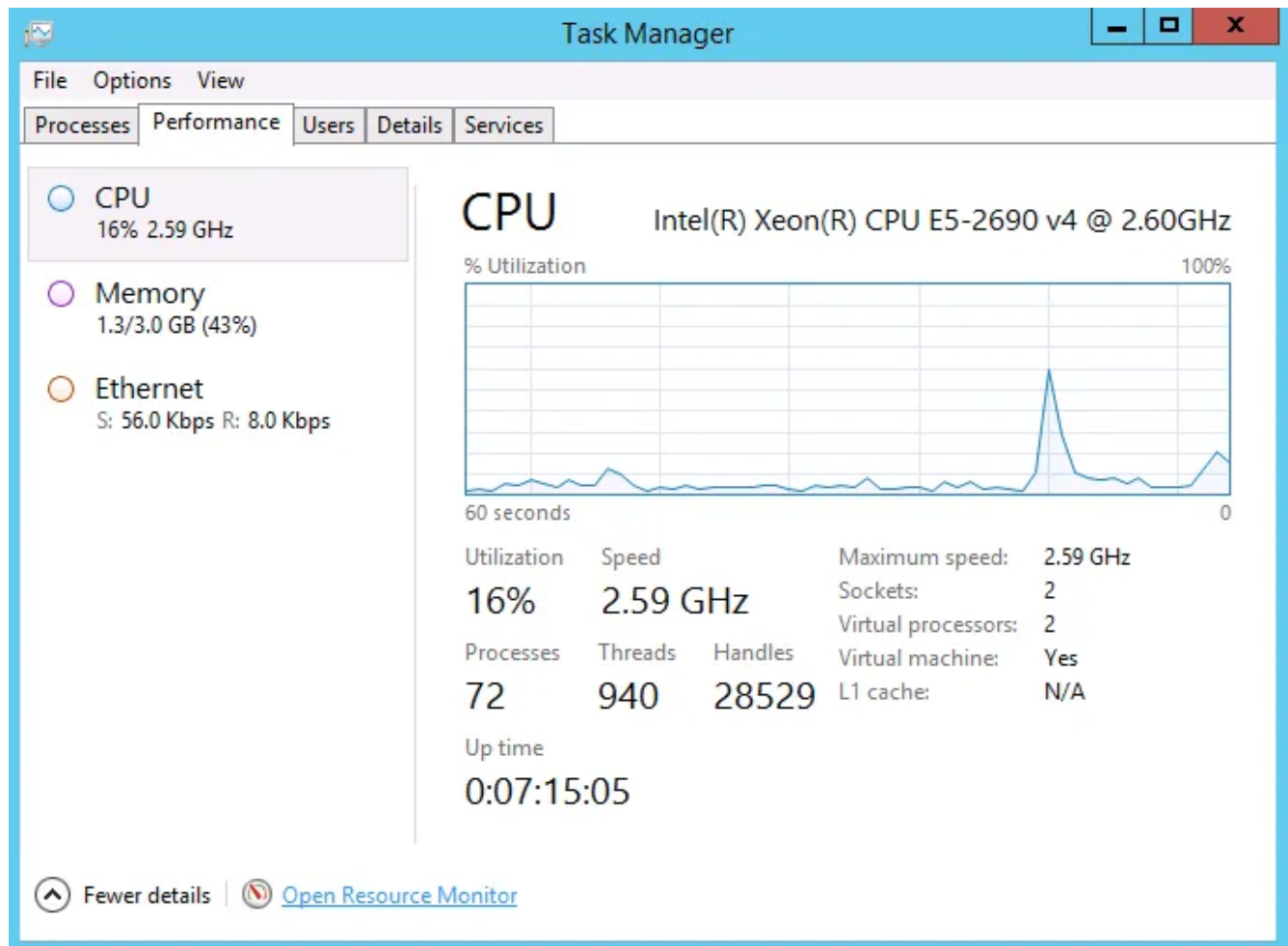
- Once you've connected to the server, click the Start button. Next, click Task Manager.



- The Task Manager gives a wealth of insight into what's happening, right at that moment. This is the absolute best way to see what's affecting your users at the moment they report an issue to you.
- You can review the processes running on the server, identify which if any are causing the issue and either communicate with the Customer or end the processes on the spot.

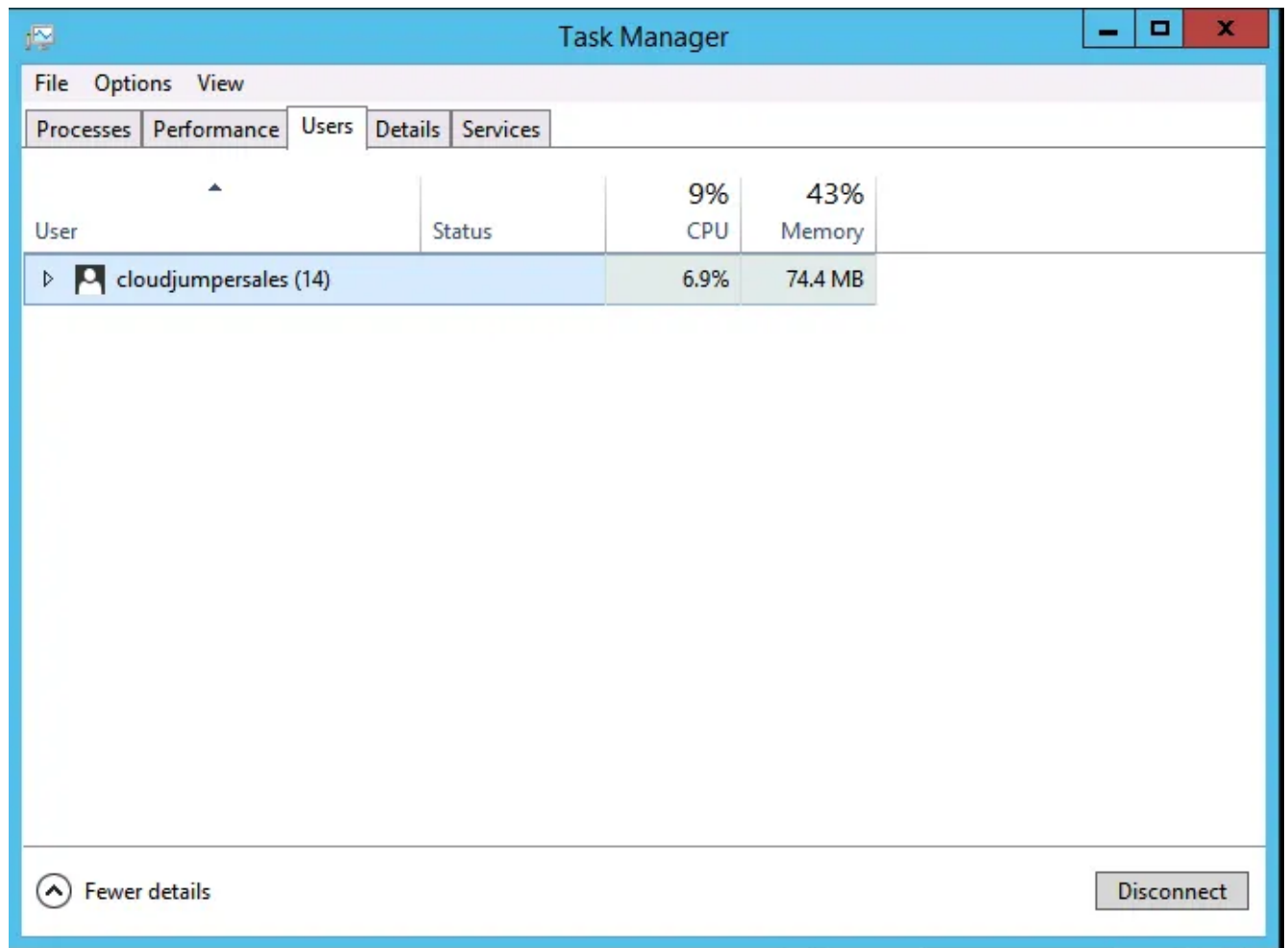


7. You can also view the Performance tab to show what's happening, live. This is a tremendous troubleshooting step – asking End users to repeat the steps they took to cause a performance issue, then seeing what happens. Similarly, if they follow general advice (close excess Chrome browser tabs, as Google Chrome tabs are a common resource consumer) you can see resource consumption decrease.

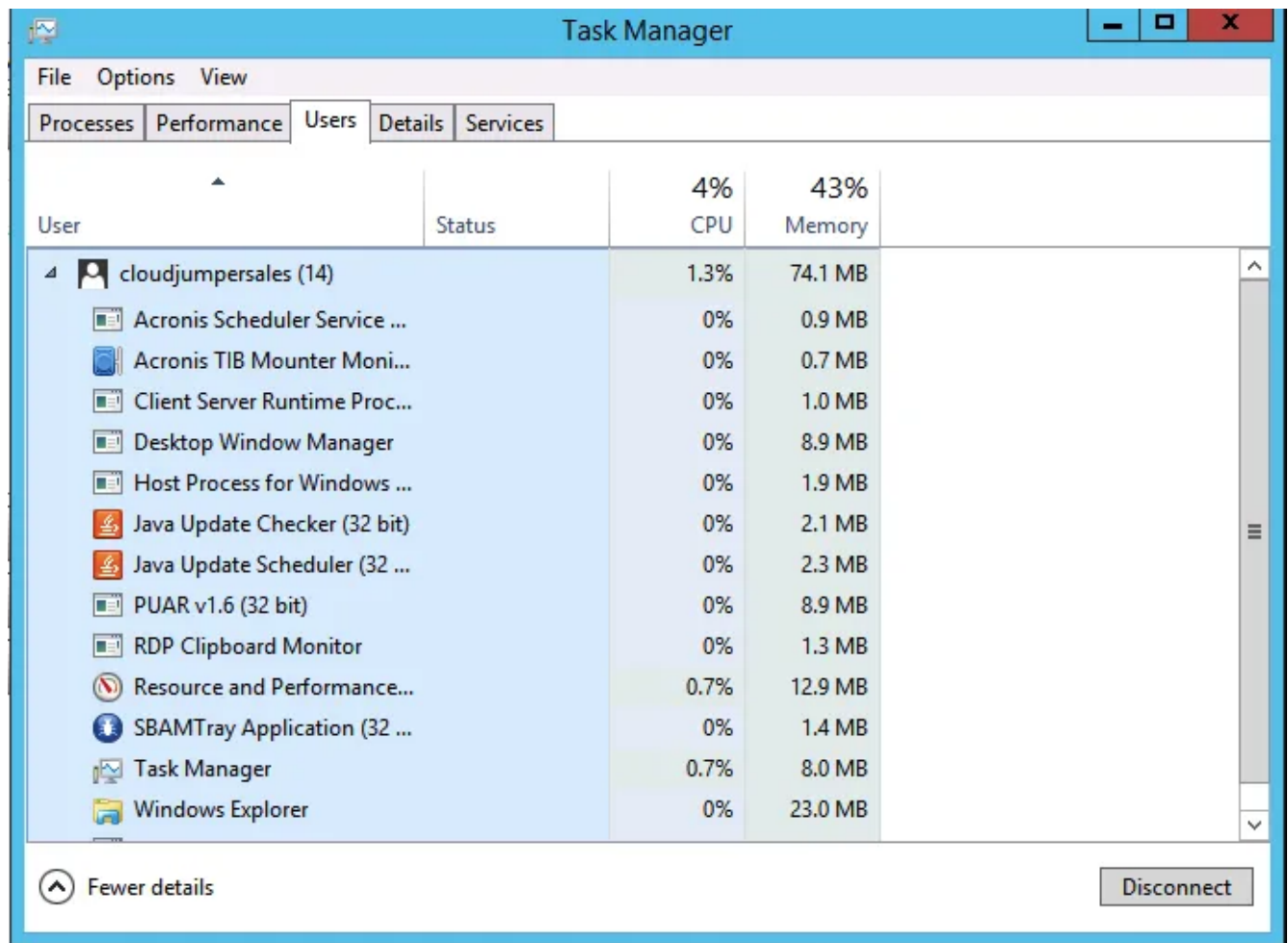


8. The users tab can show you which user, if any, is consuming the resources causing a spike in consumption.

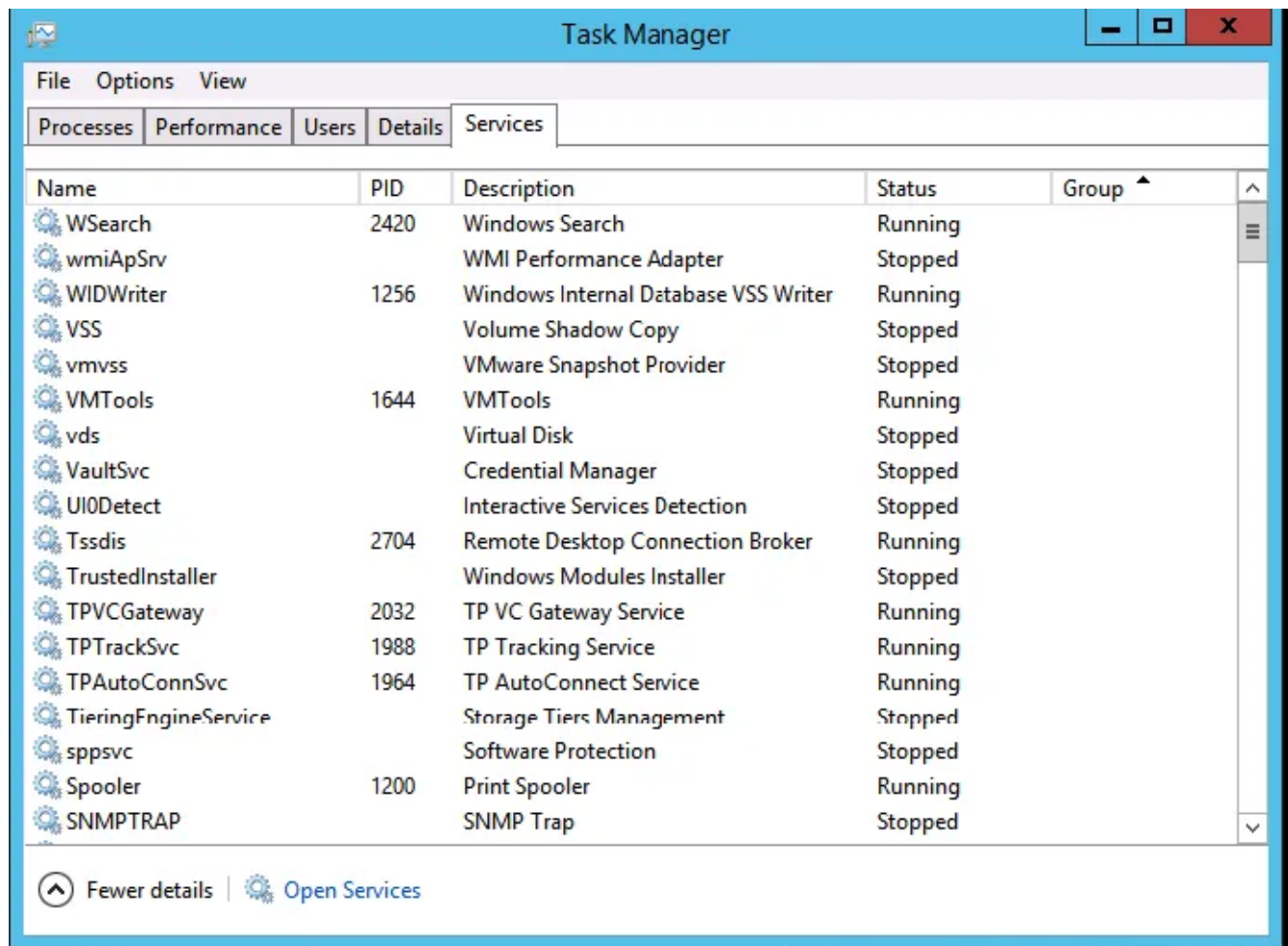




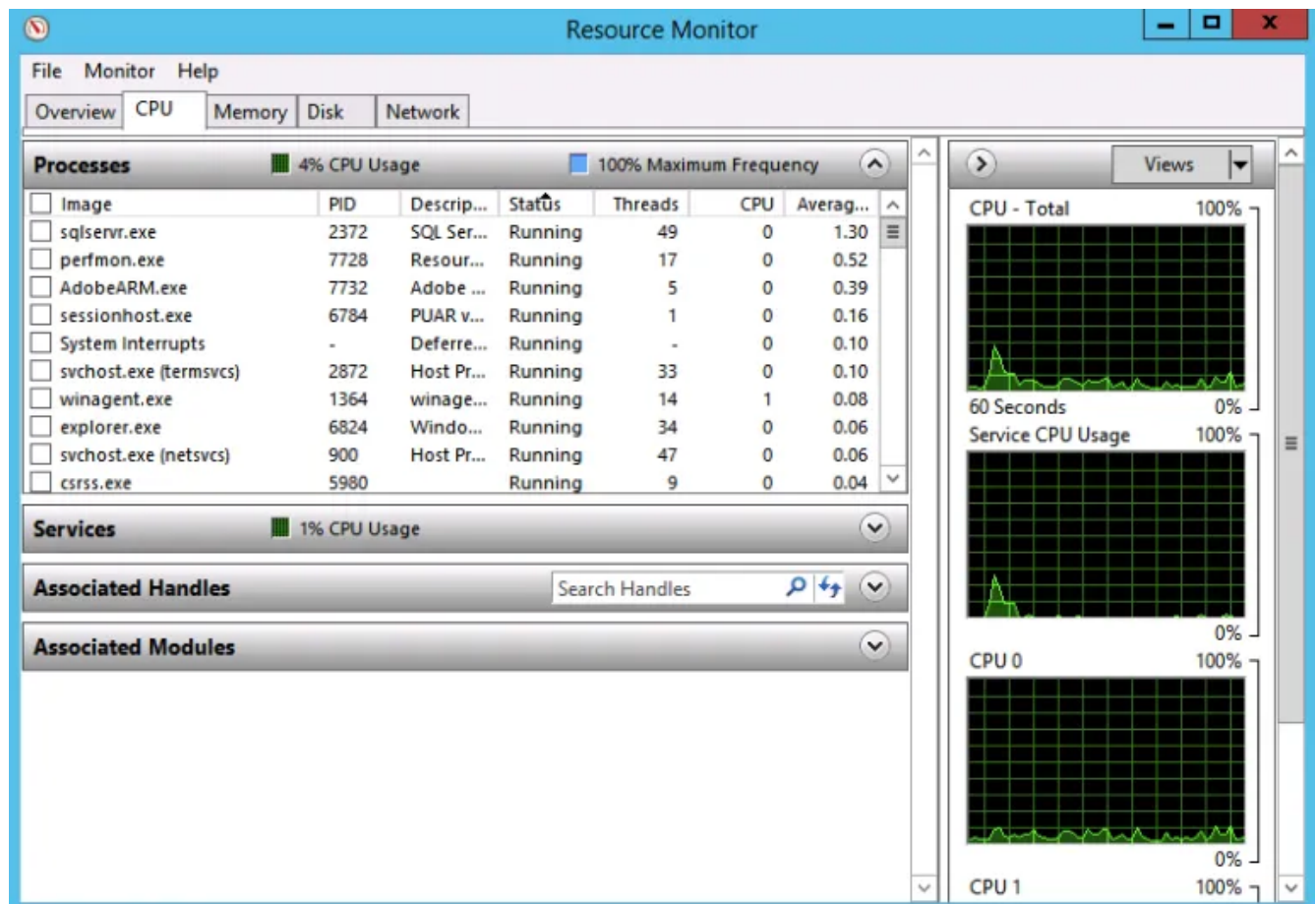
9. You can expand each End user to see which specific processes they're running and how much each one is consuming.



10. Another option is viewing which services are running.



11. Customers can also open the Resource Monitor to investigate in more detail.



## Considering storage performance

One of the more common causes of vm performance issues is insufficient disk performance. Standard (and even SSD) disks are not designed to handle the high I/O load demanded by VDS workloads. User logins tend to happen in bunches and each one demands significant I/O as profiles and settings are loaded. NetApp's high performing storage technologies such as Azure NetApp Files, CVO and CVS are particularly well suited for this workload and should be considered the default option for VDS workloads.

## Considering storage consumption

Microsoft has a long-held best practice against allowing disk consumption on any drive to exceed 90%. In their eyes, this causes performance to plummet and can cause a number of other challenges, such as not having enough storage for backups to complete and not allowing users to save their work.

RMM tools can offer storage monitoring services, including the ability to set thresholds and alerts. If storage becomes a challenge for you, working with your RMM vendor to enable these types of alerts is recommended.

For deeper investigation, install software to review drive consumption.

From conversations with customers, Windirstat or Treesize have proven to be the preferred applications for inspection of drive consumption.

Windirstat can inspect a full drive over the network if there is insufficient space to install/run an app locally or login is blocked:

+

rd001

WinDirStatPortable

File Home Share View Manage

Network > vdc01.local > media\$ > WinDirStatPortable

Search Win

Favorites

- Desktop
- Downloads
- Recent places
- This PC

Name	Date modified	Type	Size
App	12/1/2016 2:29 PM	File folder	
Data	4/19/2017 9:37 AM	File folder	
Other	12/1/2016 2:18 PM	File folder	
help	6/5/2012 3:43 PM	HTML File	5 KB
WinDirStatPortable	7/24/2012 4:12 PM	Application	177 KB

Scanning \\G84TS1vc\$ - WinDirStat

File Edit Clean Up Treemap Report Options Help

Name	Subtree Percentage	Percentage	Size	Items	Files	Subdirs	Last Change	Attr...
\\G84TS1vc\$		[638.1]	48.1 GB	207,969	156,334	51,635	4/19/2017 1:44:33 ...	
Windows		78.5%	13.7 GB	99,080	68,340	30,740	4/19/2017 1:40:59 ...	A
ProgramData		24.2%	11.7 GB	10,257	9,808	449	4/19/2017 1:38:52 ...	H
<Files>		19.3%	9.3 GB	9	9	0	4/9/2017 8:13:35 A...	
Users		13.8%	6.5 GB	70,471	60,589	17,882	4/19/2017 1:44:33 ...	R
Program Files (x86)		11.2%	5.4 GB	17,382	15,258	2,124	4/19/2017 1:37:31 ...	
Program Files		2.9%	1.4 GB	2,158	1,846	312	4/19/2017 1:35:05 ...	R
Config.Msi		0.3%	124.3 MB	21	21	0	4/18/2017 3:17:49 ...	HS
\$Recycle.Bin		0.0%	22.6 MB	299	236	63	4/19/2017 1:33:55 ...	HS
ryn		0.0%	21.3 MB	154	128	26	4/19/2017 6:00:58 ...	H
PreSetup		0.0%	1.0 MB	2	2	0	9/14/2016 5:46:41 ...	
inetpub		0.0%	658.1 KB	98	80	18	4/18/2017 6:53:15 ...	
nFlgi		0.0%	121.2 KB	17	15	2	10/25/2016 4:56:0...	
Temp		0.0%	1.9 KB	2	1	1	8/31/2016 1:04:25 ...	
Chocolatey		0.0%	454 Bytes	2	1	1	1/31/2017 7:57:35 ...	
Documents and Settings		0.0%	0	0	0	0	8/22/2013 2:49:41 ...	HS
OSTData		0.0%	0	0	0	0	10/25/2016 4:32:3...	HA
PerfLogs		0.0%	0	0	0	0	8/22/2013 3:52:33 ...	
System Volume Information		0.0%	0	0	0	0	4/18/2017 11:19:0...	HS

5 items 1.4

## Copyright Information

Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.