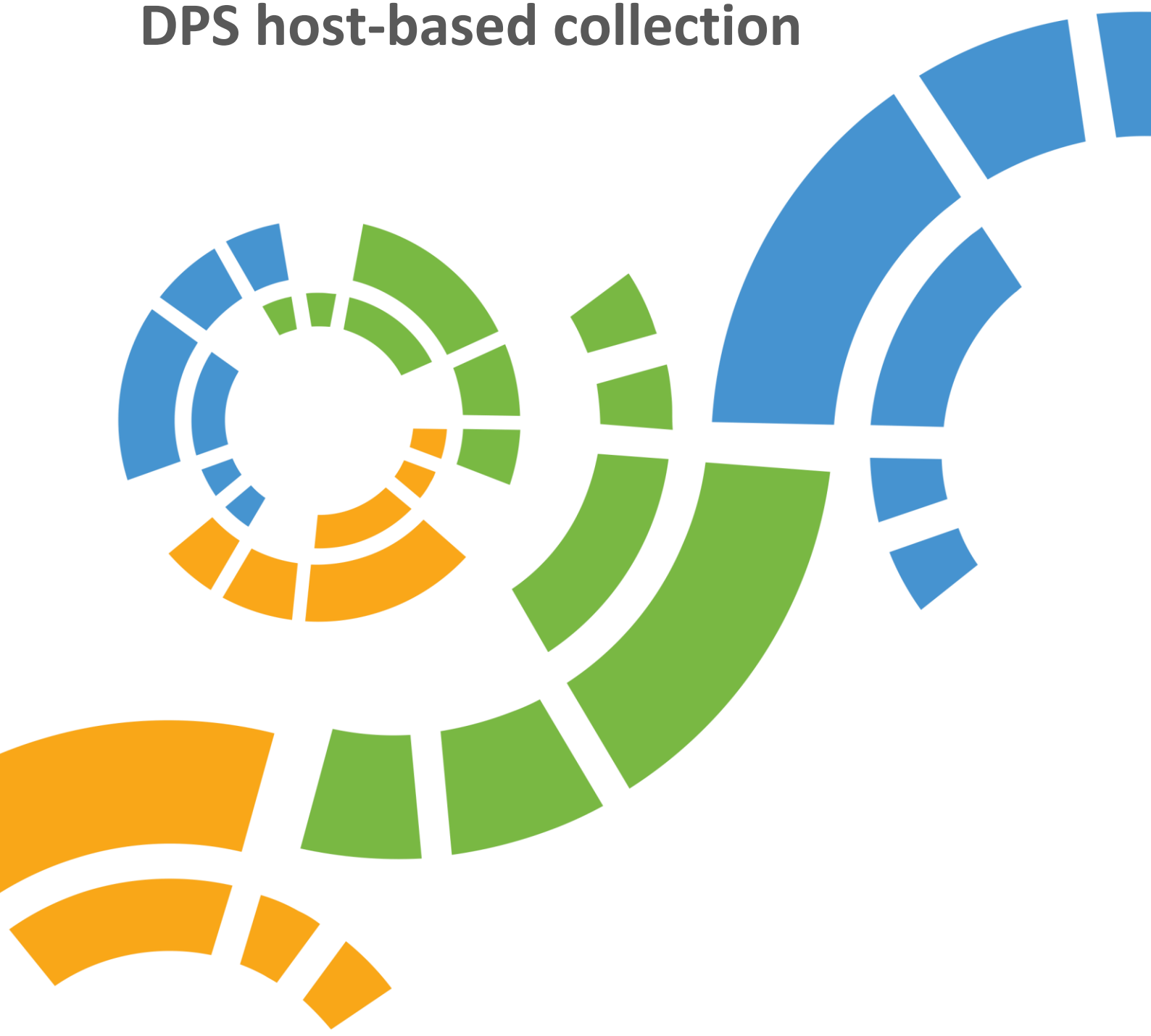
live optics

# Calculate FETB capacity using DPS host-based collection



# Contents

## Copyright Statement





## Revision History

| Date | Document Revision | Description of Changes |
|---|---|---|
| July 2024 | 1.1 | Updated *Use Optical Prime to Measure FETB Capacity* section with note for Veeam collections |
| March 2024 | 1.0 | Initial version |

## About This Document

This document provides Live Optics users with information on methods to calculate Front End Terabyte (FETB) capacity without directly attaching to data protection appliances or software.

## Audience

This document is intended for use by members of presales and channel sales teams, IT administrators and architects, and data protection administrators, architects, and solution engineers.

## Overview

Data protection products can be built on both physical and virtual environments with hundreds or thousands of protected clients (virtual machines (VMs) or physical servers). When sizing and licensing data protection products, the most important factor to consider is the FETB capacity which identifies the total capacity of the environment that should be backed up on day one.

## FETB Categories

**System Scope**: An aggregate of all data being backed up. This is the most important FETB value and represents the entire deployment.

**Workload Scope**: The sum of all data being backed up at an application level. An application might consist of one or more physical servers or VMs.

**Client Scope**: The data being backed up at each physical server or VM.

> **NOTE**: FETB can be represented both in base-10 terabytes and base-2 tibabytes. It is important to remember as different data protection products vary in how they are sized and licensed.

## Appliance Based vs Host Based Collections

There are two primary methods for scanning an existing data protection deployment:

- Appliance based
- Host based

During **appliance based assessments** (also known as vendor specific assessments), the Live Optics collector connects directly to either the data protection appliance or software service and gathers metadata directly from the data protection deployment. This method typically relies on vendor specific APIs, command-line tools, or the export of proprietary files from the data protection application.

This assessment provides details including backup schedules, backup duration, success rates, change rates, and growth rates. While this information is very valuable, the FETB capacity calculation from these assessments sometimes lacks accuracy. For example, many data protection products use long running incremental backup policies where the original backup can be lost over time.

During **host based** assessments, the Live Optics collector connects directly to each host being backed up in the data protection scheme. The capacity reported is collected directly from the host using

vendor-agnostic operating system protocols. When correctly implemented, this method continually allows for accurate FETB capacity calculations.

To guarantee an accurate FETB capacity calculation, host-based assessments are recommended over appliance-based assessments.

## Host Based Collection Types

Live Optics uses the following options to complete host based collections:

- Optical Prime
- RVTools
- RAPID Discovery

### Optical Prime

Optical Prime connects directly to Windows and Linux physical or virtual machines and VMware vCenter systems. When connected to VMware vCenter systems, Optical Prime discovers ESXi clusters, hosts, and VMs running on the hosts. It also detects VMs running on Windows and Linux based hypervisors including Hyper-V, Xen, and KVM.

**Optical Prime should be used** when the deployment is running:

- VMware with vCenter (vCenter is required)
- Hyper-V, Xen, or KVM hypervisors

If the deployment contains physical servers outside of the hypervisor framework that will be backed up, Optical Prime is suitable if:

- There are 50 or fewer physical servers
- The physical servers are running Windows or Linux

Connecting Optical Prime to VMware vCenter takes just a few minutes for each vCenter instance. Adding ESXi servers to Optical Prime takes just 5-10 minutes even for very large quantities of servers.

> **NOTE:** Connecting Optical Prime to physical servers outside of VMware must be done one at a time. For deployments of more than 50 non-VMware physical servers, it is recommended that you use RAPID Discovery instead of Optical Prime.

The Optical Prime Automated Insights Report (AIR) is a data-driven analysis for Optical Prime projects which contains both physical and virtual environment configurations and performance metrics. This report can be downloaded in Microsoft PowerPoint and Excel format from the **Reports** tab on **Project View** page of the Live Optics web portal.

### RVTools

RVTools is an industry standard for collecting information from VMware deployments. Many IT administrators already use RVTools to generate reports on their VMware environments.

**RVTools should be used** when:

- RVTools is already being run in the environment
- The VMware deployment is running without a licensed vCenter instance (RVTools can be pointed directly at ESXi hosts)

RVTools creates an Excel output which can be imported into Live Optics to generate an AIR report in PowerPoint format. This output provides easy to read results displayed in useful and insightful graphs and tables.

---

### RAPID Discovery

RAPID Discovery can quickly locate and scan any physical or virtual machine attached to a network; however, it **should be used** when there are many *physical* machines in the environment. RAPID Discovery can easily scale up from hundreds to thousands of systems.

| **NOTE:** RAPID Discovery is not recommended for VMware environments. Scanning VMware environments can be completed much faster using Optical Prime or RVTools. |
|---|

---

### Other Tools

If your deployment contains physical servers running legacy Unix operating systems such as Solaris, HP-UX, and AIX, Live Optics cannot be used.

For these operating systems, the Dell Grab Utility can be used to collect FETB capacity. Contact your Dell Solution Engineer for more information.

## Which collection option should I use?

Use the following questions to help determine the best host-based collection option for you:

**Is most of the deployment VMware?**

**If the deployment is mostly VMware, is RVTools already being used?**

If **yes**, continue using **RVTools** to calculate the FETB capacity.

If **no**, use **Optical Prime**.

If your environment is *not* VMware, use **RAPID Discovery**.

**Are some of your servers running legacy Unix operating systems like AIX, Solaris, or HP-UX?**
If yes, you must run the Dell Grab Utility scripts locally on each of these systems to determine the FETB capacity for these servers.

# Use Optical Prime to Measure FETB Capacity

The following section describes how to:

- Complete an Optical Prime collection
- Find the FETB capacity and other relevant data protection information
- Read an AIR report (for environments with VMware servers)

## Before You Begin

- Download the latest version of the Live Optics collector. See Download the Live Optics collector or Download the Live Optics collector (Linux only) for more information.

- You must have network access to:

    - Any **VMware vCenter** instances which have ESXi systems being backed up by the current data protection deployment. You will need the address of the vCenter instance(s), and a username and password with at least read-only access for the vCenter instance(s).

    - Any **physical servers** running Windows or Linux operating systems. You will need the address of the Windows and/or Linux servers, and a username and password to remotely access the servers.

    - Any **physical hypervisors** running Hyper-V, Xen, or KVM. You will need the address of each hypervisor node in the cluster, and the username and password to remotely access each node.

- See Complete an Optical Prime collection for information on using Optical Prime.

## Important Collection Information

**Upload Options**

To calculate FETB capacity, only an inventory mode Excel spreadsheet is required. However, for VMware environments, an AIR report is extremely valuable. It is recommended that you select **Establish a secure connection to the Live Optics web service** before your collection or create an SIOKIT file to upload to the Live Optics portal later. See SIOKIT Files for more information.

**Collection Duration**

All capacity-related information that Optical Prime gathers occurs during the initial discovery phase of the collection. Therefore, the shortest duration of 10 minutes is all that is required. Should you choose to complete a longer scan, 24 hours is typically enough to produce a sufficient overview of system performance.

**NOTE:** As Optical Prime runs in system memory only, its collections are session sensitive. Logging out or rebooting your host system will terminate an Optical Prime collection in progress.

**Veeam ONLY:** To report **Custom Attributes** on protected VMs, ensure they are enabled on VM backup policies by enabling notifications for successful backups.

1. When creating or editing a Veeam backup job, open notification settings.
2. Select **Set successful backup details to this VM attribute**. Veeam will now report successful backups and backup results to a VM attribute. You may use an existing attribute or create a new one. The attribute name *must* be **Veeam Backup**.

## Complete an Optical Prime Collection

1. Open the Live Optics collector and choose **Server and Cloud** > **Optical Prime**.
2. Select your preferred upload option. Here you can also choose to complete an *Inventory Mode* only collection, but no system performance details are collected.
3. Provide a name for your project and click **Next**.
4. Provide a name for your SIOKIT file. This file is generated at the end of an Optical Prime collection regardless of which upload option is selected. Click **Next**.
5. Using the **Add Remote Server** option:
    - Select VMware to add each vCenter system you wish to scan.
    - Add any additional bare-metal server servers running Windows or Linux.
    - You must manually add each node for Hyper-V (Windows), Xen (Linux), or KVM (Linux) servers.
6. Click **Connect** and provide your log on credentials.
7. Select your preferred scan duration from 10 minutes to 7 days from the drop-down menu. The recommended duration is 10 minutes or 24 hours (for longer scans).
8. Click **Start Capture** to begin the scan. Do not log out or reboot your host system or your Optical Prime scan data will be lost. Wait for the scan to complete.

## Find the FETB Capacity

### Using an Inventory Mode Collection

If your collection was run using *Inventory Mode* only, the output is an Excel spreadsheet which is saved locally.

- **For VMware servers** - In the VMware Excel spreadsheet, locate the **VMs** tab and use the sum function to add the contents of the *Guest VM Disk Used (MiB)* column. This is the current FETB capacity being used for all VMs.

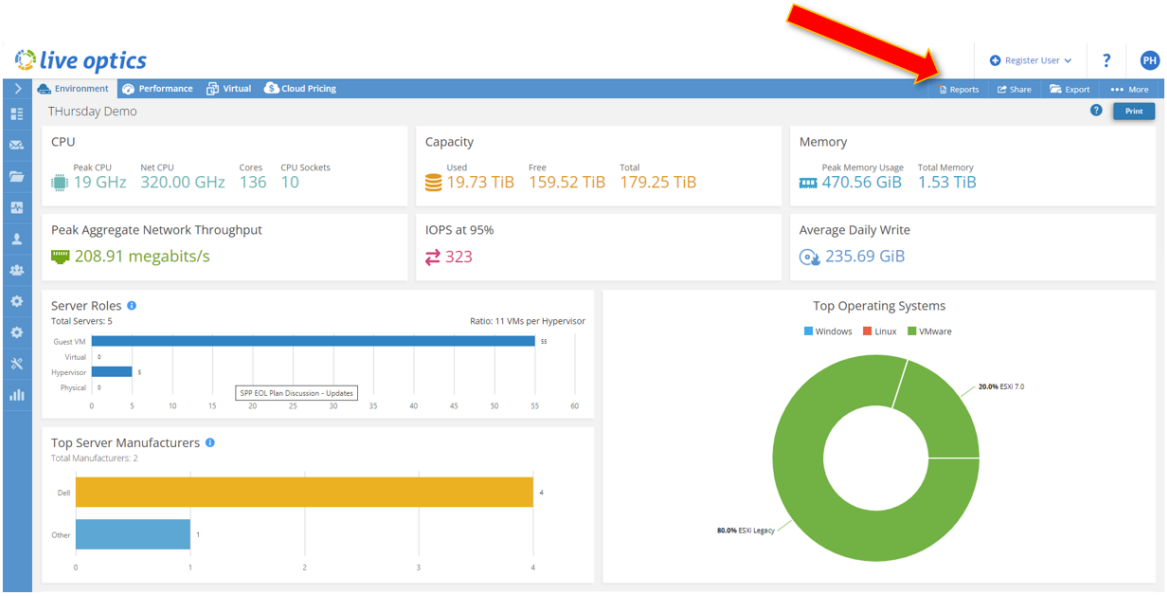
- **For non-VMware servers** - In the non-VMware Excel spreadsheet, locate the **Server Disks** tab and use the sum function to add the contents of the *Used Capacity (GiB)* column. This is the FETB capacity (if cluster disks are not present in your deployment).

  Next, locate the **Cluster Disks** tab (if they are present). There is one row per node in the cluster for each cluster disk. Ensure you do not double count by sorting using the *Device Name* column and including only one row per cluster disk. Add the *Used Capacity (GiB)* value from the **Cluster Disks** tab to the *Used Capacity (GiB)* value from the **Server Disks** tab. This is the current FETB capacity for your deployment.

## Using a Project Streamed or Uploaded to Live Optics

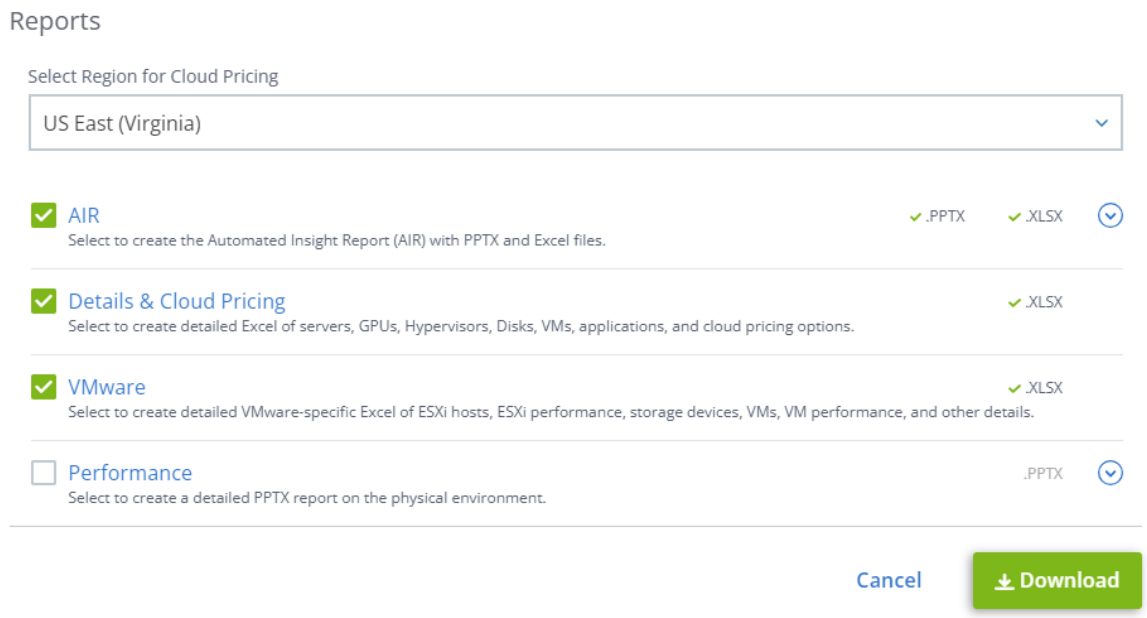
If your collection was streamed, or you uploaded the SIOKIT file to the Live Optics portal, your project is available under **Recent Projects** on the main dashboard. Select the project for which you wish to view the project details.

Useful information can be found in the online project viewer, however, for more detailed analysis, it is recommended that you download the PowerPoint and/or Excel spreadsheets from the **Reports** tab. This allows you to filter your project results, focus on systems of specific interest, and build different sizing scenarios based on your customized selections.

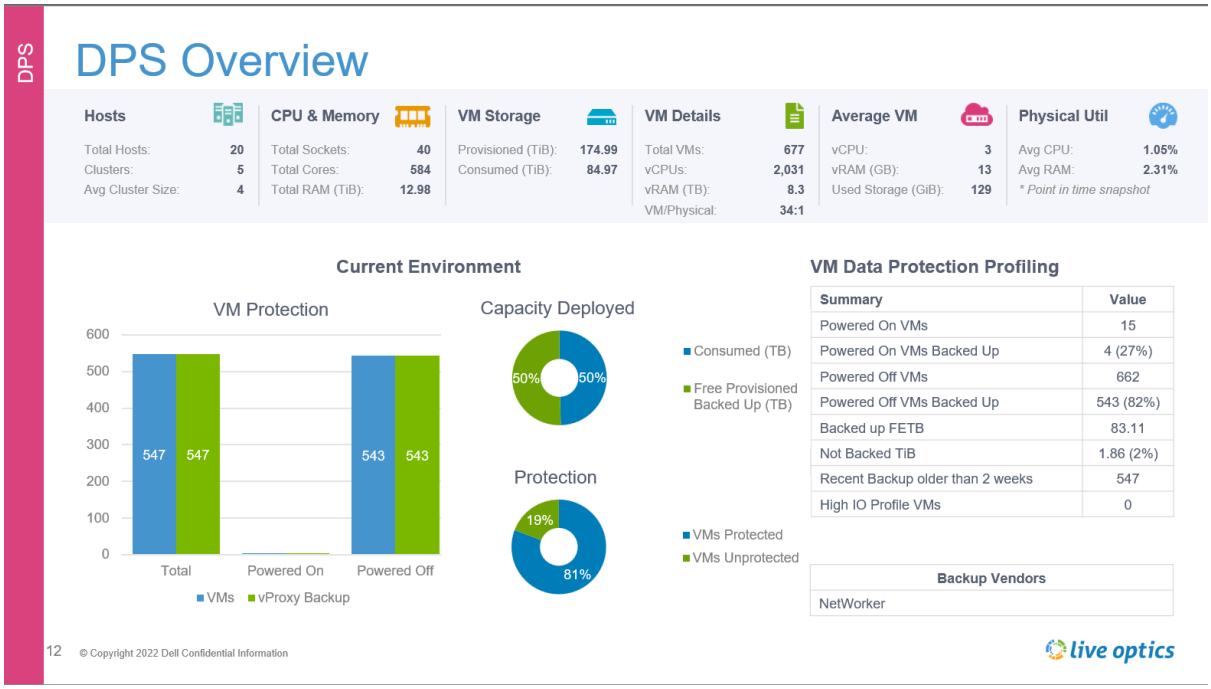



## Read an AIR Report (VMware only)

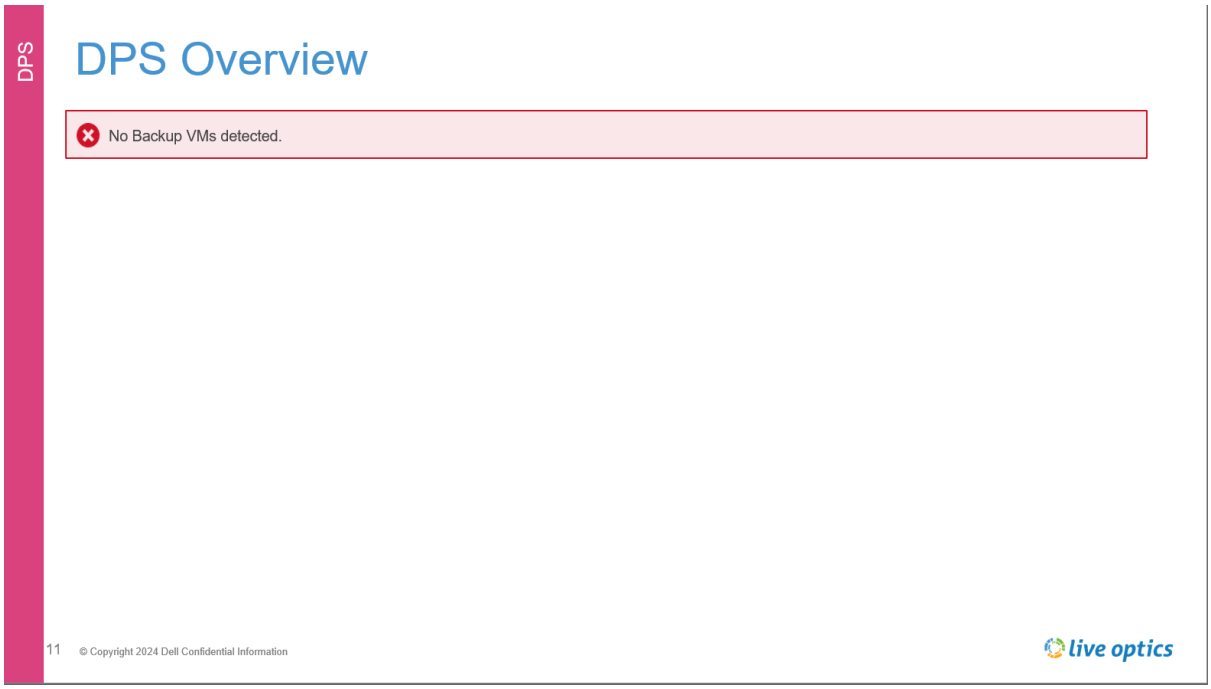
AIR reports are available for deployments using VMware servers. Click the **Reports** tab on the project view screen and ensure the **AIR** report and **VMware** options are selected before you download the reports.



Once the AIR report is downloaded, open it, and locate the **DPS Overview** slide.




If the slide is not available, you might see the following slide instead.

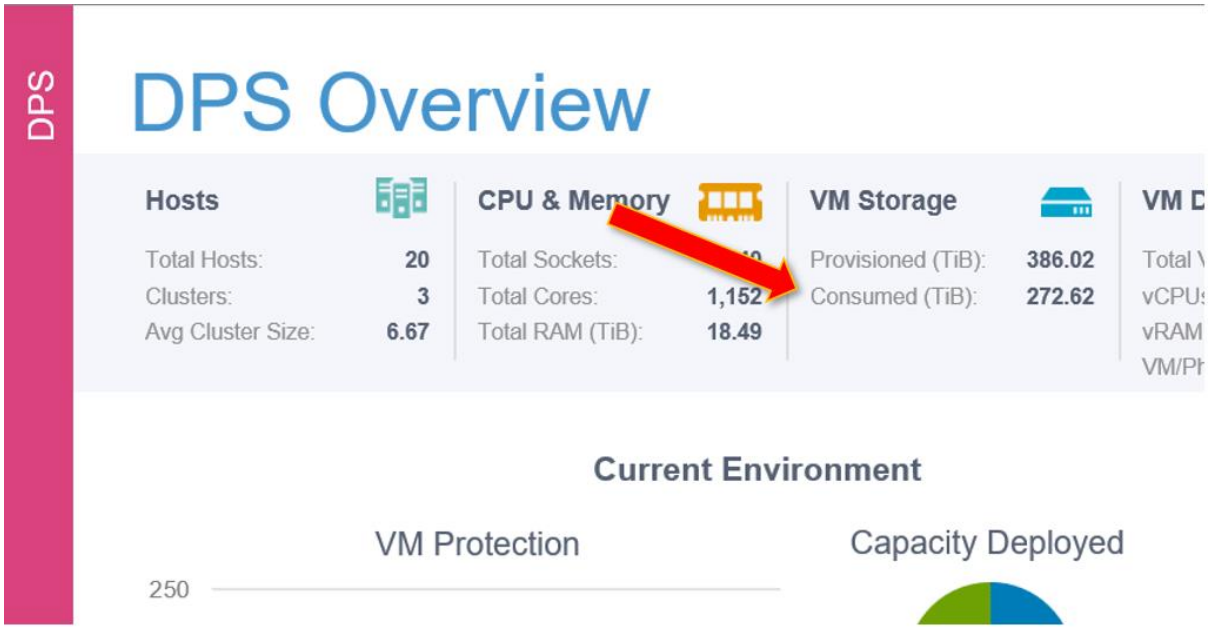



**NOTE:** If no backup VMs are detected, Optical Prime was unable to identify a backup vendor. If you have an existing backup vendor and do not see data on the DPS Overview slide, contact support@liveoptics.com. FETB capacity can still be calculated using an Excel Spreadsheet. See Using an Inventory Mode Collection for more information.

The DPS Overview slide contains valuable information including:

- Existing backup vendors
- Total provisioned size of VMs
- Total consumed size of VMs
- The consumed size of VMs currently being backed up
- The consumed size of the VMs currently *not* being backed up
- Number of VMs that have not been backed up in the past two weeks
- VMs with high IO profiles (>1000 IOPS)
- Powered off vs powered on VMs

To find the most conservative FETB capacity value, use the *VM Storage Consumed (TiB)* value.



# Use RVTools to Measure FETB Capacity

The following section describes how to:

- Download RVTools
- Complete an RVTools collection
- Upload the RVTools collection results to Live Optics
- Find the FETB capacity and other relevant data protection information

> **NOTE:** RVTools supports VMware deployments only. If your environment contains bare-metal, physical servers running Windows or Linux operating systems, they must be assessed separately, using Optical Prime or RAPID Discovery.

## Download RVTools

Visit https://www.rvtools.com for information and documentation on downloading and running RVTools.

## Complete an RVTools Collection

See How to Download and Run RVTools for a video tutorial.

## Upload the RVTools Collection Report to Live Optics

When the RVTools collection is complete, export the Excel spreadsheet report. You must upload this report to Live Optics where an AIR report is generated using the results of your collection.

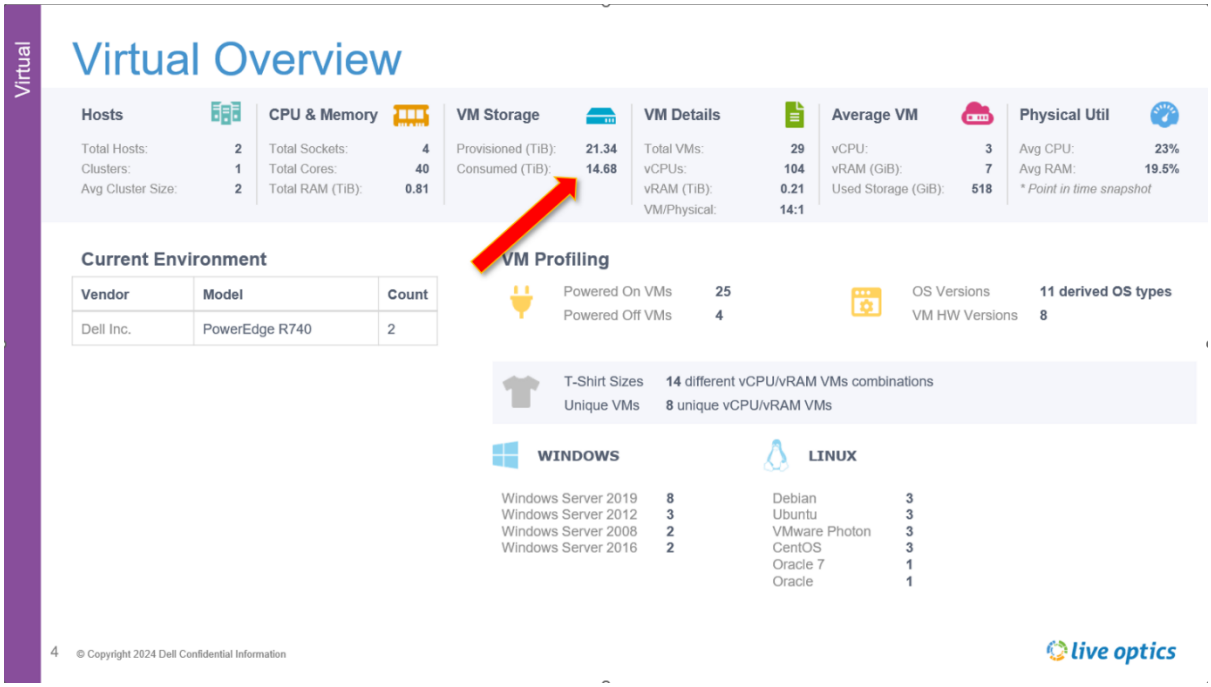
> **NOTE:** Do not edit the Excel spreadsheet before uploading it to Live Optics. The content of the spreadsheet must be consistent with the original RVTools report. Edits to the spreadsheet may cause errors during processing.

1. Log on to the Live Optics portal: https://app.liveoptics.com.
2. Under **Start a New Project**, select **Upload Files**.
3. Select **Upload RVTools Excel**.
4. Enter a **Project Name** and click **Browse** for the Excel spreadsheet exported from RVTools or drag and drop your project.
5. Click **Create Projects** to generate an AIR report.

## Find the FETB Capacity

### Using an AIR Report

Open the AIR report and locate the **Virtual Overview** slide. The *VM Storage Consumed (TiB)* value is the FETB capacity. This value excludes the *whitespace* that represents free space on the virtual disks as seen by the VMs. Whitespace is capacity allocated to the virtual disk which is currently not in use. By excluding the whitespace, the FETB capacity calculation is more accurate.




## Using the RVTools Excel Spreadsheet

You can also calculate the FETB capacity manually from the RVTools Excel spreadsheet. The most accurate FETB capacity calculation comes from the used capacity as reported by the guest VMs, which must have VMware Tools installed and be operating correctly. This data can be found in the **vPartition** tab, which lists each disk as seen by the guest VMs. The *Consumed MiB* column is the used capacity for each of the disks. In most cases, the sum of the *Consumed MiB* column is the FETB capacity for the system.

However, if there are VMs which do not have VMware Tools installed, they are not represented in the *vPartition* tab. For those VMs, you must use the **vDisk** tab, and use the *Capacity MiB* column to calculate the FETB capacity. Make sure you do not double count, as every row in the *vPartition* tab has a corresponding row in the *vDisk* tab. Include only the *vDisk* rows that are not represented in the *vPartition* tab.

If data is available in the *vPartition* tab, it is preferable over that in the *vDisk* tab. The *vPartition* tab data does not include whitespace which represents free space not used by VMs.

# Use RAPID Discovery to Measure FETB Capacity

The following section describes how to:

- Complete a RAPID Discovery collection
- Find the FETB capacity for Windows and Linux systems

## Before You Begin

- Download the latest version of the Live Optics collector. See Download the Live Optics collector or Download the Live Optics collector (Linux only) for more information.
- Have the relevant log on credentials to connect to your servers using WMI or SSH.

## Complete a RAPID Discovery Collection

- See Complete a RAPID Discovery collection for information on running a RAPID Discovery scan.

- See RAPID Discovery Demonstration for a video tutorial on running a RAPID Discovery scan.

## Find the FETB Capacity

### Using the RAPID Discovery Excel Spreadsheet

Once the servers have been identified and scanned, export the Excel spreadsheet.

- To calculate the FETB capacity for **Windows** systems, locate the **Windows Logical Disks** tab and subtract the sum of the *Size GiB* column from the sum of the *Free GiB* column. This is the FETB used capacity of the Windows systems.

- To calculate the FETB capacity for **Linux** systems, locate the **Linux File Systems** tab. The FETB used capacity of the Linux systems is the sum of the *Used GiB* column.