

HPE CLOUDPHYSICS

Customer user guide

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WHAT IS HPE CLOUDPHYSICS?

HPE CloudPhysics is a SaaS-based Big Data analytics platform for virtualized infrastructures. HPE CloudPhysics provides data-driven insights to improve IT performance, ROI, and data protection through analysis of IT metadata. This platform allows correlation of various types of data, advanced analytics and modeling, and comparison of metrics and statistics against those derived from the global customer base. HPE CloudPhysics is also extremely robust for customer environments and far exceeds the capabilities of mainstream analysis tools.

With HPE CloudPhysics, you can dramatically improve your understanding of your IT environment, reduce risk of waste and downtime, and expand your ability to convey to others how well your IT operations are functioning.

How is the solution structured?

An HPE CloudPhysics solution consists of two components:

- A data collector virtual appliance (Observer)
- A cloud-based SaaS platform that supports a broad range of analyses and presents actionable insights via web browser and alerts via email

Metadata is collected from your environment via a lightweight vApp Observer that installs in your VMware® infrastructure. The Observer needs at least read-only privileges and securely sends metadata from your data center to the SaaS platform. Observer setup takes approximately five minutes. It is a streaming application that has no noticeable impact on VMware vCenter® and avoids any adverse load on your infrastructure because it has passed numerous security audits.

The SaaS platform presents a simple, intuitive interface to analysis modules (known as “cards”). Each card is an analytics application—a slice of systems metadata and analytics packaged together as a unit. Cards generate accurate intelligence and provide actionable insights specific to your environment around problems and concerns you want to address. They can be viewed, shared, added to a personal dashboard, and published to members of your team. Sample cards include:

- VM Space Saver
- Datastore Contentions
- Snapshots Space Saver

What problems does HPE CloudPhysics solve?

Most IT organizations have one or more tools to analyze their IT infrastructure. However, there are several significant limitations associated with these types of tools:

- Limited and inflexible views of the data center
- Limited data collected
- Limited analysis and data-driven intelligence provided
- Limited impact due to lack of proactive/predictive insights
- Limited customization
- Limited usage by IT
- Limited usability due to heavy system requirements and need for ongoing maintenance and management

With HPE CloudPhysics, IT professionals can:

- Stop managing local resources demanded by other monitoring applications during an assessment. Many of these applications require large datastore, CPU, and memory resources. The demand on these resources can be eliminated with HPE CloudPhysics.
- Analyze health results via standard or custom analyses that leverage sophisticated modeling to see actionable insights related to a variety of use cases, such as operational hazards, performance tuning, and planning.
- Access the platform securely from anywhere at anytime and share the information however they choose throughout the organization and with service providers.



Three common uses for the HPE CloudPhysics platform include:

- **Improving planning:** In order to determine where IT investment is needed, you must have comprehensive visibility into where resources are currently over- and under-utilized and be able to run simulations on the impact of different future investment scenarios. Questions to ask include:
 - What would be the impact of moving to the cloud?
 - Am I wasting space in my environment?HPE CloudPhysics enables you to improve your planning activities with data-driven intelligent decisions leveraging the unique analytics capabilities of your infrastructure and statistics from the global customer base.
- **Reducing or avoiding operational hazards:** You cannot defend well against what you do not know. HPE CloudPhysics dynamically analyzes your infrastructure, compares it against known best practices and hazards, and offers insights into where you face potential exposure to failures and external attacks. Where are you susceptible to known outages caused by conflicts between components in your infrastructure? What is your exposure to vulnerabilities? Where are you misconfigured in ways that might increase the risk of an outage? HPE CloudPhysics dramatically reduces your risk of hazards by arming you with insights to help you pre-empt problems and avoid downtime.
- **Maximizing performance:** Is your infrastructure free from latency and contention while providing all the performance your users need? If you are like almost all IT professionals, the answer is probably an emphatic “No.” One of the biggest challenges in maximizing performance is identifying the sources of bottlenecks, something HPE CloudPhysics excels at. By deploying an HPE CloudPhysics solution, you can quickly identify sources of contention that are sapping performance. An HPE CloudPhysics solution also can identify potential sources of future contention, ensuring your infrastructure stays optimized.

Who should use HPE CloudPhysics, and how can they get the most from it?

HPE CloudPhysics provides value to all levels of the IT organization:

- **Executives and IT management** can improve visibility into their operations and gain an understanding of comparative health. They can also leverage scenario testing for new IT initiatives (such as cloud adoption or spending on flash), justify investments with post-installation metrics, and see where potential hazards exist. All of these insights provide the basis for action that will enhance IT robustness and reduce cost and risk.
- **Architects** can leverage the HPE CloudPhysics platform to plan for updates or changes to the existing infrastructure. By looking at current hazard exposure, sub-optimal performance, and the return on various change options, they can find the optimal path for improving IT now and in the future. They can also use HPE CloudPhysics to unearth and address areas to optimize infrastructure cost, risk, and performance.
- **Administrators** can use data-driven insights from HPE CloudPhysics on a daily basis to improve uptime, avoid hazards, and maximize performance of the existing infrastructure. They can pinpoint specific performance challenges, inefficiencies, and risks embedded in their increasingly complex environments. They are also able to share information from the platform and generate reports showing how they compare to the global HPE CloudPhysics customer base across a variety of metrics.

GETTING UP AND RUNNING

This section describes the system requirements, how to set up an account, and the process to download/deploy/configure the Observer.

System requirements

VMware vCenter 4.1 to 7.0. All VMware ESX®/VMware ESXi™ host versions supported by these VMware vCenter versions are compatible.

Google™ Chrome is the officially supported web browser. You should have good results, however, with any web browser that supports full HTML 5 compatibility.

Registration

To register for an account with HPE CloudPhysics, follow these steps:

1. An HPE CloudPhysics partner will invite you to participate in the platform via email.
2. Click **Activate Now** in the email and complete your registration.
3. Accept the user agreement.
4. Log in.



Installation

Your HPE CloudPhysics account needs to connect to your VMware vSphere® server to collect the metadata required to produce your analytics. To do this, you need to install the Observer data collection virtual appliance.

When you log in to the [HPE CloudPhysics SaaS portal](#) as a customer without an Observer vApp, HPE CloudPhysics prompts you to download and connect an Observer vApp. For customers with additional vCenters to connect, you can repeat this process. You will need one Observer vApp per VMware vCenter Server®.

The Observer vApp can be downloaded in Open Virtualization Format (OVF) or Open Virtualization Appliance (OVA) format. Most customers use OVF. After you install the formats, there is no difference between them.

TABLE 1. Optional file formats for downloading the Observer vApp

Format	Description
OVF	A lightweight appliance web download format from a hosted URL
OVA	A full appliance media format that must be downloaded in advance of install

At all times, you can find the Observer vApp installation files in your HPE CloudPhysics instance on the Observer Status screen. This is under the Connectivity Status icon, or you can browse to <https://app.CloudPhysics.com/observer-status>.

DEPLOYING THE OBSERVER

To deploy the Observer, follow these steps:

1. Get the Observer vApp files (select only one of the following two options):
 - a. **OVF format URL:** <https://download.CloudPhysics.com/observer/observer.ovf>

NOTE

Do not click the URL. This will only render meaningless data in your browser. Retain this URL for use in vSphere Client. Copy and paste this URL in your computer clipboard for later use.

- b. **OVA format (installation media format):** <https://download.CloudPhysics.com/observer/observer.ova>

To use this format, download this file to your local computer for installation.

2. In the vSphere Client, navigate to **File (Action for web client) → Deploy OVF Template**. Note that this works for OVA formats as well.)
3. Browse to your downloaded HPE CloudPhysics OVA file or supply the URL to the OVF file, and then click **Open**.
4. Proceed with standard prompts and click **Finish** to deploy.

After the Observer is configured with storage and networking fundamentals in vSphere Client, you will need to complete the configuration by powering on the virtual appliance. To activate and configure the Observer, follow these steps:

1. In vSphere Client inventory, select the Observer virtual appliance and power on the virtual appliance.
2. Open the virtual appliance console view.
3. Configure the HPE CloudPhysics virtual appliance according to the on-screen prompts. This includes entering the following information:
 - c. End-User License Agreement (EULA) acceptance.
 - d. vCenter Server location. Hewlett Packard Enterprise recommends using the fully qualified domain name (FQDN). An IP address will also work.
 - e. vCenter user credentials. See [the next section](#) for details about credential options.
 - f. Registered user ID. (This is the email address you used to register for your HPE CloudPhysics account.) This email address is permanent, so best practice is to create a service account. For example: vsphereadmin@domain.com
 - g. Optional: If needed, provide a network proxy and port number to allow your vCenter Server to reach the internet.
 - h. Optional: If needed, provide proxy server authentication credentials.
4. When configuration is complete, you will see a configuration summary screen. No additional action is needed at this point. Within 15 minutes you will see data and analytics appearing in your HPE CloudPhysics account. Go to <https://app.CloudPhysics.com/> to log in.



User credential details

To get the most out of your HPE CloudPhysics installation, Hewlett Packard Enterprise recommends using a read-only admin credential set associated with a dedicated service account. This allows HPE CloudPhysics to collect all forms of metadata necessary for all advanced analytics.

If there is sensitivity to using administrative credentials during configuration, you can assign a semi-privileged user role. You can create this role to apply the few specific additional privileges required. The resulting role is far less privileged than an administrative user.

Create this user role by following these steps:

1. In the vSphere Client, go to **Roles**.
2. Create a new role. For example: HPE CloudPhysics User
3. Edit privileges and enable (by selecting the check box) the following settings:

NOTE

Depending on the vSphere Client versions, you might find slight variations on these permission names.

- a. Global Service Managers
 - I. Host CIM Interaction (Host.Cim.CimInteraction)
 - II. Host Advanced Configuration (Host.Config.AdvancedConfig)
 - III. Host Configuration Patch (Host.Config.Patch)
 - IV. Datastore Browse (Datastore.Browse)
 - V. Host Configuration Storage (Host.Config.Storage)
 - VI. Permission Defaults (not visible in the vSphere Client user interface). For information only. (System.View, System.Read, and System.Anonymous)
 - VII. Host Configuration Patch (Host.Config.Patch)
 - VIII. Datastore Browse (Datastore.Browse)
 - IX. Host Configuration Storage (Host.Config.Storage)
 - X. Permission Defaults (not visible in the vSphere Client user interface). For information only.
4. Save the settings.
5. Associate a read-only user to also have the HPE CloudPhysics role.
6. Save the settings.

You can now use the user credentials with the required privileges to log in to the HPE CloudPhysics vApp and complete the Observer activation process.



GETTING TO KNOW HPE CLOUDPHYSICS

The HPE CloudPhysics Dashboard is your initial platform experience after sufficient data collection.

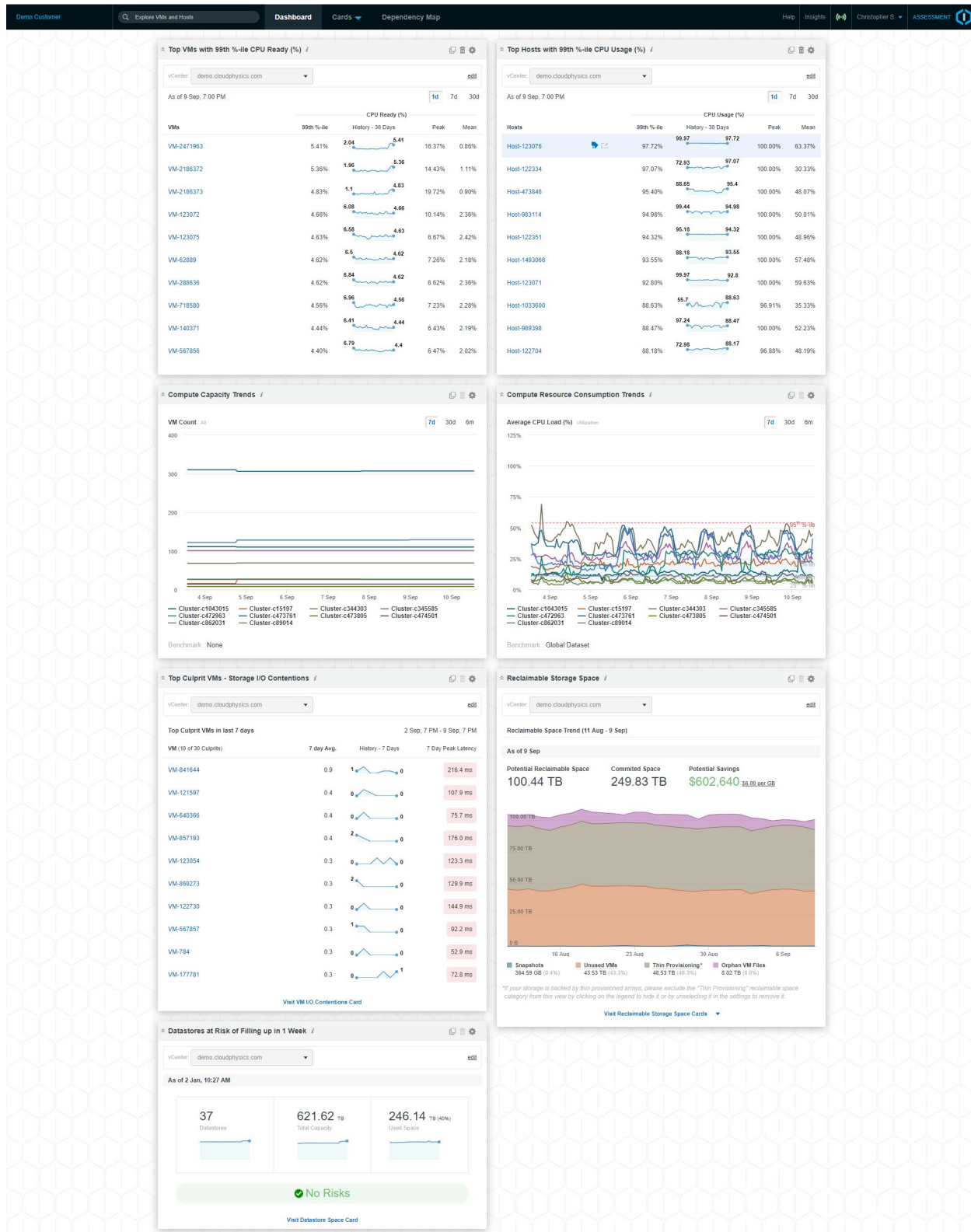


FIGURE 1. The Dashboard view in HPE CloudPhysics after your Observer vApp is connected and sufficient data is collected

Navigation

The Dashboard view is the first screen you will experience in HPE CloudPhysics after your Observer vApp is connected. At the top of this screen (and all screens) is a black navigation bar used to explore the HPE CloudPhysics product. Table 2 details the components of the navigation bar.

TABLE 2. Components of the navigation bar and their functions

Navigation element	Description
VM Explorer Search	Search function for any VM to display a detailed health and performance summary
Dashboard	Display of the current health overview of your environment and default view
Card Deck	Collection of HPE CloudPhysics cards organized by topic within the assessment deck
Daily Insights	Collected, updated alerts across all cards that apply to your data center
Global Insights	Selection of data center metrics, baselined against the global user data set
Connection Status	A status icon to provide connection status of your vApps to the cloud
User Profile	Log out location; can be used to invite additional users to join your team

To view the connection status, click the **Signal** icon located next to the user name. It links to the Observer Status page, which lists all installed Observers and provides status for each, describing the current state of connection, last data upload, and latest data available times.

The Observer Status page also provides links to the vApp installation media, installation instructions, and troubleshooting details. Inactive Observers that are no longer wanted can be deleted from this screen by admin users.

The Connection Status icon changes color corresponding to the status of the installed vApps:

- **Green:** All Observers are online and sending data.
- **Red:** All Observers are offline.
- **Orange:** Some number of Observers are offline, others are online.
- **White with Red Stripe:** No Observer is yet installed.

Your currently entitled assessment is displayed in the header in the card deck. For questions regarding your assessment, contact CloudPhysics@hpe.com.

Summary panel

When you log in, your initial experience is the Summary panel. The Summary panel collects and presents important, summarized metrics from your data center in panel modules. These panels show various core metrics and focus on data center health and trends.

HPE CloudPhysics provides several Summary panels by default that appear upon login. Each panel allows you to click **Card** in the top toolbar to investigate the summary content in the full card view. This allows for custom filtering and deep dives into the underlying data summarized in the panel view.

VM Explorer

The VM Explorer view is a detailed exploration mode for any VM in the inventory. This view provides deep visibility to configuration, changes, notifications, and performance. All relevant metrics and events are cross correlated to allow the vSphere administrator to investigate and visually discover corresponding changes and outcomes to the VM.



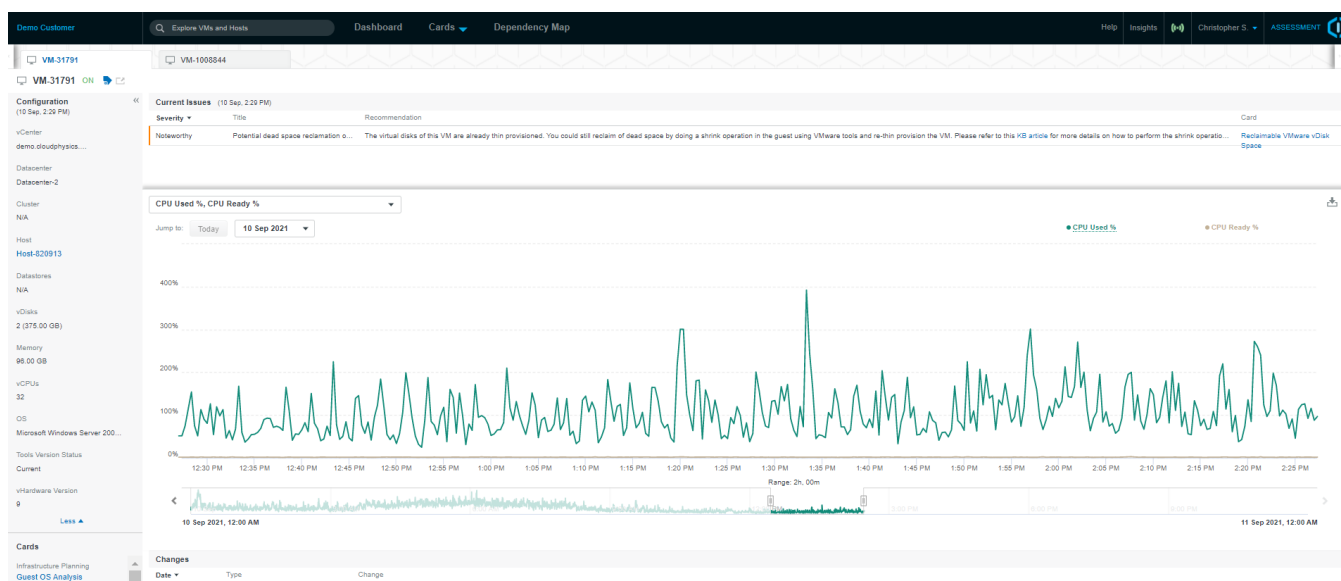


FIGURE 2. The VM Explorer view, accessed by clicking the VM Explorer Card in the Summary panel

VM Exploration mode is accessed in the search field in the navigation bar. To search for a VM, begin entering text. HPE CloudPhysics helps you locate the correct VM with type-ahead autocomplete. Upon selection, a detailed VM Exploration mode is displayed for the VM chosen. This view includes core configuration, change, notifications, and performance views for the VM. This data covers a 30-day time range from the present time backward.

VM configuration

At the core of every VM is a set of basic configurations that control access from the VM to CPU, memory, and storage. These components are displayed on the left-hand side of the VM Explorer screen. In addition, the screen also shows the latest VM cluster, host, and datastore locations. Host and datastore location can change with time as VMs are migrated. Lastly, the screen shows the guest operating system and VM tools status.

Changes log

The Changes view provides a list of recent changes that have been made to this VM over the time range. These can include VMware vSphere® vMotion® and VMware vSphere® Storage vMotion® events, snapshot creation, deletion, and consolidation, and VM creation, deletion, modification, and power state changes. Use this panel to see the change log for the VM.

Issues notifications

All notifications for the VM selected are also displayed in time order. You can see all issues over the time range, color-coded by severity. Clicking each issue reveals additional details.

Performance view

The VM Performance view is positioned in the center of the Explorer screen and displays VM performance metrics over the selected time range. These selectable metrics include usage statistics for CPU, memory, network, and storage. Metrics are shown in granular detail in two-hour selectable ranges. A full 30-days of metrics visibility is available. VMs that provide fewer than 30 days of metrics show as much information as is available. This is generally due to recent VM power-ons or newly created VMs with less than a full 30-day history.



TABLE 3. VM performance metrics displayed on the Explorer screen

Subject	Metric displayed
CPU	CPU % Ready
CPU	CPU % Demand
Memory	VM Memory Consumed
Memory	Total Reclaimed VM Memory (Swapped, Compressed, Swapped to SSD, Ballooned)
Network	Network Transmits (for all vNICs)
Network	Network Receive (for all vNICs)
Storage	VM Total Latency
Storage	Total MB/s (for all virtual disks)

Beneath the detailed performance view is an extended spark line performance view. This timeline view provides a two-week slider window to narrow into a new granular performance window.

Card Assessment Deck view

The Deck view is the classic HPE CloudPhysics card-based view. In this view, you have direct access to cards available within the assessment. Decks organize cards by topic and use case. Decks are the primary navigation within HPE CloudPhysics after you leave the Summary panel.

Decks are underneath the main navigation bar. A quick-jump card selector is also available by clicking the triangle next to the deck name.

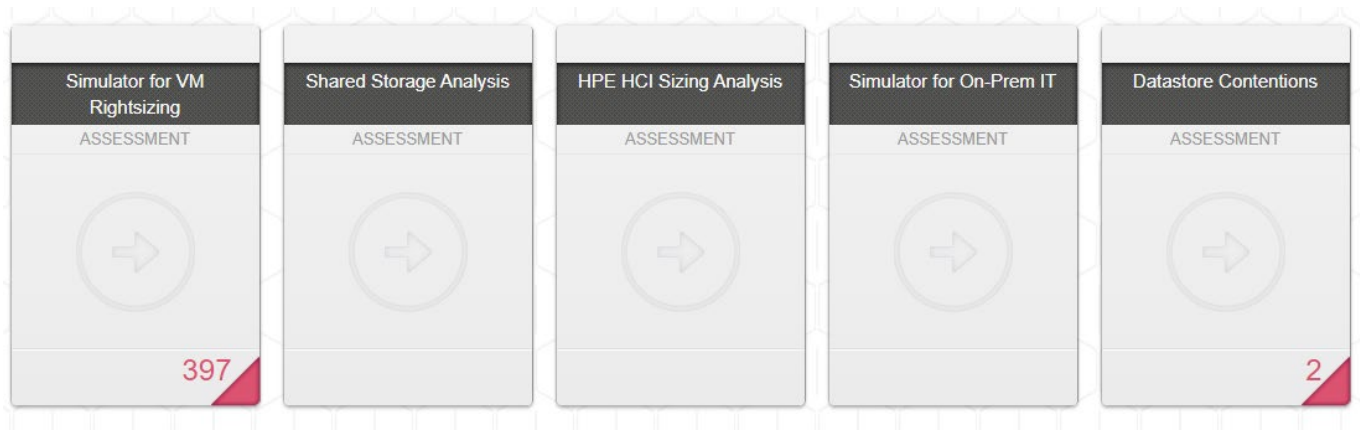


FIGURE 3. Sample cards available in the Deck view

Card face

When you view the deck, you will see all cards in the deck listed in rows, as shown in Figure 1. Each card is shown as a vertical rectangle with the name of the card displayed. Also displayed is the edition entitlement of the card. Some cards display a summary, high-level metric on the face. Red Need Attention and amber Noteworthy notifications are also summarized on the card face. Click these links to enter the card with a focus on the notification results.

TABLE 4. Descriptions of the available card decks

Deck	Description
Infrastructure Planning	Inventory and health-focused cards plus cloud-cost calculators
Performance Troubleshooting	Performance issues identification including configuration
Storage Space Management	Virtual storage reclamation opportunities and health



Card filters

On the left-hand side of all card views is a filter bar that allows you to custom-select the inventory to apply to the card. Upon selection, all summary charts, rows, and results are instantly updated. This allows you to drill down into locations, inventory, and datastores. In addition, the search field allows for RegEx-style searches of results such as SQL or Microsoft Exchange.

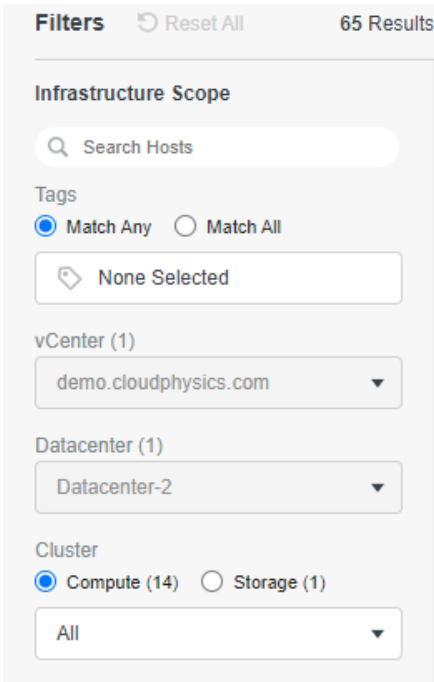


FIGURE 4. Card filters bar

Card name and description

Each card is named for the use case it presents. After each name is a gray information icon. Hovering over this information icon displays a description of the card.

Summary charts

Many HPE CloudPhysics cards provide summary charts. These show summary views of the full result set, which in many cases can summarize hundreds of VM or host results. Summary charts can include pie charts, counts, and graphs. Many chart elements reveal additional data if you hover over the chart images.

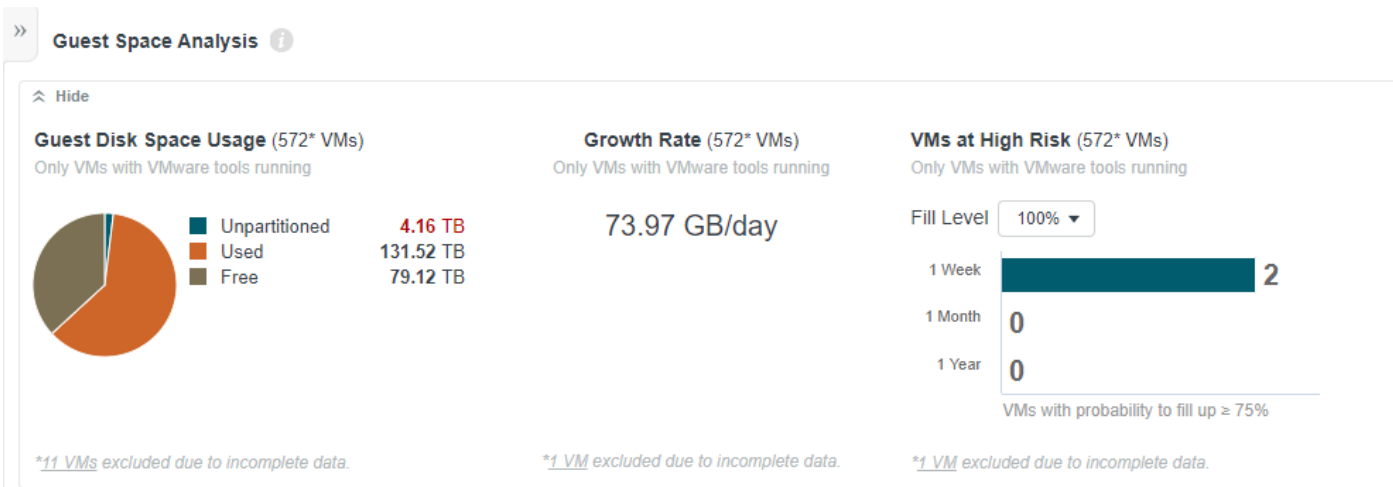


FIGURE 5. Summary chart for guest space analysis



Filtering and tagging

You can apply tags to all objects within the platform. You can use these tags in card filters to work with a limited selection of objects. You can use tags to demote location, applications, business units, or grouping-based usage. Some examples of commonly used tags are Development, Test, QA, Staging, Production, and Retired.

To add a single tag to an object, hover over an object name in a table view. A small Tag icon will appear to the right. Click this icon to open a pop-up dialog box that allows the administrator to add and edit tags associated with an object.

You can tag multiple objects at the same time with a single tag by clicking the **Tag** icon located in the Object Name column header.

You can use tags within the filter with an **Any** or **All** option to select subsets or multiple sets of objects.

Host Name		Server Model	Hardware Compatibility
Host-530610		Lenovo System x3750 M4	Unsupported by 5.5 U3
Host-529687			Unsupported by 5.5 Patch 5 Pr...
Host-1042856			Unsupported by 5.5 VMSA-201...
Host-989398			Unsupported by 5.5 Express P...
Host-983114			Unsupported by 5.5 Express P...
Host-826162			Not in HCL
Host-820913			Unsupported by 5.5 U3 VMSA-...
Host-819446			Unsupported by 5.5 U3 VMSA-...

FIGURE 6. Adding and editing tags

Need Attention, Noteworthy filter buttons

Important features of advanced HPE CloudPhysics cards are the Notification filter buttons. HPE CloudPhysics continually monitors the environment and identifies alerts corresponding to the health of the environment. Red Need Attention notifications are the most severe and warrant immediate review. Amber Noteworthy notifications indicate lower severity issues that should also be reviewed at a lesser severity. You can restore all results by clicking the **All** button.

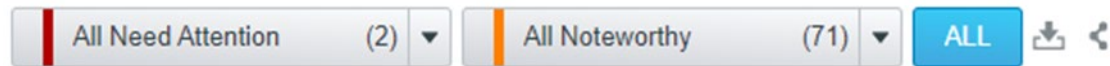


FIGURE 7. Notification filter buttons showing red Need Attention notifications and amber Noteworthy notifications

In the expandable table results, explanations give full details about why a result was triggered. These Need Attention and Noteworthy buttons correspond directly to the card face corner notifications.



Download and share

These features are available for HPE internal teams and HPE partners only. To download the metrics from a card, refer to your HPE team or partner.



FIGURE 8. The Download and Share icons

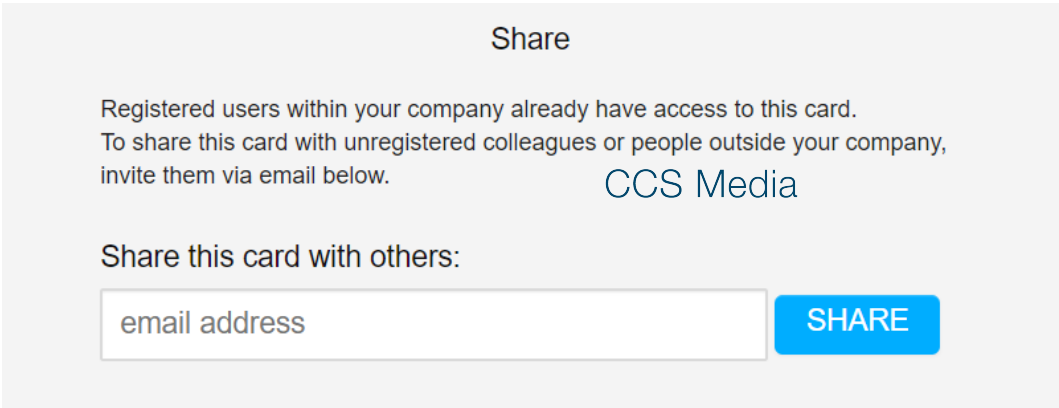


FIGURE 9. Share dialog screen

Table results

All cards include tabular results according to the filters set by the user. By default, all results are shown. Table results feature summary results counts and sortable columns. The data shown is determined by the use case of the card.

If the result corresponds to a Need Attention or Noteworthy notification, the edge of the row is colored accordingly.

VM Name	Guest OS	End of Support	32/64 bits	vCPU	vRAM	Tools Installed
VM-123047	Windows Server 2008 R2	2 years ago	64-bit	2	32.00 GB	Installed
VM-1719946	Linux 3.16.0-5-amd64 Debian ...	6 years ago		2	2.00 GB	Installed
VM-1719948	Linux 3.16.0-9-amd64 Debian ...	6 years ago		2	16.00 GB	Installed
VM-1881713	Windows Server 2003 Standard	6 years ago	32-bit	2	4.00 GB	Installed
VM-485503	Red Hat Enterprise Linux 4	7 years ago	32-bit	2	4.00 GB	Installed
VM-122301	CentOS 4/5/6/7		64-bit	4	4.00 GB	Installed
VM-1223024	FreeBSD		64-bit	2	2.00 GB	Installed
VM-1223029	FreeBSD		64-bit	2	2.00 GB	Installed
VM-122652	CentOS 4/5/6		32-bit	1	256.00 MB	Installed
VM-1237000	Windows Server 2016		64-bit	1	4.00 GB	Installed
VM-1237001	Windows Server 2016		64-bit	1	4.00 GB	Installed
VM-1237002	Windows Server 2016		64-bit	8	48.00 GB	Installed
VM-1238149	Windows Server 2016		64-bit	1	4.00 GB	Installed
VM-1240930	FreeBSD		64-bit	2	2.00 GB	Installed
VM-1255584	Windows Server 2016		64-bit	4	16.00 GB	Installed

FIGURE 10. Sample table results



Expandable rows

Many HPE CloudPhysics cards reveal additional, detailed information to support the use case of a card. This helps with deeper visibility and understanding of the data shown in the results. In cases where result rows are flagged with Need Attention or Noteworthy notifications, the expanded row will reveal specific details for the notice. Expandable rows can also contain an Informational type of message. If more than one notification is present, you can view them all one-at-a-time in a carousel. A toggle on the left-hand side of the result row opens an expandable row.

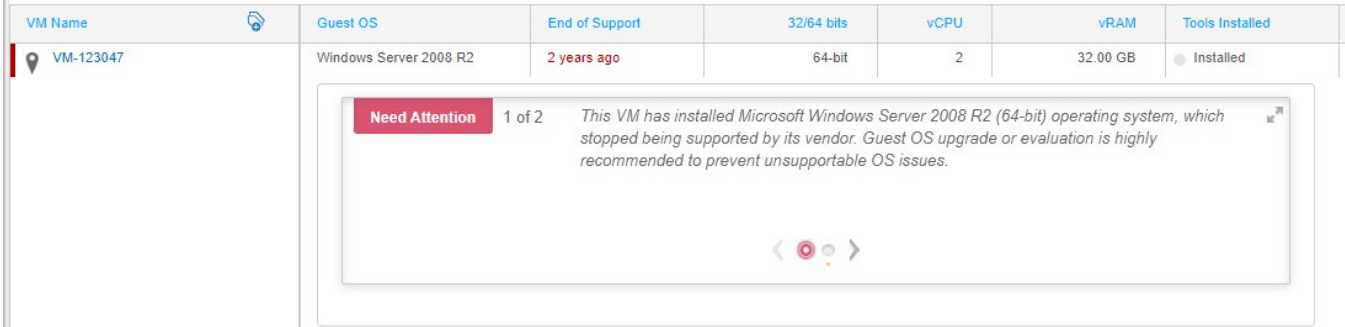


FIGURE 11. Expanded row showing detailed information about a Need Attention notification

To help the admin quickly resolve issues and close the loop, HPE CloudPhysics provides an object-relevant hyperlink, called a “vLink,” to the vSphere (Web) client. This links HPE CloudPhysics to the relevant asset screen in the vSphere Client based on your starting point within HPE CloudPhysics. No more searching around and losing context while trying to get from one location to another. Upon linking, a new browser tab opens. Authentication and security to log in to your vSphere Client is managed via your vSphere credentials, which maintain environmental security.

CUSTOMER ADMINISTRATION

As an admin user, you can invite additional co-workers to your HPE CloudPhysics account. This is accomplished in the User Management panel. Access to this panel is limited to admin users. You can find this panel after you are logged in by clicking your name in the navigation bar. Click **User Management** to enter this administration location.

After you see the User Management page, you can invite co-workers by email address. Upon receipt of the invitation, the invited person will be required to complete a registration. If invitees do not see the email that is sent, ask them to first check their email spam folder. If they still cannot find it, you can click **Re-send invitation**. Re-sending an invitation deactivates any previous invitation. Your co-worker must use the latest email.

If you want to elevate the invited user’s access to admin, you can do this after the user completes registration. By default, every invited person has a user role.

User roles

HPE CloudPhysics has two types of user roles on the platform:

- **Admin** is the super-user role in an HPE CloudPhysics environment. By default, the first user who creates the HPE CloudPhysics account is the Admin. This is often the user who initially signed up for HPE CloudPhysics and installed the Observer virtual appliance. Additional admin users can be designated. Only an existing admin user can invite and designate another user as an admin.
- **User** is a non-admin member of your company on HPE CloudPhysics.

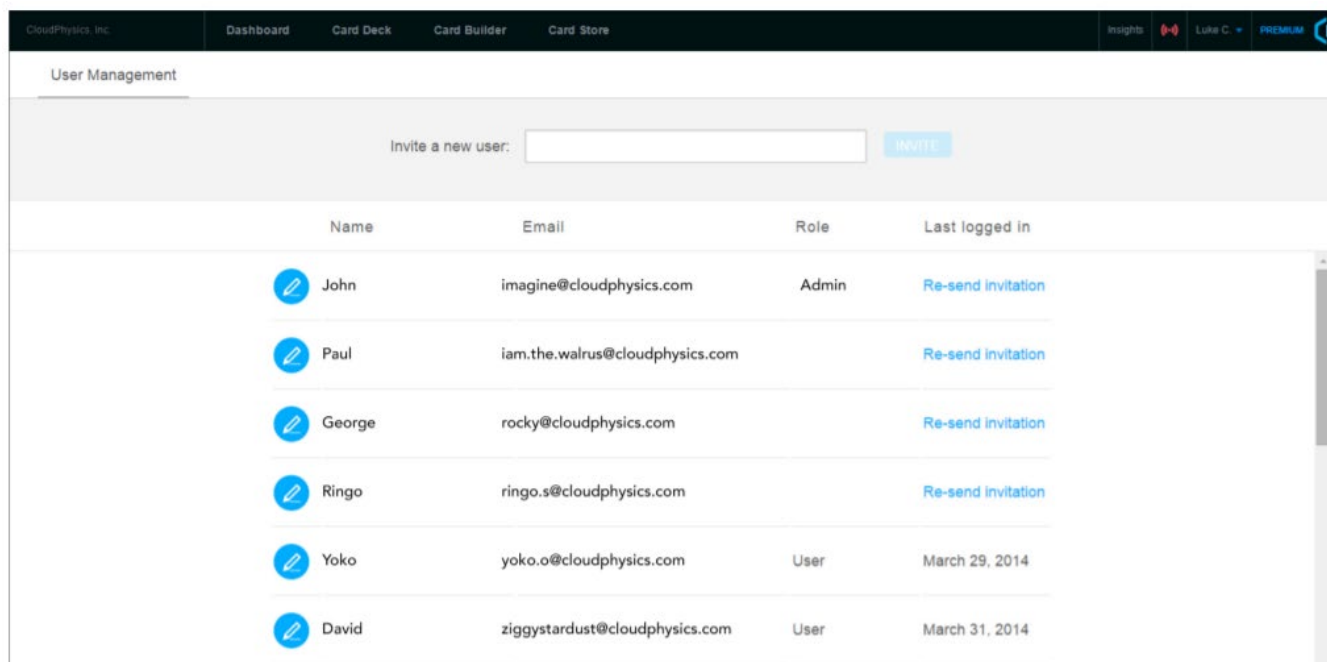
TABLE 4. Permissions by role

Role	Permissions
Admin	• Invite additional users to the account for your company via the user management interface • Change user roles per registered user • Deactivate a user • All permissions available to a user
User	• Log in to a portal account for your company • User has all benefits of the platform given by your license edition



Changing roles

Admin users can change the role of any registered user by clicking the **blue pencil icon**. This will show a dialog that allows for role change and user deactivation.



Name	Email	Role	Last logged in
 John	imagine@cloudphysics.com	Admin	Re-send invitation
 Paul	iam.the.walrus@cloudphysics.com		Re-send invitation
 George	rocky@cloudphysics.com		Re-send invitation
 Ringo	ringo.s@cloudphysics.com		Re-send invitation
 Yoko	yoko.o@cloudphysics.com	User	March 29, 2014
 David	ziggystardust@cloudphysics.com	User	March 31, 2014

FIGURE 12. Click the blue pencil icon to open a dialog window that enables you to perform role change and user deactivation tasks