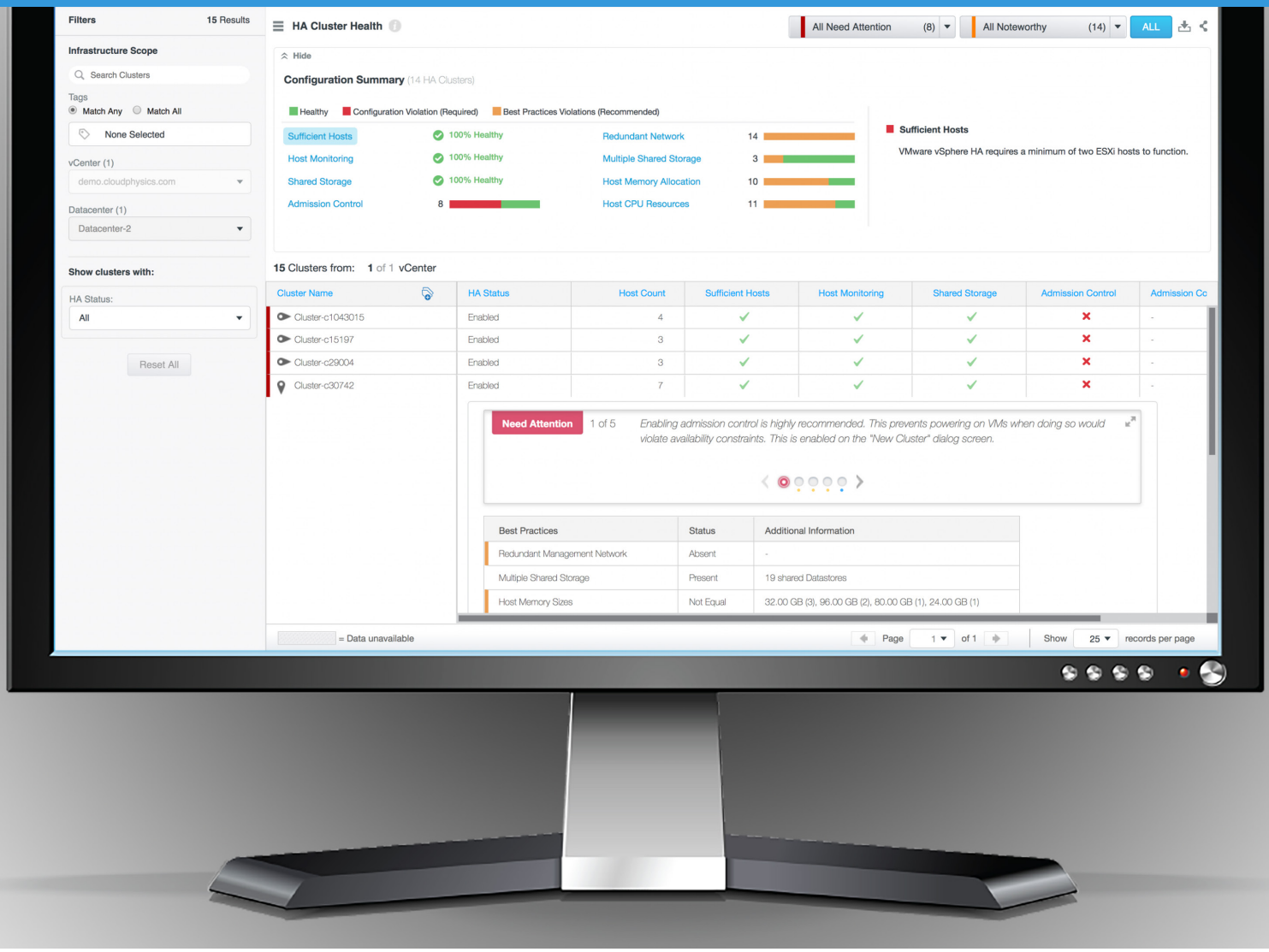
CLOUDPHYSICS

User Guide Spring 2018



Data-Driven Insights For Smarter IT

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What is CloudPhysics?

CloudPhysics is a SaaS-based Big Data analytics platform for virtualized infrastructures that 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 our global customer base. CloudPhysics is also extremely customizable for your environment and far exceeds the capabilities of mainstream analysis tools.

This unique platform activates within 5 minutes, allowing vSphere admins use CloudPhysic's data-driven insights immediately to improve uptime, avoid hazards, and maximize performance of their virtual infrastructure.

With CloudPhysics, you 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?

The CloudPhysics solution consists of two components: (1) a data collector ("Observer") virtual appliance, and (2) 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 5 minutes (see below). It is a streaming application which has no noticeable impact on vCenter, and which avoids any adverse load on your infrastructure, having passed numerous security audits.

The SaaS platform presents a simple, intuitive interface to analysis modules ("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 are looking to address. They can be viewed, shared, added to a personal dashboard, and published to members of your team. Example cards include:

- Cost Calculator for AWS
- VM Space Saver
- Datastore Contentions
- "Snapshots Gone Wild"

You can also create custom cards (analytics and reports) with Card Builder, then share them with your organization or post them to Card Store, a great place to contribute to and partake in the wealth of knowledge and expertise of the CloudPhysics customer community. Today, more than 200 community-generated cards are available.

What problems does CloudPhysics solve?

Most IT organizations have one or more tools to analyze their IT infrastructure. But there are several significant limitations associated with those tools:

- Limited and inflexible views of the data center
- Limited data they collect
- Limited analysis and data-driven intelligence they provide
- 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 CloudPhysics, IT professionals can:

- Stop managing local resources demanded by other monitoring applications. Many of these applications require large datastore, CPU and memory resources, which can all be eliminated with 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 CloudPhysics platform include:

1. **Improving planning:** In order to determine where IT investment is needed, one 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. What would be the impact of moving to the cloud, and what is the optimum way to do that? Am I wasting space in my environment? CloudPhysics enables users to improve their planning activities with data-driven intelligent decisions leveraging the unique analytics capabilities of their infrastructure and statistics from our global customer base.

2. **Reducing or avoiding operational hazards:** You can't defend well against what you don't know. 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 may increase the risk of an outage? CloudPhysics dramatically reduces your risk of hazards by arming you with insights to help you pre-empt problems and avoid downtime, making you an IT hero.

3. **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 CloudPhysics excels at. By deploying our solution, you can quickly identify sources of contention that are sapping performance. Our solution also can identify potential sources of future contention, ensuring your infrastructure stays optimized.

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

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 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 CloudPhysics to unearth and address areas to optimize infrastructure cost, risk, and performance.
- Administrators can use CloudPhysics's data-driven insights 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 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 - 6.0. All ESX/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 which supports full HTML 5 compatibility.

Registration

To register for an account with CloudPhysics, use the following steps:

1. An CloudPhysics Partner will invite you to particiapte in the platfrom via email or by visiting https://struxureon.com/get-started/.
2. You will receive an automated email to the address you provided.
3. Click "Activate Now" in the email and complete your registration.
4. Accept the User Agreement.
5. Log in.

Installation

Your CloudPhysics account next 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 data collection virtual appliance called the Observer.

Upon log in to the CloudPhysics SaaS portal, https://schneider.cloudphysics.com/ as a customer without an Observer vApp, CloudPhysics will prompt 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 vCenter Server.

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

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

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

A video detailing the installation process can be viewed online at: https://youtu.be/3nvxL_CPL9k

Deploying the Observer

1. Get the Observer vApp files (select only one of the following two options):
   - OVF format. URL https://download.cloudphysics.com/observerschneider/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, described below. Copy and paste this URL to your computer clipboard for use.
   - OVA format (installation media format) https://download.cloudphysics.com/observerschneider/observer.ova. To use this format, download this file to your local computer for installation use.
2. In the vSphere Client, navigate to "File (Action for web client) > Deploy OVF Template..." (Note: this works for OVA formats also).
3. Browse to your downloaded CloudPhysics OVA file, or supply the URL to the OVF file, and click "Open".
4. Proceed with standard prompts and click "Finish" to deploy.

Once configured with storage and networking fundamentals in vSphere Client, you will need to complete the configuration by powering on the virtual appliance.

Activating and configuring the Observer.

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 CloudPhysics virtual appliance according to the onscreen prompts. This includes entering the following information:
   - End-User License Agreement (EULA) acceptance.
   - vCenter Server location. We recommend using the fully-qualified domain name (FQDN). An IP address will also work.
   - vCenter user credentials. See details below for credential options.
   - Registered user ID (This is the email address you used to register for your CloudPhyics account) This email address is permanent so best practice is to create a service account. E.g. vsphereadmin@domian.com.
   - Optional: If needed, provide a network proxy and port number to allow your vCenter Server to reach the Internet.
   - Optional: If needed, provide proxy server authentication credentials.
4. You're done! Upon configuration completion, you will see a configuration summary screen. No additional configuration is needed at this point.

Within 15 minutes you will see data and analytics appearing in your CloudPhysics account. Go to https://schneider.cloudphysics.com/ to login.

User credential details

To get the most out of your CloudPhysics installation, we recommend using a read-only admin credential set associated with a dedicated service account. This allows CloudPhysics to collect all forms of meta-data necessary for all advanced analytics.

If there is sensitivity to using administrative credentials during configuration, a semi-privileged user role can assigned. This role can be created to apply the few specific additional privileges required. The resulting role is far less privileged than an administrative user.

This user role can be created as follows:

1. In vSphere Client, go to Roles
2. Create a new role. E.g. CloudPhysicsUser
3. Edit privileges, and enable (check off) the following. Note: Depending on versions and vSphere Client versions, you may find slight variations on the permission names below.
    - Global Service Managers
        - Host CIM Interaction (Host.Cim.CimInteraction)
        - Host Advanced Configuration (Host.Config.AdvancedConfig)
        - Host Configuration Patch (Host.Config.Patch)
        - Datastore Browse (Datastore.Browse)
        - Host Configuration Storage (Host.Config.Storage)
        - Permission Defaults (not visible in the vSphere Client user interface). FYI only.
            - System.View
            - System.Read
            - System.Anonymous
        - Host Configuration Patch (Host.Config.Patch)
        - Datastore Browse (Datastore.Browse)
        - Host Configuration Storage (Host.Config.Storage)
        - Permission Defaults (not visible in the vSphere Client user interface). FYI only.
4. Save
5. Associate a read-only user to also have the CloudPhysics role
6. Save

The user credentials with the required privileges can now be used to log into the CloudPhysics vApp and complete the Observer activation process.

Getting to Know CloudPhysics

The CloudPhysics dashboard. Your initial experience upon login.

Navigation

The Dashboard view is the first screen you will experience in CloudPhysics once you have your Observer vApp connected. The top of this, and all screens, is a black navigation bar for you to explore the CloudPhysics product. Detailed below are the components of the navigation. Each section will be described in more detail further below.

Navigation Element	Description
VM Explorer Search	Search for any VM to display a detailed health and performance summary.
Dashboard	Current health overview of your environment and default view.
Card Deck	Collections of CloudPhysics Cards, organized by topic.
Card Builder	Interface for building ad-hoc, custom reports from your own data.
Card Store	Library of community-contributed, free Cards created in Card Builder.
Daily Insights	Collected, updated alerts across all Cards which apply to your datacenter.
Global Insights	Select 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. Invite additional users to join your team.
Edition	View the current edition your company is entitled to.

Connection Status: The 'signal' icon located next to your User Name links to the Observer Status page. This page will list all installed Observers and provide 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 which are no longer wanted, can be deleted from this screen by admin users.

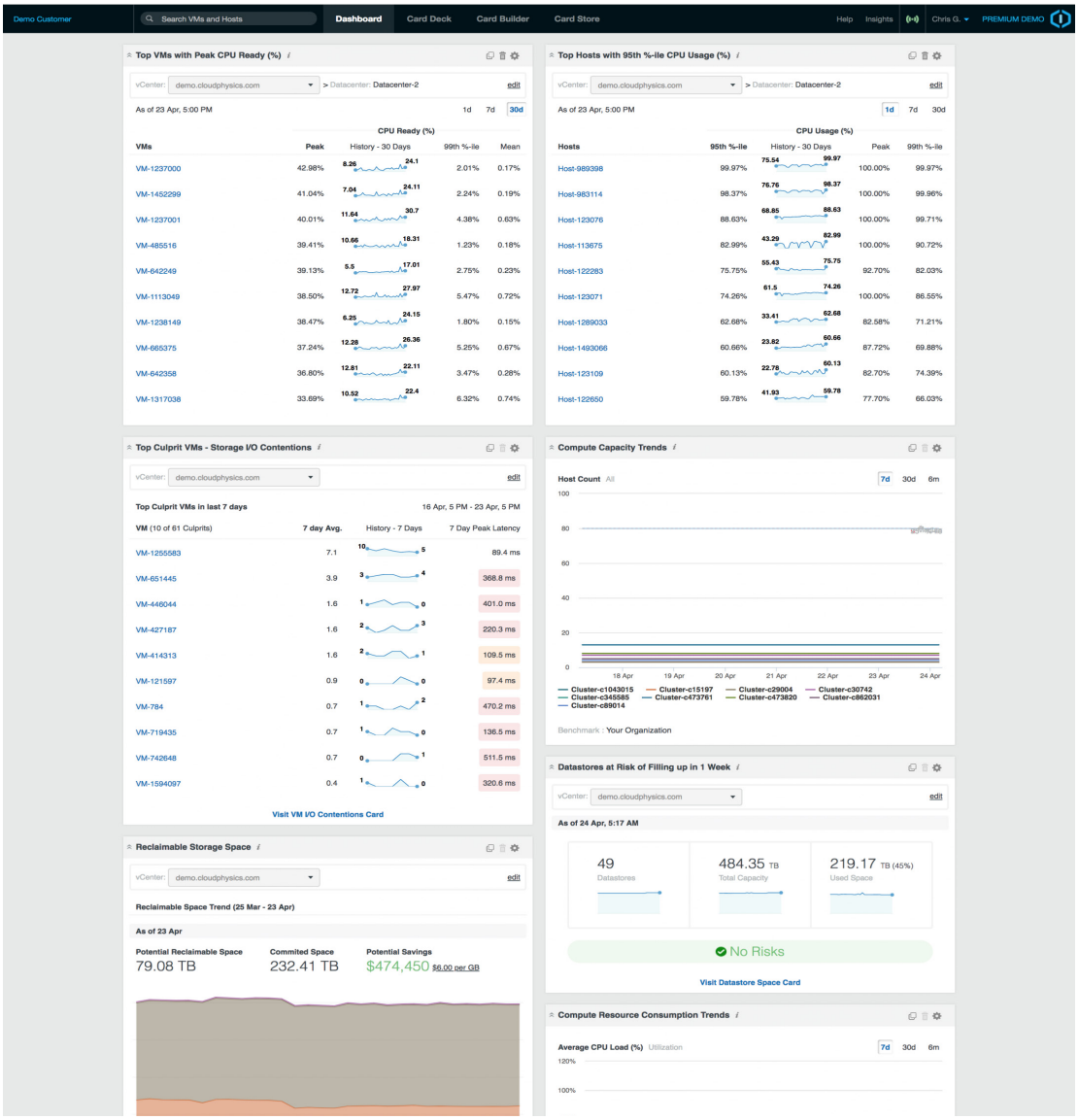
The Connection Status icon changes color corresponding to the status of the installed vApps.

- 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

Edition: Your currently entitled edition is displayed next to the CloudPhysics icon. For questions regarding your edition, or to contact Sales to change your edition, contact sales@cloudphysics.com

Dashboard

Upon log in to CloudPhysics, your initial experience is the Dashboard. The Dashboard collects and presents important, summarized metrics from your data center in panel modules. These panels show different core metrics and focus on data center health and trends.

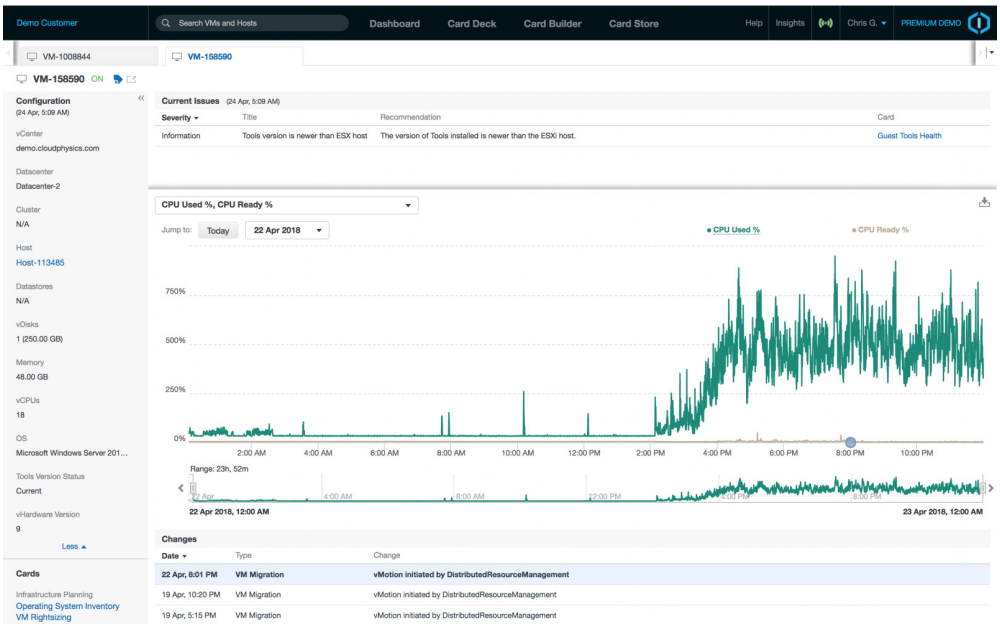


CloudPhysics provides several dashboard panels by default which appear upon login.

Each panel allows you to 'Go to Card' in order 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 your inventory which 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.



The VM exploration mode is accessed in the navigation bar with a search field. Simply begin typing to search for the VM of interest. CloudPhysics will help 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 backwards.

VM Configuration

At the core of every VM is a set of basic configurations which control the VM's access to CPU, Memory and Storage. These are displayed on the left-hand side of the VM Explorer screen. In addition, the latest VM Cluster, Host, and Datastore locations are shown. Host and Datastore location can change with time as VMs are migrated. Lastly, guest operating system and VM Tools status are shown.

Changes Log

The changes view provides recent changes which have been made to this VM over the time range. These will include vMotion and Storage vMotion events, snapshot creation, deletion, and consolidation, and VM creation, deletion, modification, and power state changes. Use this panel to see the VM's change log.

Issues Notifications

All notifications for the VM selected are also displayed in time order. See all issues over the time range, color-coded by severity. Clicking on each issue will reveal addition 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 CPU, Memory, Network, and Storage usage statistics. Metrics are shown in granular detail in two-hour selectable ranges. A full 30-days of metrics visibility is available. VMs which provide fewer than 30 days of metrics will show as much as is available. This is generally due to recent VM power-ons, or newly-created VMs with less than a full 30-day history.

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 above.

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)

Card Deck

The deck view is the classic CloudPhysics card-based view. In this view, you have direct access to operational health analytics. Decks organize cards by topic and use case. Decks are the primary navigation within CloudPhysics after you leave the dashboard.

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

Free Edition users will see a default 'Free Edition' deck which presents all cards entitled to the free edition. This deck appears at the far left. This deck is not displayed to Premium Edition customers as the Premium Edition contains all the free cards in addition to the entitled cards and features.

Custom Decks

CloudPhysics allows each user to put cards of interest together for use. Any collection of cards including those created by the portal administrator, custom-built cards from Card Builder, or cards from Card Store that have been added to My Cards can be collected in a custom deck.

To use, click on 'Edit Card Decks'. Next, click the 'Plus' (+) button and enter the name you would like to call the deck. Click Create.

To add cards to your custom deck, navigate to the location of cards you want to use. Click and hold on the double bar at the head of each card, and drag it into your deck. Repeat until complete. These can be re-edited at any time.

Anatomy of a Card

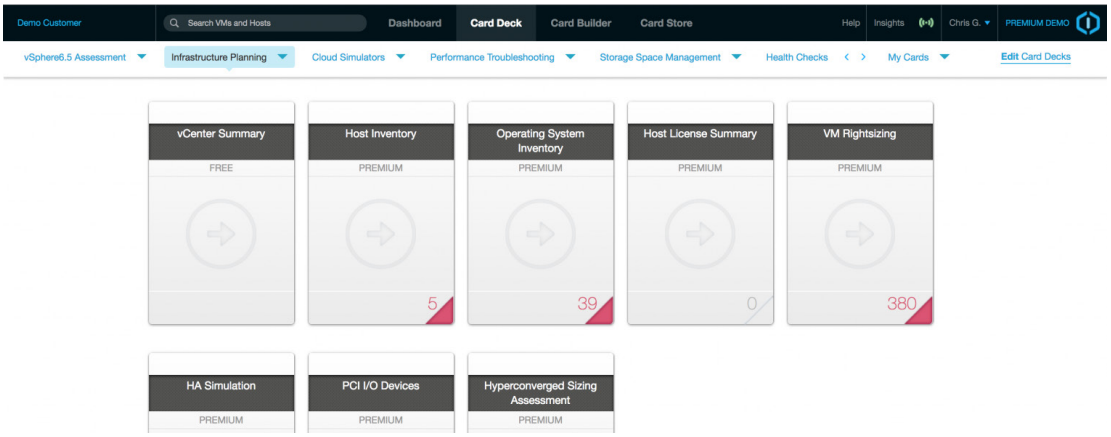
The card is the universal analysis interface on CloudPhysics. Cards covering health, best practices, performance analysis, predictive risk assessment, and many more are available. Each card fully contains a full operational use case, and allows for deep analysis with built-in functionality. Let's explore the anatomy of a card to get the most out of CloudPhysics.

Example Card

Card Face

Upon viewing a deck, all cards in the deck are listed in rows. Each card is shown as a vertical rectangle with the name displayed. Also displayed is the card's edition entitlement. 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. These can be clicked to enter the card with a focus on the notification results.

Locked cards are those which are not entitled per the current license edition in use. These can be unlocked via upgrade. Contact sales@cloudphysics.com to learn more about other editions from CloudPhysics.



Card Filters

On the left-hand side of all card views is a filter bar which allows the user to custom-select the inventory to apply to the card. Upon selection, all summary charts, rows, and results are instantly updated. This allows the user to narrow into locations, inventory, and datastores. In addition, the search field allows for

Deck	Description
Free Edition	Contains all cards available to the Free Edition users.
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.
Health Checks	Proactive and configuration-based data center health checks.
My Cards	Custom and Community-created analytics Cards.
Custom Decks	Custom-named decks which hold any cards desired by the user

RegEx-style searches of results. E.g. “Exchange” or “SQL”.

Card Name and Description

Each card is named for the use case it presents. Following each name is a gray information (i) icon. Hovering over this information icon will display a description of the card.

Summary Charts

Many CloudPhysics cards provide summary charts. These provide summary views to 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.

Need Attention, Noteworthy Filter Buttons

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

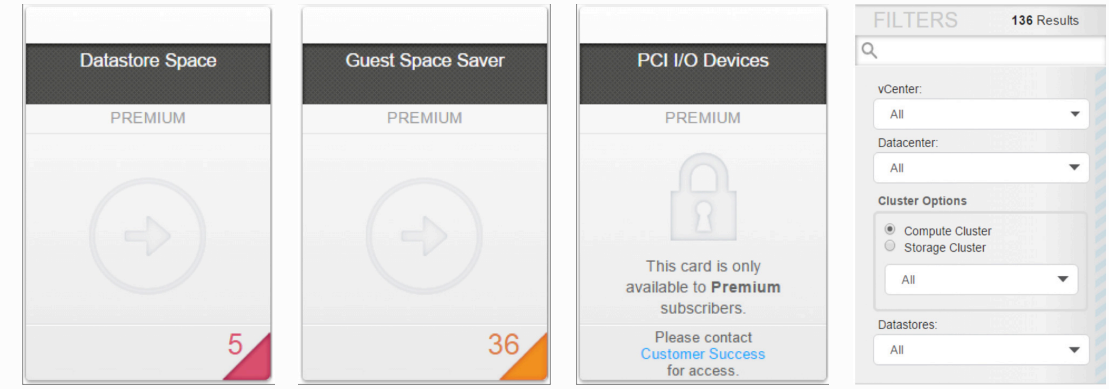
In the expandable table results, explanations are given to fully detail why a result was triggered. These Need Attention and Noteworthy buttons correspond directly to the card face corner notifications described above.

Download

All card results are downloadable in CSV (comma-separated values) format, compatible with popular spreadsheet software. Click the blue downward arrow icon to download. The Download Icon is located in the upper corner of the card.

Sharing

CloudPhysics allows individual cards to be shared with other persons. A share will give access to the card with live, updated data, and that card only. This can be a user external to your organization. Users who



Card Face *Locked Cards* *Card Filters*

receive a share will be notified by email, and will be required to register with CloudPhysics prior to being able to view the card. Registered users will not be required to re-register.

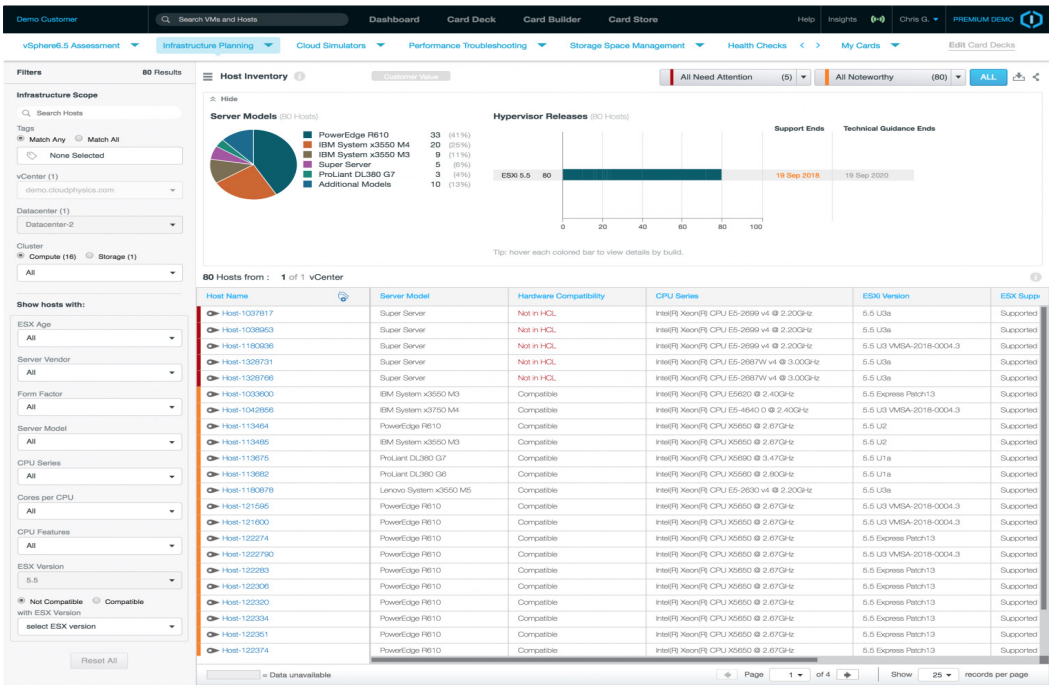
Click the share icon to open the Share dialog on the card you want to share. Shares can be removed by navigating to the Shared Cards card. This is in the My Cards Deck.

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 will be

colored accordingly.

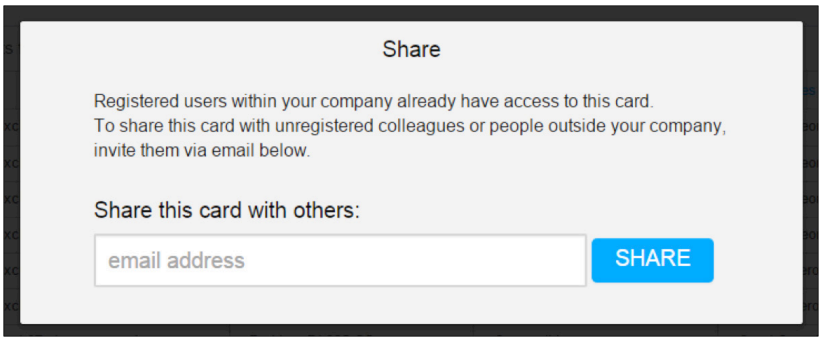


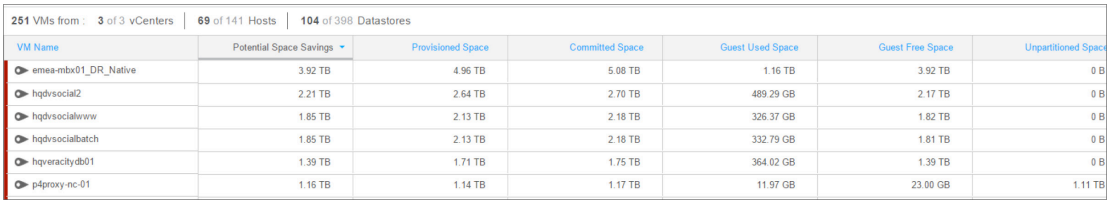
Expandable Rows

Many CloudPhysics cards reveal additional, detailed information to support the use case of a card. This helps the user 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, the user can view them all one-at-a-time in a carousel. Opening an expandable row is done with a toggle on the left-hand side of the result row.

To help the admin quickly resolve issues and close the loop, CloudPhysics provides an object-relevant hyperlink, called a vLink, back to the vSphere (Web) client. This links CloudPhysics to the relevant asset screen in the vSphere Client based on your starting point within CloudPhysics. No more searching

around and losing context while trying to get from one location to another. Upon linking, a new browser tab will be opened. Authentication and security to log into your vSphere Client is managed via your vSphere credentials, which maintains environmental security.

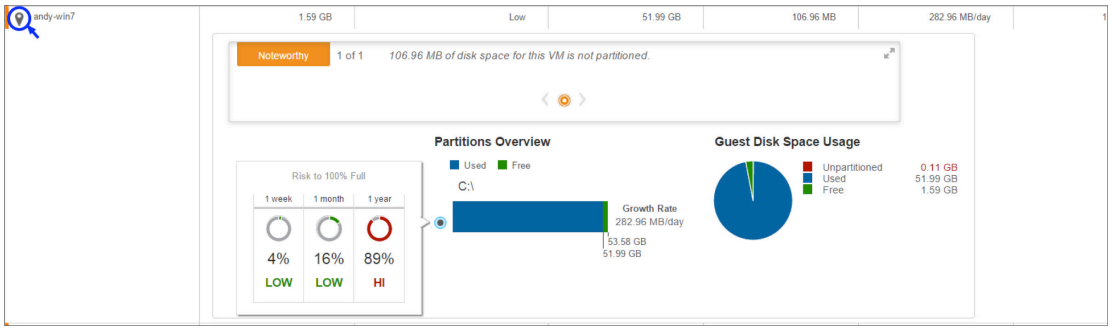




Card Builder

Card Builder is a unique offering from CloudPhysics which allows for ad-hoc reporting from your own data uploaded to CloudPhysics. This solution offers many benefits versus traditional, local script-based reporting.

1. Queries are run from CloudPhysics's servers, not from your local data center. Therefore, there is no performance impact on your data center resources.
2. No scripting language knowledge (PowerShell, Python, Perl, etc.) is necessary to use Card Builder. This



   is a drag and drop web-based interface. This removes script and user credentials maintenance.
3. No complex knowledge of VMware vSphere reporting APIs is necessary. We handle all data relationships. CloudPhysics simplifies complex and changing data relationships across VMware vSphere versions.

Upon first login to CloudPhysics Card Builder, you will see a welcome screen. To get started, click 'Build New Card'.

Create a Card

Building a card is an easy, script-free process on CloudPhysics. Upon entering the 'Build a New Card' interface, a familiar business intelligence interface is shown with access to hundreds of common virtualization data points. Each can be dragged and dropped onto the light blue canvas to build a report. The Card Builder platform will only allow data elements that will report correctly with any preceding data points placed on the canvas to ensure data correctness. Choose among over 600 data elements encompassing topics of VM, Host, Datastore, Network, DVS, Resource Pool, Cluster Storage Cluster, and vCenter. Thousands of combinations are possible to satisfy your custom report needs. Hovering over a property name will reveal additional data about the item.

Data Types

Two types of data are available on Card Builder. These are static, point-in-time data points, and performance data points. These types of data can be combined in a single report. Static data points will be formed into tabular data, one per row. Performance data will be arranged in graph form. Performance data points can be easily differentiated by a small, preceding gauge icon.

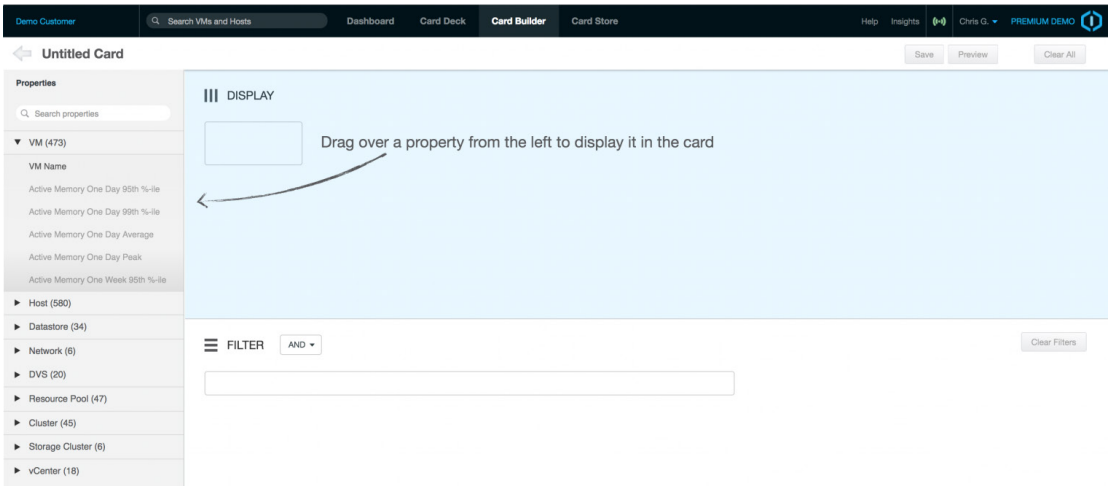
Adding Data Elements

Simply find, drag and drop a named data item from the left-hand properties bar into the light blue report canvas. To ensure you're selecting what you wish to see, you can use Preview at any time. This will show you a live report output for the query in its current form.

Adding Data Filters

To add a filter, drag and drop a data item into the Filter section below the light blue report canvas. This will show a dialog which will allow you to choose the type of filter action desired. Options presented are tied to the data type selected.

Saving Cards

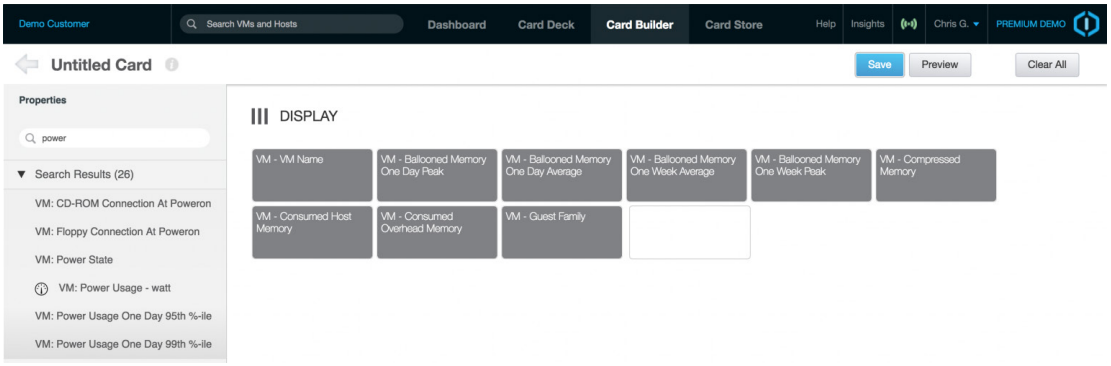


Queries in Card Builder can be run and discarded, or saved for re-use. Click 'Save' to save the card definition. Upon saving, a dialog will ask you to name the report. You can optionally also add a description and tags. This can be edited at a later time by editing the query and clicking the (i) Info icon.

Publishing a Card

After saving a query, you have several options for using this in the future.

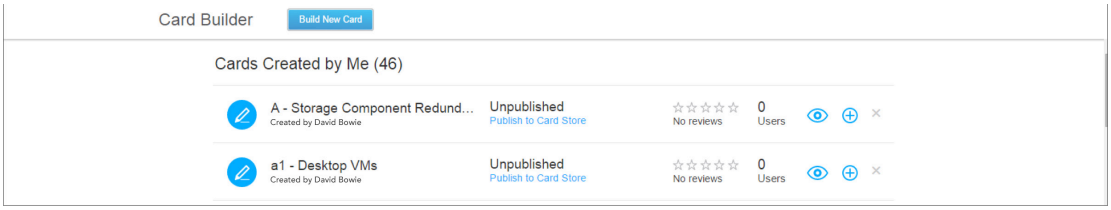
1. Return to Card Builder and preview the most recent query results. This is accomplished by clicking on the blue Eye icon.
2. Add this query to your 'My Cards' Deck and view this query as a card. This is accomplished by clicking on the blue Plus icon.
3. Contribute to Card Store. You can also contribute this card definition to the CloudPhysics community by clicking on the 'Publish to Card Store' link. This will make a copy of this card query available for all users on CloudPhysics. Your personal data is not shared, only the card definition.



Filter Options	Filter Behavior	Applies To
like	A text-matching filter regardless of string location.	Text
= (equals)	An exact text matching filter.	Text, Number
≠ (not equals)	An exact text matching filter to exclude value.	Text, Number
> (greater than)	Shows results greater than the filter value.	Number
< (less than)	Shows results less than the filter value.	Number
≤ (less than or equal)	Shows results less than or equal to the filter value.	Number
≥ (greater than or equal)	Shows results greater than or equal to the filter value.	Number
has	Allows selection from an array of values.	Text
Drop-down List	Select from an array of data values.	Text
Radio Buttons	Select from a list of data values.	Text
AND	When multiple filters are in use, show all results.	(all)
OR	When multiple filters are in use, show results of either filter.	(all)

Card Store

CloudPhysics offers user-created analytics which are available to Premium Edition customers at no extra cost. These are analytics created in Card Builder and publically shared by other CloudPhysics customers in the Card Store. Each analytic is a card definition you apply to your own data. No personal



data is shared, meaning use of these analytics is secure.

Categories

Card Store analytics are organized according to the categories. Use of these category groups can assist you in discovering analytics of interest. Several categories are provided including Cluster, Health Check, Inventory, and Storage. Several others are also provided.

Clicking on a card name will provide additional details including release date, description, and rating for more information.

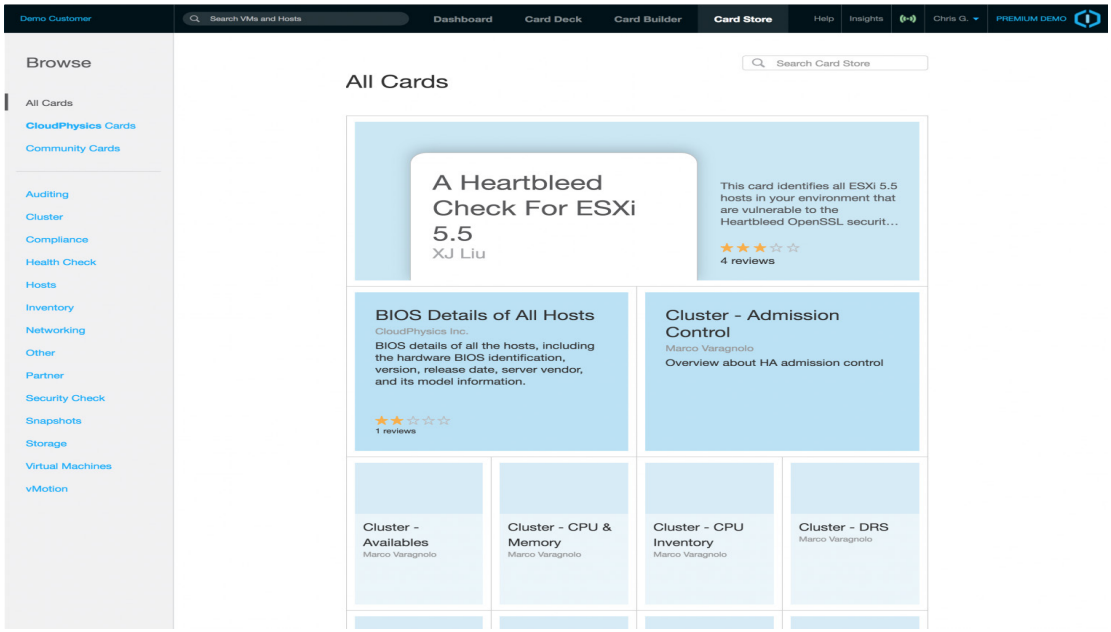
Adding a Card

To select an analytic to use, simply move your mouse over the card face and click 'Add To My Cards'. This will place the card in your 'My Cards' inventory, ready to use at any time.

Administration

Adding Users to Your CloudPhysics Account

As an admin user, you can invite additional co-workers to your CloudPhysics account. This is accomplished in the User Management panel. Access to this panel is limited to admin users. You can



find this panel once logged in, by clicking on your name in the navigation bar. Click User Management to enter this administration location.

Once in User Management, you can invite co-workers by email address. Upon invitation, the invited person will be required to complete a registration. If your invitee does not see the email that is sent, have them first check their email spam folder. If they still cannot find it, you can click re-send invitation. Re-sending an invitation will deactivate any previous invitation. Your co-worker will need to use the latest email.

If you wish to elevate the invited user's access to admin, you can do this after they complete registration. By default, every invited person will have a user role.

User Roles

CloudPhysics has two types of user roles on the platform. These are Admin and User.

1. Admin is the super-user role in your CloudPhysics environment. By default, the first user who creates the CloudPhysics account is the Admin. Often, this is the user who has initially signed up for 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.

2. User is a non-admin member of your company on CloudPhysics.

Permissions by Role

Changing Roles

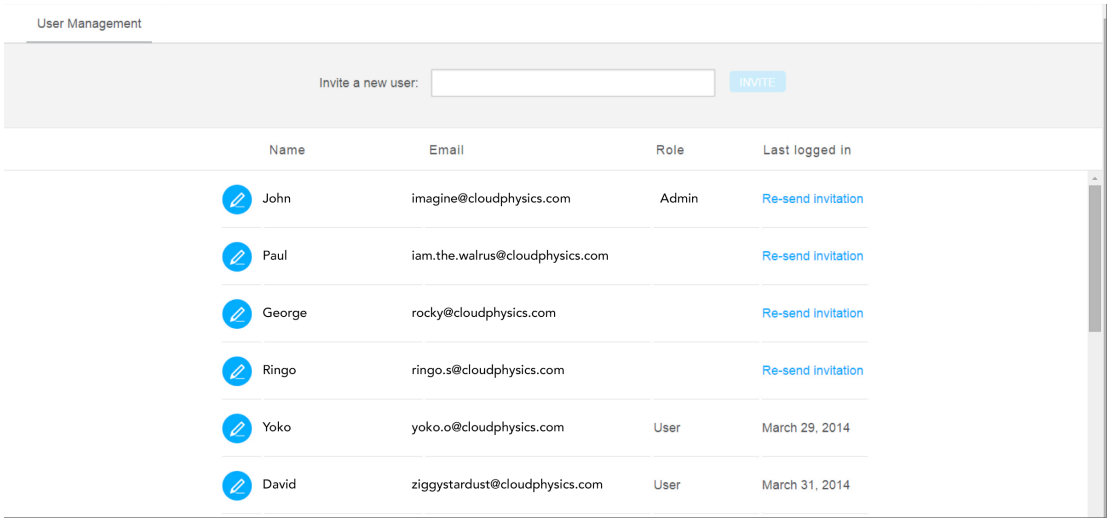
Admin users can change the role of any registered user by clicking on the blue pencil icon. This will show a dialog which allows for role change and user deactivation.

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 (below).
User	• Log into portal account for your company. • User has all benefits of the platform given by your license edition..

Administration

Partner Management

CloudPhysics works with partners to offer the CloudPhysics platform to our users. These partners



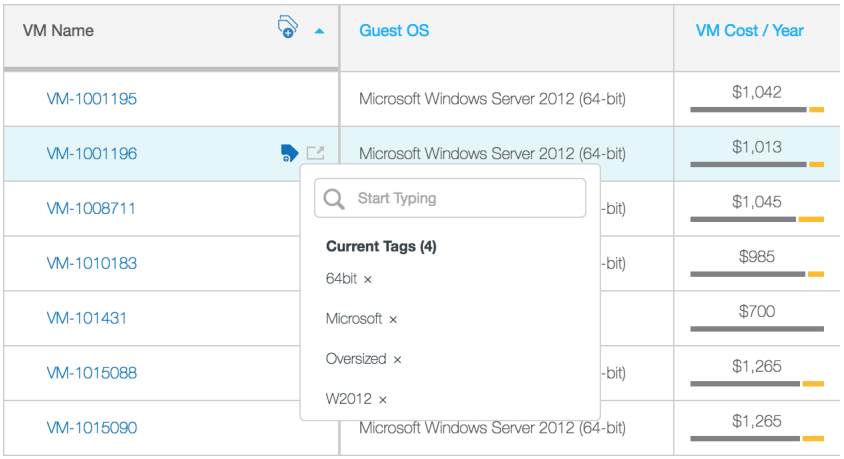
often offer additional services and work together with their invited customers to provide superior support and additional IT services. If you have been invited to the CloudPhysics service via a partner, admin users will see a partner administration section located next to User Management. Both sections are accessible by admin users from the profile pane. Partner Management will display any partners which are approved by customers to view their environment. This access can be removed by admin users as needed.

Additional Advanced Topics

Tagging

Tags can be applied to all objects within the platform. These tags can be used in card filters to work with a limited selection of objects. Tags can be used to demote location, applications, business units, or grouping-based usage. Some examples of common tags used 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. To the right will appear a small Tag Icon. Selecting this icon will pop-up a dialog box to allow the administrator to add and edit tags associated with an object.



Multiple objects can be tagged at the same time with a single tag by selecting the Tag Icon located in the object name column header.

Tags can be used within the filter with an Any or All option to select subsets or multiple sets of objects.

Cloud Simulators and Cost Calcualtors

CloudPhysics has introduced a broad set of Public Cloud Simulators to estimate costs of workloads if migrated to the Cloud. These simulators all you to work with subsets of VM's to determine if they are cloud migration candidates and map them to their ideal instance class based on size, performance, and rightsizing options.

Rightsizing can greatly reduce the cost of a workload that is migrated to the cloud by ensuring you are not buying more resources than required for the VM. A defined VM of 32 vCPU's may only need 8 vCPU's at peak usage and use less than 4 vCPU's 99% of the time. This 99th percentile option allows application owners to ignore peaks and focus on the major use cases of the workload. Review the VM performance history with the VM explorer before rightsizing to understand when and how these reductions in size will impact the VM's daily performance.

Editions

CloudPhysics is offered for use in two editions:

1. Free Edition is a cost-free version of CloudPhysics which provides a set of essential analytic Cards for use. There is no expiration to this edition.
2. Premium Edition is a full-featured version of CloudPhysics with access to all core product features.

To contact a customer success representative, email customersuccess@cloudphysics.com.

Support

CloudPhysics support is offered by email during working hours Monday-Friday. Please contact support@cloudphysics.com for assistance.

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