vOperations Suite™
Reporting and Chargeback User’s Guide
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1 Reporting and Chargeback Application

Generate virtual environment trend, configuration and chargeback reports using the vOperations Suite Reporting and Chargeback application.

The functionality of the Reporting and Chargeback application is broken into four major areas: Summary Reports, Inventory, Chargeback and the Cost Index vScope.
2 Summary Reports

Generate custom reports of infrastructure history and trends for the entire virtual environment or selected areas of the environment.

Note that all summary reports may be used in configurable dashboards (see Configurable Dashboards in the section below on common vOPS features).

There are a number of infrastructure reports available.

The desired report may be accessed by clicking on the report button.
For reports by period, the start date, end date, type and content may be selected. The **Build Report** button will then refresh the view.
For reports on a date, the specific date can be set and the view refreshed with the **Build Report** button.

All of the summary reports can be accessed from any browser using the link provided by the **URL** button.
3 Inventory

Create custom reports of virtual machine configuration, utilization and status or a complete inventory of all virtual machines.

3.1 List View

The List View of Inventory is used to create custom reports by selecting the items to be included and filtering the information for desired content.

Click the Custom View button to select the items to be included in the view.
Check the table check boxes for the desired items. Check the Tool-Tip check boxes for the items you would like to see in the tooltips.

To filter for specific values of each item, select the item in the Table Filters drop down box.
Once the filter item is selected, select the filter criteria from the second drop down box in the Table Filters.
Now enter the value for the specific item and criteria in the edit box. The filter will automatically be applied and only items that match the specific criteria will be included in the table.

Multiple filters may be used to pinpoint specific conditions. Simply click on the Add Filter button and add the filter item, criteria and value.

### 3.2 Detailed View

The Detailed View of Inventory contains detailed information about each virtual machine. The information can be used for reference or to archive virtual environment information at regular intervals.

**Hypervisor Difference Note:**

Because Hyper-V and VMware make different detailed information on individual VMs available, the specific information listed in the detailed view may differ.
4 Chargeback

Create detailed cost analysis reports for individual groups, organizations or customers. Reports include both allocation costs based on the virtual machine configuration and utilization costs based on the actual utilization of the resources.

Base prices must be defined for the hardware resources (CPU, memory, network and storage) that will be used by the customers. As described below in the section on Pricing Models, these base prices may be overridden for specific business views. For help in calculating the appropriate prices for your environment download the Chargeback Methodology whitepaper and the Chargeback Calculator from the VKernel website:


Go to Settings > General > Prices.
The prices can be set individually for each host or the hosts can be **Dragged and Dropped** into one of four tiers and the pricing set for the tier. Once the hosts are organized appropriately, enter the prices per daily unit.

The datastores/disks can be organized and the prices set in the same way as the host prices were set.
Now we create the customers. To add a customer, right click on **Customers** in the navigation tree and select **Add Customer**.
Enter the customer name and click **Add**.

Business Views are used to organize the resources that belong to a customer. Create one or more business views with the appropriate virtual objects (folders, clusters, hosts, resource pools or virtual machines). The business view or business views can then be **Dragged and Dropped** into the specific customer folder.

Then select the customer and the chargeback report will be generated.
The report period can be changed according to your preference.

4.1 Creating Customized Pricing Models

The default pricing model defined in vOPS Settings > Prices can be overridden within individual business views, and additional fixed costs can also be defined.

To override prices and add fixed costs, right click on a business view in the navigation tree and select Set Pricing Model.
The **Set Pricing Model** dialog has two panes. In the first pane, **Fixed Costs**, fixed per day costs (power, cooling, licensing) can be added to the business view by clicking **Add**. Right click on the business view and select **Set Fixed Costs**. Click **Add** and then define the name of the fixed cost and the amount which is to be added daily.

The second pane, **Override Resource Prices**, allows a new price to be set on individual resources that will override the *base price*. Note that different prices may be set for allocation and for utilization. The base price is the price set for that resource either in a containing business view or in Settings > Prices.

Within per-business-view price settings, you have three (3) possible ways to determine the price to be used for utilization or allocation on a specific resource:

- Set a specific price by selecting appropriate units and entering a value. This price will override any other price.
- Set a multiplier by selecting **X Base Price** and entering a value. This will cause the base price to be multiplied by the value specified. This may be used to provide a discount or tax on particular resources for particular products or customers.
- Leave the field blank. This will cause the base price to be used.

To understand how this works and how the base price is determined, consider the following example.

The *Marketing* business view contains two sub-views, *Division 1* and *Division 2*, as shown in the figure below. If no pricing model has been created, then any VMs in any of
these business views will use the prices set in Settings: Prices. Now create a pricing model on Marketing that changes the storage utilization and CPU allocation prices as shown. If we stop here, then all Marketing VMs will be charged the default prices for memory, network, storage allocation and CPU utilization, but will use the new prices for storage utilization and CPU allocation.

Now create a new pricing model in Division 1, as shown in the second figure. Here we have changed the memory utilization price and added a multiplier of 0.9 to the storage utilization price. The result is that VMs in Division 1 will be charged the default prices for network, memory allocation, storage allocation and CPU utilization. It will be charged the same price as other marketing VMs for CPU allocation, but now has a different special price for memory utilization. Finally, VMs in Division 1 receive a 10% discount on the marketing price for storage utilization.
Note that fixed costs may also be overridden. If a fixed cost with the same name appears both in a parent business view and a child one, VMs in the child business view will be charged the price set there, while VMs in the parent and other child business views will be charged the price set in the parent.
5 vOperations Suite Common Features

Features of the vOperations Suite that are common to all applications include: the Dashboard, the Navigation Tree, Business Views, Settings, Update, Help and Reporting.

5.1 Dashboard

The dashboard provides an overall summary of the status of the virtual environment. The Dashboard tab provides four default dashboard views: vScope, Alarms and Bottlenecks, Capacity Efficiency and Availability, and Infrastructure Overview, as well as the ability to add additional custom dashboards, hide the default views, and to re-order dashboard tabs.

5.1.1 Configurable Dashboards and Dashboard Management

New configurable dashboards can be created and customized with a variety of reports.

As seen in the screenshot above, individual reports can be configured (for example, to set a custom time frame, or to exclude certain columns) by clicking on the Configure button on the specific chart or table.

To create a new dashboard, click on the small “+” tab that follows all other dashboards - the dashboard will be created and opened in editing mode.
You may edit or delete an existing dashboard by clicking on the arrow at the right of the dashboard’s tab. You can also reorder configurable dashboard tabs by simply dragging them to the right or left.

While editing, you can rename the dashboard by entering a new name in the textbox on the right of the toolbar. You can also add, place and resize a variety of different charts and tables. To add, click + Add Report at the right of the toolbar. Simply drag the report to move, or select a side or corner and drag to resize.

5.1.2 vScope Dashboards

vScope provides an environment-wide, cross-hypervisor visualization of the status of your infrastructure from the perspectives of performance, capacity, efficiency and cost. These dashboards excel at providing high level views of your environment where a list may not give an accurate portrayal of its overall health.

For detailed information on each vScope view, see the appropriate section in each of the product guides.
5.1.3 Alarms and Bottlenecks
This view highlights the performance related status of the virtual environment.

5.1.4 Capacity Efficiency and Availability
This view highlights the efficiency of resource utilization and the availability of resources for additional growth.
5.1.5 Infrastructure Overview
This view highlights the historical virtual machine trends.
5.2 Product Navigation

You can directly navigate from any part of the appliance to any other part of the appliance by using the dropdown functionality on the application buttons at the top of the user interface. These menus reproduce the entire tab structure, so you don’t need to wait for each tab to load to navigate around the user interface.

5.3 Navigation Tree

The Navigation Tree is common to the Dashboard and all applications. It consists of two parts: Business Views and the infrastructure views gathered from vCenter and System Center. In a multi-hypervisor environment, the tree will display an Infrastructure node, followed by a VMware sub-tree and a Hyper-V sub-tree, as described below. In a single-hypervisor environment, the Infrastructure and VMware or Hyper-V nodes will not be displayed.

Business Views allow the organization of the infrastructure based on organizational use or application deployment.

Infrastructure

VMware

Host and Clusters is kept synchronized with the vCenters connected to the vOperations Suite. It contains the same objects and structures as seen in vCenter.

VMs and Templates is kept synchronized with the vCenters connected to the vOperations Suite. It also contains the same objects and structures as seen in vCenter.

Datastores contains all of the datastores used in the virtual environment.

Hyper-V

Host and Clusters is kept synchronized with SCVMM. It contains the same objects and structures as seen in SCVMM.
Disks contains all of the virtual disks used in the virtual environment.

5.4 Business Views

Business Views allow the organization of the infrastructure based on organization use or application deployment. Business views are hierarchical and can contain other business views, vCenter folders or individual objects. The same object can appear in more than one business view, allowing multiple perspectives on the infrastructure to be maintained.

There are two types of Business Views: Free-Form and Smart.

5.4.1 Free-Form Business Views

To add a free-form business view, right click on Business Views or a previously created business view in the navigation tree and select Add Free-Form Business View.

Enter the name and description of the business view. Select the inventory objects to be included in the business view and move them to the table on the right. Click Add to create the business view containing the selected objects.

Objects in the navigation tree can also be selected and then dragged and dropped into an existing business view.
5.4.2 Smart Business Views

Smart business views work differently from free-form business views in that they are dynamically populated based on a series of rules instead of by adding specific objects.

To add a smart business view, right click on Business Views or a previously created business view in the navigation tree and select Add Smart Business View.

Enter the name and description of the business view. Add a new rule set using the New Rule Set button. Multiple rule sets can be applied to each smart business view.

Each rule set can contain multiple rules. For example, a rule set containing “VM name contains SQL” and “Cluster contains prod” will create a business view that contains all VMs within the ‘prod’ cluster that also have ‘SQL’ within their name. If a new VM that matches this criteria is added to the environment it will also show up within this business view.

Click Save to finalize the rule sets and create the new smart business view.
5.5 Reports

All of the views within each application can be saved as an XML, saved as a PDF, emailed or scheduled to be emailed on a regular basis.

5.5.1 Saving Reports

Clicking the XML or PDF buttons will immediately save the current view.

5.5.2 Emailing Reports

Clicking the E-mail button will allow you to specify the type of report and one or more email address(s) to immediately send the report to.
5.5.3 Scheduling Reports

Clicking the Schedule button will allow you to specify how often the report will be sent, the type of the report and one or more email address(s) to send the report to.
5.6 vScope Explorer

The vScope Explorer application can be accessed by appending /vops to the address of the vOperations Suite.

After logging in, the vScope Performance, Capacity and Efficiency views will be available for the entire virtual environment.
5.7  Settings

The vOperations Suite Settings apply to all of the applications.

5.7.1  Settings > General > Environment

Configure the connections to the VMware vCenter(s) or ESX host(s).

Systems Center connections will appear here once properly configured, but cannot be added here directly. Please follow the detailed instructions in the installation guide to add SCOM connections.

5.7.2  Settings > General > DB Settings

The vOperations Suite requires a database for storage of the information it uses to analyze the virtual environment. The database may be either an embedded PostgreSQL database or an external Microsoft SQL or Oracle database. Approximately 30 MB of database storage will be required for each virtual machine. The PostgreSQL database is automatically configured during installation. Select Change Database if you would like to use an external database.
Then select either the Microsoft SQL or the Oracle database.

5.7.2.1 MS SQL Database Configuration – MS SQL 2005 or Later
Select the MS SQL radio button. Enter the server name or IP address of the MS SQL database server.
Enter the database credentials. If the database does not already exist, the credentials must have permissions that allow database creation. If the database already exists, the credentials need only have database owner permissions. These credentials will be used to create the database (if it doesn’t already exist), the tables and stored procedures. Either Windows authentication or SQL authentication can be selected. Use the Check settings option to verify database connectivity.

5.7.2.2 Oracle Database Configuration – 10g or Later
Select the Oracle radio button. Enter the server host and service name of the Oracle database server.
Enter the database credentials. If the database does not already exist, the credentials must have permissions that allow database creation. If the database already exists, the credentials need only have database owner permissions. These credentials will be used to create the database (if it doesn’t already exist), the tables and stored procedures. Use the **Check settings** option to verify database connectivity.
5.7.3 Settings > General > Savings
Set the costs used in estimating potential savings through reconfiguration or elimination of waste.

5.7.4 Settings > General > Prices
Set the hardware prices used to determine resource allocation and utilization costs.
5.7.5 Settings > General > Scheduled Tasks

Review, edit or delete the scheduled reports.
5.7.6 Settings > General > Automated Tasks
Review, edit or deleted the scheduled virtual object configuration changes.

![Automated Tasks](image1)

5.7.7 Settings > General > Proxy
Set the proxy connection to the Internet.

![Proxy Connection](image2)

5.7.8 Settings > General > Miscellaneous
Add the company logo or adjust other generalized settings.

![Miscellaneous Settings](image3)
5.7.9 Settings > Notifications > Alerts

Review, edit or delete the Trend, Capacity and Predictive Alerts.

Please note: These alarms are deprecated and exist for legacy compatibility. If available, please use Performance Analyzer for alerting purposes instead.
5.7.10 Settings > Notifications > System
Set general system notifications.

5.7.11 Settings > Notifications > Address Book
Review, add, edit or delete Address Book entries used for notifications and alarms.

5.7.12 Settings > Notifications > E-mail
Set the credentials used to send emails.
5.7.13 Settings > Thresholds

Thresholds are a set of configurable values that many components in the application utilize. Capacity Availability, for example, will not make any capacity recommendations that would violate a threshold. The alarms in Performance Analyzer are configured to use these thresholds as a basis for their trigger values. Current Bottlenecks and Future Bottlenecks also use these values as a basis for identifying current and trending resource bottlenecks.

There are separate tabs for VMware environments and Hyper-V environments due to the differing metrics between the two hypervisors.

Please note:

- Peak analysis period is the amount of time a value has to be sustained for before it’s considered a peak. For example, if CPU goes up to 90% for 10 minutes and drops back down, given a 15 minute peak analysis period, it won’t be labeled as a peak in vOPS. It needs to last for as long as this value is set for.
- Threshold for merging peaks is the flexibility for turning 2 separate peaks into one. If you had a 15 minute, 80% peak followed immediately by a separate 15 minute 82% peak they are really the same peak, so if the values are within the threshold percentage they will be merged into one large peak.
- The realtime warning/alarm durations set the duration on the alerts that go into Virtual Center. In order for Virtual Center to generate an alert, the warning or alarm value has to be sustained for the full duration.
5.7.13.1 Settings > Thresholds > Cluster
Review or edit the thresholds used to analyze cluster performance.

5.7.13.2 Settings > Thresholds > Host
Review or edit the thresholds used to analyze host performance.
5.7.13.3 **Settings > Thresholds > Resource Pool**

Review or edit the thresholds used to analyze resource pool performance.
5.7.13.4 **Settings > Thresholds > Virtual Machine**

Review or edit the thresholds used to analyze virtual machine performance.
5.7.13.5 **Settings > Thresholds > Storage**

Review or edit the thresholds used to analyze storage performance.
5.7.14 Settings > Users

In User Management you can enable or disable the use of Active Directory authentication.
When configuring Active Directory, you’ll need to specify the following items:

**AD Server:** Specify the FQDN or IP of a domain controller that manages Active Directory.

**DNS Domain:** Specify the DNS domain for Active Directory, such as *vkernel.com*

**AD Admin Group:** You may specify any group in Active Directory here. You may create a new group or use an existing one. Any user that resides within this group or any of its nested sub-groups will be given full administrative rights within vOPS.

Please note that you may specify other groups with which to grant specific permissions levels later on in the configuration (such as giving business users read-only rights on a specific cluster), this is *only* for administrators.

**AD Service Account:** Specify a service account with which the vOPS appliance can authenticate against LDAP.

**Password:** The password for the above account.
Important: Please note that you cannot use local users and active directory users at the same time, so enabling Active Directory will disable local users (including the default vkernel account).

If you choose not to use Active Directory, simply right-click on ‘Users’ to add a new user. Once the username and password have been specified, they will appear on the list. The new user will not start with any permissions by default, so you will need to modify them to suit your preference. Any user granted the “Add, edit and delete users” permission will be added to the ‘User Administrators’ list at the top of the User Management tree.

When using Active Directory, users logging in will, by default, receive access rights according to their permissions in vCenter in a VMware environment. They will, by default, have no access permissions in a Hyper-V environment. Administrators may choose to add them directly in order to override the default permissions. Please keep in mind that overriding the permissions in vOPS does not modify any permissions in vCenter.

Another feature of Active Directory is the use of ‘AD User Groups.’ Right-click on this
item in the menu on the left of the User Management screen and add a new AD user group. Specify any group within Active Directory. You may then set permissions for this group as a whole. These rights will be propagated to every user that is a member of this group. This allows you to grant an entire group of non-administrative vOPS users specific permissions without having to grant them on an individual basis.

5.7.15 Settings > License > { Application }

Request a trial or a purchased license, review the current license or assign socket licenses to the hosts.
VKernel vOperations Suite
Reporting and Chargeback User's Guide

First Name: Yuri
Last Name: Osenny
Email: yosenny@t-online.ru
Company Name: Alcatel
Work Phone: 123456
Country: Russia
Status/Province: Not listed

Type: Commercial
Status: License is OK
Issue Date: Fri, 04 Jan 2011 00:00:00 GMT
Expiration Date: Not Specified
Activation Key: DL/CY/DE78/HJPRW7-65R3XY-K7HOF
Socket Limit: 28 (12 assigned)

12 of 26 socket licenses used

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License Assignment