



vFoglight™ 5.2.4.5

Managing Virtualized Environments
Reference Guide



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Reference Guide
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Introduction to this Guide

This chapter provides information about what is contained in this *Reference Guide*. It also provides information about the vFoglight documentation suite and Quest Software.

This chapter contains the following sections:

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About vFoglight

vFoglight helps IT organizations understand the virtual infrastructure by managing the relationships and interaction between all the components in the environment, including data centers, data stores, clusters, resource pools, hosts and virtual machines. With vFoglight, administrators can quickly determine the root-cause of an incident or problem, track virtual machine (VM) movements and understand their impact, and identify contention for resources between virtual machines.

About this Guide

The Cartridge for VMware ships with predefined rules and views that help you monitor your virtual infrastructure. This *Reference Guide* lists those rules and views, and provides a definition for each.

This guide is intended for any user who wants to learn more about any Cartridge for VMware rule or view.

This *Reference Guide* is organized as follows:

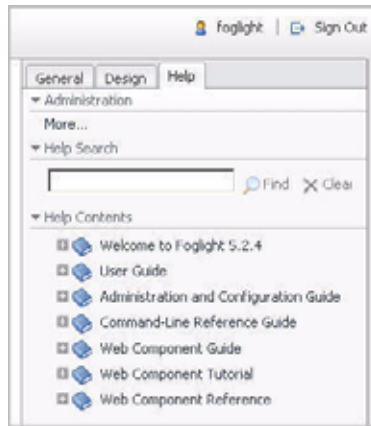
Chapter 1, Cartridge for VMware Rules—Lists and describes the predefined rules included with the Cartridge for VMware.

Chapter 2, Cartridge for VMware Views—Lists and describes the predefined views included with the Cartridge for VMware.

vFoglight Documentation Suite

The vFoglight documentation suite is made up of the core documentation set, plus the documentation set for each vFoglight cartridge that you deploy. Documentation is provided in a combination of online help, PDF and HTML.

- **Online Help:** You can open the online help by selecting the Help tab from vFoglight's action panel.



- **PDF:** The *Getting Started Guide*, *What's New Guide*, *System Requirements and Platform Support Guide*, *Installation and Setup Guide* set, *Administration and Configuration Guide*, *vFoglight User Guide*, *Command-Line Reference Guide*, *Web Component Guide*, and *Web Component Tutorial*, are provided as PDF files. The PDF guides are included in the zip file downloaded from Vizioncore. Adobe® Reader® is required.
- **HTML:** Release Notes are provided in HTML.

Core Documentation Set

The core documentation set consists of the following files:

- *Release Notes* (HTML)
- *Getting Started Guide* (PDF)
- *What's New Guide* (PDF)
- *System Requirements and Platform Support Guide* (PDF)
- *Installation and Setup Guide* set (all in PDF format):
 - *Installation and Setup Guide—Installing on Windows with an Embedded MySQL Database*
 - *Installation and Setup Guide—Installing on Windows with an External MySQL Database*

- Installation and Setup Guide—*Installing on Windows with an External Oracle Database*
- *Administration and Configuration Guide* (PDF and online help)
- *vFoglight User Guide* (PDF and online help)
- *Advanced Configuration Guide* set
 - *Command-Line Reference Guide* (PDF and online help)
 - *Web Component Guide* (PDF and online help)
 - *Web Component Tutorial* (PDF and online help)
 - *Web Component Reference* (online help)

Cartridge Documentation Sets

When you deploy a cartridge, the documentation set for the cartridge is installed. The online help for the cartridge is integrated automatically with the core vFoglight help. When you open the help, the name of the cartridge is displayed in a top level entry within the table of contents.

Some cartridges include additional PDF guides, which may be one or more of the following: a *Getting Started Guide*, an *Installation Guide*, a *User Guide*, and a *Reference Guide*.

Feedback on the Documentation

We are interested in receiving feedback from you about our documentation. For example, did you notice any errors in the documentation? Were any features undocumented? Do you have any suggestions on how we can improve the documentation? All comments are welcome. Please submit your feedback to the following email address:

info@vizioncore.com

Please do not submit Technical Support related issues to this email address.

Text Conventions

The following table summarizes how text styles are used in this guide:

Convention	Description
Code	Monospace text represents code, code objects, and command-line input. This includes: <ul style="list-style-type: none">• Java language source code and examples of file contents• Classes, objects, methods, properties, constants, and events• HTML documents, tags, and attributes
<i>Variables</i>	Monospace-plus-italic text represents variable code or command-line objects that are replaced by an actual value or parameter.
Interface	Bold text is used for interface options that you select (such as menu items) as well as keyboard commands.
<i>Files, components, and documents</i>	Italic text is used to highlight the following items: <ul style="list-style-type: none">• Pathnames, file names, and programs• The names of other documents referenced in this guide

About Vizioncore Inc.

Vizioncore was formed in July 2002 as a consulting and software-development company with the mission to create easy-to-use software solutions that performed reliable and repeatable automation of datacenter functions specifically for the Citrix platform. A main corporate goal was to enable business partners to offer solutions that targeted real-world IT issues and provided the best possible installation and automation for their clients' systems.

Vizioncore's solutions have proved successful in organizations from small to mid-sized businesses to large enterprises, in a wide variety of vertical industries, including Financial Services, Government, Healthcare, Manufacturing, and High Tech. Vizioncore, Inc. can be found in offices around the globe and at www.vizioncore.com.

Contacting Dell

Note: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

- 1 Visit <http://support.dell.com>.
- 2 Verify your country or region in the Choose A Country/Region drop-down menu at the bottom of the page.
- 3 Click Contact Us on the left side of the page. Note: Toll-free numbers are for use within the country for which they are listed.
- 4 Select the appropriate service or support link based on your need.
- 5 Choose the method of contacting Dell that is convenient for you.

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Antigua and Barbuda	Web Address E-Mail Address Technical Support., Customer Service, Sales	www.Dell.com.ag la-techsupport@dell.com 1-800-805-5924
Aomen	Technical Support Dell™ Dimension™, Dell Inspiron™, Dell Optiplex™, Dell Latitude™, and Dell Precision™ Servers and Storage	0800-105 0800-105
Argentina (Buenos Aires) International Access Code: 00 Country Code: 54 City Code: 11	Web Address E-Mail Address for Desktop/ Portable Computers E-Mail Address for Servers and EMC® Storage Products Customer Service Technical Support Technical Support Services Sales	www.dell.com.ar la-techsupport@dell.com la_enterprise@dell.com toll-free: 0-800-444-0730 toll-free: 0-800-444-0733 toll-free: 0-800-444-0724 0-800-444-3355
Aruba	Web Address E-Mail Address Technical Support., Customer Service, Sales	www.Dell.com/aw la-techsupport@dell.com toll-free: 800-1578
Australia (Sydney) International Access Code: 0011 Country Code: 61 City Code: 2	Web Address Contact Dell Web Address Technical Support., Customer Service, Sales	support.ap.dell.com support.ap.dell.com/contactus 13DELL-133355

Austria (Vienna)	Web Address	Support.euro.dell.com
International Access Code: 900	E-Mail Address	Tech_support_central_europe@dell.com
Country Code: 43	Home/Small Business Sales	0820 240 530 00
City Code: 1	Home/Small Business Fax	0820 240 530 49
	Home/Small Business Customer Service	0820 240 530 14
	Home/Small Business Support	0820 240 530 17
	Preferred Accounts/Corporate Customer	0820 240 530 16
	Service Preferred Accounts/Corporate Customer	0820 240 530 17
	Switchboard	0820 240 530 00
Bahamas	Web Address	www.dell.com/bs
	E-Mail Address	la-techsupport@dell.com
	Technical Support., Customer Service, Sales	toll-free: 1-866-874-3038
Barbados	Web Address	www.dell.com/bb
	E-Mail Address	la-techsupport@dell.com
	Technical Support., Customer Service, Sales	1-800-534-3142
Belgium (Brussels)	Web Address	Support.euro.dell.com
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	General Support Fax	02 481 92 95
	Customer Service	02 713 15 65
	Corporate Sales	02 481 91 00
	Fax	02 481 91 99
	Switchboard	02 481 91 00
Bolivia	Web Address	www.dell.com/bo
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	Technical Support., Customer Service, Sales	toll-free: 800-10-0238
Brazil	Web Address	www.dell.com/br
International Access Code: 00	E-Mail Address	BR_TechSupport@dell.com
Country Code: 55	Customer Service and Tech Support	0800 970 3355
City Code: 51	Technical Support Fax	51 2104 5470
	Customer Service Fax	51 2104 5480
	Sales	0800 722 3498
British Virgin Islands	Technical Support, Customer Service, Sales	toll-free: 1-866-278-6820
Brunei	Technical Support (Penang, Malaysia)	604 633 4966
Country Code: 673	Customer Service (Penang, Malaysia)	604 633 4888
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario)	Online Order Status Web Address	www.dell.ca/ostatus
International Access Code: 011	AutoTech (automated Hardware and Warranty Support)	support.ca.dell.com
	Customer Service	toll-free:1-800-247-9362
	Home/Home Office	toll-free:1-800-847-4096
	Small Business	toll-free:1-800-906-3355
	Medium/Large Business, Government, Education	toll-free:1-800-387-5757
	Hardware Warranty Phone Support	
	Computers for Home/Home Office	toll-free:1-800-847-4096
	Computers for Small/Medium/Large Business	toll-free:1-800-387-5757
	Government	
	Printers, Projectors, Televisions, Handheld, Digital	1-877-335-5767
	Jukebox, and Wireless Sales	toll-free:1-800-999-3355
	Home and Home Office Sales	toll-free:1-800-387-5752
	Small Business	toll-free:1-800-387-5755
	Medium/Large Business, Government	1 866 440 3355
	Spare Parts and Extended Service	
Cayman Islands	E-Mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-877-262-5415

Chile (Santiago)	Web Address	www.dell.com/cl
Country Code: 56	E-Mail Address	la-techsupport@dell.com
City Code: 2	Sales and Customer Support	toll-free: 1230-020-4823
China (Xiamen)	Technical Support Web Address	support.dell.com.cn
Country Code: 86	Technical Support E-Mail Address	support.dell.com.cn/email
City Code: 592	Customer Service E-Mail Address	customer_cn@dell.com
	Technical Support Fax	592 818 14350
	Technical Support – Dimension and Inspiron	toll-free: 800 858 2969
	Technical Support – OptiPlex, Latitude and Dell Precision	toll-free: 800 858 0950
	Technical Support – Servers and Storage	toll-free: 800 858 0960
	Technical Support – Projectors, PDAs, Switches, Routers, etc	toll-free: 800 858 2920
	Technical Support – Printers	toll-free: 800 858 2311
	Customer Service	toll-free: 800 858 2060
	Customer Service Fax	592 818 1308
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	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621
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	Technical Support, Customer Service, Sales	0800-012-0231
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International Access	E-Mail Address	czech_dell@dell.com
Code: 00	Technical Support	22537 2727
Country Code: 420	Customer Service	22537 2707
	Fax	22537 2714
	Technical Fax	22537 2728
	Switchboard	22537 2711
Denmark (Copenhagen)	Web Address	Support.euro.dell.com
International Access	Technical Support	7023 0182
Code: 00	Customer Service – Relational	7023 0184
Country Code: 45	Home/Small Business Customer Service	3287 5505
	Switchboard – Relational	3287 1200
	Switchboard Fax – Relational	3287 1201
	Switchboard – Home/Small Business	3287 5000
	Switchboard Fax – Home/Small Business	3287 5001
Dominica	Web Address	www.dell.com/dm
	E-Mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-278-6821

Dominican Republic	Web Address	www.dell.com/do
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	Technical Support, Customer Service, Sales	1-800-156-1588
Ecuador	Web Address	www.dell.com/ec
	E-Mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales (Calling from Quito)	toll-free: 999-119-877-655-3355
	Technical Support, Customer Service, Sales (Calling from Guayaquil)	toll-free: 1800-999-119-877-655-3355
El Salvador	Web Address	www.dell.com/sv
	E-Mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	800-6132
Finland (Helsinki)	Web Address	support@euro.dell.com
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	Technical Support	0207 533 555
	Customer Service	0207 533 538
	Switchboard	0207 533 533
	Sales under 500 employees	0207 533 540
	Fax	0207 533 530
	Sales over 500 employees	0207 533 533
	Fax	0207 533 530
France (Paris) (Montpellier) International Access Code: 00 Country Code: 33 City Codes: (1) (4)	Web Address	Support.euro.dell.com
	Home and Small Business	
	Technical Support	0825 387 270
	Customer Service	0825 832 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Service	0825 338 339
	Switchboard	55 94 71 00
	Sales	01 55 94 71 00
Germany (Frankfurt)	Web Address	support.euro.dell.com
	E-mail Address	tech_support_central_europe@dell.com
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	Home/Small Business Customer Service	0180-5-224400
	Global Segment Customer Service	069 9792-7320
	Preferred Accounts Customer Service	069 9792-7320
	Large Accounts Customer Service	069 9792-7320
	Public Accounts Customer Service	069 9792-7320
Greece	Switchboard	069 9792-7000
	Web Address	Support.euro.dell.com
	Technical Support	00800-44 14 95 18
	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	Web Address	www.dell.com/gd
	E-Mail Address	la-techsuppo@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-540-3355

Guatemala	Web Address	www.dell.com/gt
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	Technical Support, Customer Service, Sales	1-800-999-0136
Guyana	E-Mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-270-4609
Hong Kong	Web Address	support.ap.dell.com
International Access Code: 001 Country Code: 852	Technical Support E-mail Address	support.dell.com.cn/email
	Technical Support - Dimension and Inspiron	00852-2969 3188
	Technical Support - OptiPlex, Latitude, and Dell Precision	00852-2969 3191
	Technical Support - Servers and Storage	00852-2969 3196
	Technical Support - Projectors, PDAs, Switches, Routers, etc .	00852-3416 0906
	Customer Service	00852-3416 0910
	Large Corporate Accounts	00852-3416 0907
	Global Customer Programs	00852-3416 0908
	Medium Business Division	00852-3416 0912
Home and Small Business Division	00852-2969 3105	
India	Dell Support Website	support.ap.dell.com
Portable and Desktop Support		
	Desktop Support E-mail Address	india_support_desktop@dell.com
	Portable Support E-mail Address	india_support_notebook@dell.com
	Phone Numbers	080-25068032 or 080-25068034 or your city STD code + 60003355 or toll-free: 1-800-425-8045
Server Support		
	E-mail Address	india_support_Server@dell.com
	Phone Numbers	080-25068032 or 080-25068034 or your city STD code + 60003355 or toll-free: 1-800-425-8045
Gold Support Only		
	E-mail Address	eec_ap@dell.com
	Phone Numbers	080-25068033 or your city STD code + 60003355 or toll-free: 1-800-425-9045
Customer Service		
	Home and Small Business	India_care_HSB@dell.com toll-free : 1800-4254051
	Large Corporate Accounts	India_care_REL@dell.com toll free : 1800-4252067
Sales		
	Large Corporate Accounts	1600 33 8044
	Home and Small Business	1600 33 8046

Ireland (Cherrywood)	Web Address	Support.euro.dell.com
International Access Code: 00	Technical Support	
Country Code: 353	E-mail Address	dell_direct_support@dell.com
City Code: 1	Business computers	1850 543 543
	Home computers	1850 543 543
	At Home Support	1850 200 889
	Sales	
	Home	1850 333 200
	Small Business	1850 664 656
	Medium Business	1850 200 646
	Large Business	1850 200 646
	E-mail Address	Dell_IRL_Outlet@dell.com
	Customer Service	
	Home and Small Business	204 4014
	Business (greater than 200 employees)	1850 200 982
	General	
	Fax/Sales fax	204 0103
	Switchboard	204 4444
	U.K. Customer Service (dealing with U.K. only)	0870 906 0010
	Corporate Customer Service (dial within U.K. only)	0870 907 4499
	U.K. Sales (dial within U.K. only)	0870 907 4000
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Country Code: 39	Technical Support	02 577 826 90
City Code: 02	Customer Service	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Service	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
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	Technical Support, Customer Service, Sales (dial from within Jamaica only)	1-800-440-920

Japan (Kawasaki)	Web Address	support.jp.dell.com
International Access Code: 001 Country Code: 81 City Code: 44	Technical Support - Dimension and Inspiron	toll-free: 0120-198-26
	Technical Support outside of Japan - Dimension and Inspiron	81-44-520-1435
	Technical Support - Dell Precision, OptiPlex, and Latitude	toll-free: 0120-198-433
	Technical Support outside of Japan - Dell Precision, OptiPlex, and Latitude	81-44-556-3894
	Technical Support - Dell PowerApp™, Dell PowerEdge™, Dell PowerConnect™, and Dell PowerVault™,	toll-free: 0120-198-498
	Technical Support outside of Japan - PowerApp, PowerEdge, PowerConnect, and PowerVault	81-44-556-4162
	Technical Support - Projectors, PDAs, Printers, Routers	toll-free: 0120-981-690
	Technical Support outside of Japan - Projectors, PDAs, Printers, Routers	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Status Service	044-556-3801
	Customer Service	044-556-4240
	Business Sales Division - up to 400 employees	044-556-1465
	Preferred Accounts Division Sales - over 400 employees	044-556-3433
	Public Sales - government agencies, educational institutions, and medical institutions	044-556-5963
Global Segment Japan	044-556-3469	
Individual User	044-556-1657	
Individual User Online Sales	044-556-2203	
Individual User Real Site Sales	044-556-4649	
Switchboard	044-556-4300	
Korea (Seoul)	Web Address	Support.ap.dell.com
International Access Code: 001 Country Code: 82 City Code: 2	Technical Support, Customer Service	toll-free: 080-200-3800
	Technical Support - Dimension, PDA, Electronics, and Accessories	toll-free: 080-200-3801
	Sales	toll-free: 080-200-3600
	Fax	2194-6202
	Switchboard	2194-6000
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600 or 512 728-3772
Luxemborg	Web Address	Support.euro.dell.com
International Access Code: 00 Country Code: 352	Support	3420808075
	Home/Small Business Sales	+32 (0)2 713 15 96
	Corporate Sales	26 25 77 81
	Customer Service	+32 (0)2 481 91 19
	Fax	26 25 77 82
Macao	Technical Support	toll-free: 0800 105
Country Code: 83	Customer Service (Xiamen, China)	34 160 910
	Transaction Sales (Xiamen, China)	29 693 115

Malaysia (Penang)	Web Address	Support.ap.dell.com
International Access Code: 00	Technical Support - Dell Precision, OptiPlex, and Latitude	toll-free: 1800 880 193
Country Code: 60	Technical Support - Dimension, Inspiron, and Electronics and Accessories	toll-free: 1800 881 306
City Code: 4	Technical Support - PowerApp, PowerEdge, PowerConnect, and PowerVault	toll-free: 1800 881 386
	Customer Service	toll-free: 1800 881 306 (option 6)
	Transaction Sales	toll-free: 1800 888 202
	Corporate Sales	toll-free: 1800 888 213
Mexico	Web Address	www.dell.com/mx
International Access Code: 00	E-mail Address	la-techsupport@dell.com
Country Code: 52	Customer Technical Support	001-877-384-8979 or 001-877-269-3383
	Sales	50-81-8800 or 01-800-888-3355
	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800 or 01-800-888-3355
Montserrat	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	Toll-free: 1-866-278-6822
Netherlands	E-mail Address	la-techsupport@dell.com
Antilles	Web Address	support.euro.dell.com
Netherlands (Amsterdam)	Technical Support	020 674 45 00
International Access Code: 00	Technical Support Fax	020 674 47 66
Country Code: 31	Home/Small Business Customer Service	020 674 42 00
City Code: 20	Relational Customer Service	020 674 43 25
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand	Web Address	Support.ap.dell.com
International Access Code: 00	E-mail Address	Support.ap.dell.com/contactus
Country Code: 64	Technical Support, Customer Service, Sales	0800 441 567
Nicaragua	Web Address	www.dell.com/ni
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	001-800-220-1377
Norway (Lysaker)	Web Address	Support.euro.dell.com
International Access Code: 00	Technical Support	671 16882
Country Code: 47	Relational Customer Service	671 17575
	Home/Small Business Customer Service	231 62298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	Web Address	www.dell.com/pa
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	011-800-507-1264
Peru	Web Address	www.dell.com/pe
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	0800-50-669

Poland (Warsaw)	Web Address	support.euro.dell.com
International Access Code: 011	E-mail Address	pl_support_tech@dell.com
Country Code: 48	Customer Service Phone	57 95 700
City Code: 22	Customer Service	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Web Address	Support.euro.dell.com
International Access Code: 00	Technical Support	707200149
Country Code: 351	Customer Service	800 300 413
	Sales	800-300-410 or 800-300 -411 or 800-300-412 or 21-422-07-10
	Fax	21-424-01-12
Puerto Rico	Web Address	www.dell.com/pr
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	1-877-537-3355
St. Kitts and Nevis	Web Address	www.dell.com/kn
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-540-3355
St. Lucia	Web Address	www.dell.com/lc
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-464-4352
St. Vincent and the Grenadines	Web Address	www.dell.com/vc
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-866-464-4353
Singapore	NOTE: The phone numbers in this section should be called from within Singapore or Malaysia only.	
International Access Code: 005	Web Address	support.ap.dell.com
Country Code: 65	Technical Support - Dimension, Inspiron, and Electronics and Accessories	toll-free: 1 800 394 7430
	Technical Support - OptiPlex, Latitude, and Dell Precision	toll-free: 1 800 394 7488
	Technical Support - PowerApp, PowerEdge, PowerConnect, and PowerVault	toll-free: 1 800 394 7478
	Customer Service	toll-free: 1 800 394 7430 (option 6)
	Transaction Sales	toll-free: 1 800 394 7412
	Corporate Sales	toll-free: 1 800 394 7419
Slovakia (Prague)	Web Address	support.euro.dell.com
International Access Code: 00	E-mail Address	czech_dell@dell.com
Country Code: 421	Technical Support	02 5441 5727
	Customer Service	420 22537 2707
	Fax	02 5441 8328
	Tech Fax	02 5441 8328
	Switchboard (Sales)	02 5441 8328 02 5441 7585
South Africa (Johannesburg)	Web Address	support.euro.dell.com
International Access Code: 09/091	E-mail Address	dell_za_suppor@dell.com
Country Code: 27	Gold Queue	011 709 7713
City Code: 11	Technical Support	011 709 7710
	Customer Service	011 709 7707
	Sales	011 709 7700

Spain (Madrid)	Web Address	Support.euro.com
International Access Code: 00	Home and Small Business	
Country Code: 34	Technical Support	902 100 130
City Code: 91	Customer Service	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Service	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby)	Web Address	support.euro.dell.com
International Access Code: 00	Technical Support	08 590 05 199
Country Code: 46	Relational Customer Service	08 590 05 642
City Code: 8	Home/Small Business Customer Service	08 587 70 527
	Employee Purchase Program (EPP) Support	020 140 14 44
	Technical Support Fax	08 590 05 594
Switzerland (Geneva)	Web Address	Support.euro.dell.com
International Access Code: 00	E-mail Address	Tech_support_central_Europe@dell.com
Country Code: 41	Technical Support – Home and Small Business	0844 811 411
City Code: 22	Technical Support – Corporate	0844 822 844
	Customer Service – Home and Small Business	0848 802 202
	Customer Service – Corporate	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan	Web Address	support.ap.dell.com
International Access Code: 002	E-mail Address	support.dell.com.cn/email
Country Code: 886	Technical Support - OptiPlex, Latitude, Inspiron, Dimension, and Electronics and Accessories	toll-free: 0080 186 1011
	Technical Support - Servers and Storage	toll-free: 0080 160 1256
	Customer Service	toll-free: 0080 160 1250 (option 5)
	Transaction Sales	toll-free: 0080 165 1228
	Corporate Sales	toll-free: 0080 165 1227
Thailand	Web Address	Support.ap.dell.com
International Access Code: 001	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-free: 1800 0060 07
Country Code: 66	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1800 0600 09
	Customer Service	toll-free: 1800 006 007 (option 7)
	Corporate Sales	toll-free: 1800 006 009
	Transaction Sales	toll-free: 1800 006 006
Trinidad/Tobago	Web Address	www.dell.com/ff
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-888-799-5908
Turks and Caicos Islands	Web Address	www.dell.com/tc
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-441-4735

U.K.(Bracknell)	Web Address	upport.euro.dell.com
International Access Code: 00	E-mail Address	dell_direct_support@dell.com
Country Code: 44	Customer Service Website	support.euro.dell.com/uk/en/ECare/form/home.asp
City Code: 1344	Sales	
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Customer Service	
	Home and Small Business	0870 906 0010
	Corporate	01344 373 185
	Preferred Accounts (500-5000 employees)	0870 906 0010
	Global Accounts	01344 373 186
	Central Government	01344 373 196
	Local Government & Education	01344 373 199
	Health	01344 373 194
	Technical Support	
	Corporate/Preferred Accounts/PCA (1000+ employees)	0870 908 0500
	Other Dell Products	0870 353 0800
	General	
	Home and Small Business Fax	0870 907 4006
Uruguay	Web Address	www.dell.com/uy
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 000-413-598-2521
U.S.A. (Austin, Texas)	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: 011	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
Country Code: 1	Hardware and Warranty Support (Dell TV, Printers, and Projectors) for Relationship customers	toll-free: 1-877-459-7298
	Consumer (Home and Home Office) Support for Dell products	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Financial Services Web Address	www.dellfinancialservices.com
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	Business	
	Customer Service	toll-free: 1-800-624-9897
	Employee Purchase Program (EPP)	toll-free: 1-800-695-8133
	Customer s Support for printers, projectors, PDAs, and MP3 players	toll-free: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Dell Sales	toll-free: 1-800-289-3355 or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)

U.S. Virgin Islands	Web Address	www.dell.com/vi
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	toll-free: 1-877-702-4360
Venezuela	Web Address	www.dell.com/ve
	E-mail Address	la-techsupport@dell.com
	Technical Support, Customer Service, Sales	0800-100-4752

Cartridge for VMware Rules

The Cartridge for VMware includes a number of predefined rules that capture the expert knowledge of our virtualization specialists and are used to monitor the health of your virtual infrastructure. vFoglight allows you to modify these rules or create your own flexible rules that can be applied to complex, interrelated data from multiple sources within your distributed system.

In this chapter, rule descriptions are organized into logical groupings. To see a rule description, select the appropriate grouping from the sections listed below.

This chapter contains the following sections:

Overview of Rules	26
Thresholds	27
Agent Rules	28
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Datacenter Rules	40
Datastore Rule	47
Resource Pool Rules	49
ESX Server Rules	56
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Overview of Rules

vFoglight allows you to create flexible rules that can be applied to complex, interrelated data from multiple sources within your distributed system. You can associate several different actions with a rule, configure a rule so that it does not fire repeatedly, and associate a rule with schedules to define when it should and should not be evaluated.

Different types of data can be used in rules, including registry variables, raw metrics, derived metrics, and topology object properties.

There are two types of rules in vFoglight: simple rules and multiple-severity rules. A simple rule has a single condition, and can be in one of three states: *Fire*, *Undefined*, or *Normal*. A multiple-severity rule can have up to five severity levels: *Undefined*, *Fatal*, *Critical*, *Warning*, and *Normal*.

Rule conditions are regularly evaluated against monitoring data (metrics and topology object properties collected from your monitored environment and transformed into a standard format). Therefore, the state of the rule can change if the data changes. For example, if a set of monitoring data matches a simple rule's condition, the rule enters the *Fire* state. If the next set does not match the condition, the rule exits the *Fire* state and enters the *Normal* state.

A rule condition is a type of expression that can be true or false. When it evaluates to true, the rule is said to fire, causing any actions that are associated with the rule or severity level to be performed. You can configure a rule to perform one or more actions upon entering or exiting each state. When a multiple-severity rule fires, an alarm also appears in vFoglight.

See “Introduction to Rules” and “Creating and Editing Rules” in the vFoglight *Administration and Configuration Guide* for more information.

Thresholds

Many of the rules listed and described in this chapter have thresholds (standard deviations, utilization percentages, etc.) defined within them. Those thresholds are default values predefined in the registry.

Agent Rules

This section lists and describes the agent rules.

Rules in this section:

- [“VMW Agent Data Updates”](#) on page 29
- [“VMW Agent Messages”](#) on page 30
- [“VMW Agent Updates”](#) on page 31

VMW Agent Data Updates

Purpose

An alarm fires when the agent does not report on data (dataType) in the appropriate amount of time (timeDiffSecs).

Scope

VMWAgentDataUpdate

Rule Definition

Conditions	State	Action
The agent reports on the data in the appropriate amount of time.	Normal	None
The agent does not report on the data in the appropriate amount of time.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- vmAgents Dashboard, see the *vFoglight Cartridge for VMware User Guide*
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Agent Messages

Purpose

This rule converts agent messages into vFoglight alarms.

Scope

VMWAgent

Rule Definition

Conditions	State	Action
There are no agent messages with a severity value of either 2, 3, or 4.	Normal	None
When there is an agent message with a severity value of 2, an alarm fires displaying the message.	Warning	None
When there is an agent message with a severity value of 3, an alarm fires displaying the message.	Critical	E-mail VMW admin
When there is an agent message with a severity value of 4, an alarm fires displaying the message.	Failure	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- vmAgents Dashboard, see the *vFoglight Cartridge for VMware User Guide*
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Agent Updates

Purpose

An alarm fires when the agent does not report any data in the specified amount of time (timeDiffSecs).

Scope

VMWAgent

Rule Definition

Conditions	State	Action
The agent reports data in the specified amount of time.	Normal	None
The agent does not report any data in the specified amount of time.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- vmAgents Dashboard, see the *vFoglight Cartridge for VMware User Guide*
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

Cluster Rules

This section lists and describes the cluster rules.

Rules in this section:

- [“VMW Cluster CPU Utilization”](#) on page 33
- [“VMW Cluster Disk IO”](#) on page 34
- [“VMW Cluster Memory Utilization”](#) on page 35
- [“VMW Cluster Network IO”](#) on page 36
- [“VMW Cluster Percent Ready”](#) on page 37
- [“VMW Cluster Redundancy Verification”](#) on page 38

VMW Cluster CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for a cluster.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean CPU utilization and the CPU utilization is at 75 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 75 percent but not greater than 83 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 83 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108

- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Cluster Disk IO

Purpose

This rule monitors for spikes and dramatic drops in disk IO for a cluster.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Cluster Memory Utilization

Purpose

This rule monitors for spikes and dramatic drops in memory utilization for a cluster.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
The memory utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean memory utilization.	Normal	None
The memory utilization is more than 2.2 but no more than 2.8 standard deviations from the mean memory utilization.	Warning	None
The memory utilization is more than 2.8 standard deviations from the mean memory utilization.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Cluster Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for a cluster.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Cluster Percent Ready

Purpose

This rule fires an alarm to report that when a virtual machine within the cluster is requesting CPU cycles from the ESX Server on which it is running, it is not receiving them some percentage of the time. This will impact performance on the virtual machine.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
When the virtual machine requests CPU cycles, it is only not receiving them 2 percent or less of the time.	Normal	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 2 percent but no greater than 8 percent of the time.	Warning	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 8 percent but no greater than 12 percent of the time.	Critical	E-mail VMW admin
When the virtual machine requests CPU cycles, it is not receiving them greater than 12 percent of the time.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108

- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Cluster Redundancy Verification

Purpose

This rule fires an alarm to report that if an ESX Server within the cluster fails, the remaining servers in the cluster may not or do not have enough available CPU and/or memory to handle the increased workload.

Scope

VMWCluster

Rule Definition

Conditions	State	Action
The cluster has sufficient redundant CPU and memory capacity to handle the failure of a single ESX Server.	Normal	None
Although the cluster can handle the failure of a single ESX Server, either the resulting combined CPU utilization or the resulting combined memory utilization on the remaining servers, or both, would be beyond the warning threshold. The resulting alarm message will indicate the values of both of the new combined utilizations.	Warning	None
If an ESX Server within the cluster fails, the remaining servers do not have the capacity to handle the increased workload. The resulting alarm message will indicate the values of both of the new combined utilizations.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

Datacenter Rules

This section lists and describes the datacenter rules.

Rules in this section:

- [“VMW Datacenter CPU Utilization”](#) on page 41
- [“VMW Datacenter Disk IO”](#) on page 42
- [“VMW Datacenter Memory Utilization”](#) on page 43
- [“VMW Datacenter Network IO”](#) on page 44
- [“VMW Datacenter Percent Ready”](#) on page 45

VMW Datacenter CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for a datacenter.

Scope

VMWDatacenter

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean CPU utilization and the CPU utilization is at 90 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 90 percent but not greater than 93 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 93 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
- [“Infrastructure Overview”](#) on page 108

- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

VMW Datacenter Disk IO

Purpose

This rule monitors for spikes and dramatic drops in disk IO for a datacenter.

Scope

VMWDatacenter

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
- [“Navigation View”](#) on page 107
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VMW Datacenter Memory Utilization

Purpose

This rule monitors for spikes and dramatic drops in memory utilization for a datacenter.

Scope

VMWDatacenter

Rule Definition

Conditions	State	Action
The memory utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean memory utilization.	Normal	None
The memory utilization is more than 2.2 but no more than 2.8 standard deviations from the mean memory utilization.	Warning	None
The memory utilization is more than 2.8 standard deviations from the mean memory utilization.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
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VMW Datacenter Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for a datacenter.

Scope

VMWDatacenter

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
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VMW Datacenter Percent Ready

Purpose

This rule fires an alarm to report that when a virtual machine within the datacenter is requesting CPU cycles from the ESX Server on which it is running, it is not receiving them some percentage of the time. This will impact performance on the virtual machine.

Scope

VMWDatacenter

Rule Definition

Conditions	State	Action
When the virtual machine requests CPU cycles, it is only not receiving them 2 percent or less of the time.	Normal	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 2 percent but no greater than 8 percent of the time.	Warning	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 8 percent but no greater than 12 percent of the time.	Critical	E-mail VMW admin
When the virtual machine requests CPU cycles, it is not receiving them greater than 12 percent of the time.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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- [“Related Objects Views”](#) on page 104
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- [“Alarms Overview”](#) on page 111
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Datastore Rule

This section describes datastore rules.

Rules in this section:

- [“VMW Datastore Estimated Fill Time”](#) on page 48

VMW Datastore Estimated Fill Time

Purpose

This rule fires an alarm to report about when the datastore is likely to reach full capacity, based on its present growth rate.

Scope

VMWDatastore

Rule Definition

Conditions	State	Action
At the present growth rate, the datastore will not reach its capacity within the next month (within the next 672 hours).	Normal	None
At the present growth rate, the datastore will reach its capacity within the next month (within the next 672 hours).	Warning	None
At the present growth rate, the datastore will reach its capacity within the next week (within the next 168 hours).	Critical	E-mail VMW admin
At the present growth rate, the datastore will reach its capacity within the next 48 hours.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Infrastructure Overview”](#) on page 108
- [“Alarms Overview”](#) on page 111
- [“Alarms List View”](#) on page 112

Resource Pool Rules

This section lists and describes the resource pool rules.

Rules in this section:

- [“VMW Resource Pool CPU Utilization”](#) on page 50
- [“VMW Resource Pool Disk IO”](#) on page 51
- [“VMW Resource Pool Memory Utilization”](#) on page 52
- [“VMW Resource Pool Network IO”](#) on page 53
- [“VMW Resource Pool Percent Ready”](#) on page 54

VMW Resource Pool CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for a resource pool.

Scope

VMWResourcePool

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean CPU utilization and the CPU utilization is at 75 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 75 percent but not greater than 83 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 83 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Resource Pools Relationship Tree View”](#) on page 103
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
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- [“Infrastructure Overview”](#) on page 108

- [“Alarms Overview”](#) on page 111
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VMW Resource Pool Disk IO

Purpose

This rule monitors for spikes and dramatic drops in disk IO for a resource pool.

Scope

VMWResourcePool

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Resource Pools Relationship Tree View”](#) on page 103
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VMW Resource Pool Memory Utilization

Purpose

This rule monitors for spikes and dramatic drops in memory utilization for a resource pool.

Scope

VMWResourcePool

Rule Definition

Conditions	State	Action
The memory utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean memory utilization.	Normal	None
The memory utilization is more than 2.2 but no more than 2.8 standard deviations from the mean memory utilization.	Warning	None
The memory utilization is more than 2.8 standard deviations from the mean memory utilization.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Resource Pools Relationship Tree View”](#) on page 103
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VMW Resource Pool Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for a resource pool.

Scope

VMWResourcePool

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
- [“Resource Pools Relationship Tree View”](#) on page 103
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
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- [“Infrastructure Overview”](#) on page 108
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VMW Resource Pool Percent Ready

Purpose

This rule fires an alarm to report that when a virtual machine within the resource pool is requesting CPU cycles from the ESX Server on which it is running, it is not receiving them some percentage of the time. This will impact performance on the virtual machine.

Scope

VMWResourcePool

Rule Definition

Conditions	State	Action
When the virtual machine requests CPU cycles, it is only not receiving them 2 percent or less of the time.	Normal	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 2 percent but no greater than 8 percent of the time.	Warning	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 8 percent but no greater than 12 percent of the time.	Critical	E-mail VMW admin
When the virtual machine requests CPU cycles, it is not receiving them greater than 12 percent of the time.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101

- [“Resource Pools Relationship Tree View”](#) on page 103
- [“Related Objects Views”](#) on page 104
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ESX Server Rules

This section lists and describes the ESX Server rules.

Rules in this section:

- [“VMW ESX Server Balloon Memory Deflation”](#) on page 57
- [“VMW ESX Server CPU 0 High Utilization”](#) on page 58
- [“VMW ESX Server CPU Utilization”](#) on page 59
- [“VMW ESX Server Disconnected”](#) on page 60
- [“VMW ESX Server Disk IO”](#) on page 61
- [“VMW ESX Server Heap Free Memory”](#) on page 62
- [“VMW ESX Server Memory Utilization”](#) on page 63
- [“VMW ESX Server Memory Utilization Upward Trend”](#) on page 64
- [“VMW ESX Server Network IO”](#) on page 66
- [“VMW ESX Server Consumed Vs. Granted Memory”](#) on page 67

VMW ESX Server Balloon Memory Deflation

Purpose

This rule monitors for servers working excessively to reclaim memory. To better balance memory utilization across servers within a cluster, you can add more physical resources to a server or you can use VMotion to move a virtual machine from one server to another.

Scope

VMWESXServerMemory

Rule Definition

Conditions	State	Action
The balloon has not been growing excessively and is deflating normally.	Normal	None
The balloon has reached 20 percent of the server's memory over the course of the last 90 minutes and has failed to deflate to less than 5 percent over the last 15 minutes.	Warning	None
The balloon has reached 20 percent of the server's memory over the course of the last 90 minutes and has failed to deflate to less than 12 percent over the last 15 minutes.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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VMW ESX Server CPU 0 High Utilization

Purpose

This rule monitors for situations in which an incomplete SOAP message sent to the Web services API results in a dramatic increase in CPU usage on CPU 0 within an ESX Server or VirtualCenter.

Scope

VMWESXServerProcessor

Rule Definition

Conditions	State	Action
The CPU usage on CPU 0 is not greater than 95 percent.	Normal	None
The CPU usage on CPU 0 is greater than 95 percent.	Fatal	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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- [“Related Objects Views”](#) on page 104
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VMW ESX Server CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for an ESX Server.

Scope

VMWESXServerCPUs

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations from the mean CPU utilization and the CPU utilization is at 90 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 90 percent but not greater than 93 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 93 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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VMW ESX Server Disconnected

Purpose

This rule checks for a loss of connectivity between the VirtualCenter and an ESX Server that had virtual machines running on it.

Scope

VMWESXServer

Rule Definition

Conditions	State	Action
The ESX Server, which has virtual machines running on it, is currently connected to the VirtualCenter.	Normal	None
The ESX Server, which had virtual machines running on it, is no longer connected to the VirtualCenter.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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- [“Related Objects Views”](#) on page 104
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VMW ESX Server Disk IO

Purpose

This rule monitors for spikes and drops in disk IO for an ESX Server.

Scope

VMWESXServerStorage

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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VMW ESX Server Heap Free Memory

Purpose

This rule monitors heap memory in the vmkernel and fires an alarm when the heap memory for a particular ESX Server drops below a predefined amount.

If the amount of heap memory in the vmkernel for a particular ESX Server drops to the critical level, you may want to add more physical memory to the server or use VMotion to better balance memory utilization across servers within the cluster.

Scope

VMWESXServerMemory

Rule Definition

Conditions	State	Action
The amount of free memory in the vmkernel for the ESX Server is 10,240 KB or more.	Normal	None
The amount of free memory in the vmkernel for the ESX Server is less than 10,240 KB but not less than 6,144 KB.	Critical	E-mail VMW admin
The amount of free memory in the vmkernel for the ESX Server is less than 6,144 KB.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
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VMW ESX Server Memory Utilization

Purpose

This rule monitors for spikes and dramatic drops in memory utilization for an ESX Server.

Scope

VMWESXServerMemory

Rule Definition

Conditions	State	Action
The memory utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean memory utilization.	Normal	None
The memory utilization is more than 2.2 but no more than 2.8 standard deviations from the mean memory utilization.	Warning	None
The memory utilization is more than 2.8 standard deviations from the mean memory utilization.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
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VMW ESX Server Memory Utilization Upward Trend

Purpose

This rule monitors for upward trends in memory utilization for an ESX Server.

Scope

VMWESXServerMemory

Rule Definition

Conditions	State	Action
Over the last ten minutes the mean memory has not increased (relative to the historical mean memory) by any more than 1 percent.	Normal	None
Over the last ten minutes the mean memory has increased (relative to the historical mean memory) by more than 1 percent but not by more than 2 percent.	Warning	None
Over the last ten minutes the mean memory has increased (relative to the historical mean memory) by more than 2 percent but not by more than 3 percent.	Critical	None
Over the last ten minutes the mean memory has increased (relative to the historical mean memory) by more than 3 percent.	Fatal	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101

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VMW ESX Server Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for an ESX Server.

Scope

VMWESXServerNetwork

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
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VMW ESX Server Consumed Vs. Granted Memory

Purpose

This rule compares the amount of memory that is being requested by the virtual machines on an ESX Server to the amount of memory available on the ESX Server.

If the application workload of the ESX Server is requesting an excessive amount of the available memory resources, you must either add memory to the ESX Server or use VMotion to better balance the virtual machines across the servers within the cluster.

Scope

VMWESXServerMemory

Rule Definition

Conditions	State	Action
The virtual machines on the server are requesting just 75 percent or less of the memory the server has available.	Normal	None
The virtual machines on the server are requesting more than 75 percent but no more than 83 percent of the memory the server has available.	Warning	None
The virtual machines on the server are requesting more than 83 percent but no more than 90 percent of the memory the server has available.	Critical	E-mail VMW admin
The virtual machines on the server are requesting more than 90 percent of the memory the server has available.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Summary View”](#) on page 101
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VirtualCenter Rules

This section lists and describes the VirtualCenter rules.

Rules in this section:

- [“VMW VirtualCenter CPU Utilization”](#) on page 70
- [“VMW VirtualCenter Disk IO”](#) on page 71
- [“VMW VirtualCenter Memory Utilization”](#) on page 72
- [“VMW VirtualCenter Network IO”](#) on page 73
- [“VMW VirtualCenter Percent Ready”](#) on page 74

VMW VirtualCenter CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for a VirtualCenter.

Scope

VMWVirtualCenter

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean CPU utilization and the CPU utilization is at 90 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 90 percent but not greater than 93 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 93 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Related Objects Views”](#) on page 104
- [“Actions Panel”](#) on page 106
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VMW VirtualCenter Disk IO

Purpose

This rule monitors for spikes and dramatic drops in disk IO for a VirtualCenter.

Scope

VMWVirtualCenter

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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VMW VirtualCenter Memory Utilization

Purpose

This rule monitors for spikes and dramatic drops in memory utilization for a VirtualCenter.

Scope

VMWVirtualCenter

Rule Definition

Conditions	State	Action
The memory utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean memory utilization.	Normal	None
The memory utilization is more than 2.2 but no more than 2.8 standard deviations from the mean memory utilization.	Warning	None
The memory utilization is more than 2.8 standard deviations from the mean memory utilization.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Related Objects Views”](#) on page 104
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VMW VirtualCenter Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for a VirtualCenter.

Scope

VMWVirtualCenter

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
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VMW VirtualCenter Percent Ready

Purpose

This rule fires an alarm to report that when a virtual machine within the VirtualCenter is requesting CPU cycles from the ESX Server on which it is running, it is not receiving them some percentage of the time. This will impact performance on the virtual machine.

Scope

VMWVirtualCenter

Rule Definition

Conditions	State	Action
When the virtual machine requests CPU cycles, it is only not receiving them 2 percent or less of the time.	Normal	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 2 percent but no greater than 8 percent of the time.	Warning	None
When the virtual machine requests CPU cycles, it is not receiving them greater than 8 percent but no greater than 12 percent of the time.	Critical	E-mail VMW admin
When the virtual machine requests CPU cycles, it is not receiving them greater than 12 percent of the time.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
- [“vmExplorer Primary View”](#) on page 100
- [“Related Objects Views”](#) on page 104
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Virtual Machine Rules

This section lists and describes the virtual machine rules.

Rules in this section:

- [“VMW Virtual Machine Active Vs. Granted Memory”](#) on page 77
- [“VMW Virtual Machine Balloon Memory Deflation”](#) on page 79
- [“VMW Virtual Machine Balloon Memory Target”](#) on page 81
- [“VMW Virtual Machine Consumed Vs. Granted Memory”](#) on page 82
- [“VMW Virtual Machine CPU Utilization”](#) on page 84
- [“VMW Virtual Machine Disk Command Aborts”](#) on page 85
- [“VMW Virtual Machine Disk IO”](#) on page 86
- [“VMW Virtual Machine Logical Drive Estimated Fill Time”](#) on page 87
- [“VMW Virtual Machine Memory Allocation Versus Limit”](#) on page 88
- [“VMW Virtual Machine Memory Swapping”](#) on page 89
- [“VMW Virtual Machine Memory Utilization”](#) on page 90
- [“VMW Virtual Machine Network IO”](#) on page 91
- [“VMW Virtual Machine Power State Change”](#) on page 92
- [“VMW Virtual Machine VMware Tools”](#) on page 93
- [“VMW Virtual Machine Zero Page Memory Detection”](#) on page 94

VMW Virtual Machine Active Vs. Granted Memory

Purpose

This rule compares the amount of physical memory that is actively being used by the virtual machine to the amount of memory granted to the virtual machine by the vmkernel.

If active memory approaches the granted memory value in the virtual machine's configuration, you should consider increasing the granted memory value.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The virtual machine is actively using only 75 percent or less of the memory it has been granted by the vmkernel.	Normal	None
The virtual machine is actively using more than 75 percent but no more than 85 percent of the memory it has been granted by the vmkernel.	Warning	None
The virtual machine is actively using more than 85 percent but no more than 90 percent of the memory it has been granted by the vmkernel.	Critical	E-mail VMW admin
The virtual machine is actively using more than 90 percent of the memory it has been granted by the vmkernel.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine Balloon Memory Deflation

Purpose

This rule monitors for virtual machines working excessively to reclaim memory.

To better balance memory utilization across hosts in a cluster, you can add more physical resources to a host or you can use VMotion to move a virtual machine from one host to another.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The balloon has not been growing excessively and is deflating normally.	Normal	None
The balloon has reached 20 percent of the host's memory over the course of the last 90 minutes and has failed to deflate to less than 5 percent over the last 15 minutes.	Warning	None
The balloon has reached 20 percent of the host's memory over the course of the last 90 minutes and has failed to deflate to less than 12 percent over the last 15 minutes.	Critical	None

Views Displaying Alarms Based on this Rule

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- [“Related Objects Views”](#) on page 104
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VMW Virtual Machine Balloon Memory Target

Purpose

This rule monitors the ability of the virtual machine to swap memory locally in order to free it up for reclamation. If the virtual machine is having no trouble swapping memory normally, the balloon (and therefore the balloon target) is not excessively large. If the virtual machine is having trouble swapping memory, the balloon is excessively large.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The balloon target is 33 percent or less of the virtual machine's configured memory.	Normal	None
The balloon target is greater than 33 percent but not greater than 50 percent of the virtual machine's configured memory.	Warning	None
The balloon target is greater than 50 percent of the virtual machine's configured memory.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine Consumed Vs. Granted Memory

Purpose

This rule compares the amount of memory that is being requested by virtual machines (the application workload) to the amount of memory granted to the virtual machines by the ESX Server.

If the application workload of the ESX Server is requesting an excessive amount of the available memory resources, you must either add memory to the ESX Server or use VMotion to better balance the virtual machines across the servers within the cluster.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The virtual machine is consuming 75 percent or less of the memory it has been granted by the ESX Server.	Normal	None
The virtual machine is consuming more than 75 percent but no more than 83 percent of the memory it has been granted by the ESX Server.	Warning	None
The virtual machine is consuming more than 83 percent but no more than 90 percent of the memory it has been granted by the ESX Server.	Critical	E-mail VMW admin
The virtual machine is consuming more than 90 percent of the memory it has been granted by the ESX Server.	Fatal	E-mail VMW admin

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- “[vmExplorer Primary View](#)” on page 100
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VMW Virtual Machine CPU Utilization

Purpose

This rule monitors for spikes, dramatic drops, and sustained high levels in CPU utilization for a virtual machine.

Scope

VMWVirtualMachineHostCPUs

Rule Definition

Conditions	State	Action
The CPU utilization is no more than 2.2 standard deviations (NumSTDevs) from the mean CPU utilization and the CPU utilization is at 75 percent or less.	Normal	None
The CPU utilization is more than 2.2 but no more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 75 percent but not greater than 83 percent.	Warning	None
The CPU utilization is more than 2.8 standard deviations from the mean CPU utilization, or the CPU utilization is greater than 83 percent.	Critical	E-mail VMW admin

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine Disk Command Aborts

Purpose

This rule monitors for situations in which a disk command has been aborted because these may be an indication of hardware problems.

Scope

VMWVirtualMachineHostStorage

Rule Definition

Conditions	State	Action
There are no disk command aborts to report.	Normal	None
A disk command abort has occurred.	Critical	E-mail VMW admin

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- [“vmExplorer Primary View”](#) on page 100
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VMW Virtual Machine Disk IO

Purpose

This rule monitors for spikes and dramatic drops in disk IO for a virtual machine.

Scope

VMWVirtualMachineHostStorage

Rule Definition

Conditions	State	Action
The disk usage is no more than 2.2 standard deviations (NumSTDevs) from the mean disk usage.	Normal	None
The disk usage is more than 2.2 but no more than 2.8 standard deviations from the mean disk usage.	Warning	None
The disk usage is more than 2.8 standard deviations from the mean disk usage.	Critical	None

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VMW Virtual Machine Logical Drive Estimated Fill Time

Purpose

This rule fires an alarm to report on when the logical drive for the virtual machine is likely to reach full capacity, based on its present growth rate.

Scope

VMWVirtualMachineLogicalDisk

Rule Definition

Conditions	State	Action
At the present growth rate, the logical drive will not reach its capacity within the next month (within the next 672 hours).	Normal	None
At the present growth rate, the logical drive will reach its capacity within the next month (within the next 672 hours).	Warning	None
At the present growth rate, the logical drive will reach its capacity within the next week (within the next 168 hours).	Critical	E-mail VMW admin
At the present growth rate, the logical drive will reach its capacity within the next 48 hours.	Fatal	E-mail VMW admin

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- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine Memory Allocation Versus Limit

Purpose

This rule monitors for virtual machines that have a memory limit that is lower than their memory allocation, which could result in poor performance on the virtual machine.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The virtual machine has a memory limit that is higher than its memory allocation.	Normal	None
The virtual machine has a memory limit that is lower than its memory allocation.	Critical	None

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VMW Virtual Machine Memory Swapping

Purpose

This rule monitors for the swapping in and out of virtual machine memory.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The virtual machine has not moved any of its memory from its physical pages to the VMware swap file within the ESX Server.	Normal	None
The virtual machine has moved some of its memory from its physical pages to the VMware swap file within the ESX Server. This may adversely affect the virtual machine's performance.	Critical	None
The virtual machine is actively using memory that it has moved to the VMware swap file. This will adversely affect the virtual machine's performance.	Fatal	None

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VMW Virtual Machine Memory Utilization

Purpose

This rule monitors for high memory utilization for a virtual machine.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The memory utilization is less than 85 percent.	Normal	None
The memory utilization is equal to or greater than 85 percent and less than 90 percent.	Warning	None
The memory utilization is equal to or greater than 90 percent and less than 93 percent.	Critical	E-mail VMW admin
The memory utilization is equal to or greater than 93 percent.	Fatal	E-mail VMW admin

Views Displaying Alarms Based on this Rule

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VMW Virtual Machine Network IO

Purpose

This rule monitors for spikes and dramatic drops in network IO for a virtual machine.

Scope

VMWVirtualMachineHostNetwork

Rule Definition

Conditions	State	Action
The network usage is no more than 2.2 standard deviations (NumSTDevs) from the mean network usage.	Normal	None
The network usage is more than 2.2 but no more than 2.8 standard deviations from the mean network usage.	Warning	None
The network usage is more than 2.8 standard deviations from the mean network usage.	Critical	None

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VMW Virtual Machine Power State Change

Purpose

This rule fires an alarm if a virtual machine has been suspended or powered off recently.

Scope

VMWVirtualMachine

Rule Definition

Conditions	State	Action
The virtual machine has not been suspended or powered off recently.	Normal	None
The virtual machine has been suspended recently.	Warning	None
The virtual machine has been powered off recently.	Critical	E-mail VMW admin

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- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine VMware Tools

Purpose

This rule fires an alarm if the VMware tools on a virtual machine are out of date or not running properly.

You should always keep the VMware tools on each virtual machine up-to-date to enable the collection of all relevant data.

Scope

VMWVirtualMachine

Rule Definition

Conditions	State	Action
The VMware tools on the virtual machine are up-to-date and running properly.	Normal	None
The VMware tools on the virtual machine are either out of date or not running properly.	Warning	None

Views Displaying Alarms Based on this Rule

- [“Virtual Infrastructure View”](#) on page 98
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VMW Virtual Machine Zero Page Memory Detection

Purpose

This rule monitors for any virtual machines that have a large amount of memory that is only zero memory.

Scope

VMWVirtualMachineMemory

Rule Definition

Conditions	State	Action
The virtual machine does not have overcommitted memory resources.	Normal	None
The virtual machine may have overcommitted memory resources; more than 33 percent of its memory is filled with zeros. It is likely that the memory allocated to this virtual machine can be reduced without any impact on performance.	Warning	None

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- [“Virtual Infrastructure View”](#) on page 98
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Cartridge for VMware Views

vFoglight ships with predefined views to help you monitor your application server environment. This chapter provides quick reference information about each view.

The chapter contains the following sections:

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For more information about the each view, along with detailed descriptions of the Cartridge for VMware dashboards, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Overview of Views

vFoglight displays monitoring data in views that group, format, and display data. The main types are described below.

Dashboards are top-level views that do not receive data from other views. Dashboards usually contain a number of lower-level views. The dashboards supplied with vFoglight, as well as those created by users, are available in the navigation panel.

Lower-level views in vFoglight can be added to dashboards or can be accessed by drilling down from a dashboard. They receive and display data directly from the vFoglight Management Server or from other views. Some views filter or select data that appears in other views in the same dashboard. Some are tree views with expandable nodes for selecting servers, applications, or data.

Virtual Infrastructure View

The vmExplorer Dashboard provides a Virtual Infrastructure View. The Virtual Infrastructure View is located in the navigation panel at the left of the vFoglight GUI, under the dashboards list.

Purpose

The Virtual Infrastructure View provides an organized view of the various virtual infrastructure objects that are monitored by the VMware Cartridge. It serves as a navigation tool, and it also presents pertinent alarm information.

When you select an object from the Virtual Infrastructure View, all of the views in the vmExplorer Dashboard are updated with information pertaining to that object.

Content and Embedded Views

The Virtual Infrastructure View contains two embedded views: the Topology View and the Hierarchy View.

Within the Topology View, all of the virtual infrastructure objects are organized into a tree using object type (or topology type) containers for branches. The top-level objects in the Topology View are always the VirtualCenters.

Within the Hierarchy View, each VirtualCenter object is organized into a tree that has the same hierarchical structure as the VirtualCenter and displays the objects (Datacenters, Clusters, Resource Pools, Virtual Machines, Folders, etc.) within the VirtualCenter as branches.

Mouse-over Status Popups

When you hover the cursor over an object in the Virtual Infrastructure View, you see a popup that provides a summary of the present state of that object.

For more information about the Virtual Infrastructure View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

At A Glance View

The vmExplorer Dashboard provides an At A Glance View. The At A Glance View is located in the navigation panel of the vFoglight GUI, below the Virtual Infrastructure View.

Purpose

The At A Glance View provides key statistical information for the object that is selected in the Virtual Infrastructure View (that is, for the object that is being viewed in the vmExplorer Dashboard).

Content and Embedded Views

The content of the At A Glance View depends on the object that is being viewed in the vmExplorer Dashboard.

The At A Glance View may or may not contain the following embedded views:

- Top 5 CPU View - shows the top five CPU-consuming virtual machines for the selected object
- Top 5 Memory View - shows the top five memory-consuming virtual machines for the selected object
- Top 5 Disks View - shows the top five virtual machines in terms of disk activity for the selected object
- Top 5 NIC View - shows the top five virtual machines in terms of NIC activity for the selected object
- Top 5 Ready View - shows the top five virtual machines in terms of percent-readiness for CPU cycles for the selected object
- Status View - provides a brief summary of the present status of the parent object for a selected Virtual Machine

For more information about the At A Glance View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

vmExplorer Primary View

The vmExplorer Dashboard has a Primary View that takes up the entire display panel of the vFoglight GUI.

Purpose

The vmExplorer Primary View is the most content-intensive view in the VMware Cartridge. It provides access to summary (of alarm, resource, and other) information for the object being viewed in the vmExplorer Dashboard, as well as detailed information on performance with respect to the four core ESX infrastructure resources: CPU, memory, disk usage, and network usage.

It provides navigation tabs that can be used to view a variety of valuable information pertaining to the object being viewed.

Content and Embedded Views

The metrics and the amount of detail displayed in the Primary View vary depending on the type of object you select.

The Primary View changes in appearance and content, depending on which navigation tab and embedded view you have selected.

The Primary View may or may not contain the following embedded views:

- Summary View
- Utilizations View
- Resource Pools Relationship Tree View
- Related Objects View

Each of these views is described in this chapter.

For more information about the vmExplorer Primary View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Summary View

The Summary View is provided as part of the vmExplorer Dashboard Primary View. If you select the Summary navigation tab from the top of the vmExplorer Primary View (that is, from the Primary View heading), the Summary View is displayed just below the heading.

Purpose and Content

Typically, the Summary View provides a brief description of the object being viewed in the vmExplorer Dashboard, an overview of its available compute resources, and a count (if applicable) of the objects that are contained within it.

Sometimes the Summary View includes a graph. For example, if you select a collection of ESX Servers (that is, the ESX Servers container for a particular VirtualCenter) from the Topology View, the Summary View displays a graph that illustrates the combined CPU consumption for all of the ESX Servers in the collection.

Within a collection of objects Summary View, you can hover the cursor over any graph to see an exact unit measurement that corresponds to the placement of the cursor, and you can click any metric or chart to see a popup with a detailed chart.

For more information about the Summary View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Utilizations Views

A Utilizations View is provided in both the vmExplorer and the vmMonitor Dashboards.

In the vmExplorer Dashboard, the Utilizations View is part of the Primary View and is typically located at the center of the Primary View.

In the vmMonitor Dashboard, the Utilizations View is not considered part of another View and is typically located at the center of the dashboard.

Purpose and Content

In the vmExpolorer Dashboard, the Utilizations View provides numerical and graphical representations of utilization metrics associated with the single object (Datacenter, Cluster, Server, Resource Pool, Virtual Machine, or Datastore) or collection of objects of a particular type (Datacenters, Clusters, Servers, Resource Pools, Virtual Machines, or Datastores) that is selected.

In the vmMonitor Dashboard, the Utilizations View only provides numerical and graphical representations of utilization metrics associated with single objects.

The metrics and the amount of detail displayed on the Utilizations View vary depending on the type of object that is being viewed.

In the vmExplorer Dashboard, a Utilizations View may not appear at all depending on the object or collection of objects selected from the Virtual Infrastructure View and on the navigation tab selected from the vmExplorer Primary View heading.

Within a single object Utilizations View, you can hover the cursor over any metric to see a description of that metric, and you can click any metric or chart to see a popup with a detailed chart.

In the vmExplorer Dashboard, within a collection of objects Utilizations View, you can hover the cursor over any graph to see an exact unit measurement that corresponds to the placement of the cursor, and you can click any metric or chart to see a popup with a detailed chart.

For descriptions of the various metrics available in the Utilizations View and elsewhere in the VMware Cartridge, refer to [“Cartridge for VMware Rules”](#) on page 25.

For more information about Utilizations Views, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Resource Pools Relationship Tree View

The Resource Pools Relationship Tree View is provided in the vmExplorer Dashboard. If you select a Resource Pool container from the Topology View on the Virtual Infrastructure View and click the Summary navigation tab within the vmExplorer Primary View, a Resource Pools Relationship Tree View is displayed in the Primary View. A Resource Pools Relationship Tree contains every Resource Pool that belongs to the Clusters within the associated VirtualCenter.

Purpose and Content

The Resource Pools Relationship Tree View is useful if you want to see how the Resource Pools within the Clusters are laid out or if you want to take a look at the utilization statistics for each configured Resource Pool on the VirtualCenter.

The default Resource Pools Relationship Tree simply displays the names of the various Resource Pools and their parent/child relationships.

You can use the Normal Zoom Level button on the mini map at the top right of the Relationship Tree to zoom into a more detailed version of the Tree. You can use the Minimized Zoom Level button on the mini map to zoom back out again.

You can browse through a Relationship Tree by clicking and dragging the rectangular shadow provided on the mini map.

For more information about the Resource Pools Relationship Tree View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Related Objects Views

At least one Related Objects View is provided in both the vmExplorer and the vmMonitor Dashboards.

In the vmExplorer Dashboard, Related Objects Views are part of the Primary View and are typically located at the bottom of the Primary View. In the vmExplorer Dashboard, more than one Related Objects View may appear at a time.

In the vmMonitor Dashboard, the Related Objects View is not considered part of another view and is located at the right of the dashboard. Only one Related Objects View appears on the vmMonitor Dashboard.

Purpose and Content

Related Objects Views provide summary information on either the parent or child objects or both (whichever are applicable) of the object being viewed in the dashboard.

In the vmExplorer Dashboard, Related Objects Views differ from each other and may not appear at all depending on the object or collection of objects selected from the Virtual Infrastructure View and on the navigation tab selected from the vmExplorer Primary View heading.

In the vmExplorer Dashboard, Related Objects Views for an individual object display tables that list either the parents or descendants or both (whichever are applicable) of the selected object and provide pertinent summary details about each one. The Related Objects View for a collection of objects displays a table that lists all of the objects in the selected collection and provides pertinent summary details about each one. You can sort Related Objects View tables by a particular column by clicking the corresponding column heading. If you select an object from the table by clicking on one of the table rows, all of the views in the vmExplorer Dashboard get updated with information about that object.

In the vmMonitor Dashboard, the Related Objects View provides Status Views of summary details for either the parents or descendants or both (whichever are applicable) of the object being viewed in the dashboard. The information presented varies slightly depending on the object that is being viewed. Within the vmMonitor Related Objects View, if you click an object's icon, all of the views in the vmMonitor Dashboard are updated with information about that object.

In the vmMonitor Dashboard, the combination of the Related Objects View and the breadcrumbs at the top of the dashboard provide you with an effective way to traverse up and down through the various virtual infrastructure object levels and view all of the available metrics the VMware Cartridge provides for the virtual infrastructure.

For more information about Related Objects Views, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Actions Panel

The actions panel is located at the far right of the vFoglight GUI.

Purpose and Content

The actions panel provides you with easy access to a number of useful functions. However, it only provides additional VMware Cartridge related actions and tasks when you are viewing the vmExplorer Dashboard.

The Cartridge for VMware actions and tasks available in the actions panel vary depending on the object displayed in the vmExplorer Dashboard, and are located under the Actions, Other Actions, and Tasks headings.

Under Actions, the actions panel may provide the following additional VMware Cartridge related actions:

- Find ESX Servers
- Find Virtual Machines
- Run Migration Modeler
- View Virtual Infrastructure Alarms

Under Tasks, the actions panel may provide the following additional VMware Cartridge related tasks:

- Top CPU Consumers
- Top Memory Consumers
- Object Monitor
- View Alarms

For more information about the actions panel with respect to the VMware Cartridge and any associated actions or tasks, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Navigation View

The vmMonitor Dashboard provides a Navigation View, located at the top of the dashboard.

Purpose and Content

The Navigation View displays an icon and an object type name that together indicate the type of object that is being examined.

The vmMonitor Dashboard does not provide a direct hierarchical structure in which you can change between objects. Instead, the Navigation View has a drop-down menu with which objects from the current level may be selected. In order to traverse up or down through the infrastructure, an administrator can use the breadcrumbs at the top of the vmMonitor Dashboard or select from the various objects on the Related Objects View.

The Navigation View also contains an alarm summary, located at the far right of the view.

For more information about the Navigation View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Infrastructure Overview

The vmMonitor Dashboard provides an Infrastructure Overview, located toward the top left of the dashboard.

Purpose and Content

The Infrastructure Overview is provided at the VirtualCenter, DataCenter, and Cluster levels. This view contains information about the descendent or child objects of the object being viewed in the vmMonitor Dashboard.

The Infrastructure Overview provides a simple mechanism that you can use to see the total number of the various types of child objects within the selected object and the outstanding alarm with the highest severity that exists for an object of each type.

The number on each disk indicates the number of descendent objects of that type that exist within the selected object. The disk color indicates the status of the outstanding alarm with the highest severity that exists for an object of that type. These disk colors correspond to the colors used throughout vFoglight to indicate alarm severity.

If you click any of the disks, a popup appears that displays a current alarm list for the corresponding object type. If you then click an alarm message, you are provided with a popup menu. From the popup menu, you can choose to view either a vmExplorer Dashboard or a vmMonitor Dashboard for the corresponding object.

The Infrastructure Overview provides a simple way for an administrator to troubleshoot problems within the virtual infrastructure.

For more information about the Infrastructure Overview, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Messages View

The vmMonitor Dashboard provides a Messages View, located toward the bottom of the dashboard.

Purpose and Content

The VMware Cartridge receives VirtualCenter messages (including status changes and VirtualCenter alarms, if configured) and presents them in the vmMonitor Dashboard.

Note These messages are not generated by the VMware Cartridge.

The Messages View displays these messages for the dashboard time range specified. For specific information about dashboard time ranges, refer to the *vFoglight User Guide*.

If you click a message within the Messages View, you are taken to a vmMonitor Dashboard for the object to which the message corresponds, if appropriate. You can always use the breadcrumbs at the top of the vmMonitor Dashboard to navigate back through the virtual infrastructure.

For more information about the Messages View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Agents View

The Agents View is the only view in the vmAgents Dashboard.

Purpose and Content

The Agents View displays information on the various agent systems that are collecting and sending details to the VMware Cartridge. This view can be used to verify that agents are properly reporting information at regular intervals to the VMware Cartridge.

The Agents View also contains an alarm summary that shows you the number of alarms of each severity that are presently outstanding for agents.

For more information about the Agents View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Alarms Overview

The vmAlarms Dashboard provides an Alarms Overview, located at the top of the dashboard.

Purpose and Content

The Alarms Overview provides a quick and easy way for you to view VMware Cartridge alarms grouped by object and severity level. You can use this Overview to monitor alarms and to identify the sources of problems within the virtual infrastructure. If you click any of the alarm counts for a particular object, a popup displaying just the alarms for that object appears.

For more information about the Alarms Overview, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Alarms List View

The vmAlarm Dashboard provides an Alarms List View, which takes up the majority of the dashboard.

Purpose and Content

Each alarm row in the Alarms List contains an object icon that identifies the source of the alarm, an alarm icon that indicates the severity of the alarm, the time that the alarm occurred, and the text of the alarm. The columns are sortable so that alarms can be listed in order by source, severity, time or message. Simply click a column heading to sort the table by that column.

If you click an alarm's severity icon, a popup for acknowledging or clearing that alarm is displayed. If you click the message or any other column in the row, you are provided with a popup menu. From the popup menu, you can choose to view either a vmExplorer Dashboard or a vmMonitor Dashboard for the corresponding object.

For more information about the Alarms List View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Report Templates View

The vFoglight Report Browser Dashboard provides a Report Templates View, located at the left of the dashboard.

Purpose and Content

The Report Templates View provides a list of templates that can be used to create reports that are scheduled to run against a particular object. It also provides you with an interface you can use to create and schedule a report to run.

For more information about the Report Templates View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Scheduled Reports View

The vFoglight Report Browser Dashboard provides a Scheduled Reports View, located at the top right of the dashboard.

Purpose and Content

The Scheduled Reports View lists the reports that have been configured by an administrator to run at regular intervals.

For more information about the Scheduled Reports View, including a procedure for scheduling reports, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

Generated Reports View

The vFoglight Report Browser Dashboard provides a Generated Reports View, located at the bottom right of the dashboard.

Purpose and Content

The Generated Reports View lists reports that have run and are available for viewing in PDF format.

Once a report is generated it is displayed in the Generated Reports View. Simply click **PDF** in the View column of the Generated Reports View to view the generated report. To view a pdf file, Adobe Acrobat Reader must be installed on the system that is accessing the Report Browser Dashboard.

For more information about the Generated Reports View, see the chapter titled “Interacting with the Cartridge for VMware” in the *vFoglight Cartridge for VMware User Guide*.

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