

# vSphere Plugin

Installer/User Guide

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#### **Technical Support Site**

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/en-us/support/ for additional assistance.

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Vertiv™ vSphere Plugin Installer/User Guide

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## **1 Product Overview**

Vertiv<sup>™</sup> vSphere Plugin is a thermal management application that enables you to view the air conditioning data of Vertiv<sup>™</sup> Thermal Insight in vSphere. It also provides alarms alerts from Thermal Insight.

## 1.1 Features and Advantages

Features and advantages of the plugin are:

- Simple deployment and operation
- Centralized access to air conditioning readings
- Upload refrigeration device alarms to vSphere and users can configure relevant measures to protect the server
- Monitoring capabilities

## **1.2 Supported vSphere Version**

vSphere 6.7 and 7.0.

## **1.3 Thermal Insight Version**

Thermal Insight 1.0.0 and above.

## **1.4 System Requirements**

The following are hardware and software pre-requisites for the installation of the vSphere plugin.

#### 1.4.1 Hardware

- A normal vSphere environment, with at least one cluster and three servers under vSphere
- At least one server to run a virtual machine with 2CPU, 2G memory and 8G hard disk

#### 1.4.2 Network

- Plugin network to access Thermal Insight
- Plugin to run in the vSphere network environment

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## **2** Installation

## 2.1 User Account Registration

If vSphere Plugin is the first Vertiv software you want to download, then you need to register on the Vertiv software download portal. After registration, you can download and install the latest version of the application.

NOTE: A user can download the software if they already have an account.

## 2.1.1 Registration

- 1. Navigate to www.Vertiv.com in the web browser and hover your mouse over the Support tab.
- 2. Click Software/Firmware Updates, then click the Software Product Downloads menu option. The Software Download page appears. Locate the Vertiv<sup>™</sup> Thermal Insight Software Download on the page.
- 3. Click View Details and click the Register menu option.

NOTE: Do not close the web page. The web page automatically refreshes and displays a registration form, Create an Account for Infrastructure Management Software registration form. Use this form to enter account activation code.

- 4. Enter the mandatory field details, provide a valid email address, and agree to the terms of use. Click the *Create Account*.
- 5. An activation code is sent to the email address you provided. Check your email.
- 6. Enter the activation code in the Code field on the Create an Account for Infrastructure Management Software registration form and click *Submit*.

## 2.1.2 Download the vSphere Plugin

- 1. Follow the step 1 and 2 as mentioned in Registration above. Click vSphere Plugin for Thermal Insight.
- 2. A new window appears in the browser as shown in Figure 2.1 on the next page.

#### Figure 2.1 Log in Window

Hi, [chaotec123]		Latest Releases	Log off
Log in.			
Please login to verify your ac	cess to Software files.		
L User name	The user name field is required.		
Password	The password field is required.		
LOG IN			
WARNING: Your account will be locked after 5 Password" to recover your credentials, if need	5 incorrect login attempts. Please Click "Forgotten Username or led.		
Forgotten Username or Password?			
Create an Account			

- 3. After entering the previously registered User name and Password, click the LOG IN button.
- 4. Click the *Download* option. Once the application is downloaded, you can install the thermal management application.

NOTE: For more information on account registration and application download, refer to the Software Download section of Vertiv<sup>™</sup> Thermal Insight User Manual SL-71140.

## 2.2 vSphere Plugin Installation

Follow these steps to install the vSphere plugin to generate a virtual machine and set the IP address of the virtual machine manually or automatically.

1. Enter vSphere, select a host, deploy the plugin service, and upload the plugin package.

NOTE: Ensure that you have downloaded the plugin installation package and OVA file from the www.Vertiv.com.

#### Figure 2.2 Uploading Installation Package

Deploy OVF Template	Select an OVF template	$\times$
1 Select an OVF template	Select an OVF template from remote URL or local file system Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.	
<ol> <li>Select a name and folder</li> <li>Select a compute resource</li> </ol>	http   https://remoteserver-address/filetodeploy.ovf   .ova	
4 Review details	Local file	
5 Select storage	UPLOAD FILES vertiv-vcenter-plugin.ova	
6 Ready to complete		
	CANCEL	т

2. Select the name and folder of the plugin virtual machine by specifying a unique name and target location.

#### Figure 2.3 Virtual Machine Name - Plugin Setup

Deploy OVF Template	Select a name and folder		×	
1 Select an OVF template	Specify a unique name and t Virtual machine name:	arget location vertiv-vcenter-plugin		
2 Select a name and folder	Select a location for the virtu	ual machine.		
3 Select a compute resource	<ul> <li>✓          <sup>2</sup> <sup>2</sup>         10.146.100.15 ↓         ■ TAE Test DataCe         </li> </ul>	nter		
4 Review details				
5 Select storage				
6 Ready to complete				
			CANCEL	NEXT

3. Select the host on which the virtual machine is deployed.

Figure	2.4	Se	lectina	the	Host
		00	looting		

Deploy OVF Template	Select a compute resource			
	Select the destination compute resource for this operation			
1 Select an OVF template	✓ 📑 TAF_Test_DataCenter			
2 Select a name and folder	✓ Im XIANIF_SA_Cluster In 146,100,12			
3 Select a compute resource	0.146.100.13			
4 Review details				
5 Select storage				
6 Ready to complete				
	Compatibility Compatibility checks succeeded.			
	CANCEL BACK NEXT			

#### NOTE: Select the Host for which virtual machine is installed on Windows.

4. View the details of the plugin upload.

Deploy OVF Template	Review details Verify the template details.	×
i selectariovi template	Publisher	No certificate present
2 Select a name and folder	Product	Vertiv vSphere Plugin
3 Select a compute resource	Version	3.0.0.0
4 Review details	Vendor	vertiv
E License agreemente	Download size	1.2 GB
6 Select storage	Size on disk	2.7 GB (thin provisioned) 8.0 GB (thick provisioned)
7 Select networks		
8 Customize template		
9 Ready to complete		
		CANCEL BACK NEXT

5. Select the storage device on which the virtual machine is installed. Typically, it is installed on the vSAN store.

Figure 2.6 Virtual Machine Storage Selection

eploy OVF Template	Select storage						
	Select the storage for the	configuration and dis	k files				
1 Select an OVF template					Config	gure per disk group	Q
	<ul> <li>Encrypt this virtual man</li> </ul>	chine (Requires Key N	lanagement Ser	ver)			
2 Select a name and folder	Select virtual disk format:			As defined in the V	M storage policy	/ ~	
3 Select a compute resource	VM Storage Policy:			Da	atastore Defau	lt v	
	Name	Capacity	Provisioned	Free	Туре	Cluster	
4 Review details	datastore1	989.75 GB	3.71 GB	986.98 GB	VMFS 6		
E Liconce agreements	🗐 datastore1 (1)	989.75 GB	3.71 GB	986.99 GB	VMFS 6		
5 License agreements	datastore1 (2)	989.75 GB	583.13 GB	820.31 GB	VMFS 6		
6 Select storage	vsanDatastore	6.55 TB	1.2 TB	5.79 TB	vSAN		
7 Select networks	Compatibility						
8 Customize template	✓ Compatibility checks	succeeded.					
9 Ready to complete							
					CANCEL		JEX

6. Set up the virtual machine network. Specify the correct network configuration as follows:

#### NOTE: Do not enter the network configuration if the DHCP service is available.

## NOTE: Do not fill the field of Host Name, IP Address, Netmask Prefix, and Gateway if you dynamically obtain the IP through DHCP.

- a. The IP Address, Netmask Prefix, Gateway, and DNS parameters only function if the Hostname is entered.
- b. Hostname: Enter the host name if you need to set the IP statically.
- c. IP Address: Enter the IP Address if you need to set the IP statically.
- d. Netmask Prefix: Enter the Netmask Prefix if you need to set the IP statically.
- e. Gateway: Enter the Gateway if you need to set the IP statically.
- f. Specify the DNS and DNS Domain information in the binary if you need DNS service.
- g. Root Password: Modify the password corresponding to root used by SSH.

#### NOTE: If a root password is not provided, the default password vertiv should be used.

h. **Debugging:** Activate debug mode to modify the *photon-customization-debug.log* and the *bootstrap.log* if necessary.

### Figure 2.7 Setting Up the Virtual Machine Network

v	Credentials	1 settings
	DNS Domain	DNS Domain
	DNS	DNS Server
	Gateway	Gateway of the system.Leave blank if DHCP is desired. 10.124.59.1
	Netmask Prefix	CIDR notation (e.g. 24 for 255 255 255 0, 28 for 255 255 255 240) Leave blank if DHCP is desired. 23
	IP Address	IP Address of the system Leave blank if DHCP is desired. 10.124.59.12
	Hostname	Hostname of system.Leave blank if DHCP is desired.

#### Figure 2.8 Virtual Machine Network Selection

Deploy OVF Template	Select networks Select a destination network for each so	urce network.		×
1 Select an OVF template	Course Maturala	Destination Metwork		
2 Select a name and folder	VM Network	VM Network V		
3 Select a compute resource				1 items
4 Review details	ID Allocation Settings			
5 License agreements	IP allocation:	Static - Manual		
6 Select storage	IP protocol:	IPv4		
7 Select networks				
8 Customize template				
9 Ready to complete				
			CANCEL BACK	NEXT

#### Figure 2.9 Virtual Machine Customize Template

Deploy OVF Template 1 Select an OVF template	Customize template Customize the deployment propertie All properties have valid values	$\times$ as of this software solution. $\times$
2 Select a name and folder	✓ Networking	6 settings
3 Select a compute resource	Hostname	Hostname of system.Leave blank if DHCP is desired.
4 Review details	IP Address	IP Address of the system.Leave blank if DHCP is desired.
5 License agreements		
6 Select storage	Netmask Prefix	CIDR notation (e.g. 24 for 255.255.255.0, 28 for
7 Select networks		235.255.255.240).Leave blank it DHCP is desired.
8 Customize template	Gateway	Gateway of the system.Leave blank if DHCP is desired.
9 Ready to complete		
		CANCEL BACK NEXT

#### Figure 2.10 Virtual Machine Information View

Deploy OVF Template	Ready to comp Click Finish to start crea	tion.
i select an ovir template	Name	vertiv-vcenter-plugin-3.0.0-feature.12-SNAPSHOT-LL
2 Select a name and folder	Template name	vertiv-vcenter-plugin-3.0.0-feature.12-SNAPSHOT
3 Select a compute resource	Download size	1.2 GB
4 Review details	Size on disk	8.0 GB
	Folder	TAF_Test_DataCenter
5 License agreements	Resource	XIAN1F_SA_Cluster
6 Select storage	Storage mapping	1
7 Select networks	All disks	Datastore: vsanDatastore; Format: As defined in the VM storage policy
0. Output in termine	Network mapping	1
8 Customize template	VM Network	VM Network
9 Ready to complete		
		CANCEL BACK FINISH

When DHCP automatically assigns an IP address: After the virtual machine is deployed, start the virtual machine and wait for DHCP to assign an IP address.

If you manually set the IP address: After the virtual machine is deployed, the IP address of the startup virtual machine can be used.

	🚯 vertiv-vcenter-plu	ugin-3.0.0-fe	ature.11-SNAPSHOT-apo	ollo	🕨 📕 🛃 🤯 🔯 ACTIONS 🗸
✓ 🗗 10.146.100.15	Summary Monitor Con	nfigure Permiss	ons Datastores Networks	Snapsł	nots Updates
✓ I TAF_Test_DataCenter					
✓ ☐ XIAN1F_SA_Cluster					
10.146.100.12	B. Anno, S. Walker, S. H. Schight, "Brook V. St. & State and "Application of Applications", and applications of Application of Applications, and Applications, and Applications, Computer Systems, 2014.	Guest OS:	VMware Photon OS (64-bit)		
10.146.100.13		Compatibility:	ESXi 6.7 and later (VM version 14)	-1)	
10.146.100.14		viviware roois.	MORE INFO	1)	
🔂 Centos 7.6 SI (10.14		DNS Name:	photon		
🔓 centos7.6 SI (10.146	Powered On	IP Addresses:	10.146.101.159		
🛱 vertiv-power-insight	LAUNCH WEB CONSOLE		VIEW ALL 4 IP ADDRESSES		
🛱 vertiv-vcenter-plugin		Host:	10.146.100.12		
🛱 vertiv-vcenter-plugin	LAUNCH REMOTE CONSOLE (1)	Δ 🗔 🏹			
<table-of-contents> vertiv-vcenter-plugin</table-of-contents>					
🕞 VMware vCenter Ser	A difference of the second				Alexa a
🛱 WindowsServer 201	VM Hardware			^	Notes
🕞 WindowsServer 201	> CPU	2 CPU(s)			
🛱 WindowsServer 201	,				Edit Notes
🛱 WindowsServer 201	> Memory	2 GB, 0	08 GB memory active		
🛱 WindowsServer 201	> Hard disk 1	8 GB			Custom Attributes
WindowsServer 201					

#### Figure 2.11 Virtual Machine IP Address

7. Login to the plugin registration interface.

After starting the plugin virtual machine, enter the plugin IP address in the browser and enter the plugin service web interface for registration and authentication.

## **3 Setting Up the Application**

## 3.1 vSphere Plugin Initialization

In order to make the vSphere plugin work properly, and to be able to view the device signals and alarms monitored by the Vertiv software on vSphere through the plugin, and to trigger the actions of the virtual machines or hosts based on the alarms, you need to initialize the vSphere plugin first. In the vSphere mode (mode without the VxRail environment), the vSphere plugin needs to be initialized with information about the Vertiv monitoring software and the vSphere system. In the VxRail-double vSphere mode, the vSphere plugin needs to be initialized with information about the Vertiv monitoring about the Vertiv monitoring software, the workload vSphere system, and the load VxRail Manager system.

## 3.1.1 Logging in to plugin

Enter the plugin IP address in the browser to access the web services of plugin, for example: https://1.1.3/#/.

1. Enter the User Name and Password to login.

The default login credentials are:

- Default User Name: admin
- Password: vertiv@1234

#### Figure 3.1 Login to Plugin Window

User Name	
admin	
Password	_
••••••	
Login	
Restore Password	

2. After logging in the first time with default credentials, you are required to change your password. Change the password in the user drop-down menu in the upper right corner of the interface. The default username, admin, cannot be modified. See **Figure 3.2** below and **Figure 3.3** below.

#### Figure 3.2 Change Password for the First Time Window

Prompt			
اک Please change your passv	word when logging in for the first t	ime!	
		SURE	
	Password		
	Login		
	Restore Password		

#### Figure 3.3 Modify Password Window

VSphere plugin Step 1: Vertiv Software Registration	> (2) Step 2: Select Integration Mode	e > (3) Step 3: vSphere Registration	admin A About Change Password Log Out
	Vertiv Software Registration Configure Vertiv software settings to allow communications with the Plugin Vertiv Software Host Name/IP 10.169.82.65 Vertiv Software API key DIEC6774 Vertiv Software API secret		
	Thermal Insight 1.0.1-SNAPSHOT Unregister Update		
			Next

3. Remember your changed password. If you lose your password, click on the *Restore Password*, and you can reset it to the default password as **vertiv@1234**.

Figure 3.4 Password Reset Screen

User Name	
User Name	
Password	
Login	
Reset Password	

## 3.1.2 vSphere Mode Initialization

#### Step 1: Register the Thermal Insight to vSphere plugin.

- 1. Enter the required information in the IP address, Thermal Insight API Key, and Thermal Insight API Secret fields according to the interface prompts.
- 2. Click *Install* to register. To obtain the Vertiv software API key and the Vertiv software API secret, go to Thermal Insight's System settings and select Integrated Management. For more details, refer to the Vertiv<sup>™</sup> Thermal Insight User Manual SL-71140.

#### Figure 3.5 Plugin Registration Window

💸 vSphere plugin		admin 🗸
Step 1: Vertiv Software Registration	> (2) Step 2: Select Integration Mode > (3) Step 3: vSphere Registration	
	Vertiv Software Registration Configure Vertiv software settings to allow communications with the Plugin Vertiv Software Host Name/IP Vertiv Software API key Vertiv Software API secret	
	Register	Next

After completing registration, click Next to enter the Select Integration Mode page, as shown in Figure 3.6 below.

#### Figure 3.6 Successful Registration Window for Thermal Insight

💸 vSphere plugin	a	dmin <del>-</del>
Step 1: Vertiv Software Registration	> (2) Step 2: Select Integration Mode > (3) Step 3: vSphere Registration	
	Vertiv Software Registration         Configure Vertiv Software Bost Name/IP         Vertiv Software Host Name/IP         10 169 82 65         Vertiv Software API key         DEE067Hx         Vertiv Software API secret	
	Unregister Update	
	Ne	xt

#### Step 2: Select the vSphere Mode.

After Thermal Insight is registered, there are two modes to Select Integration Mode: vSphere Mode (selected by default) and VxRail Double-vSphere Mode, as shown in **Figure 3.7** below.

Figure 3.7 Select Integration Mode Window

😵 vSphere plugin	admin <del>-</del>
1 Step 1: Vertiv Software Registration > 2 Step 2: Select Integration Mode > 3 Step 3: vSphere Registration	
Welcome to Thermal Insight - vSphere plugin	
Thermal Insight - vSphere Plugin is a thermal management application plug-in. After successful registration, you can view thermal device alarms from Thermal Insight in vSphere and configure alarm rules. We will guide you how to configure the vSphere plugin based on actual scenarios.	
vSphere Mode	
Traditional vSphere mode(no VxRail environment), all hosts and VMs are managed through one vSphere. In order to monitor thermal device alarms in vSphere in this mode, configuration information from Thermal Insight and vSphere appliance needs to be entered in vSphere Plugin.	
VxRail Double-vSphere Mode	
Plugin application services and Thermal Insight application services are not deployed in the VMs of the workload VxRail cluster, but in other separately powered vSphere hyperconverged clusters. In order to monitor thermal device alarms in vSphere in this mode, configuration information for Thermal Insight, workload vSphere appliance and Vxrail Manager needs to be entered in vSphere plugin.	
	Previous

#### Step 3: Register the vSphere to Plugin.

- Enter the required information in the vSphere IP/Host Name, vSphere User Name, vSphere Password, and vSphere Plugin IP/Host Name fields.
- Click Register.

#### Figure 3.8 vSphere Mode Registration Window

(1) :	Step 1: Vertiv Software Registrati	Ion > (2) Step 2: Select Integration Mode > (3) Step 3: vSphere Registra vSphere Mode	ation
		vSphere Registration Configure vSphere settings to allow communications with the Plugin. vSphere IP/Host Name	
		vSphere User Name	
		vSphere Password	
		Vertiv Plugin IP/Host Name	
		Register	
0% of the registration process is comple	ted the coftware cannot be used	I normally if the registration is not completed	Drawlog at

### 3.1.3 VxRail Double-vSphere Mode Initialization

To register VxRail Double-vSphere Mode, follow the prompts after logging in to the plugin.

#### Step 1: Register Thermal Insight to vSphere plugin.

- Enter the required information in the vSphere IP/Host Name, vSphere User Name, vSphere Password, Vertiv Plugin IP/Host Name fields.
- Click Register.

#### Step 2: Select the VxRail Double-vSphere Mode.

After Thermal Insight is registered, there are two modes to Select Integration Mode: vSphere Mode (selected by default) and VxRail Double-vSphere Mode, as shown in **Figure 3.7** on the previous page.

#### Step 3: Register the vSphere and VxRail to plugin

To register the vSphere, follow the Step 3: Register the vSphere to Plugin. on the previous page .

#### To register the VxRail Manager:

- 1. Enter the required information in the VxRail Host Name/IP, VxRail User Name, VxRail Password fields.
- 2. Click Register.

(1) Ste	ep 1: Vertiv Software Registration (2) Step 2 Vxrail Do	2: Select Integration Mode > Step 3: vSphere Registration uble-vSphere	
	vSphere Registration	VxRail Manager Registration	
	Configure vSphere settings to allow communications with the Plugin.	Configure VxRail settings to allow communications with the Plugin.	
	vSphere IP/Host Name	VxRail Host Name/IP	
	vSphere User Name	VxRail User Name	
	vSphere Password	VxRail Password	
	Vertiv Plugin IP/Host Name		
	Register	Register	
	Register	Register	

Figure 3.9 Vxrail Double-vSphere Mode Registration Window

NOTE: If the plugin registration fails, there may be two situations. First, the authentication information entered is incorrect. Confirm the information and try again. Second, the plugin has been registered before. When the plugin was previously uninstalled, the alarm information of the Vertiv air conditioning device was left in vSphere. Enter vSphere to manually delete the global alarm and custom alarm of the Vertiv air conditioning device.

## 3.2 vSphere Mode

## 3.2.1 Associate servers and thermal devices

1. From the vSphere interface, click *Menu* at the top of the page. Select the *Host and clusters* option, as shown in **Figure 3.10** below.

Figure 3.10 vSphere Menu

vm vSphere Client								
Home     Shortcuts	Home         ctrl + alt + home           Shortcuts         ctrl + alt + 1							
Hosts and Clusters VMs and Templates Storage Vetworking Content Libraries Workload Management Global Inventory Lists	□         Hosts and Clusters         Ctrl + alt + 2           Q         VMs and Templates         Ctrl + alt + 3           Storage         Ctrl + alt + 4           Q         Networking         Ctrl + alt + 5           ©         Content Libraries         Ctrl + alt + 6           ♦         Workload Management         Ctrl + alt + 7           >>         Global Inventory Lists         Ctrl + alt + 8	Tree GHz total	Memory 84 2	10.62 GI	3 free 4.87 GB total	Storage 8.28 Ti 117 TB used	B free 9.45 TB total	
Policies and Profiles Auto Deploy Hybrid Cloud Services C Developer Center	<ul> <li>Policies and Profiles</li> <li>Auto Deploy</li> <li>Hybrid Cloud Services</li> <li>Developer Center</li> </ul>	8	0	19	Hosts	0	0	3
<ul> <li>Administration</li> <li>Tasks</li> <li>Events</li> <li>✓ Tags &amp; Custom Attributes</li> <li>◇ Lifecvcle Manager</li> </ul>	<ul> <li>Administration</li> <li>Tasks</li> <li>Events</li> <li>Tags &amp; Custom Attributes</li> <li>Lifecycle Manager</li> </ul>	Powered Off	Suspended	5	Connected	Disconnected	Maintenance	6
Vertiv - Cooling Insight ( DRasS VRealize Operations	Vertiv - Cooling insight	Alerts     4     1     1	Warnings  Warnings  1  1  0  0  0  0  0  0  0  0  0  0  0		VMware Cloud Director Availability VMware Update Manager VMware vSAN H5 Client Plugin Vertiv VMware vRops Client Plugin VMware vRops Client Plugin Vcenter Server Life-cycle Manager			
javascript:void(0) Alarms			1 - 5 of	5 items				*

2. Select a host under the cluster and click to enter the current host summary interface. For example, 10.146.100.12 as shown in **Figure 3.11** on the facing page.

#### Figure 3.11 Host Summary Interface

vm vSphere Client Menu v Q Search in	all environments		C 🛛 🔿 v 🛛 Administrator@VSPHERE.LO				
□ □ □ ④ ④ → 10.146.100.15	to.146.100.12   Actions ✓ Summary Monitor Configure Permissions VMs Data	stores Networks Updates					
	Hypervisor: VMware ESX, 7.0.1.17325551 Model: PowerEgge B540 PowerEgge B540 PowerEgge B540 PowerEgge B540 PowerEgge B540 PowerEgge B540 Logical Processors: 16 Nock: 4 Virtual Machines: 6 State: Connected Uptime: 1 days DOCLEDINC	JGHz	CPU Lead: 33 Minte Menory Lead: 22 7 08 Strange Lineat: 854 85 08	Free: 18.44 GHz Capaoly: 18.76 GHz Free: 9.42 GB Capaoly: 31.02 GB Free: 9.43 TB Capaoly: 7.52 TB			
vertiv-vcenter-plugin-3.0.0-aipna.i-sixAPSHOT apolio	Hardware	<ul> <li>Configuration</li> </ul>		^			
Whware vCenter Server(10.146.100.15)	Manufacturer Dell Inc.	Image Profile	(Updated) ESXI-7.0U1c-17325551-standard				
🗃 WindowsServer 2016(10.146.100.21)周期	Model PowerEdge R540	> vSphere HA Sta	te 🗸 Running (Primary)				
➢ WindowsServer 2016(10.146.100.22 周期		> Epuit Tolerance	> Fault Tolerance (Legacy) Unsupported				
WindowsServer 2016(10.146.100.24)Python		y Paul Tolerance					
Windowsserver 2016(10.146.100.28)#888     WindowsServer 2016(10.146.100.29)Mike	Memory 22.21 GB / 31.62 GB	> Fault Tolerance	Unsupported				
WindowsServer 2019(10.146.100.23)Python	> Virtual Flash Resource 0 B / 0 B	> EVC Mode	Disabled				
	> Networking localhost.						
	> Storage 2 Datastore(s)	Related Objects		^			
		Cluster	XIAN1F_SA_Cluster				
	Tags	<b>^</b>					
	Assigned Tag Category Desc	ription Custom Attributes	Custom Attributor				
		Value					
Recent Tasks Alarms				*			

3. If the current host is not connected to the summary interface, the Vertiv-Thermal Insight interfaces prompts that the device is not connected, as shown in **Figure 3.12** below.

Figure 3.12 Summary Screen for Unbound Devices



4. Switch to the configuration interface by clicking the Configure tab. Select *Vertiv - Thermal Insight -Connected Thermal Device* in the left menu bar to enter the Vertiv configuration interface. See **Figure 3.13** on the next page.

#### Figure 3.13 Device Association Interface

vm vSphere Client M	enu 🗸 🛛 🔍 Search in all environme	ents	C () ~ Administrator@VSPHERE_LOCAL ~ ()
	То.146.100.12 Actions	s •	
<ul> <li>I0.146.100.15</li> </ul>	Summary Monitor Configure	Permissions VMs Datastores Networks Updates	
<ul> <li>         ★ TAF_Test_DataCenter         ★ XIANIF_SA_Cluster         ★ 10.46.100.12         ↓ 0.146.100.13         ↓ 0.146.100.14</li></ul>	Default VM Compatibility Swap File Location System Y Licensing TI	Connected Thermal Device APPLY CLEAR hermal Equipment List	
Centos 7.6 CI(10.146.1	Host Profile	Device name	Device IP
Centos 7.6 PI(10.146.1	Time Configuration	0 10.146.102.66	10.146.102.66
G Centos / A S (10,486_ G) Centos / A S (10,486_ B) idoCker-deploy G) with-yoemi-nispith-v. B) vertu-vcenter-plugn- G) VindowsServe 2016(. G) WindowsServe 2016(.) G) WindowsServe 2016(.)	Authenfladion Services Certificate Power Management Advanced System Seetings System Resource Reservation Firewal Services Security Profile System Swap Packages Hardware • Overview PCI Devices Firmware Virtual Flash • Virtual Flash • Virtual Flash • Virtual Flash • Virtual Flash • Contected Alarms Connected Alarms		
Recent Tasks Alarms			*

5. Figure 3.14 shows Thermal Equipment List. Click the check box from the Thermal Equipment List that needs to be configured. Click APPLY in the upper left corner. The pop-up message Thermal Device connected with ESXi host successfully is displayed. It indicates that the thermal equipment is connected to the server. Selecting a device and clicking CLEAR will unbind the server from the device. See Figure 3.14 below.

Figure 3.14 Device Binding Successfully

vm vSphere Client	Menu 🗸 🛛 🔍 Search in all enviro	onments			С	⑦ ✓ Administrator@VSPHERE LOC					
	10.146.100.12	ions 🗸									
✓	Summary Monitor Configu	re Permissions VMs Datastores M	letworks Updates								
<ul> <li>TAF_Test_DataCenter</li> <li>XIAN1F_SA_Cluster</li> </ul>	Default VM Compatibility	① Thermal Device connected with ESXI host su	Thermal Device connected with ESXI host successfully     y								
<b>10.146.100.12</b>	System V	Connected Thermal Device									
10.146.100.14	Licensing	APPLY CLEAR									
🛱 Centos 7.6 Cl(10.146.1	Host Profile	Thermal Equipment List									
Centos 7.6 Pl(10.146.1	Time Configuration		Device name			Device IP					
🛱 centos7.6 packer (10.1	Certificate	0	10.146.102.66			10.146.102.66					
☆ Cento 7 6 s (10.146	Pover Management Advanced System Settings System Resource Reservation Pirewall Security Profile System Swap Packages Hardware V Overview PCI Devices Firmware Virtual Flash Resource Mana. Virtual Flash Resource Mana. Virtual Flash Host Swap Cac. Alam Definitions Scheduled Taks										
	Connected Alarms										
	Connected Thermal Device	1									
Recent Tasks Alarms							*				

Repeat steps 2 through 5 as needed to bind devices to other hosts.

## 3.2.2 Setting alarms for a single server

#### Overview

For the host level, we provide two types of alarms:

- **Global alarms:** These are the default Vertiv refrigeration device alarms installed by the plugin to all hosts under vSphere when it is registered and installed in vSphere. It is not necessary to set the global alarm manually.
- **Custom alarms**: These alarms need to be selected from the list according to the refrigeration equipment by the device to the host. Only the custom alarms installed on the device can be triggered on vSphere, and the linkage actions preset in the alarm definition can be executed.

#### **Functional module**

View global alarms for vSphere level installations. When the plugin is installed, the global alarm gets installed on all hosts in vSphere.

#### Figure 3.15 Host Installed Global Alarm

vm vSphere Client Menu v C	), Search in all environments	C () ~ Administrator@VSPHERELOCAL ~ ()
vm         VSphere Client         Munu         C           Image: Client         Image: Client         Image: Client         Image: Client           Image: Client         Image: Client         Image: Client         Image: Client         Image: Client           Image: Client         Image: Client         Image: Client         Image: Client         Image: Client           Image: Client         Image: Client         Image: Client         Image: Client         Image: Client           Image: Client         Image: Client         Image: Client         Image: C	Search & all environments     Summary Monitor 2     Configure     Permissions VMs Datastores Networks Updates     Swap Fiel Location     System	C         O         Administrator@VSPIERE LOCAL ×         Image: Comparison of the compa
3	Virtual Flash Host Swap Cac.         Cabc Details from Definition Pr.         Host         Dirichicols         Enabled           Atam Definitions         Cabc Compressor Lws Storn Pr.         Host         Dirichicols         Enabled           Scheduled Tasks         >         CRAC Compressor Lws Storn Pr.         Host         Dirichicols         Enabled           Vertier - Cooling Insight         >         Host Corpets Lws Storn Pr.         Host         Dirichicols         Enabled           Connected Alarms         -         >         Tourison Informations         Mort         Dirichicols         Enabled	07/02/023, 15303 PM 07/02/023, 15303 PM 02/02/023, 15303 PM 02/02/023, 15304 PM 02/02/023, 15344 AM 1-20 of 62 Items K < 1 / 4 → 3/
Recent Tasks Alarms		*

#### To associate a custom alarm on the host:

- 1. Select *Host* in the left pane. Click the *Configure* tab, and then select *Vertiv Thermal Insight Connected Alarms* menu option.
- 2. In the Connected Alarms page, list of custom alarms is displayed, select the alarm that needs to be installed on the host, and then click *Apply*.

vm vSphere Client M	fenu 🗸 🛛 🔍 Search in all environ	inents	C ? ~ Administrator@VSPHERE.LOCAL ~ 😳
□         □         □         ○           ∨         □         1.46.100.15         >           ∨         □         TAF_Test_DataCenter         >           ∨         □         XAAJF_SA_Cluster         1           ↓         TAHE_TON 12         >         >           □         ↓         0.46.100.12         >           □         ↓         0.46.100.12         >           □         ↓         0.46.100.13         >	Licensing	VS V Permissions VMs Datastores Networks Updates Connected Alarms APPLY Custom Alarm List	Checked 0
Centos 7.6 Cl(10.146.1	Host Profile	Alarm Name	Delay / Second
Centos 7.6 SI (10.146	Authentication Services	CRAC Electric Heater Failure - host-14	15
🔂 centos7.6 packer (10.1	Certificate	CRAC System Input Overvoltage - host-14	15
pi-docker-deploy	Power Management	CRAC System Input Undervoltage - host-14	15
vertiv-vcenter-plugin	Advanced System Settings System Resource Reservation	CRAC Return Air Over Temperature - host-14	15
vertiv-vcenter-plugin	Firewall	CRAC Compressor High Head Pressure - host-14	15
WindowsServer 2016(	Services Security Profile	CRAC Compressor Low Suction Pressure - host-14	15
WindowsServer 2016(	System Swap	CRAC Supply Air Under Temperature - host-14	15
WindowsServer 2016(	Packages	CRAC Supply Air Over Temperature - host-14	15
WindowsServer 2016(	Overview	CRAC Frequent High Pressure Alarms - host-14	15
WindowsServer 2019(	PCI Devices	CRAC Ext Condenser Pump High Water - host-14	15
	Firmware	CRAC Ext Remote Shutdown - host-14	15
	Virtual Flash Resource Mana	CRAC Return Air Sensor Issue - host-14	15
	Virtual Flash Host Swap Cac	CRAC Supply Air Sensor Issue - host-14	15
	Alarm Definitions Scheduled Tasks	CRAC Compressor High Pressure Transducer Issue - host-14	15
	Vertiv – Thermal Insight 🛛 🗸	CRAC Temperature Sensor Alarm - host-14	15
3	3 Connected Alarms		
	Connected Thermal Device		
Recent Tasks Alarms			*
1			

#### Figure 3.16 Host Association Custom Alarm

There are two ways to cancel the associated alarms:

- Delete the associated custom alarm in the Alarm Definitions page of the host.
- Uncheck the associated custom alarms in the Connected Alarms page, and then click Apply.

#### Figure 3.17 Host Delete Custom Alarm

vm vSphere Client	Menu 🗸 🛛 🔍 Search i	in all environments		(	C (?) v Administrator@VSPHERE.LOCAL v (C)
	10.146.100.15	ACTIONS V			
10.146.100.15	Summary Monitor 2	Configure Permissions Datacenters	Hosts & Clusters VMs Datastores Net	works Linked vCenter Server Systems Ex	tensions Updates
V III TAF_Test_DataCenter		Alarm Definitions			
VIANIF_SA_Cluster	Settings ~	Alarm Delinitions			
0.146.100.12	Licensing	ADD EDIT DISABLE5 DELETE			
10.146.100.14	Message of the Day	Alarm Name T	Object type Y Defined In	T Enabled T Last modified	т
Centos 7.6 CI(10.146.1	Advanced Settings	CRAC Compressor Low Discharge	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
Centos 7.6 Pi(10.146.1	Authentication Proxy	CRAC Compressor Low Discharge	Host 🗗 This Ot	oject Enabled 03/14/2024, 3:16:09	PM
Centos 7.6 Si (10.146	vCenter HA	CRAC EEV Driver Operation Abnor	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
pi-docker-deploy	Security V	CRAC Outdoor Fan Communicatio	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
vertiv-power-insight-v	Trust Authority	CRAC Outdoor Fan Driver Failure	Host 🗗 This Ot	oject Enabled 03/14/2024, 3:16:09	PM
vertiv-vcenter-plugin	Alarm Definitions	CRAC Supply Fluid Loss of Flow	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
VMware vCenter Serv	Scheduled Tasks	CRAC Outlet Fluid Under Tempera	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
WindowsServer 2016(	Storage Providers	CRAC Outlet Fluid Over Temperat	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:09	PM
WindowsServer 2016(	vSAN 🗸	○ > CRAC Inlet Fluid Over Temperature	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
WindowsServer 2016(	Update	CRAC Inlet Fluid Under Temperatu	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
WindowsServer 2016(	Internet Connectivity	CRAC Water Flow Sensor Failure	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
WindowsServer 2016		CRAC Top Blower Fan Failure	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
WindowsServer 2019(		CRAC Supply Fluid Sensor Failure	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
		CRAC Return Air Humidity High	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
		CRAC Return Air Humidity Low	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
		CRAC Water Leakage Detector Se	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:10	PM
		CRAC Internal Communications Fai	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:11	PM
		CRAC Smoke Detected	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:11	PM
		CRAC Water Under Floor	Host 🗗 This Of	oject Enabled 03/14/2024, 3:16:11	РМ
		· · · · · · ·			241-260 of 349 items K K 13 / 18 > >
Recent Tasks Alarms					*



CAUTION: When an alarm occurs on the refrigerant device connected with the host, it must be pre-installed on the host to trigger the alarm on vSphere and then execute the alarm preset action. The alarms installed on the host can be global alarms or manually associated custom alarms.

Some custom alarms may have the same name as global alarms, but their scope of action is different. By default, the global alarms are installed on all hosts and are effective for all hosts. Custom alarms are only effective for the associated Host.

If the global alarm and custom alarm installed by a host have the same name, it is recommended to disable the global alarm manually on the host to avoid conflicts. If you are unable to disable global alarms on the Host, upgrade the vSphere system version to 7.0.

#### Figure 3.18 Host Alarm

vm vSphere Client				Administrator@VSPHERE.LOCAL ~
	<b>10.146.100.12</b> Асти	NS 🗸		
✓	Summary Monitor 2 Configur	Permissions VMs Datastores Networks Updates		
V In TAF_Test_DataCenter	Default VM Compatibility	Alarm Definitions		
V XIANIF_SA_Cluster	Swap File Location			
10.146.100.12	System 🗸	ADD EDIT 5 DISABLE DELETE		
10.146.100.14	Licensing	Alarm Name <b>Y</b> Object type <b>Y</b> Defined in <b>Y</b> Enabled <b>Y</b>	Last modified	т 📗
🚰 Centos 7.6 Cl(10.146.1	Host Profile	○ > CRAC Compressor Low Discharge Host	03/14/2024, 3:16:09 PM	
Centos 7.6 PI(10.146.1	Time Configuration 4	💿 > CRAC Compressor Low Discharge Host 🛃 This Object Enabled	03/14/2024, 3:16:09 PM	
Centos 7.6 packer (10.1	Authentication Services	CRAC EEV Driver Operation Abnor Host 🗗 This Object Enabled	03/14/2024, 3:16:09 PM	
pi-docker-deploy	Power Management	🔿 > CRAC Outdoor Fan Communicatio Host 🗗 This Object Enabled	03/14/2024, 3:16:09 PM	
🔓 vertiv-power-insight-v	Advanced System Settings	CRAC Outdoor Fan Driver Failure Host This Object Enabled	03/14/2024, 3:16:09 PM	
vertiv-vcenter-plugin	System Resource Reservation	CRAC Supply Fluid Loss of Flow Host	03/14/2024, 3:16:09 PM	
Vertiv-vcenter-plugin	Firewall	CRAC Outlet Fluid Under Tempera Host 🗗 This Object Enabled	03/14/2024, 3:16:09 PM	
WindowsServer 2016(	Services	○ > CRAC Outlet Fluid Over Temperat Host 🗗 This Object Enabled	03/14/2024, 3:16:09 PM	
🕞 WindowsServer 2016(	System Swap	CRAC Inlet Fluid Over Temperature Host	03/14/2024, 3:16:10 PM	
WindowsServer 2016(	Packages	CRAC Inlet Fluid Under Temperatu Host PT This Object Enabled	03/14/2024, 3:16:10 PM	
WindowsServer 2016(	Hardware 🗸	CRAC Water Flow Sensor Failure Host	03/14/2024, 3:16:10 PM	
WindowsServer 2016	Overview	CRAC Top Blower Fan Failure Host Enabled	03/14/2024, 3:16:10 PM	
WindowsServer 2019(	PCI Devices	CRAC Supply Fluid Sensor Failure Host Enabled	03/14/2024, 3:16:10 PM	
	Firmware	CRAC Return Air Humidity High Host III This Object Enabled	03/14/2024, 3:16:10 PM	
	Virtual Flash 🗸 🗸	CRAC Return Air Humidity Low Host to This Object Enabled	03/14/2024. 3:16:10 PM	
	Virtual Flash Resource Mana	CRAC Water Leakage Detector Se Host	03/14/2024_31610 PM	
	Virtual Flash Host Swap Cac	CPAC Internal Communications Fail Host	03/14/2024_3:16:11 DM	
3	Alarm Definitions	CPAC Smoke Detected Host This Object Enabled	03/14/2024_316:11 PM	
	Scheduled Tasks		02/14/2024 2:16:11 DM	
	Vertiv – Thermal Insight 🗸		03/14/2024, 3.10.11 PM	
	Connected Alarms			241 - 260 of 349 items K K 13 / 18 > X
	connected merinal bevice			
Recent Tasks Alarms				*

## 3.2.3 Thermal device alarm

#### **Alarm definition**

After the plugin is registered to vSphere, the pre-installed alarms are displayed under the vSphere - Configure - Alarm Definitions page.

#### Figure 3.19 Alarm Definitions Window

<b>₽</b> 10.146.100.15	AC	TION	s 🗸													
Summary Monitor	Config	gure	Permissions	Datacenters	Hosts & Clusters	VMs	Datasto	ores Networks	Linked vCe	enter Se	rver Systems	Extensions	Updates			
Settings 🗸	Alar	Alarm Definitions														
General Licensing	ADI	D	EDIT ENABL	.E/DISABLE DE	LETE											
Message of the Day			Alarm Name	т	Object type		т	Defined In T	Enabled	Ŧ	Last modified				ψ τ	
Advanced Settings	0	>	CRAC Shutdown	- Loss Of Power	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:29 PM				
Authentication Proxy	0	>	CRAC Compresso	or Drive Communi	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:29 PM				
VCenter HA	0	>	CRAC Compresso	or Low Pressure T	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:29 PM				
Security ~	0	>	CRAC EEV Comm	nunication Failure	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:29 PM				
Key Providers	0	>	CRAC Return Air	Temperature Sen	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:29 PM				
Alarm Definitions	0	>	CRAC Temperatu	ire Sensor Alarm	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
Scheduled Tasks	0	>	CRAC Compresso	or High Pressure	Host			This Object	Enabled		07/10/2023, 2:	15:28 PM				
Storage Providers	0	>	CRAC Supply Air	Sensor Issue	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
vSAN 🗸	0	>	CRAC Return Air	Sensor Issue	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
Update	0	>	CRAC Ext Remote	e Shutdown	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
Internet Connectivity	0	>	CRAC Ext Conder	nser Pump High	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
	0	>	CRAC Frequent h	nigh pressure alarm	Host			🗗 This Object	Enabled		07/10/2023, 2:	15:28 PM				
													1 - 20 of 309 items	K < 1/	16 >	×

- For the newly added alarm definition, the Object type is the host, and the definition scope is the entire vSphere.
- 10.146.100.15 represents the name of vSphere.
- You can edit, disable/enable, and delete alarm definitions.

You can add some advanced operations to the alert rule when editing alarm rule. These operations are:

- Entering the maintenance mode.
- Adding the exit maintenance mode.

#### NOTE: Do not modify the IF rules. Otherwise, alarms will not be triggered. See Figure 3.20 below.

Figure 3.20 Edit Alarm Definition Window

New Alarm Definition	Alarm Rule 1	×
1 Name and Targets	F	
2 Alarm Rule 1	Host warning  V ADD ARGUMENT	
3 Reset Rule 1	AND Message v is equal to v active REMOVE	
4 Review	THEN         Trigger the alarm and *       select severity         Send email notifications         Send SNMP traps         Run script         ADD ADVANCED ACTIONS	
	ADD ANOTHER RULE DUPLICATE RULE REMOVE RULE	
	CANCEL BACK	NEXT

After configuring the alarms for a single server, the corresponding alarms will be displayed under the selected Server Configure - Alarm Definitions list.

Default VM Compatibility Swap File Location	Ala	rm [	Definitions edit <b>disable</b> delete				
Licensing			Alarm Name	Object type	Defined In T	Enabled T	Last modified
Host Profile	0	>	CRAC High Return Humidity	Host	This Object	Enabled	03/14/2024. 3:16:11 PM
Time Configuration	0	>	CRAC Low Return Humidity	Host	This Object	Enabled	03/14/2024, 3:16:11 PM
Authentication Services	0	>	CRAC Humidifier Issue	Host	This Object	Enabled	03/14/2024. 3:16:11 PM
Certificate Dower Management	0	>	CRAC Clogged Air Filter	Host	This Object	Enabled	03/14/2024, 3:16:12 PM
Advanced System Settings	0	>	CRAC Return Air Under Temperatu	Host	This Object	Enabled	03/14/2024, 3:16:12 PM
System Resource Reservation		>	CRAC Remote Sensor Over Tempe	Host	This Object	Enabled	03/14/2024. 3:16:12 PM
irewall	0	>	CRAC Remote Sensor Under Temp	Host	This Object	Enabled	03/14/2024. 3:16:12 PM
Services	l õ	>	CRAC Return Humidity Sensor Issue	Host	This Object	Enabled	03/14/2024_3:16:12 PM
Security Profile	Ĭ	>	CRACI oss of Air Flow	Host	This Object	Enabled	03/14/2024 3:16:12 PM
Packages	l o	>	CRAC High Discharge Temperature	Host	This Object	Enabled	03/14/2024 3:16:12 PM
ardware 🗸		>	CRAC Chilled Water Inlet Tempera	Host	This Object	Enabled	03/14/2024 3:16:12 PM
Overview		>	CRAC Chilled Water Outlet Tempe	Host	This Object	Enabled	03/14/2024 3:16:12 PM
PCI Devices		<u></u>	CRAC Eilter Service Due	Host	This Object	Enabled	02/14/2024, 5:16:12 PM
irmware			CRAC Pitter Service Due	Host	This Object	Enabled	03/14/2024, 3:10:13 PM
rtual Flash 🗸 🗸			CRAC Check Air Filter	Host	This Object	Enabled	03/14/2024, 3.10.15 PM
/irtual Flash Resource Mana			CRAC Condenser VPD Issue	Host	This Object	Enabled	03/14/2024, 5.16.15 PM
/irtual Flash Host Swap Cac		,	CRAC Compressor IA High Head P	Host	This Object	Enabled	03/14/2024, 3.10:13 PM
arm Definitions		>	CRAC Unspecified General Event	HOSI	Inis Object	Enabled	U3/14/2U24, 3.10:13 PM
heduled Tasks		>	CRAC External Communication Fail	HOST	Inis Object	Enabled	03/14/2024, 3:16:13 PM
rtiv – Thermal Insight 🛛 🗸	0	>	Datastore cluster is out of space	Datastore Cluster	This Object	Enabled	01/21/2021, 4:13:43 AM

#### Figure 3.21 Single Server Alarm Definitions List Window

For newly added alarm definitions, the Object type is the host, and the definition scope is the current server.

#### NOTE: You can edit, disable/enable, and delete alarm definitions.

You can add advanced operations to the alert rule while editing. These operations are:

- Entering the maintenance mode
- Adding the exit maintenance mode

#### NOTE: All operations on this interface are only applicable to the selected server.

#### **Trigger an alarm**

After the device is connected as mentioned in vSphere Mode on page 18, vSphere displays the alarm information received from Thermal Insight.

#### Figure 3.22 Summary Window

10.146	б.100.14 Асти	ons 🗸		
Summary	Monitor Configur	e Permissions VMs Datastores Networks Updates		
	Hypervisor:	VMware ESXI, 7.0.1, 17325551	CPU	Free: 16.4 GHz
9	Model: Processor Type:	PowerEdge R640	Used: 358 MHz	Capacity: 16.76 GHz
	Logical Processors:		Memory	Free: 8.69 GB
	NICs:	4	Used: 22.93 GB	Capacity: 31.62 GB
	Virtual Machines:	2	Storage	Free: 6.76 TB
	State: Uptime:	Connected 6 days	Used: 772.15 GB	Capacity: 7.52 TB
	DELLEN	MC 🖶		
CRAC S	vstem Input Overvoltage	- host-17	Acknowledg	e Reset To Green

The alarm name is displayed in the Summary tab.

#### Figure 3.23 Monitoring-All Issue Window

10.146.100.1	□ 10.146.100.12 Actions ✓												
Summary Monitor	С	onfigure	Permissions	VMs	Datastores	Networks	Updates						
Issues and Alarms	~	All Is	sues										
All Issues													
Triggered Alarms		Issue			т	Туре			r Trigger Time		т	Status	т
Performance	$\sim$												
Overview													
Advanced													
Tasks and Events	$\sim$												
Tasks													
Events													
Hardware Health													
Vertiv – Thermal Insig	nt ∨												
CRAC Status													
VSAN	$\sim$												
Performance													
Skyline Health													

#### Figure 3.24 Monitoring - Triggered Alarm Window

10.146.100.12		ACTIONS	$\sim$											
Summary Monitor	Со	nfigure	Permissions VN	ls Da	astores Netwo	ks	Updates							
Issues and Alarms	~	Trigg	gered Alarms											
All Issues Triggered Alarms		ACKNO	OWLEDGE RESET TO	GREEN										
Performance	~		Alarm Name	٣	Object	Ŧ	Object type 🛛 🔻	Severity	т	Triggered Time	Acknowledged Time	т	Acknowledged By	т
Overview			Host hardware power st	tatus	10.146.100.12		Host	CRITICAL		01/17/2024, 6:33:21 PM	01/25/2024, 3:51:06 PM		VSPHERE.LOCAL\Administrat	tor
Tasks and Events	~													1 items
Tasks														
Events														
Hardware Health														
Vertiv – Thermal Insight	~													
CRAC Status														
VSAN	~													
Performance														
Skyline Health														

#### To view the details of triggered alarms:

- 1. Click Monitor tab, and then select Issues and Alarms menu option.
- 2. Click Triggered Alarms option.

#### Figure 3.25 Alarm Rule Window

Edit Alarm Definition	Alarm Rule 1 ×	<
1 Name and Targets	IF	
2 Alarm Rule 1	t_alm_sys_externalCommFailure  V ADD ARGUMENT	
3 Reset Rule 1	AND message is equal to $\checkmark$ active REMOVE	
4 Review	THEN         Trigger the alarm and *       Show as Critical          Send email notifications         Send SNMP traps         Run script	
	ADD ADVANCED ACTIONS           ADD ANOTHER RULE         DUPLICATE RULE         REMOVE RULE           CANCEL         BACK         NEXT	

When an alarm occurs, the alarm rules are executed, as shown in **Figure 3.25** above. For example, an alarm operation is set for sending emails, SNMP traps, run scripts, etc. It indicates that you have configured these options in advance.

NOTE: In this example, the Maintenance mode is selected. Entering the maintenance mode migrates the virtual machines running on the server and then shuts down the server. For more details on the migration strategy of virtual machines, visit https://www.vmware.com/products/vsphere/drs-dpm.html.

#### End of alarm

When the alarm is over, the alarm information in the Triggered Alarms page will no longer be displayed.

#### Figure 3.26 Summary Window After an Alarm Ends

70.146	.100.12 Act	ons 🗸							
Summary	Montor Contigue Hypervisor: Model Processor Type: Logical Processors: NC: Virtual Machines: State: Uptime:	VMexer ESX, 7.0., 17325031 PowerEdge R540 Intel® Xeon(R) Silver 4208 C 16 Connected 5 days	PU @ 2.10GHz	Networks	Updates			CPU Used 272 MHz Memory Used 21.38 GB Storage Used 422.11 GB	Free 15.49 GHz Capacity 15.76 GHz Free 19.24 GB Capacity 31.62 GB Free 7.116 Capacity 7.52 TB
Hardware					^	Configuration			^
Manufa	cturer	Dell Inc.				Image Profile	(Updated) ESXI-7.0Uto	-17325551-standard	
Model		PowerEdge R540				> vSphere HA State	✓ Connected (Seco	idary)	
> CPU		8 CPUs x 2.1 GHz				> Fault Tolerance (Lega	cy) Unsupported		
Memory	(	21.38 GB / 31.62 GB				> Fault Tolerance	Unsupported		

Figure 3.27 Monitor - All Issues Window After the Alarm

10.146.100.14	Ļ	ACTIONS V						
Summary Monitor	Co	onfigure Permissions VMs Datastores	Networks Updates					
Issues and Alarms	~	All Issues						
All Issues								
Triggered Alarms		Issue T	Туре	т	Trigger Time	т	Status	Ŧ
Performance	$\sim$	CRAC System Input Overvoltage - host-17	Triggered Alarm		07/11/2023, 02:09 PM		<ol> <li>Alert</li> </ol>	
Overview								
Advanced								
Tasks and Events	$\sim$							
Tasks								
Events								
Hardware Health								
Vertiv – Cooling Insight	~							
CRAC Status								
VSAN	$\sim$							
Performance								
Skyline Health								

Click the *Monitor* tab and click on the *All Issues* and *Triggered Alarms* under Issues and Alarms to check the list of issues and alarms. You will see the previous CRAC system and input overvoltage alarm is disappeared. See Figure 3.27 above and Figure 3.28 on the next page.

Summary	Monitor	Configure	Permissions	VMs	Datastores	Networks	Updates		
<ul> <li>Issues an All Issu</li> </ul>	nd Alarms Jes	ACKNO	WLEDGE RES	et to gre	EN				
Trigge Performa Overvi	ance		Alarm Name	т О	bject	Υ	Object <del>v</del> type	Severity 🔻	Triggered Time 🔻
Advan Tasks an	ced Id Events						5	7	
Tasks Events	5						No items to	o display	
Hardwar 🔻 VxRail	e Health								
Physic vSAN	al View	4							Þ
Perfor Skyline H	mance Iealth								

Figure 3.28 Monitor - All Issues Window After the Alarm Ends

vSphere will execute the Reset Rule in the Alarm Definition.

#### Figure 3.29 Reset Rules Window

Edit Alarm Definition	Reset Rule 1 ×
1 Name and Targets	Reset the alarm to green
2 Alarm Rule 1	IF
3 Reset Rule 1	t_alm_sys_externalCommFailure  V ADD ARGUMENT
4 Review	AND message is equal to v cleared REMOVE
	THEN
	Reset the alarm to * 📀 Normal
	Send email potifications
	Send SNMP traps
	Run script
	ADD ADVANCED ACTIONS
	ADD ANOTHER RESET RULE DUPLICATE RULE REMOVE RULE
	CANCEL BACK NEXT

If the user is configured to send emails or scripts, it implies that these actions are executed when the alarm is triggered.

## 3.2.4 Displaying the Thermal Insight device information

#### Host level summary interface

Once the device is connected, click *Summary* to return to the summary interface. The Summary area lists all the devices that are connected to Vertiv – Thermal Insight.

#### Figure 3.30 Summary Window

ertiv – Thermal Insight		,
> 10.146.102.66	CRAC	

Click the > sign on the left of the device name view the detailed information of device, as shown in Figure 3.31 below.

#### Figure 3.31 Summary Expand Window

Vertiv – Thermal Insight		^
✓ 10.146.102.66	CRAC	
Device Name	10.146.102.66	
Device Model	Smart Cabinet ID Cooler	
IP Address	10.146.102.66	

#### Host level monitoring page

To view the refrigerant equipment status, click the *Monitor* tab and select *Vertiv* - *Thermal Insight* - *CRAC Status* menu option on the left side of the monitoring page, as shown in **Figure 3.32** on the next page.

#### Figure 3.32 CRAC Status Window

vm vSphere Client	wm     vSphere Client     Menu >     Q     Search in all environments     C     (2) >     Administrator@VSP4ERELOCAL >     (2)								
	10.146.100.12	actions 🗸							
√ 🗗 10.146.100.15	Summary Monitor Co	nfigure Permissions VMs Datastores Networks Updates							
V TAF_Test_DataCenter	Issues and Alarms	CDAC Status	1						
XIANIF_SA_Cluster	All Issues	CRAC Status							
10.146.100.13	Triggered Alarms		CHANGE TO ("F)						
10.146.100.14	Performance V	Supply Air Temp	Return Air Temp						
Centos 7.6 Cl(10.146.1.	Overview								
Centos 7.6 SI (10.146	Advanced								
🔓 centos7.6 packer (10.1	Tasks and Events $\sim$								
pi-docker-deploy	Tasks								
vertiv-power-insight-v	Events	2 No data to display	2 No data to display						
vertiv-vcenter-plugin	Hardware Health								
VMware vCenter Serv	Vertiv – Thermal Insight 🗸								
WindowsServer 2016(	CRAC Status								
WindowsServer 2016(	VSAN V								
WindowsServer 2016(	Performance Skyline Health	- 10.146.102.66-Sup	- 10.146.102.66-Ret						
WindowsServer 2016(	Skymerieau								
🗄 WindowsServer 2016									
H WindowsServer 2019(									
Recent Tasks Alarms			*						

The CRAC Status page displays the CRAC supply air temperature and return air temperature trend through the line chart.

#### **Cluster level summary interface**

You can view the thermal devices bound to host under the entire cluster level on the Cluster level Summary page, as shown in **Figure 3.33** below.

#### Figure 3.33 Cluster Level Summary Page

vm vSphere Client Me							٢		
1 2 9 Q	Summary         Monitor         Configure         Permissions	Hosts VMs Datastores Networks	Updates		10				
IN _	Cluster Services		~	12 Y VALUER INDUITING 12 12					
🔓 10.146.100.14 🔂 Centos 7.6 Cl(10.146.1	Custom Attributes		^	Assigned Tag	Category	Description			
Centos 7.6 Pi(10.146.1. Centos 7.6 Si (10.146 Centos 7.6 Si (10.146 pi-docker-deploy vertiv-power-insight-v	Attribute com.vmwore.vcenter.cluster.edrs.upgradeHostAdded	Value							
vertiv-vcenter-plugin  vertiv-vcenter-plugin  vertiv-vcenter-plugin  VMware vCenter Serv  WindowsSpore 2016/	Feit		1 items	Assign Remove		No items to d	lisplay		
WindowsServer 2016(	vSAN Overview		^	Cluster Resources	3 Hosts		Â		
B WindowsServer 2016( B WindowsServer 2016( B WindowsServer 2016 B WindowsServer 2019(	vSAN Capacity	1.02 TB	Details	EVC mode	Disabled				
	vSAN Health 0 2 iss	es	Details	Vertiv – Thermal Insight			^		
	VSAN Performance IOPS, throughput, and latency statistics for the past 2 hours. Details			> 10.146.102.86	CRAC				
Recent Tasks Alarms							*		

Users can view the summary of all host bound devices on the current page.

#### **Cluster level monitoring page**

You can view the refrigerant equipment operation status at cluster level when the current host device is connected. Select the cluster in the left panel, and then click the *Monitor* tab. Now, select *Vertiv - Thermal Insight - CRAC Status* menu option, as shown in **Figure 3.34** below.

vm vSphere Client	Menu 🗸 🛛 🔍 Search in all environ	ments	C ? ~ Administrator(@VSPHERE_LOCAL ~ )
	To XIAN1F_SA_Cluste	r actions ~	
✓	Summary Monitor Configure	Permissions Hosts VMs Datastores Networks Updates	
V TAF_Test_DataCenter	Network Ouization	Martin Daviera	
V R XIAN1F_SA_Cluster	vSphere HA V	Vertiv Devices	10.146.100.12 ~
10.146.100.12	Summary		CHANGE TO (°F)
10 146 100 14	Heartbeat		
Centos 7.6 CI(10.146.1	Configuration Issues	Supply Air Temp	Return Air Temp
Centos 7.6 Pl(10.146.1	Datastores under APD or PDL		
Centos 7.6 SI (10.146	Resource Allocation V		
🛱 centos7.6 packer (10.1	CPU		
pi-docker-deploy	Memory		
vertiv-power-insight-v	Storage	U No data to display	V No data to display
vertiv-vcenter-plugin	Utilization	o construction and the second second	
VMware vCenter-plugin	Storage Overview		
WindowsServer 2016	Security		
WindowsServer 2016(	Vertiv – Thermal Insight 🛛 🗸		
WindowsServer 2016(	CRAC Status		
🔂 WindowsServer 2016(	vsan 🗸	- 10.146.102.66-Sup	— 10.146.102.66-Ret
WindowsServer 2016(	Skyline Health		
WindowsServer 2016	Virtual Objects		
WindowsServer 2019(	Physical Disks		
	Resyncing Objects		
	Proactive Tests		
	Capacity		
	Performance		
	Performance Diagnostics		
	Support		
	Data Migration Pre-Check		
	Cloud Native Storage V		
	Container Volumes		
Recent Tasks Alarms			*

Figure 3.34 Cluster Level Monitoring CRAC Status Window

To view the supply air temperature and return air temperature line graph of other host connected to the refrigerant equipment, select a host name in the drop-down box displayed on the top right corner of the page.

## 3.2.5 Alarm delay

The alarm delay function triggers the alarm rules and prompts the alarm based on the delay time. For unnecessary impact on vSphere, avoid the short interval between the generation and end of the alarm.

You can view the alarm delay interface in the menu Vertiv - Thermal Insight.

vm vSphere Client Menu v Q Search in all 4	environments	04		С	? v	Administrator@VSPHERE.LOCAL V	0
Vertiv – Thermal Insight INSTANCE 10.169.82.79:443 V							
Configuration of Alarm active time in second	nds						
	Global Alarm						
	CRAC Compressor Drive Communication Failure	Global Alarm	15				
	CRAC Compressor High Head Pressure	Global Alarm	15				
	CRAC Compressor Low Suction Pressure	Global Alarm	15				
	CRAC Return Air Over Temperature	Global Alarm	15				
	CRAC Supply Air Under Temperature	Global Alarm	15				
	CRAC Supply Air Over Temperature	Global Alarm	15				
	CRAC Frequent High Pressure Alarms	Global Alarm	15				
	CRAC Ext Condenser Pump High Water	Global Alarm	15				
	CRAC Return Air Sensor Issue	Global Alarm	15				
	CRAC Supply Air Sensor Issue	Global Alarm	15				
	CRAC Compressor High Pressure Transducer Issue	Global Alarmi	15				
	CRAC Temperature Sensor Alarm	Global Alarm	15				
	CRAC Return Air Temperature Sensor Issue	Global Alarm	15				
	CRAC EEV Communication Failure	Global Alarm	15				
	CRAC Compressor Low Pressure Transducer Issue	Global Alarm	15				
	CRAC Bottom Blower Fan Failure	Global Alarm	15				
	CRAC Shutdown - Loss Of Power	Global Alarm	15				
	CRAC Frequent Low Pressure Alarms	Global Alarm	15				
Recent Tasks Alarms							*

#### Figure 3.35 Vertiv - Thermal Insight Window

#### Alarm classification

Alarms are classified as:

- Global alarms: These are the default alarms which gets installed when the plugin is registered to vSphere.
- Custom alarms: These are extended alarms. It is used to configure special alarms for a single server.

The alarm data displayed in three columns indicates the alarm name, alarm type, and delay time (in seconds).

#### Modify delay

To modify the alarm time, enter the delay time (in seconds) in the text box, and then click Save.

#### Figure 3.36 Global Alarm Configuration

vm vSphere Client Menu v Q	Search in all environments			C	cal ~ 🛛 🙄
Vertiv – Thermal Insight INSTANCE 10.169.82.79:4	43 ~				
Configuration of Alarm active time	in seconds				
					SAVE
	Global Alarm				
	CRAC Compressor Drive Communication Failure	Global Alarm 15			
	CRAC Compressor High Head Pressure	Global Alarm 15			
	CRAC Compressor Low Suction Pressure	Global Alarm 15			
	CRAC Return Air Over Temperature	Global Alarm 15			
	CRAC Supply Air Under Temperature	Global Alarm 15			
	CRAC Supply Air Over Temperature	Global Alarm 15			
	CRAC Frequent High Pressure Alarms	Global Alarm 0	_		
	CRAC Ext Condenser Pump High Water	Global Alarm 15			
	CRAC Return Air Sensor Issue	Global Alarm 15			
	CRAC Supply Air Sensor Issue	Global Alarm 15			
	CRAC Compressor High Pressure Transducer Issue	Global Alarm 15			
	CRAC Temperature Sensor Alarm	Global Alarm 15			
	CRAC Return Air Temperature Sensor Issue	Global Alarm 15			
	CRAC EEV Communication Failure	Global Alarm 15			
	CRAC Compressor Low Pressure Transducer Issue	Global Alarm 15			
	CRAC Bottom Blower Fan Failure	Global Alarm 15			
	CRAC Shutdown - Loss Of Power	Global Alarm 15			
	CRAC Frequent Low Pressure Alarms	Global Alarm 15			

As shown in **Figure 3.36** above, the delay time of the CRAC high voltage frequent alarms is modified to 0 seconds. It indicates that the alarm will trigger immediately and the warning rule will be executed.

## 3.3 VxRail Double-vSphere Mode

### 3.3.1 Associate VxRail cluster with thermal device

1. From the vSphere interface, click Menu at the top of the page. Select the Host and clusters option, as shown in **Figure 3.37** on the next page.

#### Figure 3.37 vSphere Menu

vm vSphere Client	Menu 🗸 🛛 🔍 Search in all environmen	its			C 🛛 🖓 🗸 Admini	strator@VSPHERE.LOCAL ~	٢
fi Home Shortcuts	Image: Book of the state         Ctrl + alt + home           ♦ Shortcuts         Ctrl + alt + 1						
Hosts and Clusters (1) WMs and Templates Storage (2) Networking (1) Content Libraries (2) Workload Management (3) Global Inventory Lists	It osts and Clusters         Ctrl + alt + 2           Qr         VMs and Templates         Ctrl + alt + 3           Storage         Ctrl + alt + 4           Networking         Ctrl + alt + 5           Content: Libraries         ctrl + alt + 6           Workkod Managemet         Ctrl + alt + 8           Biolobal Inventory Lists         Ctrl + alt + 8	z free 28 GHz totai	Memory 19.04 ( 75.83 GB used	GB free	Storage 8.24 TB	free 15 TB total	
Policies and Profiles Auto Deploy Hybrid Cloud Services  Developer Center	<ul> <li>Policies and Profiles</li> <li>Auto Deploy</li> <li>Hybrid Cloud Services</li> <li>Developer Center</li> </ul>	12	19 O	Hosts	0	3	
Administration           Tasks           Events           Tags & Custom Attributes           Lifecycle Manager	<ul> <li>Administration</li> <li>Tasks</li> <li>Events</li> <li>Tags &amp; Custom Attributes</li> <li>Lifecycle Manager</li> </ul>	Powered Off	Suspended	Connected	Disconnected	Maintenance	-
<ul> <li>Vertiv - Thermal Insight</li> <li>⊘ DRaaS</li> <li>⊘ vRealize Operations</li> </ul>	Vertiv - Thermal Insight     DRas5     Vealize Operations     10.146.100.14     10.146.100.13     10.146.100.15	© Alerts 3 1 1 1 0	▲ Warnings	VMware Cloud Director Aw VMware vSphere Lifecycle VMware vSAN HS Client Plu VMware vSAN HS Client Plug VMware vRops Client Plug V vCenter Server Life-cycle M	alability Manager ggn n lanager		
Recent Tasks Alarms							

2. Select one of the VxRail cluster from the list and click on it. The VxRail cluster interface will appear on the right side, as shown in **Figure 3.38** below.

vSphere Client Menu V Q Se							
	VxRail-Virtual-SAN-Cl	uster-15cb6a10-2c81-496d-94	88-76be71769c4	3 ACTIONS -			
- varial/cut twethvice.com - Varial/Cutate=15:co640-2:c81-496 Varial-Varial-SAN-Cutate=15:co640-2:c81-496 Utat=veex13:int:vertivo.com - Utat=veex13:int:vertivo.com - Centor 7:e(10:698.27.75)居時 - Centor 7:e(10:698.27.75)居 - Centor 7:e(10:698.27.75)居 - Centor 7:e(10:698.27.75)居 - Centor 7:e(10:698.27.75) - Ce	Total Motion Migrati	Permisions Hosts VMs Datasto 24 ns. 1613	res Networks Upd	ates		CPU Use: 354 0Hz Ca Merrory Use: 10192 0B Ca Storage Use: 1917B	Free: 70.72 apacity: 74.21 Free: 88 apacity: 190.1 Free: 2. Capacity: 4.
Gentos7.6-Si(10.169.82.66) 王睿集群     Gentos7.6-Si(10.169.82.73)     Gentos7.6-Si(10.169.82.73)	Related Objects		^	vSphere DRS			
niedocker/10 169 83 79)Outency	Datacenter	III VxRail-Datacenter		Tags			
protocker-(10.105.52.75) datericy				logs			
vertiv-vcenter-plugin-3.0.0-alpha.4-SNAPS	Cluster Consumers		^	Assigned Tag	Category	Description	
VMware vCenter Server Platform Services C	Resource pools	0					
VyPail Manager	vApps	0					
↓ win10 21H2-poc(10.169.82.71)万能	> Virtual machines	19					
m windows Server2016(10.169.82.76) 物篇						No items	s to displa
m windows Server2016(10.169.82.80)土規和	Custom Attributes		^	Assign Remove			
Windows Server2016-PI(10.169.82.74)候建四	- Antibury	Makes		Cluster Resources			
m windows Service2016(10.169.82.72)mike	Monoule Monail IP	10150 92 55	<u>^</u>				
	VARBER	8E-8D-32-0D-95-D6-44-CC-5E-90-1	C-2D-4C-99-EP-A5-P	Hosts	3 Hosts		
	VxRail-VERSION	4.7.500	0.20.40.301 0.40.0	EVC mode	AMD Zen Generation	n	
			*	vSAN Overview			
			3 items				

Figure 3.38 VxRail Cluster Window

3. From the VxRail cluster interface, click *Configure* and click *Connected Thermal Device* under Vertiv - Thermal Insight. The Connected Thermal Device window will appear. Select the device from the Device List that is used for cooling the current VxRail cluster and click *CONFIRM BINDING*, as shown in **Figure 3.39** on the facing page.

#### Figure 3.39 Binding Thermal Device

TAN1F_SA_Clus	ter actions ~
Summary Monitor 1 Config	pure Permissions Hosts VMs Datastores Networks Updates
Services 🗸	Connected Thermal Device
vSphere DRS vSphere Availability	Device List
Configuration Ouickstart General Key Provider VMvare EVC VM/Host Groups VM/Host Rules VM Overrides I/O Filters Host Options	3 0 10146 102.66
Host Profile	
vSAN Cluster Supervisor Cluster Trust Authority Alarm Definitions Schediuled Tasks Vertiv – Thermal Insight – > Connected Thermal Device Connected Alarms	2
vSAN 🗸	
Services Disk Management Fault Domains Datastore Sharing	4 CONFIRM BINDING

After binding, the pop-up message appears to confirm that the thermal device is connected with the VxRail cluster. In order to trigger actions according to the alarms of thermal device, you also need to bind the alarms of device with the current VxRail cluster.

🖪 XIAN -1E SA	Clu	ster Actions V	
Summary Monitor	Cont	nura Dermissions Hosts VMs Datastaras Notworks Undatas	
Summary Monitor	Com		
Services	~	O The device is successfully bound. Please note that if the alarm is not bound, the alarm w	rill still not be triaqered X
vSphere DRS		Connected Thermal Device	
vSphere Availability			
Configuration	~		
Quickstart			
General		Device Pau	und:
Key Provider		Device Bot	und.
VMware EVC			
VM/Host Groups		10.146.102.66	
VM/Host Rules			
VM Overrides			
Host Options			
Host Drofile			
Liconting			
Licensing	Ť		
VSAN Cluster			
Trust Authority			
Alarm Definitions			
Scheduled Tasks			
Vertiv – Thermal Insight	~		
Connected Thermal De	vice		
Connected Alarms			
VSAN	~		
Services			
Disk Management			
Fault Domains			REGIMO
Natastore Sharing		13	REUNU .

#### Figure 3.40 Binding Device Successfully

### 3.3.2 Associate VxRail cluster with alarm of thermal device

After binding the device, you need to manually select critical alarms and important warnings that need to be monitored before you can monitor the alarms of the thermal device in vSphere.

#### To select the critical alarms and important warning:

- 1. Select and click on the VxRail cluster to open the VxRail cluster interface.
- 2. From the VxRail cluster interface, click *Configure* and click *Connected Alarms* under Vertiv Thermal Insight. A new window for Connected Alarms will appear.
- 3. The connected alarms are dived into two type:
  - Critical Alarm
  - Important Warning
- 4. Click on the checkbox to select the Critical Alarm and Important Warning.
- 5. Click CONFIRM BINDING in the lower right corner to take effect.
- 6. If the alarms occurring in the thermal device are among the selected alarms, it can now trigger the shutdown of the Vxrail cluster. See **Figure 3.41** on the facing page for the alarm binding process.

#### Figure 3.41 Binding Alarms



To uncheck an alarm that has been bound, click on the checkbox again that has been checked on the same page. Click *CONFIRM BINDING* to uncheck the alarm, as shown in **Figure 3.42** on the next page.

#### Figure 3.42 Cancelling Bound Alarms



## 3.3.3 Alarm delay

The alarm delay function allows for the alarm rules and alarms to be triggered after a period of time has elapsed since the actual occurrence of the alarm. This is to avoid unnecessary impact on the VxRail cluster caused by short alarm intervals.

#### To set the alarm delay function:

1. Click *Menu* and select Vertiv – Thermal Insight to open the Alarm activation time configuration interface. See Figure 3.43 on the facing page.

#### Figure 3.43 Alarm Activation Time Configuration

vm v	vSphere Client	Menu 🗸	Q Search in all environments			(	₹ @~	Administrator@VSPHERE.LOCAL ~	9
Vertiv -	- Thermal Insight IN	<b>♦STANCE 10.169</b> .	82.79:443 ×						
Pollin	ng Configuratio	on for Vert	iv vSphere Plugin						SAVE
The syst	tem will repeat the co	onfirmation acco	rding to the polling interval and number	of times until all user virtual machines	are shut down.				
	Polling Interval(s)						60		
	Number of polls						10		
Alarn	n activation tir	me configu	ration, in seconds					RESET	SAVE
1	Critical Warning								
	CRAC Return Air C	Over Temperatur	e				15		
	CRAC Compressor	r High Head Pres	ssure				15		
	CRAC Compressor	r Low Suction Pre	essure				15		
	CRAC Supply Air L	Under Temperatu	ure				15		
	CRAC Supply Air C	Over Temperatur	re				15		
	CRAC Frequent Hi	igh Pressure Alar	rms				15		
	CRAC Ext Conden	iser Pump High V	Vater				15		
	CRAC Return Air S	Sensor Issue					15		
	CRAC Supply Air S	Sensor Issue					15		
	CRAC Compressor	r High Pressure 1	Transducer Issue				15		
	CRAC Temperatur	re Sensor Alarm					15		
Recent Tr	asks Alarms								*

2. You can set the delay time of each alarm. The default delay time of each alarm is 15 seconds, which means if these alarms are triggered and lasted more than 15 seconds, the VxRail cluster shutdown function will be triggered. If the alarms end within 15 seconds, the shutdown process will not be triggered. The maximum configuration period is 86400 seconds (24 hours).

#### Figure 3.44 Modifying Alarm Delay Time

vm         vSphere Client         Menu         Q         Search in all environments	C ? V Administrator@VSPHERE.LOCAL V ©
Vertiv - Thermal Insight INSTANCE 10.169.82.79:443 v	
Polling Configuration for Vertiv vSphere Plugin	SAVE
The system will repeat the confirmation according to the polling interval and number of times until all user virtual machines are shut down.	
Polling Interval(s)	60
Number of polls	10
Alarm activation time configuration, in seconds	RESET SAVE
Critical Warning	
CRAC Return Air Over Temperature	15
CRAC Compressor High Head Pressure	15
CRAC Compressor Low Suction Pressure	15
CRAC Supply Air Under Temperature	0
CRAC Supply Air Over Temperature	15
CRAC Frequent High Pressure Alarms	15
CRAC Ext Condenser Pump High Water	15
CRAC Return Air Sensor Issue	15
CRAC Supply Air Sensor Issue	15
CRAC Compressor High Pressure Transducer Issue	15
CRAC Temperature Sensor Alarm	15

## 3.3.4 Shutdown polling configuration

When Vertiv vSphere plugin triggers VxRail cluster to shut down, the plugin will shut down the user virtual machine first, and then shut down the system virtual machine and physical cluster. If the user virtual machine cannot be shut down, the subsequent shutdown process will not be performed. Polling is a process to confirm whether the user virtual machine has been shut down completely.

#### To configure the polling time and interval:

- 1. Click Menu, and click the Vertiv Thermal Insight.
- 2. The configuration is divided into two parameters: one is the polling intervals (range: 60 to 600, unit: seconds), and the other is the number of polls (range: 5 to 20). Enter the value in the Polling Intervals and Number of polls, see **Figure 3.45** on the facing page.

#### Figure 3.45 Shutdown Polling Configuration Window

Vertiv - Thermal Insight INSTANCE 10.169.82.79:443 -	
Polling Configuration for Vertiv vSphere Plugin The system will repeat the confirmation according to the polling interval and number of times until all user virtual machines are shut down.	SAVE
Polling Interval(s)	60
Number of polls	10
Alarm activation time configuration, in seconds	RESET SAVE
Critical Warning	
CRAC Return Air Over Temperature	15
CRAC Compressor High Head Pressure	15
CRAC Compressor Low Suction Pressure	15
CRAC Supply Air Under Temperature	0
CRAC Supply Air Over Temperature	15
CRAC Frequent High Pressure Alarms	15
CRAC Ext Condenser Pump High Water	15
CRAC Return Air Sensor Issue	15
CRAC Supply Air Sensor Issue	15
CRAC Compressor High Pressure Transducer Issue	15
CRAC Temperature Sensor Alarm	15

3. Click SAVE to set the polling configuration. After entering the shutdown process in VxRail Double-vSphere Mode, the plugin will repeatedly seek confirmations from VxRail Manager according to the number of polls and the polling interval until all the virtual machines of the user are shut down.

## 3.3.5 Alarm-Triggered shutdown process

In VxRail Double-vSphere Mode, the VxRail cluster that will be shutdown due to thermal device alarms is called workload VxRail. The Vertiv plugin and Thermal Insight need to be installed in another VxRail cluster environment, called management VxRail.

After the thermal device generates an alarm, if the alarm meets the existing alarm configuration (conforms to the connected thermal devices, the connected alarms, and is not cleared after the alarm delay time has passed), vSphere will display the alarm information received from Thermal Insight and start the shutdown process:

- 1. The plugin first shuts down all user virtual machines in the workload VxRail, leaving only the system virtual machines running.
- 2. After the plugin sends a shutdown command to the workload VxRail Manager, it starts to repeatedly confirm with the workload VxRail Manager that whether the entire workload VxRail cluster can be shut down. The settings of the shutdown polling interval and the number of polls described in Shutdown polling configuration on the previous page determine the period of repetitive confirmation.
- 3. Once the workload VxRail cluster confirms that it can be closed within the pre-defined period, the plugin will start to shut down the entire workload VxRail cluster and push the event log about **Plugin shutdown VxRail cluster success** to the workload vSphere.

<ul> <li>Issues and Alarms</li> </ul>	Previous Next					
All Issues	Description ~	Type ~	Date Time $\downarrow$	✓ Task ✓	Target v	User
- Derformance	Reconfigured cluster VxRall-Vitual-SAN-Cluster-15cb6a10-2c81-496d-	Information	2023/12/19 09:00:13		VyRail-Virtual-SAN-Cluste	admin
Performance     Overview	Task: Reconfigure cluster	Information	2023/12/19 09:00:12	Reconfigure cluster	VyRail-Virtual-SAN-Cluste	admin
Advanced	Iser doui@1270.01 logged out (login time: Tuesday, December 19, 20	Information	2023/12/19 09:00:12	recompare claster	taf-weysi2 intivertivco.com	daul
Tasks and Events	See double 1270.01 logged to a common		2023/12/19 09:00:12		taf-weysi2 intivertivco.com	deut
Tasks	Plugin shutdown Vyrail success		2023/12/19 09:00:12		VyRail-Virtual-SAN-Cluste	administrator@vsphere
Events	a vyrail shutdown failed	<b>0</b> 信日	2023/12/19 09:00:12		WyRailWirtual-SAN-Cluste	administrator@vsphere
vSphere DRS	Contraction Contra	Information	2023/12/19 09:00:04		tafuvevsi3 intirettivco.com	root
Recommendations	Call licer root@1270.01 logged out (login time: Tuesday, December 19, 20		2023/12/19 09:00:04		taf-weysti int vertivco.com	root
Faults	Control of the second s	<ul> <li>Information</li> </ul>	2023/12/19 09:00:03		taf-wexsi2 intvertivco.com	root
History	Genroot@1270.01 logged but (ugin time: raesday, becember 15, 20		2023/12/19 09:00:01		taf-weysti int vertivco.com	root
CPU Utilization	User root@1270.01 logged in as pyrmomi	Information	2023/12/19 09:00:01		taf-vxexsI3 int vertivco.com	root
Memory Utilization	User root@1270.01 logged out (login time: Tuesday, December 19, 20	Information	2023/12/19 09:00:01		tafvxexstl int vertivco.com	root
Network Utilization	Secrecting 27001 logged ear (sign time: raceady, seconder 19, 20	Information	2023/12/19 09:00:01		taf-vxexsi1 int vertivco.com	root
<ul> <li>vSphere HA</li> </ul>	User root@1270.01 logged out (login time: Tuesday, December 19, 20,		2023/12/19 09:00:01		taf-vxexsi3 int vertivco.com	root
Summary	User root@1270.01 logged bar (login time: root@1270.01 logged in as psymomi		2023/12/19 09:00:01		taf-vxexsI3 int vertivco.com	root
Heartbeat	User root@1270.01 logged in as psymomi	Information	2023/12/19 09:00:00		tafvxexsi2 intivertivco.com	root
Configuration Issues	User root@1270.01 logged and by Minimi		2023/12/19 09:00:00		taf-vxexsi2 int vertivco.com	root
Datastores under A		•			-	
Resource Allocation						100 it
CPU						
Memory	Date Time: 2023/12/19 09:00:12		Type:	信息		
Storage	User: administrator@vsphere.local		Target:	VyPail-Virtual-SAN-Cluster-15cb6a1	0.2c81.406d-0488.76ba71760c/	13
Utilization	Description				0 2001 4000 0400 7000777000	
Storage Overview						
Security	2023/12/19 09:00:12 Plugin shutdown Vxrail success					
P YOAN	Related events:					

#### Figure 3.46 Plugin Shutdown VxRail Success Log

NOTE: If the specified time is exceeded and it is still impossible to confirm whether the workload VxRail can be closed, then the shutdown operation will be aborted, and the event log VxRail shutdown failed will be pushed to the workload vSphere.



vm vSphere Client Menu v				
V 2 Iaf-vxrailvc.int.vertivco.com	CVXRail-Virtual-SAN-Cluster-15cb6a10-2c81-496d-9488-76be71769c43 Actions - Summary Monitor Configure Permissions Hosts VMs Datastores Networks Updates			
◆ ① VARai-Datacenter     ◆ VARai-Datacenter     ◆ Varai-SArt-Vaul-SArt-Custer-15cb6a10-2c8     ■ tat-vessel1 int vertives com     ■ tat-vessel1 int vertives com     ■ tat-vessel1 int vertives com     ■ tat-vessel3 int vertives com     ■ Centos 7.6-5(10.56.92.75)提問     ● Centos 7.6-5(10.56.92.75)提問     ● Centos 7.6-10.56.92.75)提問	Total Processors: 24 Total vMotion Migrations: 1812		CPU Used: 4.9 OHz Memory Used: 104.82 OB Storage Used: 1.92 TB	Free: 89.38 GHz Capacity: 74.26 GHz Free: 88.21 GB Capacity: 190.82 GB Free: 2.57 TB Capacity: 4.49 TB
☆ Centor 5 (10:169.82.6) 上書集群 合 Centor 7.6-Si(10:169.82.66) 上書集群 合 Centor 7.6-Si(10:169.82.73)	Varial Shutdown Failed     Thermal Insight Alarm		Acknowledge	Reset To Green Reset To Green
Preve victor machineryex. Provide a machiner	Related Objects         vsphere DRS           Datacenter         It vsRail-Datacenter			~
다 VMware VCenter Server Appliance 읎 VMware vCenter Server Platform Servi 옪 VMware VRealize Log Insight 윦 VxRail Manager	Cluster Consumers	<b>y</b>	Description	*

## **4 Troubleshooting**

## 4.1 Uninstall the Software

- 1. Uninstall all the registered information on the plugin interface, including the vSphere, VxRail Manager, and the Thermal Insight.
- 2. Shut down the virtual machine on the vSphere interface and delete the virtual machine.

## 4.2 Common Issue

#### Table 4.1 Troubleshooting

Issue	Solution
If the plugin alarm is not eliminated after the power supply is recovered.	Check whether the Thermal Insight alarm is cleared first. If not, you can manually end the alarm on Thermal Insight.
In the VxRail Double-VSphere Mode, the workload VxRail can install and run the Thermal Insight plugin to shut down other VxRail clusters.	In this case, you can use the workload VxRail to manage and shut down other VxRail
Plugin registration failure.	<ul> <li>The following conditions may cause plugin registration failure:</li> <li>The authentication information entered is incorrect. In this case, confirm the information and try again.</li> <li>If you have previously registered the plugin, but an abnormal situation occurs when uninstalling the plugin, the alarm information of the Vertiv device is retained in vSphere, and this information may cause the plugin registration to fail. In this case, enter vSphere first to manually delete the global alarms and custom alarms of the Vertiv device, and then restart the plugin registration process.</li> </ul>

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## Appendices

## **Appendix A: Technical Support and Contacts**

## A.1 Technical Support/Service in the United States

#### Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

#### Liebert® Thermal Management Products

1-800-543-2378

#### Liebert<sup>®</sup> Channel Products

1-800-222-5877

#### Liebert® AC and DC Power Products

1-800-543-2378

### A.2 Locations

#### United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

#### Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

#### Asia

7/F, Dah Sing Financial Centre 3108 Gloucester Road, Wanchai Hong Kong Vertiv™ vSphere Plugin Installer/User Guide

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