Reference Guide

vCloud Director Data Protection Extension Message Bus Specification

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This document defines how the backup service consumers should use the vCloud Protector notification system, and specifies how the notifications provide information. vCloud Protector implements a *notification* interface for clients of the vCloud Protector REST API. A primary use case for consumption of these notifications would be a user interface, but other clients, such as a chargeback billing application may also use such a notification API.

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Introduction

A consumer such as a user interface could obtain much of this information by polling the vCloud Director at certain intervals. However, this information would be inefficient, and subject to issues if you restart or have intermittent communications.

vCloud Director features a notification which is mechanism based on a message bus. The vCloud Protector backup extension publishes its notifications using the same message bus.

A consumer of backup services simply subscribes to the notifications that are of interest. In some cases, the notification itself provides all needed information. In other cases, the consumer may elect to call the vCloud Director REST API to gather additional information, when triggered by a notification that an event has occurred, or an object has changed state.

A publisher directs messages to a *message exchange*. A subscriber consumes messages from a *message queue*. As a configuration step, exchanges are connected to queues, with optional filters to restrict the messages that are delivered to each queue. A single exchange can be connected to multiple queues. The association of an exchange to a queue is called *binding*. Optionally, a *routing key* pattern can be specified to filter (reduce) the messages that are delivered from an exchange to a particular queue.

Each notification message that is published by vCloud Director corresponds to a vCloud Director *event*. These events are generated by vCloud Director, or by an extension. vCloud Director Protector is an extension.

vCloud Director maintains objects that are called *tasks* to represent long running activities. Many events are associated with tasks, but events are generated by isolated activities such as logins.

About RabbitMQ Messaging

Notifications are implemented as messages that are published on a RabbitMQ message bus. Depending on the message, the vCloud Director initiates the message, or business logic with the vCloud Protector.

RabbitMQ separates message publication from consumption. A publisher does not manage subscribers, you can manage the subscribers with RabbitMQ. A message or message type can be subscribed to and consumed by zero, or many clients. A RabbitMQ bus message is scalable to support many subscribers.

vCloud Director Tasks and Events

vCloud Director provides two types of objects for identifying activities which happen within and related to the operation of the vCloud Director system.

Tasks

Tasks identify operations which take place over time. Tasks remain available in the vCloud Director system as long as they have not been canceled or completed in some

way (either success or failure), after which they are removed from the system after a system-specified period.

Tasks are associated with objects within vCloud Director, a user who initiated the operation and an Organization within the vCloud Director. Tasks support a status field which supports the following settings: `queued`, `preRunning`, `running`, `success`, `error`, `cancelled`. They also have a Progress element which is an integer that is intended to express the percent completeness of the Task.

vCloud Director tasks which are created when certain long-running activities are initiated, and are updated during these activities to reflect the status and progress of the activity. They are very useful for seeing what is happening within a vCloud Director system. However there is no method for external applications/clients to be notified when tasks are created, completed, or change status, so they cannot be used for notifications.

vCloud Director defines the XML for a task as follows.

```
<Task xmlns="http://www.vmware.com/vcloud/v1.5" href="xs:anyURI"
type="xs:string" id="xs:string" operationKey="xs:string"
name="xs:string" endTime="xs:dateTime" expiryTime="xs:dateTime"
operation="xs:string"
operationName="xs:string" serviceNamespace="xs:string"
startTime="xs:dateTime" status="xs:string">
    <Link href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string" rel="xs:string"/>
    <Description> xs:string </Description>
    <Tasks>
      <Task> TaskType </Task>
    </Tasks>
    <Owner href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string"/>
    <Error majorErrorCode="xs:int" message="xs:string"
minorErrorCode="xs:string" stackTrace="xs:string"
vendorSpecificErrorCode="xs:string"/>
    <User href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string"/>
    <Organization href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string"/>
    <Progress> xs:int </Progress>
    <Params> ... </Params>
    <Details> xs:string </Details>
</Task>
```

For an adhoc backup, vCloud Protector Extension returns a task like:

```
Task xmlns="http://www.vmware.com/vcloud/v1.5"
   status="queued"
   serviceNamespace="com.emc.backup"
   operationName="adhocBackup"
   operation="Backup Started by User"
   name="task"
   type="application/vnd.vmware.vcloud.task+xml"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="http://www.vmware.com/vcloud/v1.5 http://
{vcloud-host}/api/v1.5/schema/master.xsd">
   <Description>...</Description>
   <Owner
       type="application/vnd.vmware.vcloud.vapp+xml"
       name="{vapp-name}"
        href="https://{vcloud-host}/api/org/{vapp-id}"/>
   <User
      type="application/vnd.vmware.admin.user+xml"
      name="{username}"
      href="https://{vcloud-host}/api/admin/user/{user-id}"/>
   <Progress>20</Progress>
   <Details>...</Details>
</Task>
```

During the lifetime of the task, the vCloud Protector updates the contents of the Task. Specifically, the `status` attribute and the `Progress` element are updated to show the status of the backup operation.

Events

Events are used to record operation milestones and changes in state or status. They may be used to indicate things that happened within a task, or any isolated event within the system. For example, each user login is registered as an event.

vCloud Director defines many internal events which are generated and logged for all the various operations which occur within vCloud Director. It also provides an extension API for external applications to generate their own custom Events and add them to the vCloud Director log.

vCloud Director defines the XML for an Event (EventType) as follows.

```
<Event xmlns="http://www.vmware.com/vcloud/v1.5"
serviceNamespace="xs:string" success="xs:boolean" type="xs:string"
typeFull="xs:string">
  <Owner href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string"/>
  <User href="xs:anyURI" id="xs:string" name="xs:string"
type="xs:string"/>
</Event>
```

An example of a completed Event might look like the following:

```
<Event success="true" serviceNamespace="com.emc.backup" type="com/emc/
event/backup/complete">
   <Owner
      type="application/vnd.vmware.vcloud.vapp+xml"
      name="{vapp-name}"
      href="https://{vcloud-host}/api/vApp/{vapp-id}"/>
   <User
      type="application/vnd.vmware.admin.user+xml"
      name="{username}"
      href="https://{vcloud-host}/api/admin/user/{user-id}" />
</Event>
```

vCloud Director automatically generates events that are related to tasks. The vCloud Director events that are generated for the lifecycle of a task are:

- task/create
- task/start
- task/complete (or task/fail, or task/abort)

vCloud Director notifications

Each event generates a corresponding notification when the `Enable Notifications` setting in the global settings of the vCloud Director is enabled. This setting can be set manually using the vCloud Director web UI, or programmatically via calls to the vCloud Director REST services.

When this setting is enabledvCloud Director publishes the Notification messages on a configured RabbitMQ (AMQP) message bus. These messages are published into a single exchange that all consumers of these Notifications share. Each consumer may create and bind a Queue to this exchange in RabbitMQ and filter the Notifications by defining a Routing Key pattern. See the section on RabbitMQ that follows for more details.

The notification that is received on the message bus:

```
<Notification xmlns="http://www.vmware.com/vcloud/extension/v1.5"
xmlns:vcloud_v1.5="http://www.vmware.com/vcloud/v1.5"
eventId="xs:string" type="xs:string">
    <vcloud_v1.5:Link href="xs:anyURI" id="xs:string"
name="xs:string" type="xs:string"
            rel="xs:string"/>
    <vcloud_v1.5:EntityLink id="xs:string" name="xs:string"
type="xs:string" rel="xs:string"/>
    <Timestamp> xs:dateTime </Timestamp>
    <OperationSuccess> xs:boolean </OperationSuccess>
</Notification>
```

Note

There is no method for the event or notification to carry additional information about the event details. The only method to communicate any additional information is to attach that data to the entity object with which the event is associated with (For example, Task/Details).

RabbitMQ (AMQP)

To support notifications, vCloud Director must be configured (via web or REST interfaces) to connect to a RabbitMQ server. These settings are also required to be configured in order to use the REST Extension services, so this is not an additional requirement for notifications.

For the web UI, go to **System** > **Administration** > **System Settings** > **Extensibility**

For the REST interface use the following to configure AMQP settings:

```
PUT https://{vcloud-host}/api/admin/extension/settings/amqp
Content-Type: application/vnd.vmware.admin.amqpSettings+xml

<?xml version="1.0" encoding="UTF-8"?>
<AmqpSettings xmlns="http://www.vmware.com/vcloud/extension/v1.5">
            <AmqpHost> ... </AmqpHost>
            <AmqpPort> ... </AmqpPort>
            <AmqpUsername> ... </AmqpUsername>
            <AmqpPassword> ... </AmqpPassword>
            <AmqpExchange> ... </AmqpExchange>
            <AmqpVHost> ... </AmqpVHost>
            <AmqpUseSSL> ... </AmqpUseSSL>
</AmqpSettings>
```

To enable notifications:

```
PUT https://{vcloud-host}/api/admin/extension/settings/
Content-Type: application/vnd.vmware.admin.notificationSettings+xml

<NotificationsSettings xmlns="http://www.vmware.com/vcloud/extension/
v1.5">
   <EnableNotifications>true</EnableNotifications>
</NotificationsSettings>
```

A GET operation can also be used to retrieve the currently configured AMQP settings so that a client may utilize the existing configuration, rather than supply a new one.

vCloud Director publishes notifications on a specific exchange. vCloud Director itself does not create this exchange; it must be created as part of the setup of RabbitMQ. The default is called "systemExchange". It should be configured as `type` = `topic` and `Durable`= `true`.

Note

There is an additional exchange, called "vCloud Director.notifications20" which also receives notifications. There are two observed differences between this exchange and systemExchange. First, the payload of the Notifications is in JSON format rather than XML. Second, this exchange contains Notifications which are generated by "extensions" while the systemExchange only appears to receive system-generated Notifications. This additional exchange is currently undocumented by VMWare.

Routing key format

This section provides information on the format of the routing key for vCloud Director AMQP message.

The routing key for a vCloud Director AMQP message has the following form:

```
operationSuccess.entity.org.user.subType1.subType2...subTypeN.
[taskName]
```

The following is an example from "VMWare vCloud API Programming Guide - vCloud Director 5.1", which defines the Routing Key format. The routing key components include:

Table 1 Routing Key Format

Key	Description
operationSuccess	A Boolean value denoting whether the operation that triggered the notification succeeded or failed.
entity	The object identifier of the object which triggered the notification.
org	The object identifier of the organization that owns the affected object.
user	The object identifier of the user who made the request.
subType—1subTypeN	Each subType is a single component of the event type name.
taskName	If entity is a task or blocking task, the task name is appended to the routing key.

Routing key patterns

This section provides information on the patterns of the routing key for vCloud Director AMQP message.

To receive messages on the RabbitMQ bus, a client must create a queue and bind it to the notification exchange. The binding specifies a routing pattern to match with the routing key that vCloud Director uses when publishing messages to the exchange. A specified queue may bind to the same exchange multiple times, using different patterns.

The routing key pattern supports the following wildcard characters: "*" matches a single word and '#' matches zero or more words.

Table 2 Routing Key Patterns

Key	Description
"#"	Match all notifications
"false.#"	Match all failed operations
"*.*.*.*.com.vmware.vcloud.event.task.*.*"	Match all task related notifications
"*.{objectId}.*.*.com.vmware.vcloud.event.task.create.*"	Match all tasks that are created to operate on a specific object
"*.*.*.*.com.vmware.vcloud.event.task.*.{taskName}"	Match all operations on a specific task

Captured sequence of Events and Routing Keys generated by vCloud Director when stopping a running vApp

This section provides information on the captured sequence of events and routing keys that vCloud Director generates when stopping a running vApp.

Table 3 Events and Routing Keys generated by vCloud Director when stopping a running vApp

Events	Description
task/create	true.b1992c04-c115-4576-95f0-fd16a9b18d23.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.task.create.vappUndeployPowerOff
vapp/undeploy_request	true.fba5cc8d-000c-463a-a0f4-8b80d756e95e.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.vapp.undeploy_request
task/start	true.b1992c04-c115-4576-95f0-fd16a9b18d23.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.task.start.vappUndeployPowerOff
vm/change_state	true.c7c1590f-7080-4aa4-99ef-c353567c9f62.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.vm.change_state
vapp/undeploy	true.fba5cc8d-000c-463a-a0f4-8b80d756e95e.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.vapp.undeploy
vapp/undeploy	true.c7c1590f-7080-4aa4-99ef-c353567c9f62.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.vm.undeploy
task/complete	true.b1992c04-c115-4576-95f0-fd16a9b18d23.2854db3e-4f74-4f7b-ab5f-8db60a12e6df.35135e6e-58ac-4fca-b28d-a48e30a10602.com.vmware.vcloud.event.task.complete.vappUndeployPowerOff

vCloud Protector extension and backup appliance usage of events and tasks

Tasks are created to support any operation that may take longer than a few seconds to complete. Some examples of these operations include the creation of internal resources. Creation of internal resources requires many steps and/or communication with external resources (Backup Repository, Backup Appliance, and so on), performing Backups, Restores, and Queries of lists of resources.

The value of Service Namespace in both task and event pages is defined as "com.emc.vcp" (for Mater release 1, they remain "com.emc.vcp.backup" and "com.emc.vcp.event" respectively).

vCloud Protector Generated Tasks

This section provides information on the protector generated tasks.

Table 4 vCloud Protector Generated Tasks

Task	Source	Operation	Display Name
ADHOC_VAPP_BACKUP	Ext	adhocBackup	Adhoc Backup Processing for Virtual Application %name (%uuid)
SCHEDULED_VAPP_BACKUP	BG	scheduledBackup	Backup Processing for Virtual Application %name (%uuid)
ADHOC_VAPP_RESTORE	Ext	adhocRestore	Adhoc Restore Processing for Virtual Application %name (%uuid)
ADHOC_FLR_VAPP_RESTORE	Ext	restoreFiles	FLR: Restore files to Virtual Machine (%uuid)
FLR_BROWSE	Ext	connectVM	FLR: Connecting Virtual Machine (%uuid)
ADHOC_REPLICATION	Ext	adhocReplications	Adhoc Replication Processing for Replication Policy %name (%uuid)
ADHOC_VAPP_REPLICATION	BG	adhocReplication	Adhoc Replication Processing for Virtual Application %name (%uuid)
SCHEDULED_VAPP_REPLICATI ON	BG	scheduledReplication	Replication Processing for Virtual Application %name (%uuid)
CREATE_BACKUP_APPLIANCE	Ext	createBackupAppliance	Create a new Backup Appliance (%uuid)
MODIFY_BACKUP	Ext	modifyBackup	Modify Backup for Virtual Application %name(%uuid)
DELETE_ BACKUP_APPLIANCE	Ext	deleteBackupAppliance	Delete a Backup Appliance (%uuid)
CREATE_BACKUP_REPO	Ext	createBackupRepo	Create a new Backup Repository (%uuid)
RESTORE_TO_NEW_VAPP	Ext	restoreToNewVApp	Restore a Backup to a New VApp (%uuid)
REGISTER_ORG	Ext	registerOrg	Registering an Organization with vCP (%uuid)
REGISTER_VCENTER	Ext	registerVCenter	Register a new vCenter (%uuid)

vCloud Protector Generated Events

This section provides information on the custom events which the vCloud Protector Extension and Backup Appliance generates to support Notifications for activities that are related to all supported features and functions.

- vCloud Director generated events are shown in red and have the prefix `com/vmware/vcloud/event/`
- vCloud Protector generated events are shown in black and have the prefix `com/emc/vCloud Protector/event/`
- The Source column indicates which component generates the Event.
  - `Ext.` means the extension from the VCLOUD PRO-TECTOR to VCLOUD DIRECTOR.
  - `BA` means the Backup Appliance.

Adhoc Backup

The following sections define the custom events of an adhoc backup.

Table 5 Adhoc backup

Event	Source	vCloud Director Task status	Object	Reason/Trigger
task/create/[taskName]	Ext	queued	Task	vCloud Protector REST API Client issues an ad-hoc backup request to the vCloud Protector Extension, and returns a vCloud Protector Task to the caller. Task/Owner element is set to the vApp.
vapp/backup/adhoc_request	Ext	queued	vApp	The ad hoc backup request was processed by the vCloud Protector Extension and sent to the Backup Appliance
task/start/[taskName]	BA	running	Task	The Backup Appliance reports that the backup has started.
vapp/backup/progress	BA	running	vApp	The Backup Appliance updates the Task/Progress (%) field.
vm/backup/start	BA	running	VM	The Backup Appliance starts VM backup
vm/backup/queued	BA	running	VM	VM backup is in queue
vm/backup/complete	BA	running	VM	The Backup Appliance detects VM backup complete
vm/backup/aborted	BA	running	VM	The Backup Appliance detects VM backup aborted

Table 5 Adhoc backup (continued)

Event	Source	vCloud Director Task status	Object	Reason/Trigger
vm/backup/failed	BA	running	VM	The Backup Appliance detects VM backup failed
task/complete/[taskName]	BA	success	Task	The Backup Appliance reports that the vApp backup completed successfully.
vapp/backup/complete_with_errors	BA	success	vApp	The Backup Appliance reports that some VMs could not be backed up and it resulted in a valid but partial vApp backup. The Backup Appliance generates this event to distinguish between complete success or complete failure. The Backup Appliance may update the Task/Details element with success/failure information.
vapp/backup/success	BA		vApp	The vApp backup completed successfully
vapp/backup/fail	BA		vApp	The vApp backup failed
task/fail/[taskName]	Ext, BA	error	Task	The vCloud Protector Extension fails to submit the request to the Backup Appliance. The Backup Appliance fails to queue the request or reports any error. The Task/Error element contains information about the cause of the error.
vapp/backup/excluded	BA	preRunning	vApp	The vApp is excluded from being backed up
vm/backup/excluded	BA	preRunning	vApp	The vm is excluded from being backed up
vapp/backup/applyDiskExclusion	BA	preRunning	vApp	The Backup Appliance applies disk exclusion before a backup; the status is success if the exclusion is up-to-date, otherwise the status is failure and the exclusion is ignored.

Scheduled Backup

The following sections define the custom events of an scheduled backup.

Table 6 Scheduled backup

Event	Source	vCloud Director Task status	Object	Reason/Trigger
task/create/ [taskName]	BA	queued	Task	The Backup Appliance initiates the start of a scheduled backup.
vapp/backup/ scheduled	BA	preRunning	vApp	The Backup Appliance queues the backup for execution.
task/start/ [taskName]	BA	running	Task	The Backup Appliance reports that the backup has started.
vapp/backup/ progress	BA	running	vApp	and the Backup Appliance updates the Task/Progress (%) field.
vm/backup/ start	BA	running	VM	The Backup Appliance starts VM backup
vm/backup/ queued	BA	running	VM	VM backup is in queue
vm/backup/ complete	BA	running	VM	The Backup Appliance detects VM backup complete
vm/backup/ aborted	BA	running	VM	The Backup Appliance detects VM backup aborted
vm/backup/ failed	BA	running	VM	The Backup Appliance detects VM backup failed
task/complete/ [taskName]	BA	success	Task	The Backup Appliance reports that the vApp backup completed successfully.
vapp/backup/ complete_with_ errors	BA	success	vApp	The Backup Appliance may report that some VMs could not be backed up and it resulted in a valid but partial vApp backup. The Backup Appliance generates this event to distinguish between complete success or complete failure. The Backup Appliance may update the Task/Details element with success/failure information.
vapp/backup/ success	BA		vApp	The vApp backup completed successfully
vapp/backup/ fail	BA		vApp	The vApp backup failed

Table 6 Scheduled backup (continued)

Event	Source	vCloud Director Task status	Object	Reason/Trigger
task/fail/[taskName]	BA	error	Task	The Backup Appliance fails to queue the request or reports any error. The Task/Error element contains information about the cause of the error.
vapp/backup/excluded	BA	preRunning	vApp	The vApp is excluded from being backed up
vm/backup/excluded	BA	preRunning	vApp	The vm is excluded from being backed up
vapp/backup/applyDiskExclusion	BA	preRunning	vApp	The Backup Appliance applies disk exclusion before a backup; the status is success if the exclusion is up-to-date, otherwise the status is failure and the exclusion is ignored.

Cancel Backup

The following sections define the custom events of a cancel backup.

Table 7 Cancel backup

Event	Source	vCloud Director Task status	Object	Reason/Trigger
vapp/backup/cancel_request	Ext	queued preRunning running	Task	The backup cancel request is processed by the vCloud Protector Extension and sent to the Backup Appliance. The Task exists.
vapp/backup/aborted	BA	queued preRunning running	vApp	The Backup Appliance initiates the cancel operation for the vAppbackup that is running.
vm/backup/aborted	BA	queued preRunning running	vApp	The Backup Appliance initiates the cancel operation for each VM backup that is running.
task/abort/[taskName]	BA	aborted	Task	The Backup Appliance reports successful abort of backup.

Quota Usage

The following sections define the custom events of a quota usage.

Table 8 Quota Usage

Event	Source	Object	Reason/Trigger
vapp/backup/consume_adhoc_quota/[vAppId]/[bytes]	BA	vApp	The ad hoc quota was consumed on (partially) successful vApp backup.
backupPolicyQuotaExceeded/PolicyStillEnable	Ext	Policy	Notify that the backup policy's quota usage exceeds its quota value, while policy is still enabled because "quotaEnforced" is false
backupPolicyQuotaExceeded/PolicyDisabled	Ext	Policy	Notify that the backup policy's quota usage exceeds its quota value, and policy is disabled
backupPolicyResume	Ext	Policy	Notify that one backup policy is resumed after its quota value updated

Restore

The following sections define the custom events of a restore.

Table 9 Restore

Event	Source	vCloud Director Task status	Object	Reason/Trigger
task/create/[taskName]	Ext	queued	Task	vCloud Protector REST API Client issues restore request to the vCloud Protector Extension, and returns a vCloud Director Task to the caller. Task/Owner element is set to the vApp.
vapp/restore/restore_request	Ext	queued	Task	The restore request is processed by the vCloud Protector Extension and sent to the Backup Appliance.
vapp/restore/scheduled [a]	BA	preRunning	vApp	The Backup Appliance queues the restore for execution.
task/start/[taskName]	BA	running	Task	The Backup Appliance reports that the restore has started.
vapp/restore/progress	BA	running	vApp	At various stages of restore, the Backup Appliance updates the Task/Progress (%) field.
vm/restore/start	BA	running	vApp	The Backup Appliance starts a rollback on the VM.

Table 9 Restore (continued)

Event	Source	vCloud Director Task status	Object	Reason/Trigger
vm/restore/queued	BA	running	VM	VM restore is in queue
vm/restore/complete	BA	running	vApp	The Backup Appliance detects completion of VM rollback operation, in case VM was deleted this event is thrown after the import is complete
vm/restore/aborted	BA	running	vApp	The Backup Appliance detects VM restore aborted
vm/restore/failed	BA	running	vApp	The Backup Appliance detects VM restore failed
vm/restore/delete	BA	running	vApp	The Backup Appliance deleted a VM during the restore
vapp/restore/wrapup/start [b]	BA	running	vApp	Private event for vCloud Protector Server to begin wrapping up the restore process
vapp/restore/wrapup/complete [c]	BA	running	vApp	Private event for RESTClient to begin restoring the vApp configuration, the platform has finished its end of the restore processing.
vapp/restore/wrapup/failed [d]	BA	running	vApp	The Backup Appliance failed to finished the restore process, perhaps a VM could not be imported
task/complete/[taskName]	RESTClient	success	Task	The RESTClient listens for vapp/restore/wrapup/complete event and after the configuration has been restored the task can be marked as 100% done

a. not found in BG
b. service namespace is "com.emc.vcp.event.vapp.restore.wrapup.start";
c. service namespace is "com.emc.vcp.event.vapp.restore.wrapup.complete";
d. service namespace is "com.emc.vcp.event.vapp.restore.wrapup.failed";

Auditing: Create, Delete, or Modify vCloud Protector Extension internal objects and relationships

The following sections define the custom events to create, delete, or modify vCloud Protector extension internal objects and relationships.

Table 10 Auditing: Create, Delete, or Modify vCloud Protector Extension internal objects and relationships

Event	Source	Reason/Trigger
appliance/create	Ext	Create a Backup Appliance
appliance/modify	Ext	Modify a Backup Appliance
appliance/delete	Ext	Delete a Backup Appliance
repository/create	Ext	Create a Backup Repository in an Org Vdc
repository/modify	Ext	Modify a Backup Repository in an Org Vdc
repository/delete	Ext	Delete a Backup Repository from an Org Vdc
schedule/create	Ext	Create a Backup Schedule
schedule/modify	Ext	Modify a Backup Schedule
schedule/delete	Ext	Delete a Backup Schedule
retention/create	Ext	Create a Backup Retention
retention/modify	Ext	Modify a Backup Retention
retention/delete	Ext	Delete a Backup Retention
optionSet/create	Ext	Create a Backup Option Set
optionSet/modify	Ext	Modify a Backup Option Set
optionSet/delete	Ext	Delete a Backup Option Set
policyTemplate/create	Ext	Create a Backup Policy Template
policyTemplate/modify	Ext	Modify a Backup Policy Template
policyTemplate/delete	Ext	Delete a Backup Policy Template
policyTemplateCatalog/ create	Ext	Create a Backup Policy Template Catalog
policyTemplateCatalog / modify	Ext	Modify a Backup Policy Template Catalog
policyTemplateCatalog / delete	Ext	Delete a Backup Policy Template Catalog
vcenterRegistration/create	Ext	Register a vCenter into a Backup Appliance
vcenterRegistration/ modify	Ext	Modify a vCenter into a Backup Appliance

Table 10 Auditing: Create, Delete, or Modify vCloud Protector Extension internal objects and relationships (continued)

Event	Source	Reason/Trigger
vcenterRegistration/delete	Ext	Delete a vCenter into a Backup Appliance
proxyRegistration/create	Ext	Register a Backup Proxy on a vCenter
proxyRegistration /modify	Ext	Modify a Backup Proxy Registration
proxyRegistration /delete	Ext	Delete a Backup Proxy Registration
orgRegistration/create	Ext	Register an Organization and enclosed Virtual Data Centers
orgRegistration /delete	Ext	Delete an Org Registration
backupPolicy/create	Ext	Create a Backup Policy
backupPolicy /modify	Ext	Modify a Backup Policy
backupPolicy /delete	Ext	Delete a Backup Policy
backupPolicy/attach	Ext	Attach one or more vApps to a Backup Policy
replicationPolicy/create	Ext	Create a Replication Policy in a Backup Repository.
replicationPolicy /modify	Ext	Modify a Replication Policy of a Backup Repository.
replicationPolicy /delete	Ext	Delete a Replication Policy from a Backup Repository.
defaultBackupPolicy / modify	Ext	Change the Default Backup Policy of an Org Vdc
defaultBackupPolicy/ attach	Ext	Attach one or more vApps to the Default Backup Policy of an Org Vdc.
backupConfiguration/ modify	Ext	Change the Backup Configuration parameters of an Org Vdc.
activeRepository /modify	Ext	Change the Active Backup Repository of an Org Vdc.
replicationPolicy/attach	Ext	Attach one or more vApps to a Replication Policy of a Backup Repository.
defaultReplicationPolicy/ modify	Ext	Change the default Replication Policy of a Backup Repository.
defaultReplicationPolicy/ attach	Ext	Attach one or more vApps to a default Replication Policy of a Backup Repository.
adhocReplication/create	Ext	
backup/modify	Ext	Modify a Backup (Retention)
backup/delete	Ext	Delete a Backup

Table 10 Auditing: Create, Delete, or Modify vCloud Protector Extension internal objects and relationships (continued)

Event	Source	Reason/Trigger
backupExcludeList/modify	Ext	Modify the include/exclude list of VMs and Disks for a vApp backup.
backupExcludeList/delete	Ext	Remove the include/exclude list of a vApp
backupRepositoryPrimaryBytesExceeded	Ext	
backupRepositoryDailyNewBytesExceeded	Ext	

Notifications to RabbitMQ

All events from BG to RabbitMQ are listed in the table. Some of them can be used for chargeback purpose. The pattern of routing keys follows VMware's convention except the use of operationName or taskName:
`operationSuccess.entity.org.user.subType1.subType2...subTypeN.[operationName]`

Table 11 RabbitMQ Notifications

Event	Source	Routing Key	Chargeback	Reason/Trigger
vAppBackupEvent	BG	true.entity.org.user.com.emc.vcp.event.vapp.backup	Yes	A vApp is backed up successfully.
vAppDeleteBackupEvent	BG	true.entity.org.user.com.emc.vcp.event.vapp.delete_backup		A vApp backup is deleted successfully.
vAppRetentionUpdateEvent	BG	true.entity.org.user.com.emc.vcp.event.vapp.update_backup_retention		The retention of a vApp backup is updated successfully.
vAppRestoreEvent	BG	true.entity.org.user.com.emc.vcp.event.vapp.restore	Yes	A vApp backup is restored successfully.
vAppReplicationEvent	BG	true.entity.org.user .com.emc.vcp.event.vapp.replicate	Yes	A vApp backup on source side is replicated successfully.

vAppBackupEvent

```
<vAppBackupEvent eventVersion="1.0" taskId="daljdaldja" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z" back-upType="adhoc|scheduled">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
     <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
     <OrgName>Stone_Brewery</OrgName>
     <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
     <OrgvDCName>Stone_Org_vDC</OrgvDCName>
     <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
     <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
     <OwnerName>SYSTEM</OwnerName>
```

```
   </vAppInfo>
   <vAppBackupInfo vAppBackupId="23" backupVmCount="3"
vmsSelected="2" actualVMs="1">
     <BackupHost>ave370.asl.lab.emc.com</BackupHost>
     <BackupStoreName>vdd670a.asl.lab.emc.com</BackupStoreName>
     <BackupStoreId>83F73B79687F2FC06902E778A6C9147F5F19A3C4</
BackupStoreId>
     <BytesModified>1332</BytesModified><!-- from the VM's
perspective -->
     <BytesProcessed>2342324</BytesProcessed>
     <StartTime>2013-08-16T18:16:30.092Z</StartTime>
     <EndTime>2013-08-16T18:22:23.801Z</EndTime>
     <EffectiveRetention>2013-10-15T18:16:02.000Z</EffectiveRetention>
     <VmBackupInfoList>
<VmBackupInfo vmId="VM cloud guid1" vmName="vCloud Name"
includeVm="true" vmBackup-Status="success" vmBackupId="20">
     <BytesModified>99241</BytesModified>
     <StartTime>2013-08-16T18:16:30.092Z</StartTime>
     </VmBackupInfo>
     <VmBackupInfo vmId="VM cloud guid2" vmName="" includeVm="true"
vmBackupStatus="failed"/>
     <VmBackupInfo vmId="VM cloud guid3" vmName="" includeVm="false"/>
   </VmBackupInfoList>
   </vAppBackupInfo>
</vAppBackupEvent>
```

vAppDeleteBackupEvent

```
<vAppDeleteBackupEvent eventVersion="1.0" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z">
  <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
   <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
   <OrgName>Stone_Brewery</OrgName>
   <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
   <OrgvDCName>Stone_Org_vDC</OrgvDCName>
   <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
   <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
   <OwnerName>SYSTEM</OwnerName>
  </vAppInfo>
  <vAppBackupInfo vAppBackupId="23"/>
</vAppDeleteBackupEvent>
```

vAppRetentionUpdateEvent

```
<vAppRetentionUpdateEvent eventVersion="1.0" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
     <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
     <OrgName>Stone_Brewery</OrgName>
     <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
     <OrgvDCName>Stone_Org_vDC</OrgvDCName>
     <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
     <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
     <OwnerName>SYSTEM</OwnerName>
   </vAppInfo>
   <vAppBackupInfo vAppBackupId="23">
     <EffectiveRetention>2013-10-15T18:16:02.000Z</EffectiveRetention>
   </vAppBackupInfo>
</vAppRetentionUpdateEvent>
```

vAppRestoreEvent

This section provides information on the types of restore events.

Rollback

```
<vAppRestoreEvent eventVersion="1.0" taskId="abc123def" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z" re-storeType="rollback">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
      <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
      <OrgName>Stone_Brewery</OrgName>
      <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
      <OrgvDCName>Stone_Org_vDC</OrgvDCName>
      <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
      <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
      <OwnerName>SYSTEM</OwnerName>
   </vAppInfo>
   <vAppRestoreInfo source="local" vAppBackupId="23"
backupvmcount="3" vmsSelected="2">
      <BackupHost>ave370.asl.lab.emc.com</BackupHost>
      <BackupStoreName>vdd670a.asl.lab.emc.com</BackupStoreName>
      <BackupStoreId>83F73B79687F2FC06902E778A6C9147F5F19A3C4</
BackupStoreId>
      <BytesRestored>1332</BytesRestored><!-- Need definition - Bytes
written -->
      <BytesProcessed>2342324</BytesProcessed>
      <StartTime>2013-08-16T18:16:30.092Z</StartTime>
      <EndTime>2013-08-16T18:22:23.801Z</EndTime>
     <VmRestoreInfoList>
<VmRestoreInfo vmId="guid-from-backup" vmName="Vm1FromBackup"
includeVm="true" vmRe-storeStatus="success" vmBackupId="20">
   <BytesRestored>13241</BytesRestored>
   <BytesProcessed>2342324</BytesProcessed>
   <StartTime>2013-08-16T18:16:30.092Z</StartTime>
   <EndTime>2013-08-16T18:22:23.801Z</EndTime>
   </VmRestoreInfo>
<VmRestoreInfo vmId="VM cloud guid2" vmName="Vm2FromBackup"
includeVm="true" vmRe-storeStatus="success" vmBackupId="20">
   <BytesRestored>13241</BytesRestored>
   <BytesProcessed>2342324</BytesProcessed>
   <StartTime>2013-08-16T18:16:30.092Z</StartTime>
   <EndTime>2013-08-16T18:22:23.801Z</EndTime>
</VmRestoreInfo>
<VmRestoreInfo vmId="VM cloud guid3" vmName="Vm3FromBackup"
includeVm="false"/>
    </VmRestoreInfoList>
  </vAppRestoreInfo>
</vAppRestoreEvent>
```

Single VM Rollback

```
<vAppRestoreEvent eventVersion="1.0" taskId="abc123def" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z" re-storeType="singlevmrollback">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
      <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
      <OrgName>Stone_Brewery</OrgName>
      <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
      <OrgvDCName>Stone_Org_vDC</OrgvDCName>
      <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
      <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
      <OwnerName>SYSTEM</OwnerName>
   </vAppInfo>
   <vAppRestoreInfo source="local|remote" vAppBackupId="23"
backupVmCount="3" vmsSelected="1">
      <BackupHost>ave370.asl.lab.emc.com</BackupHost>
```

```
      <BackupStoreName>vdd670a.asl.lab.emc.com</BackupStoreName>
      <BackupStoreId>83F73B79687F2FC06902E778A6C9147F5F19A3C4</
BackupStoreId>
      <BytesModified>1332</BytesModified>
      <BytesProcessed>2342324</BytesProcessed>
      <StartTime>2013-08-16T18:16:30.092Z</StartTime>
      <EndTime>2013-08-16T18:22:23.801Z</EndTime>
      <VmRestoreInfoList>
<VmRestoreInfo vAppId="VM cloud guid1" vmName="" includeVm="true"
vmRestoreStatus="success" vmBackupId="20">
      <BytesModified>13241</BytesModified>
      <BytesProcessed>2342324</BytesProcessed>
      <StartTime>2013-08-16T18:16:30.092Z</StartTime>
      <EndTime>2013-08-16T18:22:23.801Z</EndTime>
                    </VmRestoreInfo>
      </VmRestoreInfoList>
   </vAppRestoreInfo>
</vAppRestoreEvent>
```

Restore to New

```
<vAppRestoreEvent eventVersion="1.0" taskId="abc123def" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z" re-storeType="new">
<vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
   <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
   <OrgName>Stone_Brewery</OrgName>
   <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
   <OrgvDCName>Stone_Org_vDC</OrgvDCName>
   <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
   <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
   <OwnerName>SYSTEM</OwnerName>
  </vAppInfoSrc>
  <vAppInfoDst vAppIdDst="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppNameDst="Accounting">
   <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudIdDst>
   <OrgName>Stone_Brewery</OrgNameDst>
   <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgIdDst>
   <OrgvDCName>Stone_Org_vDC</OrgvDCNameDst>
   <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCIdDst>
   <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerIdDst>
   <OwnerName>SYSTEM</OwnerNameDst>
  </vAppInfoDst>
  <vAppRestoreInfo source="local" vAppBackupId="23" backupVmCount="3"
vmsRestored="2">
   <BackupHost>ave370.asl.lab.emc.com</BackupHost>
   <BackupStoreName>vdd670a.asl.lab.emc.com</BackupStoreName>
   <BackupStoreId>83F73B79687F2FC06902E778A6C9147F5F19A3C4</
BackupStoreId>
   <BytesModified>1332</BytesModified>
   <BytesProcessed>2342324</BytesProcessed>
   <StartTime>2013-08-16T18:16:30.092Z</StartTime>
   <EndTime>2013-08-16T18:22:23.801Z</EndTime>
   <VmRestoreInfoList>
<VmRestoreInfo vmId="VM cloud guid1" vmName="" includeVm="true"
vmRestoreStatus="success" vmBackupId="20">
   <BytesModified>13241</BytesModified>
   <BytesProcessed>2342324</BytesProcessed>
   <StartTime>2013-08-16T18:16:30.092Z</StartTime>
   <EndTime>2013-08-16T18:22:23.801Z</EndTime>
  </VmRestoreInfo>
<VmRestoreInfo vmId="VM cloud guid2" vmName="" includeVm="true"
vmRestoreStatus="success" vmBackupId="20">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
      <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
      <OrgName>Stone_Brewery</OrgName>
      <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
      <OrgvDCName>Stone_Org_vDC</OrgvDCName>
      <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
```

```
      <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
      <OwnerName>SYSTEM</OwnerName>
   </vAppInfo>
   <BytesModified>13241</BytesModified>
   <BytesProcessed>2342324</BytesProcessed>
   <StartTime>2013-08-16T18:16:30.092Z</StartTime>
   <EndTime>2013-08-16T18:22:23.801Z</EndTime>
  </VmRestoreInfo>
  <VmRestoreInfo vmId="VM cloud guid3" vmName="" includeVm="false"/>
  </VmRestoreInfoList>
  </vAppRestoreInfo>
</vAppRestoreEvent>
```

vAppReplicationEvent

```
<vAppReplicationEvent eventVersion="1.0" adhocReplTaskid="skjssljs"
adhocReplUserid="SYSTEM" taskId="daljdaldja" userId="xyz"
eventTime="2013-08-16T18:25:23.801Z" replicationType="adhoc|
scheduled">
   <vAppInfo vAppId="2928ca6b-efb9-482e-b7cc-47432fb0a918"
vAppName="Accounting">
     <vCloudId>5d022727-5921-4793-9458-03d5af80be29</vCloudId>
     <OrgName>Stone_Brewery</OrgName>
     <OrgId>681f8907-f0cb-4372-a481-6b113f220a59</OrgId>
     <OrgvDCName>Stone_Org_vDC</OrgvDCName>
     <OrgvDCId>ee18a662-a128-4a94-b992-62d8d361063e</OrgvDCId>
     <OwnerId>3b5cc907-ca8c-477b-99c4-10229751acce</OwnerId>
     <OwnerName>SYSTEM</OwnerName>
  </vAppInfo>
  <vAppReplInfo destinationHost="hostname">
     <BytesProcessed>10628809</BytesProcessed>
     <BytesModified>95681</BytesModified>
     <StartTime>2013-11-21T22:18:27.856Z</StartTime>
     <EndTime>2013-11-21T22:18:27.857Z</EndTime>
     </vAppReplInfo>
</vAppReplicationEvent>
```

Notifications and Event Types

This section provides information on the complete listing of Notification/Event Types that vCloud Director generates.

Table 12 Notifications and Event Types

Type (com/vmware/vcloud/event/...)	Description
session/login	A login session was created.
user/import	A user was imported from LDAP.
user/remove	An imported user was removed from the organization.
user/modify	One or more properties of a user were modified.
user/lockout	An account was locked based on the organization's password policy settings.
user/unlock	A locked account was unlocked.
user/lock_expired	The lock on an account has expired.
user/create	A local user was created in an organization.
org/create	An organization was created.

Table 12 Notifications and Event Types (continued)

Type (com/vmware/vcloud/event/...)	Description
org/modify	An organization was modified.
org/delete	An organization was deleted.
network/create	A network was created.
network/modify	A network was modified.
network/delete	A network was deleted.
network/deploy	A network was deployed.
network/undeploy	A network was undeployed.
catalog/create	A catalog was created.
catalog/delete	A catalog was deleted.
catalog/modify	One or more properties of a catalog were modified
catalog/publish	A catalog was published.
catalogItem/create	An item was added to a catalog.
catalogItem/delete	An item was removed from a catalog.
vdc/create_request	A request to create a vDC was blocked pending administrative action.
vdc/create	A vDC was created.
vdc/modify	One or more properties of a vDC was modified.
vdc/delete_request	A request to delete a vDC was blocked pending administrative action.
vdc/delete	A vDC was deleted.
vdc/fast_provisioning/modify	The UsesFastProvisioningvalue of a vDC was modified.
vdc/thin_provisioning/modify	The IsThinProvisionvalue of a vDC was modified.
vappTemplate/create	A vApp template was created.
vappTemplate/import	A virtual machine was imported from vSphere as a vApp template.
vappTemplate/modify	One or more properties of a vApp template were modified.
vappTemplate/delete	A vApp template was deleted.
vappTemplate/create_request	A request to create a vApp template was blocked pending administrative action.
vappTemplate/import_request	A request to import a vApp template was blocked pending administrative action.
vappTemplate/modify_request	A request to modify a vApp template was blocked pending administrative action.

Table 12 Notifications and Event Types (continued)

Type (com/vmware/vcloud/event/...)	Description
vappTemplate/delete_request	A request to delete a vApp template was blocked pending administrative action.
vapp/create	A vApp was created (instantiated)
vapp/import	A virtual machine was imported from vSphere as a vApp.
vapp/modify	One or more properties of a vApp were modified.
vapp/delete	A vApp was deleted.
vapp/deploy	A vApp was deployed.
vapp/undeploy	A vApp was undeployed.
vapp/runtime_lease_expiry	The runtime lease of a vApp has expired.
vapp/create_request	A request to instantiate a vApp template was blocked pending administrative action.
vapp/import_request	A request to import a vApp was blocked pending administrative action.
vapp/modify_request	A request to modify a vApp was blocked pending administrative action.
vapp/delete_request	A request to delete a vApp was blocked pending administrative action.
vapp/deploy_request	A request to deploy a vApp was blocked pending administrative action.
vapp/undeploy_request	A request to undeploy a vApp was blocked pending administrative action.
vm/create_request	A request to create a virtual machine was blocked pending administrative action.
vapp/quarantine_reject	An uploaded OVF was rejected after quarantine.
vapp/upload_timeout	An OVF upload has timed out.
vm/create	A virtual machine was created by instantiating a vApp.
vm/modify_request	A request to modify a virtual machine was blocked pending administrative action.
vm/modify	One or more properties of a virtual machine were modified.
vm/delete	A virtual machine was deleted.
vm/change_state	The power state of a virtual machine has changed.
vm/deploy_request	A request to deploy a virtual machine was blocked pending administrative action.
vm/deploy	A virtual machine was deployed.
vm/undeploy_request	A request to undeploy a virtual machine was blocked pending administrative action.

Table 12 Notifications and Event Types (continued)

Type (com/vmware/vcloud/event/...)	Description
vm/undeploy	A virtual machine was undeployed.
vm/consolidate_request	A request to consolidate a virtual machine was blocked pending administrative action.
vm/consolidate	A virtual machine was consolidated.
vm/relocate_request	A request to relocate a virtual machine was blocked pending administrative action.
vm/relocate	A virtual machine was relocated.
media/create	A media object created by upload or import.
media/import	A media object was imported.
media/modify	One or more properties of a media object were modified.
media/delete	A media object was deleted.
media/create_request	A request to create a media object was blocked pending administrative action.
media/import_request	A request to import a media object was blocked pending administrative action.
media/modify_request	A request to modify a media object was blocked pending administrative action.
media/delete_request	A request to delete a media object was blocked pending administrative action.
media/upload_timeout	A media upload has timed out.
media/quarantine_reject	An uploaded media object was rejected after quarantine.
providerVdc/create_request	A request to create a provider vDC was blocked pending administrative action.
providerVdc/create	A provider vDC was created.
providerVdc/modify	One or more properties of a provider vDC were modified.
providerVdc/delete_request	A request to delete a provider vDC was blocked pending administrative action.
providerVdc/delete	A provider vDC was deleted.
vc/create	A vCenter server was registered.
vc/modify	One or more properties of a registered vCenter server were modified.
vc/delete	A registered vCenter server was registered.
task/create	A task was created.
task/start	A non-blocking task has started or a blocking task has resumed.
task/abort	A task was aborted.
task/complete	A task has completed.

Table 12 Notifications and Event Types (continued)

Type (com/vmware/vcloud/event/...)	Description
task/fail	A task has failed.
blockingtask/create	A task was blocked and a notification created.
blockingtask/resume	A blocking task was resumed.
blockingtask/abort	A blocking task was aborted.
blockingtask/fail	A blocking task was failed.
datastore/modify	One or more properties of a datastore object were modified.
datastore/delete A	Datastore object was deleted.

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