



Cisco Policy Suite 5.5.2 Backup and Restore Guide

Version 5.5.2

November 27, 2013

Cisco Systems, Inc.

www.cisco.com

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco website at www.cisco.com/go/offices.

Text Part Number: OL-29749-02

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

© 2013 Cisco Systems, Inc. All rights reserved.



Getting Started v

Readers v

Additional Information v

CHAPTER 1

Backup and Restore 1-1

Before your begin 1-1

Overview 1-1

Backup Strategies 1-1

Backup Schedule 1-2

Mongo DB Backup 1-2

 Full Environment 1-2

 Example Mongo DB Automatic 1-3

 All In One Environment 1-3

Mongo Database Restore 1-4

MySQL Backups 1-5

MySQL Restore 1-6

Subversion Backups 1-6

 Example Subversion Automatic 1-8

Subversion Restores 1-8

Validating the Backup 1-10

Backing Up a Virtual Machine 1-10

Next Steps 1-12



Getting Started

Read about these topics in these sections:

- [Readers](#)
- [Additional Information](#)

Readers

This guide is for:

- Deployment engineers
- Network engineers
- System engineers

You should be familiar with Linux, MySQL, and SVN as well as general backup and restore procedures at an intermediate level.

Additional Information

This document assumes an intermediate level of understanding of network architecture, configuration, and operations.





Backup and Restore

Revised: November 27, 2013, OL-29749-02

Before You Begin

- Install CPS and have it running successfully. Backups are stored on customer-provided hardware, preferably in a location apart from where CPS is currently running.
- Initiate the backups using either manual or automated methods. The responsibility for backup up the CPS system off-box is the customers.
- No backup procedures are run on the CPS machines, all processes to backup data are run from external machines. However, some procedures such as database dumps need to be performed directly on the VM.

Overview

To backup data from the CPS system, three separate procedures are needed.

The data to be backed up resides in these databases:

- MySQL
- Mongo DB
 - balance_mgmt
 - portal
 - radius
 - session_cache
 - spr
- Subversion - policy data

Access all VMs separately for backup purposes.

Backup Strategies

There are several methods to back up these data areas:

- Use your own company policies and tools.
- Use a third-party instruction for a specific area. For example, use Zabbix instructions to back up Zabbix data.
- Use the instructions provided here.

Backup Schedule

Your first backup operation should occur after a successful installation and configuration. This provides a baseline and tests your backup procedures with respect to hardware, software, and protocols.

Then, do backups on this schedule as a best practice.

Backup this...	...this often
VMs	Monthly
Mongo DB	Daily
Subversion (SVN) configuration information	Weekly or if there any changes
MySQL for reporting data	Prefer daily, at least weekly, if you use the reporting feature in CPS

Mongo DB Backup

The CPS uses Mongo for these data repositories:

- portal
- sessionMgr
- balance_mgmt
- radius
- session_cache
- spr

Full Environment

This list of databases in a full environment includes the host and Mongo instance they are stored in. Default values are provided

audit	27730 on SessionMgr
balance_mgmt	27718 on SessionMgr
collectd	27017 on perfcient01
portal	either 27717 or 27718 on SessionMgr
radius	27717 on SessionMgr

session_cache	27717 on SessionMgr
spr	27720 on SessionMgr

If only a specific database from the instance needs to be dumped, add the **-db** argument to **mongodump**:

```
mongodump --port [port_num] --db [db_name]
```

This still creates a directory called **dump** under the current directory, then creates another directory under **dump** called **db_name**

**Note**

Recall that the sessionMgrs reside on an internal network that generally is not accessible by anything other than other VMs in the CPS environment. A potential backup solution is to do this:

- Step 1** SSH to pcrfclient01
- Step 2** Run: `usr/bin/mongodump --host [primary_sessionmgr] --port [port_num]`
- Step 3** Run this command to archive the dump: `tar -cvf sessionmgr-[port_num]_date.tar dump`
- Step 4** Transfer `sessionmgr-[port_num]_[date].tar` to backup media.

Example Mongo DB Automatic

You can automate these steps by combining a cron job on pcrfclient01 and the scheduling of your backup software.

**Note**

You must make sure that there is enough space on pcrfclient01 to hold the backup. If more space is needed, the Cisco technical representative can work with you to increase the disk size. If you have a SAN for backups, mount it from pcrfclient01 so that Mongo dumps are written directly to it.

This example automatically creates a dump of the 27718 database at `/var/tmp/sessionmgr-[port_num]_[date]` every night at 10:00 p.m.

- Step 1** SSH to pcrfclient01 as root, then run `crontab -e` to edit the root user's cron tab.
- Step 2** Add this line:


```
22 * * * /usr/bin/mongodump --host set02/sessionmgr01:27718,sessionmgr02:27718 -o /var/tmp/sessionmgr-27718_$(date +%m%d%y)
```
- Step 3** Save the file and the new cron tab will be installed.
Now you know that the 27718 database will be backed up every night at 10:00PM. The files could then be SCP'd off of the server for secondary backups.

All In One Environment

To create a backup of the mongo portal database, for example, from the source machine enter this command:

```
mongodump --port 27017 -db portal
```

To restore, to the target machine:

```
mongorestore --host <IP_address> --port 27017 dump/portal
```

Mongo Database Restore

Prior to restoring the data, all CPS machines must be stopped. Restoring can be done on the same machine that the backups are stored using the application that was used to backup the database.

These commands must be run by a Mongo DB engineer with Linux experience.

This example shows how to restore the Mongo DB balance_mgmt database:

Step 1 Stop all the CPS and IOManager machines by logging into them and issuing the command – **service qns stop**

Step 2 Determine the replica set's primary with these steps.

- a. Log into pcrfclient01.
- b. Run this to get into the mongo shell: **/usr/bin/mongo --port 27718**
- c. Run this from the mongo shell to determine which member is the primary: **db.isMaster()**

Example output showing sessionmgr01 as the primary:

```
[root@pcrfclient01 data]# mongo --port 27718
MongoDB shell version: 2.2.0
connecting to: 127.0.0.1:27718/test
set02:ARBITER> db.isMaster()
{
  "setName" : "set02",
  "ismaster" : false,
  "secondary" : false,
  "hosts" : [
    "sessionmgr02:27718",
    "sessionmgr01:27718"
  ],
  "arbiters" : [
    "pcrfclient01:27718"
  ],
  "primary" : "sessionmgr01:27718",
  "arbiterOnly" : true,
  "me" : "pcrfclient01:27718",
  "maxBsonObjectSize" : 16777216,
  "localTime" : ISODate("2013-04-23T18:25:14.795Z"),
  "ok" : 1
}
```

Step 3 If this is the master, run the following command from the backup server:

- a. Transfer the dump to pcrfclient01
- b. Run this from pcrfclient01:

```
mongorestore --host [primary_sessionmgr] --port [port_num] --db [db_name]
```

Use the **-db** argument only if the dump contains multiple databases and you only want to restore one of them from it.



Note You must make sure perclient01 has enough space to hold the dump. If using a SAN to store backups, it may be feasible to mount that SAN directly to perclient01 and read database dumps directly from it.

Step 4 Log into the database and verify it is running and accessible:

- a. Log into session manager 1 – **ssh sessionmgr01**

```
cd /usr/local/mongodb/bin
```

```
./mongo --port 27718
```

- b. **show dbs** (you should see balance_mgmt)

```
db.account.findOne()
```

- c. This should return a record.

```
db.account.count()
```

- d. This should return the expected number of records.

MySQL Backups

The CPS uses the MySQL database for the reporting feature. Your enterprise may not use this optional CPS feature.



Note This backup can be used to create a copy of the SuM database on an external machine and used for data analysis.

Backup MySQL databases from the command line using the **mysqldump** command. These steps make manual database dumps from the command line, not the Workbench GUI.

The syntax to dump a single database is:

```
mysqldump -u [db_user] -p[db_password] database [db_name] > backup_name.sql
```

The syntax to dump all databases is:

```
mysqldump -u [db_user] -p[db_password] --opt --all-databases > backup_name.sql
```

An example of the command:

```
mysqldump -u root -pbroadhop database reporting > reporting_042313.sql
```



Tip To use this backup method, the dump must occur directly on the reporting VM. Make sure there is enough extra space on the VM to hold the backup. After the backup is taken, perhaps transfer it to a backup medium and then remove it from the VM.

**Tip**

Regular dumps could be automated using a cron job.

At this point you will have a recurring backup of the MySQL data.

MySQL Restore

Perform restores by transferring the mysqldump file back to the reporting server and then restoring it using mysql:

```
mysql -u [db_user] -p[db_password] [db_name] < backup_name.sql
```

In general, the systems need to be stopped and the database idle prior to restoring data. The restore procedure is completely destructive, so prior to beginning it is important that the backup file is verified before deleting the existing data.

**Note**

This activity is best performed by a qualified MySQL database engineer with Linux experience.

Subversion Backups

Subversion contains policy information. Backup the Subversion data backed up after making and publishing changes to the CPS policies.

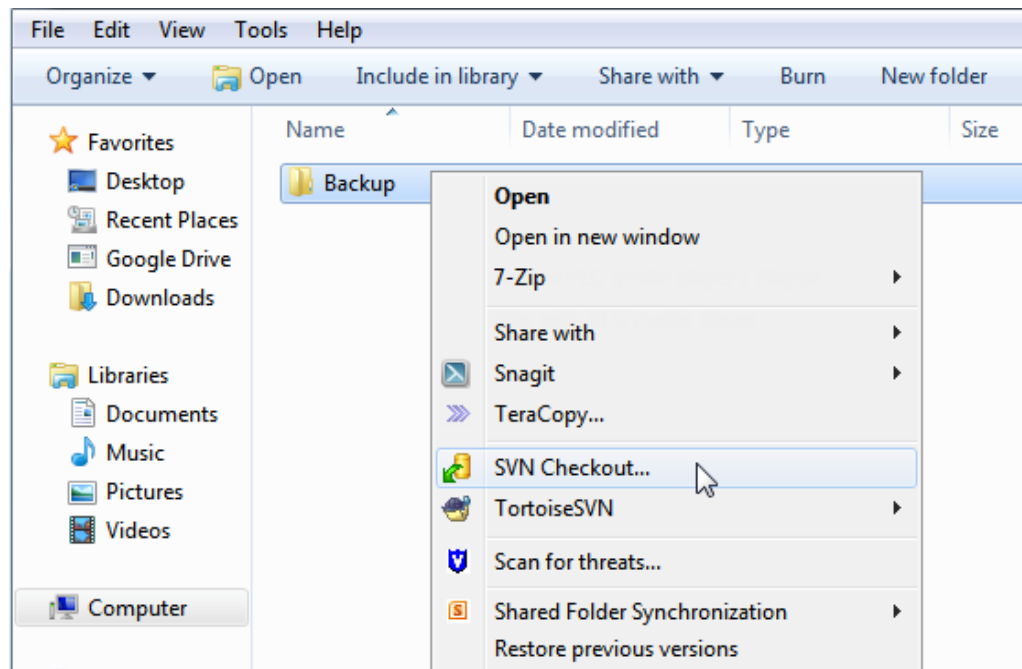
The easiest way to backup Subversion data is to use the Tortoise SVN software. Downloaded this software from <http://tortoisesvn.net/downloads.html>

This is a Windows-based utility that allows you to back up files from subversion quickly and easily.

Once you install it new options will appear when you right click a directory.

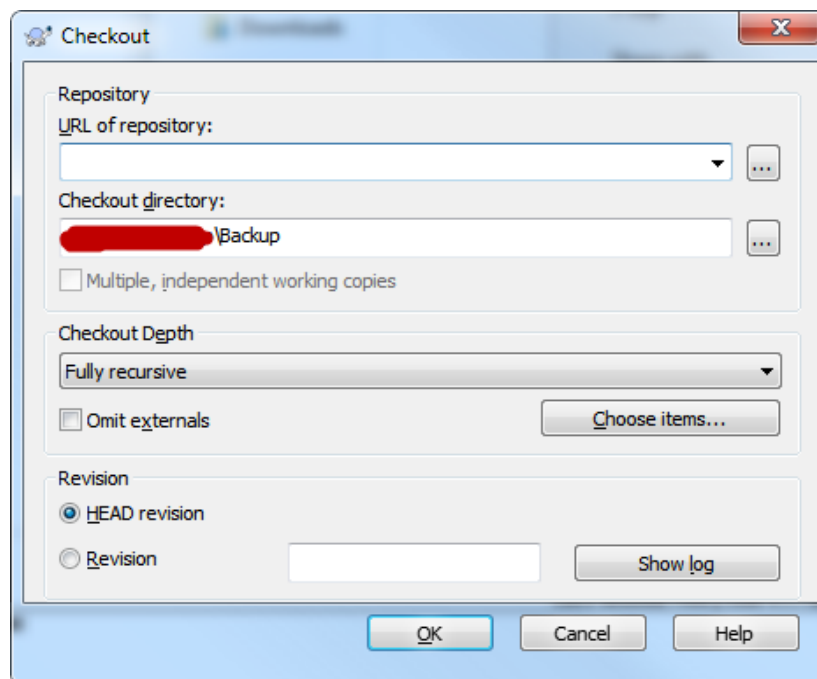
Step 1 Create a new directory to store the backup in.

Step 2 Right click on the directory.

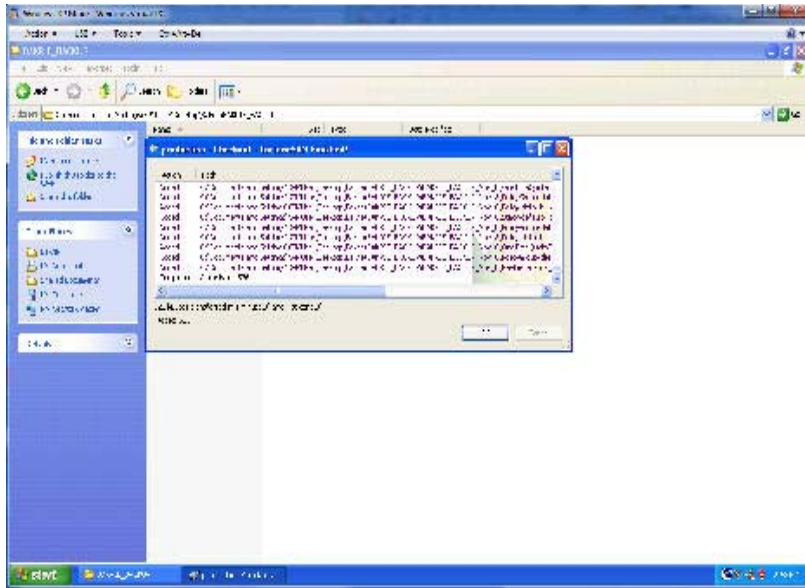


Step 3 Select SVN Checkout.

Use the path for “URL of Repository” http://<pcrfclient01_IP>/repos/configuration/production
 The checkout directory will be the directory you right-clicked on.
 Leave other options as default.



- Step 4** Click OK. The screen prompts you for a username and password. Use **broadhop/broadhop**.
The download of the SVN data begins. It will take approximately 2 minutes.
When it completes successfully you will see this screen



You now have a backup of the CPS policy data in SVN.

More information on Tortoise is available on their web site at <http://tortoisesvn.net/support.html>

To do automatic backups, create a cron job that runs on pcrclient01 to back the repository up to a directory, then that directory can be SCP'd to another server.

Example Subversion Automatic

These steps automatically back up the repository to `/var/tmp/repo-[date]` every night at 9:30PM:

Step 1 SSH to pcrclient01 as root, then run `crontab -e` to edit the root user's crontab

Step 2 Add this line:

```
30 21 * * svnadmin hotcopy /var/www/svn/repos /var/tmp/repo-$(date +%m%d%y) --clean logs
```

Step 3 Save the file and the new crontab will be installed.

Subversion Restores

A backup created as above can be restored this way:

Step 1 SCP the backup to pcrclient01

Step 2 Stop httpd so that no new connections to SVN occur:

service httpd stop

Step 3 Move the current repository to a new location:

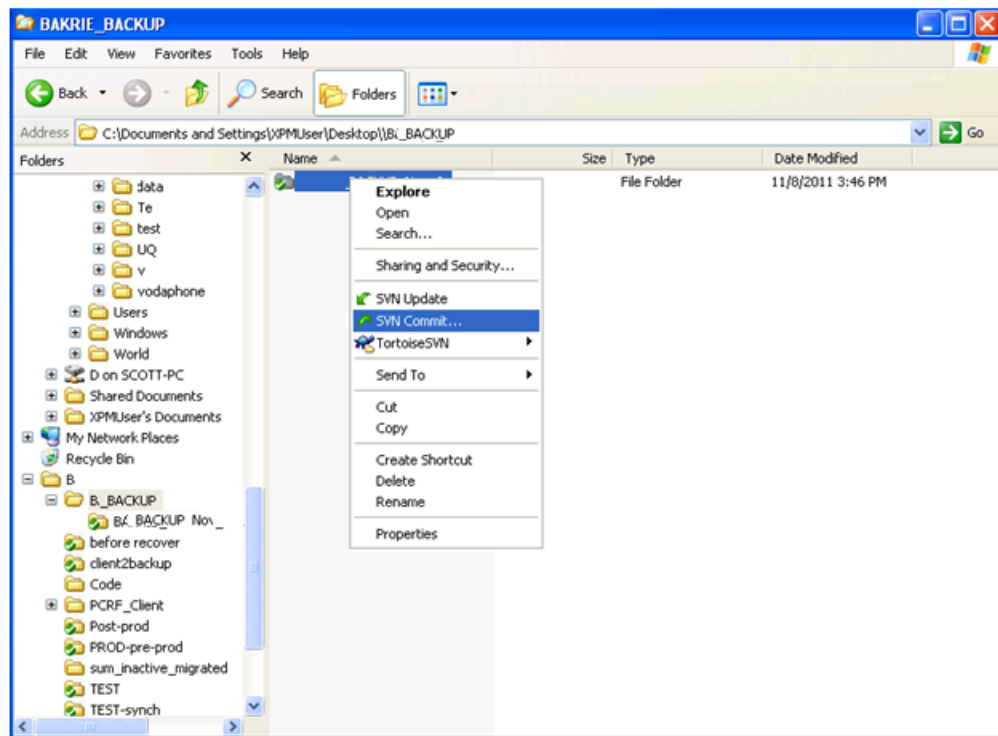
```
mv /var/www/svn /var/tmp/cur_repo
```

Step 4 Move the backed up files to **/var/www/svn**

Subversion data can be restored at any time. The systems will re-read it once it has been committed.

Step 1 Log into the machine containing the backups and which has the tortoise SVN application running. Right click on the version you want to restore.

Step 2 Select SVN Commit.



Step 3 When the process completes, open the Policy Builder client and Publish the changes.



Validating the Backup

After you make a backup of any database, you can check these things to make sure the backup is valid:

- Observe and correct any errors or warnings during the backup. For example, the backup may be aborted if there is not enough file space available or if the media is corrupt.
- Make sure that the file size of the backup is the same as the original, and that it is not zero.
- Open the backup database with an appropriate third-party tool.

Backing Up a Virtual Machine

CPS software is based on the strategy of virtual machines rather than physical machines.

Backing up an entire virtual machine backs up data and software applications.

Read this section to backup a specific virtual machine with vSphere.

To back up a VM in its entirety, use these steps.

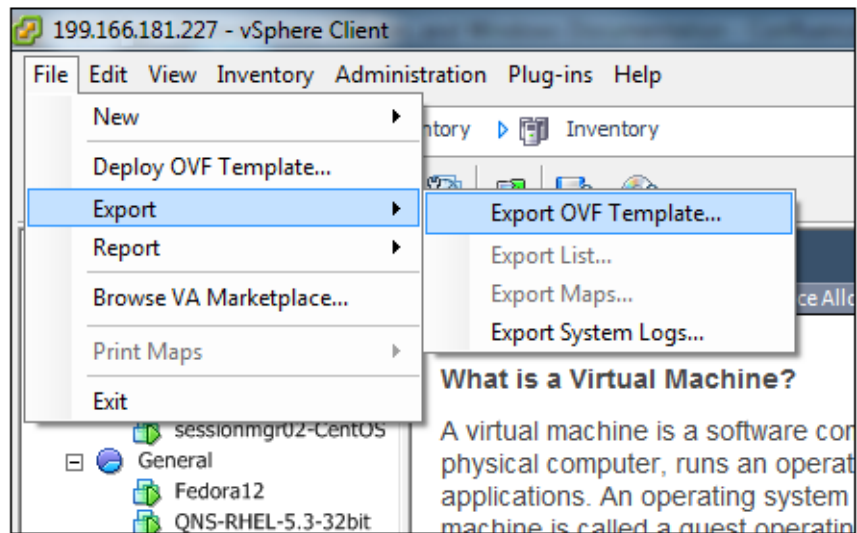
Step 1 Open your vSphere client and log into the ESXi/ESX machine

Step 2 Power down the virtual machine (VM).

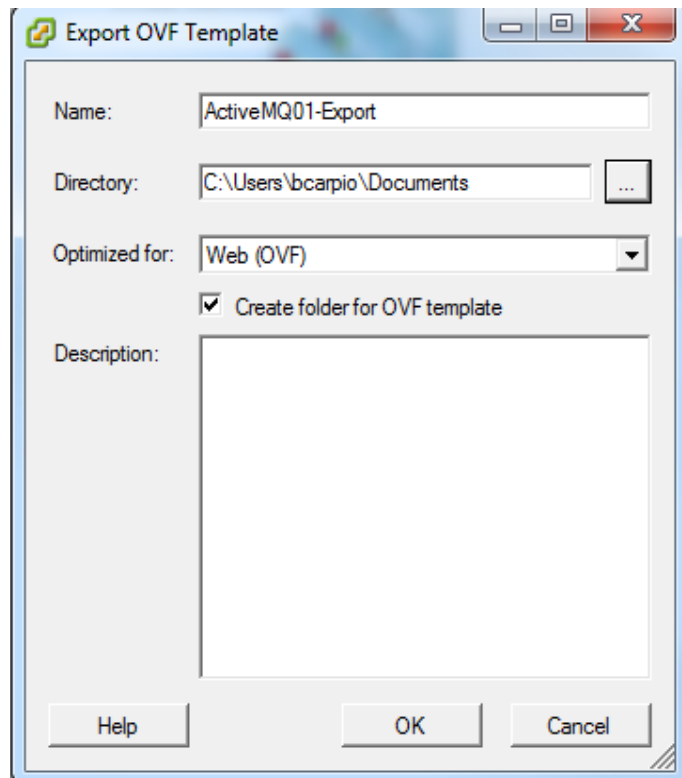


Note In Linux, type **init 0** to shutdown the VM cleanly.

Step 3 When the virtual machine is powered down, highlight it and select File > Export > Export OVF Template.



- Step 4** Give the VM a name and path.
- Step 5** Set the optimization as Web (OVF).
- Step 6** Check the box Create Folder For OVF Template.
- Step 7** Press OK.



Next Steps

With these instructions, your backup routines should be adequate and timely. If in doubt, try to restore backups to a test environment and gauge your success. Please contact your Cisco technical representative at any time with questions or concerns.