Install and configure IBM TSM Backup Archive client on CentOS, Redhat, Fedora Linux

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In this article I'll explain how to install IBM Spectrum Protect client well known over the years with TSM (Tivoli Service Manager) which as of time of writting perhaps the best backup solution for Linux / Unix server. The install process is rather trivial, but there are few configuration things worthy to mention and explain. IBM Tivoli is a 2 component system consisting of Client and Server just like most solutions, we know thus before proceeding you should already have setup a functional backup server with attached and configured storages but this is a topic for another future article.

1. Login and configure TSM server to add the backup host machine you'll be connecting

If you don't have the access to remote server if you're in a Corporation network and you don't have the Admin credentials to Tivoli Server, ask a colleague who has access to add you the hostname you would like to backup.
He should generate you as a minimum a connect password and hand it back to you in encrypted form (GPG / PGP etc.). Besides setting the new client to connect password, it is necessery to communicate when and how frequently the backup is to be prepared and respectively he should set the required backup schedule configuration etc.

2. Check OS version

As minimum this article assumes you'll be using some kind of RPM based distribution.

```
[root@centos ~]# cat /etc/redhat-release
```

CentOS Linux release 7.9.2009 (Core)

In my case this was CentOS, any other RPM based distribution should work. For specifics check out

```
README_*.htm
```

3. Remove version lock If version lock is there

On our servers we do use one feature of yum called versionlock to prepare some colleague to install or update some package with yum by mistake.

If you don't know versionlock and you want to install and use it you will have to install RPM package **yum-plugin-versionlock**

```
[root@centos ~]#  yum install -y yum-plugin-versionlock
...
```

Versionlock is used for Restricting a Package to a Fixed Version Number with yum.

In case if you have *versionlock* installed **to list the versionlock restricted versions to not be ovewritten do:**

```
[root@centos ~]# yum versionlock list
...
```

....
.....
0:gskcrypt64-8.0-55.14.*
0:lm_sensors-libs-3.4.0-8.20160601gitf9185e5.el7.*
0:sysstat-10.1.5-19.el7.*
0:TIVsm-API64-8.1.10-0.*
versionlock list done

- *To clean up already set lock for current installed packages*

[root@centos ~]# yum versionlock clear

4. Install TSM Backup API and Backup Archiver Client RPMs

If you have already created a **/etc/yum.repos.d/3party.repo** with a mirror of IBM binaries and repository is enabled you can perhaps do something like:

[root@centos ~]# yum install -y Tivsm-BA

Otherwise go and follow official IBM Tivoli installation instructions

In short once .rpms are downloaded from IBM's site, this comes to:

4.1. Install the required dependent library gskcrypt64

```
[root@centos ~]# rpm -U gskcrypt64-8.x.x.x.linux.x86_64.rpm
gskssl64-8.x.x.x.linux.x86_64.rpm
```

4.2. Install Tivoli Storage Manager API

Application programming interface (API) is API which contains the Tivoli Storage Manager API shared libraries and samples, default directory install location is **/opt/tivoli/tsm/client/api/bin64**

```
[root@centos ~]# rpm -i TIVsm-API64.x86_64.rpm
```

4.3. Install the backup-archive client

```
[root@centos ~]# rpm -i TIVsm-BA.x86_64.rpm
```

Its most files will be stored under dir **/opt/tivoli/tsm/client/ba/bin.**

This **directory is considered to be the default installation directory for many backup-archive client files.** The sample system-options file (**dsm.sys.smp**) is written to this directory. If the **DSM_DIR** environment variable is not set, the dsmc executable file, the resource files, and the **dsm.sys** file are stored in this directory.

If **DSM_CONFIG** is not set, the client user-options file must be in this directory.

If you do not define **DSM_LOG**, writes messages to the dsmerror.log and dsmsched.log files in the current working directory.

Optionally: Install the Common Inventory Technology package that is used by the API. This package depends on the API so it must be installed after the API package is installed.

```
[root@centos ~]#  rpm -i TIVsm-APIcit.x86_64.rpm
```

Optionally: Install the Common Inventory Technology package the client uses to send PVU metrics to the server. This package depends on the client package so it must be installed after the client package is installed.

```
[root@centos ~]#  rpm -i TIVsm-BAcit.x86_64.rpm
```

If finally no optional stuff is installed the minumum for operational (Tivoli) Spectrum Protect is to at least below 2 RPMs being installed:

```
[root@centos ~]# rpm -qa |grep -i TivSM

TIVsm-BA-8.1.10-0.x86_64

TIVsm-API64-8.1.10-0.x86_64
```

5. Create /var/tsm log directory

```
[root@centos ~]# mkdir /var/tsm
[root@centos ~]# chown root:root /var/tsm
```

6. Hardcode to /etc/hosts TSM server hosts / addresses somewhere at File EOF

[root@centos ~]# vim /etc/hosts

Includfe at End of File

TSM Server Records

10.50.8.1 tsmserver1.backup-server-fqdn.com tsmserver1

10.50.8.2 tsmserver2.backup-server-fqdn.com tsmserver2

Hardcoding records is a good idea if you don't use DNS at all, e.g. for security **/etc/resolv.conf** is empty or if you have configured the machine Name Record resolve order to be first read from /etc/hosts. For those who don't know in Linux this is done via **/etc/nsswitch.conf** (for more how it is configured - **man nsswitch.conf** command)

7. Create /opt/tivoli/tsm/client/ba/bin/{dsm.sys,dsm.opt,inclexcl.tsm} configs

- **dsm.sys main config mandatory file**

[root@centos ~]# vi /opt/tivoli/tsm/client/ba/bin/dsm.sys

Paste inside and save :**wq!**:

```
*===================================================================

*

* File:     /usr/tivoli/tsm/client/ba/bin/dsm.sys

*

* Who:

*

* Project: TSM

*

* Purpose:  Tivoli Storage Manager client user options

*

* Release:  Tivoli BA client 5.3.4

*

* Author:

*

*===================================================================

*

* Modification history:

*

* [Chg.]   [When]       [Who]          [What]

* 1.       19.11.2021      Georgi Georgiev    Creation.

*
```

```
*============================================================

* TSM Server Location

*   Servername          tsmserver1

*   COMMmethod          TCPip

*   TCPPort             1500

*   TCPServeraddress    tsmserver1.backup-server-fqdn.com

*   Passwordaccess      generate

*   SCHEDLOGNAME        /logs/tivoli/sched.log

*   SCHEDLOGRETENTION   21 D

*   SCHEDMODE           PROMPT

*   ERRORLOGNAME        /logs/tivoli/dsmerror.log

*   ERRORLOGRETENTION   30 D

*   INCLEXCL            /opt/tivoli/tsm/client/ba/bin/inclexcl.tsm

*============================================================
=====

*TSM SERVER

   Servername          tsmserver2

   COMMmethod          TCPip

   TCPPort             1400

   TCPServeraddress    tsmserver2.backup-server-fqdn.com

   NodeName            server-hostname1

   Passwordaccess      generate

   SCHEDLOGNAME        /var/tsm/sched.log

   SCHEDLOGRETENTION   21 D
```

SCHEDMODE prompted

MANAGEDServices schedule

ERRORLOGNAME **/var/tsm/dsmerror.log**

ERRORLOGRETENTION 30 D

* INCLEXCL **/opt/tivoli/tsm/client/ba/bin/inclexcl.tsm**

##########

TCPServeraddress – should equal to the complete hostname where the TSM backup server is configured

Nodename – should be your server hostname from where you create backup usually returned by **hostname** command

- **dsm.opt Additional options file**

[root@centos ~]# vi /opt/tivoli/tsm/client/ba/bin/dsm.opt

*===

*

* File: /opt/tivoli/tsm/client/ba/bin/dsm.opt

*

*

* Project: TSM

*

* Purpose: Tivoli Storage Manager client user options

*

* Release: Tivoli BA client 5.3.4

*

* Author:

*

*==

*

* Modification history:

*

* [Chg.] [When] [Who] [What]

*

*

*==

* Quiet

SERVERNAME TSMSERVER2

* Sample config you might want to modify it according to your preferences

Archsymlinkasfile no

Subdir yes

dateformat 2

followsymbolic yes

guitreeviewafterbackup yes

quiet

DOMAIN "/"

DOMAIN "/boot"

DOMAIN "/home"

** below line is commented*
** DOMAIN "/var"*

########

- **Define what directories files / shuld be excluded from backup**

 # vi /opt/tivoli/tsm/client/ba/bin/in?clexcl.tsm

exclude.dir /tmp

exclude.dir /var/cache

*exclude /var/lock/**

exclude.dir /var/log

*exclude /var/spool/**

exclude.dir /var/tmp

exclude.dir /var/tsm

exclude.dir /var/run

- **Note ! Within dsm.sys you have also to have define SCHEDMODE prompted instead of** SCHEDMODE polling:

Config should be as:

SCHEDMODE prompted

managedservices schedule

8. Authenticate to tsmserver2 host for a first time to remote Tivoli Backup Serv

Run the Tivoli connect client dsmc

 # dsmc

? empty username (if TSMServer configured so or otherwise provide the user provided by an Admin)
? enter password given by TSM Admin

q sched ? should answer with a schedule

tsm> **q sched**

Schedule Name: INC_DAILY_PROD

Description: **03:30 Days Schedule Prod**

Schedule Style: Classic

Action: Incremental

Options:

Objects:

Priority: 5

Next Execution: 13 Hours and 38 Minutes

Duration: 2 Hours

Period: 1 Day

Day of Week: Any

Month:

Day of Month:

Week of Month:

Expire: Never

Schedule Name: Archives_365_DAYS_prod

Description: 365 Days Archive monthly Prod

Schedule Style: Classic

Action: Archive

Options: -archmc=ARCHIVE_365_DAYS-description="Archive of Logfiles" -deletefiles

Objects: /var/log/*.gz

Priority: 5

Next Execution: 492 Hours and 38 Minutes

Duration: 2 Hours

Period: 1 Month

Day of Week: Any

Month:

Day of Month:

Week of Month:

Expire: Never

tsm>

As you see above you get some details on when backup is to be executed, e.g. what time it is scheduled (in this case it is **03:30 Days Schedule Prod** early morning**)**, how often it is supposed to re-run, what is it priority, what is the type of backup (i.e. **incremental**) and how long is left until next execution.

incr command? Start the backup (will create first incremental full backup)

q fi command? T*o show (list) backuped FileSystems*

tsm> q fi

#	Last Incr Date	Type	File Space Name
1	10-11-2021 12:08:43	EXT2	/
2	10-11-2021 12:09:01	EXT4	/boot
3	10-11-2021 12:09:03	EXT4	/home
4	10-11-2021 12:09:24	EXT4	/var

```
5     10-11-2021 12:03:17     EXT4    /vz
```

As you can see we have a recent backup of our OpenVZ machine Hypervisor host :)

quit ? logout from dsmc

9. Check entires within defined /var/tsm/{dsmsched.log, sched.log, dsmerror.log}

If problems connecting check **/var/tsm/dsmerror.log**

Once **incr** backup command is finished check that all is backupped normal within **/var/tsm/sched.log**

10. Start dsmcad process

```
[root@centos ~]# /etc/init.d/dsmcad start
```

Or

```
[root@centos ~]# systemctl start dsmcad
```

11. Add service to auto start on server boot time

Depending on where, the machine is old legacy **System V** system or a systemd RedHat / CentOS you should either add it in **chkconfig** tool to auto start or enable the systemctl service.

11.1. Enable dsmcad autoboot on SystemV legacy machine

```
[root@centos ~]# chkconfig --add dsmcad
```

11.2 Enable dmscad boot on recent systemd machine as of year 2021

```
[root@centos ~]# systemctl enable dsmcad.service
```

or

```
[root@centos ~]# systemctl start dsmcad.service
```

12. Enable back yum versionlock for all installed RPM packages (Optional)

```
[root@centos ~]#  yum versionlock \*
```