osutrack

Version 1.2

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The MIT License

SPDX short identifier: MIT

Introduction

osutrack is a utility designed to track a group of USB disks being rotated to move a version of on-premises data from a server to an off-line or off-site location.

osutrack monitors and can provide alerts in 5 categories:

1. No USB disk from the assigned group is currently connected.
2. The USB disk currently connected has been connected for too many days, time to swap over with one of the off-site disks.
3. One of the off-site USB disks now contains data that is too far out of date and that disk should be connected to be refreshed.
4. The most recently updated USB disk is running out of free space.
5. There are too few USB disks being monitored in rotation.

If any of these alerts are raised, osutrack prints an alert message, sends a message to the desktop notifier if on a Synology DSM 6 platform and exits with a non-zero return code.

The non-zero return code can trigger further actions, such as the DSM task scheduler emailing a copy of the alert to an administrator.

All of the alert thresholds have defaults but are easily changed on the command line.

Please Note

This software is not known to Synology and is not endorsed by Synology.

This software uses Synology DSM commands included with DSM 6 to send DSM desktop notifications, but makes no modification to any Synology software. The osutrack command itself is a single file of Python source code and may be installed on a regular file share.

This software is provided to you in readable Python source code for your inspection prior to execution so use of this code is entirely at your own risk. The terms of use are spelled out formally in the MIT License included in this repository and by using the --license option in each program. If you are not willing to accept these terms of use, do not run this code.

Using osutask

Track File

Every time osutask is run (*), osutask looks for a connected USB disk by searching for a “track file”. A track file is a simple, one-line text file on the USB disk that should contain a unique USB disk label that can be used to identify that disk.

The default name for this file is “osutrack.txt” and it should be placed in the top directory of the USB disk for easy recognition.

The label should be no more than 32 characters and should use only letters, numbers and the plus, minus or underscore symbols. All other characters, including spaces, will be converted to underscores internally by osutrack.

The label should correspond to something easily identifiable on the disk itself. For the examples in this documentation you will see labels such as “Hitachi_1TB_Yellow” which captures the manufacturer, disk size and the fact that when I bought 3 of them together I put a coloured sticker on each for rapid identification.

When osutrack is started it runs a find command looking for this file. By default osutrack will search in the top directory of any attached USB device. This may be changed with command line options. The default search is run with the command:

```
find /volumeUSB? -maxdepth 2 -type f -name “osutrack.txt” -print -quit
```

If this command finds a track file then the label is read and a new history record is created.

Please note:

- The directory search point, /volumeUSB?, is subject to shell wildcard expansion, the track file name is not.
- A top level file on a USB disk will have a path similar to:
  /volumeUSB1/usbshare/osutrack.txt
  Directory usbshare is 1 level deep below /volumeUSB1 and osutrack.txt is 2 levels deep hence the maxdepth 2 parameter to search the top level of USB disks.
- osutrack will stop searching after finding a track file so multiple USB disks cannot be recorded simultaneously.

More generally, the search is:

```
find DIR_SEARCH -maxdepth MAX_DEPTH -type f -name “track_file” -print -quit
```

with DIR_SEARCH defaulting to “/volumeUSB?” and MAX_DEPTH defaulting to 2. Both may be changed on the command line.

(*) The one exception to updating every run mentioned above is if osutrack is run with the –remove option. This option allows the user to remove a label from osutrack’s history and, as a manual maintenance task, this will not add an update record or check for alerts at the same time.

History File

osutrack stores its records in a single, clear-text history file. This file is intended to be human readable with the most recent records at the top for quick review. osutrack cannot function without a history file so it is a required argument on the command line.

```
/path/to/osutrack --history_file /path/to/history.txt
```

The history file grows by a line every time a track file record is added. To prevent the file growing indefinitely, one of the command line parameters, HISTORY_DAYS, specifies for how long records should be kept. By default this parameter is 60 meaning 60 days, so when osutrack runs, if it finds a record in the history file older than 60 days it is removed.

Example History File:

```
2017-09-13 02:29 [Wed] # Size: 985G, Used: 763G, Avail: 223G, Free: 22% # Hitachi_1TB_Yellow
2017-09-12 02:38 [Tue] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-11 02:30 [Mon] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-10 02:23 [Sun] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-09 02:24 [Sat] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-08 02:41 [Fri] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-07 02:33 [Thu] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-06 02:29 [Wed] # Size: 985G, Used: 755G, Avail: 230G, Free: 23% # Hitachi_1TB_Purple
2017-09-05 02:37 [Tue] # Size: 985G, Used: 760G, Avail: 225G, Free: 22% # Hitachi_1TB_Orange
2017-09-04 02:44 [Mon] # Size: 985G, Used: 760G, Avail: 225G, Free: 22% # Hitachi_1TB_Orange
2017-09-03 02:35 [Sun] # Size: 985G, Used: 760G, Avail: 225G, Free: 22% # Hitachi_1TB_Orange
```

Please note, although the central ‘free space’ section looks very similar to “df” output, the final value has been changed from Use% to Free% following user testing.

Alerts

When osutrack generates an alert it echoes it to the normal program text output stream, if on a Synology server it copies it to the desktop notifier and at the end of the program osutrack exits with a non-zero exit code.

Age comparisons are rounded to the nearest day to avoid boundary issues when running osutrack around the same time each day.

Alert thresholds may be changed on the command line.

alert_disk_age (integer number of days)

The most recent record for each USB disk is compared to the current date/time. If the record is “alert_disk_age” days old (or older) this alert is raised. The default settings are based on 3 disks in a weekly rotation, each disk has 1 week on-site then 2 weeks off-site so 15 days is the chosen default alert value. Setting the number to zero disables this check.

alert_disk_count (integer number of disks)

This is a simple check to see how many different disks are recorded in the history file. Setting the number to zero disables this check.

When first starting to use a new group of off-site disks it is important that they all be initialised with data as soon as practical and this alert acts as a reminder until this is done.

This alert can also be useful if a lost or faulty disk is taken out of history by a remove command to act as a reminder that a replacement disk needs to be initialised.

alert_free_space (integer %Free space)

This is a check against the free space percentage in the most recent record in the history file and is intended to provide a warning that the off-site disks are getting full and may need to be upgraded, or the backup set may need to be pruned. The default is set to 5 and this means “alert if free space is 5% or lower”, setting the number to zero disables this check.

alert_swap_age (integer number of days)

This is a warning that the current disk has been connected for too many days and should be rotated off-site. The default is 7, and means “alert if this disk was used since 7 days ago”. Setting the number to zero disables this check.

Explanation of Day Count:

The basic assumption is that osutrack is run after the daily backup process. Assuming the USB disk track file was just found then today's history file record has just been created and, when measured for age, today is "0 days ago". Yesterday is "age = 1 day ago" and if the disk has been in use daily for a full week then there will be 7 sequential records for this disk and the 7th record would be age "6 days ago".

If the disk is then updated for an 8th day in a row, the sequence is from 0 days ago to 7 days ago. Assume alert_swap_age = 7 and when the history file is scanned and osutrack finds this 8th record at age "7" then an alert is generated.

Every time the most recent record changes label the sequence count is effectively reset. This system is more reliable than simple sequence counting as even if an update is missed, or repeated on a day, the age check integrity is preserved.

no_alert_not_found

By default, failing to find a track file will raise an alert to warn a disk is not connected. With this option, a message will still be printed to output but not finding a track file will not raise an alert to the DSM desktop notification system nor will it cause osutrack to exit non-zero.

Command Line

The following information is available by typing “osmtask -h” at a command line:

```
usage: osutrack [-h] [--alert_disk_age ALERT_DISK_AGE]
                [--alert_disk_count ALERT_DISK_COUNT]
                [--alert_free_space ALERT_FREE_SPACE]
                [--alert_swap_age ALERT_SWAP_AGE] [-D DIR_SEARCH]
                [-f HISTORY_FILE] [-H HISTORY_DAYS] [-l]
                [--max_depth MAX_DEPTH] [--no_alert_not_found] [-q]
                [--remove REMOVE] [-t TRACK_FILE] [-T] [-v]

Keep track of the rotation and free space of USB disks

optional arguments:
  -h, --help            show this help message and exit
  --alert_disk_age ALERT_DISK_AGE, --ada ALERT_DISK_AGE
                        alert if disk data (default: 15) days old
  --alert_disk_count ALERT_DISK_COUNT, --adc ALERT_DISK_COUNT
                        alert if monitored disk count below (default: 3)
  --alert_free_space ALERT_FREE_SPACE, --afs ALERT_FREE_SPACE
                        alert if disk free space at/below (default: 5)%
  --alert_swap_age ALERT_SWAP_AGE, --asa ALERT_SWAP_AGE
                        alert if same disk connected for (default: 7) days
  -D DIR_SEARCH, --dir_search DIR_SEARCH
                        search for track_file below (default: "/volumeUSB?")
  -f HISTORY_FILE, --history_file HISTORY_FILE
                        store history records in this file
  -H HISTORY_DAYS, --history_days HISTORY_DAYS
                        remove history records older than (default: 60) days
  -l, --licence, --license
                        display program licence
  --max_depth MAX_DEPTH
                        max search depth below dir_search (default: 2)
  --no_alert_not_found, --nanf
                        do not alert if track file not found
  -q, --quiet           suppress intro and summary unless alerting
  --remove REMOVE       remove records containing disk label name, prevents
                        all other updates and checks
  -t TRACK_FILE, --track_file TRACK_FILE
                        file on USB disk containing disk label name (default:
                        osutrack.txt)
  -T, --time_stamp      add time stamps to output
  -v, --verbose         show progress, -vv for debug level

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```

Sample Output

This example output is generated by:

```
/path/to/osutrack -f /path/to/history.txt -vT
```

Output:

```
osutrack, version 1.2
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display.
2017-09-24 23:34:26 Remove old history records (keep: 60 days)
2017-09-24 23:34:26 Removed 0 records
2017-09-24 23:34:26 Searching for 'osutrack.txt' from: ['/volumeUSB1']
2017-09-24 23:34:26 Found track file : /volumeUSB1/usbshare/osutrack.txt
2017-09-24 23:34:26 Track file label: Hitachi_1TB_Orange
2017-09-24 23:34:26 2017-09-24 23:34 [Sun] # Size: 985G, Used: 746G, Avail:
239G, Free: 24% # Hitachi_1TB_Orange
2017-09-24 23:34:26 Check if swap age at/above 7 days
2017-09-24 23:34:26 Swap age check ok: 2 days : Hitachi_1TB_Orange
2017-09-24 23:34:26 Check disk count at least 3
2017-09-24 23:34:26 Disk count check ok: 3
2017-09-24 23:34:26 Check if disk age at/above 15 days
2017-09-24 23:34:26 Disk age check ok:  0 days : Hitachi_1TB_Orange
2017-09-24 23:34:26 Disk age check ok:  4 days : Hitachi_1TB_Yellow
2017-09-24 23:34:26 Disk age check ok: 12 days : Hitachi_1TB_Purple
2017-09-24 23:34:26 Check if latest free space at/below 5%
2017-09-24 23:34:26 Free space check ok: 24% : Hitachi_1TB_Orange
2017-09-24 23:34:26 39 records in history file
2017-09-24 23:34:26 0 alerts
```