

# Copy OneOnOne API

Version 1.0

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# 1. Introduction

This manual belongs to the product called "Copy OneOnOne", which is a plugin for TV's server (see <https://www.tychoveltmeijer.nl/>). Copy OneOnOne (that runs on Windows) can compare two directories (and their sub directories), collect the differences and equalize the selected differences by copying or deleting files and changing the attributes. The changes between the two directories are saved in 5 different categories: 'Added files', 'Deleted files', 'Modified size', 'Modified Time' and 'changed Attributes'.

Through an API another program can control Copy OneOnOne. It can Start/stop comparing directories, get the status, (un)select files for the backup process and start/stop the backup process.

Copy OneOnOne API expects a HTTP (1.1) request on the URL '/api/'. The reply will always be in JSON. The plugin works on the 'Presentation layer' of the OSI model, if the URL does not start as expected ('/api/?'), the HTTP request is passed on to the application layer (or the next Presentation layer if present). For more information about how this works, you can read TV's server documentation.

The HTTP request is not protected in any way, so, before you use this product, make sure your firewall is configured and blocks any outside connections on the port this program works on. You can choose the port that this product runs on when you configure this product in TV's server. There is no default port, and the product will not run if you do not configure.

# 2. User interface

This product can only be used by an external user interface. You can use the included website. You can do this by configuring this product in TV's server the following way. When creating the service, select 'TCP/IP protocol' as receiver, 'Copy OneOnOne API' as manipulator, and 'HTTP protocol' as laborer. Make sure that you unselect option 'Multiple requests allowed on one connection' from protocol 'HTTP protocol' (this is not supported by the Copy OneOnOne API.). You copy the website in the path you configured by HTTP protocol to be the WWWroot. From now on you can use the API by going to `http://127.0.0.1:<port>/`.

# 3. Query string

The query string is the string behind the question mark in the URL. This program does not support POST-content and only responds to GET requests. The variable names and actions described below are case-insensitive. The query must always include variable name 'action'. This can contain one of the following values:

Action	Explanation	Other variables (not optional)
Start	Start comparing two directories.	<b>dir1</b> The directory to backup <u>from</u> <b>dir2</b> The directory to backup <u>to</u> <b>Remark:</b> Both may contain UTF-8 characters (escaped

		or not)
Stop	Stop comparing two directories.	-
Start-Backup	Start backup process.	-
Stop-Backup	Stop backup process.	-
Get-Progress	Get the status.	-
Get-No-Access-Dir1 Get-No-Access-Dir2 Get-Deleted  Get-Added  Get-Modified-Attributes Get-Modified-Size Get-Modified-DateTime	<u>Get a list of:</u> - Dir/files that are not accessible in directory1/2; - Files that where deleted from dir1 (but still exist in dir2); - Files that where created in dir1 and do no exist in dir2; - Files that differ from attributes; - Files that differ in file size; - Files that differ in last modified date/time	<b>Start</b> the starting file ID you want to receive the information from; <b>Length</b> the amount of files it should return.
Select-Deleted Select-Added Select-Modified-Attributes Select-Modified-Size Select-Modified-DateTime	Select files to be backup-ed in one of the categories.	<b>List</b> an JSON array with the Ids to select.
Unselect-Deleted Unselect-Added Unselect-Modified-Attributes Unselect-Modified-Size Unselect-Modified-DateTime	Unselect files to be backup-ed in one of the categories.	<b>List</b> an JSON array with the Ids to unselect.
Get-Result-Enum	As result of the backup process every file will get an integer. 0=not back upped yet, 1=succeeded and every code above 1 is an error. With this command you get the user friendly error messages for every possible error code.	
Get-Deleted-Results Get-Added-Results Get-Modified-Attributes-Results Get-Modified-Size-Results Get-Modified-DateTime-Results	Get the results from the backup-ed files.	<b>Start</b> the starting file ID you want to receive the results from; <b>Length</b> the amount of results it should return.

## 4. Result error

If one of the actions cannot be executed a default error format will be returned. This is, as all returned message, in JSON format.

```
{
```

"error": a string with an error message,

"result": an integer with 0 (error) or 1 (no error)

<**optional** if action 'Get-Process' is executed, and this error message is returned, it will include 'obstacles' from Get-Process as well>

}

## 5. Action Start

This action will start the process of comparing two directories. This process will not write or change any file or directory! This action requires two variables: dir1 and dir2. 'dir1' must contain the path to where backup from, and 'dir2' to backup to. This means that if a file is found in dir1 and does not exist in dir2 this file is treated as 'added file', whereas a file found in dir2 and not in dir1 is treated as a 'deleted file'. Both variables may include UTF-8 characters, escaped. or not escaped.

**Return value:** It returns the same format as described in chapter 'Result error'. If the comparing process is started successfully, 'result' will be set to 1 and 'error' will be an empty string.

## 6. Action stop

This action will stop the process of comparing two directories.

**Return value:** It returns the same format as described in chapter 'Result error'. If the comparing process is flagged to be stopped successfully, 'result' will be set to 1 and 'error' will be an empty string.

## 7. Action Start-Backup

This action will start the backup process. This means that the selected files will be copied/removed or that the attributes will be changed. By default no files are selected, so this action will do nothing if the Select-\* action is not executed.

**Return value:** It returns the same format as described in chapter 'Result error'. If the backup process is started successfully, 'result' will be set to 1 and 'error' will be an empty string.

## 8. Action Stop-Backup

This action will stop the backup process. It won't stop halfway copying a file, therefore it can take a while before the backup process is actually stopped.

**Return value:** It returns the same format as described in chapter 'Result error'. If the backup process is flagged to be stop successfully, 'result' will be set to 1 and 'error' will be an empty string.

## 9. Action Get-Progress

This action will send JSON with the progress of the comparing/backup process.

**Return value:** If the comparing/backup process is not started yet, it will return the same format as described in chapter 'Result error'. If one of those processes is started/finished it will return JSON in the following format:

```
{  
  "result":1,  
  "status": a string that can be "done", "scanning" or "backuping",  
    "done" program is done comparing or with the backup;  
    "scanning" is busy comparing the two directories  
    "backuping" is busy with the backup process  
  "timesStarted":an integer, every time action "Start" is called successfully, this integer is  
  incremented,  
  "obstacles": an array of programs that may slow down the compare process. This are mostly  
  virus scanners,. When writing this documentation, this list will only contain Windows  
  Defender. If you know how to detect other (anti-virus)software that may cause this software  
  to run slow, please contribute.  
  [  
    {  
      "displayName": a string eg "Windows Defender Realtime Security",  
      "running":a boolean if the program is running or not,  
      "disableManualUrl":a string with an URL to a documentation that tells the  
      user how to disable this program. Make sure that the user understands that  
      disabling this can cause problems and is always at own risk!!  
    }  
  ],  
  "sizeToBackup":  
  {  
    "number": an integer with the size, in bytes, that is going to be copied from dir1 to  
    dir2 if the backup process is started. This number is based on the amount of selected  
    added/modified files,  
    "formatted": a user friendly formatted string with the same data as in number eg.  
    "22,66 kB (23.204 bytes)"  
  },  
  "filesToRemove":  
  {
```

**"number"**: an integer with the amount of files to be removed from dir2 when the backup process is started. This number is based on the amount of selected 'removed files',

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"filesToChangeAttributes"**:

{

**"number"**: an integer with the amount of files where the attributes from dir1 to dir2 need to be copied when the backup process is started. This number is based on the amount of selected 'attributes files',

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"currentFolder"**: a string with the folder the program is currently (or the last one before it finished) comparing/backuping,

**"currentFile"**: a string with the file the program is currently (or the last one before it finished) comparing/backuping,

**"dir1"**: an object with information about the directory to backup from.

{

**"path"**: a string with the path of the directory to backup from,

**"size"**:

{

**"number"**: an integer with the size, in bytes, of the size of all the files that are counted in this (and sub)directory(ies),

**"formatted"**: a user friendly formatted string with the same data as in number eg. "22,66 kB (23.204 bytes)"

},

**"dirs"**:

{

**"number"**: an integer with the amount of sub directories counted in this directory,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"files":**

{

**"number"**: an integer with the amount of files counted in this directory and its sub directories,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"noAccessDirs":**

{

**"number"**: an integer with the amount of directories that were not accessible,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"noAccessFiles":**

{

**"number"**: an integer with the amount of directories and files that were not accessible. You can retrieve the names of those using action Get-No-Access-Dir1

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

}

},

**"dir2":**

{

Same object as "dir1", except that it is about the directory to backup **to** (dir1 is about the directory to backup from)

},

**"stats"**: an object with information about the compare progress

{

**"modifiedAttributes":**

{

**"number"**: an integer with the amount of found files with different attributes. You can retrieve the files using action Get-Modified-Attributes,

**"formatted"**: a user friendly formatted string with the same data as in number  
eg. "203.543"

},

**"modifiedTimeDate"**:

{

**"number"**: an integer with the amount of found files with different last modified time/date. You can retrieve the files using action Get-Modified-DateTime,

**"formatted"**: a user friendly formatted string with the same data as in number  
eg. "203.543"

},

**"modifiedSize"**:

{

**"number"**: an integer with the amount of found files with different size. You can retrieve the files using action Get-Modified-Size,

**"formatted"**: a user friendly formatted string with the same data as in number  
eg. "203.543"

},

**"addedfiles"**:

{

**"number"**: an integer with the amount of found files that are added. You can retrieve the files using action Get-Added,

**"formatted"**: a user friendly formatted string with the same data as in number  
eg. "203.543"

},

**"removedfiles"**:

{

**"number"**: an integer with the amount of files that were found removed. You can retrieve the files using action Get-Deleted,

**"formatted"**: a user friendly formatted string with the same data as in number  
eg. "203.543"

}

},

**"results"**: an object with the results of the backup process

{

**"changedIncremental":**

{

**"number"**: an integer that is incremented every time a result (of the backup process) is changed. You can retrieve those results using action Get-\*-Results. Because of performance reasons, the results are not always in sync, therefore you may not always find new results when this integer is incremented. When the backup process is finished, all results are synced and this integer is incremented as well.

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"copiedSize":**

{

**"number"**: an integer with the size, in bytes, that is copied during the backup process. You can show the progress to the user combining this value and the ["sizeToBackup"] value,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "22,66 kB (23.204 bytes)"

},"**removedfiles**":

{

**"number"**:an integer with the amount of files that are deleted during the backup process. You can show the progress to the user combining this value and the ["filesToRemove"] value,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

},

**"changedAttributes":**

{

**"number"**:an integer with the amount of files that the attributes are changed from during the backup process. You can show the progress to the user combining this value and the ["filesToChangeAttributes"] value,

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543"

}

}

}

## 10. Action Get-\*

One of the actions described below can list the files that are found to be added, deleted, modified or where not accessible. These actions requires two variables: start and length. Start is the starting file ID you want to receive and length is the amount of files you want to receive.

ACTION	Explanation	Length in the list Get-Progress
Get-No-Access-Dir1	<u>Get a list of:</u> - Dir/files that are not accessible in directory1;	["dir1"]["noAccessFiles"]
Get-No-Access-Dir2	- Dir/files that are not accessible in directory2;	["dir2"]["noAccessFiles"]
Get-Deleted	- Files that where deleted from dir1 (but still exist in dir2);	["stats"]["removedfiles"]
Get-Added	- Files that where created in dir1 and do no exist in dir2;	["stats"]["addedfiles"]
Get-Modified-Attributes	- Files that differ from attributes;	["stats"]["modifiedAttributes"]
Get-Modified-Size	- Files that differ in file size;	["stats"]["modifiedSize"]
Get-Modified-DateTime	- Files that differ in last modified date/time	["stats"]["modifiedTimeDate"]

**Return value:** If there is an error, it will return the same format as described in chapter 'Result error'. If no error, it will return the following format:

```
{
  "list":
  {
    "1": this is the ID of the file. There is never an id '0'
    {
      "filename": a string with the filename
      "path": a string with the path of the file. This path is relative,
      "old":
      {
        "number":
          Action Get-Modified-Size or Get-Added an integer with the
          size, in bytes, of the file in path2;
          Action Get-Modified-DateTime an integer with the return
          value of function GetFileTime() of the file in path2;
          Action Get-Deleted a Zero integer;
          Action Get-Modified-Attributes an integer with the return
          value of function GetFileAttributes() of the file in path2,
```

except for flags 0x10, 0x40, 0x200, 0x400, 0x800 and 0x4000, since these flags are not changed by this program;

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543", "2,79 kB (2.859 bytes)" or "ARCHIVE HIDDEN" or "Wed, 24 Aug 2022 15:24:30 GMT ".

},

**"new"**:

{

**"number"**:

*Action Get-Modified-Size or Get-Added*: an integer with the size, in bytes, of the file in path1;

*Action Get-Modified-DateTime* an integer with the return value of function GetFileTime() of the file in path1;

*Action Get-Deleted* an integer with the size, in bytes, of the file in path2;

*Action Get-Modified-Attributes* an integer with the return value of function GetFileAttributes() of the file in path1, except for flags 0x10, 0x40, 0x200, 0x400, 0x800 and 0x4000, since these flags are not changed by this program;

**"formatted"**: a user friendly formatted string with the same data as in number eg. "203.543", "2,79 kB (2.859 bytes)", "ARCHIVE HIDDEN" or "Wed, 24 Aug 2022 15:24:30 GMT ".

},

**"result"**: an integer with the result of the backup process. 0=no result, 1=succeeded and ever number above 1 is an error. Execute action Get-Result-Enum to get a user readable error message,

**"selected"**: a boolean, if is true then the file is selected for the backup process, of false, it's not selected for the backup process.

},

**"2"**:{

<same structure as "1", except now with the information about file 2>

},

**"3"**:

{

...

},

```

    },
    "length": an integer with the amount of list in 'list'
}

```

## 11. Action Select-\*

One of the actions described below can select the files for the backup process. These actions requires one variable: list. List is an JSON array with the file ids to select for the backup process.

Select-Deleted	Select files in the 'deleted' category;
Select-Added	Select files in the 'added' category;
Select-Modified-Attributes	Select files in the 'modified attributes' category;
Select-Modified-Size	Select files in the 'modified size' category;
Select-Modified-DateTime	Select files in the 'last modified date time' category;

**Return value:** It returns the same format as described in chapter 'Result error'. If the list is validated successfully, then all the files in list are selected, 'result' will be set to 1 and 'error' will be an empty string. If the list not validated successfully validated, no file will be selected, 'result' will be set to 0 and an error message will be given.

## 12. Action Unselect-\*

One of the actions described below can deselect the files for the backup process. These actions requires one variable: list. List is an JSON array with the file ids to de-select for the backup process.

Unselect-Deleted	Deselect files in the 'deleted' category;
Unselect-Added	Deselect files in the 'added' category;
Unselect-Modified-Attributes	Deselect files in the 'modified attributes' category;
Unselect-Modified-Size	Deselect files in the 'modified size' category;
Unselect-Modified-DateTime	Deselect files in the 'last modified date time' category;

**Return value:** It returns the same format as described in chapter 'Result error'. If the list is validated successfully, then all the files in list are deselected, 'result' will be set to 1 and 'error' will be an empty string. If the list not validated successfully validated, no file will be deselected, 'result' will be set to 0 and an error message will be given.

## 13. Action Get-Result-Enum

As a result of the backup process every file will get an integer. 0=not back upped yet, 1=succeeded and every code above 1 is an error. With this command you get the user friendly error messages for every possible error code.

**return value** These are the current error messages, this may change in the future.

```
{
```

```

"17": "The file is copied successfully, but the attributes of the file in path2 file do not match
the attributes of the file in path1.",
"16": "Could not remove file.",
"15": "After changing, the attributes of the file in path2 still do not match the attributes of the
file in path1.",
"14": "After copying the file, the size of the file in path2 still does not match the size of the
file path1.",
"13": "Could not set the last modified date/time of file in path 2.",
"12": "A write operation was failed on file in path2.",
"11": "A read operation was failed on file in path1.",
"10": "The file in path2 could not be opened to be written to.",
"9": "The file in path2 was not found.",
"8": "The file in path1 was not found.",
"7": "The last modified date/time of file in path2 does not match the last modified date/time
it had at the moment it was found during the compare process.",
"6": "The last modified date/time of file in path1 does not match the last modified date/time
it had at the moment it was found during the compare process.",
"5": "The attributes of file in path2 do not match the attributes it had at the moment it was
found during the compare process.",
"4": "The attributes of file in path1 do not match the attributes it had at the moment it was
found during the compare process.",
"3": "The size of file in path2 does not match the size it had at the moment it was found
during the compare process.",
"2": "The size of file in path1 does not match the size it had at the moment it was found
during the compare process.",
"1": "The action was successful.",
"0": "There is no result."
}

```

## 14. Action Get-\*-Results

You may have figured out that the results are also included in the response of the GET-\* actions. The reason for a separate action, that only returns the results, is performance. Sending and processing the return value from a GET-\* action eats a lot of CPU and bandwidth, especially if we are talking about a few of hundred thousand of files. This action is quicker in respond time and more easy to process.

Every time the integer ["results"]["changedIncremental"] in the return value of Get-Progress is changed, a result of a file is changed. Because of performance reasons, the results are not always in sync, therefore you may not always find new results when this integer is incremented. When the backup process is finished, all results are synced and this integer is incremented as well.

One of the actions described below will return the backup results of the requested files. These actions require two variables: Start and Length. Start is the starting file ID you want to receive the results from. Length is the amount of results you want to receive.

Get-Deleted-Results	Get the results from the backup-ed files in the 'deleted' category;
Get-Added-Results	Get the results from the backup-ed files in the 'added' category;
Get-Modified-Attributes-Results	Get the results from the backup-ed files in the 'modified attributes' category;
Get-Modified-Size-Results	Get the results from the backup-ed files in the 'modified size' category;
Get-Modified-DateTime-Results	Get the results from the backup-ed files in the 'last modified date time' category;

**Return value:** If there is an error, it will return the same format as described in chapter 'Result error'. If no error, it will return the following format:

```
{
  "result": for every requested file the result
  {
    "1": "0",
    "2": "0",
    "3": "1",
    "4": "1"
  },
  "length": an integer with the amount of returned file results
}
```