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December 8, 2021

# GHSL-2021-125: Path traversal in SharpZipLib - CVE-2021-32840, CVE-2021-32841, CVE-2021-32842



[Jaroslav Lobacevski](#)

## Coordinated Disclosure Timeline

- 2021-09-03: Report sent to sharpziplib@containrrr.dev according to [security policy](#).
- 2021-09-08: No response. The email repeated.
- 2021-09-17: No response. Public [issue](#) created asking for the contact.
- 2021-09-17: Contact established.
- 2021-09-19: [v1.3.3](#) with a fix was released.

## Summary

SharpZipLib allows full or partial (depending on the version) traversal of the extraction path.

## Product

[SharpZipLib](#)

## Tested Version

0.86.0-1.3.2, however according to the SharpZipLib [security policy](#), version 0.86.0 is no longer supported.

## Details

### Issue 1: 0.86.0 <= SharpZipLib <= 1.2.0 TAR extraction doesn't validate if the destination path is under the expected extraction directory

The following [code example from SharpZipLib wiki](#):

```
using System;
using System.IO;
using ICSharpCode.SharpZipLib.Tar;

public void ExtractTar(String tarFileName, String destFolder)
{
    Stream inStream = File.OpenRead(tarFileName);

    TarArchive tarArchive = TarArchive.CreateInputTarArchive(inStream);
    tarArchive.ExtractContents(destFolder);
    tarArchive.Close();

    inStream.Close();
}
```

A TAR file entry `../evil.txt` will be extracted in the parent directory of `destFolder`.

### Impact

It leads to arbitrary file write that may lead to code execution.

### CVE

- CVE-2021-32840

### Issue 2: 1.3.0 <= SharpZipLib <= 1.3.2 TAR extraction directory path is not enforced to be slash terminated

Starting version 1.3.0 a check was added if the [destination file is under destination directory](#):

```
if (!allowParentTraversal && !Path.GetFullPath(destFile).StartsWith(destDir, StringComparison.InvariantCultureIgnoreCase))
{
    throw new InvalidNameException("Parent traversal in paths is not allowed");
}
```

However it is not enforced that `destDir` ends with slash. If the `destDir` is not slash terminated like `/home/user/dir` it is possible to create a file with a name that begins with the destination directory, i.e. `/home/user/dir.sh`.

### Impact

Because of the file name and destination directory constraints the arbitrary file creation impact is limited and depends on the use case.

### CVE

- CVE-2021-32841

### Issue 3: 0.86.0 <= SharpZipLib <= 1.3.1 ZIP extraction directory path is not enforced to be slash terminated

The following [code example from SharpZipLib wiki](#):

```
using System;
using ICSharpCode.SharpZipLib.Zip;

public void TestFastZipUnpack(string zipFileName, string targetDir) {
    FastZip fastZip = new FastZip();
    string fileFilter = null;

    // Will always overwrite if target filenames already exist
    fastZip.ExtractZip(zipFileName, targetDir, fileFilter);
}
```

Starting version 1.0.0 a check was added if the [destination file is under destination directory](#):

```
if (_baseDirectory != null) {
    name = Path.Combine(_baseDirectory, name);

    if (!allowParentTraversal && !Path.GetFullPath(name).StartsWith(_baseDirectory, StringComparison.InvariantCultureIgnoreCase))
    {
        throw new InvalidNameException("Parent traversal in paths is not allowed");
    }
}
```

However it is not enforced that `_baseDirectory` ends with slash. If the `_baseDirectory` is not slash terminated like `/home/user/dir` it is possible to create a file with a name thats begins as the destination directory one level up from the directory, i.e. `/home/user/dir.sh`.

## Impact

Because of the file name and destination directory constraints the arbitrary file creation impact is limited and depends on the use case.

## CVE

- CVE-2021-32842

## Credit

This issue was discovered and reported by GHSL team member [@JarLob](#) (Jaroslav Lobačevski).

## Contact

You can contact the GHSL team at [securitylab@github.com](mailto:securitylab@github.com), please include a reference to GHSL-2021-125 in any communication regarding this issue.

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