Synced Write-up

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Introduction

The best known file transfer service is the `File Transfer Protocol` (FTP), which was covered thoroughly in the `Fawn` machine. The main concern with FTP is that it is a very old and slow protocol. FTP is a protocol used for copying entire files over the network from a remote server. In many cases there is a need to transfer only some changes made to a few files and not to transfer every file every single time. For these scenarios, the `rsync` protocol is generally preferred.

The changes that need to get transfered are called deltas. Using `deltas` to update files is an extremely efficient way to reduce the required bandwidth for the transfer as well as the required time for the transfer to complete.

The official definition of `rsync` according to the Linux manual page is:

```
Rsync is a fast and extraordinarily versatile file copying tool. It can copy locally,
to/from another host over any remote shell, or to/from a remote rsync daemon. It offers
a large number of options that control every aspect of its behavior and permit very
flexible specification of the set of files to be copied. It is famous for its delta-
transfer algorithm, which reduces the amount of data sent over the network by sending
only the differences between the source files and the existing files in the
destination. Rsync is widely used for backups and mirroring and as an improved copy
command for everyday use.
```

It follows directly from the definition of `rsync` that it's a great tool for creating/maintaining backups and keeping remote machines in sync with each other. Both of these functionalities are commonly implemented in corporate environment. In these environments time is of of the most importance, so `rsync` is preferred due to the speedup it offers for these tasks.

The main stages of an `rsync` transfer are the following:

1. `rsync` establishes a connection to the remote host and spawns another `rsync` receiver process.
2. The sender and receiver processes compare what files have changed.
3. What has changed gets updated on the remote host.

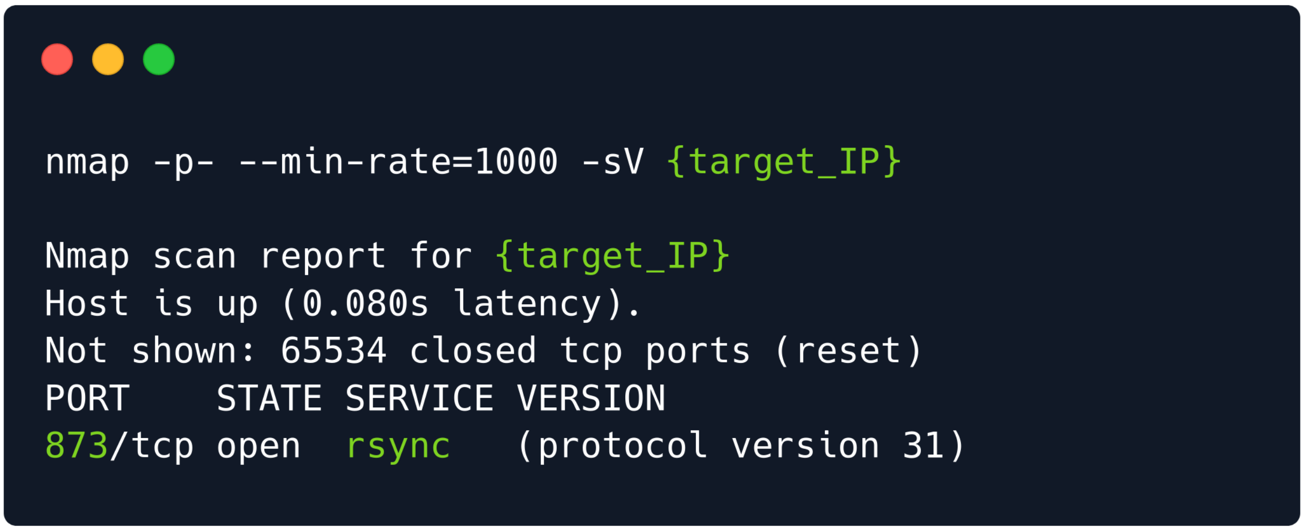
It often happens that `rsync` is misconfigured to permit anonymous login, which can be exploited by an attacker to get access to sensitive information stored on the remote machine. Synced is a Linux box that exposes a directory over `rsync` with anonymous login. We are able to remotely access this directory using the command line tool `rsync` and retrieve the flag.

Enumeration

We will begin by scanning the remote host for any open ports and running services with a Nmap scan. We will be using the following flags for the scan:

```
-p- : This flag scans for all TCP ports ranging from 0-65535
-sV : Attempts to determine the version of the service running on a port
--min-rate : This is used to specify the minimum number of packets that Nmap should
send per second; it speeds up the scan as the number goes higher
```

```
nmap -p- --min-rate=1000 -sV {target_IP}
```



```
nmap -p- --min-rate=1000 -sV {target_IP}

Nmap scan report for {target_IP}
Host is up (0.080s latency).
Not shown: 65534 closed tcp ports (reset)
PORT    STATE SERVICE VERSION
873/tcp open  rsync   (protocol version 31)
```

The scan shows that only port `873` is open. Moreover, Nmap informs us that the service running on this port is `rsync`.

What is rsync?

As we have already mentioned `rsync` is an open source utility that provides fast incremental file transfer. The way `rsync` works makes it an excellent choice when there is a need to synchronize files between a computer and a storage drive and across networked computers. Because of the flexibility and speed it offers, it has become a standard Linux utility, included in all popular Linux distribution by default. More information about `rsync` can be found at the Wikipedia page.

Connecting to rsync

Since `rsync` is already pre-installed on almost all Linux distributions, we can start interacting with the remote machine.

The generic syntax used by `rsync` is the following:

```
rsync [OPTION] … [USER@]HOST::SRC [DEST]
```

where *SRC* is the file or directory (or a list of multiple files and directories) to copy from, *DEST* is the file or directory to copy to, and square brackets indicate optional parameters.

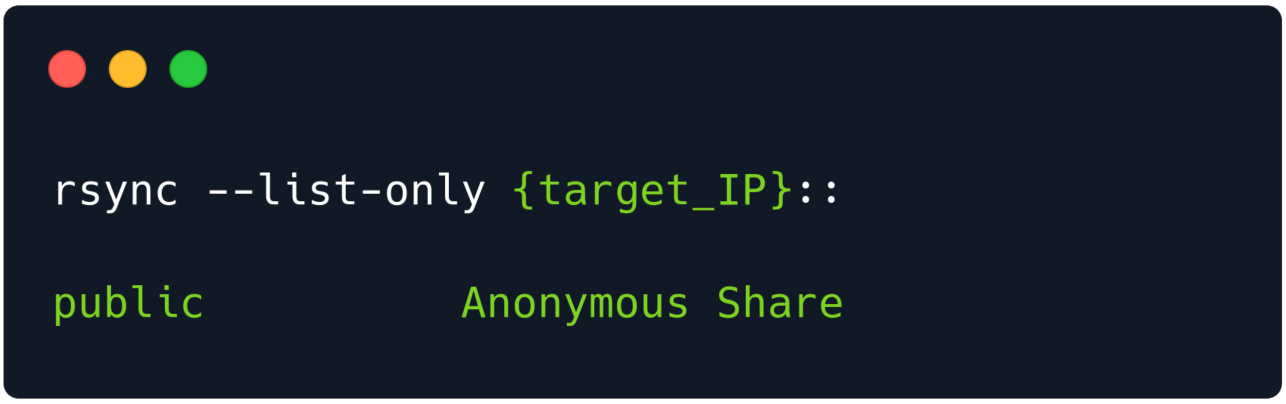
The `[OPTION]` portion of the syntax, refers to the available options in `rsync`. The list with all valid options is available over at the official manual page of `rsync` under the section `Options Summary`.

The `[USER@]` optional parameter is used when we want to access the the remote machine in an authenticated way. In this case, we don't have any valid credentials at our disposal so we will omit this portion and try an *anonymous* authentication.

As our first attempt we will try to simply list all the available directories to an anonymous user. Reading through the manual page we can spot the option `--list-only`, which according to the definition is used to "list the files instead of copying them".

At this point, we have crafted our first command that we will use to interact with the remote machine.

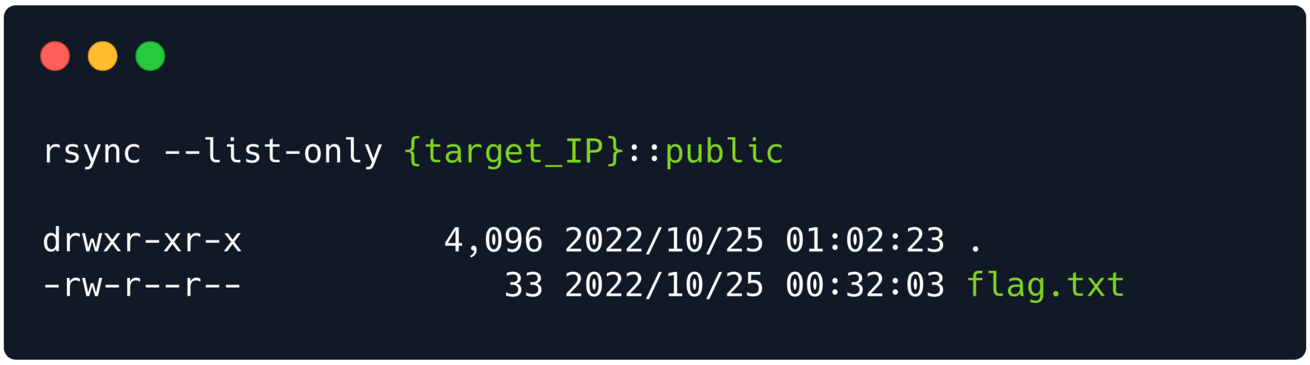
```
rsync --list-only {target_IP}::
```



```
rsync --list-only {target_IP}::

public          Anonymous Share
```

Looking at the output, we can see that we can access a directory called `public` with the description `Anonymous Share`. It is a common practice to call shared directories just `shares`. Let's go a step further and list the files inside the `public` share.

```
rsync --list-only {target_IP}::public
```



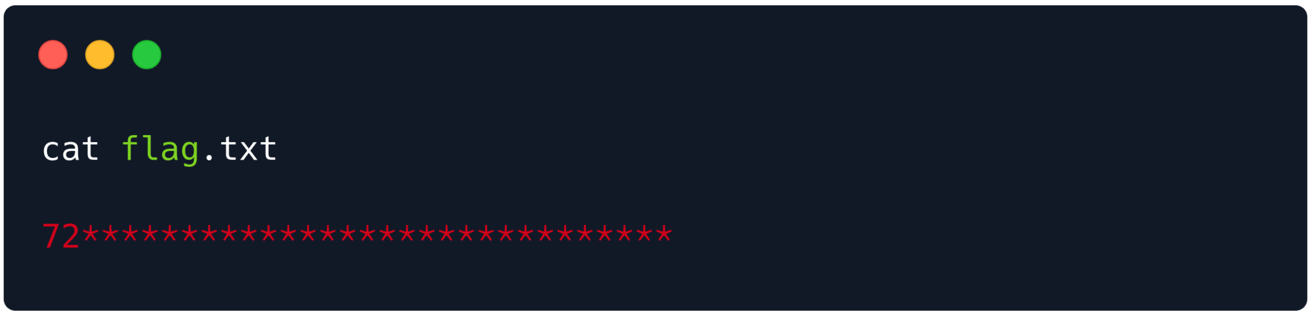
```
rsync --list-only {target_IP}::public

drwxr-xr-x          4,096 2022/10/25 01:02:23 .
-rw-r--r--             33 2022/10/25 00:32:03 flag.txt
```

We notice a file called `flag.txt` inside the `public` share. Our last step is to copy/sync this file to our local machine. To do that, we simply follow the general syntax by specifying the `SRC` as `public/flag.txt` and the `DEST` as `flag.txt` to transfer the file to our local machine.

```
rsync {target_IP}::public/flag.txt flag.txt
```

Executing this command returns no output. But, on our local directory we have a new file called `flag.txt`. Let's read its contents.

```
cat flag.txt
```



```
cat flag.txt

72******************************
```

Congratulations! You have successfully retrieved the flag file from the remote machine using the `rsync` protocol.