Libraries for exploits

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ABSTRACT

Some user has **powerful permissions** over one file. Poor planning means we can **run commands on the server**. Combining these, we can hack our way into the user, and use their permissions to **escalate to root**.

KEY CONCEPTS

File Permissions

The most powerful user on a system can decide which sub-users are allowed to see, edit, and run which files. This powerful user is called “root.”

REFERENCES

GitHub repo

LD_PRELOAD

Password spraying

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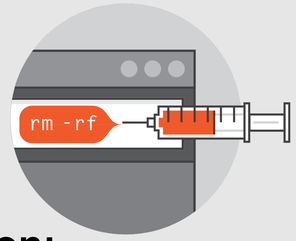
COMMAND INJECTION

The Risk: Unfiltered user input allows attackers to run commands on your server. Even with limited "www-data" permissions, attackers can cause serious damage, make horizontal movements, or escalate privilege.



Prevention:

- **Validate:** Rigorously check all input against strict rules.
- **Sanitize:** Remove or convert dangerous characters.
- **Use Safer Alternatives:** Employ libraries or APIs designed for executing commands.

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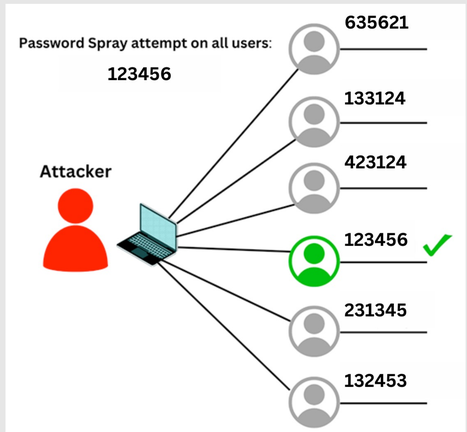
PASSWORD SPRAYING

Our system uses pin codes: passwords are 6 digits.

$$6^{10} = 60{,}466{,}176$$



Prevention:

- **Block Brute Force:**
  - Limit failed logins per IP address to 10.
- **Stronger Passwords:**
  - More character variations
  - 6 characters from letters and numbers = 6^{62} variations
  - Simply longer passwords

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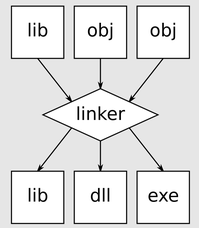
LD_PRELOAD

Before executing a script:

- **Magic number & permissions**
  - Type of file
  - User and group permissions
- **Resolving links**
  - Which libraries to use
  - File dependencies



- **Loading shared libraries**
  - Malloc(), printf()
- **Trick:**
  - Load a shared library containing **void _init()** using **LD_PRELOAD**
  - Run a reverse shell from C with elevated privileges

Prevention:

- Limit sudoers permissions as much as possible

EXTENSIONS

Cron Jobs: Scheduled tasks for repeated attacks
Systemd Jobs: System services for stealthy execution
.bash_profile Autostart: Launch attacks at login
SSH Keys: Authorize your ssh keys for keyless login as root
Removing History: remove bash execution history