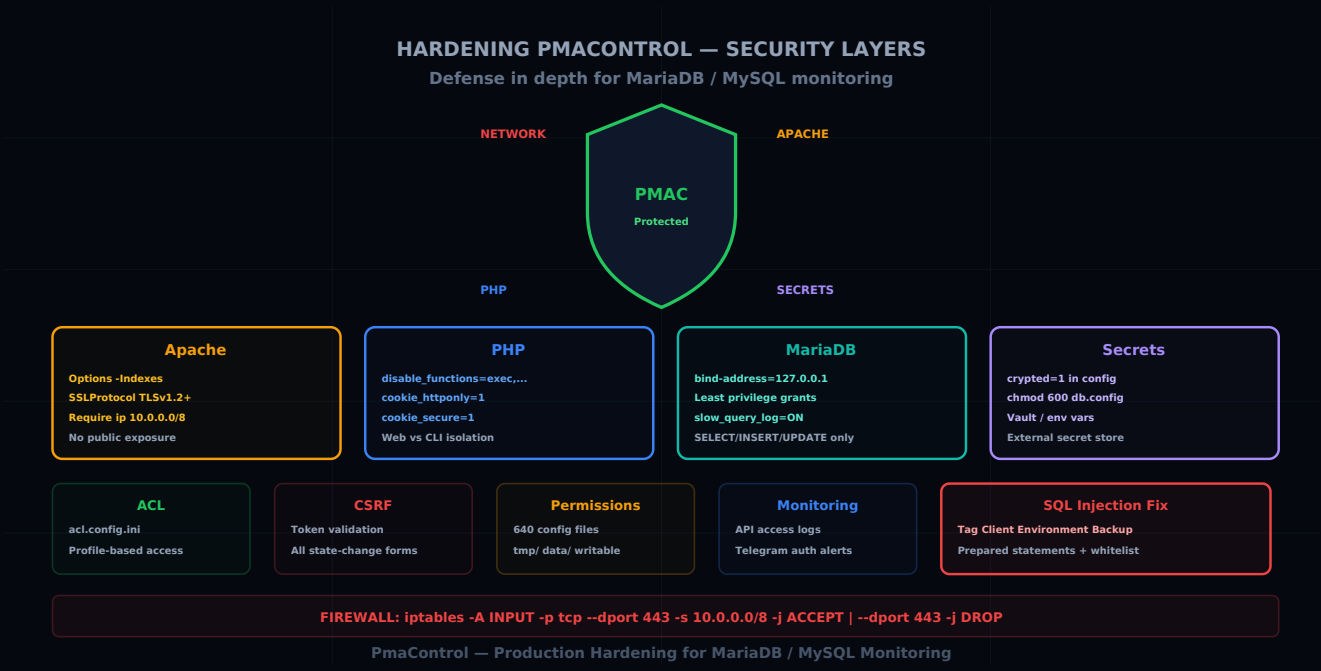
Hardening PmaControl in Production: Complete Security Guide

Aurélien LEQUOY · April 13, 2026

PMACONTROL SECURITY HARDENING APACHE PHP MARIADB



PmaControl Holds the Keys to the Kingdom

PmaControl monitors your production MariaDB / MySQL servers. It stores connection credentials, SSH keys, performance metrics, database structure. If an attacker compromises PmaControl, they potentially gain access to **your entire database infrastructure**.

This guide details the hardening measures to apply before putting PmaControl into production. It comes from an internal security audit and covers every layer: Apache, PHP, MariaDB, secrets, ACL, CSRF, file permissions, and monitoring.

Layer 1: Apache

Disable Directory Listing

By default, Apache can display directory contents when no index file exists. This is an information leak:

```
<Directory /srv/www/pmacontrol>
    Options -Indexes
    AllowOverride All
    Require all granted
</Directory>
```

The `-Indexes` is non-negotiable. Without it, an attacker can explore the project structure and find configuration files, logs, dumps.

Force HTTPS

PmaControl transmits credentials in plain text in HTTP requests. Without HTTPS, an attacker on the network can intercept them:

```
<VirtualHost *:80>
    ServerName pmacontrol.internal.company.com
    Redirect permanent / https://pmacontrol.internal.company.com/
</VirtualHost>

<VirtualHost *:443>
    ServerName pmacontrol.internal.company.com
    SSLEngine On
    SSLCertificateFile /etc/ssl/certs/pmacontrol.pem
    SSLCertificateKeyFile /etc/ssl/private/pmacontrol.key

    # Modern TLS only
    SSLProtocol -all +TLSv1.2 +TLSv1.3
    SSLCipherSuite HIGH:!aNULL:!MD5:!3DES

    DocumentRoot /srv/www/pmacontrol
</VirtualHost>
```

Restrict to Internal Network

PmaControl should **never** be exposed on the Internet. Limit access to the internal network:

```
<Location />
    Require ip 10.0.0.0/8
```

```
    Require ip 172.16.0.0/12
    Require ip 192.168.0.0/16
</Location>
```

Or even better: place PmaControl behind a VPN and do not expose it through public Apache at all.

Remove the Default Vhost

Apache's default vhost (`000-default.conf`) responds to any request on the server's IP. Remove it:

```
a2dissite 000-default.conf
systemctl reload apache2
```

Security Headers

Add HTTP security headers:

```
Header always set X-Content-Type-Options "nosniff"
Header always set X-Frame-Options "SAMEORIGIN"
Header always set X-XSS-Protection "1; mode=block"
Header always set Referrer-Policy "strict-origin-when-cross-origin"
Header always set Content-Security-Policy "default-src 'self'; script-src 'self' 'unsafe-inline'; style-src 'self' 'unsafe-inline'"
```

Layer 2: PHP

Disable Dangerous Functions

PmaControl uses `exec()` and `shell_exec()` for certain operations (SSH, collection). The solution is not to disable them globally, but to isolate the workers that need them.

For the web vhost (the interface):

```
; php.ini or .user.ini in the DocumentRoot
disable_functions = exec,shell_exec,system,passthru,popen,proc_open
expose_php = Off
```

For CLI workers (Aspirateur, Listener):

```
; php-cli.ini — these workers need shell_exec
disable_functions =
```

This separation ensures the web interface cannot execute system commands, even if an attacker finds a vulnerability.

Secure Sessions

```
session.cookie_httponly = 1
session.cookie_secure = 1
session.cookie_samesite = Strict
session.use_strict_mode = 1
session.name = PMACSESSID
```

`cookie_httponly` prevents JavaScript from accessing the session cookie (XSS protection). `cookie_secure` forces sending only over HTTPS. `cookie_samesite = Strict` protects against basic CSRF.

Limit Uploads and Execution

```
upload_max_filesize = 2M
post_max_size = 8M
max_execution_time = 30
max_input_time = 60
memory_limit = 256M
```

PmaControl does not need massive uploads. Limit to reduce the attack surface.

Hide PHP Version

```
expose_php = Off
```

This removes the `X-Powered-By: PHP/8.x` header from HTTP responses.

Layer 3: MariaDB

Restrict PmaControl User Privileges

After installation, the PmaControl user often has all privileges. Restrict them:

```
-- Revoke excessive privileges
REVOKE ALL PRIVILEGES ON *.* FROM 'pmacontrol'@'localhost';

-- Grant only what is needed
GRANT SELECT, INSERT, UPDATE, DELETE ON pmacontrol.* TO 'pmacontrol'@'localhost';
GRANT SELECT ON performance_schema.* TO 'pmacontrol'@'localhost';
GRANT REPLICATION CLIENT ON *.* TO 'pmacontrol'@'localhost';
GRANT PROCESS ON *.* TO 'pmacontrol'@'localhost';

FLUSH PRIVILEGES;
```

The principle of least privilege: PmaControl only needs to read metrics and write to its own database.

Bind to Localhost

The PmaControl database should listen only on the local interface:

```
[mysqld]
bind-address = 127.0.0.1
```

If PmaControl and its database are on the same server (typical configuration), there is no reason to listen on the network.

Enable Sensitive Query Logging

```
[mysqld]
general_log = OFF          # Too verbose for production
slow_query_log = ON
long_query_time = 1
log_error = /var/log/mysql/error.log
```

The slow query log helps detect abnormal queries that could indicate an exploited SQL injection.

Layer 4: Secrets

Encrypt Credentials

PmaControl stores connection credentials in `db.config.ini.php`. This file supports encryption:

```
; configuration/db.config.ini.php
[default]
driver = mysql
host = 127.0.0.1
port = 3306
login = pmacontrol
password = "ENCRYPTED_VALUE_HERE"
database = pmacontrol
crypted = 1
```

The `crypted=1` flag tells PmaControl to decrypt the password at runtime. The encryption key is separate from the configuration file.

Use an External Secret Store

For critical production deployments, externalize secrets:

- **Vault** (HashiCorp): PmaControl can read secrets via the API
- **AWS Secrets Manager** or **GCP Secret Manager**: for cloud deployments
- **Environment variables**: the minimum viable option, better than plain text

```
# Example with environment variables
export PMAC_DB_PASSWORD="secret_value"
export PMAC_SSH_PASSPHRASE="ssh_secret"
```

Protect Configuration Files

```
# Owner: www-data (the Apache user)
chown root:www-data /srv/www/pmacontrol/configuration/*.php

# Permissions: read for group, nothing for others
chmod 640 /srv/www/pmacontrol/configuration/*.php

# The credentials file should only be readable by www-data
chmod 600 /srv/www/pmacontrol/configuration/db.config.ini.php
```

Layer 5: ACL (Access Control Lists)

Review acl.config.ini

PmaControl has a profile-based ACL system. The `acl.config.ini` file defines which profile can access which controller.

```
; configuration/acl.config.ini
[admin]
* = allow

[dba]
Slave = allow
Server = allow
Dashboard = allow
Backup = deny
Config = deny

[readonly]
Slave = allow
Server = allow(show)
Dashboard = allow
* = deny
```

Essential rules:

- **Restrict sensitive controllers**: `Config`, `Backup`, `Install`, `Api` should only be accessible to admins
- **Create a read-only profile**: for developers who need to view without modifying
- **Audit regularly**: verify that newly added controllers are covered by ACLs

Protect Critical Endpoints

Some endpoints are particularly sensitive:

```
[admin]
Install = allow      ; Installation / reinstallation
Config = allow       ; Configuration modification
Api = allow          ; Full REST API
Backup = allow       ; Backup access (contains data)

[dba]
Install = deny       ; NEVER accessible to non-admins
Config = deny
```

```
Api = allow(read)    ; Read-only via API
Backup = deny
```

Layer 6: CSRF (Cross-Site Request Forgery)

Verify Token Presence

Every PmaControl form must include a CSRF token:

```
<form method="POST" action="/slave/start/42/">
    <input type="hidden" name="csrf_token" value="<?= $csrf_token ?>">
    <button type="submit">Start Slave</button>
</form>
```

On the server side, the controller must validate the token:

```
if ($_POST['csrf_token'] !== $_SESSION['csrf_token']) {
    throw new SecurityException('Invalid CSRF token');
}
```

Priority Actions to Protect

State-modifying actions are the most critical:

- START/STOP SLAVE
- SKIP error
- Server add/remove
- Configuration changes
- User creation/deletion

Without CSRF protection, an attacker could force a logged-in DBA to stop a production server's replication by sending them a malicious link.

Layer 7: File Permissions

Permission Tree

```
# Main directory: readable, not writable
chown -R root:www-data /srv/www/pmacontrol/
chmod -R 750 /srv/www/pmacontrol/

# Write directories: www-data owner
chown -R www-data:www-data /srv/www/pmacontrol/tmp/
chown -R www-data:www-data /srv/www/pmacontrol/data/

# PHP files: read-only for www-data
find /srv/www/pmacontrol/App/ -name "*.php" -exec chmod 640 {} \;

# Configuration: restrictive
chmod 640 /srv/www/pmacontrol/configuration/*.php
chmod 600 /srv/www/pmacontrol/configuration/db.config.ini.php
```

The principle: `www-data` can read code and write to `tmp/` and `data/`. It cannot modify source code or configuration.

Layer 8: Security Monitoring

Log API Access

Every REST API call should be logged with:

- Timestamp
- Source IP
- User (token)
- Endpoint called
- Response code

```
// In the API middleware
$log = sprintf(
    "[%s] %s %s %s -> %d",
    date('Y-m-d H:i:s'),
    $_SERVER['REMOTE_ADDR'],
    $user->name,
    $_SERVER['REQUEST_URI'],
    http_response_code()
```

```
);
file_put_contents('/var/log/pmacontrol/api.log', $log . "\n", FILE_APPEND);
```

Telegram Alerts on Authentication Failures

Configure a Telegram alert for every login failure:

```
if (!$auth->isValid()) {
    Telegram::send(
        "Auth failure on PmaControl\n" .
        "IP: " . $_SERVER['REMOTE_ADDR'] . "\n" .
        "User: " . $_POST['login'] . "\n" .
        "Time: " . date('Y-m-d H:i:s')
    );
}
```

Three failures from the same IP within 5 minutes should trigger a temporary block.

Monitor Configuration Files

Use `inotifywait` or a similar tool to detect unauthorized modifications:

```
inotifywait -m -r /srv/www/pmacontrol/configuration/ -e modify,create,delete |
while read path action file; do
    echo "[$action] $path$file" >> /var/log/pmacontrol/config_changes.log
    # Send Telegram alert
done
```

Layer 9: Network

Firewall Rules

```
# Allow HTTP/HTTPS only from internal network
iptables -A INPUT -p tcp --dport 80  -s 10.0.0.0/8 -j ACCEPT
iptables -A INPUT -p tcp --dport 443 -s 10.0.0.0/8 -j ACCEPT
iptables -A INPUT -p tcp --dport 80  -j DROP
iptables -A INPUT -p tcp --dport 443 -j DROP

# Allow MySQL only on localhost
iptables -A INPUT -p tcp --dport 3306 -s 127.0.0.1 -j ACCEPT
```

```
iptables -A INPUT -p tcp --dport 3306 -j DROP
```

No Public Exposure

PmaControl should **never** be accessible from the Internet. Even with authentication, the attack surface is too large:

- Monitored server credentials are stored
- SSH keys are stored
- The interface allows executing actions on production servers

If remote access is needed, use a VPN (WireGuard, OpenVPN) or an SSH tunnel.

Layer 10: SQL Injections — Remediation

Our internal audit identified SQL injection risks in four controllers:

Controller	Risk	Remediation
`Tag.php`	Dynamic WHERE clause building	Prepared statements
`Client.php`	Concatenation in filters	Prepared statements
`Environment.php`	Variable interpolation in ORDER BY	Column whitelist
`Backup.php`	Unescaped parameter in LIKE	Prepared statements

Before (Vulnerable):

```
// Tag.php — VULNERABLE
$sql = "SELECT * FROM tags WHERE name LIKE '%" . $_GET['search'] . "%'";
$results = $db->query($sql);
```

After (Secure):

```
// Tag.php — SECURE
$sql = "SELECT * FROM tags WHERE name LIKE ?";
$results = $db->query($sql, ['%' . $_GET['search'] . '%']);
```

For ORDER BY clauses, whitelisting is the only safe solution:

```
$allowed_columns = ['name', 'created_at', 'id'];
$sort = in_array($_GET['sort'], $allowed_columns) ? $_GET['sort'] : 'name';
$sql = "SELECT * FROM tags ORDER BY " . $sort;
```

Hardening Checklist

Before putting PmaControl into production, validate each point:

- [ ] Apache: `-Indexes` enabled
- [ ] Apache: HTTPS enforced
- [ ] Apache: access restricted to internal network
- [ ] Apache: default vhost removed
- [ ] PHP: dangerous functions disabled on web vhost
- [ ] PHP: `session.cookie_httponly = 1`
- [ ] PHP: `session.cookie_secure = 1`
- [ ] PHP: `expose_php = Off`
- [ ] MariaDB: user with minimal privileges
- [ ] MariaDB: `bind-address = 127.0.0.1`
- [ ] Secrets: encrypted credentials (`crypted=1`)
- [ ] Config files: permissions 640
- [ ] ACL: sensitive controllers restricted
- [ ] CSRF: tokens on all action forms
- [ ] Permissions: `tmp/` and `data/` are the only writable directories
- [ ] Monitoring: API access logging
- [ ] Monitoring: alerts on authentication failures
- [ ] Network: firewall in place
- [ ] Network: no public exposure
- [ ] SQL: prepared statements in Tag, Client, Environment, Backup

Conclusion

Securing PmaControl is not a luxury — it is an obligation. The tool has access to your production MariaDB / MySQL servers, stores credentials, and can execute commands via SSH.

Hardening is done in layers: each layer (Apache, PHP, MariaDB, secrets, ACL, CSRF, permissions, network) adds a barrier. If one layer is breached, the others slow down the attacker.

The good news: all these measures are standard and can be applied in a single working day. The cost is negligible compared to the risk of your database infrastructure being compromised.