

- DB 시스템을 구축하여 주어진 보안 요구 조건에 따라 설정하고 DB 모니터링 시스템 구축 및 인젝션 취약점에 대해 설정하고 테스트하시오.

Web Server(APM), Wordpress, DB 모니터링(PMM-Server) 시스템 구축

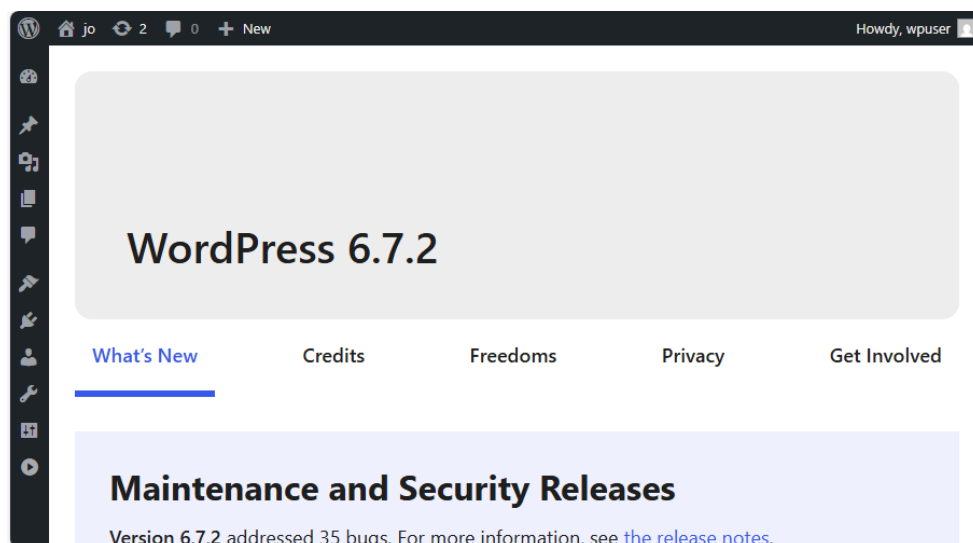
APM 구축

```
[root@localhost ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Tue 2025-04-15 09:35:07 KST; 1h 11min ago
     Docs: man:httpd.service(8)
   Main PID: 45083 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0"
   Tasks: 177 (limit: 11084)

[root@localhost ~]# php -v
PHP 8.0.30 (cli) (built: Aug  3 2023 17:13:08) ( NTS gcc x86_64 )
Copyright (c) The PHP Group
Zend Engine v4.0.30, Copyright (c) Zend Technologies
    with Zend OPcache v8.0.30, Copyright (c), by Zend Technologies

[root@localhost ~]# systemctl status mariadb
● mariadb.service - MariaDB 10.5 database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: disabled)
   Active: active (running) since Tue 2025-04-15 09:35:43 KST; 1h 11min ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 47586 (mariadb)
```

Wordpress 구축 (jo 로 변경했음)



DB 시스템 구축 및 기본 데이터 입력 시 10 점 - Web Server 에 위와 같이 DB 구축

ANIMAL_INS					
ANIMAL_ID	ANIMAL_TYPE	DATETIME	INTAKE_CONDITION	NAME	SEX_UPON_INTAKE
A354597	Cat	2014-05-02 12:16:00	Normal	Ariel	Spayed Female
A373687	Dog	2014-03-20 12:31:00	Normal	Rosie	Spayed Female
A412697	Dog	2016-01-03 16:25:00	Normal	Jackie	Neutered Male
A413789	Dog	2016-04-19 13:28:00	Normal	Benji	Spayed Female
A414198	Dog	2015-01-29 15:01:00	Normal	Shelly	Spayed Female
A368930	Dog	2014-06-08 13:20:00	Normal		Spayed Female

ANIMAL_OUTS				
ANIMAL_ID	ANIMAL_TYPE	DATETIME	NAME	SEX_UPON_OUTCOME
A354597	Cat	2014-05-02 12:16:00	Ariel	Spayed Female
A373687	Dog	2014-03-20 12:31:00	Rosie	Spayed Female
A368930	Dog	2014-06-13 15:52:00		Spayed Female


```

MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_INS;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME          | INTAKE_CONDITION | NAME   | SEX_UPON_INTAKE |
+-----+-----+-----+-----+-----+-----+
| A354597   | Cat         | 2014-05-02 12:16:00 | Normal          | Ariel  | Spayed Female    |
| A368930   | Dog         | 2014-06-08 13:20:00 | Normal          |        | Spayed Female    |
| A373687   | Dog         | 2014-03-20 12:31:00 | Normal          | Rosie  | Spayed Female    |
| A412697   | Dog         | 2016-01-03 16:25:00 | Normal          | Jackie | Neutered Male    |
| A413789   | Dog         | 2016-04-19 13:28:00 | Normal          | Benji  | Spayed Female    |
| A414198   | Dog         | 2015-01-29 15:01:00 | Normal          | Shelly | Spayed Female    |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.000 sec)

MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_OUTS;
+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME          | NAME   | SEX_UPON_OUTCOME |
+-----+-----+-----+-----+-----+
| A354597   | Cat         | 2014-05-02 12:16:00 | Ariel  | Spayed Female    |
| A368930   | Dog         | 2014-06-13 15:52:00 |        | Spayed Female    |
| A373687   | Dog         | 2014-03-20 12:31:00 | Rosie  | Spayed Female    |
+-----+-----+-----+-----+-----+
3 rows in set (0.000 sec)

```

- ANIMAL_OUTS 테이블에 COST 필드 추가 및 데이터 입력 시 5 점

```
MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_OUTS;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME           | NAME | SEX_UPON_OUTCOME | COST |
+-----+-----+-----+-----+-----+-----+
| A354597   | Cat         | 2014-05-02 12:16:00 | Ariel | Spayed Female    | 100.00 |
| A368930   | Dog         | 2014-06-13 15:52:00 |      | Spayed Female    | 200.00 |
| A373687   | Dog         | 2014-03-20 12:31:00 | Rosie | Spayed Female    | 150.00 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.000 sec)
```

- COST(입양 비용) 필드의 데이터 합계와 평균 구하기 5 점

```
MariaDB [ANIMAL_DB]> SELECT SUM(COST) AS TOTAL_COST FROM ANIMAL_OUTS;
+-----+
| TOTAL_COST |
+-----+
|      450.00 |
+-----+
1 row in set (0.000 sec)

MariaDB [ANIMAL_DB]> SELECT AVG(COST) AS AVERAGE_COST FROM ANIMAL_OUTS;
+-----+
| AVERAGE_COST |
+-----+
|  150.000000 |
+-----+
1 row in set (0.000 sec)
```

- NAME 필드 기준으로 오름차순 정렬 시 5 점

```
MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_INS ORDER BY NAME ASC;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME           | INTAKE_CONDITION | NAME | SEX_UPON_INTAKE |
+-----+-----+-----+-----+-----+-----+
| A368930   | Dog         | 2014-06-08 13:20:00 | Normal           |      | Spayed Female    |
| A354597   | Cat         | 2014-05-02 12:16:00 | Normal           | Ariel | Spayed Female    |
| A413789   | Dog         | 2016-04-19 13:28:00 | Normal           | Benji | Spayed Female    |
| A412697   | Dog         | 2016-01-03 16:25:00 | Normal           | Jackie | Neutered Male    |
| A373687   | Dog         | 2014-03-20 12:31:00 | Normal           | Rosie | Spayed Female    |
| A414198   | Dog         | 2015-01-29 15:01:00 | Normal           | Shelly | Spayed Female    |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.000 sec)

MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_OUTS ORDER BY NAME ASC;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME           | NAME | SEX_UPON_OUTCOME | COST |
+-----+-----+-----+-----+-----+-----+
| A368930   | Dog         | 2014-06-13 15:52:00 |      | Spayed Female    | 200.00 |
| A354597   | Cat         | 2014-05-02 12:16:00 | Ariel | Spayed Female    | 100.00 |
| A373687   | Dog         | 2014-03-20 12:31:00 | Rosie | Spayed Female    | 150.00 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.000 sec)
```

- VIEW 테이블 생성 시 5 점

```
MariaDB [ANIMAL_DB]> SHOW FULL TABLES IN ANIMAL_DB WHERE TABLE_TYPE = 'VIEW';
+-----+-----+
| Tables_in_ANIMAL_DB | Table_type |
+-----+-----+
| ANIMAL_INS_VIEW      | VIEW      |
| ANIMAL_OUTS_VIEW     | VIEW      |
+-----+-----+
2 rows in set (0.000 sec)

MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_INS_VIEW;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME           | INTAKE_CONDITION | NAME | SEX_UPON_INTAKE |
+-----+-----+-----+-----+-----+-----+
| A354597   | Cat         | 2014-05-02 12:16:00 | Normal           | Ariel | Spayed Female   |
| A368930   | Dog         | 2014-06-08 13:20:00 | Normal           |      | Spayed Female   |
| A373687   | Dog         | 2014-03-20 12:31:00 | Normal           | Rosie | Spayed Female   |
| A412697   | Dog         | 2016-01-03 16:25:00 | Normal           | Jackie | Neutered Male   |
| A413789   | Dog         | 2016-04-19 13:28:00 | Normal           | Benji | Spayed Female   |
| A414198   | Dog         | 2015-01-29 15:01:00 | Normal           | Shelly | Spayed Female   |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.001 sec)

MariaDB [ANIMAL_DB]> SELECT * FROM ANIMAL_OUTS_VIEW;
+-----+-----+-----+-----+-----+-----+
| ANIMAL_ID | ANIMAL_TYPE | DATETIME           | NAME | SEX_UPON_OUTCOME | COST |
+-----+-----+-----+-----+-----+-----+
| A354597   | Cat         | 2014-05-02 12:16:00 | Ariel | Spayed Female     | 100.00 |
| A368930   | Dog         | 2014-06-13 15:52:00 |      | Spayed Female     | 200.00 |
| A373687   | Dog         | 2014-03-20 12:31:00 | Rosie | Spayed Female     | 150.00 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.001 sec)
```

DB Server 에 kituser1, kituser2, kituser3 사용자 생성 및 권한, 접근제어 설정

– kituser1 : KSec DB 에 모든 권한(로컬호스트)

```
MariaDB [ANIMAL_DB]> CREATE USER 'kituser1'@'localhost' identified by '1234';
Query OK, 0 rows affected (0.002 sec)
MariaDB [ANIMAL_DB]> GRANT ALL PRIVILEGES ON KSec.* TO 'kituser1'@'localhost';
Query OK, 0 rows affected (0.002 sec)
MariaDB [KCyber]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

– kituser2 : KCyber DB 의 Cyber1 Table 에 대해 select, create 권한(로컬호스트)

```
MariaDB [ANIMAL_DB]> CREATE USER 'kituser2'@'localhost' IDENTIFIED BY '1234';
Query OK, 0 rows affected (0.002 sec)
MariaDB [KCyber]> GRANT SELECT ON KCyber.Cyber1 TO 'kituser2'@'localhost';
Query OK, 0 rows affected (0.002 sec)
MariaDB [KCyber]> GRANT CREATE ON KCyber.* TO 'kituser2'@'localhost';
Query OK, 0 rows affected (0.003 sec)

MariaDB [KCyber]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

– kituser3 : KCyber DB 의 Cyber2 Table 에 대해 모든 권한(원격호스트 : 192.168.5.50)

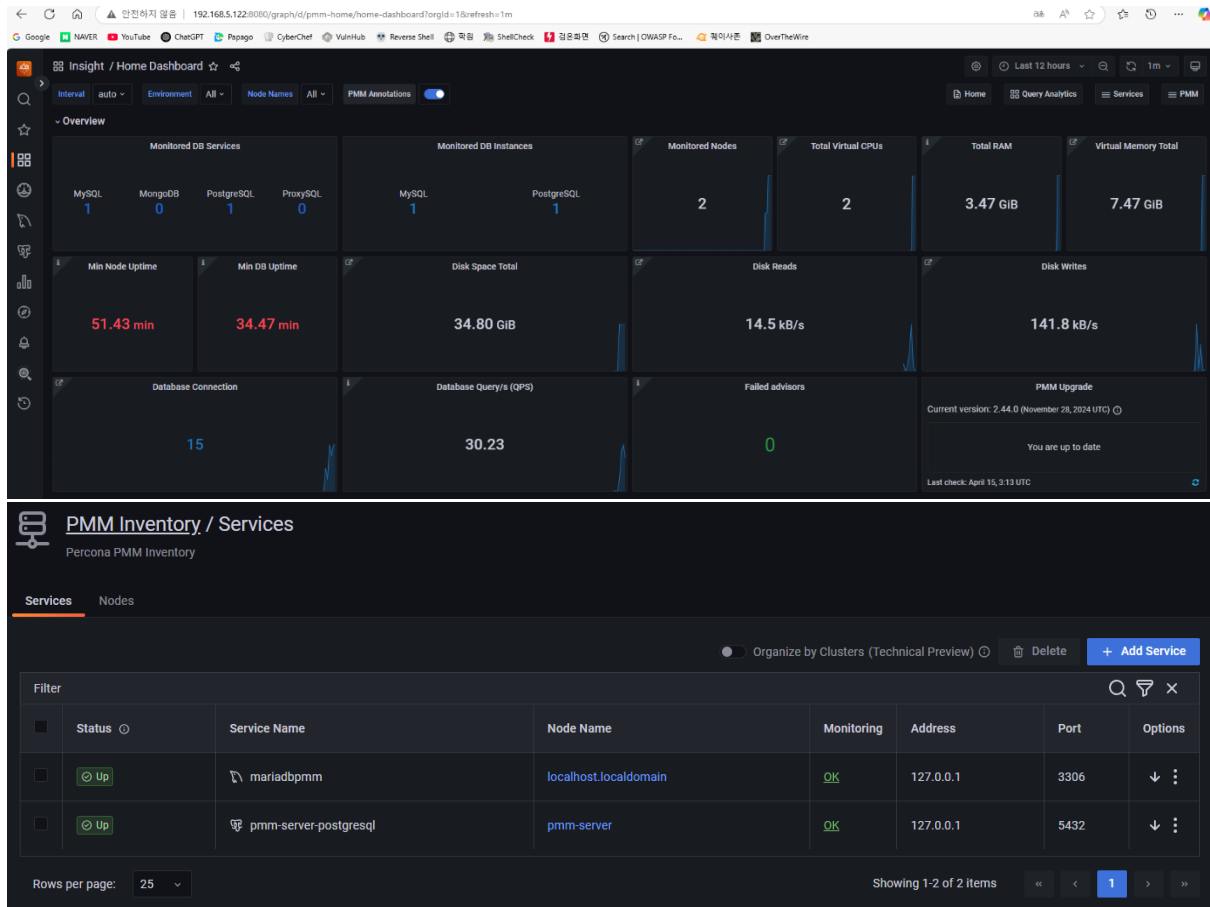
```
MariaDB [KCyber]> CREATE USER 'kituser3'@'192.168.5.50' IDENTIFIED BY '1234';
Query OK, 0 rows affected (0.002 sec)
MariaDB [KCyber]> GRANT ALL PRIVILEGES ON KCyber.Cyber2 TO 'kituser3'@'192.168.5.50';
Query OK, 0 rows affected (0.002 sec)

MariaDB [KCyber]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

전체 설정 시 30 점(각 10 점) / 미 설정 시 0 점

PMM 을 이용하여 DB 모니터링 서버를 구축하고 클라이언트를 등록하여 관리할 수 있다.

구축 및 클라이언트 등록 시 30 점(구축 20 점, DB 서버 등록 10 점) / 미 구축 시 0 점



서버에서 연결된 것을 확인 완료

```
[root@localhost html]# pmm-admin status
Agent ID : /agent_id/9bbb7904-579c-4f3b-af9a-ac9926c003bf
Node ID : /node_id/426118c8-a6a6-46c9-a936-fcfd90d95a05
Node name: localhost.localdomain

PMM Server:
  URL      : https://192.168.5.122:4443/
  Version: 2.44.0

PMM Client:
  Connected      : true
  Time drift     : 1m1.459384449s
  Latency        : 384.663µs
  Connection uptime: 100
  pmm-admin version: 2.44.0
  pmm-agent version: 2.44.0
```

클라이언트에서 서버가 연결됐는지 확인 완료