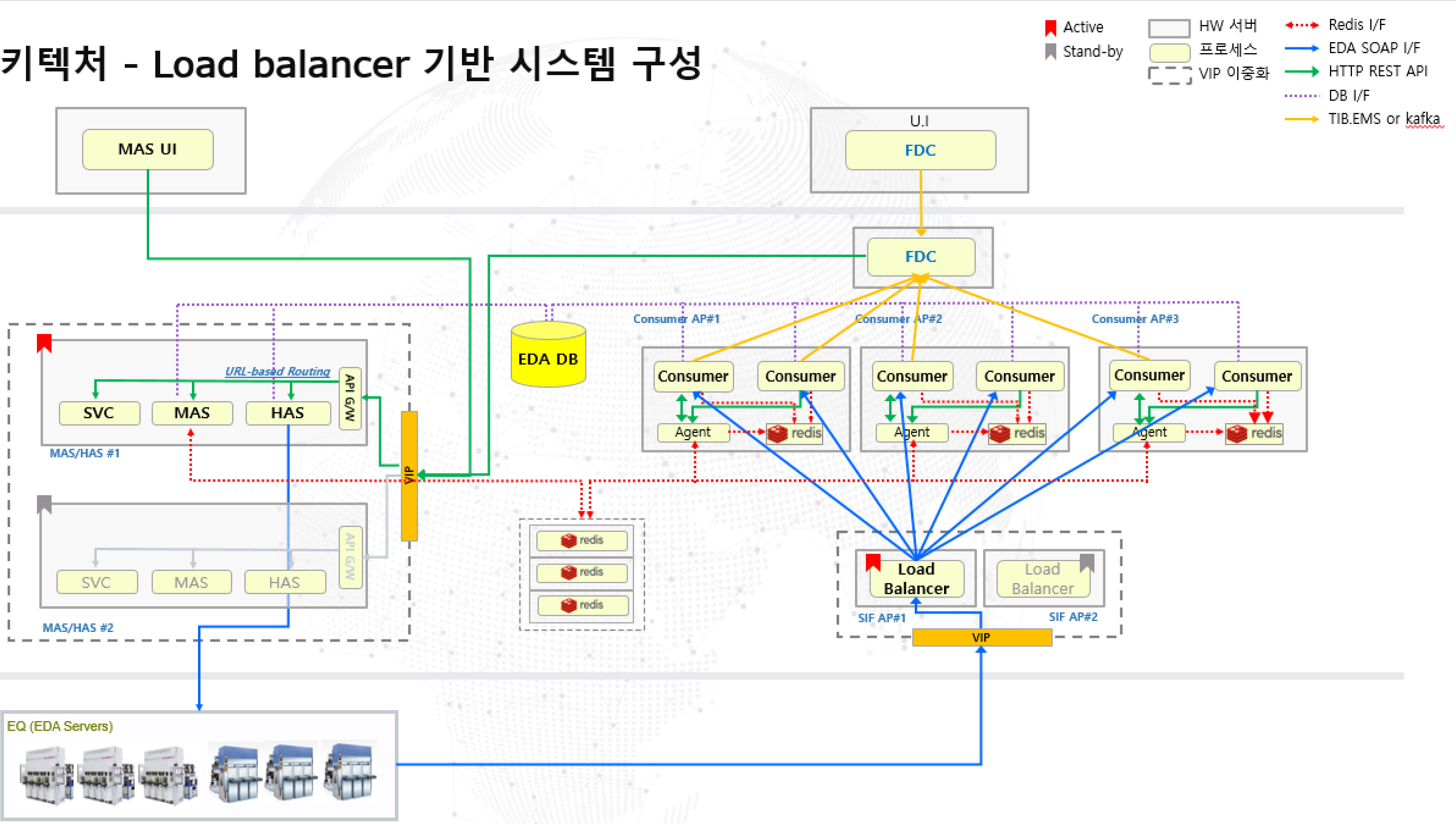
# MAS-Server

Joonho Park
2025-09-01

## Introduction

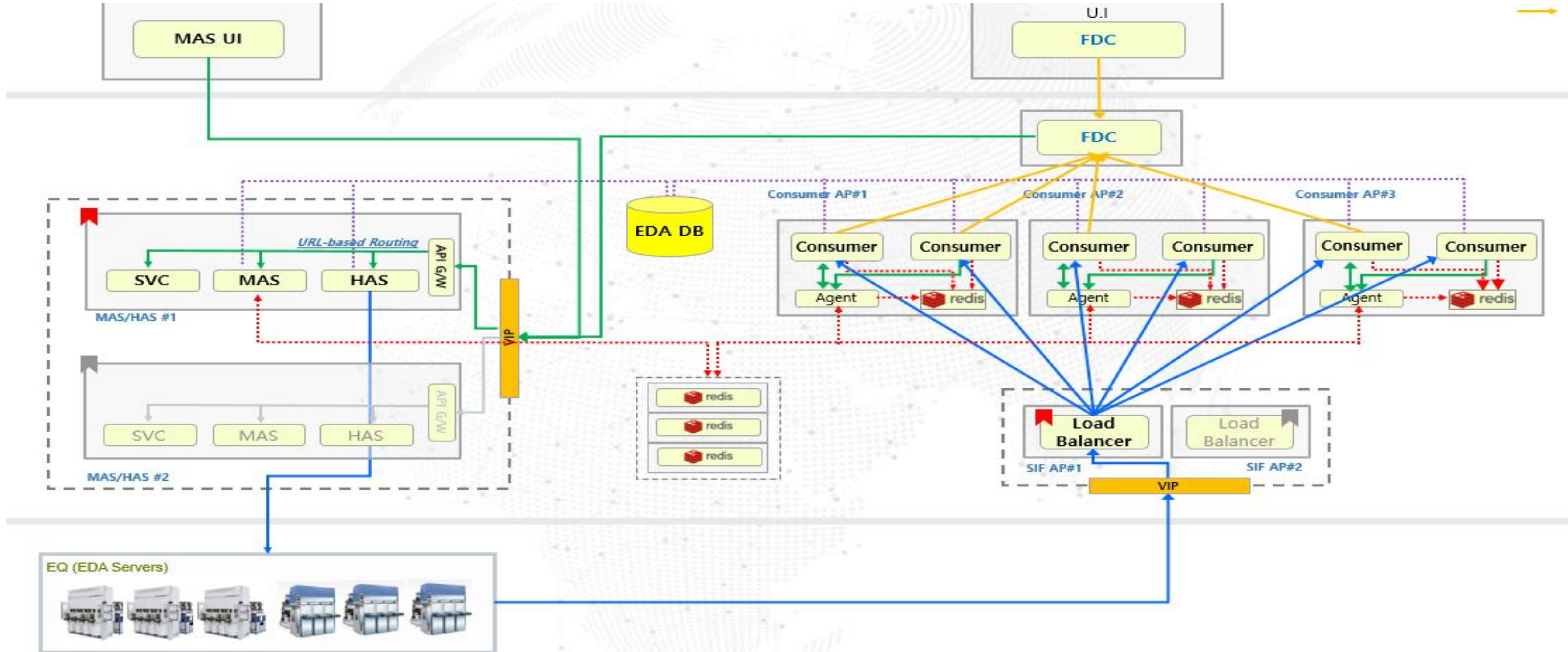
- EDA 전반적인 통합 UI 시스템 필요.
- Rest API 통신
- UI(Client) 와 EQ, Consumer, DB, Redis 를 연결 하는 Server 프로그램 필요.
- VIP 를 통해 Fail Over 기능 포함.

# 아키텍처 - Load balancer 기반 시스템 구성



# Problem Setup

- API 통신, Redis Pub/Sub, PostgreSql 필요.

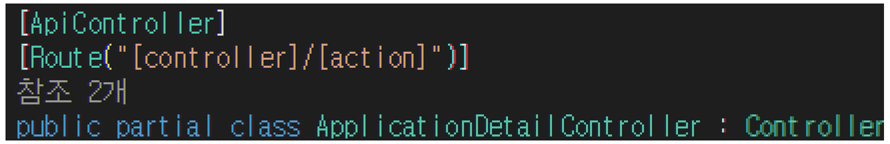


## Scope

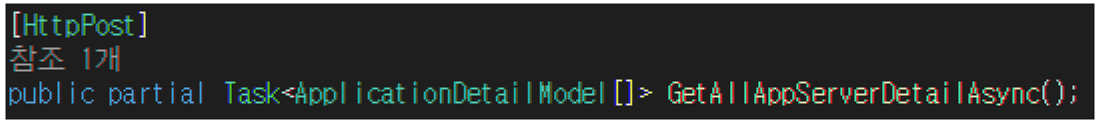
- Controller Service Repository Pattern 적용
- Postgre DB Connection
- Redis Connection / Subscribe
- Redis Sentinel -> Master 를 따라가도록 적용.
- Proxy Master 상태 확인.

## **Problem solution** -Controller Service Repository Pattern 적용

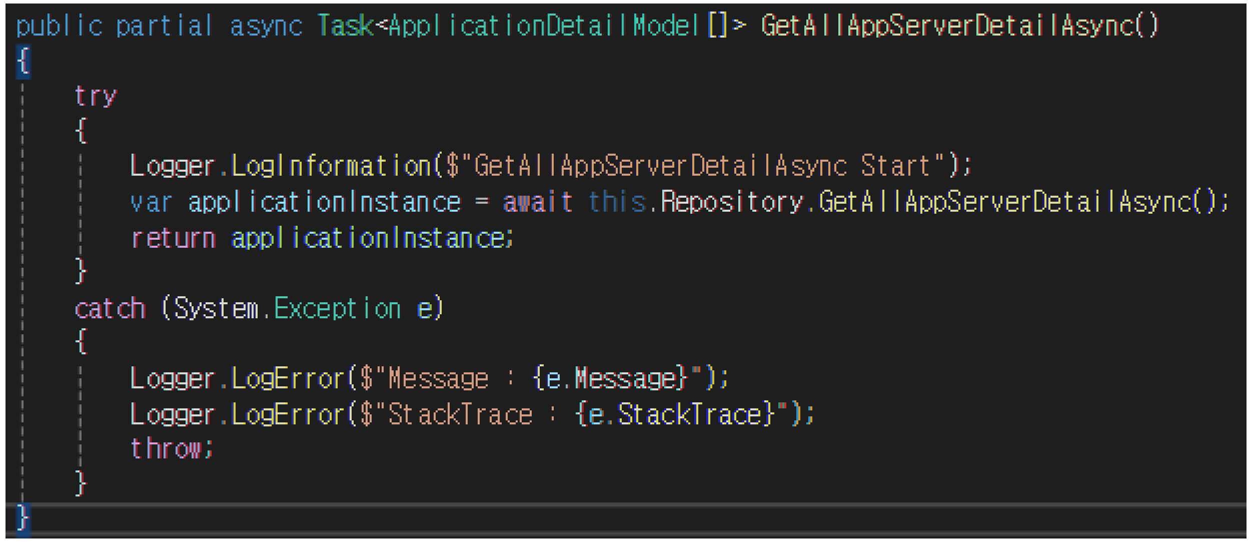
- Controller/Action 으로 Post – Controller 에서 Repository 호출 후 처리.



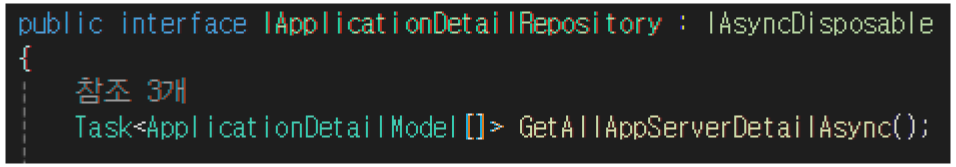
```
[ApiController]
[Route("[controller]/[action]")]
참조 2개
public partial class ApplicationDetailController : Controller
```



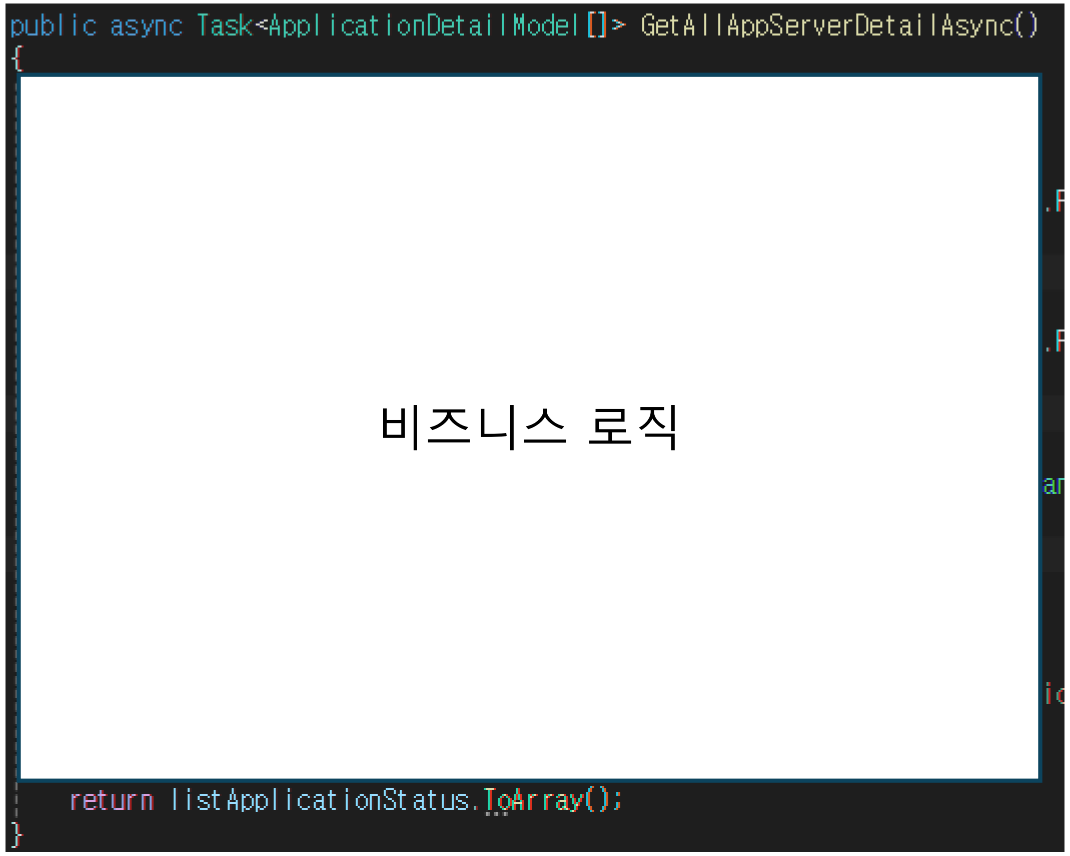
```
[HttpPost]
참조 1개
public partial Task<ApplicationDetailModel[]> GetAllAppServerDetailAsync();
```



```
public partial async Task<ApplicationDetailModel[]> GetAllAppServerDetailAsync()
{
    try
    {
        Logger.LogInformation($"GetAllAppServerDetailAsync Start");
        var applicationInstance = await this.Repository.GetAllAppServerDetailAsync();
        return applicationInstance;
    }
    catch (System.Exception e)
    {
        Logger.LogError($"Message : {e.Message}");
        Logger.LogError($"StackTrace : {e.StackTrace}");
        throw;
    }
}
```



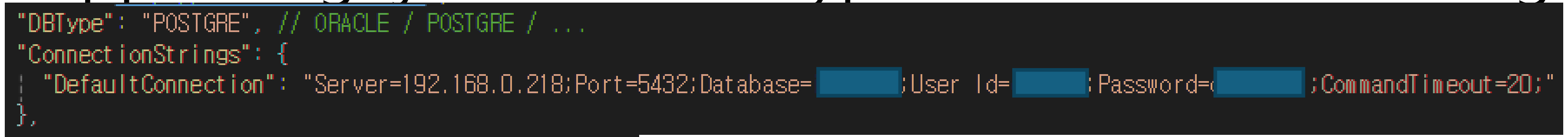
```
public interface IApplicationDetailRepository : IAsyncDisposable
{
    참조 3개
    Task<ApplicationDetailModel[]> GetAllAppServerDetailAsync();
```



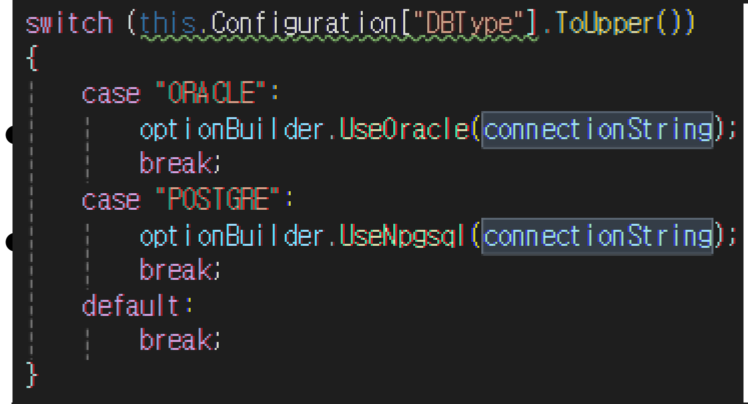
```
public async Task<ApplicationDetailModel[]> GetAllAppServerDetailAsync()
{

비즈니스 로직

    return listApplicationStatus.ToArray();
}
```

# **Problem solution** - Postgres DB Connection

- Appsettings.json 에서 DBType 과 Connection String 관리.

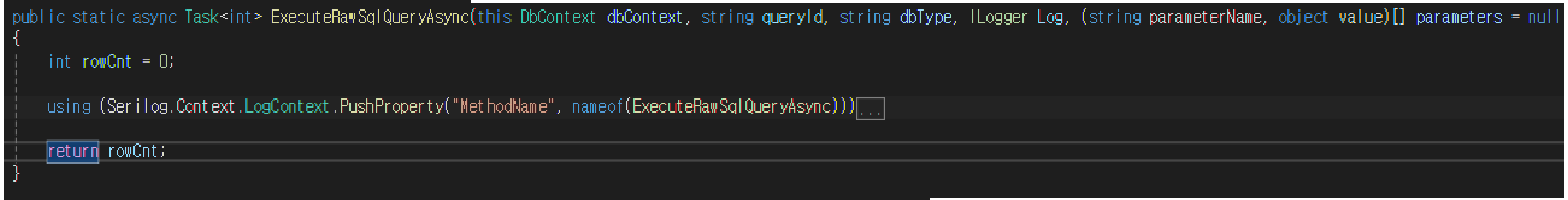


```
"DBType": "POSTGRE", // ORACLE / POSTGRE / ...
"ConnectionStrings": {
  "DefaultConnection": "Server=192.168.0.218;Port=5432;Database=[redacted];User Id=[redacted];Password=[redacted];CommandTimeout=20;"
},
```

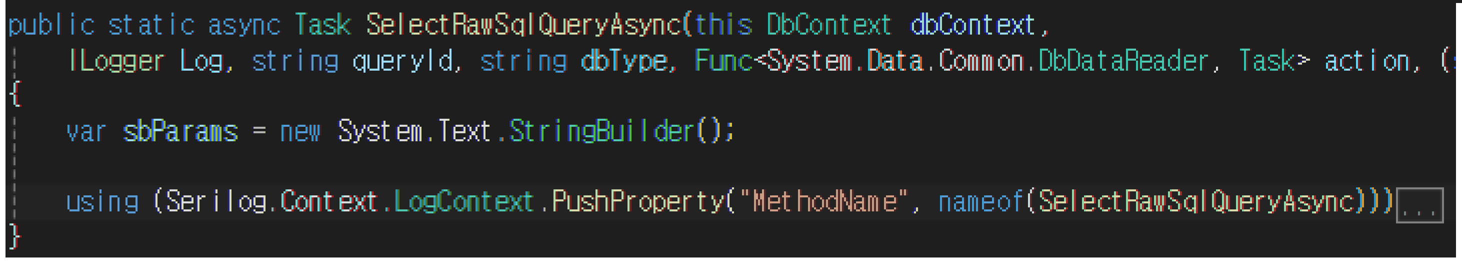


```
switch (this.Configuration["DBType"].ToUpper())
{
    case "ORACLE":
        optionBuilder.UseOracle(connectionString);
        break;
    case "POSTGRE":
        optionBuilder.UseNpgsql(connectionString);
        break;
    default:
        break;
}
```

DBType 에 따라 Builder switch
이후 Query.xml 에 정의 된 queryId 로 쿼리 실행.



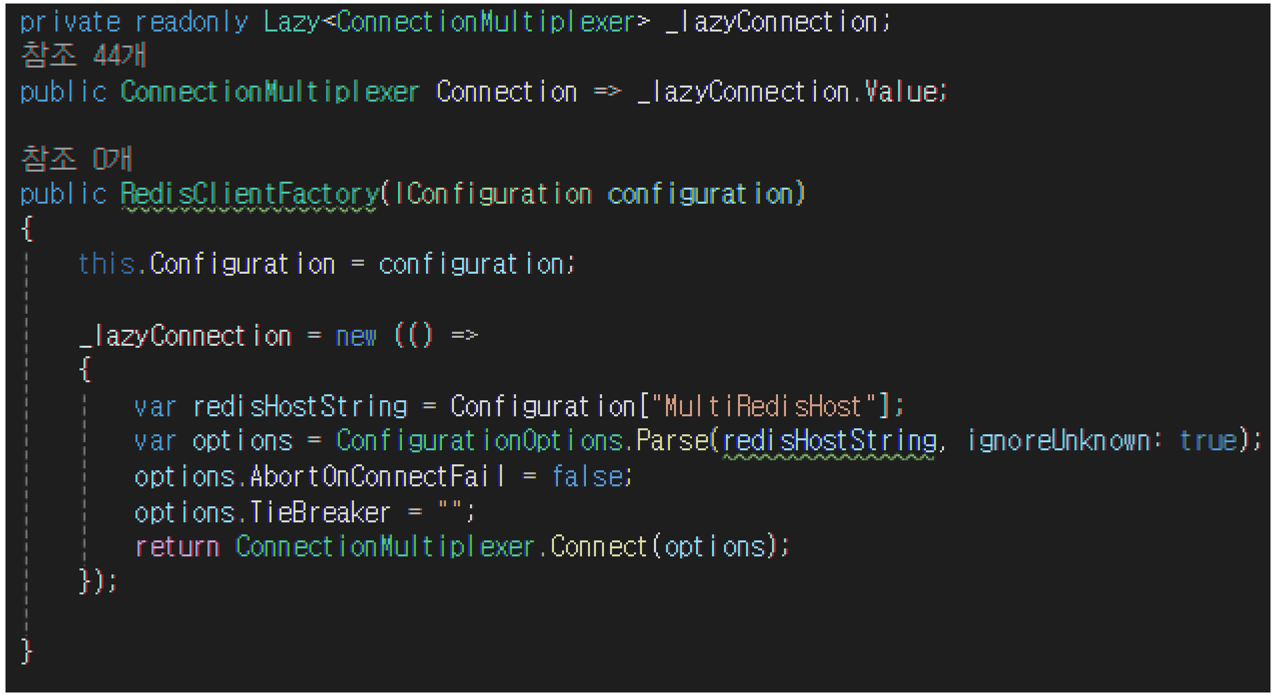
```
public static async Task<int> ExecuteRawSqlQueryAsync(this DbContext dbContext, string queryId, string dbType, ILogger Log, (string parameterName, object value)[] parameters = null
{
    int rowCnt = 0;

    using (Serilog.Context.LogContext.PushProperty("MethodName", nameof(ExecuteRawSqlQueryAsync)))...

    return rowCnt;
}
```



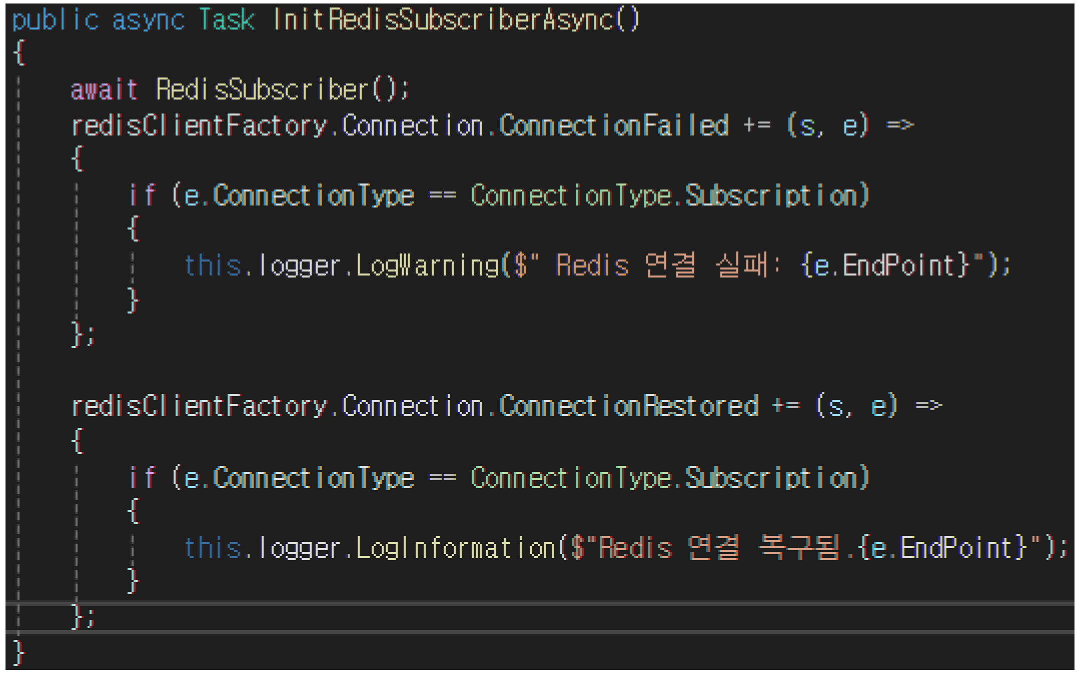
```
public static async Task SelectRawSqlQueryAsync(this DbContext dbContext,
    ILogger Log, string queryId, string dbType, Func<System.Data.Common.DbDataReader, Task> action, (
{
    var sbParams = new System.Text.StringBuilder();

    using (Serilog.Context.LogContext.PushProperty("MethodName", nameof(SelectRawSqlQueryAsync)))...
}
```

# Problem solution - Redis Connection / Subscribe

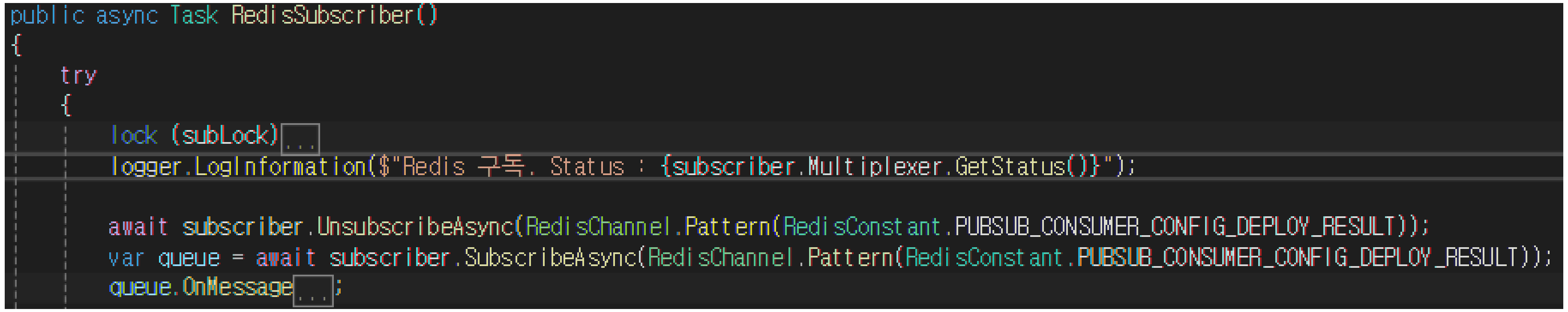
- 최초 한번만 구독 하도록 실행 / Master 변경 시에도 구독 유지.



```
private readonly Lazy<ConnectionMultiplexer> _lazyConnection;
참조 44개
public ConnectionMultiplexer Connection => _lazyConnection.Value;

참조 0개
public RedisClientFactory(IConfiguration configuration)
{
    this.Configuration = configuration;

    _lazyConnection = new (() =>
    {
        var redisHostString = Configuration["MultiRedisHost"];
        var options = ConfigurationOptions.Parse(redisHostString, ignoreUnknown: true);
        options.AbortOnConnectFail = false;
        options.TieBreaker = "";
        return ConnectionMultiplexer.Connect(options);
    });

}
```



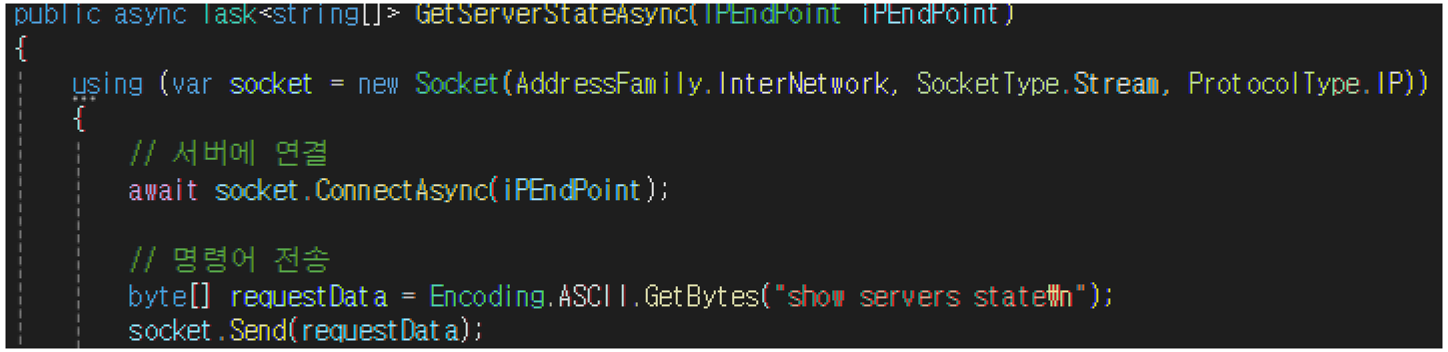
```
public async Task InitRedisSubscriberAsync()
{
    await RedisSubscriber();
    redisClientFactory.Connection.ConnectionFailed += (s, e) =>
    {
        if (e.ConnectionType == ConnectionType.Subscription)
        {
            this.logger.LogWarning($" Redis 연결 실패: {e.EndPoint}");
        }
    };

    redisClientFactory.Connection.ConnectionRestored += (s, e) =>
    {
        if (e.ConnectionType == ConnectionType.Subscription)
        {
            this.logger.LogInformation($"Redis 연결 복구됨.{e.EndPoint}");
        }
    };
}
```



```
public async Task RedisSubscriber()
{
    try
    {
        lock (subLock)...
        logger.LogInformation($"Redis 구독. Status : {subscriber.Multiplexer.GetStatus()}");

        await subscriber.UnsubscribeAsync(RedisChannel.Pattern(RedisConstant.PUBSUB_CONSUMER_CONFIG_DEPLOY_RESULT));
        var queue = await subscriber.SubscribeAsync(RedisChannel.Pattern(RedisConstant.PUBSUB_CONSUMER_CONFIG_DEPLOY_RESULT));
        queue.OnMessage...;
```

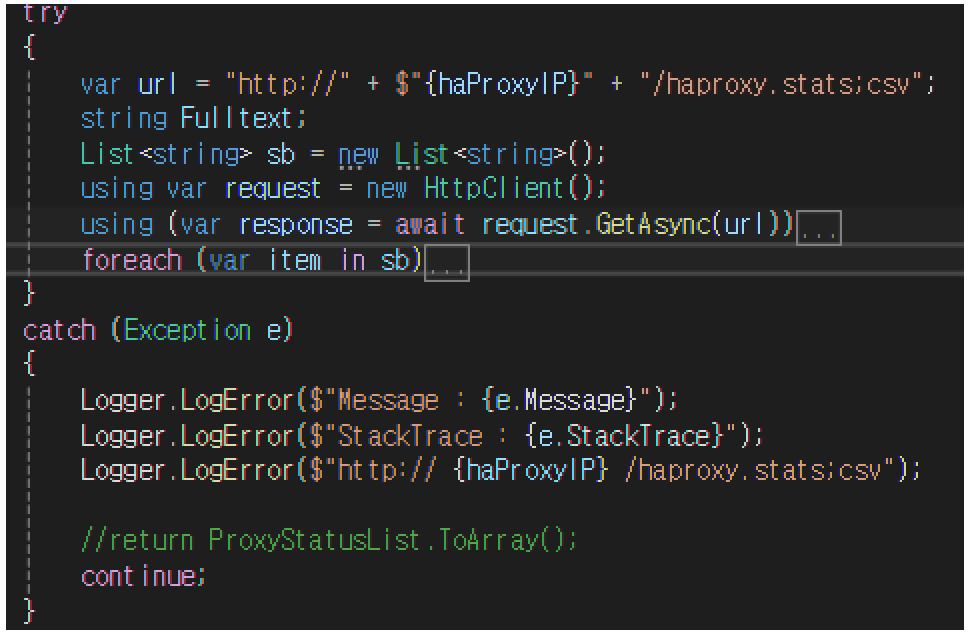
## **Problem solution -** Proxy Master 상태 확인.

- Proxy Socket 연결 후 Command 로 데이터 가져오도록 함.

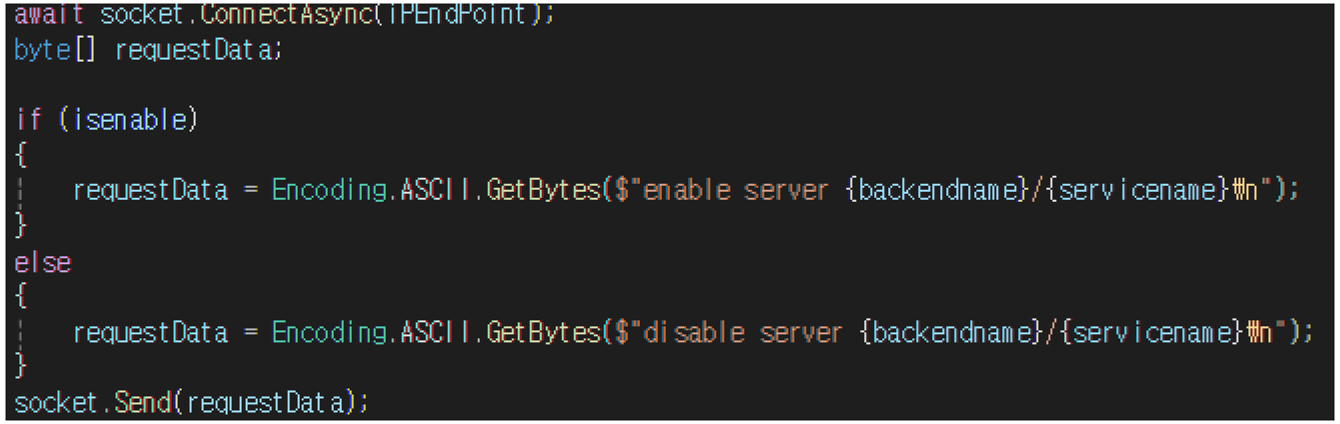


```
public async Task<string[]> GetServerStateAsync(IPEndPoint iPEndPoint)
{
    using (var socket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.IP))
    {
        // 서버에 연결
        await socket.ConnectAsync(iPEndPoint);

        // 명령어 전송
        byte[] requestData = Encoding.ASCII.GetBytes("show servers state₩n");
        socket.Send(requestData);
```

- Proxy Url 로 http 통신으로 데이터 받아 옴.



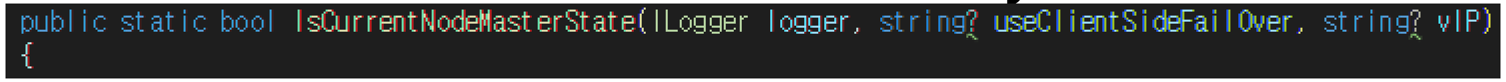
```
try
{
    var url = "http://" + $"{haProxyIP}" + "/haproxy.stats;csv";
    string Fulltext;
    List<string> sb = new List<string>();
    using var request = new HttpClient();
    using (var response = await request.GetAsync(url))...
    foreach (var item in sb)...
}
catch (Exception e)
{
    Logger.LogError($"Message : {e.Message}");
    Logger.LogError($"StackTrace : {e.StackTrace}");
    Logger.LogError($"http:// {haProxyIP} /haproxy.stats;csv");

    //return ProxyStatusList.ToArray();
    continue;
}
```



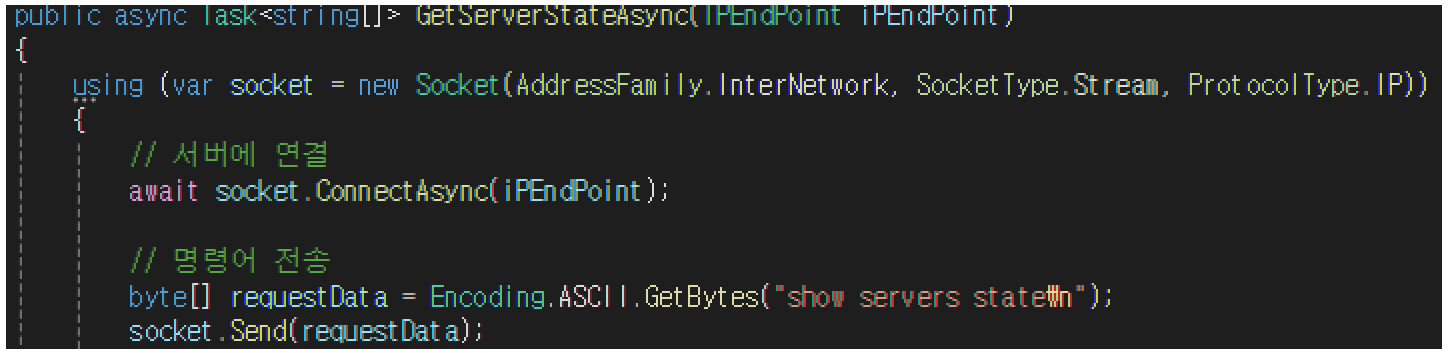
```
await socket.ConnectAsync(iPEndPoint);
byte[] requestData;

if (isenable)
{
    requestData = Encoding.ASCII.GetBytes($"enable server {backendname}/{servicename}₩n");
}
else
{
    requestData = Encoding.ASCII.GetBytes($"disable server {backendname}/{servicename}₩n");
}
socket.Send(requestData);
```

## **Problem solution -** Proxy Master 상태 확인.

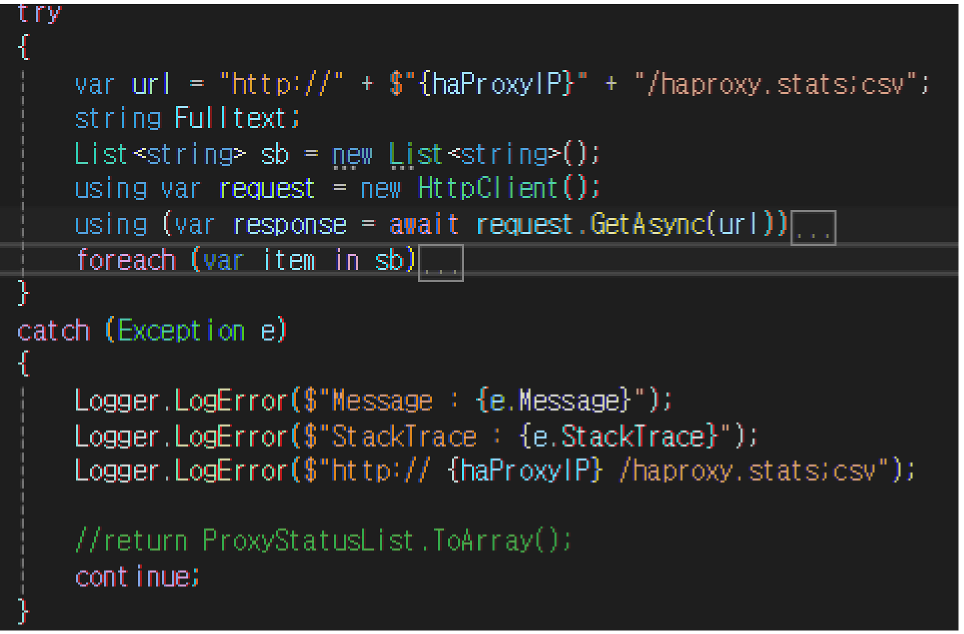
- Proxy Socket 연결 후 Command 로 데이터 가져오도록 함.
- 해당 MAS 의 IP 주소가 Proxy Master 주소 를 가지고 있는지 확인.



```
public static bool IsCurrentNodeMasterState(ILogger logger, string? useClientSideFailOver, string? vIP)
{
```

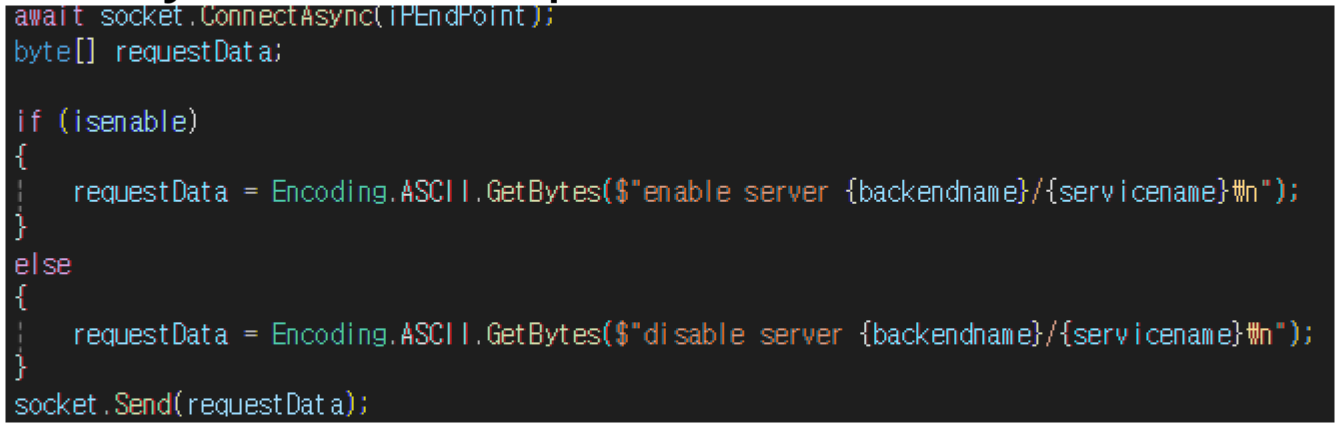


```
public async Task<string[]> GetServerStateAsync(IPEndPoint iPEndPoint)
{
    using (var socket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.IP))
    {
        // 서버에 연결
        await socket.ConnectAsync(iPEndPoint);

        // 명령어 전송
        byte[] requestData = Encoding.ASCII.GetBytes("show servers state\n");
        socket.Send(requestData);
```



```
try
{
    var url = "http://" + $"{haProxyIP}" + "/haproxy.stats;csv";
    string Fulltext;
    List<string> sb = new List<string>();
    using var request = new HttpClient();
    using (var response = await request.GetAsync(url))...
    foreach (var item in sb)...
}
catch (Exception e)
{
    Logger.LogError($"Message : {e.Message}");
    Logger.LogError($"StackTrace : {e.StackTrace}");
    Logger.LogError($"http:// {haProxyIP} /haproxy.stats;csv");

    //return ProxyStatusList.ToArray();
    continue;
}
```

Proxy Url 로 http 통신으로 데이터 받아 옴.



```
await socket.ConnectAsync(iPEndPoint);
byte[] requestData;

if (isenable)
{
    requestData = Encoding.ASCII.GetBytes($"enable server {backendname}/{servicename}\n");
}
else
{
    requestData = Encoding.ASCII.GetBytes($"disable server {backendname}/{servicename}\n");
}
socket.Send(requestData);
```

## Result Notes

- 통합 UI 하나로 EDA Operation 수행 가능.
- 안정적인 Redis 통신 가능
- DBType 에 따른 Swich 용이.
- Data 끊김 없이 Proxy 관리 가능.