```
# Charting Website Tiered Architecture
## **Tier Overview**
       NOOB
                            REGISTERED
                                                        VIPER
    (Anonymous)
                                                     ($3/month)
                               (Free)
  • Basic Plotly

    Enhanced

                                                   • Premium
  • Client-side
                           • Hybrid

    Server-heavy

  • Watermarked

    Watermarked

    Branded

  • IP-limited

    Session-limit

    Unlimited

## **Architecture Layers**
### **1. Client-Side Layer (All Tiers)**
                      CLIENT-SIDE LAYER
       File
                         Chart
                                           Export
      Upload
                        Rendering
                                           Tools
       Data
                         Basic
                                            Local
      Parsing
                        Styling
                                          Storage
### **2. Server-Side Layer (Tier-Dependent)**
                     SERVER-SIDE LAYER
       User
                         Chart
                                           Advanced
      Auth
                        Processing
                                          Analytics
                                           Custom
       Rate
                         Premium
                                          Branding
      Limiting
                        Features
## **Tier-Specific Architecture**
### **NOOB Tier Architecture**
                          NOOB TIER
   CLIENT-SIDE (100%)
       File
                         Basic
                                           Watermark
      Upload
                        Plotly
                                           System
   SERVER-SIDE (Minimal)
       ΙP
                         Rate
      Tracking
                        Limiting
```

```
**Server Calls:**
- `POST /api/track-usage` - IP-based usage tracking
- `GET /api/limits` - Check monthly limits
- `POST /api/watermark` - Generate watermarks
### **REGISTERED Tier Architecture**
                         REGISTERED TIER
   CLIENT-SIDE (80%)
        Enhanced
                            Advanced
                                                 Session
                                                Storage
        Upload
                            Styling
   SERVER-SIDE (20%)
        User
                            Enhanced
                                                 Code
        Auth
                           Processing
                                               Download
**Server Calls:**
- `POST /api/auth/login` - User authentication
- `POST /api/process-enhanced` - Enhanced chart processing
- `GET /api/download-code` - Code generation (limited per session)
- `POST /api/save-preferences` - User preferences
### **VIPER Tier Architecture**
                            VIPER TIER
   CLIENT-SIDE (40%)
        Premium
                                                 Advanced
                            Custom
        Upload
                            Branding
                                                 Export
   SERVER-SIDE (60%)
                                                 Analytics
        Premium
                            Advanced
       Processing
                           Features
                                                 & Stats
        Custom
                            Unlimited
                                                 Priority
       Branding
                            Downloads
                                                 Support
**Server Calls:**
- `POST /api/premium/process` - Premium chart processing
- `POST /api/branding/apply` - Custom branding application
- `GET /api/premium/features` - Advanced chart types
- `POST /api/analytics/track` - Usage analytics
- `GET /api/premium/downloads` - Unlimited downloads
## **Data Flow Architecture**
      USER
                            CLIENT
                                             .▶|
                                                   SERVER
   INTERFACE
                           SIDE
                                                  SIDE
```

Tier-

Specific

Local

Processing

Tier

Detection

```
## **Security & Code Protection Strategy**
### **Client-Side Protection**
                    CODE PROTECTION
       Obfuscate
                        Minify
                                          Split
       Critical
                        Code
                                          Logic
       Functions
                                          Across
                                          Tiers
       Server
                        Dynamic
      Validation
                        Loading
                                          Watermark
       Required
                        of Code
                                          All Tiers
### **Server-Side Validation**
                   SERVER VALIDATION
       Tier
                                          Feature
                        Rate
      Checking
                       Limiting
                                         Access
                                          ΙP
       User
                        Session
      Auth
                       Tracking
                                         Tracking
## **API Endpoint Architecture**
### **NOOB Endpoints**
/api/track-usage

    Track IP-based usage

/api/limits

    Check monthly limits

/api/watermark
                     - Generate watermarks
/api/basic-features - Basic chart features
### **REGISTERED Endpoints**
/api/auth/*
                     - Authentication
/api/enhanced/*
                     - Enhanced features
/api/download/*

    Code downloads (limited)

/api/preferences
                     - User preferences
### **VIPER Endpoints**
/api/premium/*
                     - Premium features
/api/branding/*
                     - Custom branding
/api/analytics/*
                     - Usage analytics
/api/unlimited/*
                     - Unlimited features
## **Scalability Considerations**
### **Cost Optimization**
- **NOOB**: Minimal server resources, heavy client-side
```

- **REGISTERED**: Balanced approach, session-based limits- **VIPER**: Server-heavy but optimized for cost efficiency

Performance Strategy - **Caching**: Server-side caching for common operations - **CDN**: Static assets served via CDN - **Load Balancing**: Distribute server load across instances - **Database**: Efficient queries, connection pooling ## **Implementation Roadmap** ### **Phase 1: NOOB Tier** - Implement IP-based tracking - Basic client-side functionality - Watermark system - Rate limiting ### **Phase 2: REGISTERED Tier** - User authentication system - Enhanced features - Session-based limits - Code download system ### **Phase 3: VIPER Tier** - Premium features - Custom branding - Analytics system - Unlimited downloads ## **Technical Requirements** ### **Frontend Technologies** - HTML5, CSS3, JavaScript (ES6+) - Plotly.js for charting - Local storage for session management - Canvas API for watermarking ### **Backend Technologies**

Security Measures

- AWS/GCP for cloud hosting

- JWT tokens for authentication

Python Flask/Django or Node.jsPostgreSQL/MongoDB for data storageRedis for caching and session management

- Rate limiting middleware
- Input validation and sanitization
- HTTPS encryption
- CORS configuration

This architecture provides a robust, scalable foundation that protects code while delivering appropriate functionality for each tier level.