Apollo Tyres R&D - Tyre Virtualization Tool Documentation

1. Project Background

The Apollo Tyres Tyre Virtualization Tool is an enterprise-level web application developed specifically for Apollo Tyres' Research and Development department. This comprehensive platform revolutionizes tyre simulation workflows by providing a centralized system for managing various simulation protocols, automating processes, and ensuring consistent results.

Purpose:-
- To streamline and standardize tyre simulation processes across the organization
- To reduce manual effort in simulation setup and execution
- To provide real-time monitoring and tracking of simulation jobs
- To maintain a secure and organized repository of simulation data

Key Capabilities:-
- Support for multiple industry-standard protocols (MF 6.2, MF 5.2, FTire, CDTire, and Custom)
- Automated workflow management and job scheduling
- Real-time status monitoring
- Secure user authentication and role-based access
- Centralized data storage and management

2. Navigation Guide for First-Time Users

Accessing the System:-
1. Open your web browser and navigate to http://localhost:3000
2. You will be presented with the login page

User Authentication:-
- For first-time access, use the default administrative credentials for engineers:
  - Email: admin@apollotyres.com
  - Password: Apollo@123

- For Manager access use.
  - Email: manager@apollotyres.com
  - Passwod: Manager@123

Main Dashboard Navigation:-
After successful login, you will see the main dashboard with the following sections:
1. Project Management
   - Create New Project
   - View Existing Projects
   - Project History

2. Protocol Selection
   - MF 6.2
   - MF 5.2
   - FTire
   - CDTire
   - Custom

3. Job Management
  - Start/Stop Simulations
  - Monitor Progress
  - View Results

3. System Setup Guide

Prerequisites:-

1. Hardware Requirements
  - Processor: Intel i5/AMD equivalent or higher
  - RAM: 16GB minimum recommended
  - Storage: 50GB free space
  - Operating System: Windows 10 or later

2. Software Requirements
  - Node.js (v14 or higher)
  - PostgreSQL (v12 or higher)
  - Abaqus Simulation Software
  - Modern web browser (Chrome/Firefox recommended)

Database Setup

PostgreSQL Installation
  - Download PostgreSQL from official website
  - Run installer with default settings
  - Set password for 'postgres' user
  - Note down installation directory

4. Installation Guide

Step 1: Node.js Installation
1. Download Node.js from [official website](https://nodejs.org/)
2. Run installer with default settings
3. Verify installation:
bash
node --version
npm --version

Step 2: Project Setup
1. Clone repository:
git clone https://github.com/NiteeshL/Apollo-Tyres.git
cd apollo-tyres

2. Install dependencies:
bash
npm install express pg bcrypt jsonwebtoken multer xlsx rimraf
npm install nodemon --save-dev

Step 3: Protocol Configuration

1. Create required directories:
mkdir -p protocols/MF62 protocols/MF52 protocols/FTire protocols/CDTire protocols/Custom

2. Copy template files:
- Place protocol Excel templates in respective directories
- Verify file permissions

5. Running the Project

Development Mode
npm run dev

Production Mode
npm start

Verification Steps
1. Check console for successful database connection
2. Navigate to http://localhost:3000
3. Login with admin credentials
4. Create test project
5. Upload sample Excel file
6. Monitor job execution

Monitoring and Maintenance
1. Regular Checks
   - Database connection status
   - File system storage
   - Job execution logs

2. Troubleshooting
   - Check server logs for errors
   - Verify database connectivity
   - Ensure Abaqus accessibility

3. Backup Procedures
   - Database backups
   - Configuration files
   - Project data

Support and Documentation

For technical support or additional information:
- Review internal documentation
- Check error logs

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