Date: February 14, 2026

Environment: AWS EC2 (Burstable Instance), Ubuntu 24.04 LTS

Objective: Fix broken installation script, recover from corrupted package manager state, and deploy a full stack (Oracle DB, Spring Boot, React).

Phase 1: Python Environment & Script Fixes

Issue: The initial deployment script hopefully-it-works.sh failed immediately due to strict error checking and OS-level Python protection (PEP 668).

1. **Unbound Variable Crash (set -u)**
    - **Error:** ./hopefully-it-works.sh: line 159: output: unbound variable
    - **Cause:** The script used set -u (treat unset variables as errors) but declared local output without a value.
    - **Fix:** Initialized variables explicitly:

      Bash

      ```
      local output=""
      local rc=0
      ```

2. **PEP 668 "Externally Managed Environment"**
    - **Error:** error: externally-managed-environment when running pip install.
    - **Cause:** Ubuntu 24.04 prevents pip from modifying system Python packages to avoid breakage.
    - **Fix:** Updated the pip command to bypass this protection explicitly for this project:

      Bash

      ```
      python3 -m pip install --no-cache-dir --break-system-packages --ignore-installed -r requirements.txt
      ```

Phase 2: Oracle Database Recovery ("The Zombie Package")

Issue: An attempted installation of Oracle Database 21c via alien failed, leaving apt and dpkg in a broken, unrecoverable state.

1. **Surgical Removal of Broken Package**
    - **Error:** dpkg: error processing package oracle-database-xe-21c / roohctl -enable failed.
    - **Fix:** We "neutered" the failing maintainer scripts to trick dpkg into removing the package.

      Bash

      ```
      echo "exit 0" | sudo tee /var/lib/dpkg/info/oracle-database-xe-21c.postinst
      echo "exit 0" | sudo tee /var/lib/dpkg/info/oracle-database-xe-21c.prerm
      sudo dpkg --purge --force-all oracle-database-xe-21c
      ```

2. **Manual "Bare Metal" Installation**
    - **Library Mismatch:** Oracle requires libaio1, but Ubuntu 24.04 provides libaio1t64.
    - **Fix:** Created a compatibility symlink:

      Bash

      ```
      sudo ln -s /usr/lib/x86_64-linux-gnu/libaio.so.1t64 /usr/lib/x86_64-linux-gnu/libaio.so.1
      ```

    - **RPM Conversion:** Converted the RedHat RPM to Ubuntu DEB using alien. *Note: This caused high CPU usage and throttling on the AWS T-series instance.*

      Bash

      ```
      sudo alien --scripts -i oracle-database-xe-21c-1.0-1.ol8.x86_64.rpm
      ```

3. **Database Configuration**
    - **Action:** Initialized the database instance and listeners.

      Bash

      ```
      sudo /etc/init.d/oracle-xe-21c configure
      ```

    - **Environment Persistence:** Added Oracle paths to .bashrc to fix sqlplus: command not found.

      Bash

      ```
      export ORACLE_HOME=/opt/oracle/product/21c/dbhomeXE
      export PATH=$PATH:$ORACLE_HOME/bin
      export ORACLE_SID=XE
      ```

Phase 3: Backend (Spring Boot) Troubleshooting

Issue: The launcher script 3mk-zoz.sh failed due to missing build tools and Java version mismatches.

1. **Missing Maven**
    - **Error:** mvn: command not found.
    - **Fix:** Installed Apache Maven:

      Bash

      ```
      sudo apt update && sudo apt install -y maven
      ```

2. **Root Path Logic Error**
    - **Error:** cd: /root/Teeth-Management-System/...: No such file.
    - **Cause:** Running the script with sudo changed the home directory ~ to /root.
    - **Fix:** Executed script as the standard user (ubuntu), which correctly resolved ~ to /home/ubuntu.
3. **Java Version Mismatch**
    - **Error:** Fatal error compiling: error: release version 17 not supported.

- **Cause:** System default was Java 11/8; Project pom.xml required Java 17.
- **Fix:** Installed and activated OpenJDK 17.

  Bash

  ```
  sudo apt install -y openjdk-17-jdk
  sudo update-alternatives --set java /usr/lib/jvm/java-17-openjdk-amd64/bin/java
  ```

Phase 4: Network & Access (The "It Works on My Machine" Fix)

Issue: The application was running successfully on the AWS server (ports 8080 and 5173), but was inaccessible from your local computer.

1. **Diagnosis:**
   - curl localhost:8080 on the server returned **403 Forbidden** (Success - Server is up).
   - Browser connection failed because the server's localhost is isolated from the public internet.
2. **Resolution: SSH Tunneling (Port Forwarding)**
   - Configured Termius to map remote ports to your local machine:
     - **Backend:** Remote 127.0.0.1:8080 $\to$ Local 8080
     - **Frontend:** Remote 127.0.0.1:5173 $\to$ Local 5173

Final System Status

- **Database:** Oracle Database 21c XE [Running, Tables Created]
- **Backend:** Java Spring Boot [Running on port 8080]
- **Frontend:** React/Vite [Running on port 5173]
- **Access:** Tunneled via SSH to Localhost.