**Port Checker Application**

I have designed this straightforward, cross-platform tool using Python and PyQt5 for monitoring and diagnosing TCP and UDP ports on both local and remote machines. The application checks essential ports for HP Anyware PCoIP Agents, performs ping tests, NSLookup, and custom port checks, all within a simple and user-friendly interface that provides real-time feedback. It uses multithreading to keep the application responsive and includes a Dark Mode for ease of use in low-light conditions.

**Key Features**

* **Local and Remote Port Checks**:
  + Uses the socket module to create TCP and UDP sockets for checking if ports are open or closed on local and remote machines.
  + Uses psutil to list active UDP connections on the local machine, verifying if required ports are in use.
  + Specifically verifies ports needed for HP Anyware PCoIP Agents:
    - **TCP 443**: Client Authentication (Inbound)
    - **TCP 4172**: PCoIP Session Establishment (Inbound)
    - **UDP 4172**: PCoIP Session Data (Inbound and Outbound)
    - **TCP 60443**: Connection Broker Communication (Inbound)
    - **TCP 443**: Cloud Licensing (Outbound)
  + Ensures consistent functionality across both local and remote environments.
* **Ping Test**: Tests the reachability of remote hosts by IP address or domain, quickly assessing network connectivity.
* **NSLookup**: Resolves domain names to IP addresses or vice versa, aiding in diagnosing network name resolution issues.
* **Custom Port Check**: Allows users to specify custom ports or ranges, with optional IP addresses, to check their status on local or remote machines.
* **Cross-Platform Executables**: The application is packaged as executables for Windows, macOS, and Linux using GitHub Actions for CI/CD and PyInstaller.
* **Dark Mode**: Toggle between light and dark themes, reducing eye strain, especially in low-light conditions.

**Multithreading with QThread**

* **PortCheckWorker Class**:
  + Runs port checks in a separate thread using the QThread class, keeping the GUI responsive.
  + Processes each port check concurrently, sending results back to the main thread to update the GUI with real-time statuses.
* **Multithreading Workflow**:
  + The main GUI initiates the worker thread with a list of ports and a checking function.
  + The worker thread performs the checks independently, and the results are displayed live in the application.

**Usage Commands for Different OS**

1. **Windows**  
   After downloading the executable:
   * Double-click to open, or:
     1. Open the Command Prompt.
     2. Navigate to the executable's directory.
     3. Run:

port\_checker.exe

1. **macOS**  
   After downloading the executable:
   * 1. Open the Terminal.
     2. Navigate to the executable's directory.
     3. Make the file executable:

* chmod +x port\_checker
* sudo ./port\_checker

1. **Linux**  
   After downloading the executable:
   * 1. Open the Terminal.
     2. Navigate to the executable's directory.
     3. Make the file executable:

* chmod +x port\_checker
* sudo ./port\_checker

This setup ensures efficient use of the Port Checker across platforms, verifying that HP Anyware ports are properly configured and accessible.