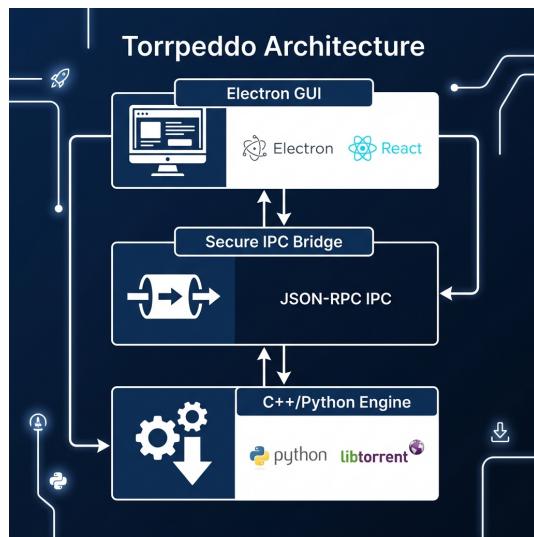


# TORRPEDDO PROJECT

## BOOK



### Executive Summary

Torrpedo is an industrial-grade, premium torrent client designed for the modern desktop. Built primarily with Python and the Electron framework, Torrpedo leverages the powerful `libtorrent` suite to offer a seamless, high-performance experience that bridges the gap between complex network protocols and professional user interfaces.

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### Architectural Deep Dive

Torrpedo follows a decoupled architectural pattern, separating the presentation layer from the core logic and network engine. This is achieved through three primary layers:

## **1. Frontend: Electron Framework**

What is Electron?

Electron is an open-source framework developed by GitHub that allows developers to build cross-platform desktop applications using web technologies: HTML, CSS, and JavaScript. It combines the Chromium rendering engine (for the UI) and the Node.js runtime (for system-level access).

Benefits for Torrpedo:

- Visual Excellence: Leveraging the full power of modern CSS and web components to create a "WOW" factor UI that feels premium.

## **2. The Bridge: IPC (Inter-Process Communication)**

What is IPC?

IPC, or Inter-Process Communication, is a mechanism that allows different processes to share data and coordinate actions. In Torrpedo, we use a custom IPC bridge to connect the Electron frontend with the Python backend.

Implementation: Secure JSON-RPC

Communication is handled via a JSON-RPC protocol over stdin/stdout channels.

Why this approach?

- Decoupling: The engine can be updated, debugged, or even replaced without touching the UI.

### **3. Backend Engine: Python & libtorrent**

The Core: libtorrent with Python Bindings

At the heart of Torpedo is `libtorrent`, a feature-complete BitTorrent implementation. While the underlying engine is implemented in high-performance C++, Torpedo utilizes the official Python bindings for rapid development and seamless integration with the bridge logic.

Multi-threaded Performance:

- Engine Level: The `libtorrent` 2.0+ engine utilizes an internal thread pool for disk I/O, network polling, and piece validation. This allows for parallel processing of multiple torrent fragments simultaneously.

## **Development Process & Methodology**

The Torpeddo project followed a "Platform-First" methodology:

1. Language Choice: Python was selected for its extensive library support and ease of integration with libtorrent and IPC protocols.

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