

## 40. SIMPLE DIRECTMEDIA LAYER

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Simple DirectMedia Layer as a technology for handling various multimedia computer systems, including video, sound, input/output systems is introduced in this paper.

This paper delves into the key features of SDL and its applications in creating interactive applications. SDL stands for Simple DirectMedia Layer. It is an open-source cross-platform development library created to provide low-level access to audio, input/output, and graphics hardware. SDL is widely used in the development of computer games, multimedia applications and emulators due to its simplicity and efficiency.

SDL was conceived in 1996-1997 by Sam Latinga, a former head software developer at Loki Software during his work on the emulator of Microsoft Windows for Macintosh. Utilizing subprograms originally developed for the emulator, SDL's design facilitated integration into Macintosh, Windows, and Linux programs. At present, SDL is supported by a substantial open-source community constantly enhancing the library and initiating new projects based on SDL. It is noteworthy to mention that SDL was integrated in prominent projects like "Team Fortress 2" by Valve Software [1].

Primarily coded in C and compatible with C++, SDL offers various versions tailored for use with different programming languages: Python, C# and other languages. Initially designed to operate with graphics including pixel manipulation, audio, joystick, input/output, and CD-ROM systems, SDL's performance can be significantly enhanced with supplementary modules like "SDL\_image," "SDL\_ttf," "SDL\_mixer," providing additional functionality for managing images, sounds, fonts, and networks.

Simple DirectMedia Layer API (Application programming interface) is procedural, focusing on providing functions instead of high-level structures with their own methods. Thus, the creation of top-level abstractions is almost completely delegated to the developer. As a result, any meaningful application made with SDL requires manual initialization of all subsystems being operated and the creation of its own event loop for handling requests from the computer subsystems and maintaining the program's lifecycle. The example of the C++ program with the event loop is given below:

```
int main(int argc, const char * argv[]) {
    SDL_Init(SDL_INIT_VIDEO); //SDL and video subsystem initialization
    SDL_Window* window = SDL_CreateWindow("test", 10, 10, 640, 480, 0);
    SDL_Event e; bool running = true; while (running) { //Event loop.
        while (SDL_PollEvent(&e)) { if (e.type == SDL_QUIT) running = false; } }
    SDL_Quit(); return 0;}
```

Most subprograms are engineered to function uniformly on major platforms. That streamlines project development for diverse computers and operating systems through minimizing platform-specific intricacies such as window management and hardware acceleration challenges. Consequently, SDL creators manage the majority of platform distinctions, enabling developers to concentrate on project design. The official SDL Wiki [2] serves as a comprehensive electronic repository detailing all functions and structures offered by the library, encompassing their structural references, platform-specific attributes, and practical usage illustrations.

Simple DirectMedia Layer provides developers with a comprehensive range of low-level access to hardware resources, thereby serving as a versatile and indispensable tool that streamlines the intricate process of developing multimedia applications greatly. Its inherent cross-platform compatibility, steadfast support of hardware acceleration, and resilient audio and input handling capabilities position SDL as a preminent solution for game developers and multimedia designers.

### References:

1. Simple DirectMedia Layer [Electronic resource]. – Mode of access: [www.libsdl.org](http://www.libsdl.org). – Date of access: 05.03.2024.
2. SDL Wiki [Electronic resource]. – Mode of access: <https://wiki.libsdl.org/SDL2/FrontPage>. – Date of access: 04.03.2024.