New Year garland

Max duration time: 2 days

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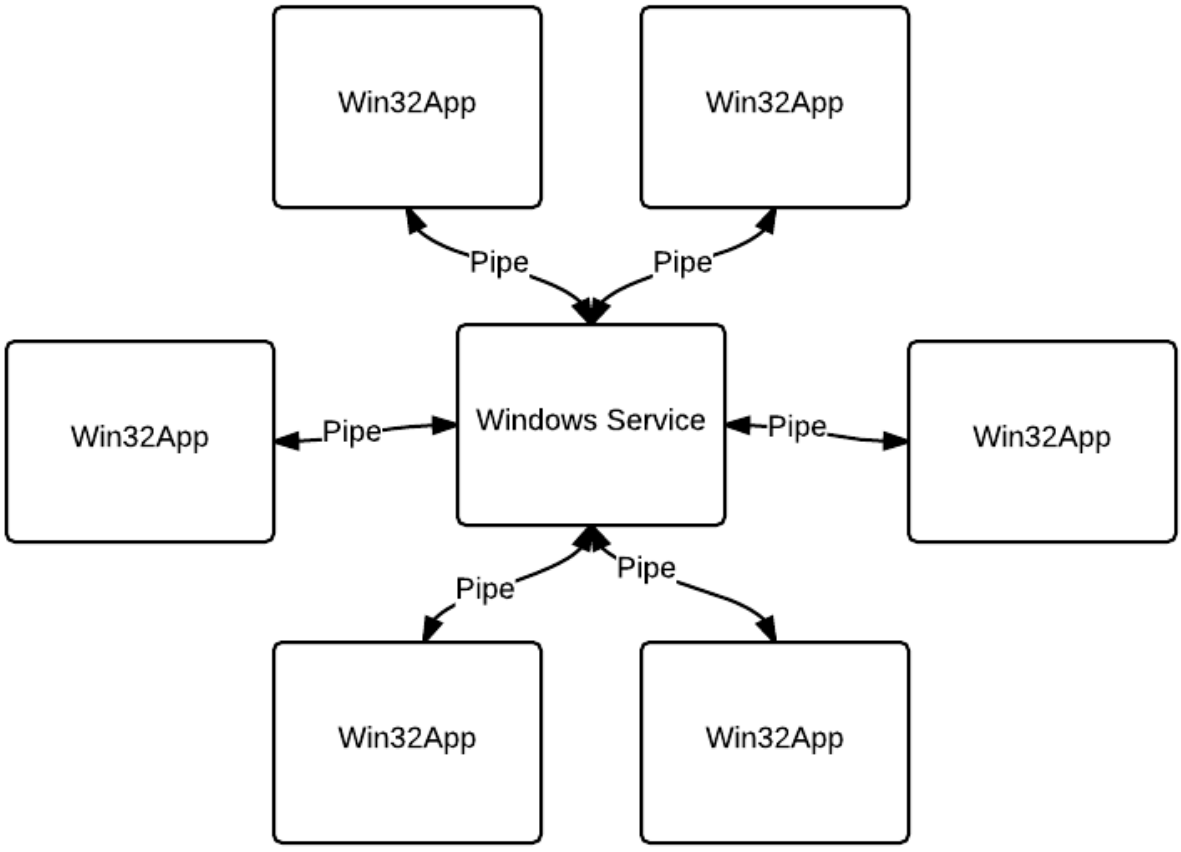
Overview

This document is private property of Infostroy Ltd company. The test task described in this document designed for junior C++ developers. This task is not a part of real project and one will be never used as part of real project. The goal of this task is verification the employee skills.

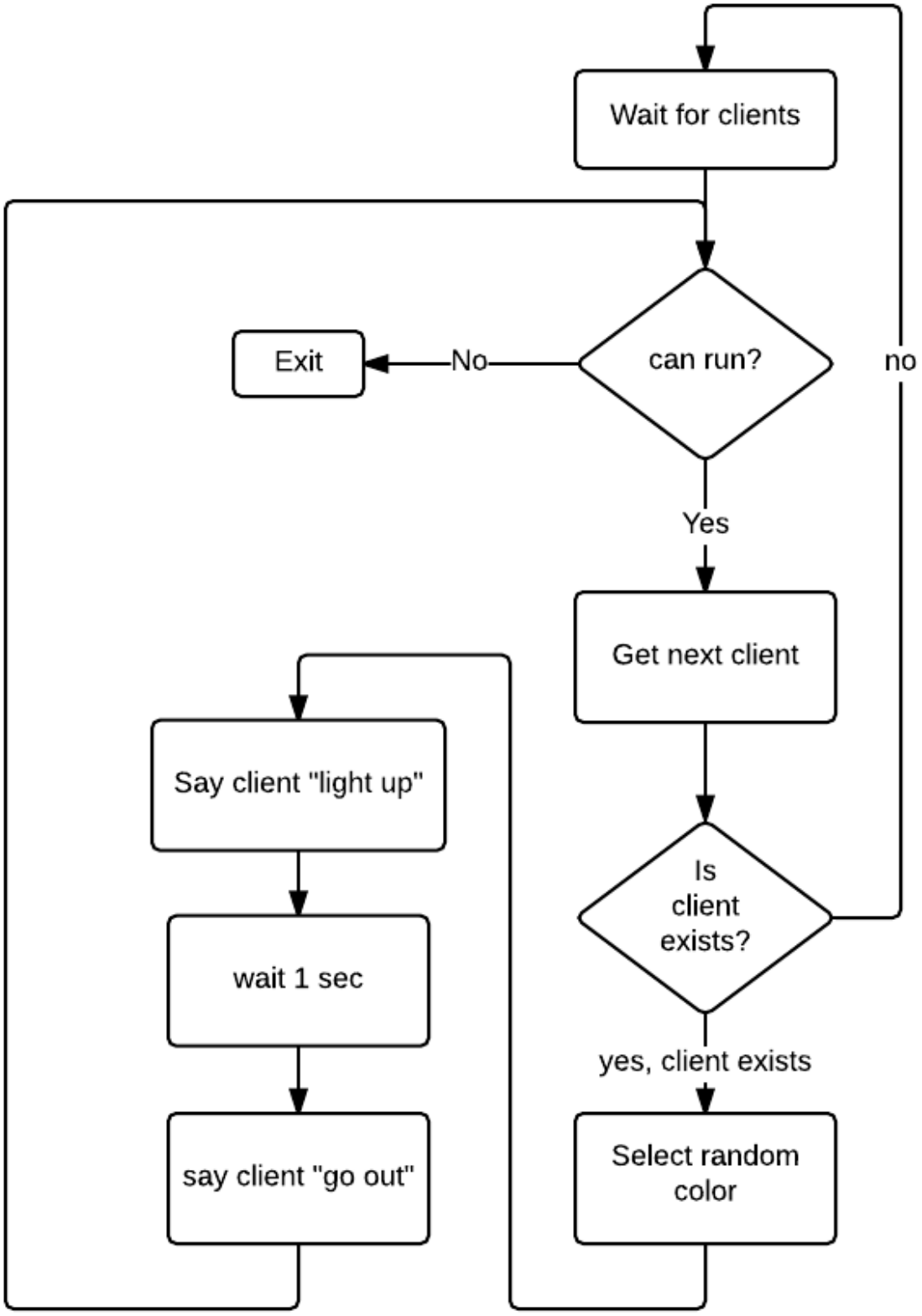
The New Year holidays are coming soon, so the New Year theme is very actual. Because of this we decided to create test task called “New Year garland” :-)

The project is very simple, several win32 applications, which draw one lightbulb of garland, connect to the Windows Service and service manages which lightbulb will light in particular period of time. The high level architecture displayed below:

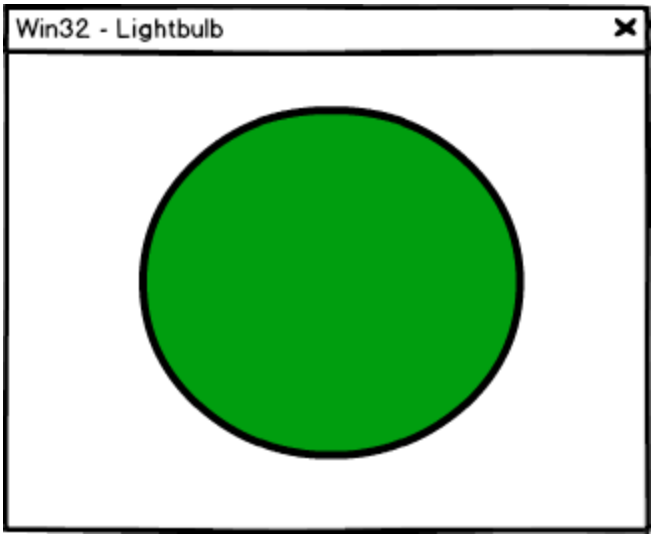


The Windows Service works as pipe server. The amount of connected win32 applications must be unlimited. So user can start for example 10 clients and see mini light show.

The service must keep track connected clients. When at least one client connected, the service must start garland logic and inform each client when and which color the client must draw. The flow diagram of this process displayed below:



The UI part of win32 application must be simple as possible. For example the following UI will work ok:



Technologies

- c++/c++11
- Win32
- Win API
- Threads
- Interprocess communications (Event, Pipe, Mutex)
- GDI/GDI+
- Windows Services

Technical requirements

The application consists of two parts:

- Windows Service, which manages connected clients;
- Win32 app, with can ability connect to the Windows Service and also can draw lightbulb.

The interprocess communication between service and clients must be organized by using pipes and events.

Windows Service

The Windows Service must be implemented by using Win32 API. For more information see this link: http://msdn.microsoft.com/en-us/library/windows/desktop/ms685141(v=vs.85).aspx

The service must be organized as pipe server. So, after starting, it must wait for new clients as long as service running. The name of the pipe can be hardcoded.

The name of the service must be: “New Year Garland”.

Win32 App

The client application must be implemented as simple Win32 App. This app works as pipe client. So, during startup it must try connect to the pipe server (our Windows Service). If connection is failed, client app must display simple message and shut down. When connection is ok, the app must wait for commands from service. So when service says “light up”, the app displays lightbuble (see Overview section).

The app must shutdown when connection with pipe server is lost. For example user can start 50 clients and then stop Windows Service by using Service Control Manager. In this case all client applications must be closed without any messages.

Delivery requirements

The sources codes must be zipped into single archive. Also the archive must include all description how to build and run the application.