# Техническое задание на программу для ЭВМ «Планировщик задач» версия 1.

# 1. Описание

Программа представляет собой программу для планирования задач согласно заданного алгоритма. Проекты, под которые планируются задачи, хранятся в базе данных в виде дерева. Проект содержит ряд полей, использующихся для вычисления очередного проекта, добавляющегося в задачи.

Программа состоит из сервера, осуществляющего работу с данными, web-клиента и десктопного клиента.

# 2. Логика работы

В приложении две основных сущности – «проект» и «расписание». Проекты – базовые структуры, хранящиеся в виде дерева. Выбор проекта для добавления в расписание осуществляется с помощью формулы на основании нескольких полей проекта. Добавление выбранного проекта в расписание осуществляется на основании политики добавления.

Политика представляет собой набор условий и действий при выполнении условий. Одно из условий может быть на добавление проекта в расписание. Если условие не выполняется, выборка проекта не сохраняется, все действия откатываются. Если условие на добавление в расписание отсутствует, проект добавляется в расписание безусловно.

К проекту в один момент времени может быть привязана одна политика. Если проект без политики, используется политика по умолчанию для данного пользователя.

Дерево проектов можно привязать к файловой системе на клиентской (только при использовании десктопного клиента) или серверной стороне.

Добавление проектов в расписание выполняется либо вручную, либо можно настроить периодическое задание (настраивается как периодичность выполнения, так и условия очередного выполнения).

# 3. Требования

Сервер должен обрабатывать не менее 300 запросов в секунду. Выбор и добавление проекта в расписание должно занимать не более пяти секунд при количестве проектов не более 10000.

Ограничение авторизаций пользователя: не более трёх неудачных попыток за 10 минут. Уведомление о попытках неудачных авторизаций после десяти подряд.

Роли в первой версии не предусмотрены.

# 4. Технологии

## 4.1. Сервер

* EntityFramework
* ASP .NetCore
* .NetCore 3.x
* Swagger
* Jwt bearer
* Serilog

## 4.2. Базы данных

* PostgreSQL (сервер)
* SqLite (клиент)

## 4.3. Тестирование

* XUnit
* Moq

## 4.4. Web-client

* ASP .NetCore
* ReactJS или AngularJS
* Html
* Css
* JQuery

## 4.5. Установщик

* WixInstaller

## 4.6. Клиент

* SqLite (+ EntityFramework?)
* .Net Framework 4.7
* WPF
* HttpClient

# 5. Лицензирование

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Исходные коды хранятся на Github. Очередной релиз выпускается после окончания всех работ по очередному ТЗ и прохождения всех тестов. Мажорная версия выпускается если доработки не содержат обратной совместимости. Иначе выпускается минорная версия. Для исправлений и мелких доработок выпускается патч.

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# 7. Модели данных

## 7.1. Модели базы данных

### 7.1.1. user

***user:***

***id uuid not null primary key,***

***name varchar(100) not null,***

***description varchar(1000) null,***

***login varchar(100) not null,***

***password varchar(100) not null,***

***version\_date timestamptz not null,***

***is\_deleted boolean not null default false,***

***unique index (login) where not is\_deleted***

### 7.1.2. project

***project:***

***id uuid not null primary key,***

***name varchar(100) not null,***

***path\_name varchar(255) not null,***

***description varchar(1000) null,***

***user\_id uuid null,***

***parent\_id uuid null,***

***priority int not null default 1,***

***period int null,***

***cycle\_period int not null default 4320,***

***add\_time int null,***

***last\_used\_date timestamptz not null,***

***select\_count int not null default 0,***

***is\_leaf bool not null default true,***

***add\_fields json null,***

***is\_private bool not null default true,***

***version\_date timestamptz not null,***

***is\_deleted boolean not null default false,***

***unique index (parent\_id, path\_name) where not is\_deleted***

***constraint fk\_project\_parent\_id foreign key (parent\_id, user\_id) references project(id, user\_id),***

***constraint fk\_project\_user\_id foreign key (user\_id) references user(id)***

***index idx\_project\_user\_id (user\_id)***

***index idx\_project\_parent\_id (parent\_id)***

***index idx\_project\_ last\_used\_date (last\_used\_date)***

### 7.1.3. user\_history

***user\_history:***

***h\_id long not null primary key,***

***id uuid null,***

***name varchar(100) null,***

***description varchar(1000),***

***login varchar(100) null,***

***password varchar(100) null,***

***version\_date timestamptz null,***

***is\_deleted boolean null,***

***change\_date timestamptz not null,***

### 7.1.4. settings

***settings:***

***id uuid not null primary key,***

***param\_name varchar(100) not null,***

***param\_value varchar(1000) null,***

### 7.1.5. schedule

***schedule:***

***id uuid not null primary key,***

***project\_id uuid not null,***

***userid uuid not null,***

***order bigint not null,***

***begin\_date timestamptz not null,***

***end\_date timestamptz not null,***

***elapsed\_time int not null default 0,***

***version\_date timestamptz not null,***

***is\_deleted boolean not null default false,***

***unique index (userid, order) where not is\_deleted***

***constraint fk\_schedule\_user\_id foreign key (user\_id) references user(id, user\_id),***

***constraint fk\_schedule\_project\_id foreign key (project\_id) references project(id)***

***index idx\_schedule\_user\_id (userid)***

***index idx\_schedule\_project\_id (project\_id)***

***index idx\_ schedule \_ begin\_date (begin\_date)***

***index idx\_ schedule \_ end\_date (end\_date)***

***index idx\_ schedule \_ order (order)***

### 7.1.6. project\_history

***project\_history:***

***h\_id long not null primary key,***

***id uuid null,***

***name varchar(100) null,***

***path\_name varchar(255) null,***

***description varchar(1000) null,***

***user\_id uuid null,***

***parent\_id uuid null,***

***priority int null,***

***period int null,***

***cycle\_period int null,***

***add\_time int null,***

***last\_used\_date timestamptz null,***

***select\_count int null ,***

***is\_leaf bool null,***

***add\_fields json null,***

***is\_private bool null,***

***version\_date timestamptz null,***

***is\_deleted boolean null,***

***change\_date timestamptz not null,***

***index idx\_project\_history\_user\_id (user\_id)***

***index idx\_project\_history\_id (id)***

***index idx\_project\_history\_change\_date (change\_date)***

### 7.1.7. h\_schedule

***h\_schedule:***

***h\_id long not null primary key,***

***id uuid null,***

***project\_id uuid null,***

***userid uuid null,***

***order bigint null,***

***begin\_date timestamptz null,***

***end\_date timestamptz null,***

***elapsed\_time int null,***

***version\_date timestamptz null,***

***is\_deleted boolean null,***

***change\_date timestamptz not null,***

### 7.1.8. formula

***formula:***

***id uuid not null primary key,***

***name varchar(100) not null,***

***text varchar(1000),***

***is\_default Boolean not null,***

***version\_id uuid not null,***

***version\_num int not null,***

***version\_date timestamptz not null,***

***is\_deleted boolean not null***

***constraints:***

***unique name where not is\_deleted***

***unique version\_id***

***unique (version\_num, id )***

## 7.2. Серверные

### 7.2.1. User

#### 7.2.2.1. User

***User: Entity***

***{***

***public string Name;***

***public string Description;***

***public string Login;***

***public string Password;***

***}***

#### 7.2.2.2. UserHistory

***UserHistory: EntityHistory***

***{***

***public string Name;***

***public string Description;***

***public string Login;***

***public string Password;***

***}***

## 7.3. Клиентские

### 7.3.1. Пользователь

#### 7.3.1.1. User

***User: Entity***

***{***

***public string Name;***

***public string Description;***

***public string Login;***

***public string Password;***

***}***

#### 7.3.1.2. UserIdentity

***UserIdentity: IIdentity***

***{***

***public string Login;***

***public string Password;***

***}***

#### 7.3.1.1. UserCreator

***UserCreator***

***{***

***public string Name;***

***public string Description;***

***public string Login;***

***public string Password;***

***}***

### 7.3.2. Проекты

#### 7.3.2.2. ProjectHistory

***ProjectHistory: EntityHistory***

***{***

***public string Name ;***

***public string Path ;***

***public Guid? ParentId ;***

***public bool IsLeaf ;***

***public DateTimeOffset? LastUsedDate ;***

***public int? Period ;***

***public int Priority;***

***}***

### 7.3.3. Базовый класс

#### 7.3.3.1. Entity

***Entity***

***{***

***public Guid Id;***

***}***