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1 Компоненты

Клиентское подключение:

- [cmp_http_client_wasm](./cmp_http_client_wasm.md)
- [cmp_http_client](./cmp_http_client.md)
- [cmp_modbus_client](./cmp_modbus_client.md)
- [cmp_websocket_client_wasm](./cmp_websocket_client_wasm.md)
- [cmp_websocket_client](./cmp_websocket_client.md)

Сервера:

- [cmp_http_server_esp](./cmp_http_server_esp.md)
- [cmp_http_server](./cmp_http_server.md)
- [cmp_websocket_server](./cmp_websocket_server.md)

Брокеры сообщений:

- [cmp_esp_mqtt_client](./cmp_esp_mqtt_client.md)
- [cmp_mqtt_client](./cmp_mqtt_client.md)
- [cmp_redis_client](./cmp_redis_client.md)

Интерфейс пользователя:

- [cmp_leptos](./cmp_leptos.md)
- [cmp_slint](./cmp_slint.md)

Авторизация:

- [cmp_auth](./cmp_auth.md)

Сохранение данных:

- [cmp_esp_nvs](./cmp_esp_nvs.md)
- [cmp_influxdb](./cmp_influxdb.md)
- [cmp_surrealdb](./cmp_surrealdb.md)
- [cmp_timescaledb](./cmp_timescaledb.md)
- [cmp_webstorage](./cmp_webstorage.md)

Взаимодействие с аппаратной частью

- [cmp_esp_adc](./cmp_esp_adc.md)
- [cmp_esp_gpio](./cmp_esp_gpio.md)
- [cmp_esp_wifi](./cmp_esp_wifi.md)
- [cmp_raspberrypi_gpio](./cmp_raspberrypi_gpio.md)

Логика исполнения

- [cmp_plc](./cmp_plc.md)

Систеная информация

- [cmp_system_info](./cmp_system_info.md)

Служебные компоненты:

- [cmp_add_input_stream](./cmp_add_input_stream.md)
- [cmp_add_output_stream](./cmp_add_output_stream.md)
- [cmp_derive](./cmp_derive.md)
- [cmp_external_fn_process](./cmp_external_fn_process.md)
- [cmp_inject_periodic](./cmp_inject_periodic.md)
- [cmp_logger](./cmp_logger.md)

1.1 cmp_add_input_stream

1.2 cmp_add_output_stream

1.3 cmp_auth

Компонент авторизации пользователей

1.3.1 Платформы

target triple	Поддержка
aarch64-linux-android	-
aarch64-unknown-linux-gnu	+
riscv32imc-esp-espidf	-
x86_64-linux-android	-
x86_64-unknown-linux-gnu	+
wasm32-unknown-unknown	-

1.3.2 Конфигурация

1.3.2.1 Config

secret_key	String	Секретный ключ для валидации токенов
store		Хранилище данных доступа
Локальное сохранение: store: cmp_auth::ConfigStore::Local(vec! [cmp_auth::ConfigStoreLocalItem { login: "admin".into(), password: "admin".into(), role: AuthPermissions::Admin, }]),		

1.4 cmp_derive

1.5 cmp_esp_adc

1.6 cmp_esp_gpio

Компонент для работы с входами и выходами GPIO микроконтроллера ESP

target triple	Поддержка
aarch64-linux-android	-
aarch64-unknown-linux-gnu	-
riscv32imc-esp-espidf	+
x86_64-linux-android	-
x86_64-unknown-linux-gnu	-
wasm32-unknown-unknown	-

1.6.1 Конфигурация

1.6.1.1 Config

inputs	Конфигурация входов
<pre>inputs: vec![cmp_esp_gpio::ConfigGpioInput { peripherals: peripherals.pins.gpio9.into(), fn_output: value Message::new_custom(Custom::EspBootButton(value)), }],</pre>	
outputs	Конфигурация выходов
<pre>outputs: vec![cmp_esp_gpio::ConfigGpioOutput { peripherals: peripherals.pins.gpio1.into(), fn_input: msg match msg.data { MsgData::Custom(Custom::EspRelay(value)) => Some(value), _ => None, }, is_low_triggered: false, }],</pre>	

1.7 cmp_esp_mqtt_client

Клиент MQTT микроконтроллера ESP32

1.7.1 Платформы

target triple	Поддержка
aarch64-linux-android	-
aarch64-unknown-linux-gnu	-
riscv32imc-esp-espidf	+
x86_64-linux-android	-
x86_64-unknown-linux-gnu	-
wasm32-unknown-unknown	-

1.8 cmp_esp_nvs

1.9 cmp_esp_wifi

1.10 cmp_external_fn_process

1.11 cmp_http_client

1.12 cmp_http_client_wasm

1.13 cmp_http_server

1.14 cmp_http_server_esp

1.15 cmp_influxdb

1.16 cmp_inject_periodic

1.17 cmp_leptos

Компонент для интеграции веб-приложения на основе фреймворка [Leptos](https://leptos.dev).

1.17.1 Платформы

target triple	Поддержка
aarch64-linux-android	-
aarch64-unknown-linux-gnu	-
riscv32imc-esp-espidf	-
x86_64-linux-android	-
x86_64-unknown-linux-gnu	-
wasm32-unknown-unknown	+

1.17.2 Конфигурация

1.17.2.1 Config

body_component	Корневой компонент для монтирования
body_component:	view! { <App/> }
hostname	Имя хоста, на котором развернуто веб-приложение

1.17.3 Создание проекта

1.17.3.1 .vscode/settings.json

```
{
  "rust-analyzer.cargo.target": "wasm32-unknown-unknown"
}
```

1.17.3.2 Tauri

```
cargo create-tauri-app --beta
```

```
# добавить поддержку Android
cargo tauri android init
```

1.17.3.3 Tailwind

Установить:

```
npm install -D tailwindcss
npm install -D @tailwindcss/forms
npx tailwindcss init
```

Создать файл tailwind.config.js:

```
/** @type {import('tailwindcss').Config} */

module.exports = {
  content: {
    files: [
      "*.html",
      "./src/**/*.rs",
      "../rsiot/src/components/cmp_leptos/components/**/*.rs"
    ],
  },
  plugins: [require('@tailwindcss/forms').],
}
```

Создать файл input.css в корне проекта:

```
@tailwind base;
@tailwind components;
@tailwind utilities;
```

Добавить в index.html:

```
<html>
  <head>
    <!-- Подключаем стили Tailwind -->
    <link data-trunk rel="tailwind-css" href="input.css" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
  </head>
</html>
```

1.17.3.4 Material Theme

Создаем тему в Material Theme Builder. Скачиваем набор файлов css, распаковываем в папку material-theme. В начале файла input.css прописываем:

```
/* Material theme */
@import "../material-theme/dark.css";
```

```
@import "../material-theme/dark-hc.css";
@import "../material-theme/dark-mc.css";
@import "../material-theme/light.css";
@import "../material-theme/light-hc.css";
@import "../material-theme/light-mc.css";
```

Прописать секцию theme в tailwind.config.json:

```
module.exports = {
  content: {
    files: [...],
  },
  plugins: [...],
  theme: {
    extend: {
      colors: {
        primary: "var(--md-sys-color-primary)",
        "surface-tint": "var(--md-sys-color-surface-tint)",
        "on-primary": "var(--md-sys-color-on-primary)",
        "primary-container": "var(--md-sys-color-primary-container)",
        "on-primary-container": "var(--md-sys-color-on-primary-container)",
        secondary: "var(--md-sys-color-secondary)",
        "on-secondary": "var(--md-sys-color-on-secondary)",
        "secondary-container": "var(--md-sys-color-secondary-container)",
        "on-secondary-container": "var(--md-sys-color-on-secondary-container)",
        tertiary: "var(--md-sys-color-tertiary)",
        "on-tertiary": "var(--md-sys-color-on-tertiary)",
        "tertiary-container": "var(--md-sys-color-tertiary-container)",
        "on-tertiary-container": "var(--md-sys-color-on-tertiary-container)",
        error: "var(--md-sys-color-error)",
        "on-error": "var(--md-sys-color-on-error)",
        "error-container": "var(--md-sys-color-error-container)",
        "on-error-container": "var(--md-sys-color-on-error-container)",
        background: "var(--md-sys-color-background)",
        "on-background": "var(--md-sys-color-on-background)",
        surface: "var(--md-sys-color-surface)",
        "on-surface": "var(--md-sys-color-on-surface)",
        "surface-variant": "var(--md-sys-color-surface-variant)",
        "on-surface-variant": "var(--md-sys-color-on-surface-variant)",
        outline: "var(--md-sys-color-outline)",
        "outline-variant": "var(--md-sys-color-outline-variant)",
        shadow: "var(--md-sys-color-shadow)",
        scrim: "var(--md-sys-color-scrim)",
        "inverse-surface": "var(--md-sys-color-inverse-surface)",
        "inverse-on-surface": "var(--md-sys-color-inverse-on-surface)",
        "inverse-primary": "var(--md-sys-color-inverse-primary)",
        "primary-fixed": "var(--md-sys-color-primary-fixed)",
        "on-primary-fixed": "var(--md-sys-color-on-primary-fixed)",
        "primary-fixed-dim": "var(--md-sys-color-primary-fixed-dim)",
        "on-primary-fixed-variant": "var(--md-sys-color-on-primary-fixed-variant)",
        "secondary-fixed": "var(--md-sys-color-secondary-fixed)",
        "on-secondary-fixed": "var(--md-sys-color-on-secondary-fixed)",
        "secondary-fixed-dim": "var(--md-sys-color-secondary-fixed-dim)",
        "on-secondary-fixed-variant": "var(--md-sys-color-on-secondary-fixed-variant)",
        "tertiary-fixed": "var(--md-sys-color-tertiary-fixed)",
        "on-tertiary-fixed": "var(--md-sys-color-on-tertiary-fixed)",
        "tertiary-fixed-dim": "var(--md-sys-color-tertiary-fixed-dim)",
        "on-tertiary-fixed-variant": "var(--md-sys-color-on-tertiary-fixed-variant)",
        "surface-dim": "var(--md-sys-color-surface-dim)",
        "surface-bright": "var(--md-sys-color-surface-bright)",
        "surface-container-lowest": "var(--md-sys-color-surface-container-lowest)",
        "surface-container-low": "var(--md-sys-color-surface-container-low)",
        "surface-container": "var(--md-sys-color-surface-container)",
        "surface-container-high": "var(--md-sys-color-surface-container-high)",
        "surface-container-highest": "var(--md-sys-color-surface-container-highest)",
        "green-color": "var(--md-extended-color-green-color)",
        "green-on-color": "var(--md-extended-color-green-on-color)",
        "green-color-container": "var(--md-extended-color-green-color-container)",
        "green-on-color-container": "var(--md-extended-color-green-on-color-container)",
        "yellow-color": "var(--md-extended-color-yellow-color)",
        "yellow-on-color": "var(--md-extended-color-yellow-on-color)",
        "yellow-color-container": "var(--md-extended-color-yellow-color-container)",
        "yellow-on-color-container": "var(--md-extended-color-yellow-on-color-container)",
      },
    },
  },
}
```

Для выбора темы применяем класс к элементу html.body:

```
<body class="dark"></body>
```

Допустимые классы:

- dark-high-contrast
- dark-medium-contrast
- dark
- light-high-contrast
- light-medium-contrast
- light

Добавить в файл `input.css`:

```
:root {  
  --md-ref-typeface-brand: "Roboto";  
  --md-ref-typeface-plain: system-ui;  
}
```

Material theme builder почему-то не экспортирует настройки шрифтов. Когда пофиксят - пересмотреть.

1.17.3.5 Iconify

```
npm i -D @iconify/tailwind  
npm i -D @iconify/json
```

Добавить в файл `tailwind.config.js`:

```
const { addIconSelectors } = require("@iconify/tailwind");  
  
module.exports = {  
  plugins: [addIconSelectors(["mdi", "material-symbols"])],  
}
```

Добавить в параметры `addIconSelectors` семейства иконок.

Далее в проекте иконки можно вставлять:

```
<span class="iconify material-symbols--menu-rounded h-5 w-5"></span>
```

2 Исполнитель

2.1 WASM (Leptos)

```
use leptos::*;
use tokio::task::LocalSet;

use crate::components::cmp_leptos;
fn main() -> anyhow::Result<()> {
    #[component]
    fn App() -> impl IntoView {
        view! {}
    }

    // cmp_leptos -----
    let config_leptos = cmp_leptos::Config {
        body_component: || view! { <App/> },
        hostname: "localhost".into(),
    };

    // config_executor -----
    let config_executor = ComponentExecutorConfig {
        buffer_size: 100,
        executor_name: "example_leptos".into(),
        fn_auth: |msg, _| Some(msg),
    };

    // executor -----

    let context = LocalSet::new();
    context.spawn_local(async move {
        ComponentExecutor::<Custom>::new(config_executor)
            .add_cmp(cmp_leptos::Cmp::new(config_leptos))
            .wait_result()
            .await?;
        Ok(()) as anyhow::Result<()>
    });
    spawn_local(context);
    Ok(())
}
```


3 Внешние сервисы

Конфигурация различных внешних сервисов.

3.1 EMQX

MQTT-брокер

3.1.1 docker

```
services:
  emqx:
    container_name: emqx
    healthcheck:
      test: ["CMD", "/opt/emqx/bin/emqx", "ctl", "status"]
      interval: 5s
      timeout: 25s
      retries: 5
    hostname: emqx
    image: emqx:5.6.0 # https://hub.docker.com/_/emqx
    networks:
      - network_internal
    ports:
      - 1883:1883
      - 8083:8083
      - 8084:8084
      - 8883:8883
      - 18083:18083
    profiles:
      - dev
      - target
    volumes:
      - emqx_volume:/opt/emqx/data

networks:
  network_internal:

volumes:
  emqx_volume:
    name: emqx_volume
```

3.2 Go2rtc

Сервис конвертирования видеопотока с видеокамеры.

3.2.1 docker

```
services:
  go2rtc:
    container_name: go2rtc
    hostname: go2rtc
    image: alexxit/go2rtc
    network_mode: host
    privileged: true
    restart: unless-stopped
    profiles:
      - target
      - dev
    volumes:
      - "./config_services/go2rtc:/config"
```

3.2.2 ./config_services/go2rtc/go2rtc.yaml

```
streams:
  tapo: rtsp://administrator:Admin123!@10.0.6.3:554/stream1

api:
  origin: "*"
  listen: ":8003"
```

3.3 Grafana

3.3.1 docker

```
services:
  grafana:
    container_name: grafana
    hostname: grafana
    image: grafana/grafana:10.2.3 # https://hub.docker.com/r/grafana/grafana/tags
    environment:
      - GF_PATHS_PROVISIONING=/etc/grafana/provisioning
      - GF_AUTH_ANONYMOUS_ENABLED=true
      - GF_AUTH_ANONYMOUS_ORG_ROLE=Admin
      - GF_SECURITY_ALLOW_EMBEDDING=true
      # настройки источника - TimescaleDB
      - TIMESCALEDB_HOST=timescaledb
      - TIMESCALEDB_PORT=5432
      - TIMESCALEDB_DB_DATA=db_data
      # настройки источника - логгер loki
      - LOKI_HOST=loki
      - LOKI_PORT=3100
      # настройки источника - InfluxDB
      - INFLUXDB_HOST=influxdb
      - INFLUXDB_PORT=8086
      - INFLUXDB_ORG=org
      - INFLUXDB_BUCKET=bucket
      - INFLUXDB_TOKEN=token
    ports:
      - "3000:3000"
    profiles:
      - dev
      - target
    volumes:
      - ./config_services/grafana/datasources:/etc/grafana/provisioning/datasources
      - ./config_services/grafana/dashboards:/etc/grafana/provisioning/dashboards
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro
    networks:
      - network_internal
```

```
networks:
  network_internal:
```

3.3.2 Файлы конфигурации

3.3.2.1 ./config_services/grafana/datasources/

В папке хранятся файлы для настройки источников данных.

influxdb.yaml:

```
apiVersion: 1

datasources:
  - name: InfluxDB
    type: influxdb
    access: proxy
    url: http://${INFLUXDB_HOST}:${INFLUXDB_PORT}
    jsonData:
      version: Flux
      organization: ${INFLUXDB_ORG}
      defaultBucket: ${INFLUXDB_BUCKET}
      tlsSkipVerify: true
    secureJsonData:
      token: ${INFLUXDB_TOKEN}
```

loki.yaml:

```
apiVersion: 1

datasources:
  - name: loki
    type: loki
    access: proxy
    orgId: 1
    url: http://${LOKI_HOST}:${LOKI_PORT}
    basicAuth: false
    isDefault: true
    version: 1
    editable: false
```

timescaledb.yaml:

```
apiVersion: 1
```

```
datasources:
- name: timescaledb
  type: postgres
  url: ${TIMESCALEDB_HOST}:${TIMESCALEDB_PORT}
  user: postgres
  secureJsonData:
    password: "postgres"
  jsonData:
    database: ${TIMESCALEDB_DB_DATA}
    sslmode: "disable" # disable/require/verify-ca/verify-full
    maxOpenConns: 100 # Grafana v5.4+
    maxIdleConns: 100 # Grafana v5.4+
    maxIdleConnsAuto: true # Grafana v9.5.1+
    connMaxLifetime: 14400 # Grafana v5.4+
    postgresVersion: 1500 # 903=9.3, 904=9.4, 905=9.5, 906=9.6, 1000=10
    timescaledb: true
  editable: false
```

3.3.2.2 ./config_services/grafana/dashboards/

В папке хранятся все дашборды. Структура папок переносится в структуру дашбоардов. В корне папки нужно разместить файл config.yaml:

```
apiVersion: 1

providers:
- name: dashboards
  type: file
  updateIntervalSeconds: 5
  options:
    path: /etc/grafana/provisioning/dashboards
    foldersFromFilesStructure: true
```

3.4 InfluxDB (v2)

3.4.1 docker

```
services:
  influxdb:
    container_name: influxdb
    environment:
      - DOCKER_INFLUXDB_INIT_MODE=setup
      - DOCKER_INFLUXDB_INIT_USERNAME=admin
      - DOCKER_INFLUXDB_INIT_PASSWORD=Admin123!
      - DOCKER_INFLUXDB_INIT_ORG=org
      - DOCKER_INFLUXDB_INIT_BUCKET=bucket
      - DOCKER_INFLUXDB_INIT_ADMIN_TOKEN=token
    hostname: influxdb
    image: influxdb:2.7.6 # https://hub.docker.com/_/influxdb
    networks:
      - network_internal
    ports:
      - "8086:8086"
    volumes:
      - influxdb_data:/var/lib/influxdb2
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro

networks:
  network_internal:

volumes:
  influxdb_data:
    name: influxdb_data
# TODO - healthcheck
```

3.5 InfluxDB (v3)

3.6 Loki

Для проверки запуска можно открыть в браузере:

- <http://localhost:3100/metrics>
- <http://localhost:3100/ready>

3.6.1 docker

services:

loki:

command: -config.file=/etc/loki/local-config.yaml

container_name: loki

healthcheck:

test: wget --spider http://localhost:3100/ready

interval: 10s

timeout: 20s

retries: 15

hostname: loki

image: grafana/loki:2.9.2 # https://hub.docker.com/r/grafana/loki/tags?page=1&name=2.

networks:

- network_internal

ports:

- "\${LOKI_PORT}:3100"

profiles:

- dev

- target

volumes:

- loki_data:/loki

- /etc/timezone:/etc/timezone:ro

- /etc/localtime:/etc/localtime:ro

volumes:

loki_data:

name: loki_data

networks:

network_internal:

3.7 Portainer

3.7.1 docker

```
services:
  portainer:
    container_name: portainer
    hostname: portainer
    image: portainer/portainer-ce:latest
    ports:
      - "${PORTAINER_PORT}:9000"
    profiles:
      - target
    restart: always
    volumes:
      - portainer_data_volume:/data
      - /var/run/docker.sock:/var/run/docker.sock
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro

volumes:
  portainer_data_volume:
    name: portainer_data_volume
```

3.8 Redis

3.8.1 docker

```
services:
  redis:
    container_name: redis
    healthcheck:
      test: redis-cli --raw incr ping
      interval: 5s
      timeout: 5s
      retries: 5
    hostname: redis
    image: redis/redis-stack:latest
    networks:
      - network_internal
    ports:
      - "${REDIS_PORT}:6379" # порт Redis
      - "${REDIS_PORT_UI}:8001" # порт UI
    volumes:
      - redis_data:/data # для сохранения данных
      - ./services/redis/redis.conf:/redis-stack.conf # путь к файлу конфигурации
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro

networks:
  network_internal:

volumes:
  redis_data:
    name: redis_data
```

3.8.2 Файлы конфигурации

3.8.2.1 redis.conf

Для сохранения сообщений при перезапуске:

```
appendonly yes
```

3.9 Rust

Запуск программ на rust в контейнерах docker

3.9.1 docker (бекенд)

```
services:
  backend:
    command: ./backend
    container_name: backend
    depends_on:
      redis:
        condition: service_healthy
        restart: true
      loki:
        condition: service_healthy
        restart: true
    hostname: backend
    image: ubuntu:noble
    networks:
      - network_internal
    environment:
      - RUST_LOG=info
    profiles:
      - target
    volumes:
      - ./backend:/backend
      - ../env:/env
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro
```

```
networks:
  network_internal:
```

3.9.2 docker (cmp_leptos)

```
services:
  frontend:
    container_name: frontend
    hostname: frontend
    image: nginx
    networks:
      - network_internal
    ports:
      - "8000:80"
    profiles:
      - target
    volumes:
      - ./frontend/dist:/usr/share/nginx/html
      - ./frontend/nginx.conf:/etc/nginx/conf.d/default.conf
```

```
networks:
  network_internal:
```

```
volumes:
  surrealdb_data:
    name: surrealdb_data
```

```
# TODO - healthcheck
```

3.10 Sentryshot

Сохранение потока с видеокамеры. [Ссылка на репозиторий](#).

3.10.1 docker

```
services:
  sentryshot:
    shm_size: 500m
    image: codeberg.org/sentryshot/sentryshot:v0.2.17
    ports:
      - 2020:2020
    environment:
      - TZ=Europe/Minsk
    profiles:
      - target
    volumes:
      - ./config_services/sentryshot/configs:/app/configs
      - ./config_services/sentryshot/storage:/app/storage
```

Проверить версию - <https://codeberg.org/SentryShot/sentryshot/releases>.

3.10.2 Файлы конфигурации

3.10.2.1 ./sentryshot/configs/sentryshot.toml

Проверить max_disk_usage.

```
# Port app will be served on.
port = 2020

# Directory where recordings will be stored.
storage_dir = "/app/storage"

# Directory where configs will be stored.
config_dir = "/app/configs"

# Directory where the plugins are located.
plugin_dir = "/app/plugins"

# Maximum allowed storage space in GigaBytes.
# Recordings are delete automatically before this limit is exceeded.
max_disk_usage = 100

# PLUGINS

# Authentication. One must be enabled.

# Basic Auth.
[[plugin]]
name = "auth_basic"
enable = false

# No authentication.
[[plugin]]
name = "auth_none"
enable = true

# Motion detection.
# Documentation ./plugins/motion/README.md
[[plugin]]
name = "motion"
enable = false

# TFlite object detection.
# Enabling will generate a `tflite.toml` file.
[[plugin]]
name = "tflite"
enable = false

# Thumbnail downscaling.
# Downscale video thumbnails to improve page load times and data usage.
[[plugin]]
name = "thumb_scale"
enable = false
```

3.10.2.2 ./sentryshot/configs/monitors/

В папке хранятся файлы конфигурации для каждой камеры. Пример файла для камеры RTSP:

```
{
  "alwaysRecord": true,
  "enable": true,
  "id": "tapo",
  "name": "tapo",
  "source": "rtsp",
  "sourcertsp": {
    "mainStream": "rtsp://administrator:Admin123!@192.168.31.3:554/stream1",
    "protocol": "tcp"
  },
  "videoLength": 15
}
```

3.11 SurrealDB

3.11.1 docker

```
services:
  surrealdb:
    command: start --user root --pass root file:/data/database.db
    container_name: surrealdb
    hostname: surrealdb
    image: surrealdb/surrealdb:latest
    networks:
      - network_internal
    ports:
      - "${SURREALDB_PORT}:8000"
    user: root
    volumes:
      - surrealdb_data:/data

networks:
  network_internal:

volumes:
  surrealdb_data:
    name: surrealdb_data
# TODO - healthcheck
```

3.12 SystemD

Пример создания файла для автозапуска сервисов с помощью SystemD

3.12.1 project.service

```
[Unit]
Description=PROJECT_DESC
Requires=docker.service
After=docker.service

[Service]
Type=oneshot
RemainAfterExit=yes
WorkingDirectory=/home/user/PROJECT_FOLDER
ExecStart=/home/user/.cargo/bin/nu scripts/target-start.nu
ExecStop=/home/user/.cargo/bin/nu scripts/target-stop.nu
TimeoutStartSec=0

[Install]
WantedBy=multi-user.target
```

3.13 TimescaleDB

3.13.1 docker

```
services:
  timescaledb:
    command: postgres
    -c config_file=/etc/postgresql/postgresql.conf
    -c hba_file=/etc/postgresql/pg_hba.conf
    container_name: timescaledb
    healthcheck:
      test: pg_isready -d db_prod
      interval: 30s
      timeout: 60s
      retries: 5
      start_period: 80s
    hostname: timescaledb
    image: timescale/timescaledb:2.12.2-pg15
    networks:
      - network_internal
    environment:
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=postgres
    ports:
      - "5432:5432"
    profiles:
      - dev
      - target
    volumes:
      - ./timescaledb/postgresql.conf:/etc/postgresql/postgresql.conf
      - ./timescaledb/pg_hba.conf:/etc/postgresql/pg_hba.conf
      - ./timescaledb/init.sql:/docker-entrypoint-initdb.d/init.sql
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro

networks:
  network_internal:
```

3.13.2 postgresql.conf

```
listen_addresses = '*'
max_locks_per_transaction = 10000
```

3.13.3 pg_hba.conf

```
local all all trust
host all all 0.0.0.0/0 trust
```

3.13.4 init.sql

```
CREATE DATABASE db_conf;
CREATE DATABASE db_data;

\c db_data
CREATE EXTENSION IF NOT EXISTS timescaledb;

-- enum agg_type
CREATE TYPE agg_type AS ENUM (
  'curr',
  'first',
  'inc',
  'sum',
  'mean',
  'min',
  'max'
);

-- table raw
CREATE TABLE raw (
  ts          TIMESTAMPTZ      NOT NULL,
  entity      TEXT             NOT NULL,
  attr        TEXT             NOT NULL,
  value       DOUBLE PRECISION NULL,
  agg         AGG_TYPE         NOT NULL,
  aggtss      TIMESTAMPTZ      NULL,
  aggnxt      AGG_TYPE[]       NULL,
  UNIQUE (ts, entity, attr, agg)
);
SELECT create_hypertable(
  'raw', 'ts',
  chunk_time_interval => INTERVAL '24 hours'
);
ALTER TABLE raw SET (
```



```
        timescaledb.compress,  
        timescaledb.compress_segmentby='entity, attr, agg'  
    );  
SELECT add_compression_policy('raw', INTERVAL '100000 hours');  
  
-- agg_30min  
CREATE TABLE agg_30min (LIKE raw);  
  
-- create databases for test  
CREATE DATABASE db_data_test WITH TEMPLATE db_data;  
CREATE DATABASE db_conf_test WITH TEMPLATE db_conf;
```