

پیاده‌سازی سرویس ابری مدیریت دستگاه‌های موبایل (MDM)

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شهریور ۱۴۰۳



[Link](#)

فهرست مطالب

- بیان مسئله و مفاهیم اولیه
- پیشینه و پروژه‌های مشابه
- پیاده‌سازی
 - مهندسی نیازمندی
 - طراحی معماری
 - فناوری‌ها
 - خروجی و نتایج
- جمع‌بندی

بیان مسئله



[Link](#)

- رشد استفاده از دستگاهها
- رشد فناوری‌های موبایلی
- بوجود آمدن نیازهای جدید
- سادگی
- یکپارچگی
- امنیت



GLPI

[Flyve with GLPI Plugin](#)



[MicroMDM](#)

پروژه‌های مشابه (متن باز)



[Headwind MDM](#)

نیازمندی‌ها

- کنترل دستگاه‌ها با ارسال فرمان

- احراز هویت کاربران

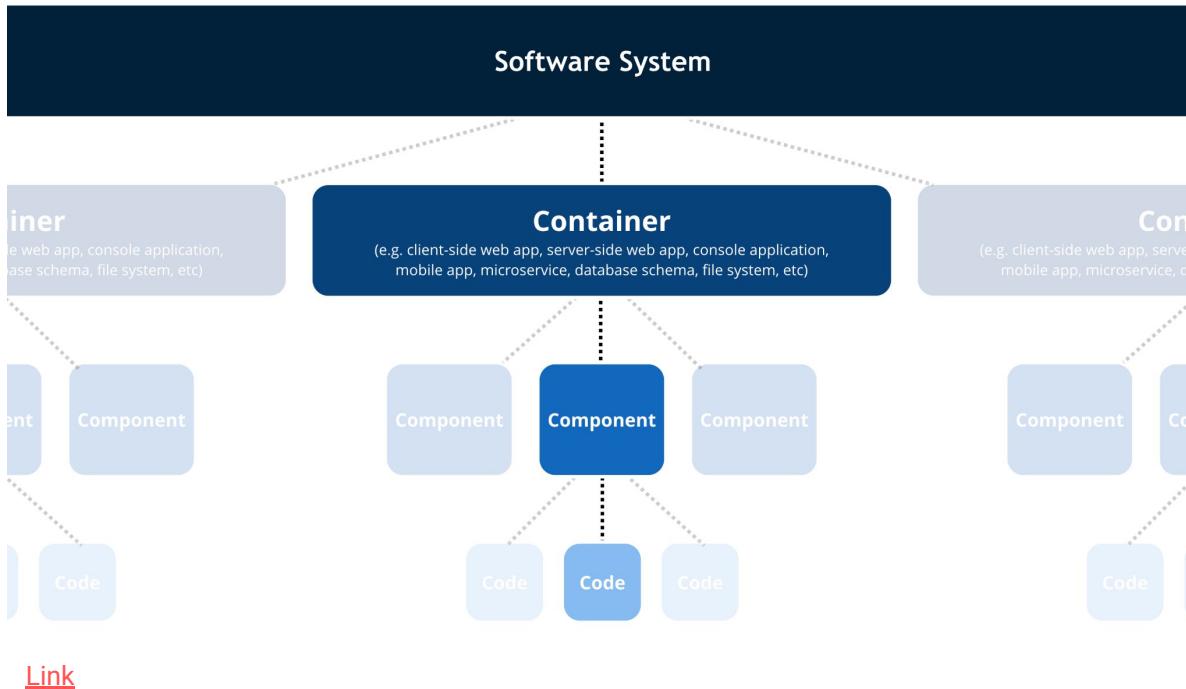
- نظارت بر کاربران

- مدیریت لاغ‌ها

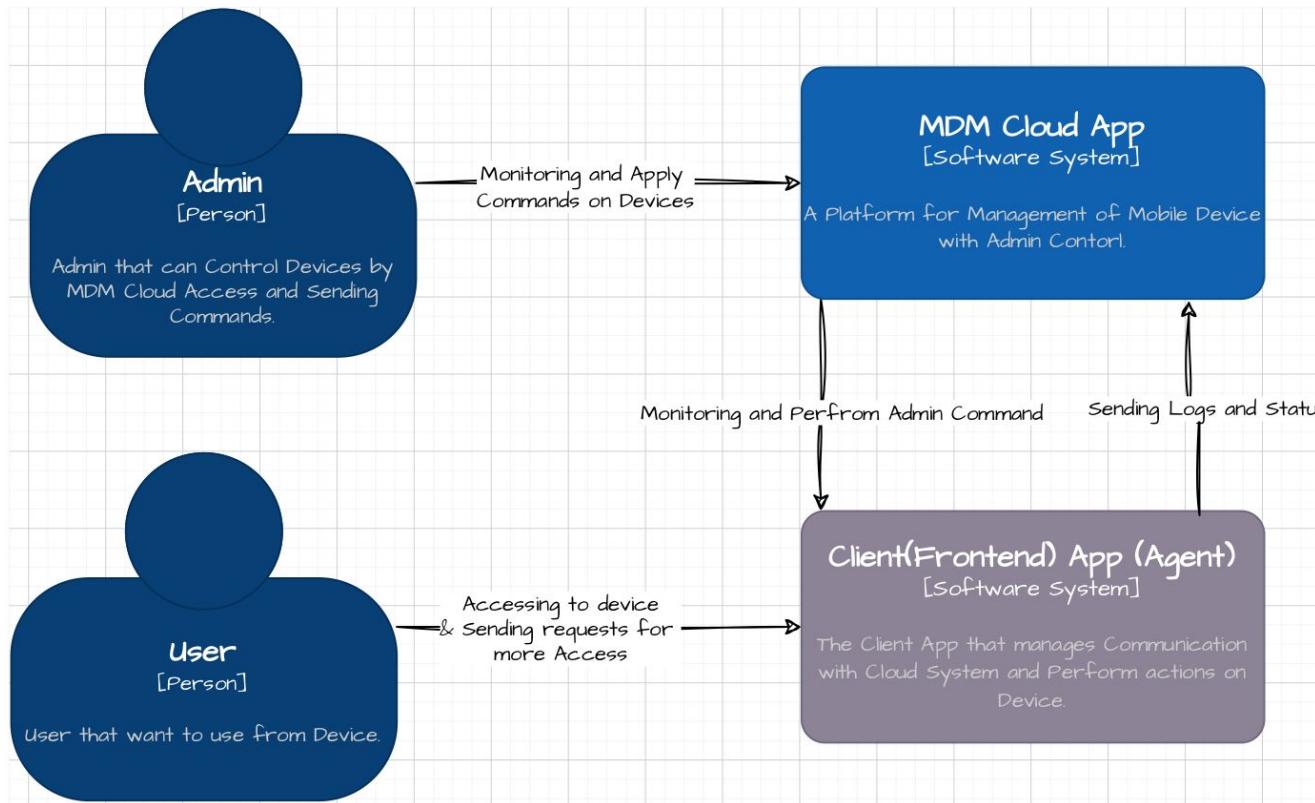


[Link](#)

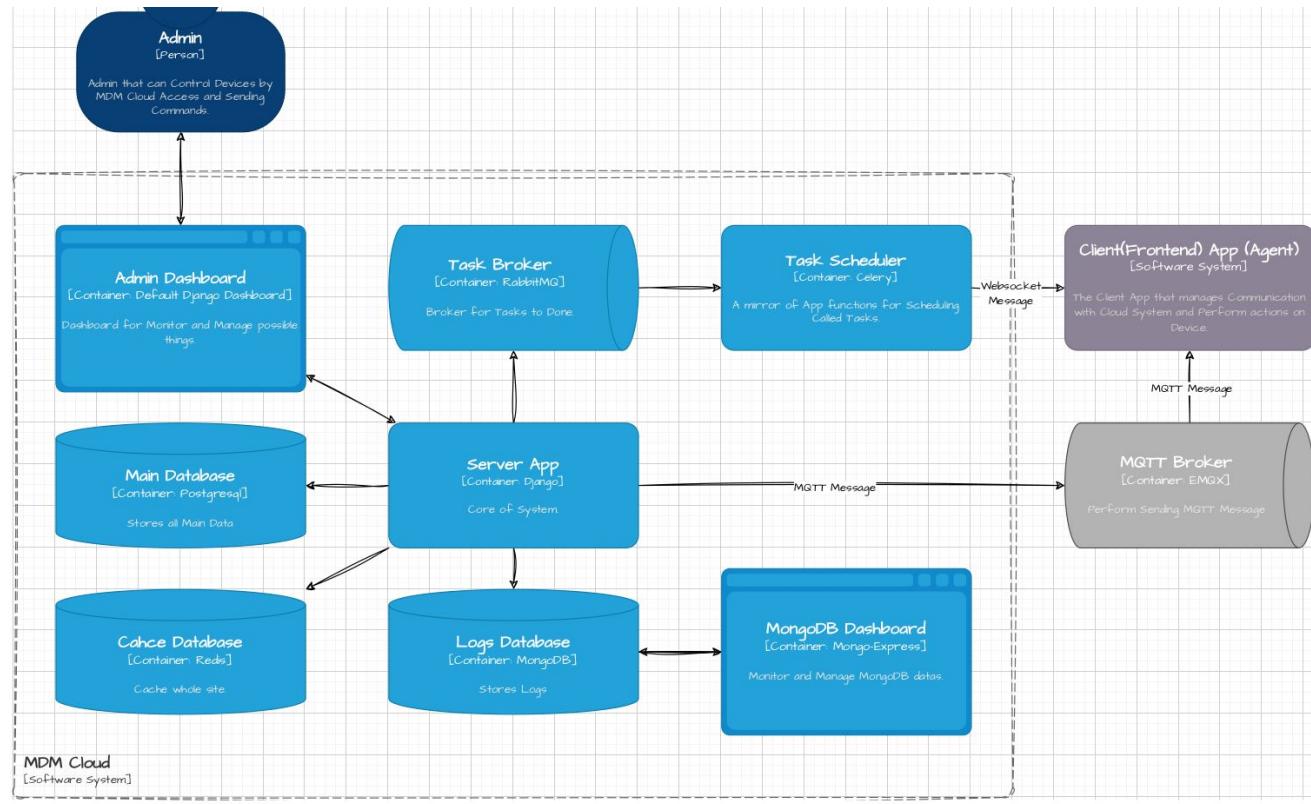
طراحی معماري با مدل C4



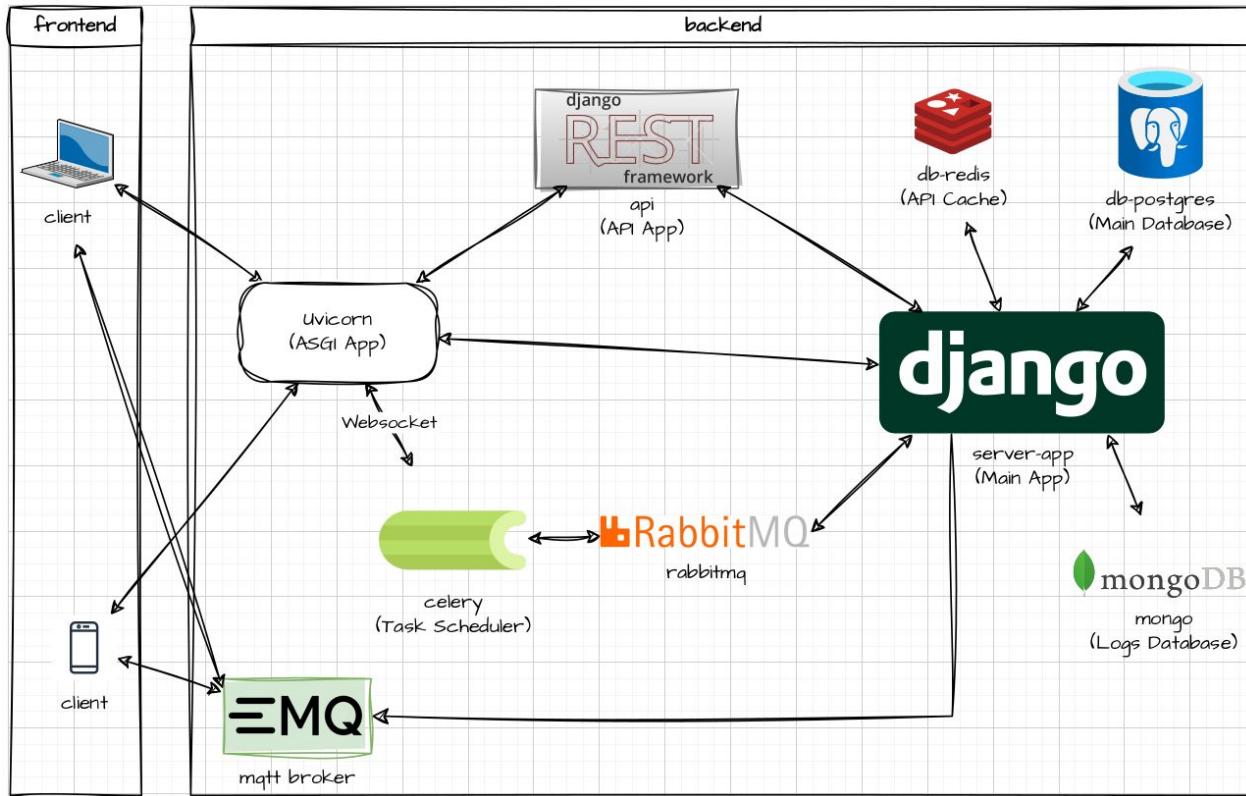
نماودار Context



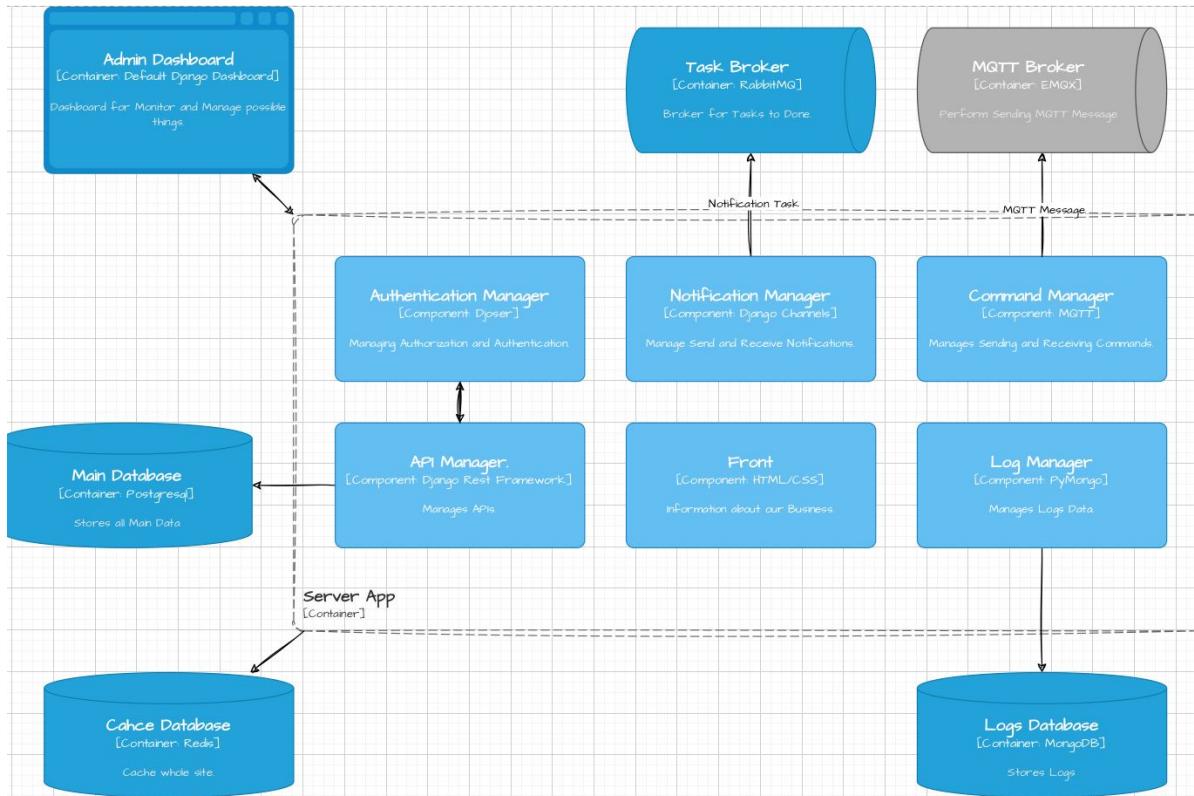
نماودار Container



معماری پروژہ



نماودار Component

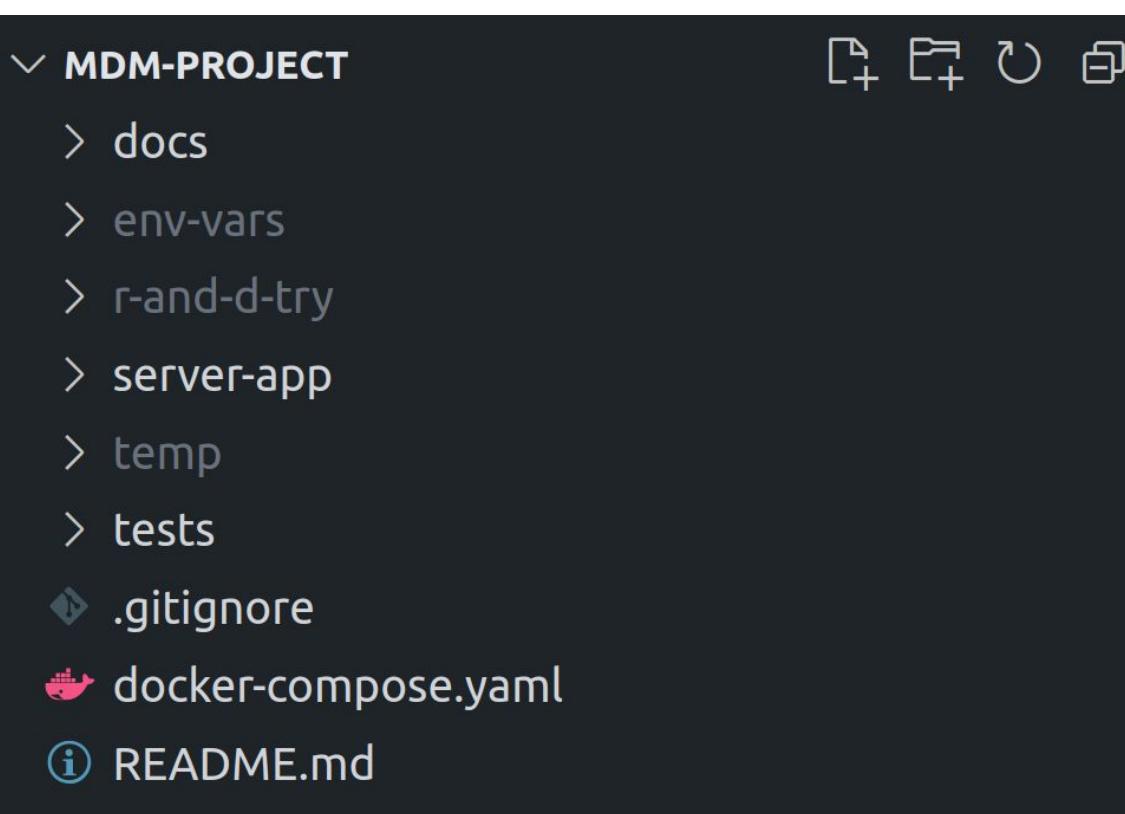


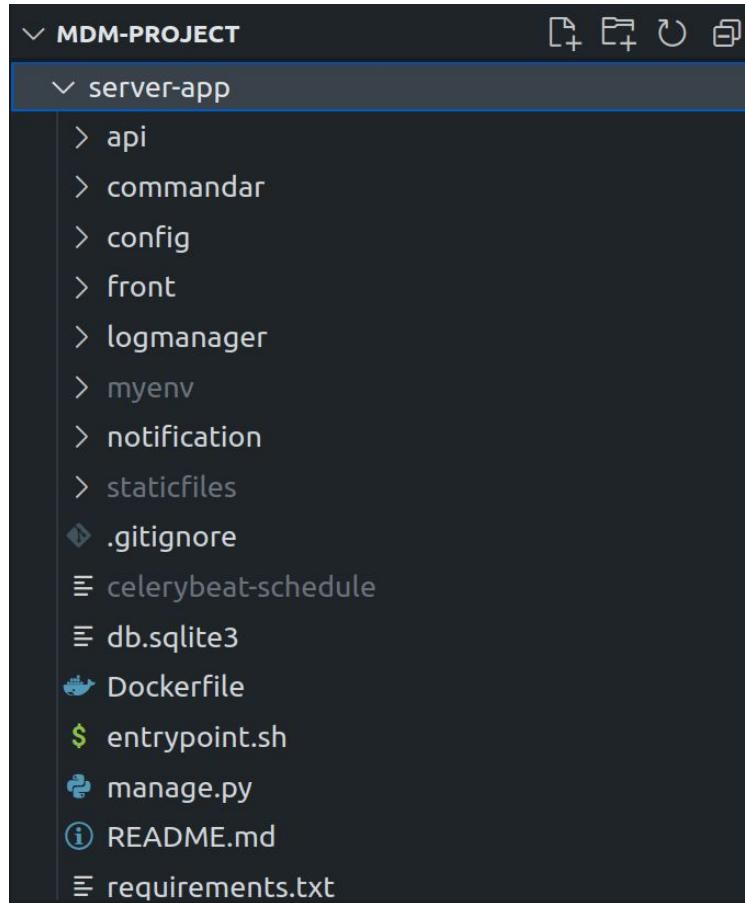
پیاده‌سازی

کانتینرهای برنامه بعد از اجرا

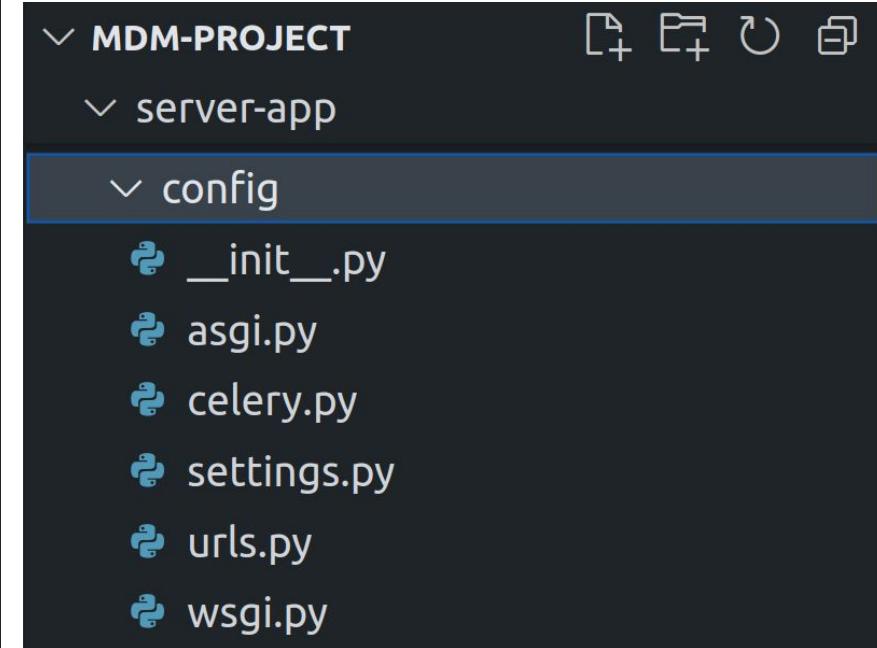
```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 76x15
→ mdm-project git:(main) ✘ docker compose up -d
[+] Running 13/13
✓ Network mdm-project_mongonet      C...          0.1s
✓ Network mdm-project_postgres      C...          0.1s
✓ Network mdm-project_redisnet      C...          0.1s
✓ Network mdm-project_rabbitnet    Created        0.1s
✓ Container mdm-project-flower-1   Started       0.8s
✓ Container rabbitmq               Started       0.9s
✓ Container mdm-project-redis-1    Started       0.5s
✓ Container mongo                  Started       0.8s
✓ Container pgadmin                Started       0.8s
✓ Container postgres               Started       0.9s
✓ Container celery-worker         Starte...     1.5s
✓ Container server-app            Started       1.6s
✓ Container mongo_express        Starte...     1.5s
```

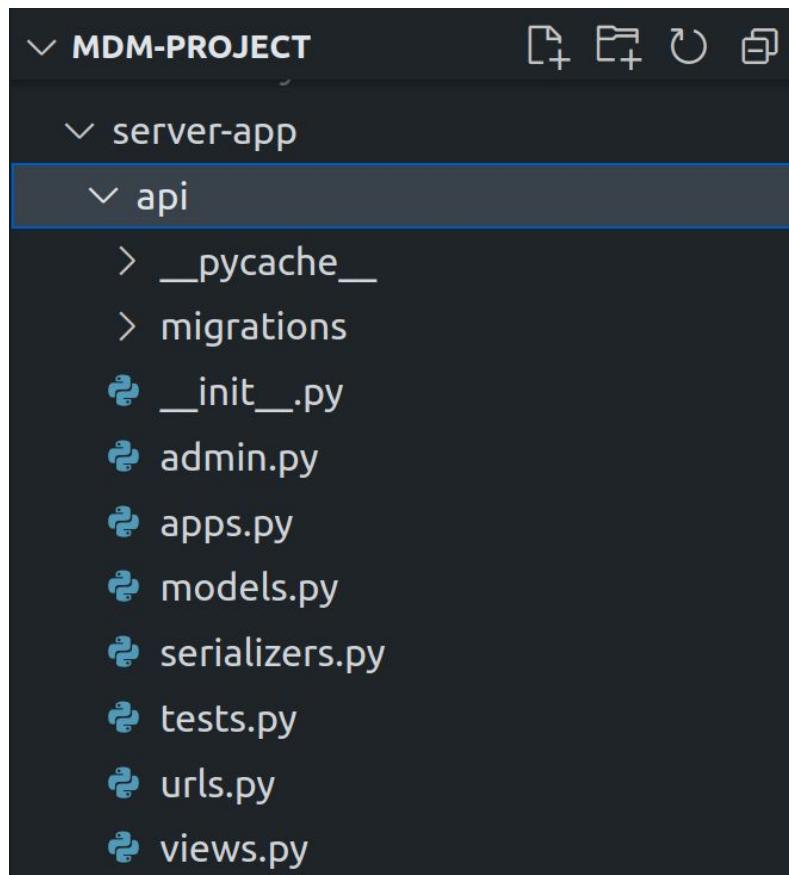
ساختار کلی پروژہ





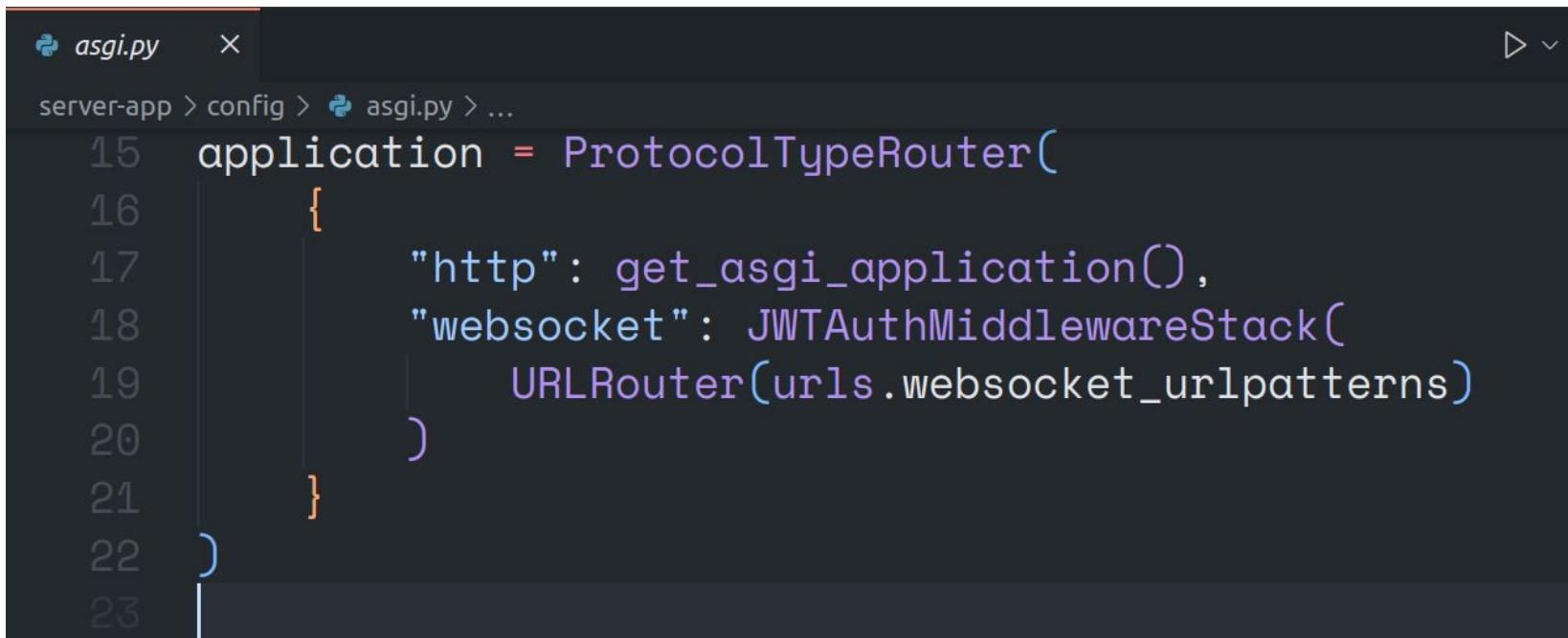
ساختار برنامہ مرکزی





ساختار برنامه‌های Django

راہاندازی ASGI برای Django



The screenshot shows a code editor window with the file `asgi.py` open. The code defines an ASGI application using the `ProtocolTypeRouter` from the `channels` library. It maps HTTP and WebSocket protocols to different application components.

```
15 application = ProtocolTypeRouter( 16     { 17         "http": get_asgi_application(), 18         "websocket": JWTAuthMiddlewareStack( 19             URLRouter(urls.websocket_urlpatterns) 20         ) 21     } 22 } 23 |
```

نمونه کاربری

داشبورد مدیر

نمونه کاربری داشبورد مدیر - نمای ابتدائی

The screenshot shows the Django administration interface running in Mozilla Firefox. The title bar reads "Site administration | Django site admin — Mozilla Firefox" and the address bar shows "localhost:8000/admin/". The main header says "Django administration" and "WELCOME, AKBAR. VIEW SITE / CHANGE PASSWORD / LOG OUT".

The left sidebar lists several sections:

- API**: Applications, Commands, Devices.
- AUTH TOKEN**: Tokens.
- NOTIFICATION**: Notifications.

Each section has "Add" and "Change" buttons. The "Recent actions" sidebar on the right lists the following:

- + nasrin User
- + {Log: kind: INFO, content: something good happened} Log
- + {Device: name: Sumsong Galaxy M32, user: abbas} Device
- + abbas User

نمونه کاربری داشبورد مدیر - نظارت بر موجودیت‌ها

The screenshot shows the Django administration interface for a device management application. The top navigation bar includes links for 'Select device to change', 'ADD DEVICE +', and user information ('WELCOME, AKBAR. VIEW SITE / CHANGE PASSWORD / LOG OUT'). The main content area is titled 'Django administration' and displays the heading 'Select device to change'. On the left, a sidebar lists several models with their respective add buttons: 'API', 'Applications', 'Commands', 'Devices', 'AUTH TOKEN', and 'Tokens'. The 'Devices' model is currently selected. The main list area shows two devices: 'akbar's Pixel' and 'abbas's Sumsong Galaxy M32', each with a checkbox next to it labeled 'DEVICE'. Below the list, it says '2 devices'.

Select device to change | Django site admin — Mozilla Firefox

localhost:8000/admin/api/device/ 200%

Django administration

WELCOME, AKBAR. [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Home › Api › Devices

Start typing to filter...

API

Applications [+ Add](#)

Commands [+ Add](#)

Devices [+ Add](#)

AUTH TOKEN [+ Add](#)

Tokens [+ Add](#)

Select device to change

Action: ----- Go 0 of 2 selected

DEVICE

akbar's Pixel

abbas's Sumsong Galaxy M32

2 devices

نمونہ کاربری داشبورد مدیر - تغییر موجودیت

akbar's Pixel | Change device — Django site admin — Mozilla Firefox

localhost:8000/admin/api/device/b12a8372-671a-4ebd-b1b5-4aa1c634f198/change/

WELCOME, AKBAR. VIEW SITE / CHANGE PASSWORD / LOG OUT

Django administration

Home > Api > Devices > akbar's Pixel

Start typing to filter...

- API**
- Applications [+ Add](#)
- Commands [+ Add](#)
- Devices** [+ Add](#)
- AUTH TOKEN
- Tokens [+ Add](#)
- NOTIFICATION
- Notifications [+ Add](#)

Change device

akbar's Pixel

Device name:

Device type:

Os version:

Device user:

HISTORY

SAVE **Save and add another** **Save and continue editing** **Delete**

نمونه کاربری داشبورد مدیر - کنترل دسترسی‌های کاربران

The screenshot shows the Django admin interface for changing a user. The URL is `localhost:8000/admin/auth/user/4/change/`. On the left, there's a sidebar with categories: API, Applications, Commands, Devices, AUTH TOKEN, Tokens, AUTHENTICATION AND AUTHORIZATION, Users, and NOTIFICATION. The 'Users' section is currently selected.

User permissions:

- contenttypes | content type | Can delete content type
- contenttypes | content type | Can view content type
- notification | notification | Can add notification
- notification | notification | Can change notification** (highlighted)
- notification | notification | Can delete notification

Specific permissions for this user:

- Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.

Fields:

- Username: alialavi
- First name: (empty)
- Last name: (empty)
- Email address: (empty)

نمونه کاربری داشبورد مدیر - تعریف نماهای سفارشی

CUSTOM VIEWS

Logs_view

Send_mqtt_notif_view

Send_notif_view

نمونه کاربری

API

نمونه کاربری API - گرفتن توکن برای احراز هویت

```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 65x13
→ mdm-project git:(main) ✘ curl \
-X POST \
-H 'Content-Type: application/json' \
-d '{"username": "mohammad", "password": "aA1234%^"}' \
http://127.0.0.1:8000/auth/jwt/create
{
    "refresh": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1
    IjoicmVmcmVzaC1sImV4cCI6MTcyNTA5MTg5MSwiZWFOIjoxNzI1MDA1NDkxLCJqd
    Gki0iJiYzk5MDBjZTV1MmU0NWE0YjZ1N2FhZmJhZWRhZTA5MyIsInVzZXJfaWQi0j
    V9.uq8EOUi7aDrBcIgtUR1oEjr1YPpVgGWgq1y4_rKxDUM",
    "access": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoiYWNjZXNzIiwidXh
    wIjoxNzI1MDA1NzkwLCJpYXQiOjE3MjUwMDU0OTEsImp0aSI6IjVkJYzdinWEwNjJh
    YjQxMzZhMmNjYTQ2MjEzNDE4Y2VlIiwidXNlc19pZCI6NX0.dfbN10bm6qQ5qa9Jv
    naJ7SVRV0hkoUfcMggewv33_Wc"
}
```

نمونه کاربری API - اضافہ کردن دستگاہ

```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 90x18
→ mdm-project git:(main) ✘ curl \
-X POST \
-H 'Content-Type: application/json' \
-H 'Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoiYWNjZXNzIiwidXhwIjoxNzI1MDA2MDM3LCJpYXQiOjE3MjUwMDU3MzcsImp0aSI6ImJhOTVkMWNiMTY1NjQzM4ZmNkNWYyMzkzOTJmYTkzIiwidXNlc19pZCI6MX0.1Aaeqvq_ddpQf9eFCu9IbRj1JsvilCd2r5FfjNM0iFE' \
-d '{"device_name": "Galaxy M12", "device_type": "Android", "os_version": "12.0"}' \
-i http://127.0.0.1:8000/api/v1/devices/
HTTP/1.1 201 Created
date: Fri, 30 Aug 2024 08:16:03 GMT
server: uvicorn
content-type: application/json
vary: Accept
allow: GET, POST, HEAD, OPTIONS
content-length: 123
x-frame-options: DENY
x-content-type-options: nosniff
referrer-policy: same-origin
cross-origin-opener-policy: same-origin
```

نمونہ کاربری API - تغییر مشخصات دستگاہ

```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 90x18
→ mdm-project git:(main) ✘ curl \
-X PUT \
-H 'Content-Type: application/json' \
-H 'Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoiYWNjZXNzIiwidXhwIjoxNzI1MDA2MDM3LCJpYXQiOjE3MjUwMDU3MzsImp0aSI6ImJhOTVkMWNiMTY1NjQzMjY4ZmNkNWYyMzkzOTJmYTkzIiwidXNlc19pZCI6MX0.1Aaeqvq_ddpQf9eFCu9IbRj1Jsvi1Cd2r5FfjNM0iFE' \
-d '{"device_name": "Galaxy M12", "device_type": "Android", "os_version": "14.0"}' \
-i http://127.0.0.1:8000/api/v1/devices/50e48735-cd69-481c-8749-0bc423620779/
HTTP/1.1 200 OK
date: Fri, 30 Aug 2024 08:18:40 GMT
server: uvicorn
content-type: application/json
vary: Accept
allow: GET, PUT, PATCH, DELETE, HEAD, OPTIONS
content-length: 123
x-frame-options: DENY
x-content-type-options: nosniff
referrer-policy: same-origin
cross-origin-opener-policy: same-origin
```

نمونه کاربری API - حذف دستگاه

```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 90x18
→ mdm-project git:(main) ✘ curl \
-X DELETE \
-H 'Content-Type: application/json' \
-H 'Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoiYWNjZXNzIiwidXhwIjoxNzI1MDA2MDM3LCJpYXQiOjE3MjUwMDU3MzcsImp0aSI6ImJhOTVkmWNniMTY1NjQzM4ZmNkNWYyMzkzOTJmYTkzIiwidXNlc19pZCI6MX0.1Aaeqvq_ddpQf9eFCu9IbRj1JsvilCd2r5FfjNM0iFE' \
-i http://127.0.0.1:8000/api/v1/devices/50e48735-cd69-481c-8749-0bc423620779/
HTTP/1.1 204 No Content
date: Fri, 30 Aug 2024 08:20:06 GMT
server: uvicorn
vary: Accept
allow: GET, PUT, PATCH, DELETE, HEAD, OPTIONS
content-length: 0
x-frame-options: DENY
x-content-type-options: nosniff
referrer-policy: same-origin
cross-origin-opener-policy: same-origin
```

نمونه کاربری

فرستادن اعلان

با پروتکل
Websocket

گرفتن توکن برای احراز هویت

```
abbas@abbas-ASUS:~/Documents/ay-repos/ay-sbu/mdm-project 76x15
→ mdm-project git:(main) ✘ curl \
-X POST \
-H 'Content-Type: application/json' \
-d '{"username": "abbas", "password": "aA1234%^"}' \
http://127.0.0.1:8000/auth/jwt/create
{
    "refresh": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoicmVmcmV
zaCIsImV4cCI6MTcyNTEzNzc2NiwiWF0IjoxNzI1MDUxMzY2LCJqdGkiOiI4ODA0MzM1NTExYzc
0ZjE0YTNmNz11OTIwNTM0Nzk1YyIsInVzZXJfaWQiOjJ9.ZyykNqU7B02E8H1p36L6YKRXNL1Gwb
yALacaxgUx1Ps",
    "access": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXB1IjoiYWNjZXNzIiwidXhwIjoxNzI1MDUxNjY2LCJpYXQiOjE3MjUwNTEzNjYsImp0aSI6IjVkJY2
M4YjhMYTE1NDRjYzRhZDdjODZmNDg1OWEwNmJiIiwidXNlc19pZCI6Mn0.kwBV4b6v0q8Qya0wRu
BPX9R2Zaw6PiF8IfUZ1La5ADk"
}
```

اتصال با توکن گرفته شده Websocket Client

The screenshot shows a browser window titled "Browser WebSocket Client" with the URL "chrome-extension://mdmlhchldhfnfkfmljgeinlffmdgkjo/index.html". The interface includes sections for "Options" and "Client". Under "Client", there is a "Server URL (Required)" field containing "ws://localhost:8000/ws/?token=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXBhIjoiYWh". A "Protocol" field is also present. The connection status is shown as "Connection Status: OPENED" with a red "Disconnect" button.

Browser WebSocket Client

Server URL (Required)

Enter the server URL:

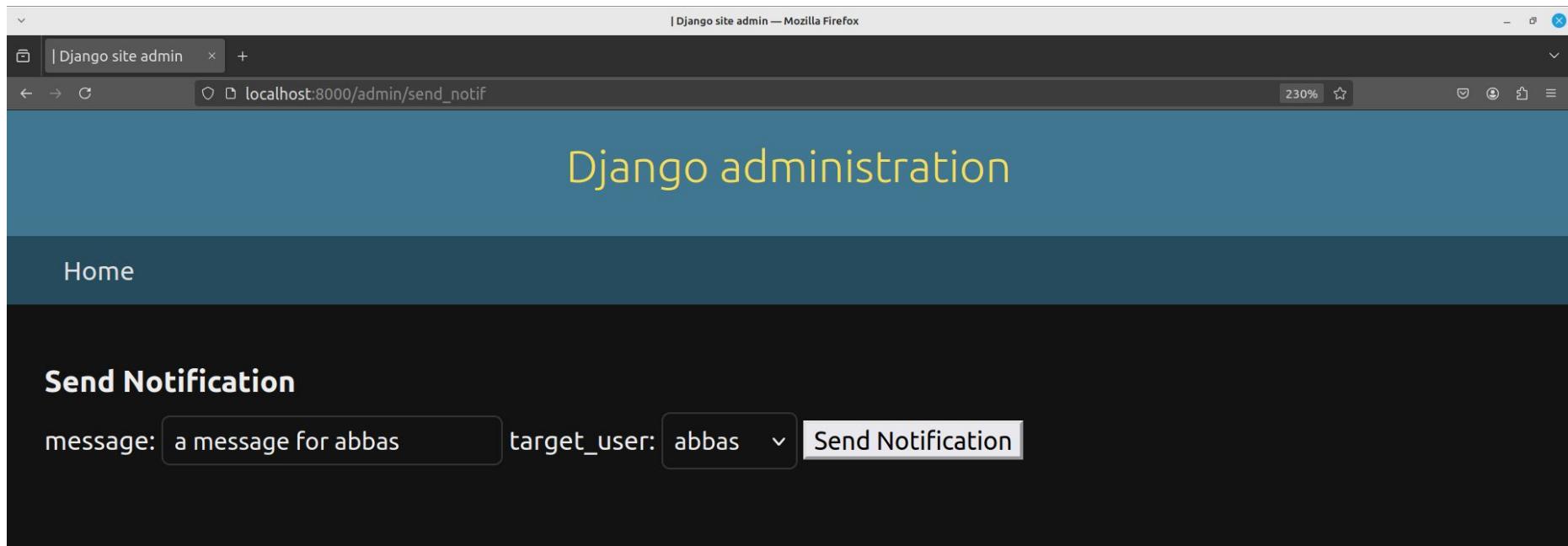
```
ws://localhost:8000/ws/?token=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2tlbl90eXBhIjoiYWh
```

Protocol

Connection Status: **OPENED**

Disconnect

فرستادن اعلان توسط مدیر از داشبورد



دریافت اعلان بصورت بلاذرنگ توسط

The screenshot shows a browser window titled "Browser WebSocket". The address bar displays "Browser WebSocket Client chrome-extension://mdmlhchldhfnfnkfmljgeinlffmdgkjo/index.html". The main content area is titled "Received Messages". It contains a message in red text: {"type": "notification", "message": "<div class=\"notification\"><p>a message for abbas</p></div>"}.

Received Messages

Outgoing messages from the client are shown in red. Incoming messages from the server are shown in black. Click on an incoming message to pretty-print it.

Clear Messages

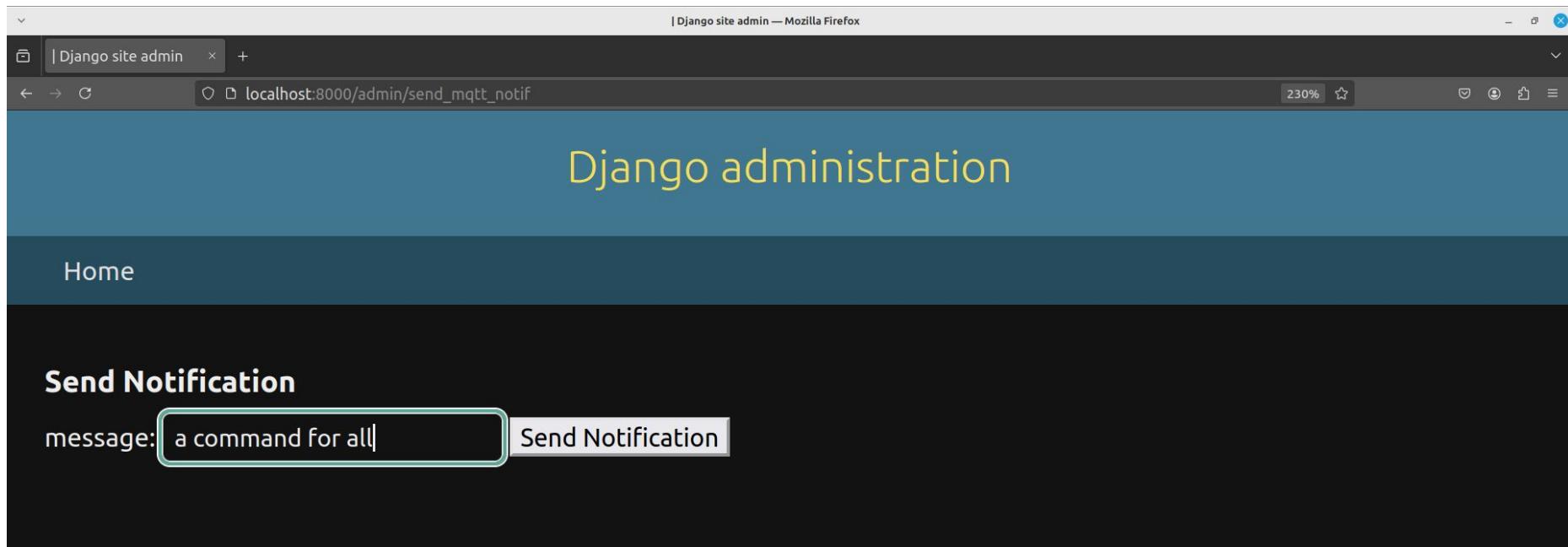
```
{"type": "notification", "message": "<div class=\"notification\"><p>a message for abbas</p></div>"}
```

نمونه کاربری

فرستادن اعلان

با پروتکل MQTT

فرستادن پیام از سرور به صف MQTT



گوش دادن کلائینت بے صف MQTT و دریافت پیام

```
python3 sub.py 95x19
(myenv) → tests git:(main) ✘ python3 sub.py
/home/abbas/Documents/ay-repos/ay-sbu/mdm-project/tests/sub.py:4: DeprecationWarning: Callback
API version 1 is deprecated, update to latest version
    client = mqtt.Client()
Connected to MQTT Broker!
Received 'a command for all' on topic 'ay/commands', qos=0
```

نمونه کاربری

دیدن و انتخاب لایگها از

پایگاه داده MongoDB

دیدن لگ‌های MongoDB در داشبورد

The screenshot shows a Django administration interface running in Mozilla Firefox. The title bar reads "Django site admin — Mozilla Firefox". The address bar shows the URL "localhost:8000/admin/log". The main content area has a blue header with the text "Django administration". Below the header, there is a dark blue navigation bar with the word "Home". The main content area is titled "Logs from MongoDB". It contains two input fields: "FindQuery:" and "Projection:", both currently empty. To the right of these fields is a blue "OK" button. Below the input fields, three log entries are displayed as JSON objects:

```
{'_id': ObjectId('66cf1e328a52c85e7de0a118'), 'type': 'info'}  
{'_id': ObjectId('66d040529538c45ec899f752'), 'type': 'debug', 'message': 'images saved by user'}  
{'_id': ObjectId('66d047789538c45ec899f754'), 'type': 'critical', 'message': {'title': 'battery', 'description': 'battery is charged fully'}}
```

جمع‌بندی

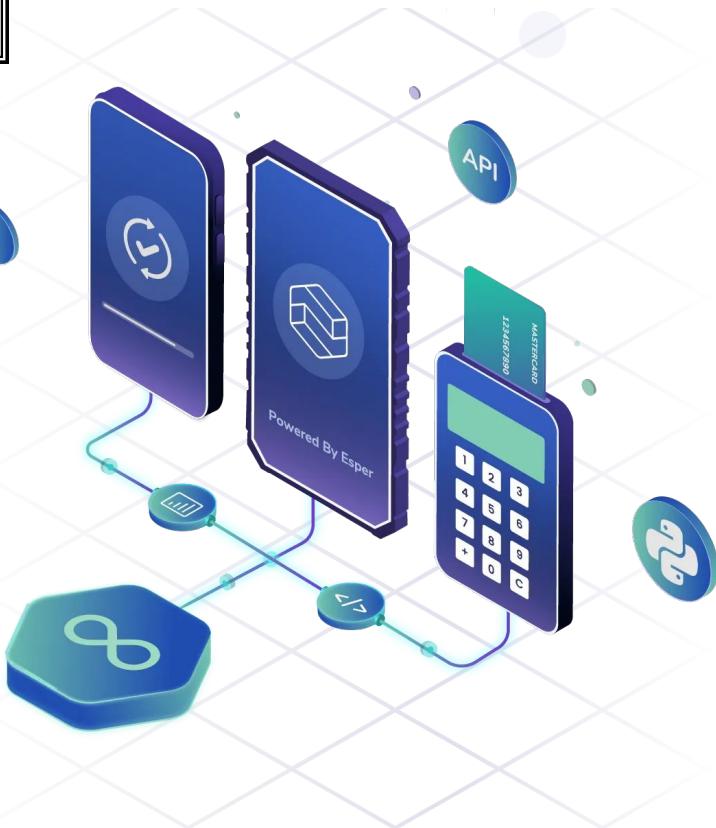
- تحقیق بر روی موضوع

- بررسی پروژه‌های مشابه متن باز

- پیاده‌سازی

- ویژگی‌های کاربردی

- موارد کاربری



[Link](#)

با تشکر از توجه شما

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