TRAINING DAY26 REPORT

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What Are Django Channels?

Django Channels extend Django's default capabilities beyond traditional HTTP (request/response) —

allowing it to handle **real-time communication** like:

- WebSockets
- Chat applications
- Live notifications
- Background tasks
- IoT or live sensor data streaming

In short:

Channels make Django **asynchronous**, allowing it to support **real-time, event-driven** applications.

Why Channels Are Needed

Normally, Django works on a **synchronous** WSGI (Web Server Gateway Interface).

That means — for each request, Django waits until it's processed before serving the next.

But real-time apps (like chat or live dashboards) require **continuous connections**.

That's where **ASGI (Asynchronous Server Gateway Interface)** and **Channels** come in.

Feature	**Without Channels**	**With Channels**
Protocols	HTTP only	HTTP + WebSockets
Nature	Synchronous	Asynchronous
Real-time updates	❌ No	✅ Yes
Use case	Traditional web apps	Live data, chats, notifications

Architecture of Django Channels:

Channels introduce **three main components:**

1. **Channel Layer** → A communication system that lets different parts of Django talk to each other.

   (Usually backed by Redis.)

2. **Consumers** → Act like asynchronous Django views.
   - Handle WebSocket connections.
   - Can send/receive data to/from clients.
3. **Routing** → Similar to URL routing, but for WebSocket connections.

How Channels Work with DRF:

- **DRF** is used for REST APIs (HTTP communication).

- **Channels** is used for WebSocket APIs (real-time communication).

  They can work **together** in one Django project —

  e.g., you can use DRF for normal CRUD APIs and Channels for **real-time updates** on those objects.

Django Channels extends Django's abilities to handle protocols other than HTTP, such as **WebSockets**, enabling **real-time communication** and **asynchronous behavior**.

It is built on **ASGI (Asynchronous Server Gateway Interface)**, replacing Django's default WSGI.

Channels introduce the concepts of:

- **Consumers:** Asynchronous equivalents of views.
- **Channel Layers:** Allow communication between consumers.
- **Routing:** Maps WebSocket URLs to consumers.

Use Cases: Chat apps, live notifications, dashboards, real-time updates.

Example: In a Task Manager app, Django REST Framework can handle CRUD operations while Channels handle live task updates using WebSockets and Redis as the message broker.