EUROPEAN LANGUAGE GRID

META-NET
META-FORUM 2022

EUROPEAN LANGUAGE EQUALITY

Session 2: ELG platform
Final Release of the ELG Platform: Functional Overview, Demo and Tutorial

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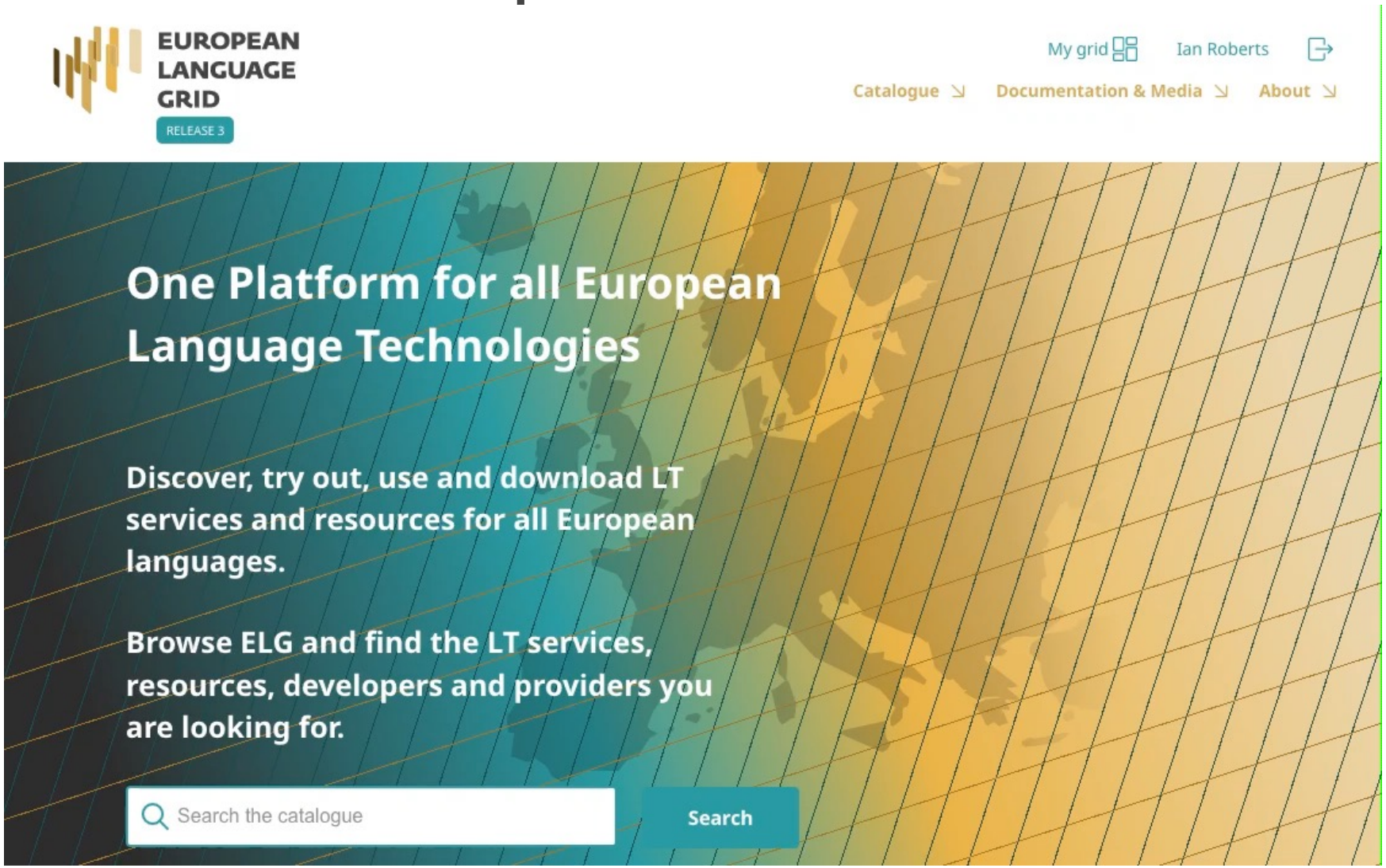
08/09-06-2022 META-FORUM 2022 – Joining the European Language Grid (hybrid conference)
http://www.european-language-grid.eu – http://european-language-equality.eu

Tools and services in the ELG platform

- Additional metadata elements specific to tools and services include:
  - Service function, e.g. speech recognition, part of speech tagging, …
  - Software distribution details
    - Always “Docker image” for integrated services, other options include links to the source code repository
  - Hardware requirements (RAM, CPU, GPU, …)
  - Input and output formats, (human) languages, annotation types, sample input data
  - Any additional parameters

Tools and services in the ELG platform



Publishing your service on the ELG platform

1. Implement the appropriate API
   - ELG specifies flexible APIs for LT services
     - Input types: text, audio, images
     - Output formats: text, audio, “annotations”, classification
   - Helper tools available for Python & Java
2. Package your code as a container image
   - If you use helpers, you get this for free
   - Otherwise there are many existing open-source services to use as a template
3. Describe your service with ELG metadata
   - Including technical metadata giving image location, port number, required RAM/CPU, etc.
4. Submit for validation

1. Implement the appropriate API

- HTTP APIs based on simple JSON message structures
  - Binary data – audio & image – handled like web file upload forms
- Mix-and-match input and output types as required for your tool
  - Text in / text out – translation, summarization, …
  - Text in / annotations out – named entity recognition, semantic annotation, …
  - Audio in / text out – speech recognition
  - Audio in / annotations out – speaker diarisation, keyword detection, …
  - Image in / text out – OCR, image labelling
  - Text in / audio out – Text-to-speech
  - etc. etc.

1. Implement the appropriate API

- ELG provides helper tools for popular languages (Python, Java)
  - See the platform documentation
- These handle the details of HTTP server, JSON parsing and serialization, error handling
- You can concentrate on your business logic
- If your tool already has an API you can implement a lightweight “adapter”

2. Package your code as a container image

- Standard tools for this, most notably Docker
- Example dockerfiles available in ELG documentation
- Python & Java helpers generate the boilerplate for you
- Many existing ELG tools are open source with permissive licences, feel free to use them for inspiration

3. Describe your service with ELG metadata

- Interactive editor guides you through the process
- Key items:
  - Name & description, contact details for provider
  - Classification metadata – function, keywords, …
  - Documentation links
  - Input & output formats and languages
  - Technical metadata
    - Image location, endpoint address within the image
    - Unusual hardware requirements (lots of RAM or CPU)
  - Legal metadata
    - Licence / terms of use

4. Submit for validation

- All ELG submissions go through manual validation to assess licence and metadata coherence
- Services also go through “technical validation”
  - ELG team deploys your service to our cluster, assigns “try out” UI, tests the service with your example data
  - Iterative process – validator may have questions or suggested changes
- We want to help! Validator will work with you to address any issues
- Once all sides are happy, service is published
  - ELG-hosted services will be assigned a DOI

The ELG Python client https://gitlab.com/european-language-grid/platform/python-client

- Easy installation using pip:

```
> pip install elg
```

- Allow the usage of the ELG APIs through Python
  - Search the ELG
  - Download hosted corpora
  - Call compatible services

- Provide tools to facilitate the interactions with the ELG
  - Create an ELG compatible service from a Python tool
  - Deploy ELG services locally

DEMO 1: Basic function of the Python client

localhost:8889/notebooks/QuickStart.ipynb#

jupyter QuickStart (unsaved changes)

Logout

File Edit View Insert Cell Kernel Help Trusted Python 3 (ipykernel)

Run Markdown

Quickstart

The SDK contains a class for each main ELG functionality.

The `Catalog` class is for browsing the catalogue, the `Entity` class is for representing an ELG entity (i.e., an ELG resource), the `Service` class is for using the ELG services, etc...

These classes can be imported directly from the `elg` package as follows:

In [ ]:
```
from elg import Catalog, Entity, Service, Authentication, Corpus
```

Browsing the catalogue

First you have to init a `Catalog` object.

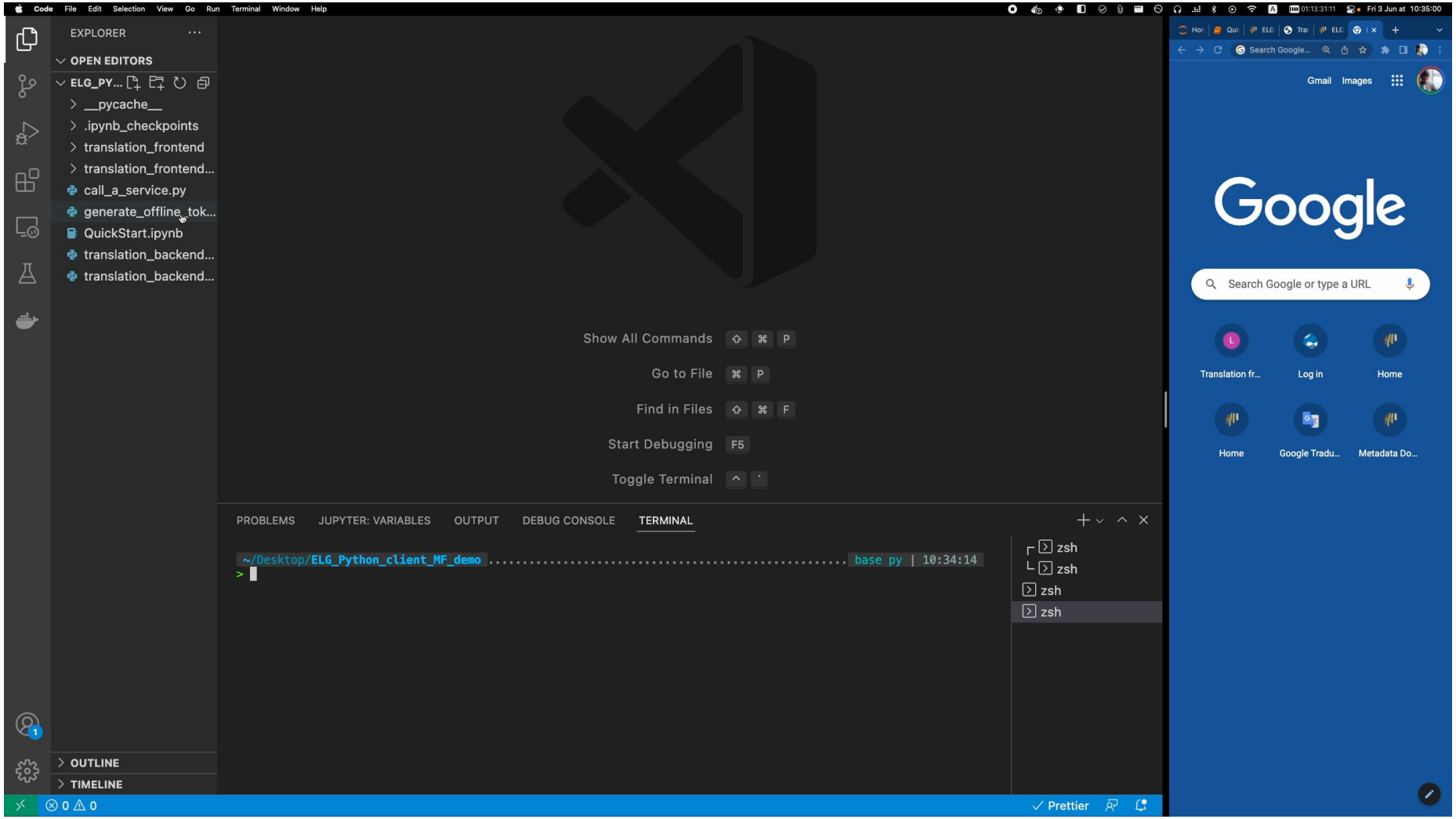
Then you can use the search method to search for resources. This method returns a list of `Entity` which can be displayed individually.

For example, we can search for a Machine Translation service for English and French.

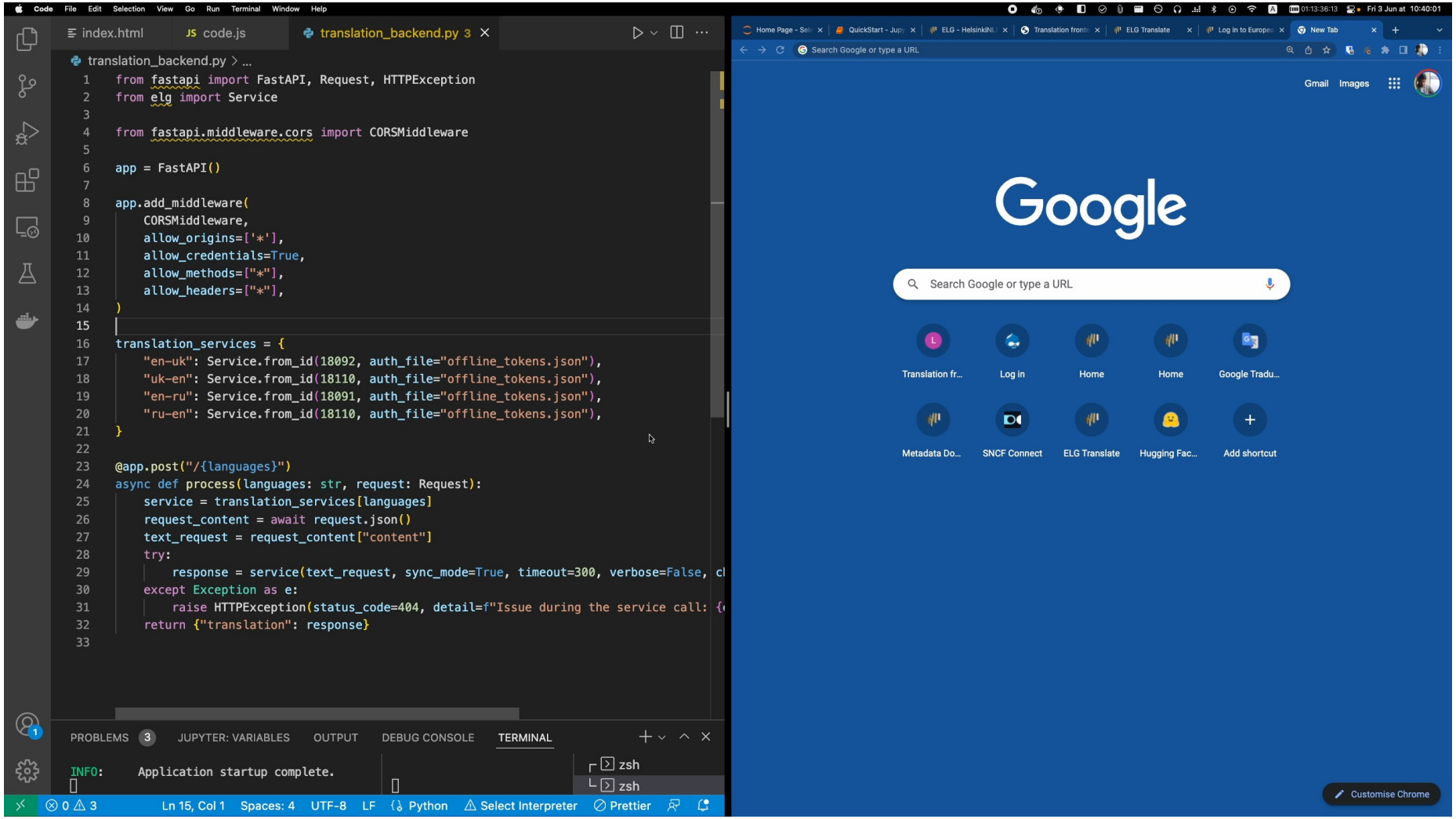
In [ ]:
```
catalog = Catalog()

# Search and get the result as a list of Entity
results = catalog.search(
    resource = "Tool/Service", # "Corpus", "Lexical/Conceptual resource" or "Language description"
    function = "Machine Translation", # function should be pass only if resource is set to "Tool/Service"
    languages = ["en", "fr"], # string or list if multiple languages
    limit = 100,
)
print(f"Machine Translation service for English and French:\n{list(results)[0]}")
```

DEMO 2: Build a translation system using ELG services and Python (1)



DEMO 2: Build a translation system using ELG services and Python (2)



DEMO 2: Build a translation system using ELG services and Python (3)

translation_backend_2.py > process

```python
from fastapi import FastAPI, Request, HTTPException
from elg import Service

from fastapi.middleware.cors import CORSMiddleware

app = FastAPI()

app.add_middleware(
    CORSMiddleware,
    allow_origins=['*'],
    allow_credentials=True,
    allow_methods=["*"],
    allow_headers=["*"],
)

translation_services = {
    "en-uk": Service.from_id(18092, auth_file="offline_tokens.json"),
    "uk-en": Service.from_id(18110, auth_file="offline_tokens.json"),
    "en-ru": Service.from_id(18091, auth_file="offline_tokens.json"),
    "ru-en": Service.from_id(18110, auth_file="offline_tokens.json"),
    "t2s_en": Service.from_id(4837, auth_file="offline_tokens.json"),
}


@app.post("/{languages}")
async def process(languages: str, request: Request):
    service = translation_services[languages]
    request_content = await request.json()
    text_request = request_content["content"]
    if languages == "t2s_en":
        try:
            response = service(text_request, sync_mode=True, timeout=300, verbose=Fals
            path = f"{response.content[:20].replace('/', '_')}.wav"
            response.to_file(f"translation_frontend_2/audios/{path}")
        except Exception as e:
            raise HTTPException(status_code=404, detail=f"Issue during the service ca
        return {"path": path}
    try:
        response = service(text_request, sync_mode=True, timeout=300, verbose=False,
    except Exception as e:
        raise HTTPException(status_code=404, detail=f"Issue during the service call:
    return {"translation": response}
```

```
INFO:     127.0.0.1:63653 - "POST /t2
s_en HTTP/1.1" 200 OK
```

localhost:3000

Translation frontend

Translate from English to Ukrainian

translate

Translate from Ukrainian to English

translate

listen

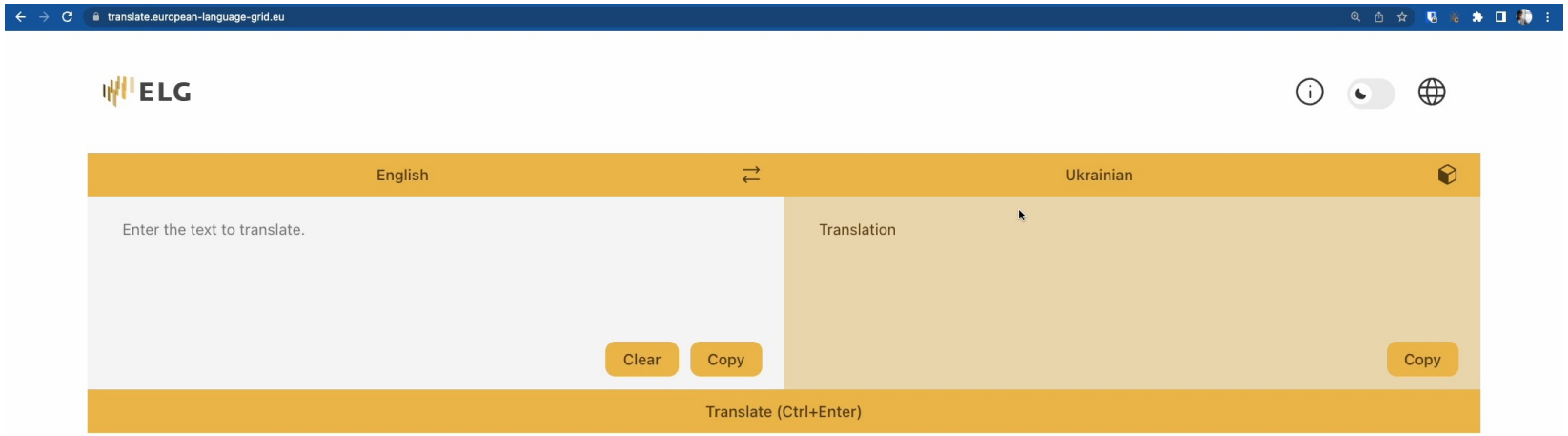
Translate from English to Russian

translate

Translate from Russian to English

translate

DEMO 3: translate.european-language-grid.eu



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ELG services, some use cases in real world applications

- Detect hate speech in comments to filter them
- Translate conversations between users
- Add speech synthesis to a chatbot
- Extract information from documents
- Many many more …

→ Easy integration with ELG APIs and the ELG Python client

European Language Grid

European Language Equality

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