



Lab 8 Environment setting and LangSmith Tutorial

Part 1: Environment Setup

Before working with LangSmith, ensure your environment is properly configured with the following prerequisites:

- Python `3.11` or higher (3.11+ required for LangSmith compatibility)
 - Environment Setup Steps can be found here in [Lab 0](#).
- Project dependencies from `requirements.txt` (separate files for MacOS and Windows)
 - Download the file to the same directory as your `.env` file.
 - Rename the downloaded file to `requirements.txt`
 - Activate the your virtual environment by running the code below:

```
pip install -r requirements.txt
```

- `LangSmith API key` (see below 2.1)
- Access to `CGU VPN` for PGVector connection

Part 2: LangSmith Tutorial

LangSmith is a powerful platform for developing, evaluating, and monitoring language model applications. This tutorial will guide you through:

- Setting up LangSmith with your project
- Creating and tracking chains and agents

- Evaluating model performance
- Debugging complex workflows
- Monitoring your applications

Go to <https://www.langchain.com/langsmith> to create an free account.

1. Setup and Authentication

- To create an API key head to the [LangSmith settings page](#). Then click **Create API Key**.
- Copy and paste the API key into your .env file:

- Set up the configuration in your source code, here we use an example from lab 8

```
langsmith_api_key = os.getenv("LANGSMITH_API_KEY")

# Enable LangSmith tracing for observability/debugging
os.environ["LANGCHAIN_TRACING"] = "true"
# Set the project name for LangSmith, it will create a new project if it doesn't exist
os.environ["LANGCHAIN_PROJECT"] = "GenAI-Class-Lab8"
```

- (Optional) You may use this as a python decorator if you define a function that is not integrated into LangChain, LangGraph function or class.

```
# Import the `trace` decorator from LangSmith to enable tracing of some i
individual customized function calls and metadata for observability/debug
ging.
from langsmith import trace
```

2. Observability, Monitoring and Evaluation

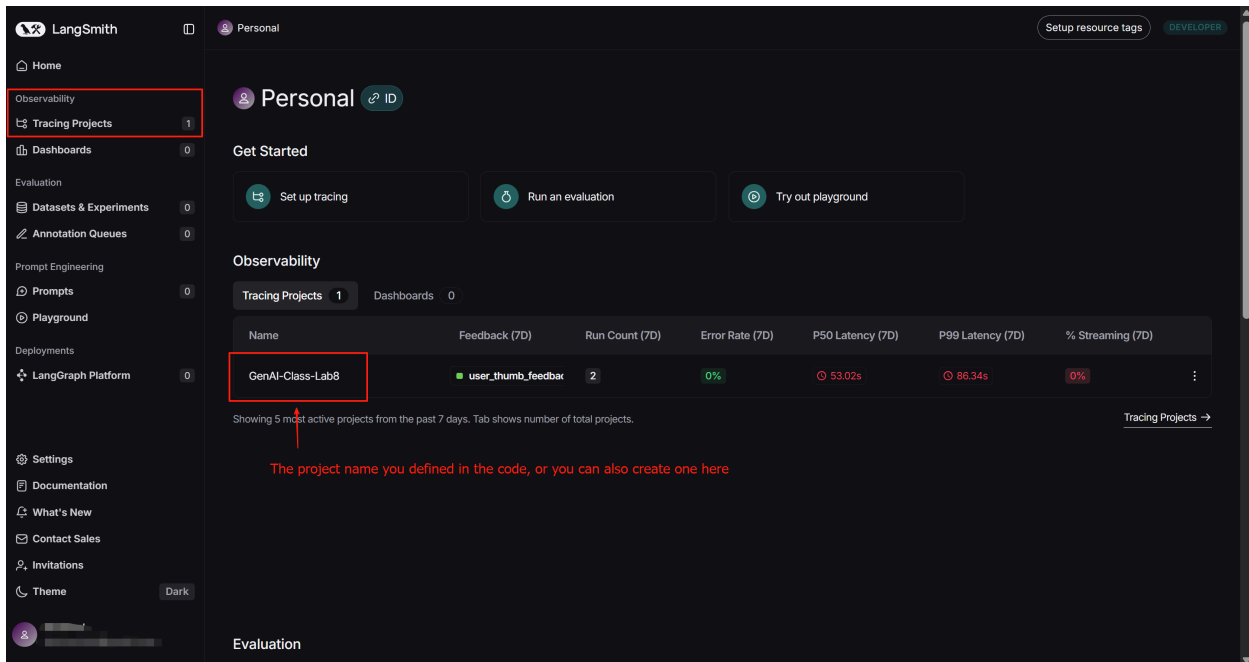
Concepts | 🦜 LangSmith

This conceptual guide covers topics that are important to understand when logging traces to LangSmith. A Trace is essentially a series of steps that your application takes to go

 <https://docs.smith.langchain.com/observability/concepts>



- Go to the tracing projects in your LangSmith account



LangSmith

Personal

Setup resource tags DEVELOPER

Home

Observability

Tracing Projects 1

Dashboards 0

Get Started

Set up tracing Run an evaluation Try out playground

Observability

Tracing Projects 1 Dashboards 0

Name	Feedback (7D)	Run Count (7D)	Error Rate (7D)	P50 Latency (7D)	P99 Latency (7D)	% Streaming (7D)
GenAI-Class-Lab8	user_thumb_feedback	2	0%	53.02s	86.34s	0%

Showing 5 most active projects from the past 7 days. Tab shows number of total projects.

The project name you defined in the code, or you can also create one here

Tracing Projects →

Settings Documentation What's New Contact Sales Invitations Theme Dark

Evaluation

All the runs for this project name will be recorded here. You can check the basic statistics, like the number of runs, error rates, and latency.

- Open one of the tracing projects

Personal > Tracing Projects > GenAI-Class-Lab8

GenAI-Class-Lab8

Add resource tags DEVELOPER

ID Data Retention 14d Add Rule

Your records by default will be cleaned after 14 days

Runs Threads Monitor Setup

1 filter Last 7 days Root Runs LLM Calls All Runs Columns

Name	Input	Output	Error	Start Time	Latency	Dataset	Anno
LangGraph	Search the database first to se...	Search the database fi...		3/30/2025, 1:30:39 ...	87.02s		
LangGraph	What did Drucker say about kn...	Peter Drucker discuss...		3/30/2025, 1:18:58 ...	19.03s		

Here are two runs

Stats
Last 7 days

RUN COUNT
2

TOTAL TOKENS
30,988 / \$0.05

MEDIAN TOKENS
15,494

ERROR RATE
0%

% STREAMING
0%

LATENCY
P50: 53.02s
P99: 86.34s

FEEDBACK
user_thumb_feedb...

Filter Shortcuts

Feedback

You will see all the runs' basic stats, like input, output, token usage, time, and etc.

- Open one of the runs

LangGraph nodes

- __start__ 1.20s
- DocumentRetriever 3.74s
- RelevanceGrader 3.57s
- AnswerGenerator 10.33s

Input

Question: What did Drucker say about knowledge workers in his books?

Output

DOCUMENTS documents 9

Document	Score	Year	Relevance
. It takes his knowledge and uses it as the resource, the m...	17	2002	+3
. Knowledge workers, after all, first came into being in an...	196	2008	+3
. They do not come with a merger or an acquisition. It is c...	132	2004	+3
. For increasingly the ability of organizations to survive wi...	132	2004	+3
23 May Knowledge-Worker Productivity Knowledge-work...	321	2004	+3
. The knowledge worker who fails to understand this will ...	145	2008	+3
. 5. Productivity of the knowledge worker is not—at least ...	321	2004	+3
24 May Defining the Task in Knowledge Work In knowled...	323	2004	+3
. Drucker analyzes the new realities of strategy, shows h...	806	2004	+3

Metadata

- STATUS: Success
- TOTAL TOKENS: 8,485 tokens / \$0.0113926
- LATENCY: 19.03s
- TYPE: Chain
- TAGS: streamlit_app_call

You will see all the intermediate results and stats for each node. (If you use the trace decorator, it will be displayed here as a node as well.)

AnswerGenerator 10.33s

- ChatOpenAI gpt-4o 7.89s
- _write 0.00s
- check_generation_vs_docume... 2.42s
 - RunnableSequence 1.25s
 - ChatOpenAI gpt-4o-mini 1.25s
 - JsonOutputParser 0.00s
 - RunnableSequence 1.17s
 - ChatOpenAI gpt-4o-mini 1.16s
 - JsonOutputParser 0.00s

You can expand one of the nodes to see more granular details.

For more details, check their official documentation at
<https://docs.smith.langchain.com/>