Easy Model Deployer

None

None

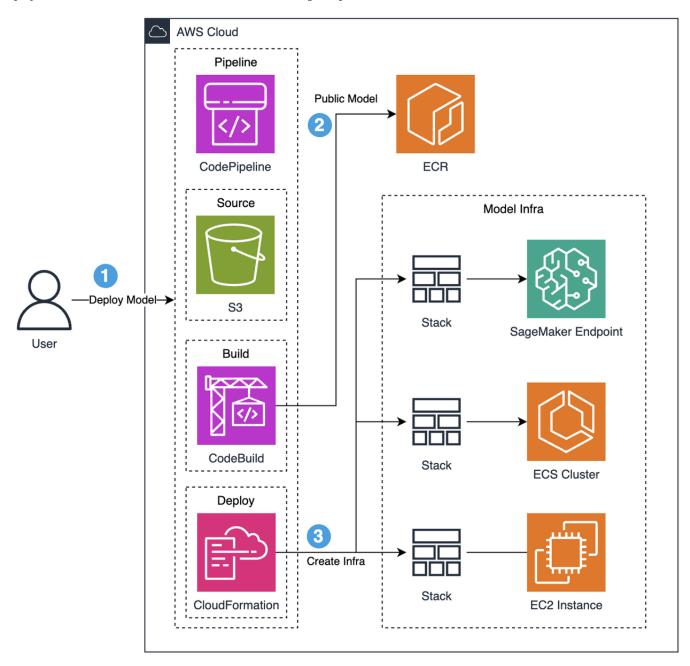
None

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1. Architecture

Deploy models to the cloud with EMD will use the following components in Amazon Web Services:



- $1.\ User/Client\ initiates\ model\ deployment\ task,\ triggering\ pipeline\ to\ start\ model\ building.$
- 2. AWS CodeBuild constructs the large model using predefined configuration and publishes it to Amazon ECR.
- 3. AWS CloudFormation creates a model infrastructure stack based on user selection and deploys the model from ECR to AWS services (Amazon SageMaker, EC2, ECS).

2. Installation

2.1 Installation Guide

2.1.1 Prerequisites

- Python 3.9 or higher
- pip (Python package installer)

2.1.2 Setting up the Environment

1. Create a virtual environment:

```
python -m venv emd-env
```

2. Activate the virtual environment:

```
source emd-env/bin/activate
```

3. Install the required packages:

```
pip install https://github.com/aws-samples/easy-model-deployer/releases/download/emd-0.7.1/emd-0.7.1-py3-none-any.whl
```

2.2 Deployment parameters

2.2.1 --force-update-env-stack

No additional emd bootstrap required for deployment. Because of other commands, status/destroy etc. require pre-bootstrapping. Therefore, it is recommended to run emd bootstrap separately after each upgrade.

2.2.2 -- extra-params

Extra parameters passed to the model deployment. extra-params should be a Json object of dictionary format as follows:

```
"model_params": {
},
"service_params":{
},
"instance_params":{
},
"engine_params":{
    "cli_args": "<command line arguments of current engine>",
    "api_key":"<api key>"
},
"framework_params":{
    "uvicorn_log_level":"info",
    "limit_concurrency":200
}
}
```

To learn some practice examples, please refer to the Best Deployment Practices.

2.3 Local deployment on the ec2 instance

This is suitable for deploying models using local GPU resources.

2.3.1 Pre-requisites

Start and connect to EC2 instance

It is recommended to launch the instance using the AMI "Deep Learning OSS Nvidia Driver AMI GPU PyTorch 2.6 (Ubuntu 22.04)".

2.3.2 Deploy model using EMD

```
emd deploy --allow-local-deploy
```

There some EMD configuration sample settings for model deployment in the following two sections: Non-reasoning Model deployment configuration. Wait for the model deployment to complete.

Non-reasoning Model deployment configuration

QWEN2.5-72B-INSTRUCT-AWQ

```
? Select the model series: qwen2.5
? Select the model name: Qwen2.5-72B-Instruct-AWQ
? Select the service for deployment: Local
? input the local gpu ids to deploy the model (e.g. 0,1,2): 0,1,2,3
? Select the inference engine to use: tgi
? (Optional) Additional deployment parameters (JSON string or local file path), you can skip by pressing Enter: {"engine_params":{"api_key":"<YOUR_API_KEY>",
"default_cli_args": "--max-total-tokens 30000 --max-concurrent-requests 30"}}
```

LLAMA-3.3-70B-INSTRUCT-AWO

```
? Select the model series: llama
? Select the model name: llama-3.3-70b-instruct-awq
? Select the service for deployment: Local
? input the local gpu ids to deploy the model (e.g. 0,1,2): 0,1,2,3
engine type: tgi
framework type: fastapi
? (Optional) Additional deployment parameters (JSON string or local file path), you can skip by pressing Enter: {"engine_params":{"api_key":"<YOUR_API_KEY>",
"default_cli_args": "--max-total-tokens 30000 --max-concurrent-requests 30"}}
```

Reasoning Model deployment configuration

DEEPSEEK-R1-DISTILL-QWEN-32B

```
? Select the model series: deepseek reasoning model
? Select the model name: DeepSeek-R1-Distill-Qwen-32B
? Select the service for deployment: Local
? input the local gpu ids to deploy the model (e.g. 0,1,2): 0,1,2,3
engine type: vllm
framework type: fastapi
? (Optional) Additional deployment parameters (JSON string or local file path), you can skip by pressing Enter: {"engine_params":{"api_key":"<YOUR_API_KEY>",
"default_cli_args": "--enable-reasoning --reasoning-parser deepseek_r1 --max_model_len 16000 --disable-log-stats --chat-template emd/models/chat_templates/
deepseek_r1_distill.jinja --max_num_seq 20 --gpu_memory_utilization 0.9"}}
```

DEEPSEEK-R1-DISTILL-LLAMA-70B-AWQ

```
? Select the model series: deepseek reasoning model
? Select the model name: deepseek-r1-distill-llama-70b-awq
? Select the service for deployment: Local
? input the local gpu ids to deploy the model (e.g. 0,1,2): 0,1,2,3
? Select the inference engine to use: tgi
framework type: fastapi
? (Optional) Additional deployment parameters (JSON string or local file path), you can skip by pressing Enter: {"engine_params":{"api_key":"<YOUR_API_KEY>",
"default_cli_args": "--max-total-tokens 30000 --max-concurrent-requests 30"}}
```

2.4 Examples

3. Best Deployment Practices

This document provides examples of best practices for deploying models using EMD for various use cases.

3.1 Famous Models

3.1.1 Qwen 3 Series

```
emd deploy --model-id Qwen3-30B-A3B --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime
emd deploy --model-id Qwen3-32B --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime
emd deploy --model-id Qwen3-8B --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime
```

3.1.2 GLM Z1/0414 Series

```
emd deploy --model-id GLM-Z1-32B-0414 --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime
emd deploy --model-id GLM-4-32B-0414 --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime
```

3.1.3 Mistral Small Series

emd deploy --model-id Mistral-Small-3.1-24B-Instruct-2503 --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime

3.1.4 Gemma 3 Series

emd deploy --model-id gemma-3-27b-it --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime

3.1.5 Qwen Series

Qwen2.5-VL-32B-Instruct

 $emd \ deploy \ \hbox{--model-id Qwen2.5-VL-32B-Instruct --instance-type } \ g5.12 x large \ \hbox{--engine-type } v llm \ \hbox{--service-type } sagemaker_real time \ \hbox{-$

QwQ-32B

emd deploy --model-id QwQ-32B --instance-type g5.12xlarge --engine-type vllm --service-type sagemaker_realtime

3.2 Deploying to Specific GPU Types

Choosing the right GPU type is critical for optimal performance and cost-efficiency. Use the --instance-type parameter to specify the GPU instance.

3.2.1 Example: Deploying Qwen2.5-7B on g5.2xlarge

emd deploy --model-id Qwen2.5-7B-Instruct --instance-type g5.2xlarge --engine-type vllm --service-type sagemaker_realtime

3.3 Achieving Longer Context Windows

To enable longer context windows, use the --extra-params option with engine-specific parameters.

3.3.1 Example: Deploying model with 16k context window

```
emd deploy --model-id Qwen2.5-7B-Instruct --instance-type g5.4xlarge --engine-type vllm --service-type sagemaker_realtime --extra-params '{
    "engine_params": {
      "vllm_cli_args": "--max_model_len 16000 --max_num_seqs 4"
    }
}'
```

3.3.2 Example: Deploying model on G4dn instance

```
emd deploy --model-id Qwen2.5-14B-Instruct-AWQ --instance-type g4dn.2xlarge --engine-type vllm --service-type sagemaker_realtime --extra-params '{
    "engine_params": {
        "environment_variables": "export VLLM_ATTENTION_BACKEND=XFORMERS && export PYTORCH_CUDA_ALLOC_CONF=expandable_segments:True",
        "default_cli_args": " --chat-template emd/models/chat_templates/qwen_2d5_add_prefill_chat_template.jinja --max_model_len 12000 --max_num_seqs 10 --
        gpu_memory_utilization 0.95 --disable-log-stats --enable-auto-tool-choice --tool-call-parser hermes"
    }
}'
```

3.3.3 Example: Customize model download methods

- You can load models from different locations by addingappropriate values in the extra-params parameter
- Load model from S3

```
{
  "model_params":{
    "model_files_s3_path":"<S3_PATH>"
    }
}
```

• Load model from local path (only applicable for local deployment)

```
{
  "model_params": {     "model_files_local_path":"<LOCAL_PATH>"
  }
}
```

· Skip downloading and uploading model files in codebuild, which will significantly reducedeployment time

```
{
  "model_params": {
    "need_prepare_model":false
}
}
```

• Specify the download source for model files

```
{
    "model_params":{
        "model_files_download_source":"huggingface|modelscope|auto(default)"
    }
}
```

• Specify the model ID on huggingface or modelscope

```
{
"model_params": {
    "huggingface_model_id":"model id on huggingface", "modelscope_model_id":"model id on modelscope"
    }
}
```

3.4 Environmental variables

• LOCAL_DEPLOY_PORT: Local deployment port, default: 8080

3.5 Common Troubleshooting

- If your deployment fails due to out-of-memory issues, try:
- Using a larger instance type
- Reducing max_model_len and max_num_seqs in the engine parameters

 \bullet Setting a lower gpu_memory_utilization value (e.g., 0.8 instead of the default)

4. Usse EMD client to invoke deployed models

 ${\tt emd \ invoke \ MODEL_ID \ MODEL_TAG \ (Optional)}$

4.1 LLM models

emd invoke DeepSeek-R1-Distill-Qwen-7B
...
Invoking model DeepSeek-R1-Distill-Qwen-7B with tag dev
Write a prompt, press Enter to generate a response (Ctrl+C to abort),
User: how to solve the problem of making more profit
Assistant:<think>
Okay, so I need to figure out how to make more profit. Profit is basically the money left after subtracting costs from revenue, right? So, increasing profit means either making more money from sales or reducing the expenses. Let me think about how I can approach this.

4.2 VLM models

1. upload image to a s3 path



aws s3 cp image.jpg s3://your-bucket/image.jpg

2. invoke the model

emd invoke Qwen2-VL-7B-Instruct
...
Invoking model Qwen2-VL-7B-Instruct with tag dev
Enter image path(local or s3 file): s3://your-bucket/image.jpg

```
Enter prompt: What's in this image?
```

4.2.1 Video(Txt2Video) models

1. input prompt for video generation

```
emd invoke txt2video-LTX ...

Invoking model txt2video-LTX with tag dev

Write a prompt, press Enter to generate a response (Ctrl+C to abort),

User: Two police officers in dark blue uniforms and matching hats enter a dimly lit room through a doorway on the left side of the frame. The first officer,
with short brown hair and a mustache, steps inside first, followed by his partner, who has a shaved head and a goatee. Both officers have serious expressions
and maintain a steady pace as they move deeper into the room. The camera remains stationary, capturing them from a slightly low angle as they enter. The room
has exposed brick walls and a corrugated metal ceiling, with a barred window visible in the background. The lighting is low-key, casting shadows on the
officers' faces and emphasizing the grim atmosphere. The scene appears to be from a film or television show.
...
```

2. download generated video from output_path

4.3 Embedding models

```
emd invoke bge-base-en-v1.5
...
Invoking model bge-base-en-v1.5 with tag dev
Enter the sentence: hello
...
```

4.4 Rerank models

```
emd invoke bge-reranker-v2-m3
...
Enter the text_a (string): What is the capital of France?
Enter the text_b (string): The capital of France is Paris.
...
```

4.5 ASR models(whisper)

1. upload audio to a s3 path

```
aws s3 cp xx.wav s3://your-bucket/xx.wav
```

2. invoke the model

```
emd invoke whisper
...
Enter the s3 path to the audio file: s3://your-bucket/xx.wav
Enter model [large-v3-turbo/large-v3]: large-v3-turbo
...
```

5. Usse Langchain interface to invoke deployed models

5.1 LLM models

```
from emd.integrations.langchain_clients import SageMakerVllmChatModel
from langchain_core.output_parsers import StrOutputParser
from langchain_core.messages import HumanMessage, AIMessage from langchain_tools.base import StructuredTool
from langchain_core.utils.function_calling import (
    convert_to_openai_function,
    convert_to_openai_function)
}
chat_model = SageMakerVllmChatModel(
    model_id="Qwen2.5-7B-Instruct",
    model_wkargs={
        "temperature":0.5,
     }
})
chain = chat_model | StrOutputParser()
messages = [
        HumanMessage(content="9.11 9.9 "),
     ]
print(chain.invoke(messages))
```

5.2 VLM models

1. upload image to a s3 path

```
aws s3 cp image.jpg s3://your-bucket/image.jpg
```

2. invoke the model

```
emd invoke Qwen2-VL-7B-Instruct
...
Invoking model Qwen2-VL-7B-Instruct with tag dev
Enter image path(local or s3 file): s3://your-bucket/image.jpg
Enter prompt: What's in this image?
...
```

5.2.1 Video(Txt2Video) models

Not supported

5.3 Embedding models

```
import time
from emd.integrations.langchain_clients import SageMakerVllmEmbeddings
from emd.integrations.langchain_clients import SageMakerVllmRerank
embedding_model = SageMakerVllmEmbeddings(
    model_id="bge-m3",
)
text = 'The giant panda (Ailuropoda melanoleuca), sometimes called a panda bear or simply panda, is a bear species endemic to China.'
t0 = time.time()
r1 = embedding_model.embed_query(text)
t1 = time.time()
embedding_model.embed_documents([text]*1000)
t2 = time.time()
print(f"embed_query: {t1-t0}")
print(f"embed_documents: {t2-t1}")
```

5.4 Rerank models

```
import time
from emd.integrations.langchain_clients import SageMakerVllmRerank
docs = ["hi",'The giant panda (Ailuropoda melanoleuca), sometimes called a panda bear or simply panda, is a bear species endemic to China.']
query = 'what is panda?'
rerank_model = SageMakerVllmRerank(
    model_id="bge-reranker-v2-m3"
```

)
print(rerank_model.rerank(query=query,documents=docs))

6. Test OpenAI compatible interface

6.0.1 Sample Code

```
import openai
# Change the api_key here to the parameter you passed in via extra-parameter
api_key = "your_openai_api_key"
def chat_with_openai_stream(prompt):
    client = openai.OpenAI(
         api_key=api_key,
base_url="http://ec2-54-189-171-204.us-west-2.compute.amazonaws.com:8080/v1"
    response = client.chat.completions.create(
    model="Qwen2.5-72B-Instruct-AWQ",
          # model="Qwen2.5-1.5B-Instruct",
         messages=[
{"role": "user", "content": prompt}
         stream=True,
         temperature=0.6
    print("AI: ", end="", flush=True)
     print(response)
    for chunk in response:
    content = chunk.choices[0].delta.content
         think = getattr(chunk.choices[0].delta,"reasoning_content",None)
if think is not None:
    print(think,end="",flush=True)
else:
              print(content, end="", flush=True)
def chat_with_openai(prompt):
    client = openai.OpenAI(
         api_key=api_key,
         base_url="http://127.0.0.1:9000/v1"
    response = client.chat.completions.create(
         stream=False
    print(response)
# Test the stream and non-stream interface
chat_with_openai_stream("What is the capital of France?")
chat_with_openai("What is the capital of France?")
```

7. Supported Model

ModelSeries	ModelType	Supported Engines	Supported Instances
glm4	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
internlm2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
internlm2.5	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
internlm2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
internlm2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
internlm2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm,tgi,tgi	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm,tgi	g5.12xlarge,g5.24xlarge,g5.48xlarg
qwen2.5	llm	vllm	g5.48xlarge
qwen2.5	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlar
qwen2.5	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
qwen2.5	llm	vllm,tgi	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
qwen2.5	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
qwen reasoning model	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
qwen reasoning model	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
llama	llm	tgi	g5.12xlarge,g5.24xlarge,g5.48xlarq
deepseek reasoning model	llm	vllm,tgi	g5.12xlarge,g5.24xlarge,g5.48xlarg
deepseek reasoning model	llm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlar
deepseek reasoning model	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
deepseek reasoning model	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
	glm4 internlm2.5 internlm2.5 internlm2.5 internlm2.5 internlm2.5 internlm2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.5 qwen2.6 q	glm4 Ilm internlm2.5 Ilm internlm2.5 Ilm internlm2.5 Ilm internlm2.5 Ilm internlm2.5 Ilm qwen2.5 Ilm qwen2.6 Ilm qwen2.6 Ilm qwen2.6 Ilm qwen2.7 Ilm qwen2.8 Ilm qwen2.9 Ilm	glm4 Ilm vilm internlm2.5 Ilm vilm internlm2.5 Ilm vilm qwen2.5 Ilm vilm,tgi,tgi qwen2.5 Ilm vilm qwen2.6 Ilm vilm qwen2.6 Ilm tilm qwen2.7 Ilm vilm qwen2.8 Ilm vilm qwen2.9 Ilm vilm qwen2.9 Ilm vilm qwen2.9 Ilm vilm qwen2.9 Ilm vilm qwen1 tilm qwen1 tigi qw

ModeId	ModelSeries	ModelType	Supported Engines	Supported Instances
DeepSeek-R1-Distill- Qwen-1.5B_ollama	deepseek reasoning model	llm	ollama	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
DeepSeek-R1-Distill- Qwen-1.5B-GGUF	deepseek reasoning model	llm	llama.cpp	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
DeepSeek-R1-Distill- Qwen-32B-GGUF	deepseek reasoning model	llm	llama.cpp	g5.12xlarge,g5.24xlarge
DeepSeek-R1-Distill- Llama-8B	deepseek reasoning model	llm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
deepseek-r1-distill- lama-70b-awq	deepseek reasoning model	llm	vllm,tgi	g5.12xlarge,g5.24xlarge,g5.48xlarg
deepseek- r1-671b-1.58bit_ollama	deepseek reasoning model	llm	ollama	g5.48xlarge
deepseek- r1-671b-1.58bit_gguf	deepseek reasoning model	llm	llama.cpp,ktransformers	g5.8xlarge,g5.12xlarge,g5.16xlarge, 4xlarge,g6e.8xlarge,g6e.12xlarge,g
deepseek- r1-671b-2.51bit_gguf	deepseek reasoning model	llm	ktransformers	g5.12xlarge,g5.16xlarge,g5.24xlarg 12xlarge,g6e.16xlarge,g6e.24xlarg
deepseek- r1-671b-4bit_gguf	deepseek reasoning model	llm	ktransformers	g5.24xlarge,g5.48xlarge,g6.24xlarg
deepseek-v3-UD- IQ1_M_ollama	deepseek v3	llm	ollama	g5.48xlarge
Baichuan-M1-14B- Instruct	baichuan	llm	vllm,huggingface	g5.12xlarge,g5.24xlarge,g5.48xlarq
ReaderLM-v2	jina	llm	vllm,tgi	g4dn.2xlarge,g5.2xlarge,g5.4xlarge
Qwen2-VL-72B- Instruct-AWQ	qwen2vl	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
Qwen2.5-VL-72B- Instruct-AWQ	qwen2vl	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
Qwen2.5-VL-32B- Instruct	qwen2vl	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
QVQ-72B-Preview- AWQ	qwen reasoning model	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlarg
Qwen2-VL-7B-Instruct	qwen2vl	vlm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
InternVL2_5-78B-AWQ	internvl2.5	vlm	lmdeploy	g5.12xlarge,g5.24xlarge,g5.48xlarg
gemma-3-4b-it	gemma3	vlm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g

ModeId	ModelSeries	ModelType	Supported Engines	Supported Instances
gemma-3-12b-it	gemma3	vlm	vllm	g5.2xlarge,g5.4xlarge,g5.8xlarge,g
gemma-3-27b-it	gemma3	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlar
Mistral-Small-3.1-24B- Instruct-2503	mistral	vlm	vllm	g5.12xlarge,g5.24xlarge,g5.48xlar
txt2video-LTX	comfyui	video	comfyui	g5.4xlarge,g5.8xlarge,g6e.2xlarge
whisper	whisper	whisper	huggingface	g5.xlarge,g5.2xlarge,g5.4xlarge,g5
bce-embedding- base_v1	bce	embedding	vllm	g4dn.2xlarge,g5.xlarge,g5.2xlarge
bge-base-en-v1.5	bge	embedding	vllm	g5.xlarge,g5.2xlarge,g5.4xlarge,g5
bge-m3	bge	embedding	vllm	g5.xlarge,g5.2xlarge,g5.4xlarge,g5
jina-embeddings-v3	jina	embedding	huggingface	g5.xlarge,g5.2xlarge,g5.4xlarge,g5
bge-reranker-v2-m3	bge	rerank	vllm	g4dn.2xlarge,g5.xlarge,g5.2xlarge
bge-reranker-large	bge	rerank	vllm	g4dn.2xlarge,g5.xlarge,g5.2xlarge
jina-reranker-v2-base- multilingual	jina	rerank	huggingface	g5.xlarge,g5.2xlarge,g5.4xlarge,g5