

<epam>

# AI Agent

J U N E 2 0 2 5

**There are no magic! It is simple REST API!**

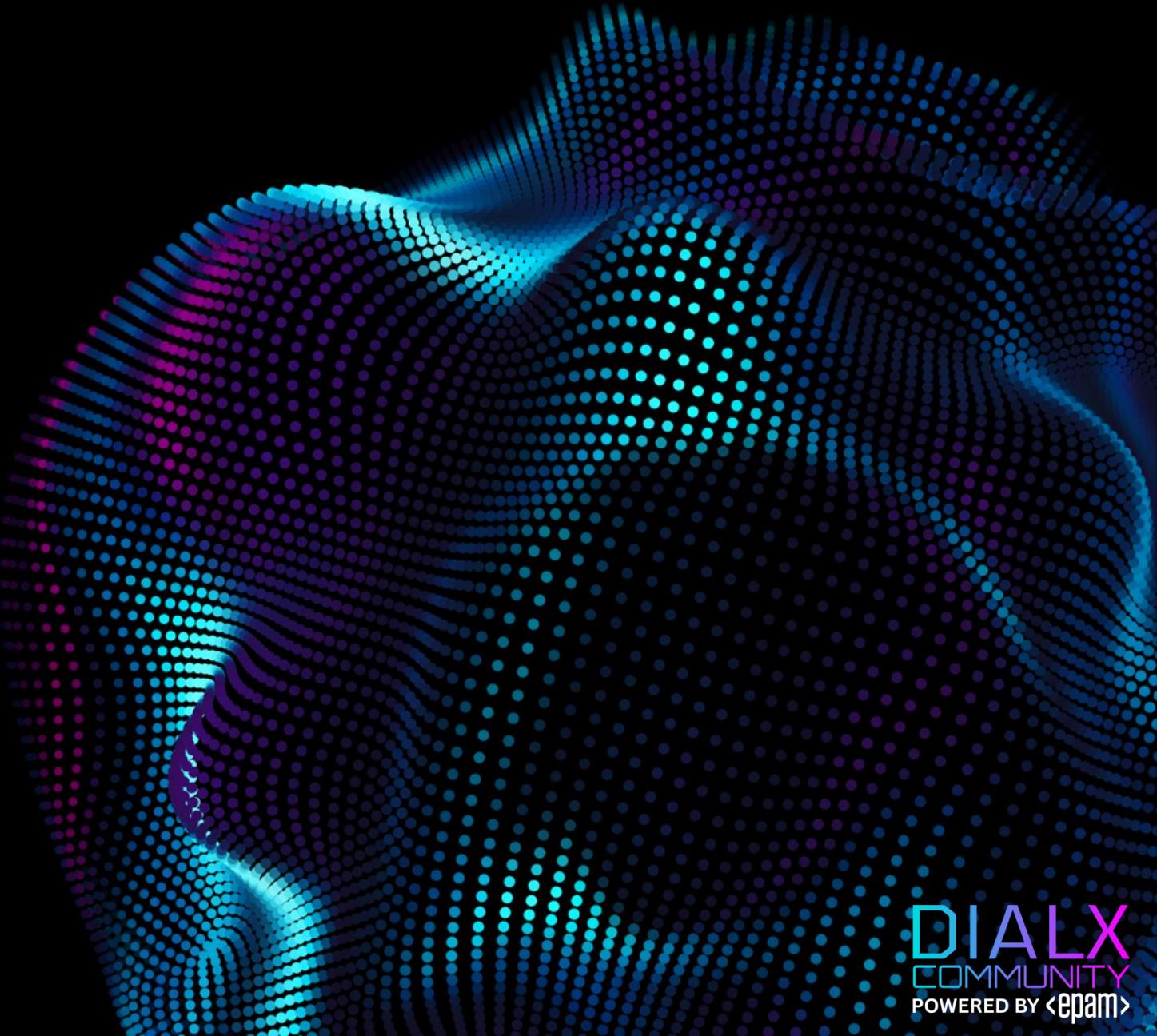
## **Before we start:**

- **Raise your hand and ask questions if you have any**
- **It is better to ask questions when you have**
- **Also, type them in chat**
- **We will need DIAL API key for this session**

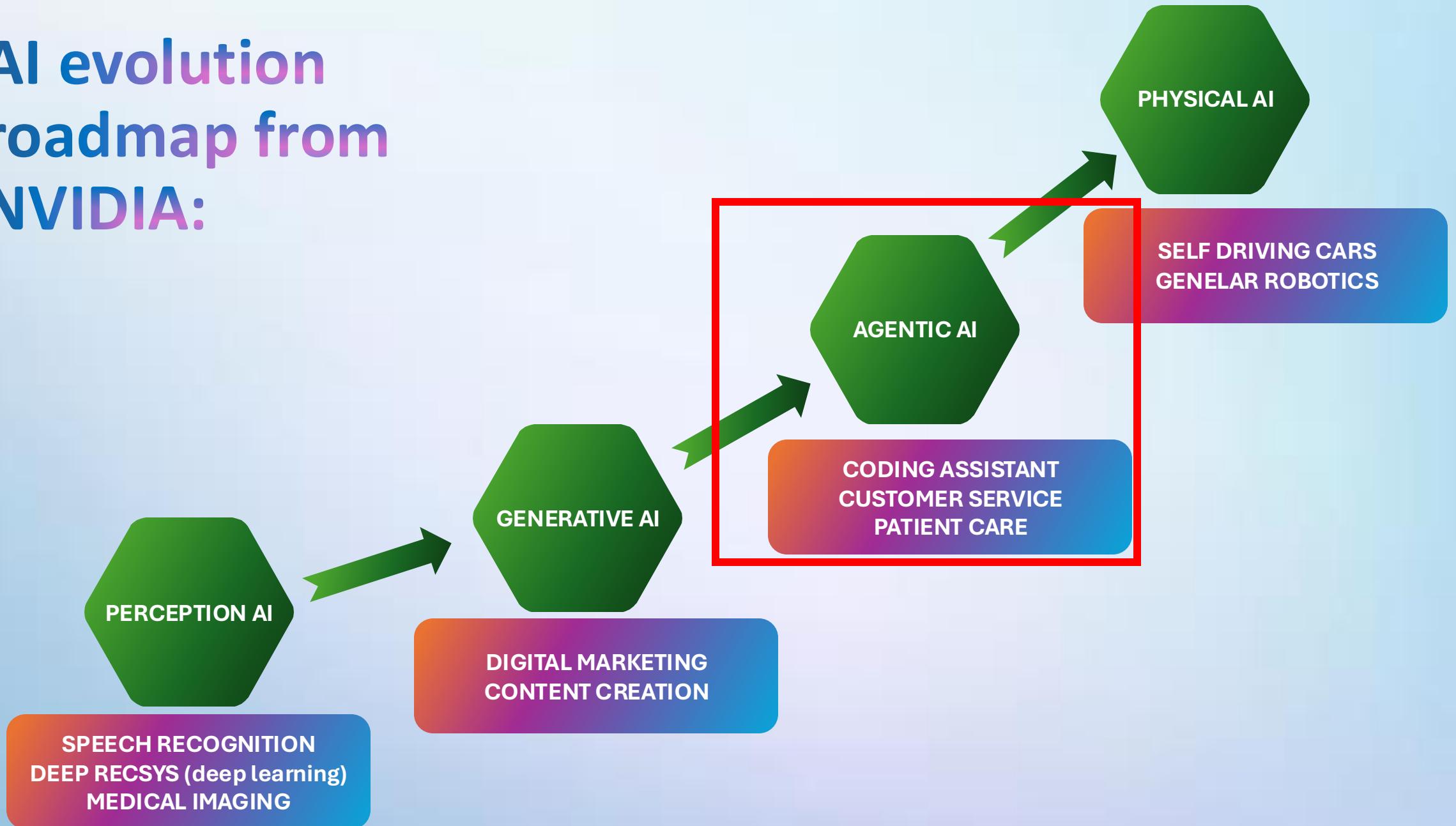
# Agenda:

- Presentation:
  - About Agent
  - Request configuration
  - Response from LLM with tool calls
  - Request to LLM with tool messages
- Workshop:
  - Create simple Agent without any frameworks

# About



# AI evolution roadmap from NVIDIA:

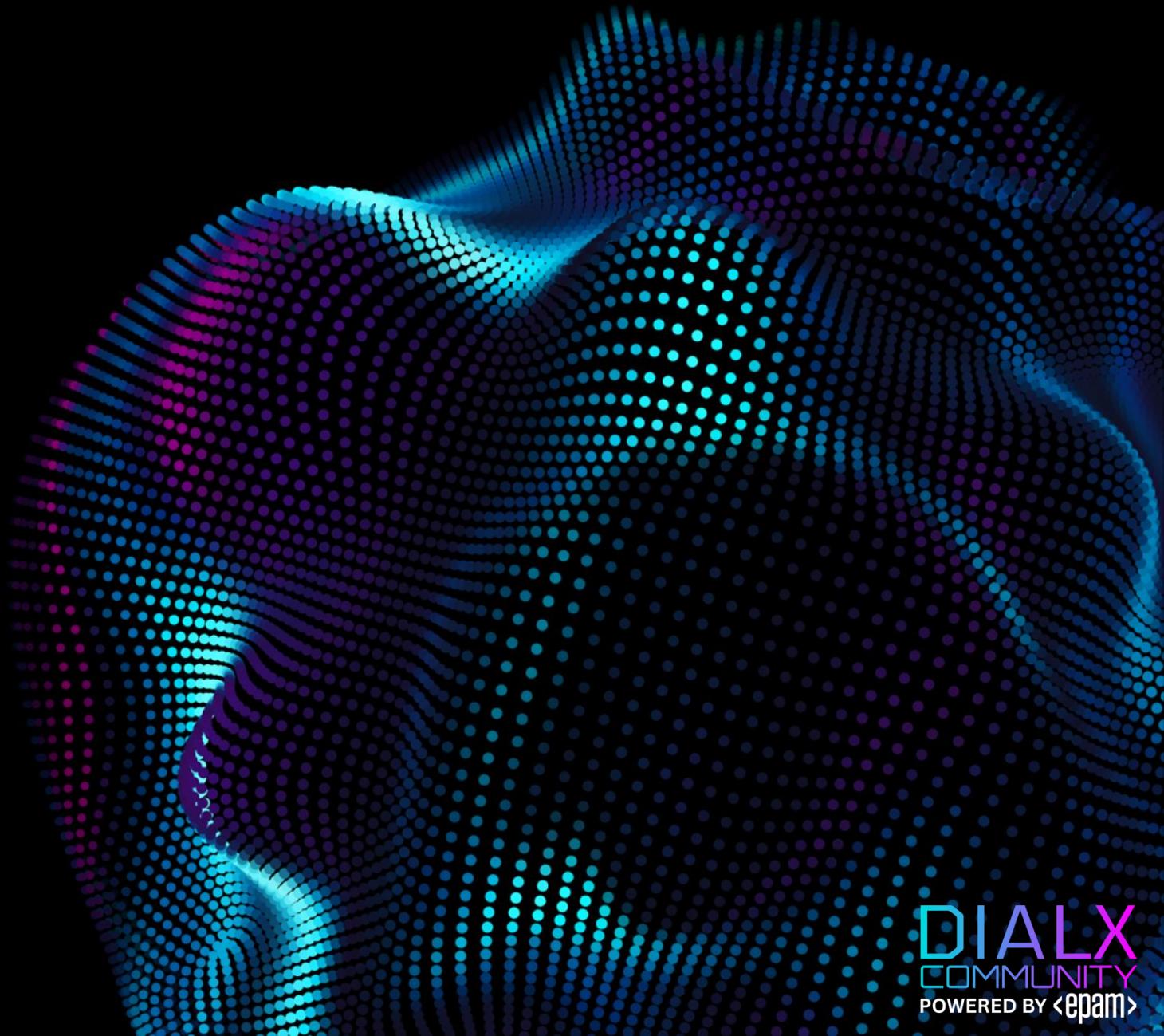


# AI Agents:

An agent is an AI system designed to autonomously achieve goals through planning, reasoning, and taking actions. It can interact with its environment, make decisions, use tools, and learn from experience.



# Request with Tools

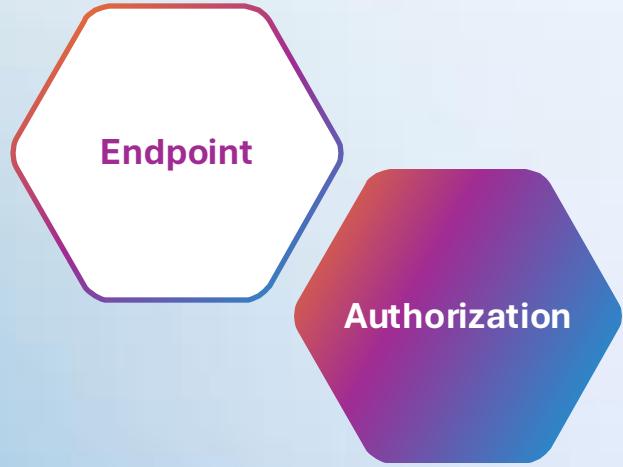


# Request:



`https://ai-proxy.lab.epam.com/openai/deployments/{model}/chat/completions`

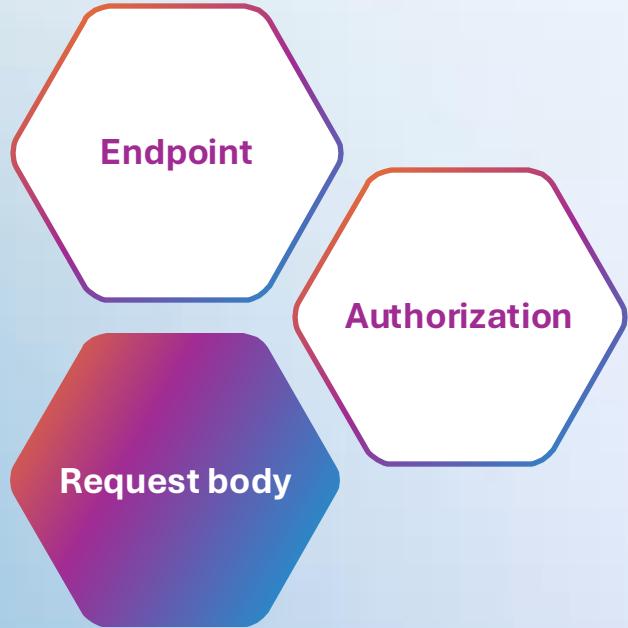
# Request:



Api-Key: {YOUR\_API\_KEY}

[https://dialx.ai/dial\\_api#section/Authorization](https://dialx.ai/dial_api#section/Authorization)

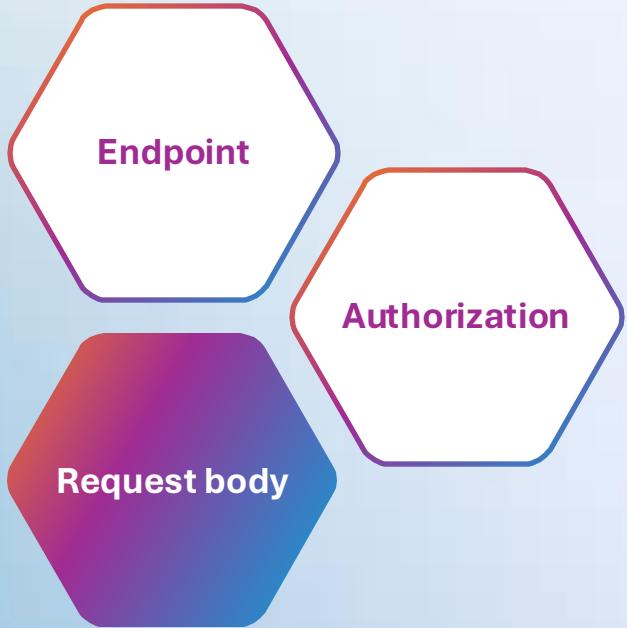
# Request:



**Messages:**  
Conversation history

```
{
  "messages": [...],
  "tools": [
    {
      "function": {
        "name": "<func_name_registered_in_app>",
        "description": "Helps LLM to understand where to use such tool",
        "parameters": {
          "type": "object",
          "properties": {
            "sol": {
              "type": "integer",
              "description": "Sol of Mars."
            }
          },
          "required": ["sol"],
          "additionalProperties": false
        },
        "strict": true
      }
    }
  ]
}
```

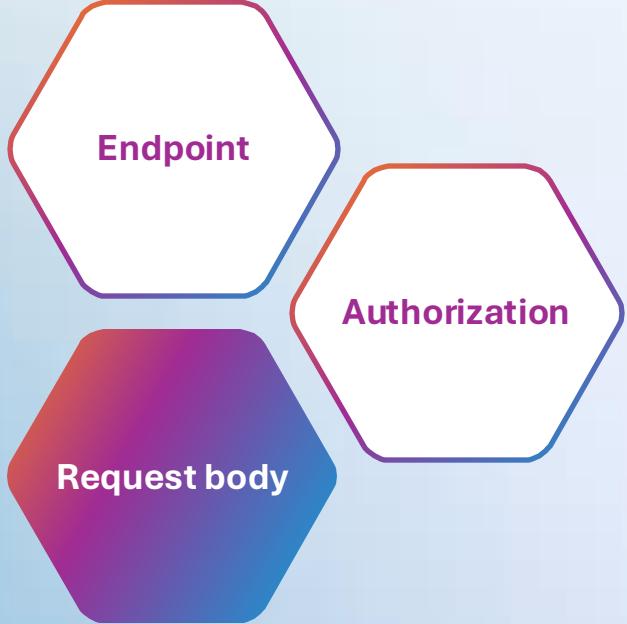
# Request:



**Tools:**  
Array with all tool configurations

```
{  
  "messages": [ ],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

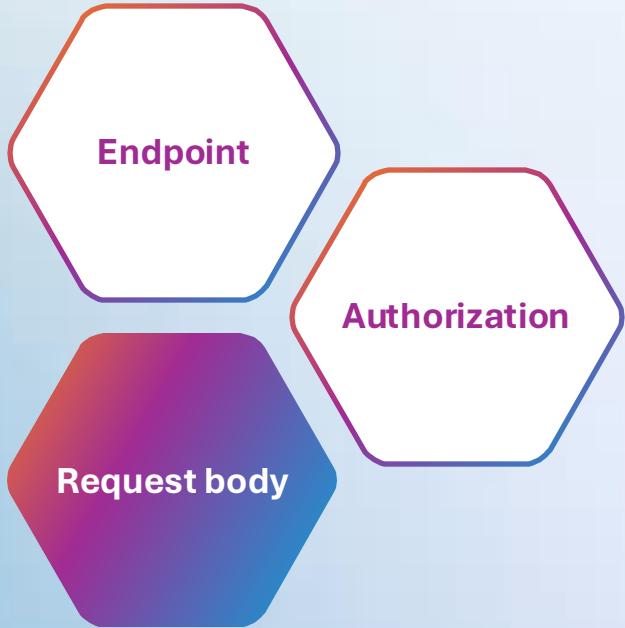
# Request:



**function:**  
JSON schema with tool  
configuration

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            },  
            "required": ["sol"],  
            "additionalProperties": false  
          },  
          "strict": true  
        }  
      }  
    }  
  ]  
}
```

# Request:

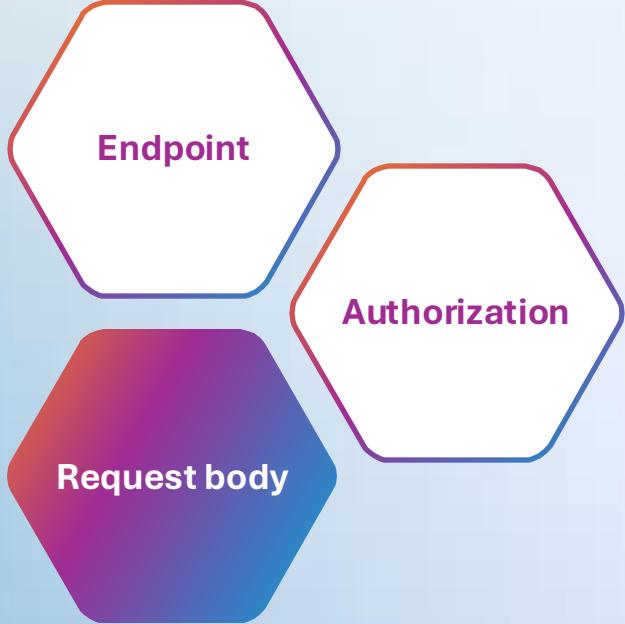


## name:

**Unique identifier of tool in your system, that you will use to call the tool**

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        description : Helps LLM to understand where to use such tool ,  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

# Request:



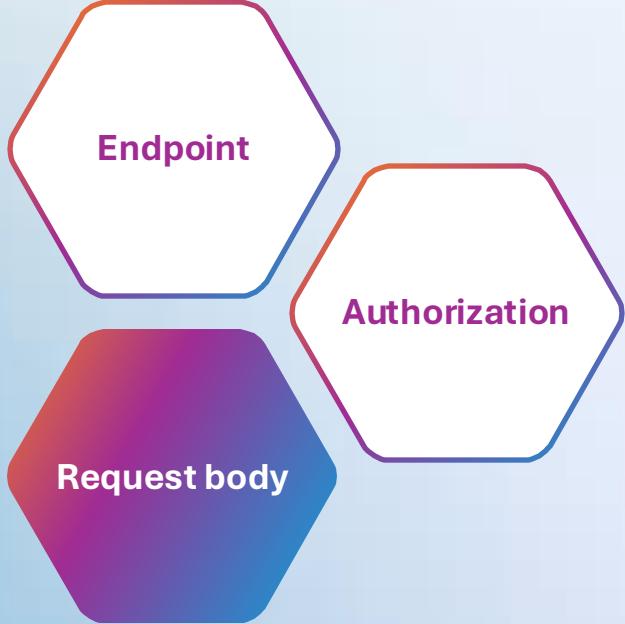
## description:

Prompt with details about tool.  
With this prompt LLM will chose  
when to call this tool.

Max chars 1024

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

# Request:

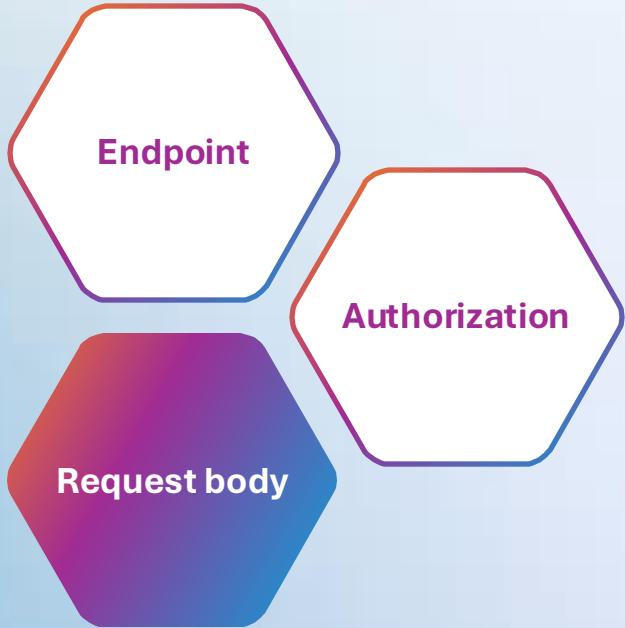


## parameters:

Parameters that tool(function) applies. Parameters should have proper description that LLM will be able to provide proper values. Max chars amount for description is 1024.

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

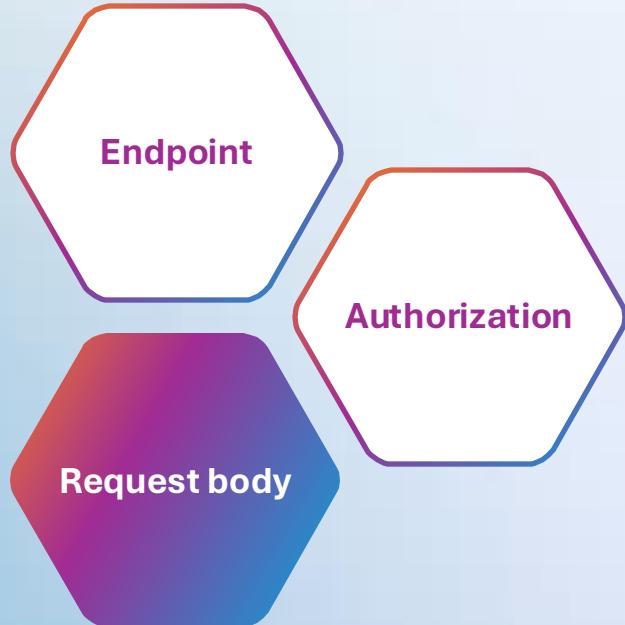
# Request:



**required:**  
List with properties names that are required when

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

# Request:

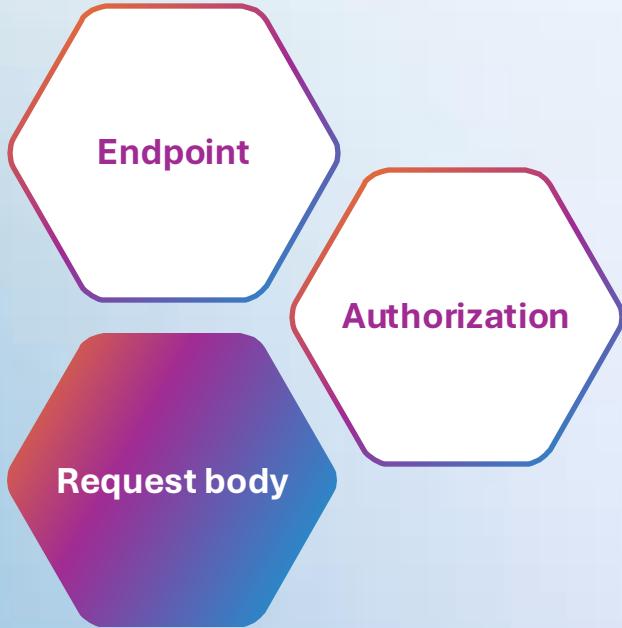


## additionalProperties:

Additional properties are allowed  
for openai and anthropic models.  
Google (gemini) does not support it

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

# Request:

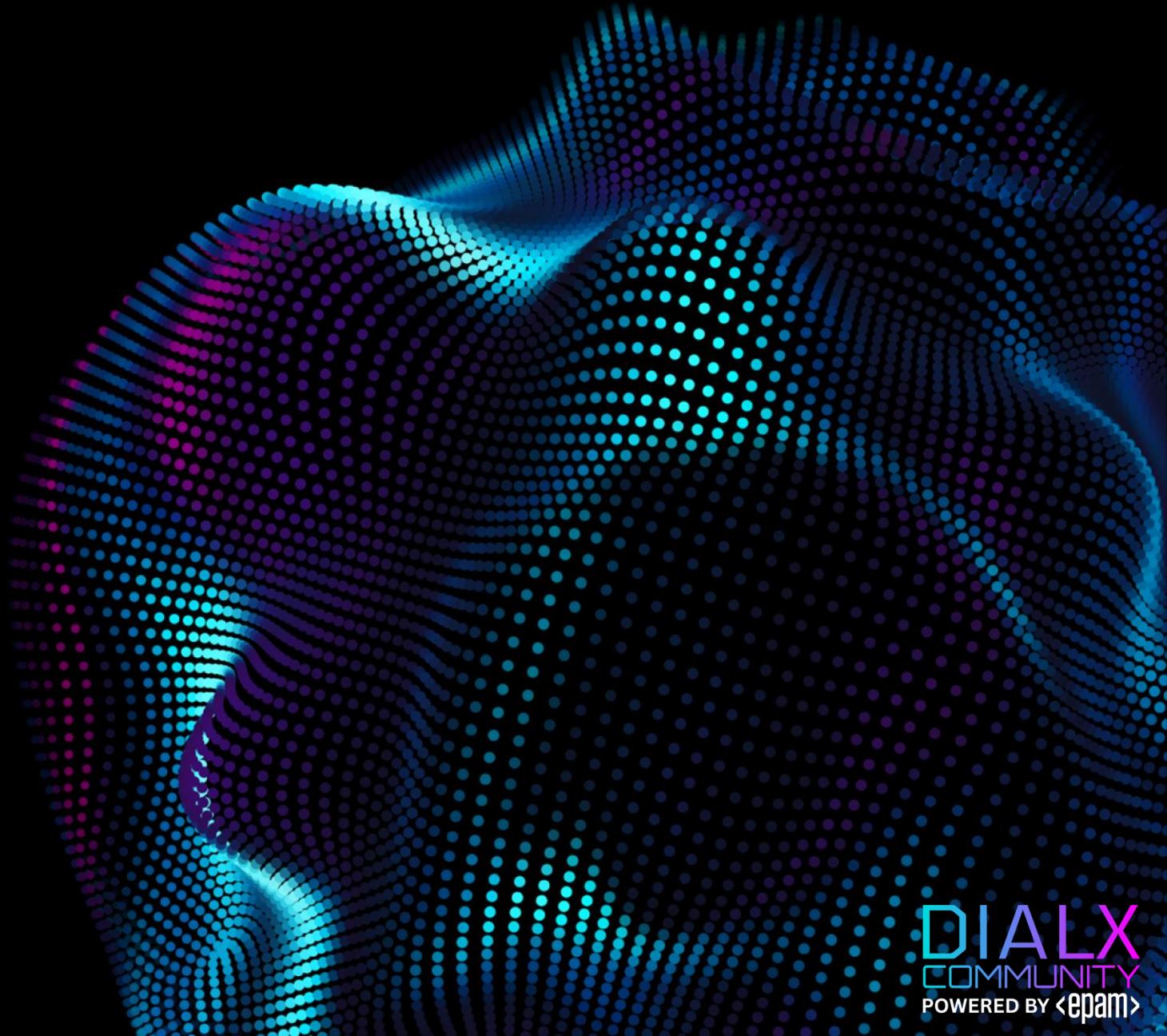


## strict:

Whether LLM should strictly follow this JSON schema.  
ONLY for openai models.  
Openai recommend to set always as *true*.

```
{  
  "messages": [...],  
  "tools": [  
    {  
      "function": {  
        "name": "<func_name_registered_in_app>",  
        "description": "Helps LLM to understand where to use such tool",  
        "parameters": {  
          "type": "object",  
          "properties": {  
            "sol": {  
              "type": "integer",  
              "description": "Sol of Mars."  
            }  
          },  
          "required": ["sol"],  
          "additionalProperties": false  
        },  
        "strict": true  
      }  
    }  
  ]  
}
```

# LLM response with tool calls



# Response:

**choices:**  
**contains array with messages  
where you can choose the most  
appropriate message for you.**

```
{  
...  
"model" : "gpt-4o-2024-08-06",  
"choices" : [ {  
"index" : 0,  
"message" : {  
"role" : "assistant",  
"content" : null,  
"tool_calls" : [  
{  
"id" : "call_8Ob1TsUgcTNAcJVsQb674Wq",  
"type" : "function",  
"function" : {  
"name" : "nasa_image_stealer",  
"arguments" : "{\"sol\": 401}"  
}  
},  
{  
"id" : "call_EvRjSO3UzymUzu3JTDoDAKo0",  
"type" : "function",  
"function" : {  
"name" : "nasa_image_stealer",  
"arguments" : "{\"sol\": 402}"  
}  
}  
]  
,"refusal" : null  
},  
"finish_reason" : "tool_calls"  
],  
...  
}
```

# Response:

## finish\_reason:

explains us the reason of generation finish. When LLM call tools it will have the value `*tool\_calls*` and such value is the indicator that tools should be called.

```
{  
  ...  
  "model" : "gpt-4o-2024-08-06",  
  "choices" : [ {  
    "index" : 0,  
    "message" : {  
      "role" : "assistant",  
      "content" : null,  
      "tool_calls" : [  
        {  
          "id" : "call_8Ob1TsUgcTNAclVssQb674Wq",  
          "type" : "function",  
          "function" : {  
            "name" : "nasa_image_stealer",  
            "arguments" : "{\"sol\": 401}"  
          }  
        },  
        {  
          "id" : "call_EvRjSO3UzymUzu3JTDoDAKo0",  
          "type" : "function",  
          "function" : {  
            "name" : "nasa_image_stealer",  
            "arguments" : "{\"sol\": 402}"  
          }  
        }  
      ],  
      "refusal" : null  
    },  
    "finish_reason" : "tool_calls"  
  ]  
}
```

# Response:

Choice contains message that consist of:

- role
- content
- tool\_calls array

```
{  
  ...  
  "model": "gpt-4o-2024-08-06",  
  "choices": [ {  
    "index": 0,  
    "message": {  
      "role": "assistant",  
      "content": null,  
      "tool_calls": [  
        {  
          "id": "call_8Ob1TsUgcTNAcJVssQb674Wq",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 401}"  
          }  
        },  
        {  
          "id": "call_EvRjSO3UzymUzu3JTDoDAKo0",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 402}"  
          }  
        }  
      ],  
      "refusal": null  
    },  
    "finish_reason": "tool_calls"  
  ]},  
  ...  
}
```

# Response:

## tool\_calls:

Array with all tool calls that should be performed

```
{  
  ...  
  "model" : "gpt-4o-2024-08-06",  
  "choices" : [ {  
    "index" : 0,  
    "message" : {  
      "role" : "assistant",  
      "content" : null  
    },  
    "tool_calls" : [  
      {  
        "id" : "call_8Ob1TsUgcTNAcJVssQb674Wq",  
        "type" : "function",  
        "function" : {  
          "name" : "nasa_image_stealer",  
          "arguments" : "{\"sol\": 401}"  
        }  
      },  
      {  
        "id" : "call_EvRjSO3UzymUzu3JTDoDAKo0",  
        "type" : "function",  
        "function" : {  
          "name" : "nasa_image_stealer",  
          "arguments" : "{\"sol\": 402}"  
        }  
      }  
    ],  
    "refusal" : null  
  },  
  "finish_reason" : "tool_calls"  
],  
...  
}
```

# Response:

## Tool call:

id:

is the special identifier of tool call that we need to pass with tool response to LLM.

Different vendors have different approaches for generation such *id*

```
{  
  ...  
  "model": "gpt-4o-2024-08-06",  
  "choices": [ {  
    "index": 0,  
    "message": {  
      "role": "assistant",  
      "content": null,  
      "tool_calls": [  
        {  
          "id": "call_8Ob1TsUgcTNAcJVssQb674Wq",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 401}"  
          }  
        },  
        {  
          "id": "call_EvRjSO3UzymUzu3JTDoDAKo0",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 402}"  
          }  
        }  
      ],  
      "refusal": null  
    },  
    "finish_reason": "tool_calls"  
  ]  
  ...  
}
```

# Response:

**Tool call:**

**function:**

**Has two params:**

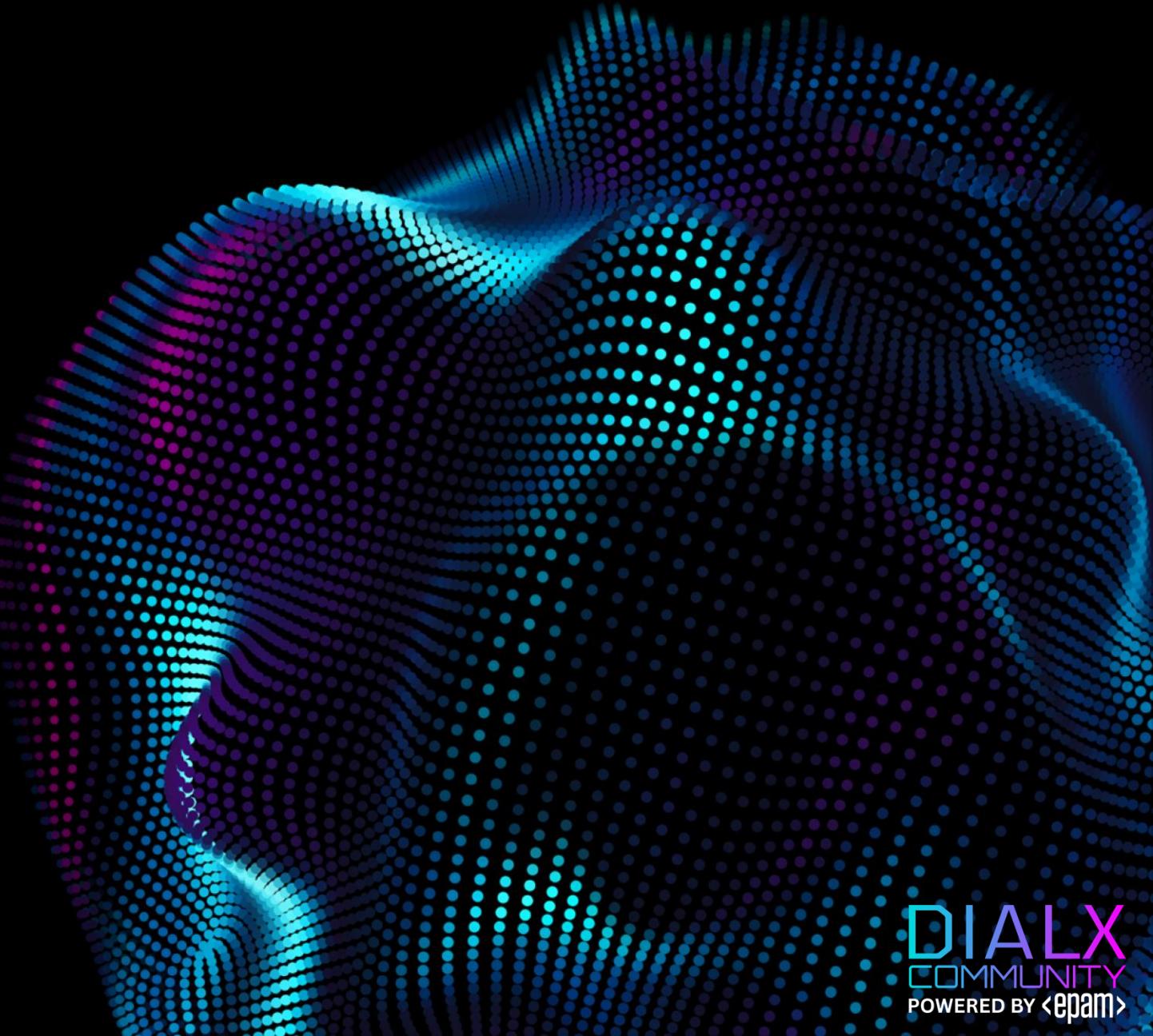
**name: for identification of tool**

**arguments: JSON with arguments.**

**Arguments will be provided  
according to JSON schema that  
was passed with request**

```
{  
  ...  
  "model": "gpt-4o-2024-08-06",  
  "choices": [ {  
    "index": 0,  
    "message": {  
      "role": "assistant",  
      "content": null,  
      "tool_calls": [  
        {  
          "id": "call_8Ob1TsUgcTNAcJVsQb674Wq",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 401}"  
          }  
        },  
        {  
          "id": "call_EvRjSO3UzymUzu3JTDoDAKo0",  
          "type": "function",  
          "function": {  
            "name": "nasa_image_stealer",  
            "arguments": "{\"sol\": 402}"  
          }  
        }  
      ],  
      "refusal": null  
    },  
    "finish_reason": "tool_calls"  
  ]}  
  ...  
}
```

Request with  
tool  
execution  
results



# Request with tool response:

## History

```
{  
  "model" : "gpt-4o"  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    } ],  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to show a close-up ...  
    "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to depict a ....",  
    "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
  } ]  
  "tools" : [...]  
}
```

# Request with tool response:

Tool responses

```
{  
  "model" : "gpt-4o",  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    }  
  ],  
  "role" : "tool",  
  "name" : "nasa_image_stealer",  
  "content" : "The image appears to show a close-up ...  
  "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
}, {  
  "role" : "tool",  
  "name" : "nasa_image_stealer",  
  "content" : "The image appears to depict a ....",  
  "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
]  
],  
  "tools" : [...]  
}
```

# Request with tool response:

Called function result

```
{  
  "model" : "gpt-4o",  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    }  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to show a close-up ...  
    "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to depict a ....",  
    "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
  }]  
  "tools" : [...]  
}
```

# Request with tool response:

Content:  
Result of tool  
execution

```
{  
  "model" : "gpt-4o",  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    }  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to show a close-up ...  
    "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to depict a ....",  
    "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
  }]  
  "tools" : [...]  
}
```

# Request with tool response:

The `tool_call_id` is used to associate a tool call with its corresponding result. If you do not pass this ID or provide an incorrect one, the LLM will return an error indicating an unrecognized tool call.

Additionally, if any tool call IDs are missing in the request, the API will return an error specifying which tool calls are absent."

```
{  
  "model" : "gpt-4o",  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    } ],  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to show a close-up  
    "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to depict a ....",  
    "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
  } ]  
  "tools" : [...]  
}
```

# Request with tool response:

Don't forget to put tools to ALL requests to LLM

```
{  
  "model" : "gpt-4o",  
  "messages" : [ {  
    "role" : "system",  
    "content" : "You are an advanced AI agent. Your goal is to assist user with his questions."  
  }, {  
    "role" : "user",  
    "content" : "Find descriptions of largest NASA pictures for sol 401, 402 and tell me if they have smth similar?\""  
  }, {  
    "role" : "assistant",  
    "content" : null,  
    "tool_calls" : [ {  
      "id" : "call_9U8E8NTBgkiNSEwur9tQvPF9",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 401}" }  
    }, {  
      "id" : "call_KHUVHYJKeuWVlzqLUxqAflpA",  
      "type" : "function",  
      "function" : { "name" : "nasa_image_stealer", "arguments" : "{\"sol\": 402}" }  
    }  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to show a close-up ...  
    "tool_call_id" : "call_9U8E8NTBgkiNSEwur9tQvPF9"  
  }, {  
    "role" : "tool",  
    "name" : "nasa_image_stealer",  
    "content" : "The image appears to depict a ....",  
    "tool_call_id" : "call_KHUVHYJKeuWVlzqLUxqAflpA"  
  }]  
  "tools" : [...]  
}
```



**Subscribe to WeAreCommunity**

<https://wearecommunity.io/communities/dial>

---

Keep in touch with our latest updates.  
Here you find webinars, workshops and  
articles about DIALX features and products.

## Join us:



**Subscribe to YouTube**

<https://www.youtube.com/@TeamDIALX>

---

Here we publish videos about our newest  
products and features.



**Join our Discord community**

<https://discord.gg/jvTCQv4E4q>

---

✨ AI DIALX Community ✨ is the place where  
you can find help with your questions about  
DIALX, direct communication with DIALX team  
and contributors.

DIALX  
COMMUNITY  
POWERED BY <epam>

Thank you!