kser Documentation

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Cedric Dumay

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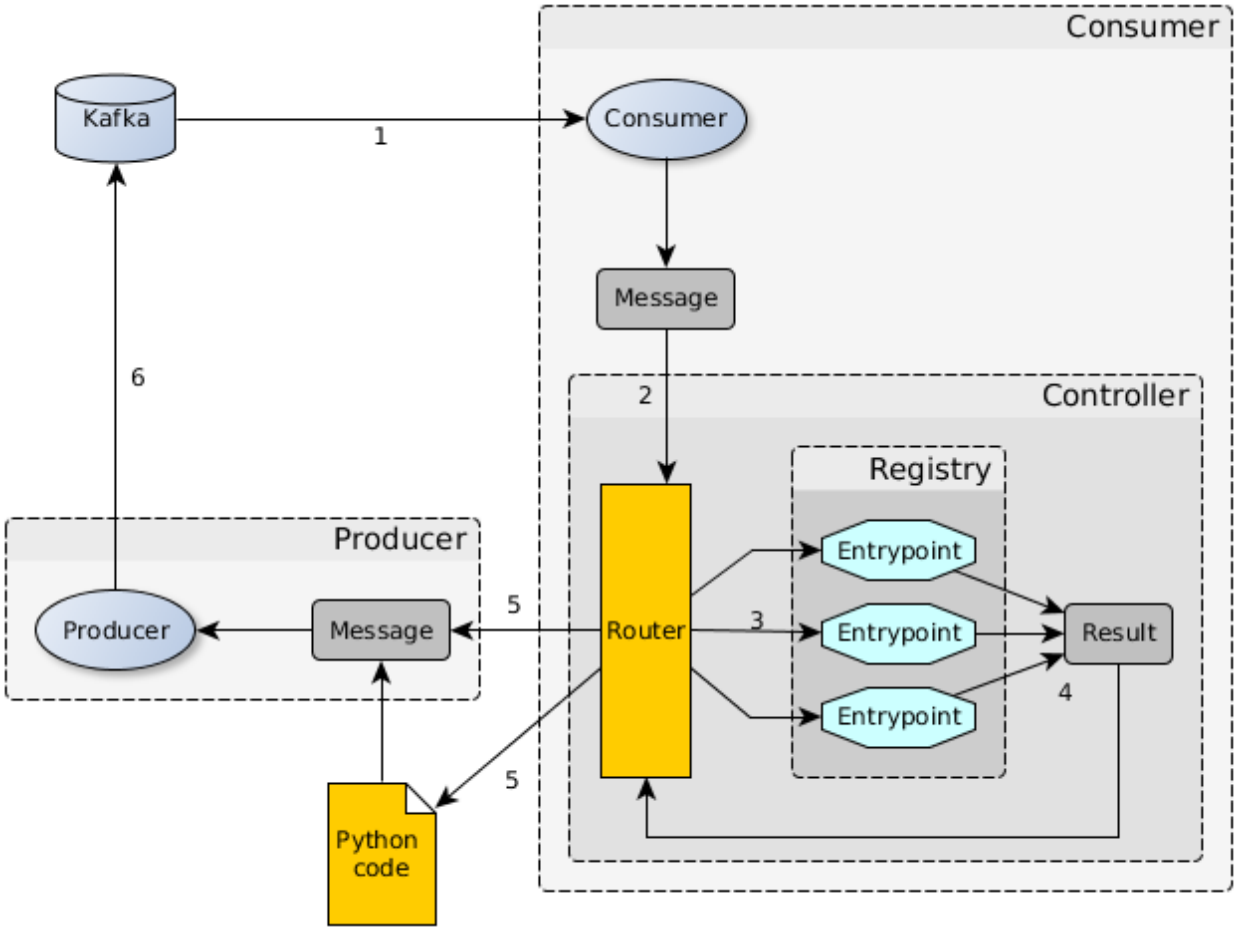
Contents

Kser is a bundle of python library whose purpose is to serialize tasks to be executed on Kafka consumers.



1. A message comes from Kafka.
2. Consumer deserialize message and send it to the “router” witch dispatch the message to the registry.
3. Registry loads the correct entrypoint based on the message content.
4. Registry execute the entrypoint with the message data and return a result.
5. Result is sent back to the router which dispatch it.
6. Result may be sent back to kafka using the Producer.

CHAPTER 1

Features & API Focus

1.1 kser.entry — Entries

class kser.entry.**Entrypoint**(*uuid=None*, *params=None*, *result=None*)

An entrypoint is the code which will be registred in the controller to handle execution.

param str uuid An unique identifier.

param dict params Entrypoint parameters

param cdumay_result.Result result previous task result

REQUIRED_FIELDS
Tuple or list of keys required by the entrypoint.

check_required_params()
Perform a self test. It can be used to check params received, states... By default, this method check the presence of each item stored in *kser.entry.Entrypoint.REQUIRED_FIELDS* in the *kser.entry.Entrypoint.params* dictionnary.

execute(*result=None*)
The main method used to launch the entrypoint execution. This method is execption safe. To execute an entrypoint without catching execption uses *kser.entry.Entrypoint.unsafe_execute()*.

Parameters **result** (*cdumay_result.Result*) – Previous task result

Returns The execution result

Return type cdumay_result.Result

classmethod from_Message(*kmsg*)
Initialize the entrypoint from a kser.schemas.Message

Parameters **kmsg** (*kser.schemas.Message*) – A message received from Kafka.

Returns The entrypoint

Return type *kser.entry.Entrypoint*

log(*message*, *level=logging.INFO*, **args*, ***kwargs*)
Adds entrypoint information to the message and sends the result to logging.log.

Parameters

- **message** (*str*) – message content
- **level** (*int*) – Logging Level
- **args** (*list*) – Arguments which are merged into msg using the string formatting operator.
- **kwargs** (*dict*) – Keyword arguments.

onerror(*result*)
Trigger call on execution error.

Parameters **result** (*cdumay_result.Result*) – Current execution result that led to the error.

Returns Return back the result

Return type cdumay_result.Result

onsuccess(*result*)
Trigger call on execution success.

Parameters **result** (*cdumay_result.Result*) – Current execution result that led to the success.

Returns Return back the result

Return type cdumay_result.Result

postinit()
Trigger call on execution post initialization.

Parameters **result** (*cdumay_result.Result*) – Current execution result that led to the success.

Returns Return back the result

Return type cdumay_result.Result

postrun(*result*)
Trigger call on execution post run. This trigger is called regardless of execution result.

Parameters **result** (*cdumay_result.Result*) – Current execution result.

Returns Return back the result

Return type cdumay_result.Result

prerun()
Trigger call before the execution.

run()
The entrypoint body intended to be overwrite.

to_Message(*result=None*)
Serialize an entrypoint into a `kser.schemas.Message`.

Parameters **result** (*cdumay_result.Result*) – Execution result.

Returns Return a message.

Return type kser.schemas.Message

unsafe_execute(*result=None*)

Unlike *kser.entry.Entrypoint.execute()* this method launch the entrypoint execution without catching execption.

Parameters **result** (*cdumay_result.Result*) – Previous task result

Returns The execution result

Return type cdumay_result.Result

1.1.1 Example usage

Let's define a basic entrypoint:

```
import logging
from kser.entry import Entrypoint
from cdumay_result import Result

logging.basicConfig(
   level=logging.DEBUG,
   format="%(asctime)s %(levelname)-8s %(message)s"
)

class Hello(Entrypoint):
    REQUIRED_FIELDS = ['name']

    def run(self):
        return Result(
            uuid=self.uuid, stdout="Hello {name} !".format_map(self.params)
        )
```

Execution result:

```
>>> Hello(params=dict(name="Cedric")).execute()
2018-02-21 18:26:46,762 DEBUG    Hello.PreRun: __main__.Hello[d455cba6-b329-4d2d-a4e5-
↪1fc2a0ff2781]
2018-02-21 18:26:46,762 DEBUG    Hello.Run: __main__.Hello[d455cba6-b329-4d2d-a4e5-
↪1fc2a0ff2781]
2018-02-21 18:26:46,762 DEBUG    Hello.PostRun: __main__.Hello[d455cba6-b329-4d2d-
↪a4e5-1fc2a0ff2781]
2018-02-21 18:26:46,763 INFO     Hello.Success: __main__.Hello[d455cba6-b329-4d2d-
↪a4e5-1fc2a0ff2781]: Hello Cedric !
```

Has we can see there is a required parameter *name*. Let's see what's happen if we didn't set it:

```
>>> Hello().execute()
2018-02-21 18:35:47,493 DEBUG    Hello.PreRun: __main__.Hello[f581fb61-0de1-489c-a0df-
↪2c03ce1d35b4]
2018-02-21 18:35:47,495 ERROR    Hello.Failed: __main__.Hello[f581fb61-0de1-489c-a0df-
↪2c03ce1d35b4]: Missing parameter: name
```

What's happen if we uses *kser.entry.Entrypoint.unsafe_execute()* instead of *kser.entry.Entrypoint.execute()*:

```
>>> Hello().unsafe_execute()
2018-02-21 18:39:23,522 DEBUG    Hello.PreRun: __main__.Hello[6aa38be5-cd82-441b-8853-
↪318545a053ad]
```

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```
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/opt/kser/src/kser/entry.py", line 220, in unsafe_execute
    self._prerun()
  File "/opt/kser/src/kser/entry.py", line 147, in _prerun
    self.check_required_params()
  File "/opt/kser/src/kser/entry.py", line 54, in check_required_params
    raise ValidationError("Missing parameter: {}".format(param))
cdumay_rest_client.exceptions.ValidationError: Error 400: Missing parameter: name␣
↪(extra={})
```

See also:

cdumay-result A basic lib to serialize exception results.

cdumay-rest-client A basic REST client library.

1.2 `kser.crypto` — Message encryption

This module allow you to encrypt and decrypt messages in kafka

1.2.1 Install

pip install kser[crypto]

1.2.2 API focus

`kser.crypto.CryptoMessage(context)`:

It's a container which includes the original message as well as the nonce required by the consumer to decipher the content

param dict context We use marshmallow context to store the secretbox_key

`kser.crypto.CryptoMessage.`**`decode`**(*jdata*)

Encode message using libsodium

Parameters **`kmsg`** (*`kser.schemas.Message`*) – Kafka message

Returns the Encoded message

`kser.crypto.CryptoMessage.`**`encode`**(*kmsg*)

Decode message using libsodium

Parameters **`jdata`** (*`str`*) – jdata to load

Returns the Encoded message

1.2.3 Example

For this example, we'll use kafka-python as kafka backend.

Consumer example:

```python
from kser.controller import Controller
from kser.crypto import CryptoMessage
from kser.python_kafka.consumer import Consumer


class CryptoController(Controller):
    TRANSPORT = CryptoMessage


class CryptoConsumer(Consumer):
    REGISTRY = CryptoController


if __name__ == '__main__':
    consumer = CryptoConsumer(config=dict(...), topics=list(...))
    consumer.run()
```

Producer example:

```python
import os
from uuid import uuid4

from cdumay_result import Result
from kser.crypto import CryptoSchema
from kser.python_kafka.producer import Producer
from kser.schemas import Message


class CryptoProducer(Producer):
    # noinspection PyUnusedLocal
    def send(self, topic, kmsg, timeout=60):
        result = Result(uuid=kmsg.uuid)
        try:
            self.client.send(topic, CryptoSchema(context=dict(
                secretbox_key=os.getenv("KSER_SECRETBOX_KEY", None)
            )).encode(self._onmessage(kmsg)).encode("UTF-8"))

            result.stdout = "Message {}[{}] sent in {}".format(
                kmsg.entrypoint, kmsg.uuid, topic
            )
            self.client.flush()

        except Exception as exc:
            result = Result.from_exception(exc, kmsg.uuid)

        finally:
            if result.retcode < 300:
                return self._onsuccess(kmsg=kmsg, result=result)
            else:
                return self._onerror(kmsg=kmsg, result=result)


if __name__ == '__main__':
    producer = CryptoProducer(config=dict(...))
    producer.send("my.topic", Message(uuid=str(uuid4()), entrypoint="myTest"))
```

1.3 Operation and task

Kser provide a way to create and launch operations. An operation is a list of task executed linearly.

Note: Each operation's task may be executed on different consumer.

1.3.1 API focus

class kser.sequencing.task.**Task**(*uuid=None*, *params=None*, *status="PENDING"*, *result=None*, *metadata=None*)

A task is a *kser.entry.Entrypoint* with additional attributes. To do this, use a database as shared backend.

Parameters

- **uuid** (*str*) – task unique identifier
- **params** (*dict*) – task parameter
- **status** (*str*) – task status
- **result** (*cdumay_result.Result*) – forwarded result from a previous task
- **metadata** (*dict*) – task context

log(*message*, *level=logging.INFO*, **args*, ***kwargs*)

Send log entry, prefixing message using the following format:

```
{TaskName}.{TaskStatus}: {EntryPointPath}[{TaskUUID}]:
```

Parameters

- **message** (*str*) – log message
- **level** (*int*) – Logging level
- **args** (*list*) – log record arguments
- **kwargs** (*dict*) – log record key arguments

class kser.sequencing.operation.**Operation**(*uuid=None*, *params=None*, *status="PENDING"*, *result=None*, *metadata=None*)

In fact it's a *kser.sequencing.task.Task* which has other task as child.

classmethod new(***kwargs*)

Warning: Deprecated, do not use this method anymore.

Initialize the operation using a `dict`.

Parameters **kwargs** (*dict*) – key arguments

Returns A new operation

Return type *kser.sequencing.operation.Operation*

classmethod parse_inputs(***kwargs*)

> **Warning:** Deprecated, do not use this method anymore.

Use by `kser.sequencing.operation.Operation.new` to check inputs

Parameters **kwargs** (*dict*) – key arguments

Returns parsed input

Return type dict

set_status(*status*, *result=None*)
Update operation status

Parameters

- **status** (*str*) – New status
- **result** (*cdumay_result.Result*) – Execution result

add_task(*task*)
Add task to operation

Parameters **task** (`kser.sequencing.task.Task`) – task to add

prebuild(***kwargs*)
To implement, perform check before the operation creation

Parameters **kwargs** (*dict*) – key arguments

next(*task*)
Find the next task

Parameters **task** (`kser.sequencing.task.Task`) – previous task

Returns The next task

Return type *kser.sequencing.task.Task* or None

launch_next(*task=None*, *result=None*)
Launch next task or finish operation

Parameters

- **task** (`kser.sequencing.task.Task`) – previous task
- **result** (*cdumay_result.Result*) – previous task result

Returns Execution result

Return type cdumay_result.Result

launch()
Send the first task

Returns Execution result

Return type cdumay_result.Result

finalize()
To implement, post build actions (database mapping ect. . .)

Returns Self return

Return type *kser.sequencing.operation.Operation*

build_tasks(**kwargs)
Initialize tasks

Parameters **kwargs** (*dict*) – tasks parameters (~=context)

Returns list of tasks

Return type list(*kser.sequencing.task.Task*)

compute_tasks(**kwargs)
Perfrom checks and build tasks

Returns list of tasks

Return type list(*kser.sequencing.operation.Operation*)

build(**kwargs)
Create the operation and associate tasks

Parameters **kwargs** (*dict*) – operation data

Returns The operation

Return type *kser.sequencing.operation.Operation*

send()
To implement, send operation to Kafka

Returns The operation

Return type *kser.sequencing.operation.Operation*

class kser.sequencing.registry.**OperationRegistry**(*app=None*, *controller_class=kser.controller.Controller*)
A which route `kser.schemas.Message` from Kafka to the requested *kser.sequencing.operation.Operation*.

Parameters

- **app** (*flask.Flask*) – Flask application if any
- **controller_class** (*kser.controller.Controller*) – Controller to use

subscribe(*callback*)
Register an *kser.sequencing.operation.Operation* into the controller. This method is a shortcut to `kser.controller.Controller.register`.

Parameters **callback** (`kser.sequencing.task.Task`) – Any class which implement *Task*.

load_tasks()
To implement, load operation tasks

1.3.2 Example

The following example is based on a dice game, player roll tree time dices.

Consumer

```python
import logging
logging.basicConfig(
    level=logging.INFO, format="%(asctime)s %(levelname)-8s %(message)s"
)

import random

from cdumay_result import Result
from kser.sequencing.operation import Operation
from kser.sequencing.registry import OperationRegistry
from kser.sequencing.task import Task

oregistry = OperationRegistry()


@oregistry.subscribe
class DiceRoll(Task):
    def run(self):
        launch = random.randint(1, 6)
        return Result(uuid=self.uuid, stdout="You made a {}".format(launch))


@oregistry.subscribe
class DiceLaunch(Operation):
    def build_tasks(self, **kwargs):
        return [DiceRoll(), DiceRoll(), DiceRoll()]


if __name__ == '__main__':
    from flask import Flask
    from kser.python_kafka.consumer import Consumer

    app = Flask(__name__)
    oregistry.init_app(app)
    cons = Consumer(...)
    cons.REGISTRY = oregistry.controller
    cons.run()
```

Explanations:

- **line 13**: We initialize the registry
- **line 16/23**: We subscribe the task/operation into the registry
- **line 35-37**: We start the consumer

Producer

Producer has nothing special for this feature.

```python
import logging
logging.basicConfig(
    level=logging.INFO, format="%(asctime)s %(levelname)-8s %(message)s"
)

import uuid
from kser.python_kafka.producer import Producer
```

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```
8  from kser.schemas import Message
9
10 pro = Producer(...)
11 pro.send('...', Message(uuid=str(uuid.uuid4()), entrypoint="__main__.DiceRoll"))
```

Explanations:

- **line 10**: We initialize the producer
- **line 11**: We send a Message with the entrypoint *__main__.DiceRoll* that matches our Task registred

Execution

Producer console output:

```
2018-08-10 18:46:20,082 INFO     <BrokerConnection host=************/************
↪port=9093>: Authenticated as admin
2018-08-10 18:46:20,549 INFO     Broker version identifed as 0.10
2018-08-10 18:46:20,550 INFO     Set configuration api_version=(0, 10) to skip auto
↪check_version requests on startup
2018-08-10 18:46:20,711 INFO     <BrokerConnection host=************/************
↪port=9093>: Authenticated as admin
2018-08-10 18:46:20,731 INFO     Producer.Success: __main__.DiceRoll[872c3be0-51ac-
↪457f-a4d9-12c2f7667b80]: Message __main__.DiceRoll[872c3be0-51ac-457f-a4d9-
↪12c2f7667b80] sent in *****
2018-08-10 18:46:20,731 INFO     Closing the Kafka producer with 999999999 secs
↪timeout.
2018-08-10 18:46:20,741 INFO     Kafka producer closed
```

Consumer console output:

```
2018-08-10 18:44:42,355 INFO     Operation registry: loaded __main__.DiceRoll
2018-08-10 18:44:42,355 INFO     Operation registry: loaded __main__.DiceLaunch
2018-08-10 18:44:42,696 INFO     <BrokerConnection host=************/************
↪port=9093>: Authenticated as admin
2018-08-10 18:44:43,163 INFO     Broker version identifed as 0.10
2018-08-10 18:44:43,163 INFO     Set configuration api_version=(0, 10) to skip auto
↪check_version requests on startup
2018-08-10 18:44:43,164 INFO     Updating subscribed topics to: ['*****']
2018-08-10 18:44:43,165 INFO     Consumer.Starting...
2018-08-10 18:44:43,182 INFO     Group coordinator for ***** is
↪BrokerMetadata(nodeId=114251126, host='************', port=9093, rack=None)
2018-08-10 18:44:43,182 INFO     Discovered coordinator 114251126 for group *****
2018-08-10 18:44:43,182 INFO     Revoking previously assigned partitions set() for
↪group *****
2018-08-10 18:44:43,182 INFO     (Re-)joining group *****
2018-08-10 18:44:46,230 INFO     Skipping heartbeat: no auto-assignment or waiting on
↪rebalance
2018-08-10 18:44:46,249 INFO     Joined group '*****' (generation 2) with member_id
↪kafka-python-1.3.1-db5cdcc7-3be9-4cf6-a4e7-06a97cc69120
2018-08-10 18:44:46,249 INFO     Elected group leader -- performing partition
↪assignments using range
2018-08-10 18:44:46,268 INFO     Successfully joined group ***** with generation 2
2018-08-10 18:44:46,268 INFO     Updated partition assignment: [TopicPartition(topic=
↪'*****', partition=0), TopicPartition(topic='*****', partition=1),
↪TopicPartition(topic='*****', partition=2)]
```

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```
2018-08-10 18:44:46,269 INFO     Setting newly assigned partitions
↪{TopicPartition(topic='*****', partition=0), TopicPartition(topic='*****',␣
↪partition=1), TopicPartition(topic='*****', partition=2)} for group *****
2018-08-10 18:46:20,750 INFO     DiceRoll.Success: __main__.DiceRoll[872c3be0-51ac-
↪457f-a4d9-12c2f7667b80]: You made a 1
2018-08-10 18:46:20,751 INFO     Controller.Success: __main__.DiceRoll[872c3be0-51ac-
↪457f-a4d9-12c2f7667b80]: You made a 1
```

As we can see, the task __main__.DiceRoll is sent by the producer and executed by the consumer with the stdout "You made a 1"

1.4 Prometheus export

Kser support prometheus metric export.

1.4.1 Install

$ pip install kser[prometheus]

1.4.2 Configuration

Configuration is done using environment variable:

Table 1: Configuration variables

Environment variable	Default value
KSER_METRICS_ENABLED	no
KSER_METRICS_ADDRESS	0.0.0.0
KSER_METRICS_PORT	8888

The exporter has only 2 metrics defined by default, it's just a sample. A good way to implement your own is to override the triggers methods (prefixed with '_') like the following example:

```
from kser import KSER_METRICS_ENABLED
from prometheus_client import Counter
from kser.entry import Entrypoint

MY_METRIC = Counter('kser_my_metric', 'a usefull metric')


class MyEntrypoint(Entrypoint):
    def _run(self):
        if KSER_METRICS_ENABLED == "yes":
            MY_METRIC.inc()

        return self.run()
```

See also:

prometheus_client Prometheus instrumentation library for Python applications.

1.5 Opentracing support with Jaeger

Kser support opentracing and Jaeger to follow and display operation and task execution.

1.5.1 Install

$ pip install kser[opentracing]

1.5.2 Configuration

Configuration is done using environment variable:

Table 2: Configuration variable

Environment variable	Default value
JAEGER_HOST	localhost

1.5.3 Example

Note: We assume that you have a working jaeger...

The following example is based on a dice game, player roll five time dices:

```
import logging

logging.basicConfig(
    level=logging.DEBUG,
    format="%(asctime)s %(levelname)-8s %(message)s"
)

import time
import random

from cdumay_result import Result
from kser.tracing.task import OpentracingTask
from kser.tracing.operation import OpentracingOperation


def contrived_time():
    time.sleep(random.randint(1, 20) / 10)


class DiceRoll(OpentracingTask):
    def prerun(self):
        contrived_time()

    def run(self):
        launch = random.randint(1, 6)
        time.sleep(random.randint(1, 3))
        return Result(uuid=self.uuid, stdout="You made a {}".format(launch))

```

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```
29      def postrun(self, result):
30          contrived_time()
31          return result
32
33
34  class DiceLaunch(OpentracingOperation):
35      def build_tasks(self, **kwargs):
36          return [
37              DiceRoll(),
38              DiceRoll(),
39              DiceRoll(),
40          ]
41
42
43  if __name__ == '__main__':
44      import os
45      from jaeger_client import Config
46      from cdumay_opentracing import OpenTracingManager
47      from kser.entry import Entrypoint
48      from kser.tracing.driver import OpenTracingKserDriver
49
50      tracer = Config(service_name="test-kser", config=dict(
51          sampler=dict(type='const', param=1), logging=True,
52          local_agent=dict(reporting_host=os.getenv('JAEGER_HOST', 'localhost'))
53      )).initialize_tracer()
54
55      OpenTracingManager.register(Entrypoint, OpenTracingKserDriver)
56
57      DiceLaunch().build().execute()
58      time.sleep(4)
59      tracer.close()
```

Explanations:

- **line 11-12**: as we can see, we use the specialized classes `kser.tracing.operation.OpentracingOperation` and `kser.tracing.task.OpentracingTask` based on *`kser.sequencing.operation.Operation`* and *`kser.sequencing.task.Task`*.
- **line 21/25/29**: we simulate execution time
- **line 50-53**: We initialize tracing using Jaeger.
- **line 55**: We register the Kser driver `kser.tracing.driver.OpenTracingKserDriver` for subclass of *`kser.entry.Entrypoint`*.
- **line 57**: We launch the operation `DiceLaunch`.
- **line 59**: yield to IOLoop to flush the spans
- **line 60**: we flush any buffered spans

Console output:

```
2018-08-08 12:36:59,753 Initializing Jaeger Tracer with UDP reporter
2018-08-08 12:36:59,754 Using sampler ConstSampler(True)
2018-08-08 12:36:59,758 opentracing.tracer initialized to <jaeger_client.tracer.
↪Tracer object at 0x7f1c7d59a668>[app_name=kser]
2018-08-08 12:36:59,759 DiceLaunch.PreBuild: __main__.DiceLaunch[8a75d3f6-71b6-4dad-
↪98b5-fa1ed6b2f160]: {}
```

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```
2018-08-08 12:36:59,760 DiceLaunch.BuildTasks: 5 task(s) found
2018-08-08 12:36:59,760 DiceLaunch[8a75d3f6-71b6-4dad-98b5-fa1ed6b2f160] - PreRun
2018-08-08 12:36:59,760 DiceLaunch.SetStatus: __main__.DiceLaunch[8a75d3f6-71b6-4dad-
↪98b5-fa1ed6b2f160] status update 'PENDING' -> 'RUNNING'
2018-08-08 12:36:59,760 Reporting span␣
↪b72e015e7d14cf41:9ae003a32eafcc52:b72e015e7d14cf41:1 kser.DiceLaunch[8a75d3f6-71b6-
↪4dad-98b5-fa1ed6b2f160] - PreRun
2018-08-08 12:36:59,761 DiceRoll[bb9e2fa6-29a9-4431-95ee-6573103349c5] - PreRun
2018-08-08 12:37:01,462 Reporting span␣
↪b72e015e7d14cf41:411604082021b77a:3478b474ed615e6:1 kser.DiceRoll[bb9e2fa6-29a9-
↪4431-95ee-6573103349c5] - PreRun
2018-08-08 12:37:01,462 DiceRoll[bb9e2fa6-29a9-4431-95ee-6573103349c5] - Run
2018-08-08 12:37:02,463 Reporting span␣
↪b72e015e7d14cf41:af5d7ba4127a6f6c:3478b474ed615e6:1 kser.DiceRoll[bb9e2fa6-29a9-
↪4431-95ee-6573103349c5] - Run
2018-08-08 12:37:02,463 DiceRoll[bb9e2fa6-29a9-4431-95ee-6573103349c5] - PostRun
2018-08-08 12:37:03,865 Reporting span␣
↪b72e015e7d14cf41:cb0a705e20b36496:3478b474ed615e6:1 kser.DiceRoll[bb9e2fa6-29a9-
↪4431-95ee-6573103349c5] - PostRun
2018-08-08 12:37:03,865 DiceRoll.Success: __main__.DiceRoll[bb9e2fa6-29a9-4431-95ee-
↪6573103349c5]: You made a 3
2018-08-08 12:37:03,865 Reporting span␣
↪b72e015e7d14cf41:3478b474ed615e6:b72e015e7d14cf41:1 kser.DiceRoll[bb9e2fa6-29a9-
↪4431-95ee-6573103349c5] - Execute
2018-08-08 12:37:03,866 DiceRoll[31090ded-0563-4497-ac7f-7523f79c4bb9] - PreRun
2018-08-08 12:37:04,066 Reporting span␣
↪b72e015e7d14cf41:c49fb0550bd27b25:1ec1d003a3d94c66:1 kser.DiceRoll[31090ded-0563-
↪4497-ac7f-7523f79c4bb9] - PreRun
2018-08-08 12:37:04,067 DiceRoll[31090ded-0563-4497-ac7f-7523f79c4bb9] - Run
2018-08-08 12:37:05,067 Reporting span␣
↪b72e015e7d14cf41:1be20968f7d6cc1f:1ec1d003a3d94c66:1 kser.DiceRoll[31090ded-0563-
↪4497-ac7f-7523f79c4bb9] - Run
2018-08-08 12:37:05,068 DiceRoll[31090ded-0563-4497-ac7f-7523f79c4bb9] - PostRun
2018-08-08 12:37:06,870 Reporting span␣
↪b72e015e7d14cf41:70c9928dd1f6e1df:1ec1d003a3d94c66:1 kser.DiceRoll[31090ded-0563-
↪4497-ac7f-7523f79c4bb9] - PostRun
2018-08-08 12:37:06,871 DiceRoll.Success: __main__.DiceRoll[31090ded-0563-4497-ac7f-
↪7523f79c4bb9]: You made a 3
2018-08-08 12:37:06,871 Reporting span␣
↪b72e015e7d14cf41:1ec1d003a3d94c66:b72e015e7d14cf41:1 kser.DiceRoll[31090ded-0563-
↪4497-ac7f-7523f79c4bb9] - Execute
2018-08-08 12:37:06,871 DiceRoll[1d1a0361-fe0f-4cbe-92fc-abe0a801dba1] - PreRun
2018-08-08 12:37:07,072 Reporting span␣
↪b72e015e7d14cf41:f337f69f34da1345:c17278695688fe0d:1 kser.DiceRoll[1d1a0361-fe0f-
↪4cbe-92fc-abe0a801dba1] - PreRun
2018-08-08 12:37:07,072 DiceRoll[1d1a0361-fe0f-4cbe-92fc-abe0a801dba1] - Run
2018-08-08 12:37:10,075 Reporting span␣
↪b72e015e7d14cf41:304bef5db6be72c2:c17278695688fe0d:1 kser.DiceRoll[1d1a0361-fe0f-
↪4cbe-92fc-abe0a801dba1] - Run
2018-08-08 12:37:10,076 DiceRoll[1d1a0361-fe0f-4cbe-92fc-abe0a801dba1] - PostRun
2018-08-08 12:37:11,677 Reporting span␣
↪b72e015e7d14cf41:9499a64a4c55ebf:c17278695688fe0d:1 kser.DiceRoll[1d1a0361-fe0f-
↪4cbe-92fc-abe0a801dba1] - PostRun
2018-08-08 12:37:11,677 DiceRoll.Success: __main__.DiceRoll[1d1a0361-fe0f-4cbe-92fc-
↪abe0a801dba1]: You made a 5
2018-08-08 12:37:11,677 Reporting span␣
↪b72e015e7d14cf41:c17278695688fe0d:b72e015e7d14cf41:1 kser.DiceRoll[1d1a0361-fe0f-
↪4cbe-92fc-abe0a801dba1] - Execute
```

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```
2018-08-08 12:37:11,678 DiceRoll[f24e7816-e953-4183-891c-a3a3dc008128] - PreRun
2018-08-08 12:37:12,579 Reporting span␣
↪b72e015e7d14cf41:d2200a6f5b029a7f:942840d8feffd756:1 kser.DiceRoll[f24e7816-e953-
↪4183-891c-a3a3dc008128] - PreRun
2018-08-08 12:37:12,580 DiceRoll[f24e7816-e953-4183-891c-a3a3dc008128] - Run
2018-08-08 12:37:15,580 Reporting span␣
↪b72e015e7d14cf41:139b24d83aee44bf:942840d8feffd756:1 kser.DiceRoll[f24e7816-e953-
↪4183-891c-a3a3dc008128] - Run
2018-08-08 12:37:15,581 DiceRoll[f24e7816-e953-4183-891c-a3a3dc008128] - PostRun
2018-08-08 12:37:16,782 Reporting span␣
↪b72e015e7d14cf41:95fdaed9ade3b3f7:942840d8feffd756:1 kser.DiceRoll[f24e7816-e953-
↪4183-891c-a3a3dc008128] - PostRun
2018-08-08 12:37:16,783 DiceRoll.Success: __main__.DiceRoll[f24e7816-e953-4183-891c-
↪a3a3dc008128]: You made a 4
2018-08-08 12:37:16,783 Reporting span␣
↪b72e015e7d14cf41:942840d8feffd756:b72e015e7d14cf41:1 kser.DiceRoll[f24e7816-e953-
↪4183-891c-a3a3dc008128] - Execute
2018-08-08 12:37:16,784 DiceRoll[ae5d36a7-a2b7-4ac1-a5e8-39004059e3c5] - PreRun
2018-08-08 12:37:18,686 Reporting span␣
↪b72e015e7d14cf41:bea78e6f943f7aa8:54941f4bb4657ec2:1 kser.DiceRoll[ae5d36a7-a2b7-
↪4ac1-a5e8-39004059e3c5] - PreRun
2018-08-08 12:37:18,687 DiceRoll[ae5d36a7-a2b7-4ac1-a5e8-39004059e3c5] - Run
2018-08-08 12:37:21,690 Reporting span␣
↪b72e015e7d14cf41:fc937aa7e2d633d3:54941f4bb4657ec2:1 kser.DiceRoll[ae5d36a7-a2b7-
↪4ac1-a5e8-39004059e3c5] - Run
2018-08-08 12:37:21,691 DiceRoll[ae5d36a7-a2b7-4ac1-a5e8-39004059e3c5] - PostRun
2018-08-08 12:37:22,892 Reporting span␣
↪b72e015e7d14cf41:c4393051442fdecc:54941f4bb4657ec2:1 kser.DiceRoll[ae5d36a7-a2b7-
↪4ac1-a5e8-39004059e3c5] - PostRun
2018-08-08 12:37:22,893 DiceRoll.Success: __main__.DiceRoll[ae5d36a7-a2b7-4ac1-a5e8-
↪39004059e3c5]: You made a 6
2018-08-08 12:37:22,893 Reporting span␣
↪b72e015e7d14cf41:54941f4bb4657ec2:b72e015e7d14cf41:1 kser.DiceRoll[ae5d36a7-a2b7-
↪4ac1-a5e8-39004059e3c5] - Execute
2018-08-08 12:37:22,894 DiceLaunch[8a75d3f6-71b6-4dad-98b5-fa1ed6b2f160] - PostRun
2018-08-08 12:37:22,894 Reporting span␣
↪b72e015e7d14cf41:d31e32e75feaba57:b72e015e7d14cf41:1 kser.DiceLaunch[8a75d3f6-71b6-
↪4dad-98b5-fa1ed6b2f160] - PostRun
2018-08-08 12:37:22,894 DiceLaunch.SetStatus: __main__.DiceLaunch[8a75d3f6-71b6-4dad-
↪98b5-fa1ed6b2f160] status update 'RUNNING' -> 'SUCCESS'
2018-08-08 12:37:22,895 DiceLaunch.Success: __main__.DiceLaunch[8a75d3f6-71b6-4dad-
↪98b5-fa1ed6b2f160]: You made a 6
2018-08-08 12:37:22,895 Reporting span b72e015e7d14cf41:b72e015e7d14cf41:0:1 kser.
↪DiceLaunch[8a75d3f6-71b6-4dad-98b5-fa1ed6b2f160] - Execute
```

Display in jaeger:

Select **kser** in the service list and click on you trace:

Note: Only execution is traced

Deeper:

Kser allow you to create operation using another operation using `kser.tracing.operation.OpentracingOperation.compute_tasks()`. Computed tasks will be append to the operation span directly. The reuse the the previous code and append

```
class Yahtzee(OpentracingOperation):
    def build_tasks(self, **kwargs):
        tasks = list()
        tasks += DiceLaunch().compute_tasks()
        tasks += DiceLaunch().compute_tasks()
        tasks += DiceLaunch().compute_tasks()
        return tasks
```

This will create a span with 3x5 tasks in it.

See also:

cdumay-opentracing Library to facilitate opentracing integration

OpenTracing API for Python Python library for OpenTracing.

jaeger-client-python Jaeger Bindings for Python OpenTracing API

Index