Intelligent applications and machine learning on OpenShift with radanalytics.io

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First things first

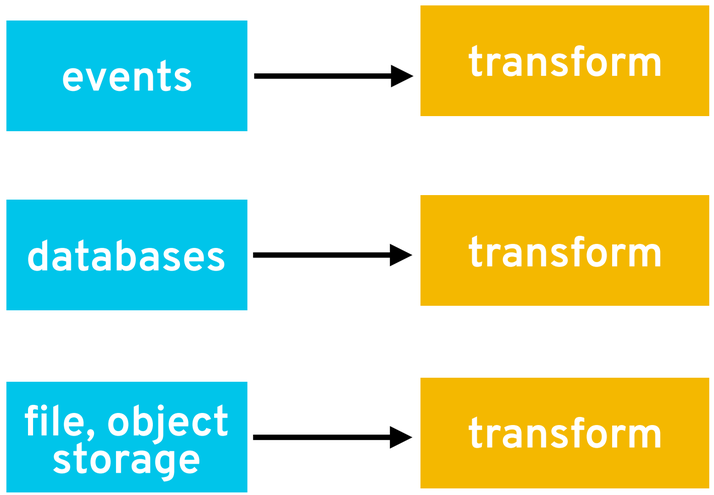
https://console.txl.radanalyticslabs.io:8443/

INTELLIGENT APPLICATIONS

Intelligent applications **collect and learn from data** in order to provide **improved functionality** with **longevity** and **popularity**.

Intelligent applications are **how we put AI into production today**.

Intelligent applications have driven **advances in AI and machine learning** for the last two decades.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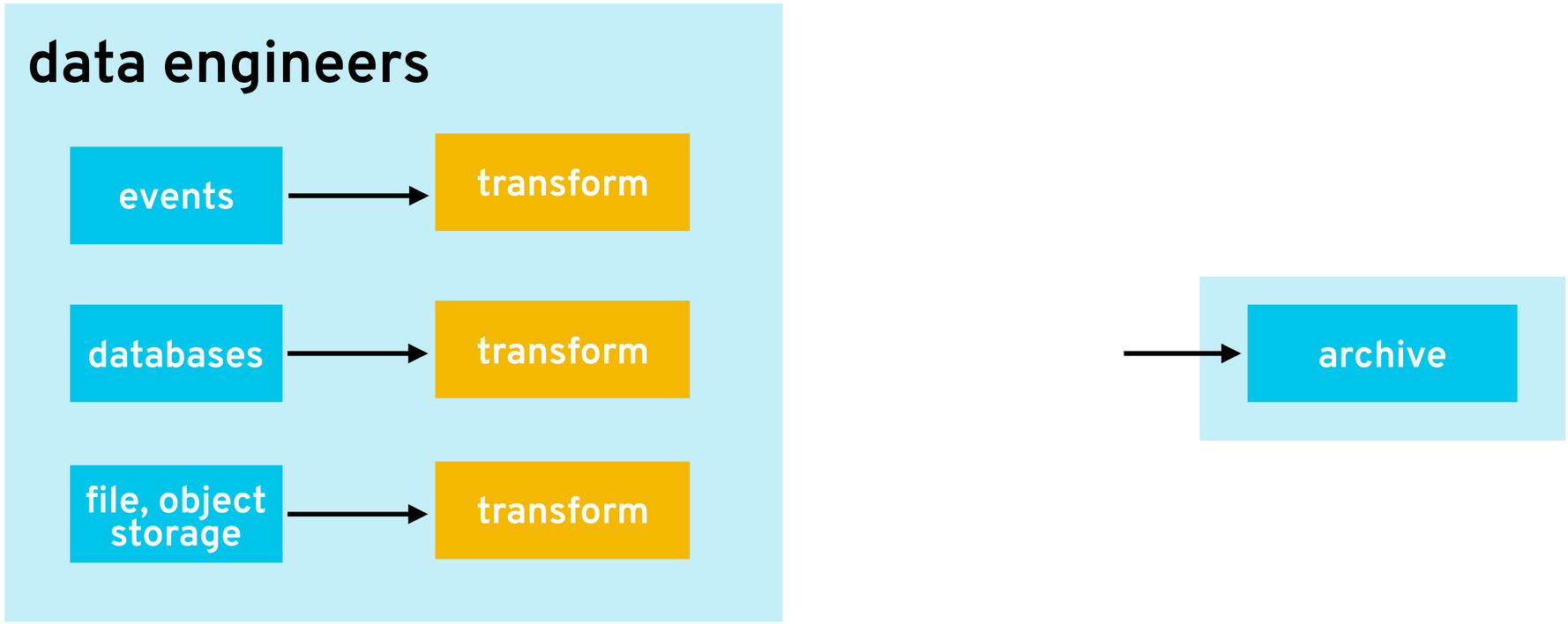
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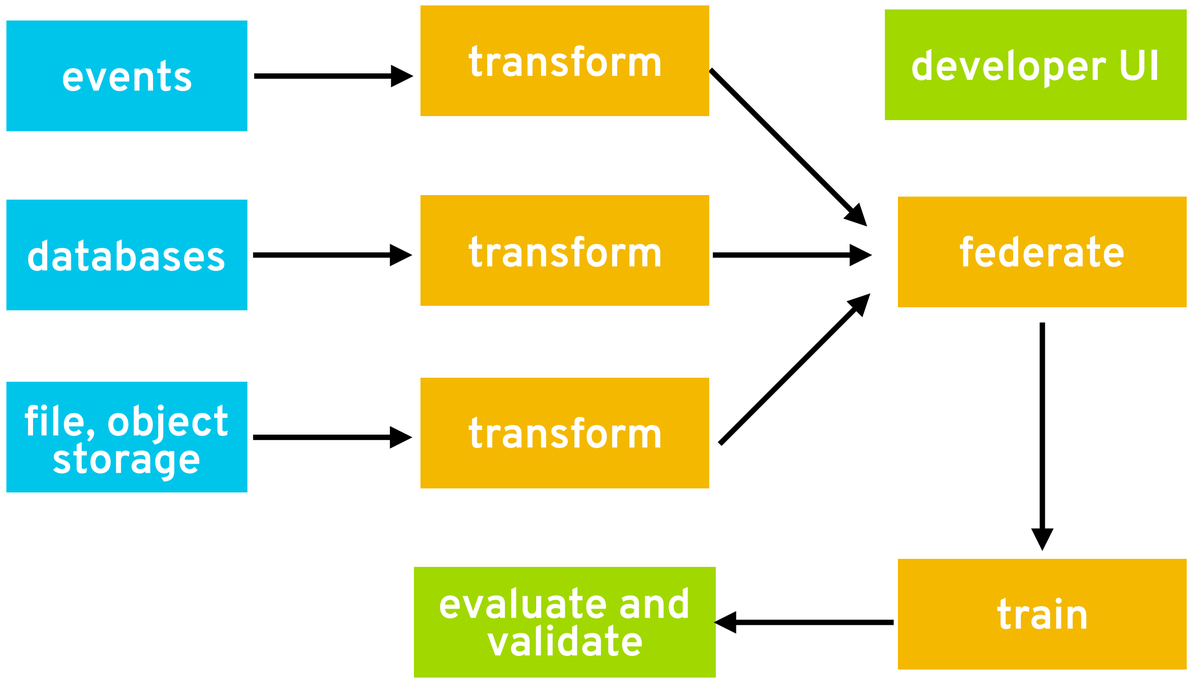
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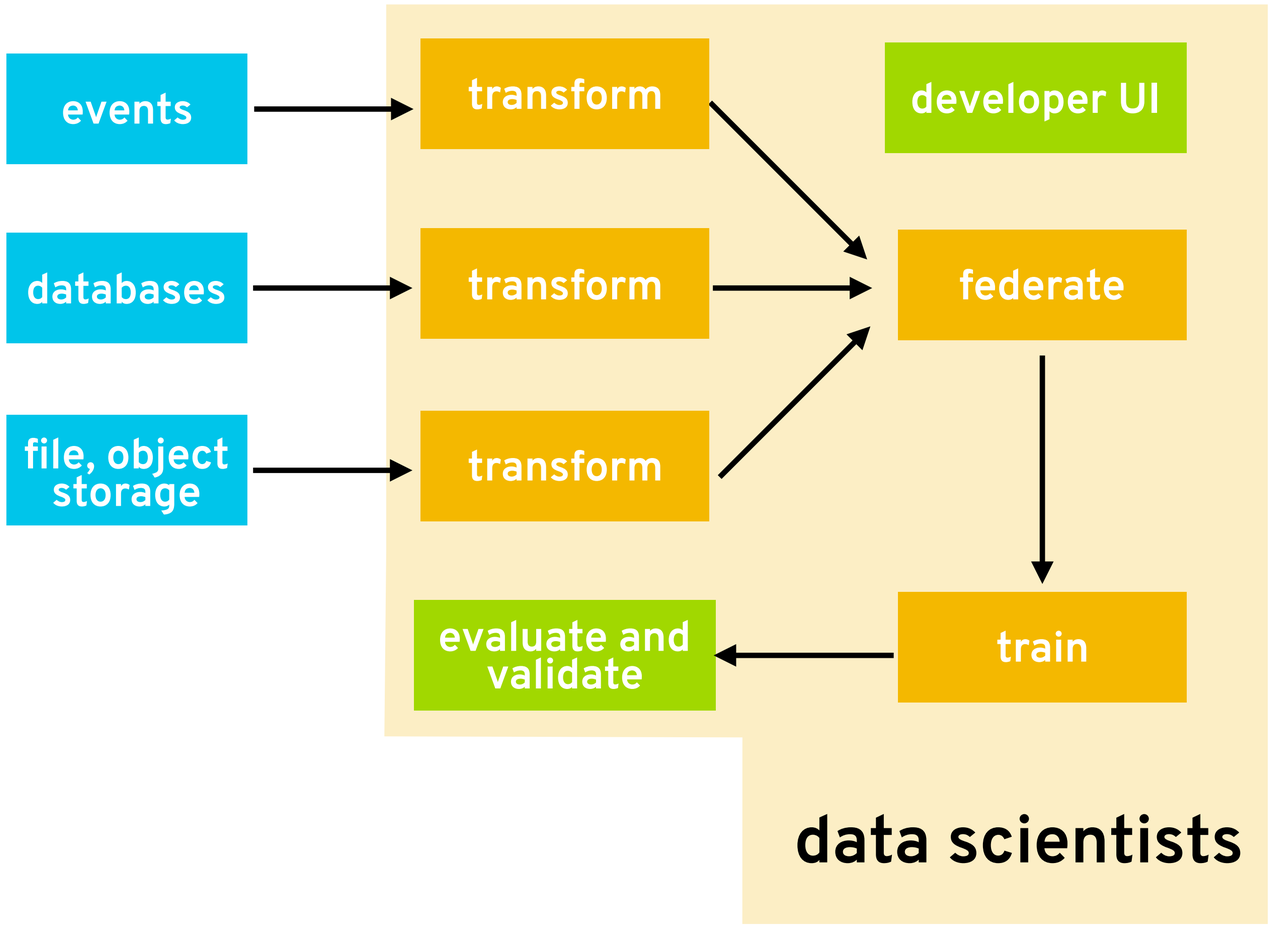
evaluate and validate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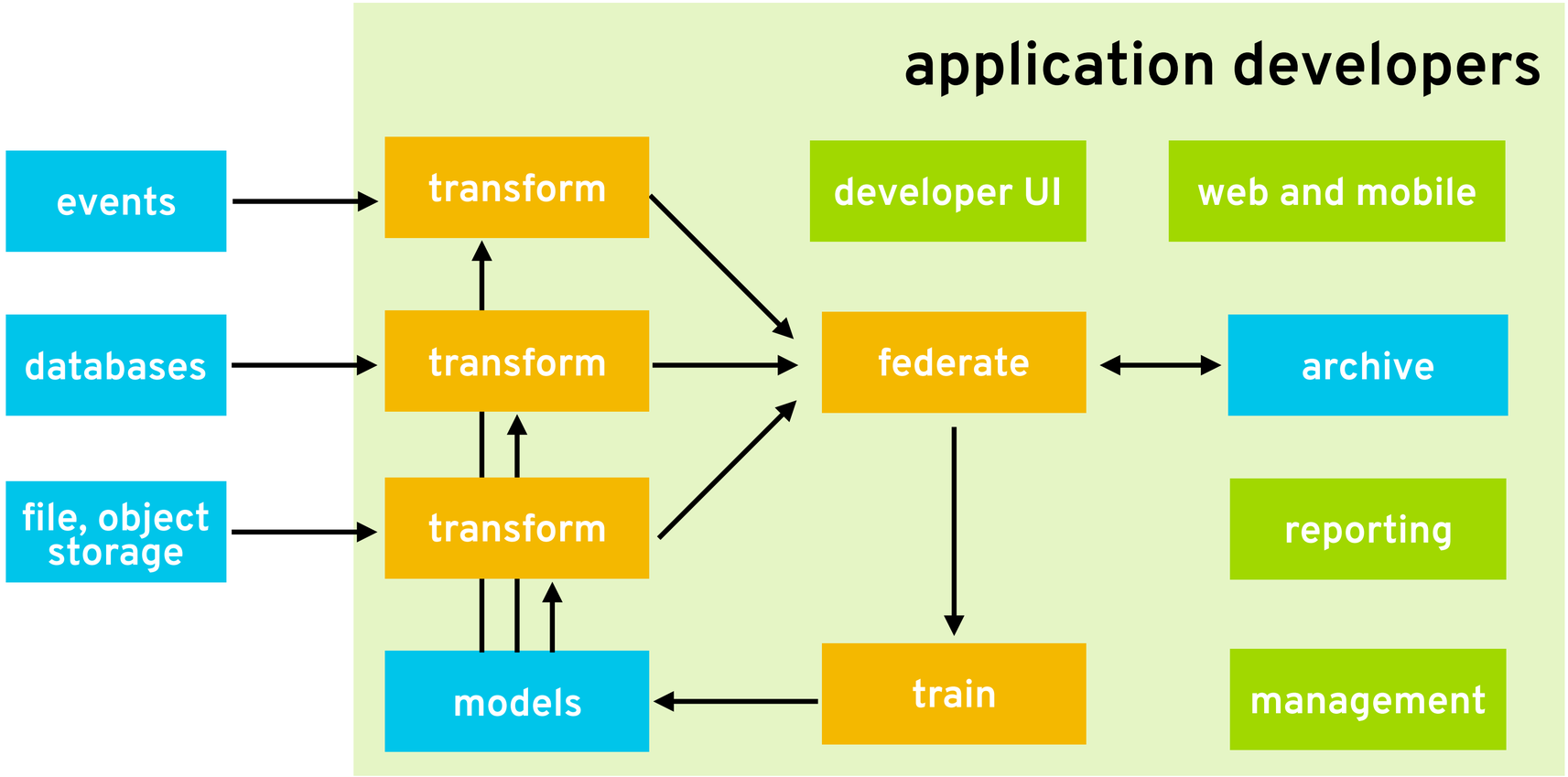
data scientists


application developers
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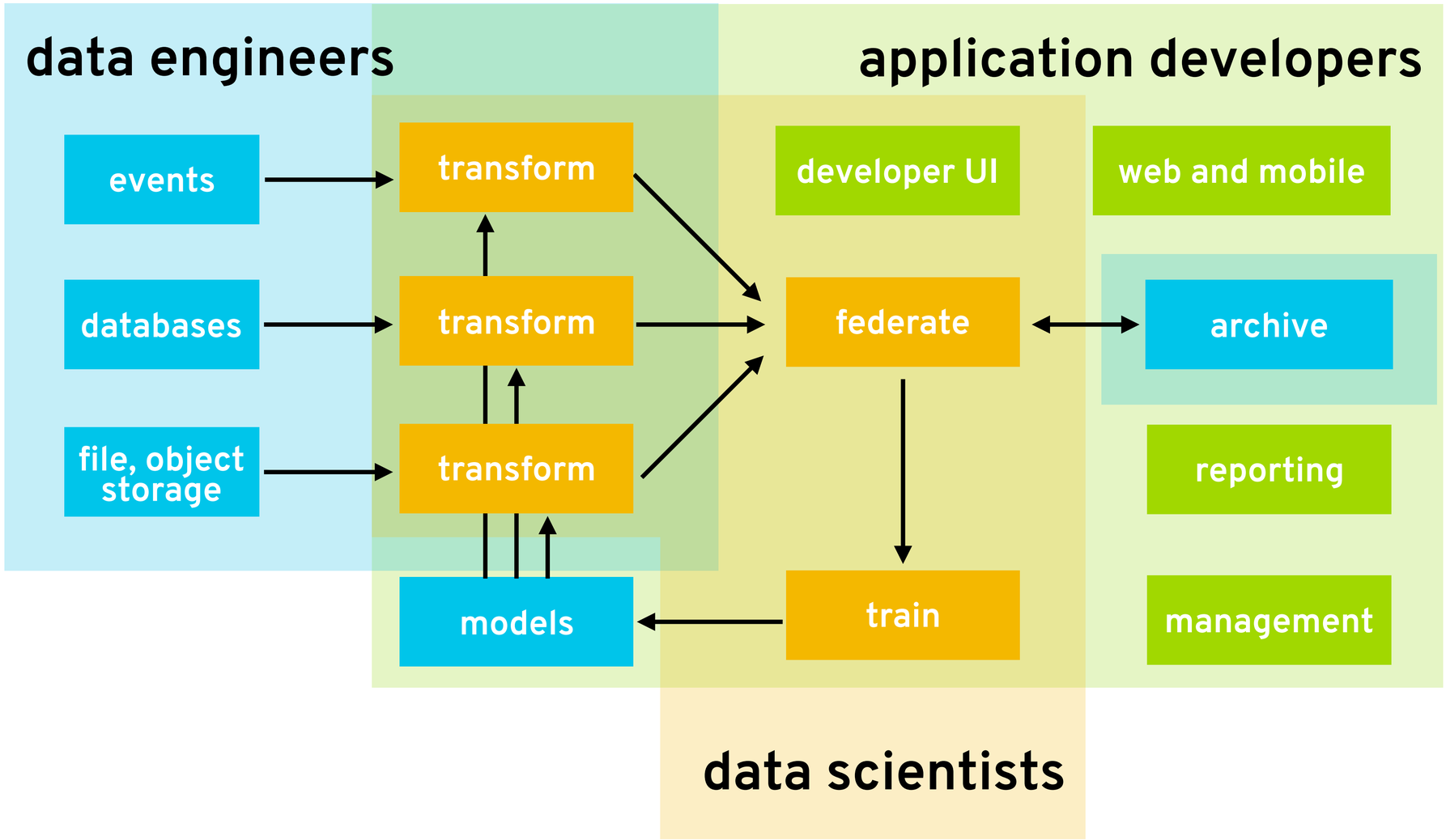
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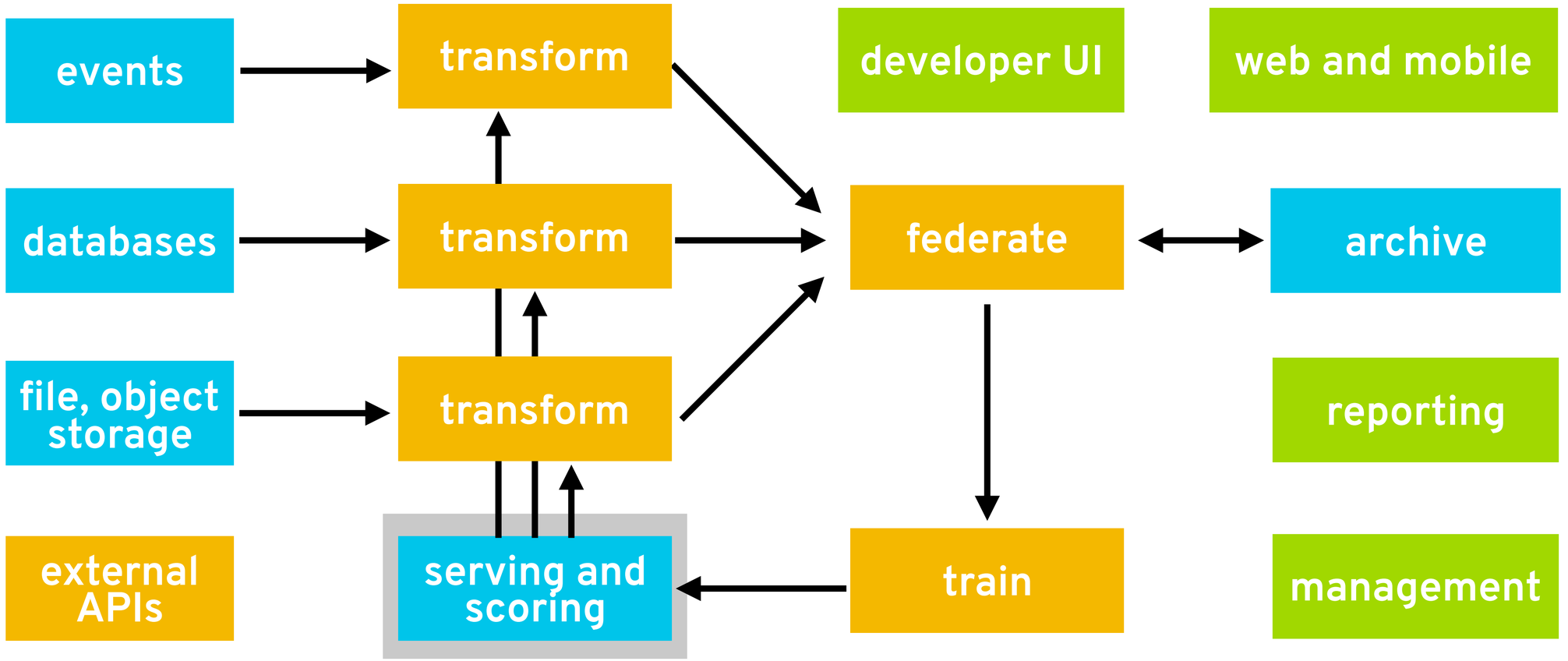
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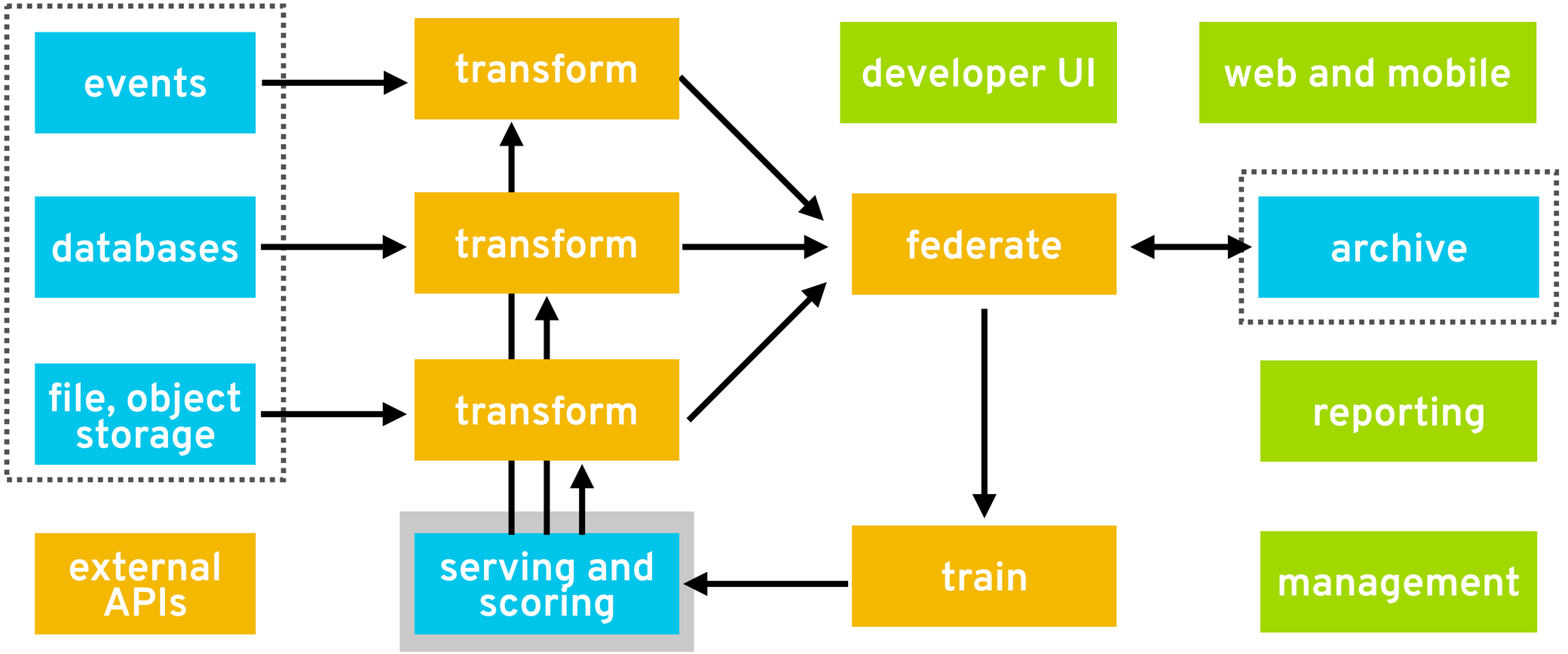
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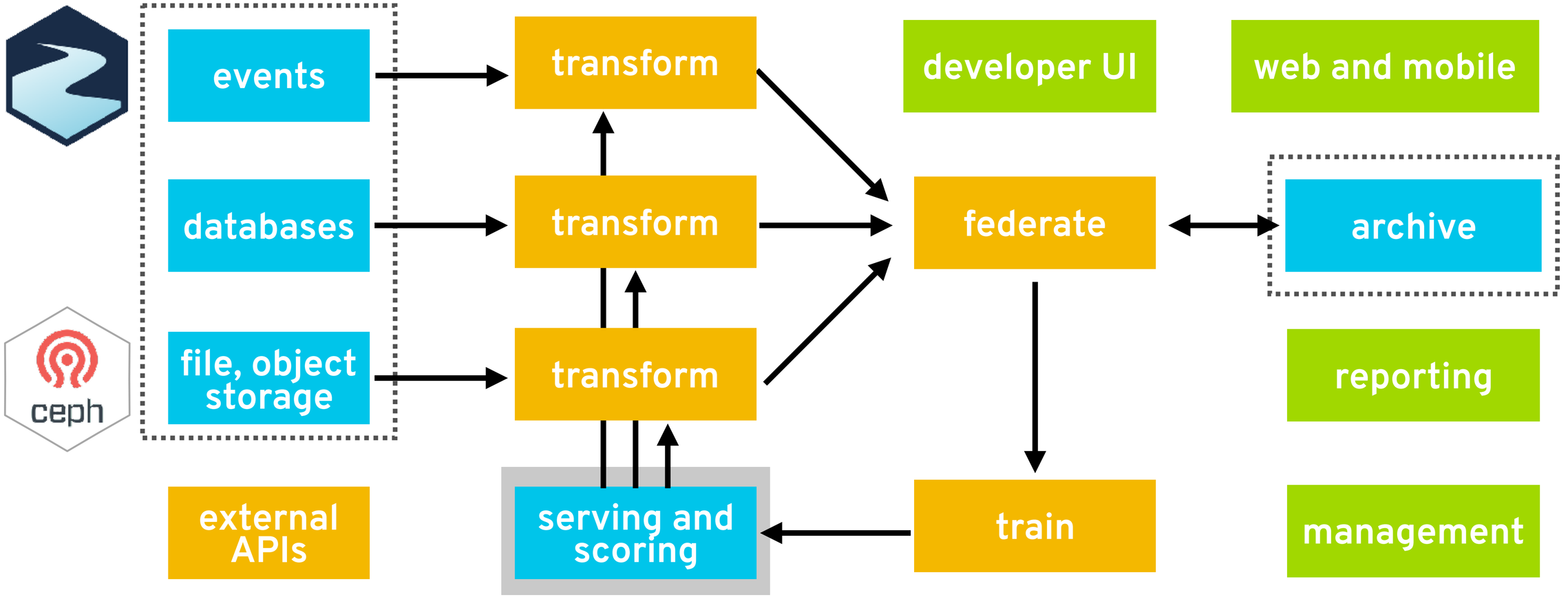
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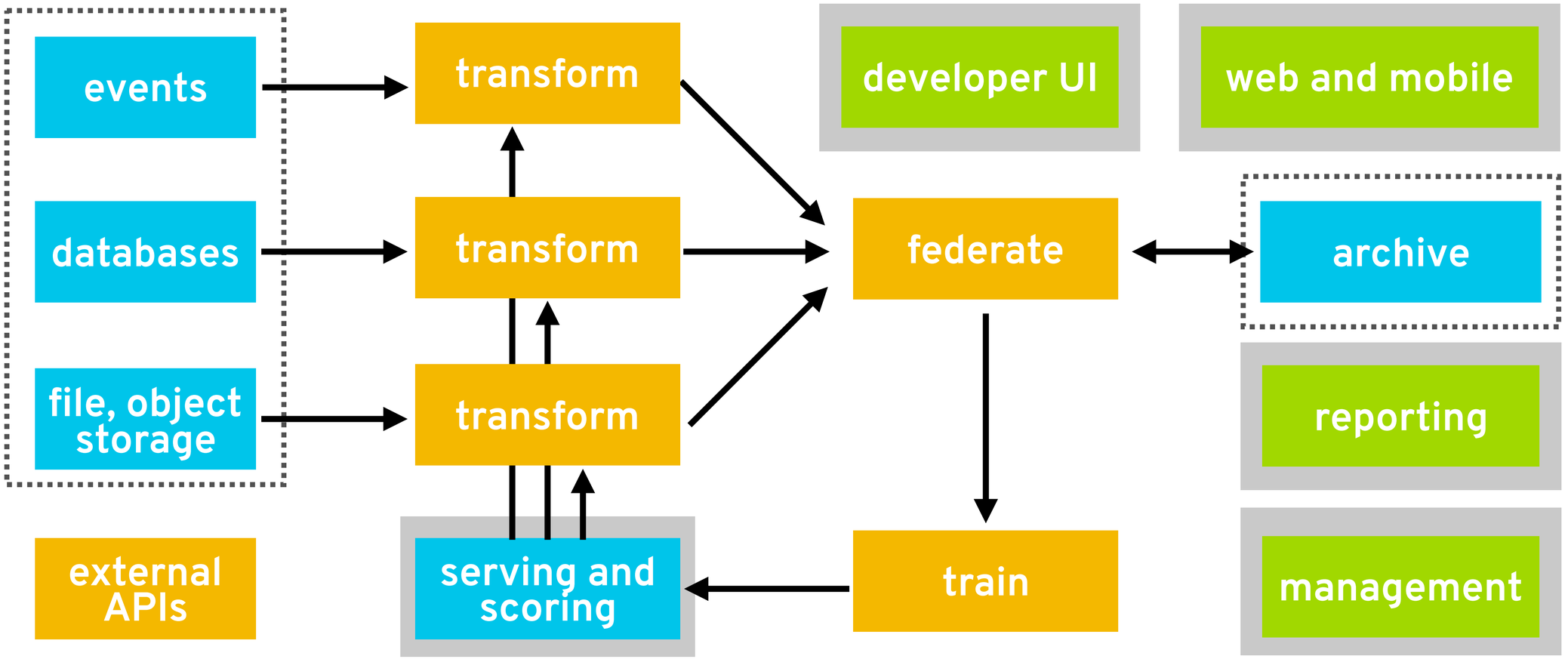
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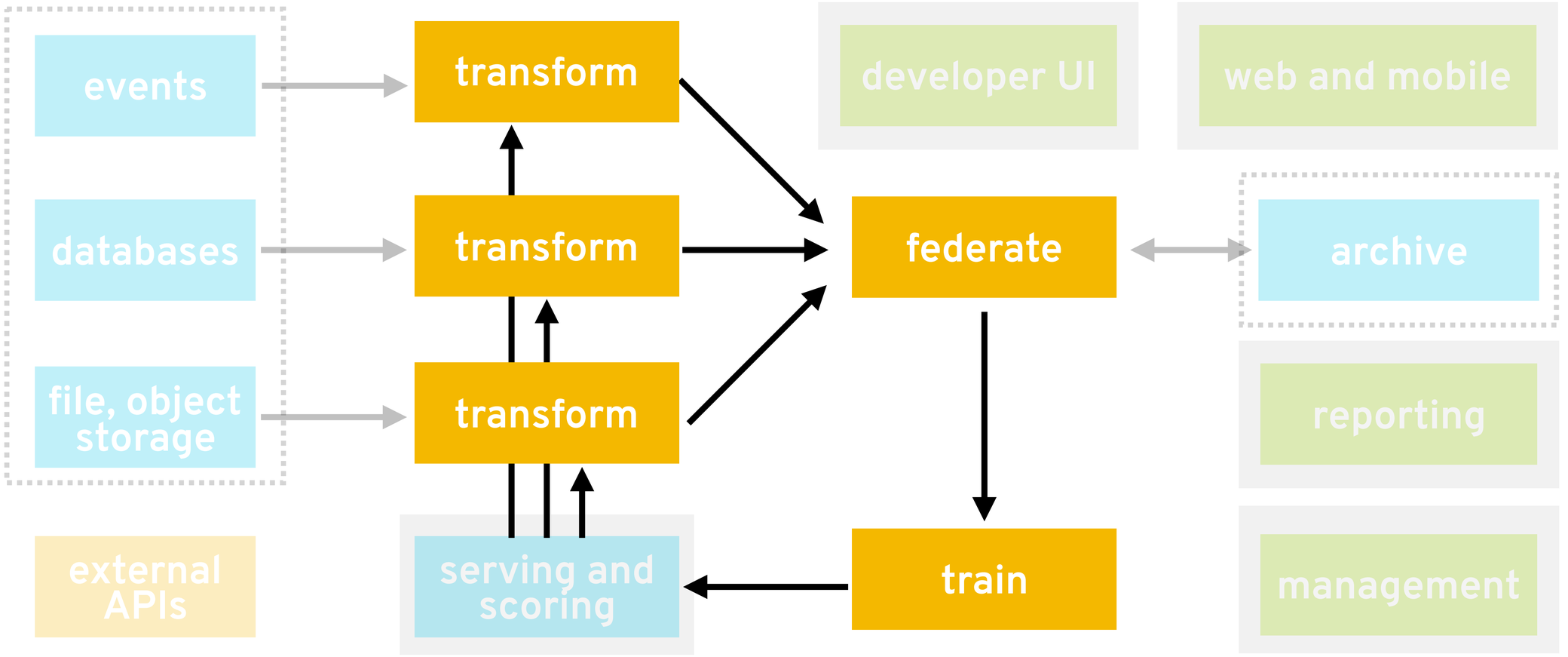
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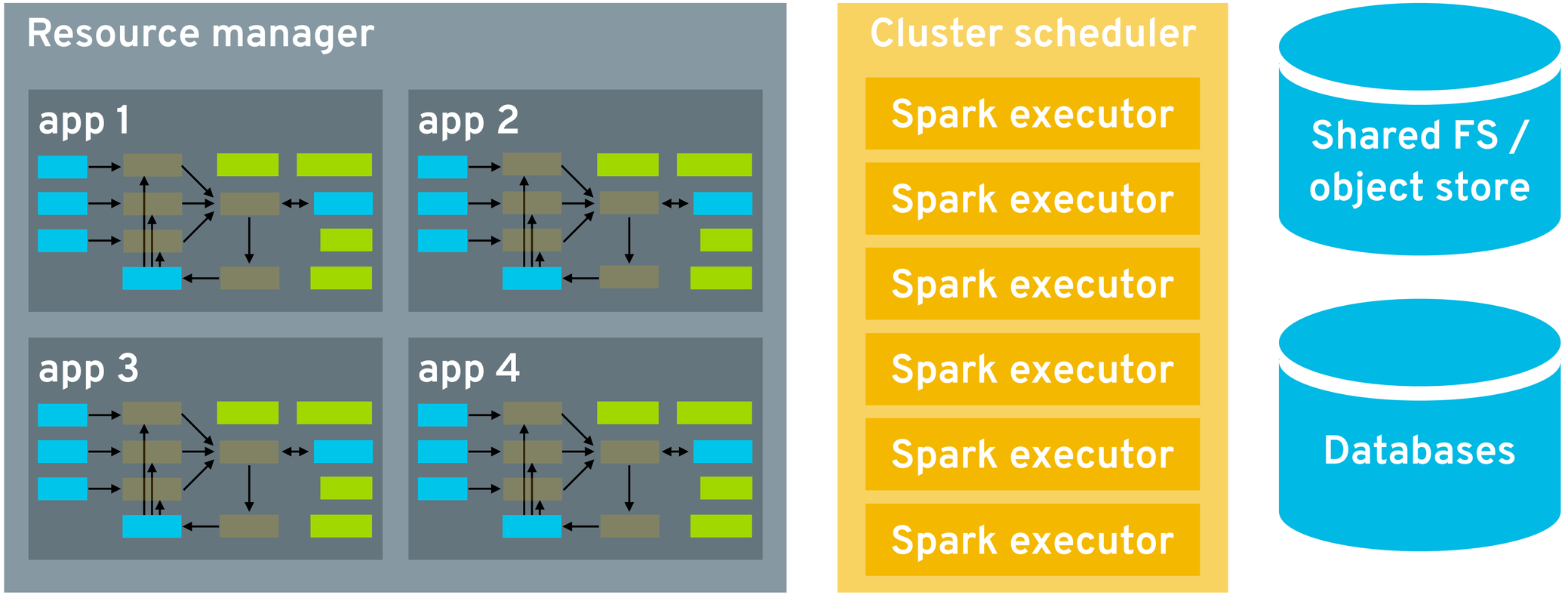
Multitenant compute clusters



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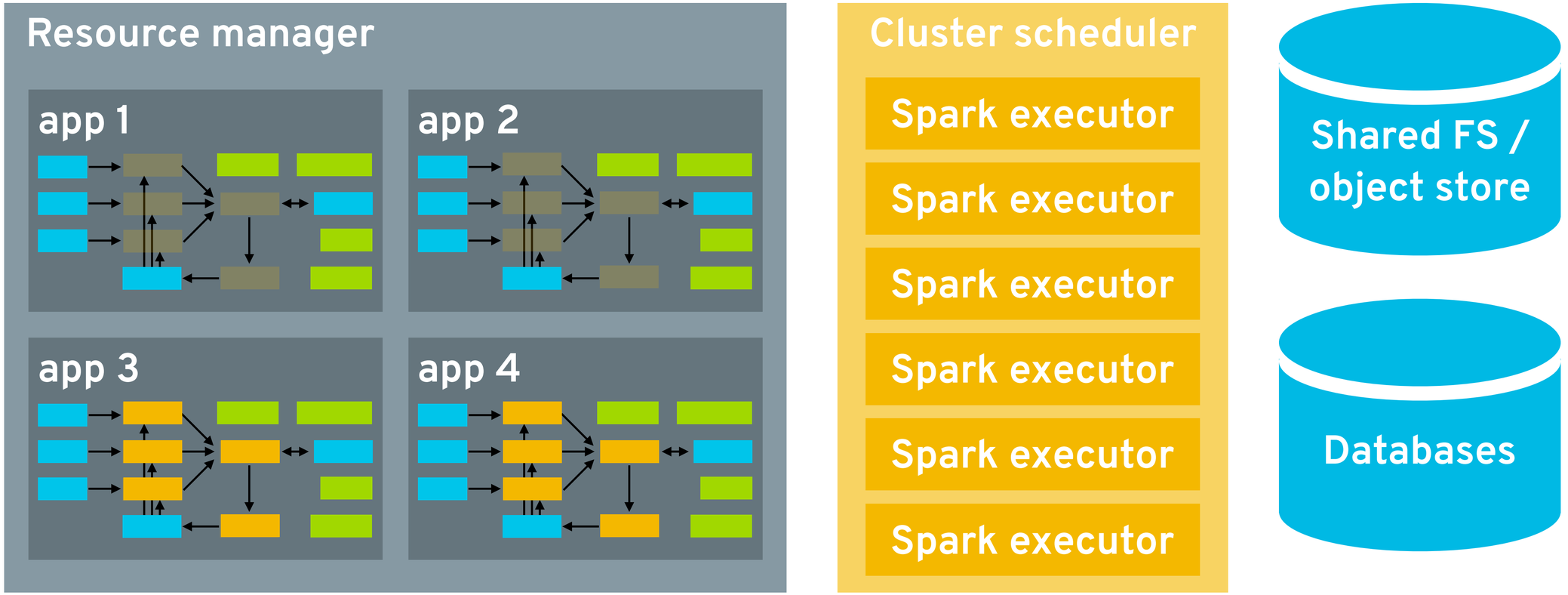
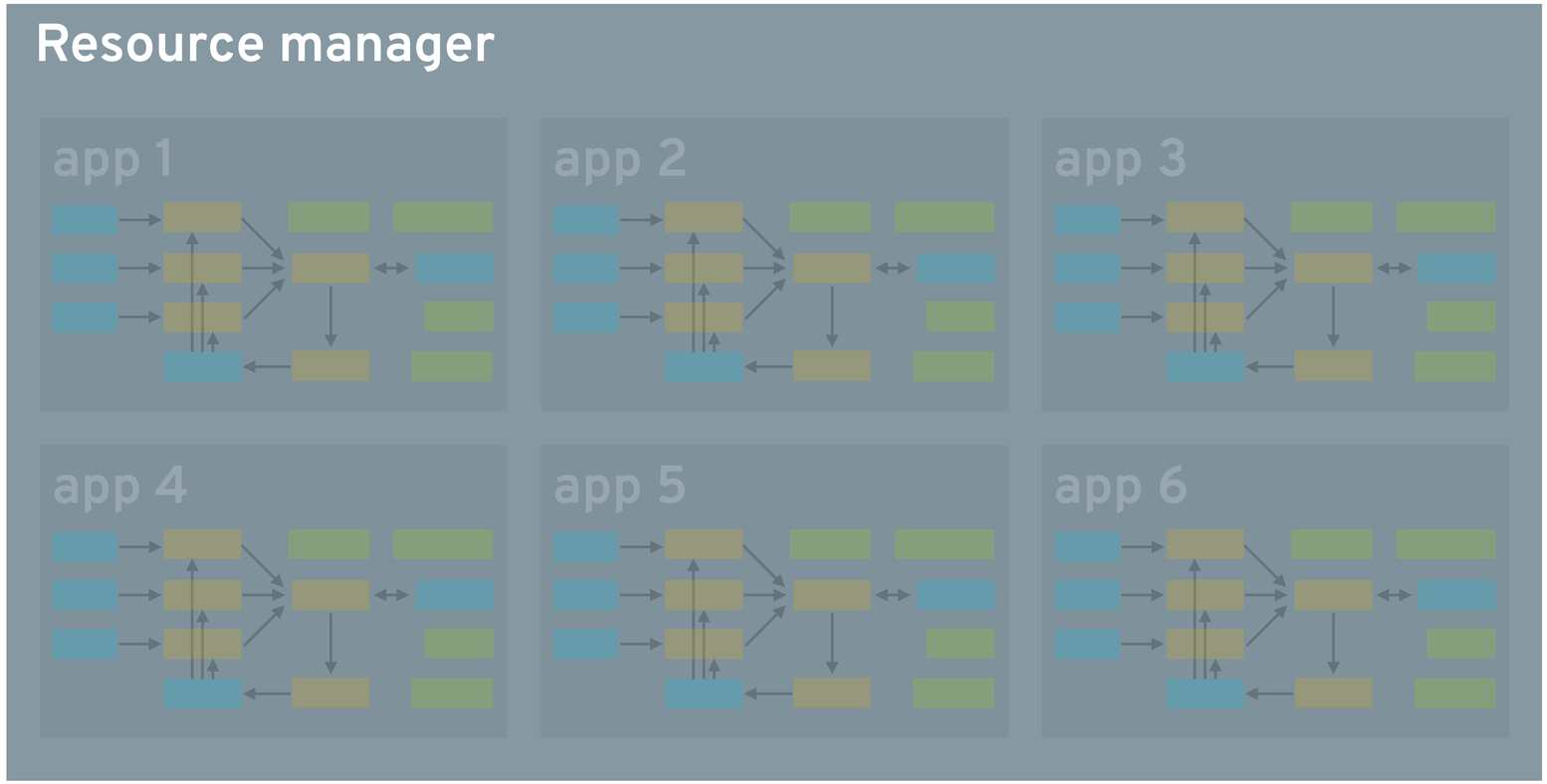


One cluster per application



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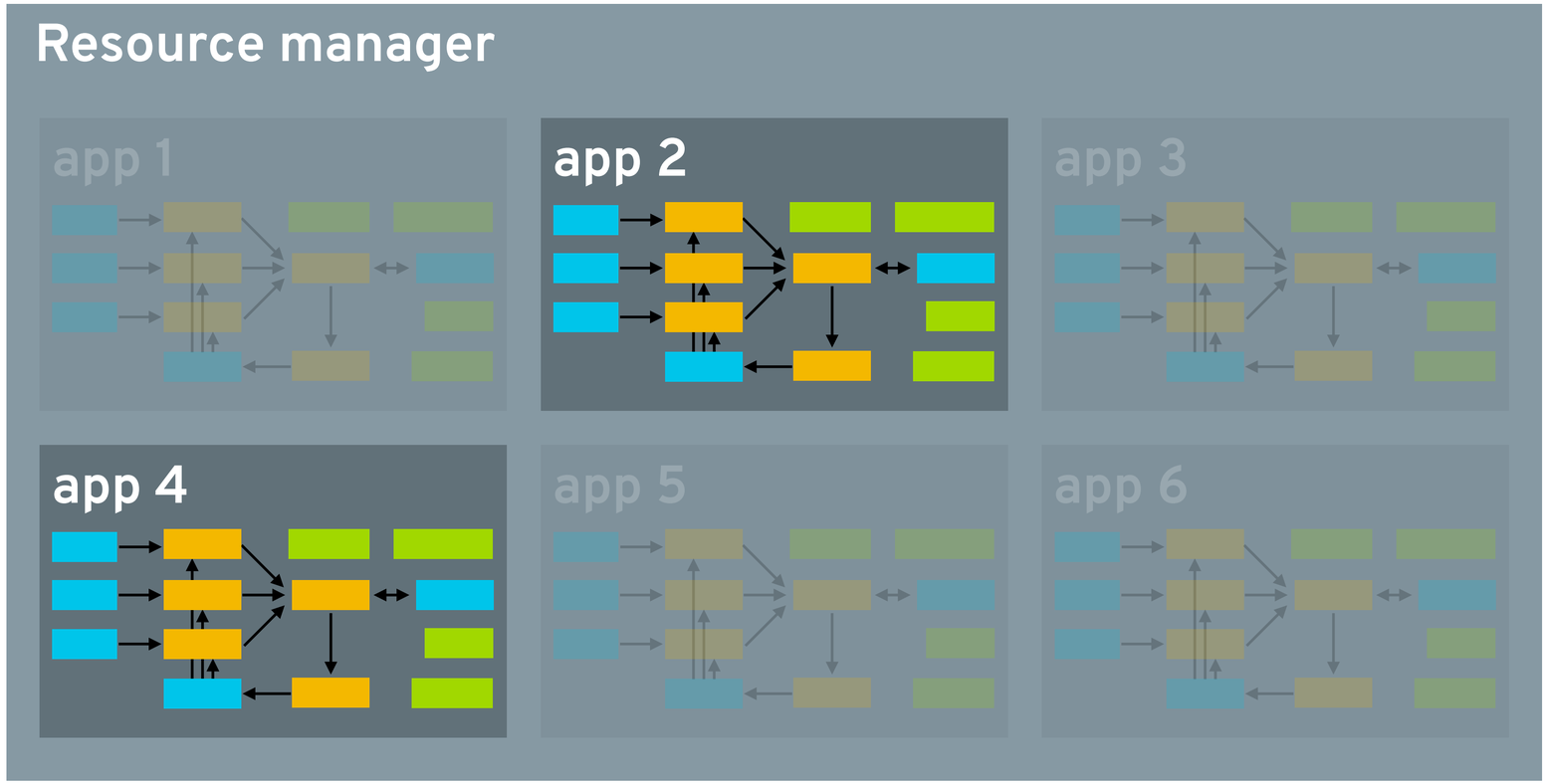

A trivial Spark example

```
file = sc.textFile("file://...")

counts = file.flatMap(lambda l: l.split(" "))
              .map(lambda w: (w, 1))
              .reduceByKey(lambda x, y: x + y)

# computation actually occurs here
counts.saveAsTextFile("file://...")
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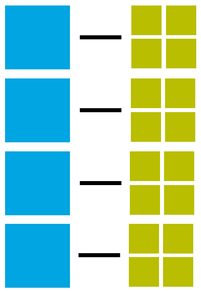

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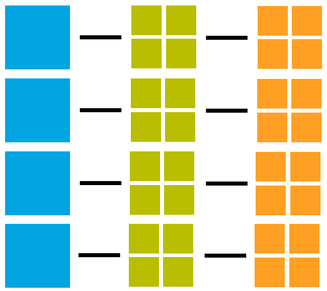

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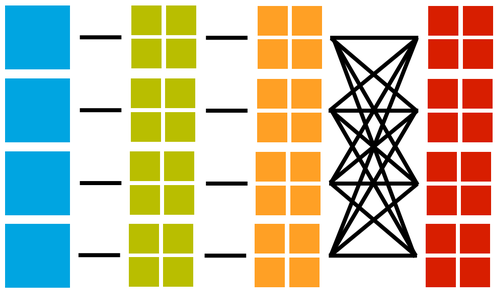

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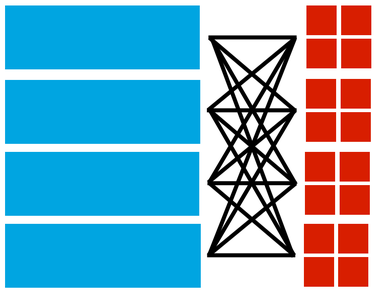
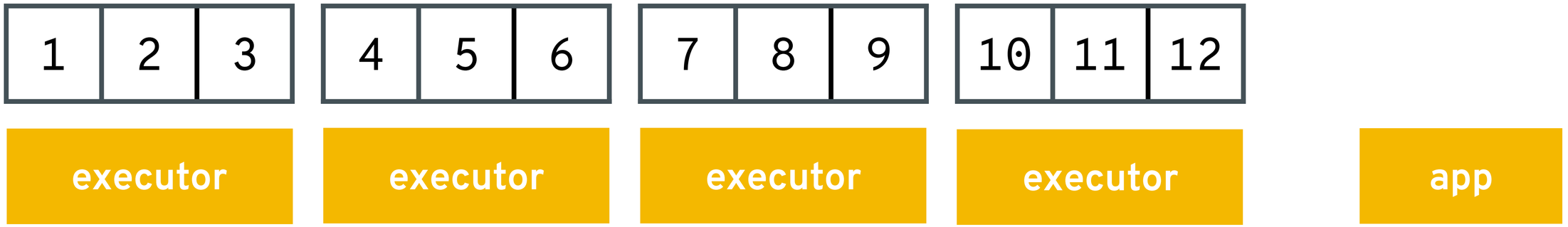


Data-processing microservices



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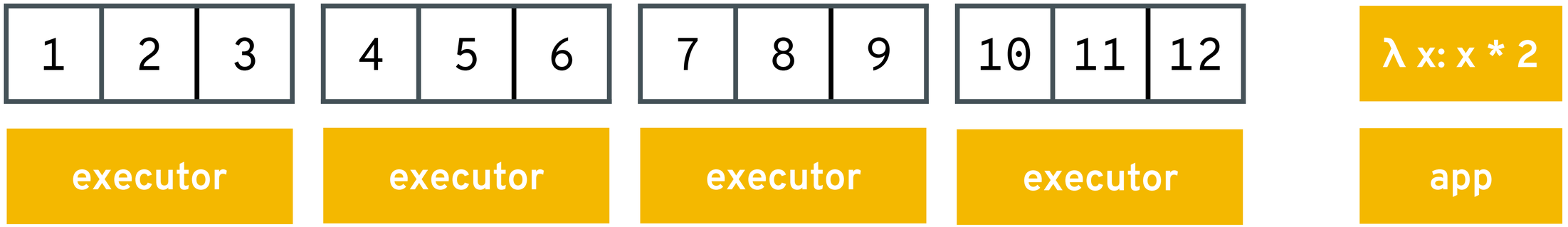

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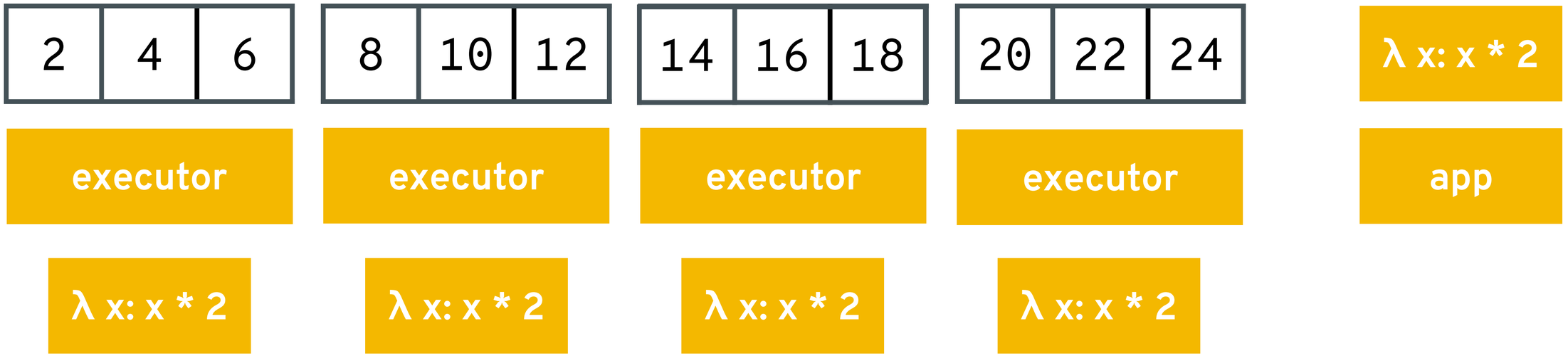

Data-processing microservices

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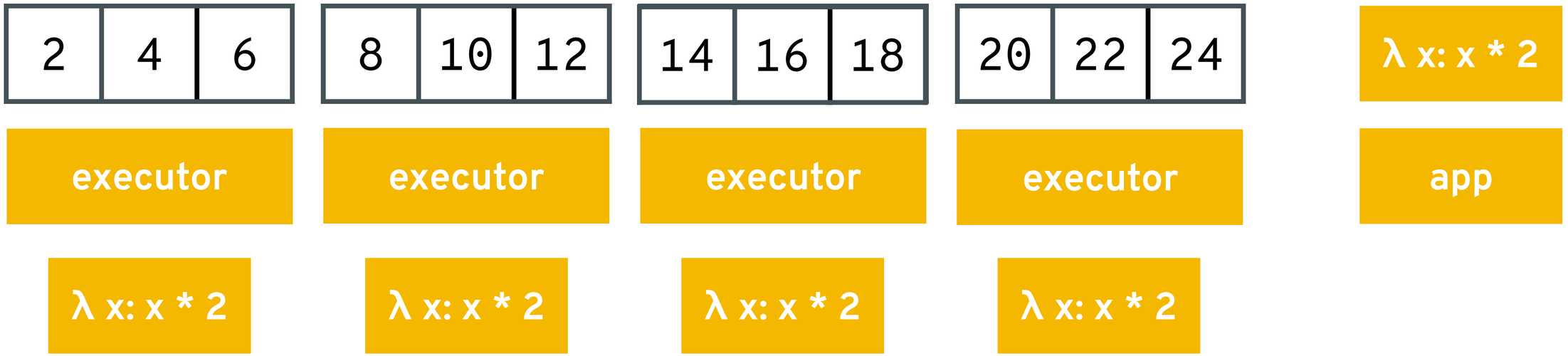


Graph | SQL | ML | Streaming

Spark core (collections and scheduler)

ad hoc | Kubernetes | Mesos | YARN

RADANALYTICS.IO

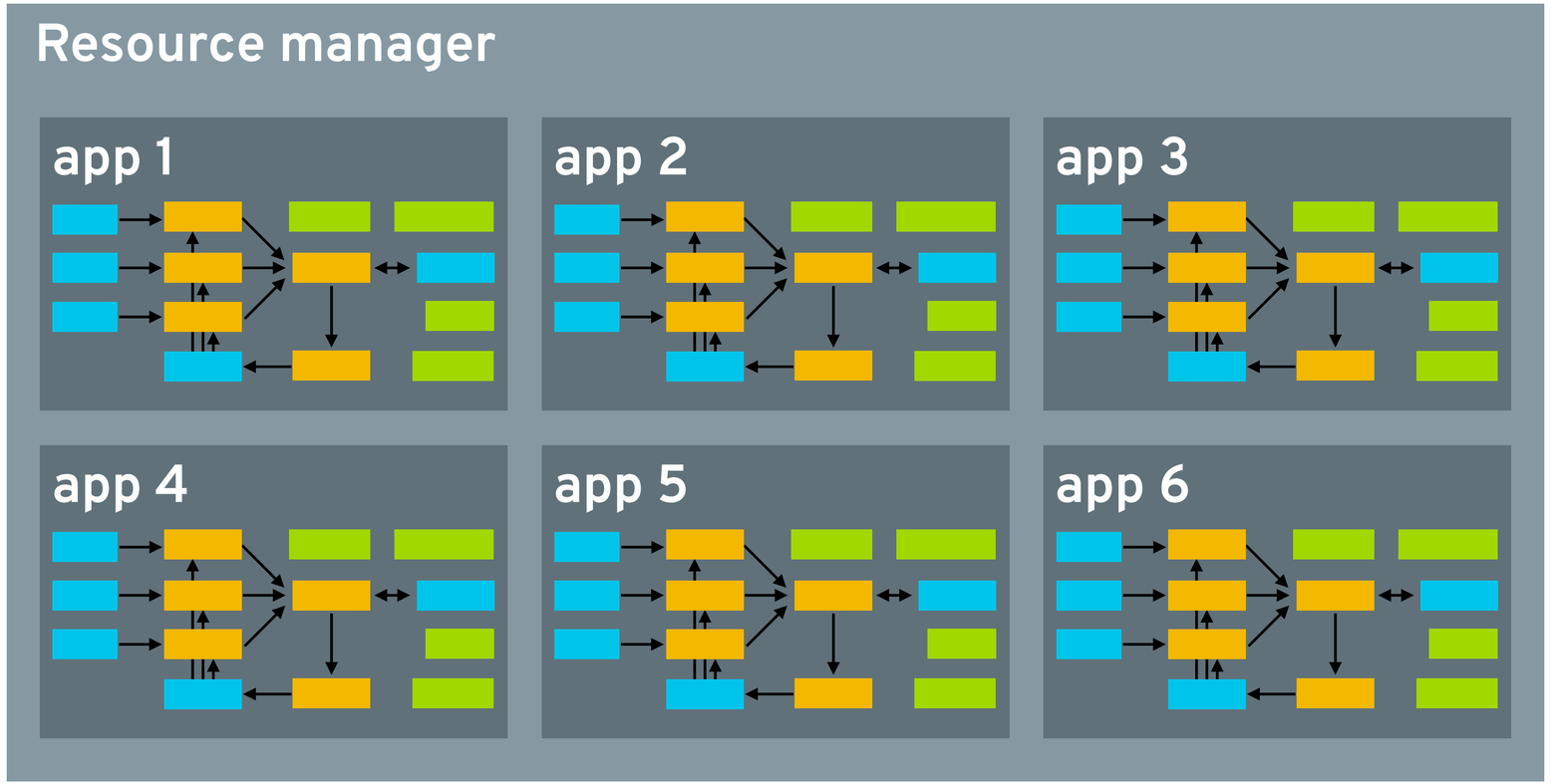
radanalytics.io

An **open-source community** enabling **intelligent applications** on **OpenShift**

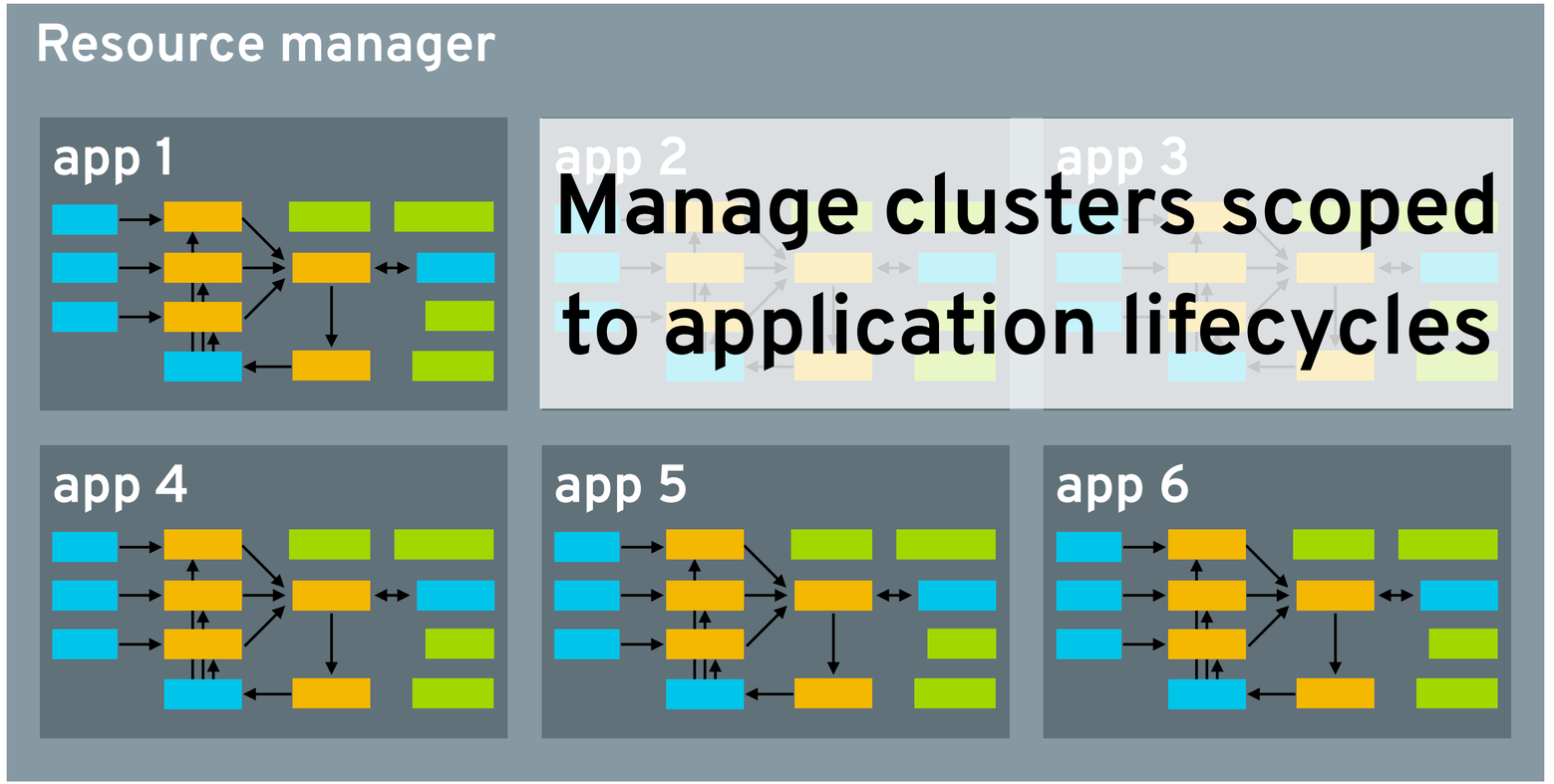
Tooling to manage **Apache Spark**, **Jupyter notebooks**, and **TensorFlow** **training** and **model serving**

Numerous example applications

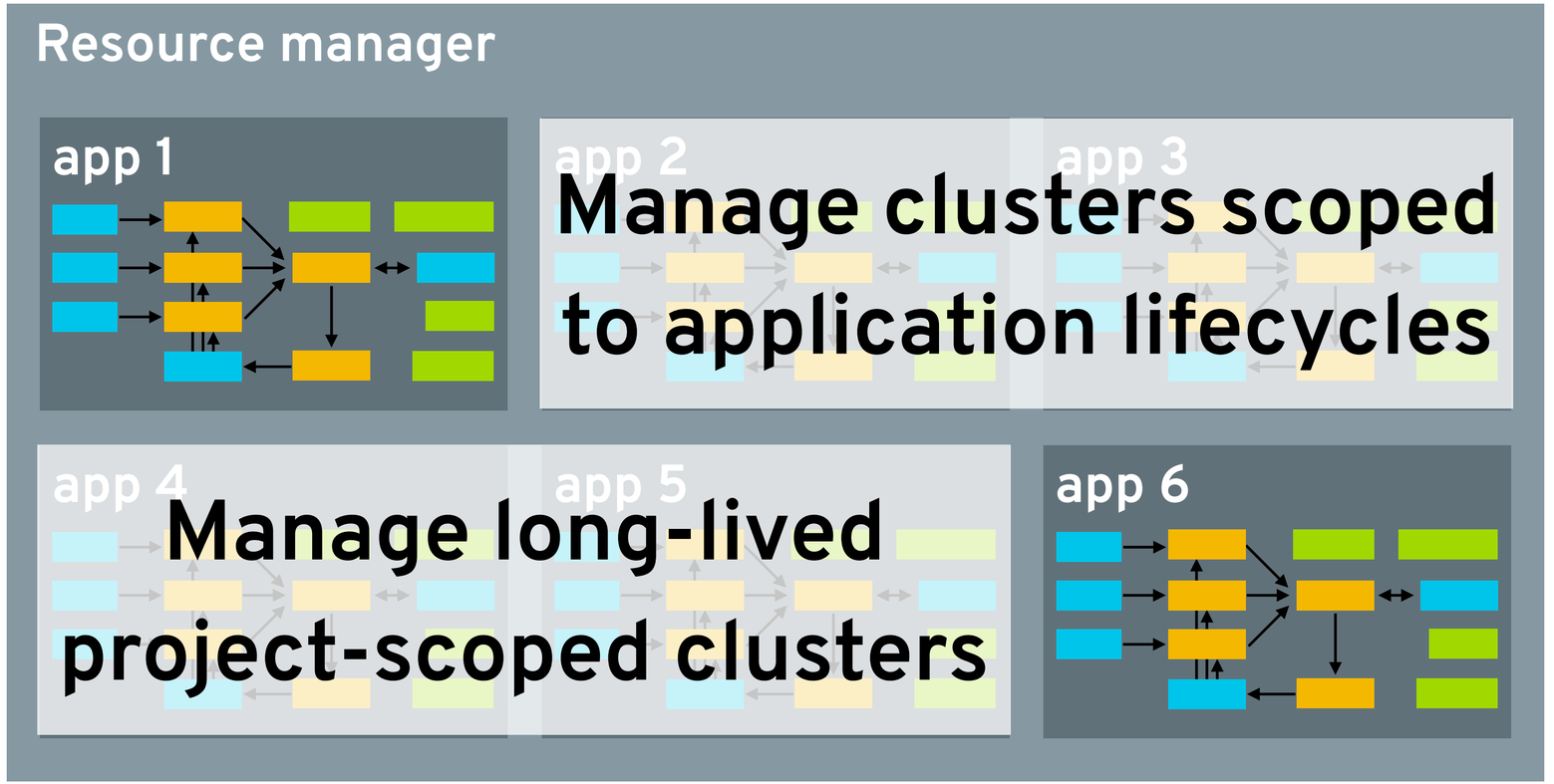
Spark management tooling



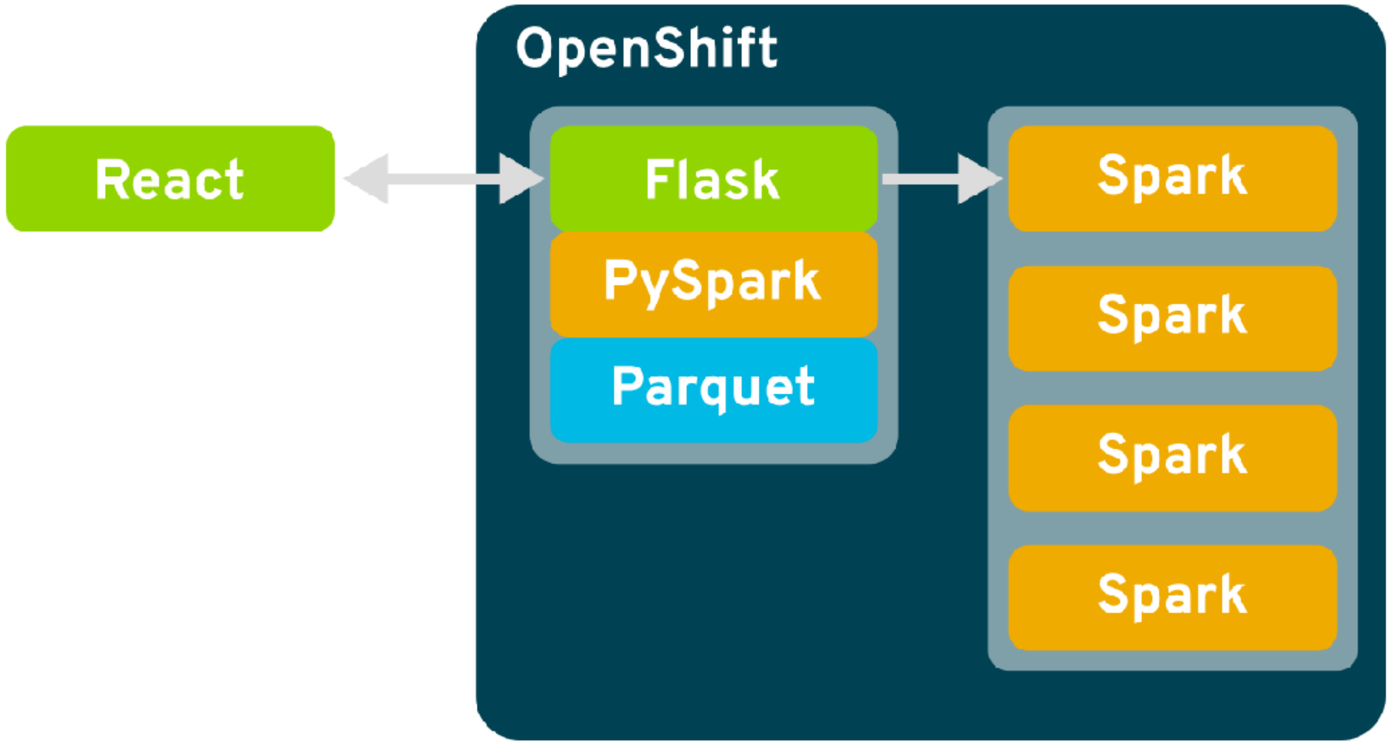
Spark management tooling



Spark management tooling

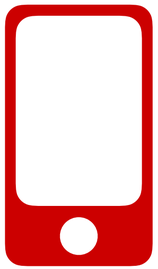


MIGRATING FROM NOTEBOOK TO APPLICATION



https://github.com/radanalyticsio/var-sandbox

```
def simstep(pf, params, prng):
  def daily_return(sym):
      mean, stddev = params[sym]
      change = (prng.normalvariate(mean, stddev) + 100) / 100.0
      return change
  return dict([(s, daily_return(s) * v) for s, v in pf.items()])
```

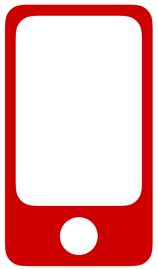


```
def simstep(pf, params, prng):
    """Simulate a single step of activity for a stock.

    This function takes a dictionary of stock value data, a dictionary
    containing stock prediction models, and a random.Random instance to
    generate new variances from. It will return a dictionary with the
    updated, randomly predicted, values for the stocks indexed by
    symbol.
    """
    def daily_return(sym):
        mean, stddev = params[sym]
        change = (prng.normalvariate(mean, stddev) + 100) / 100.0
        return change
    return {s: daily_return(s) * v for s, v in pf.items()}
```

```
def simulate(seed, pf, params, days):
    from random import Random
    prng = Random()
    prng.seed(seed)
    pf = pf.copy()

    for day in range(days):
        pf = simstep(pf, params, prng)
    return pf
```

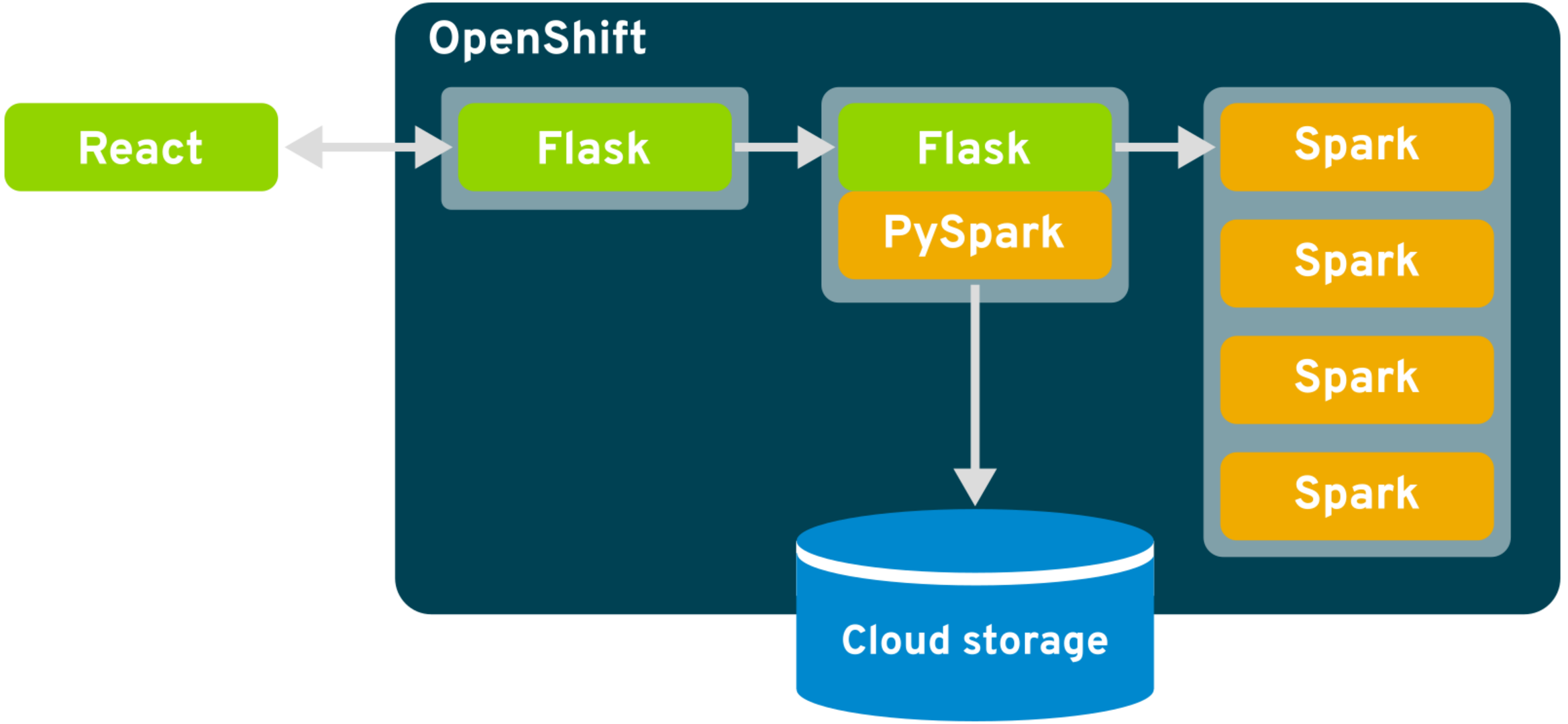


```
def simulate(seed, pf, params, days):
    """Simulate a number of days worth of stock changes.

    This function accepts a seed for the randomizer, a dictionary of
    stock value data, a dictionary of stock prediction models, and a
    number of days to simulate. It will return a dictionary with the
    updated stock value predictions indexed by symbol.
    """
    prng = random.Random()
    prng.seed(seed)
    pf = pf.copy()
    for day in range(days):
        pf = simstep(pf, params, prng)
    return pf
```

DEPLOYING THE APPLICATION

BUILDING TOWARDS PRODUCTION


OpenShift
React
Flask
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PySpark
Spark
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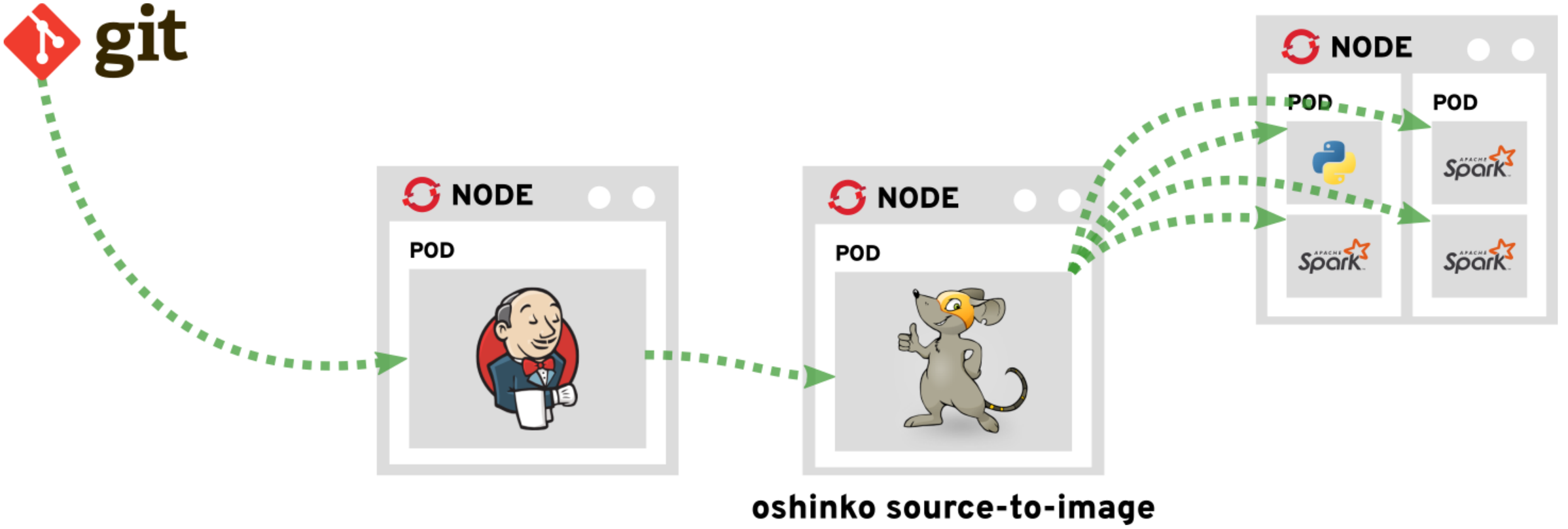
Spark
Cloud storage


git
NODE
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THANKS!

https://radanalytics.io
https://github.com/radanalyticsio/workshop
https://github.com/radanalyticsio/var-sandbox

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@willb and @FOSSJunkie