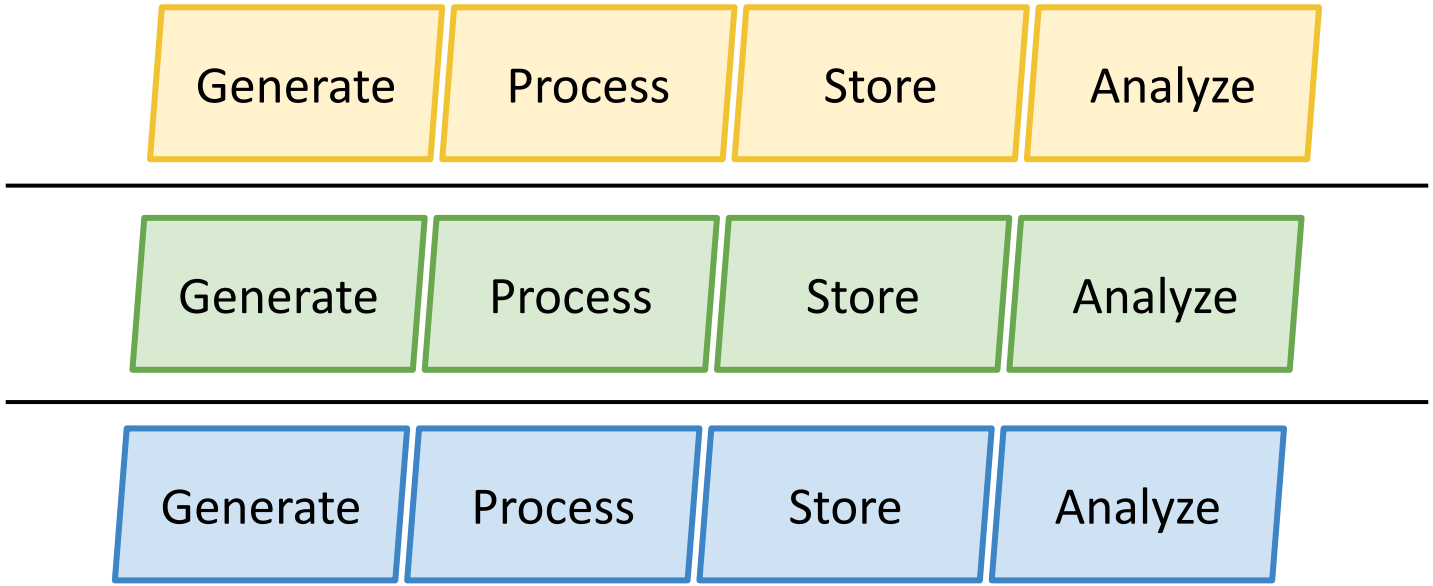

KubeCon
CloudNativeCon
Europe 2023
observIQ
Daniel Jaglowski

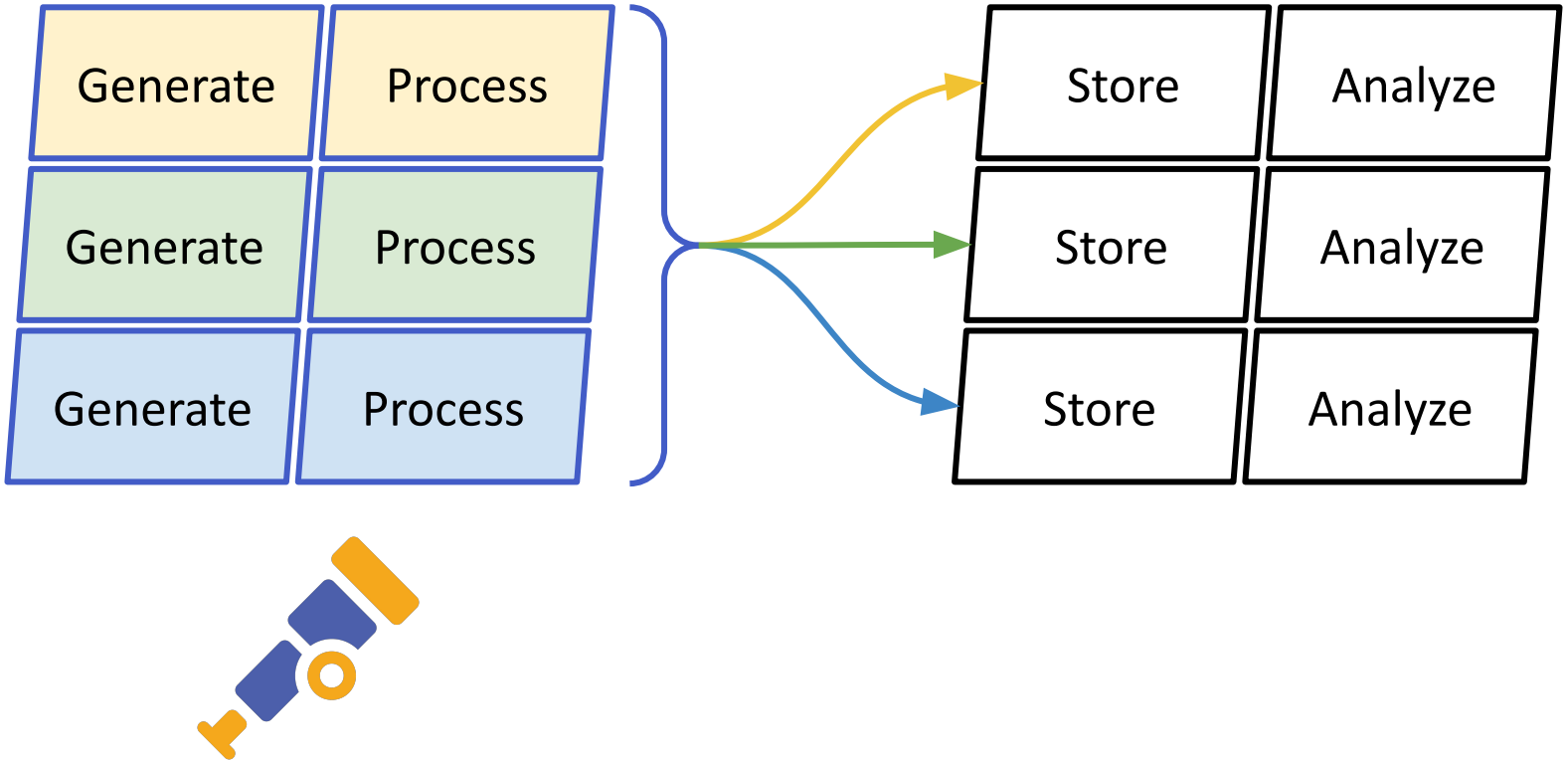
Agenda

1. Context
2. Pipeline Mechanics
3. Limitations
4. Connectors

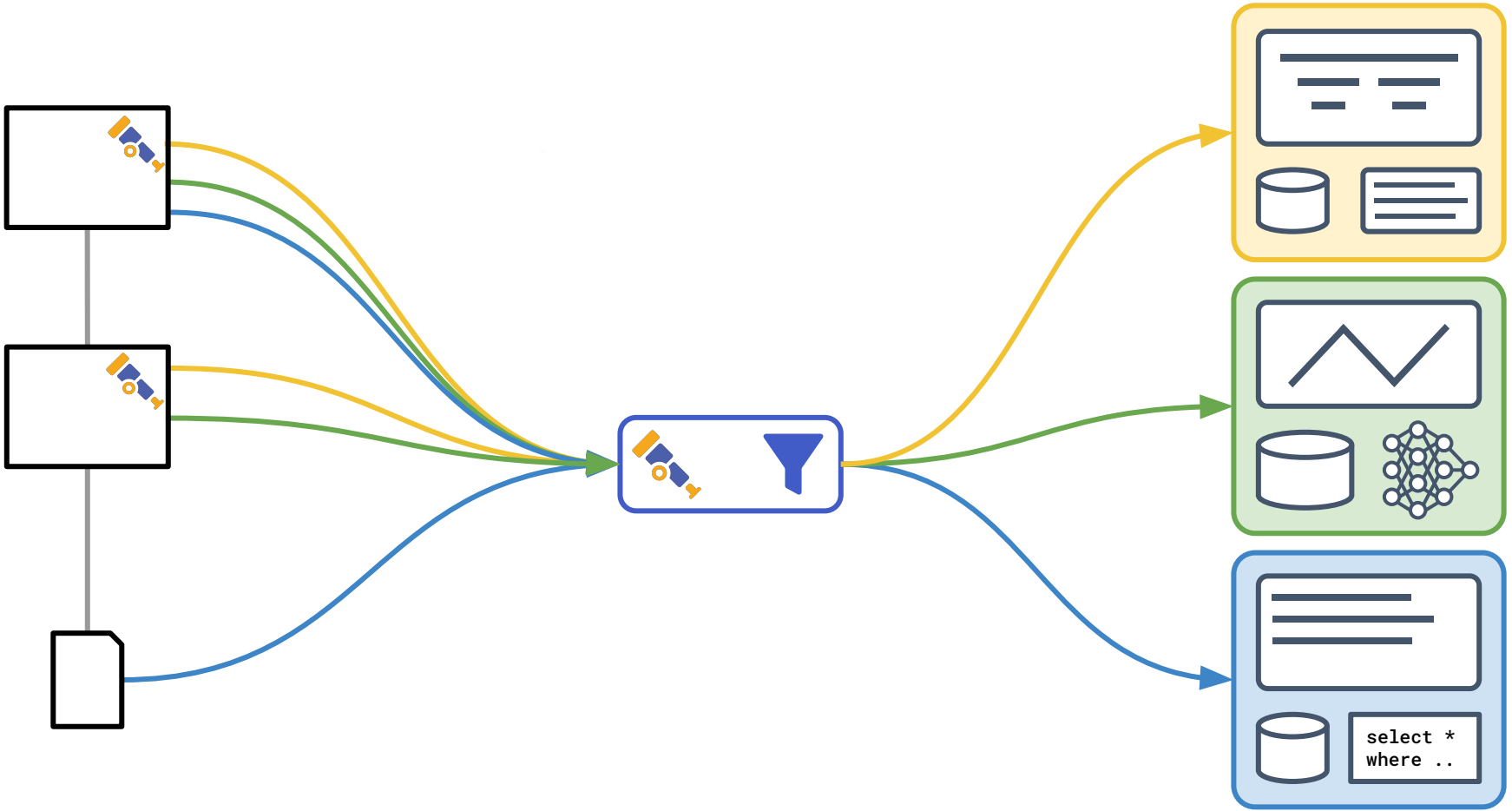
Observability



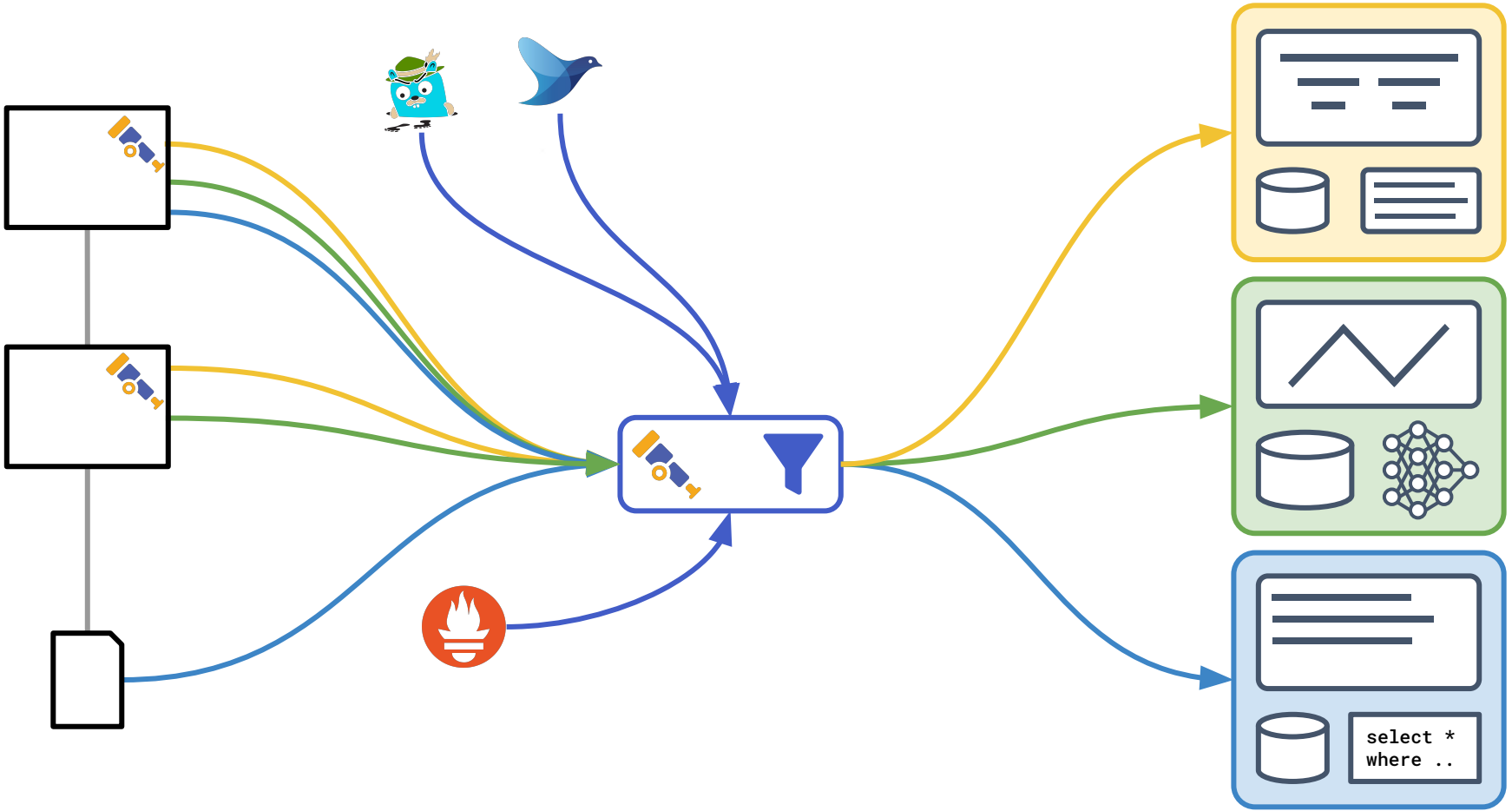
OpenTelemetry



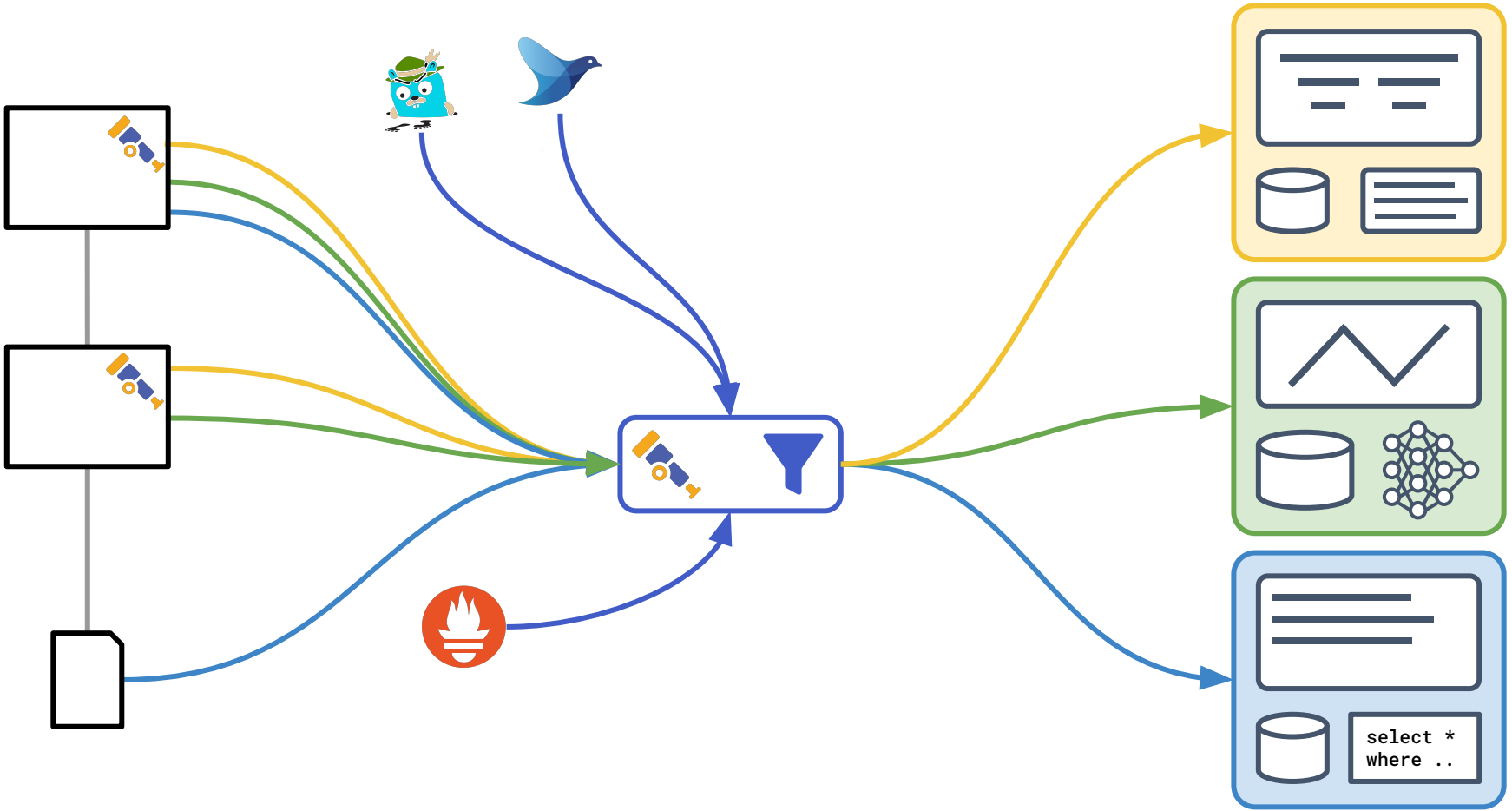
OpenTelemetry



OpenTelemetry



OpenTelemetry



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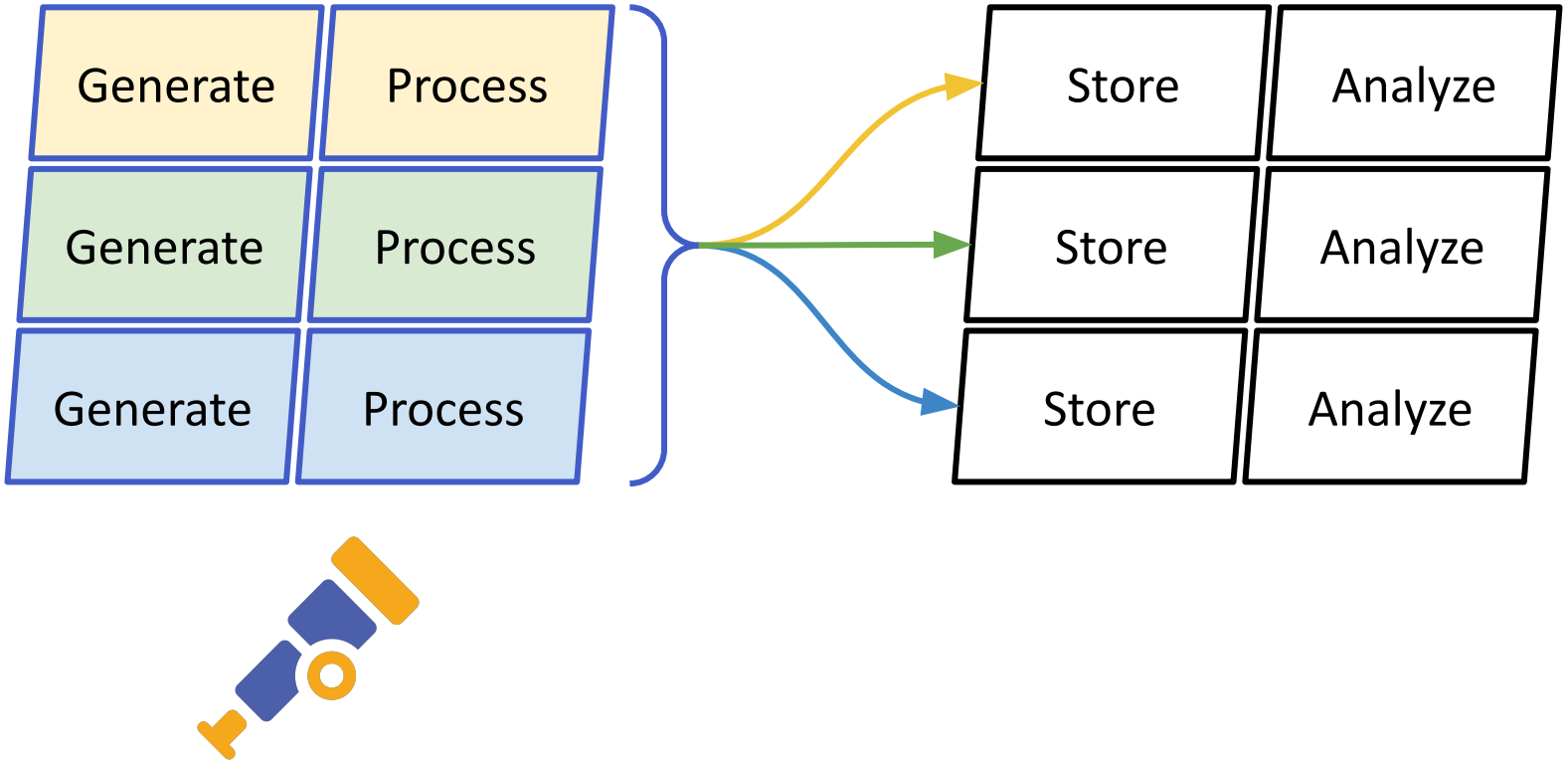
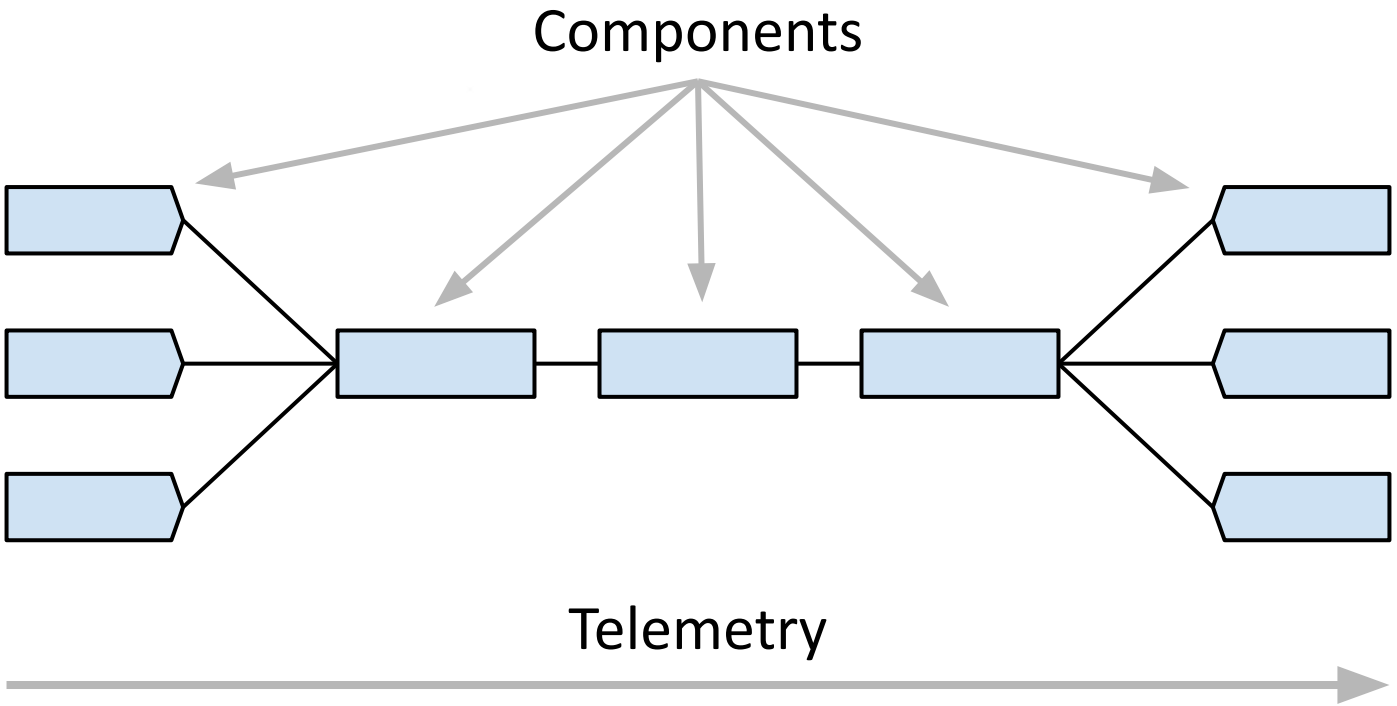
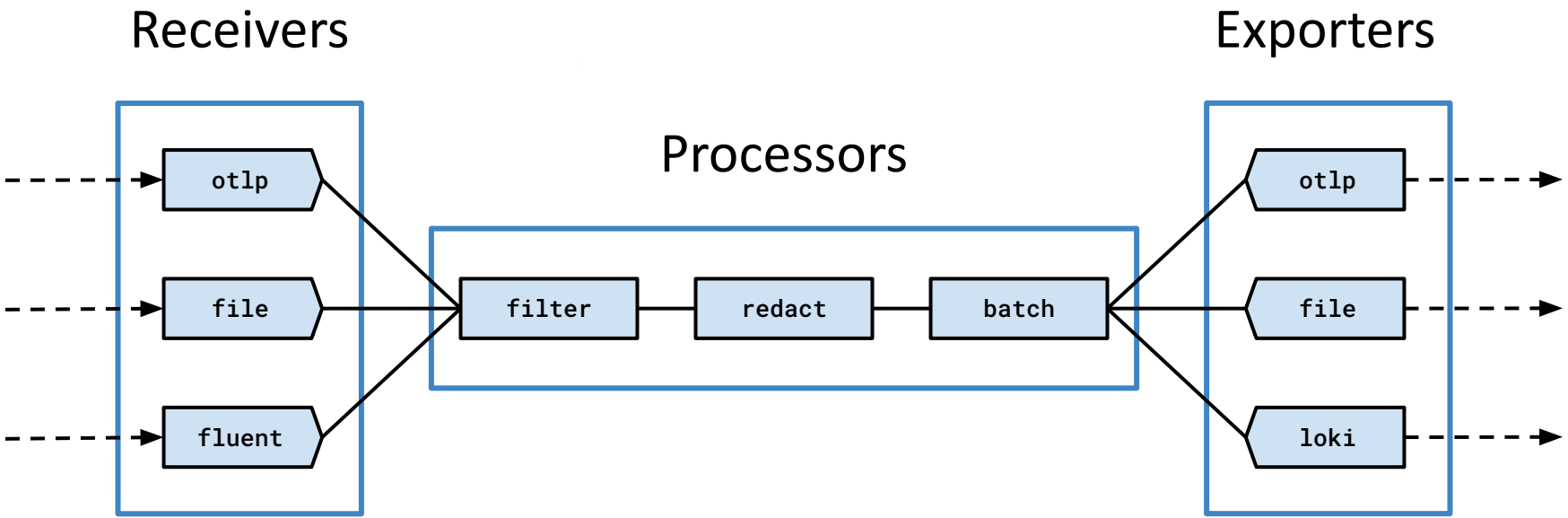


Pipelines



Pipelines


Receivers
Processors
Exporters
otlp
file
fluent
filter
redact
batch
otlp
file
loki

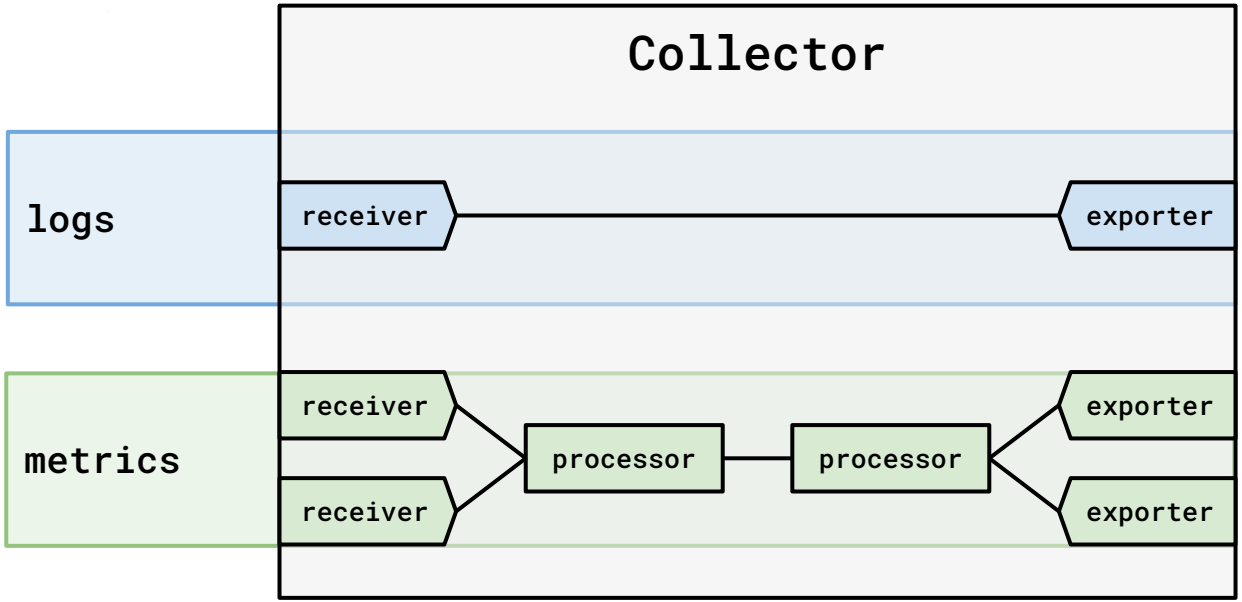
Pipelines

Required

- 1 Receiver
- 1 Exporter
- Data Type

Optional

- + Receivers
- + Processors
- + Exporters

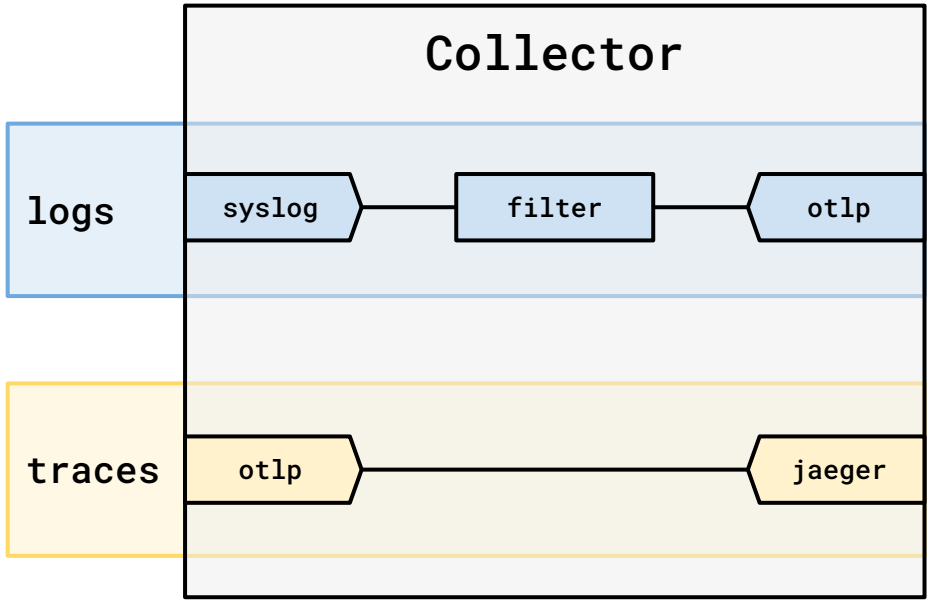


Pipelines

Requirements

- Data Type

Component	logs	metrics	traces
otlp	✔	✔	✔
filter	✔	✔	✔
syslog	✔		
jaeger			✔



Configuration

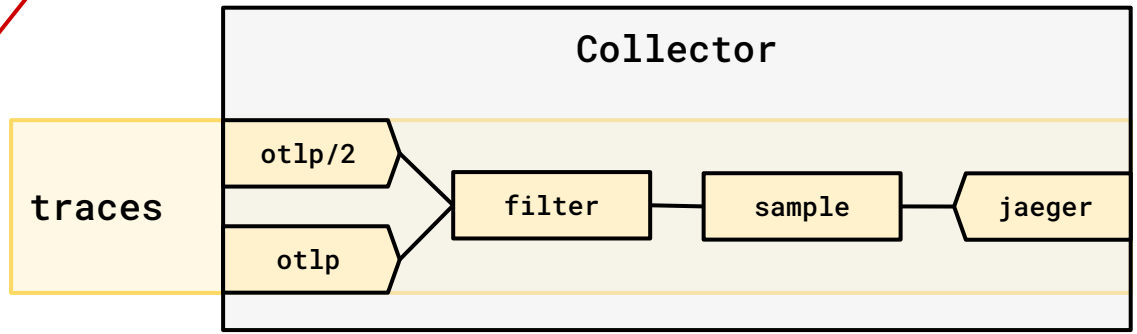

```
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

Component Classes



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receivers:
  otlp:
    endpoint: my.otlp:1111
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    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
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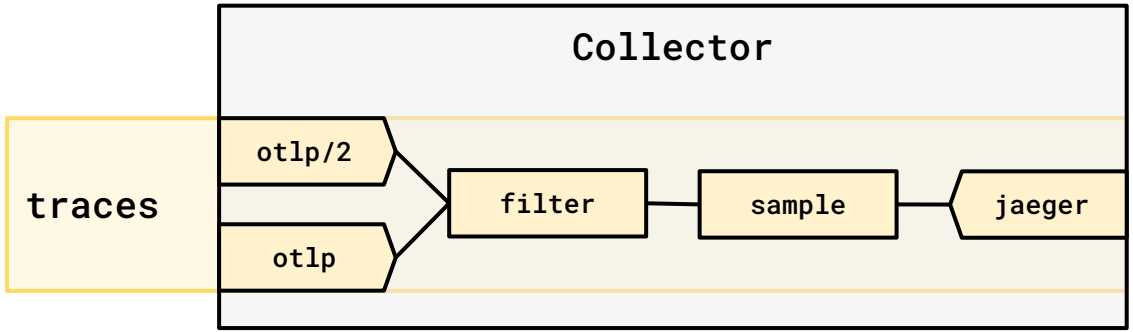
pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

Components



Configuration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receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```
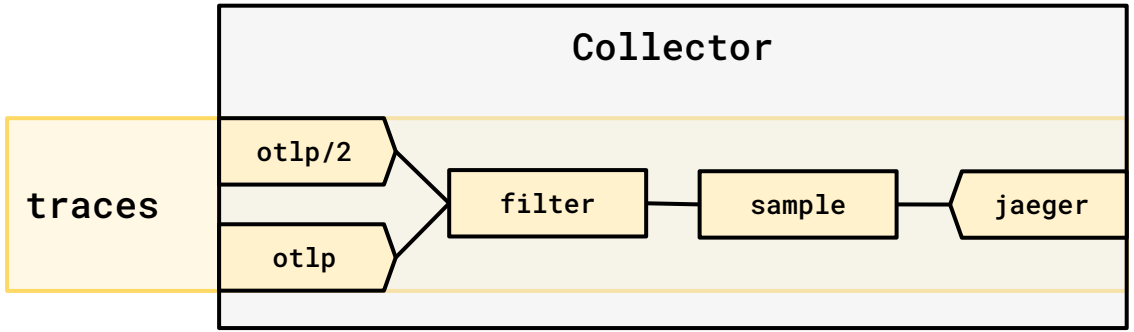

Component Parameters



Configuration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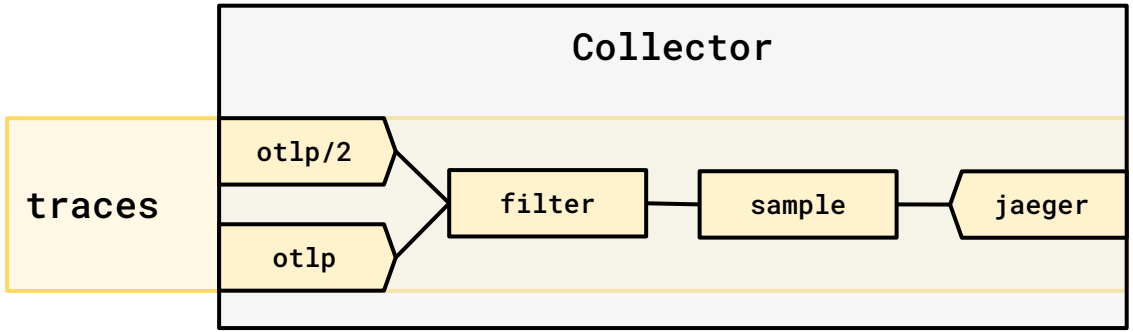
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

Component IDs `type[/name]`



Configuration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receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```
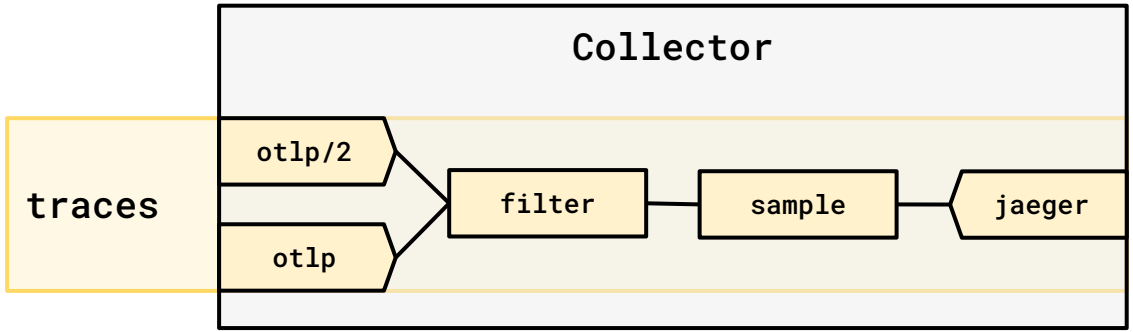
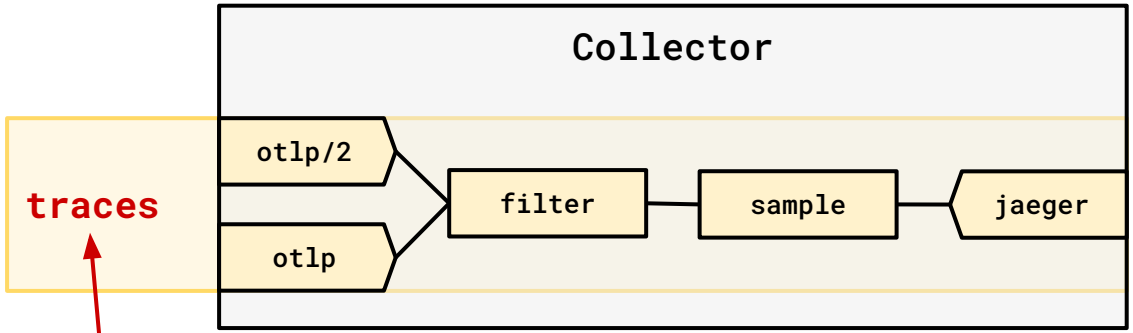



Pipeline Configuration

Configuration

```
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

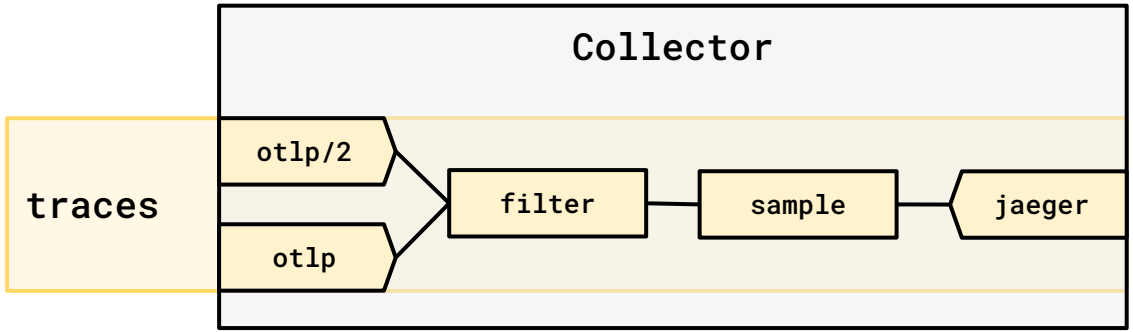


Pipeline ID

datatype[/name]

Configuration


```
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

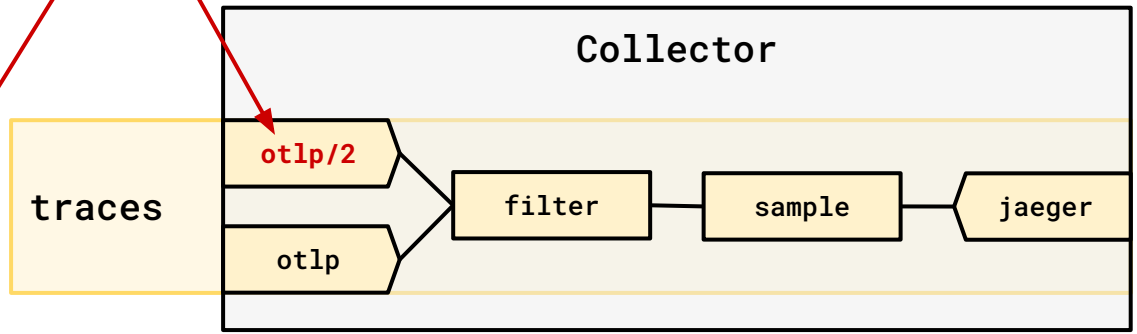


Component Lists

Configuration

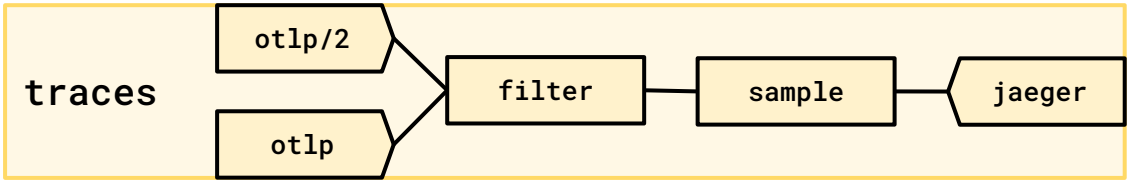

```
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

Component ID

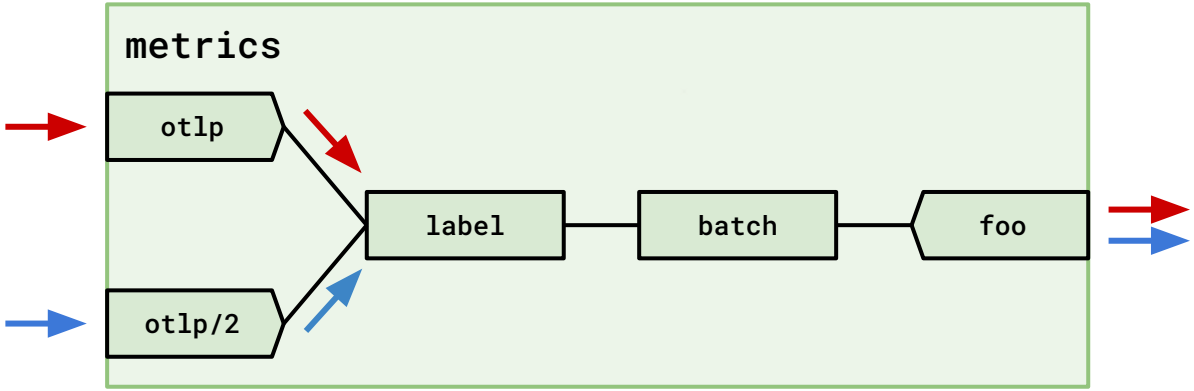


Configuration


```
receivers:
  otlp:
    endpoint: my.otlp:1111
  otlp/2:
    endpoint: my.otlp:2222

processors:
  sample:
  filter:

exporters:
  jaeger:

pipelines:
  traces:
    receivers: [otlp, otlp/2]
    processors: [filter, sample]
    exporters: [jaeger]
```

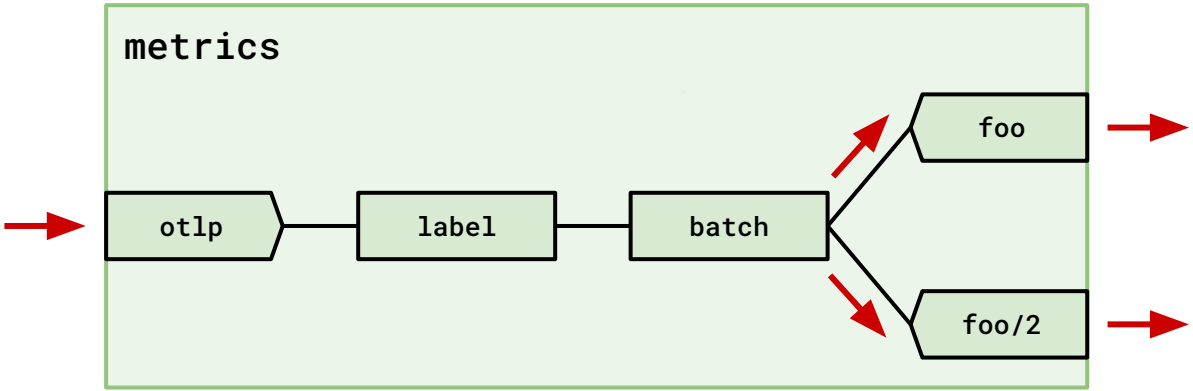


Data Streams



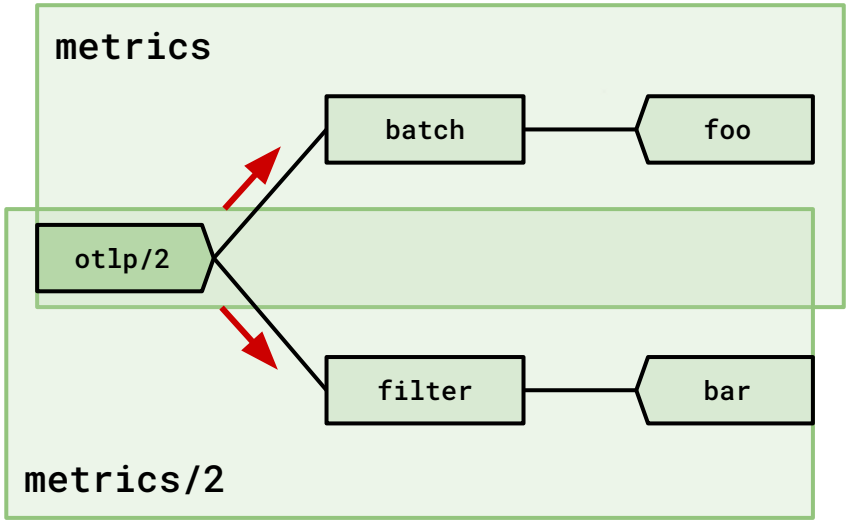

```
pipelines:

  metrics:
    receivers: [otlp, otlp/2]
    processors: [label, batch]
    exporters: [foo]
```

Data Streams



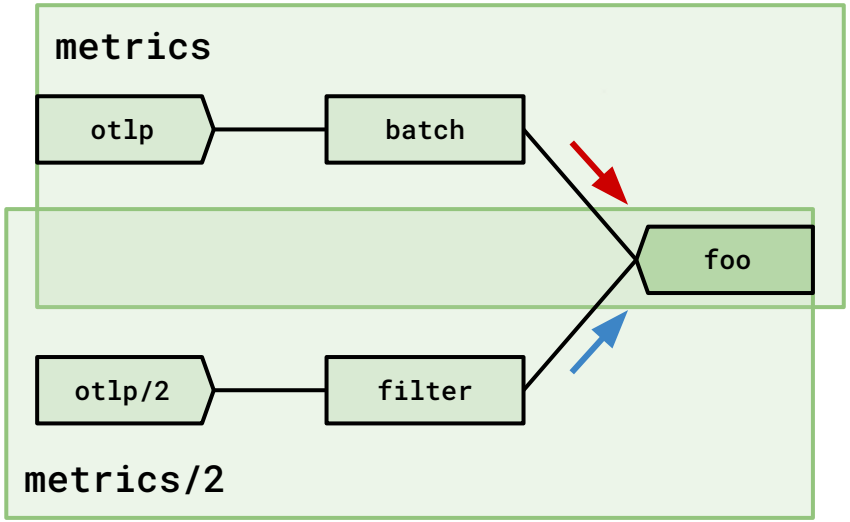

```
pipelines:

  metrics:
    receivers: [otlp]
    processors: [label, batch]
    exporters: [foo, foo/2]
```

Shared Components



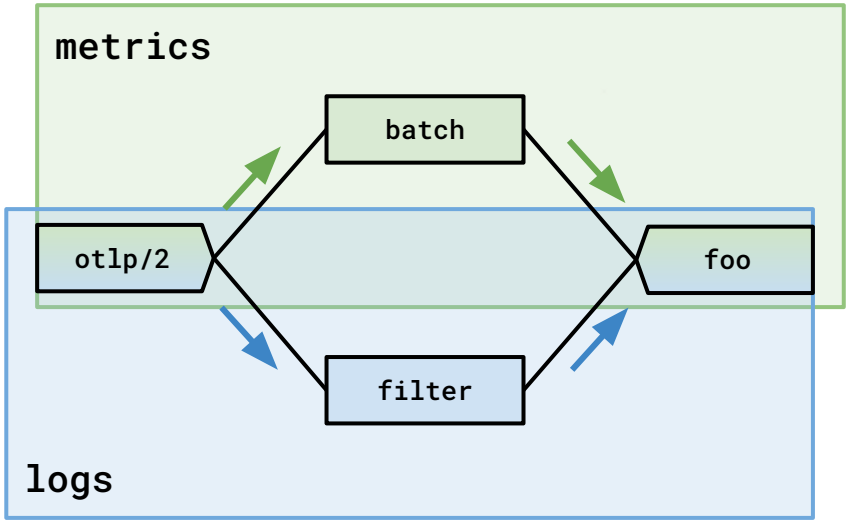

```
pipelines:

  metrics:
    receivers: [otlp/2]
    processors: [batch]
    exporters: [foo]

  metrics/2:
    receivers: [otlp/2]
    processors: [filter]
    exporters: [bar]
```

Shared Components




```
pipelines:

  metrics:
    receivers: [otlp]
    processors: [batch]
    exporters: [foo]

  metrics/2:
    receivers: [otlp/2]
    processors: [filter]
    exporters: [foo]
```

Shared Components




```
pipelines:

  metrics:
    receivers: [otlp/2]
    processors: [batch]
    exporters: [foo]

  logs:
    receivers: [otlp/2]
    processors: [filter]
    exporters: [foo]
```

Pipelines Mechanics

Requirements

Receiver 

Exporter 

Data Type 

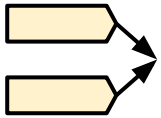
Shared Components

Receivers MAY be shared

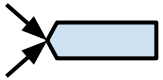
Processors are NOT shared

Exporters MAY be shared

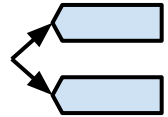
Merge

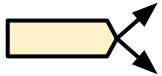


After multiple receivers

Before shared exporter 

Replicate

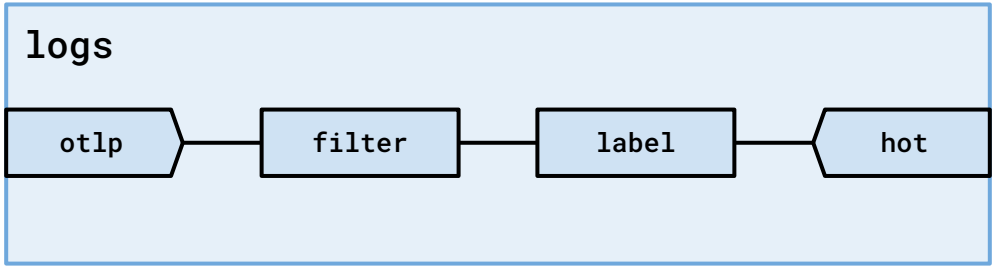
Before multiple exporters 



After shared receiver

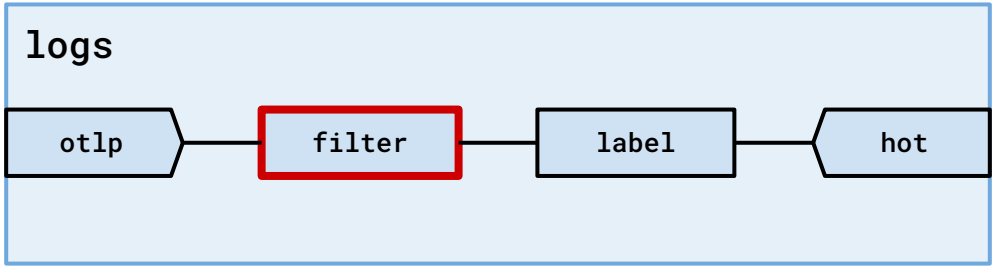
Scenario 1

- Expensive analytics tool



Scenario 1

- Expensive analytics tool
- Must preserve all logs



Scenario 1

- Expensive analytics tool
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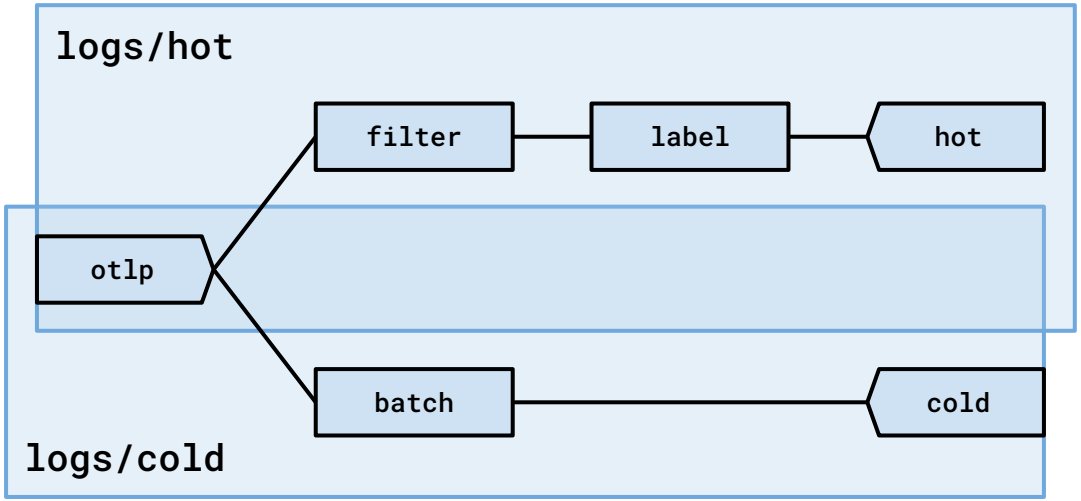
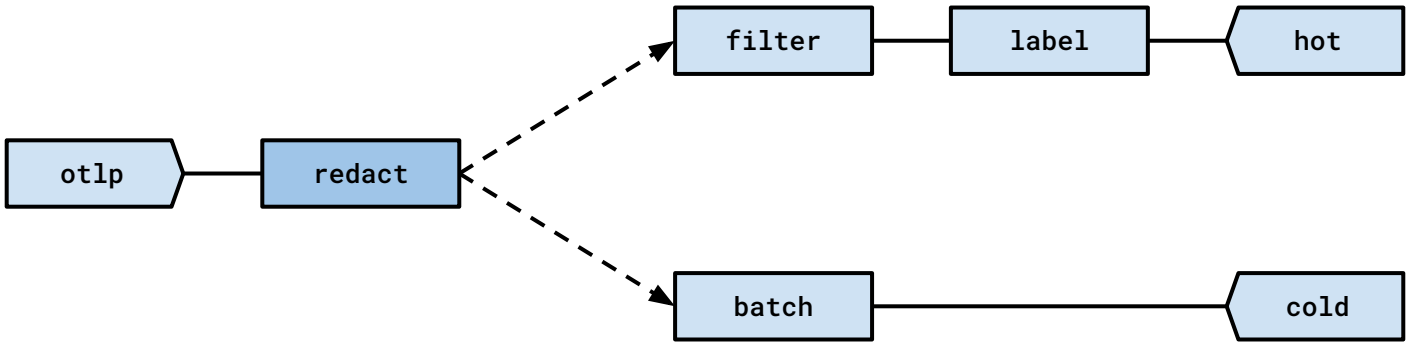


Scenario 1

- Expensive analytics tool
- Must preserve all logs
- Must redact PII immediately



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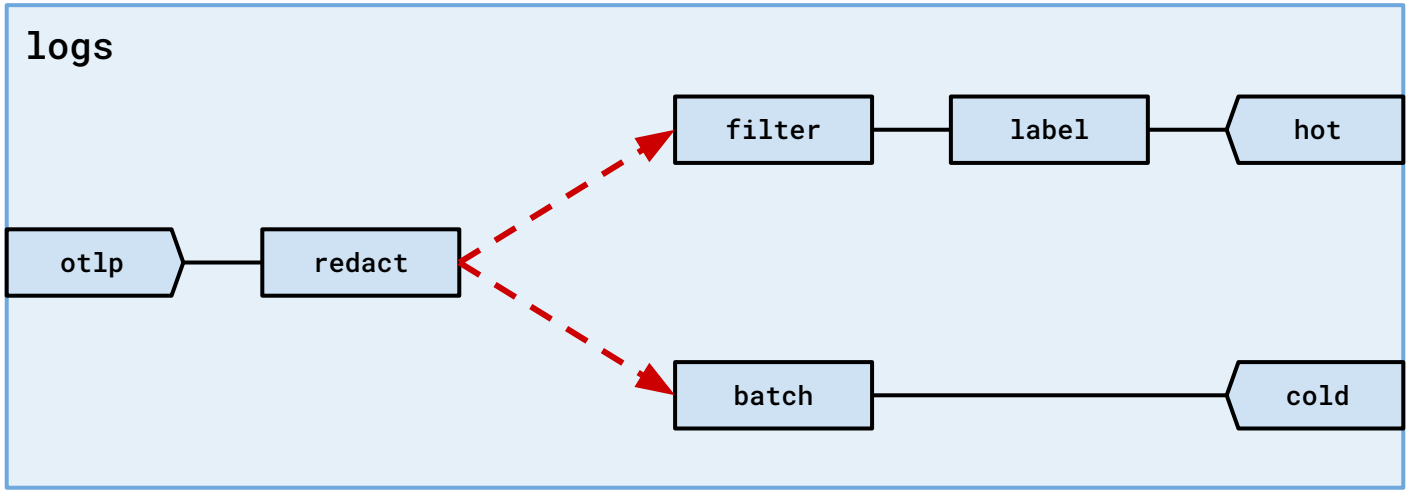

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- Expensive analytics tool
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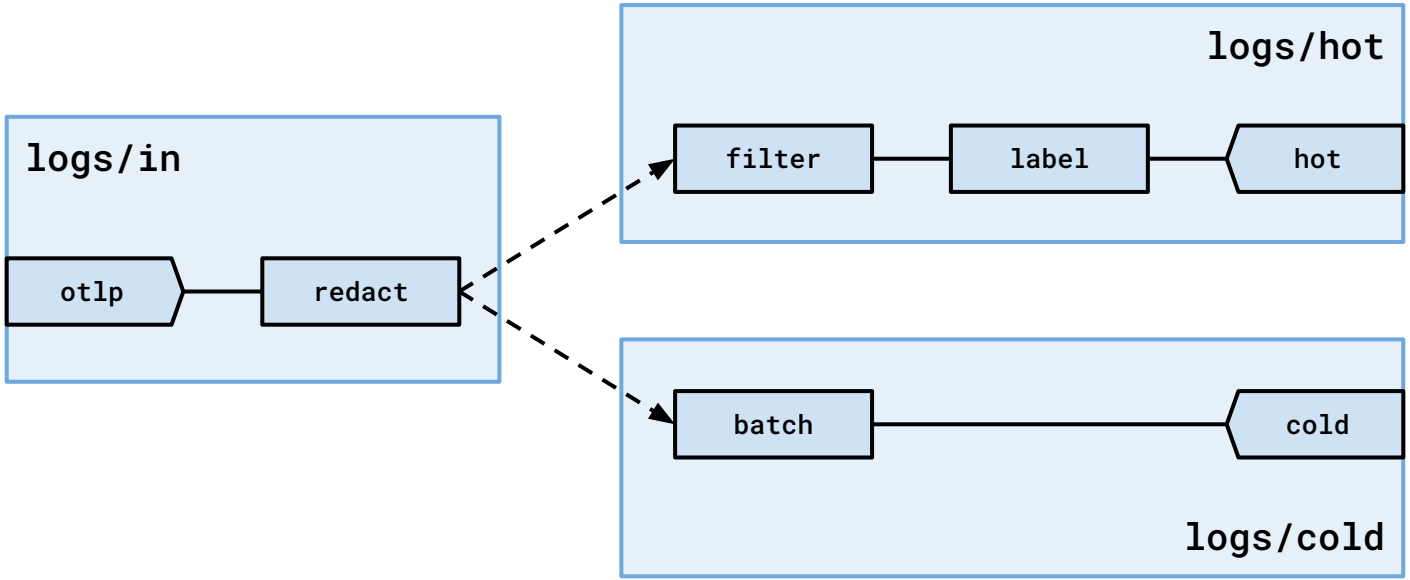
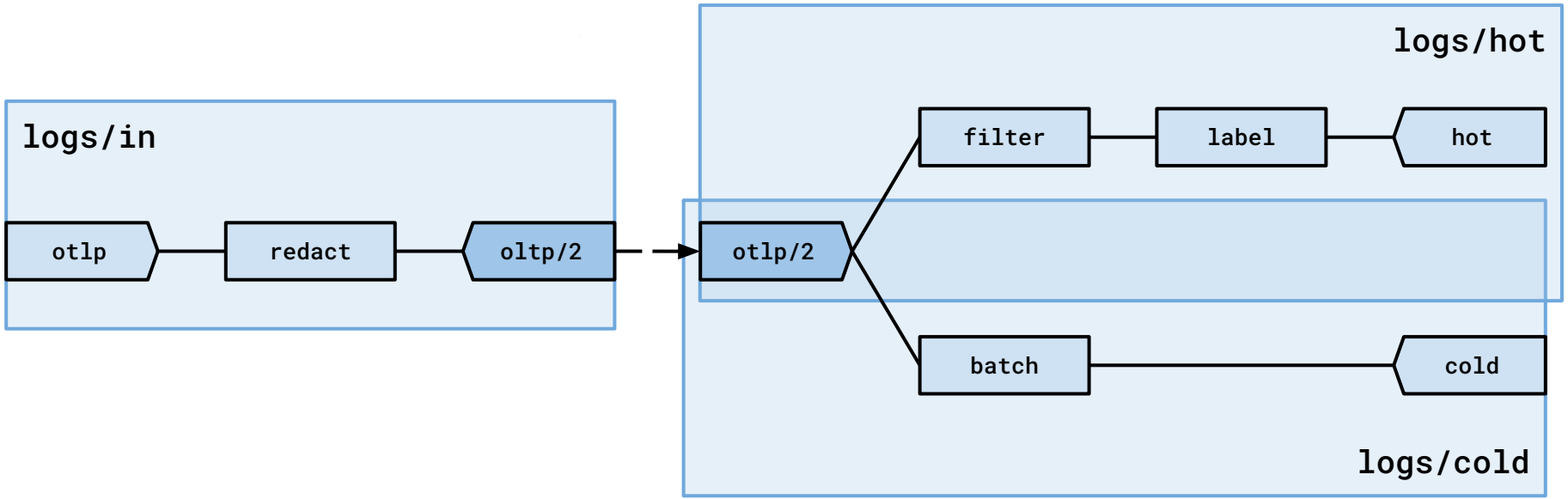
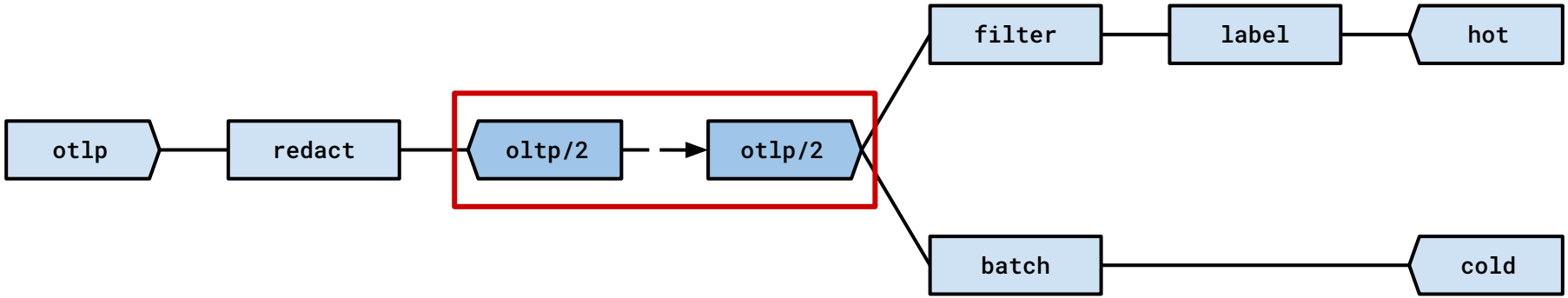


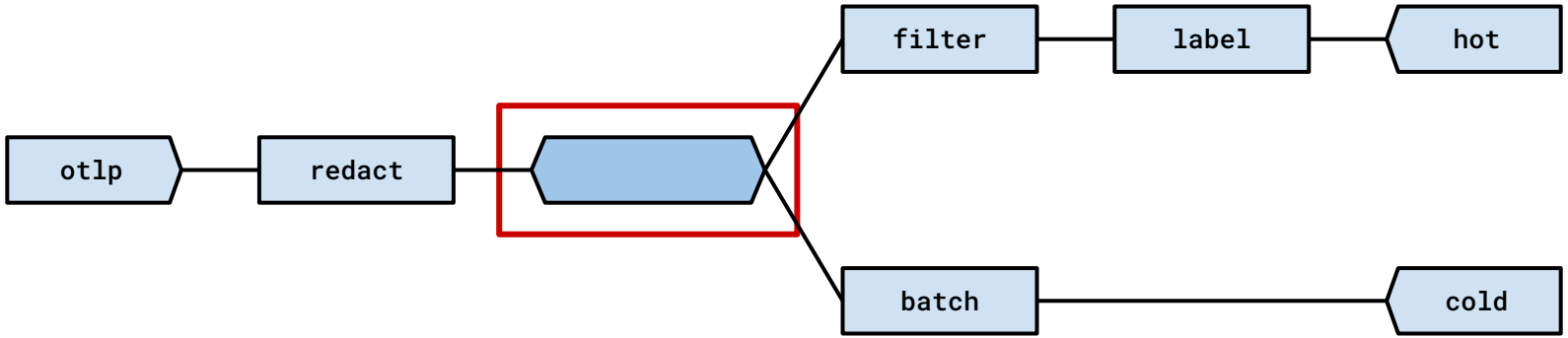
Sequential Pipelines



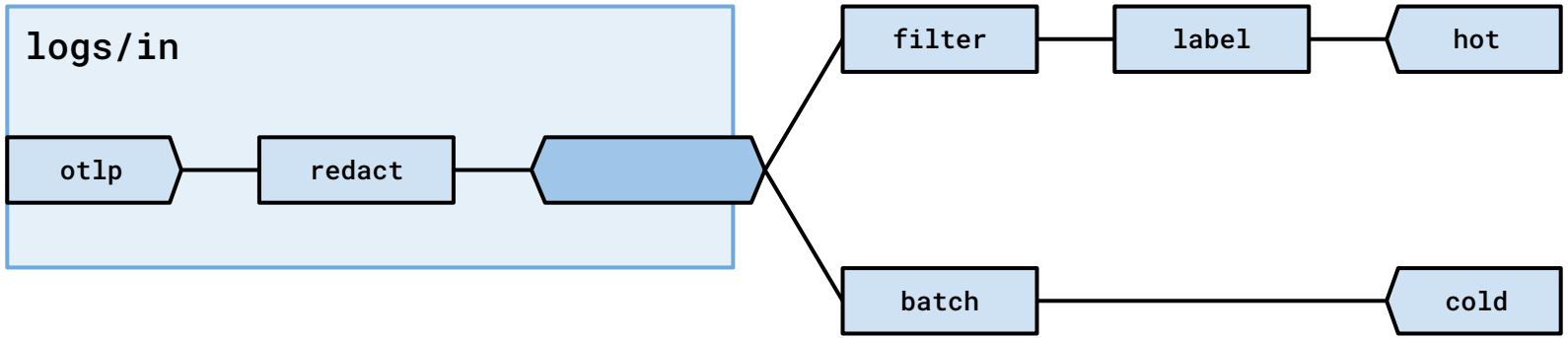
Sequential Pipelines



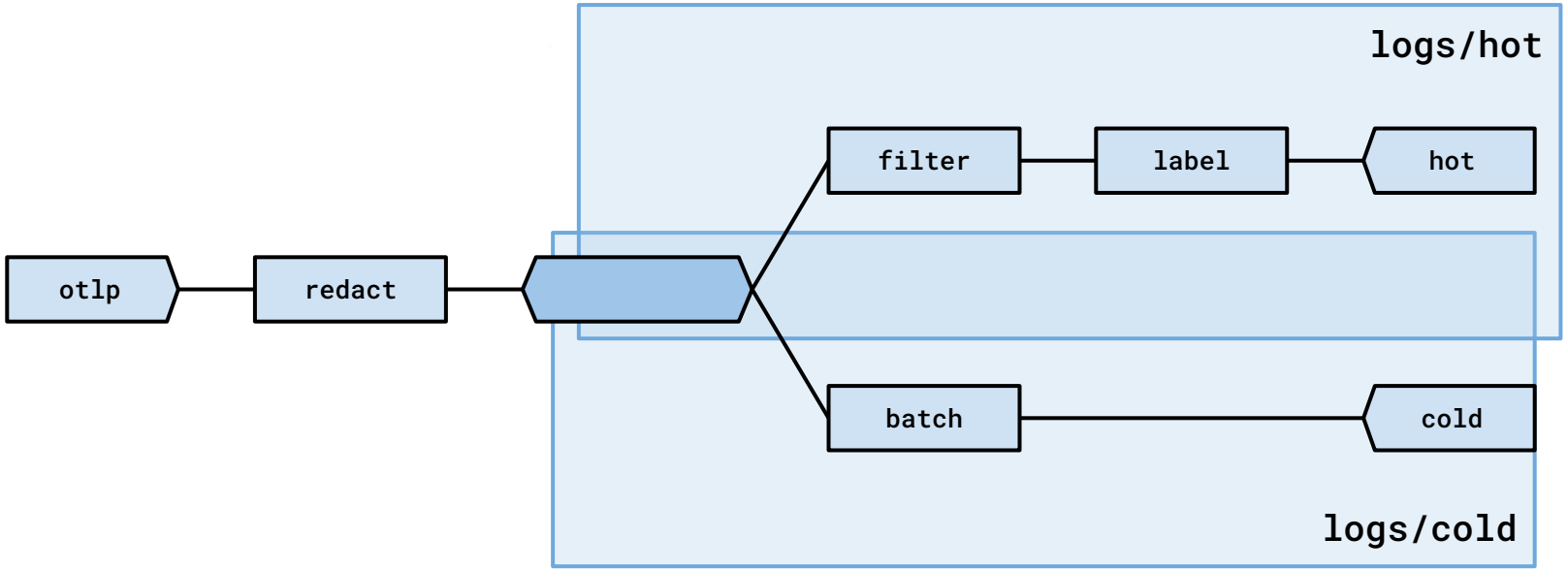
Connector



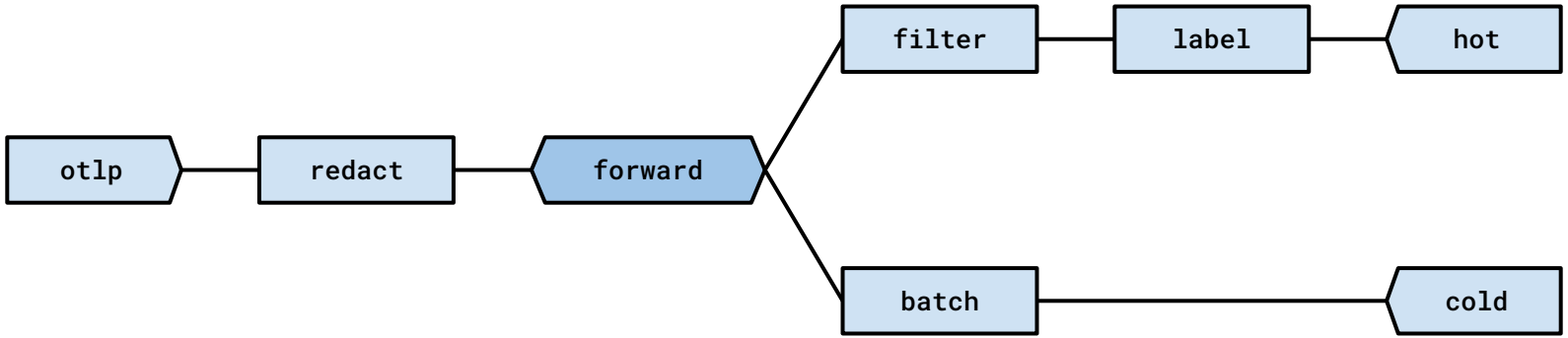
Connector



Connector



Forward Connector



Connector Configuration


```
receivers:
  otlp: ...

processors:
  batch: ...
  transform: ...
  filter: ...

exporters:
  hot: ...
  cold: ...

connectors:
  forward:
```

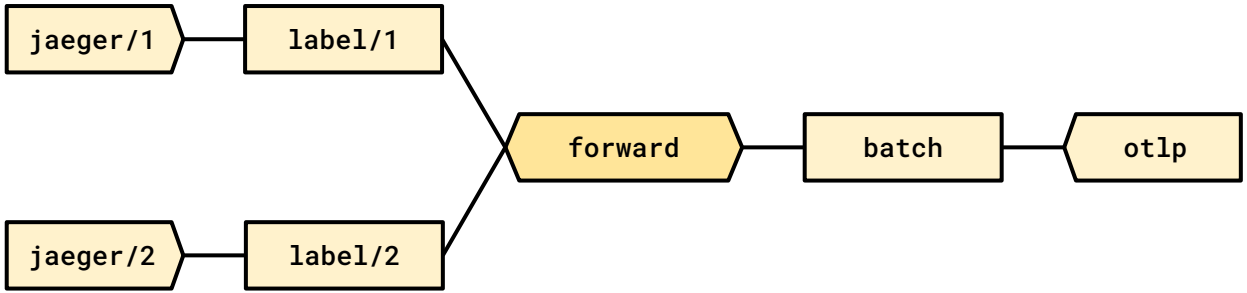
```
pipelines:

  logs/in:
    receivers: [otlp]
    processors: [redact]
    exporters: [forward]

  logs/hot:
    receivers: [forward]
    processors: [filter, label]
    exporters: [hot]

  logs/cold:
    receivers: [forward]
    processors: [batch]
    exporters: [cold]
```

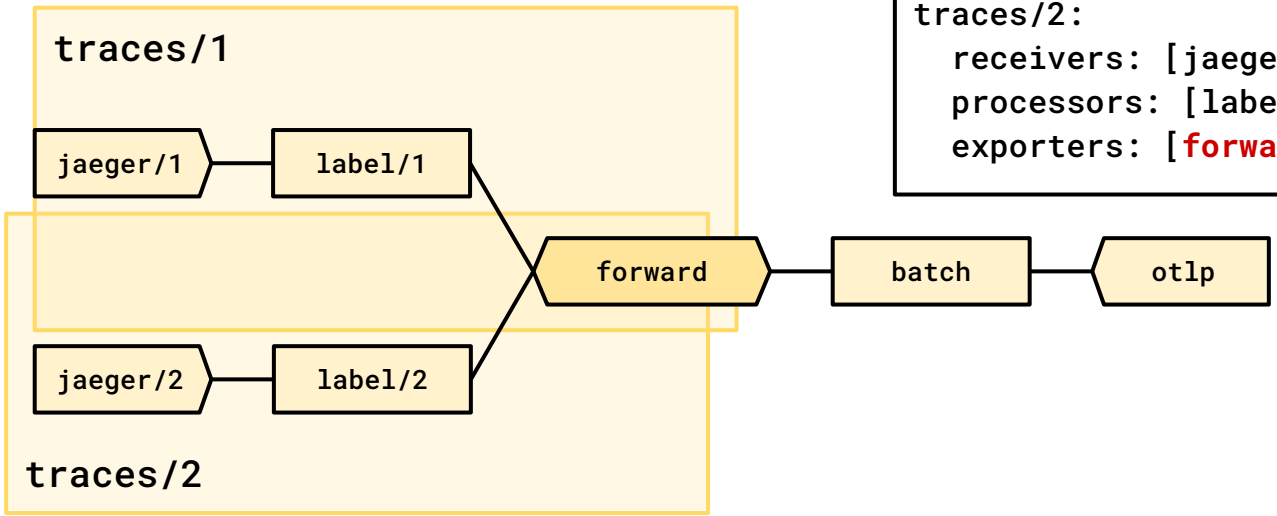
Forward Connector



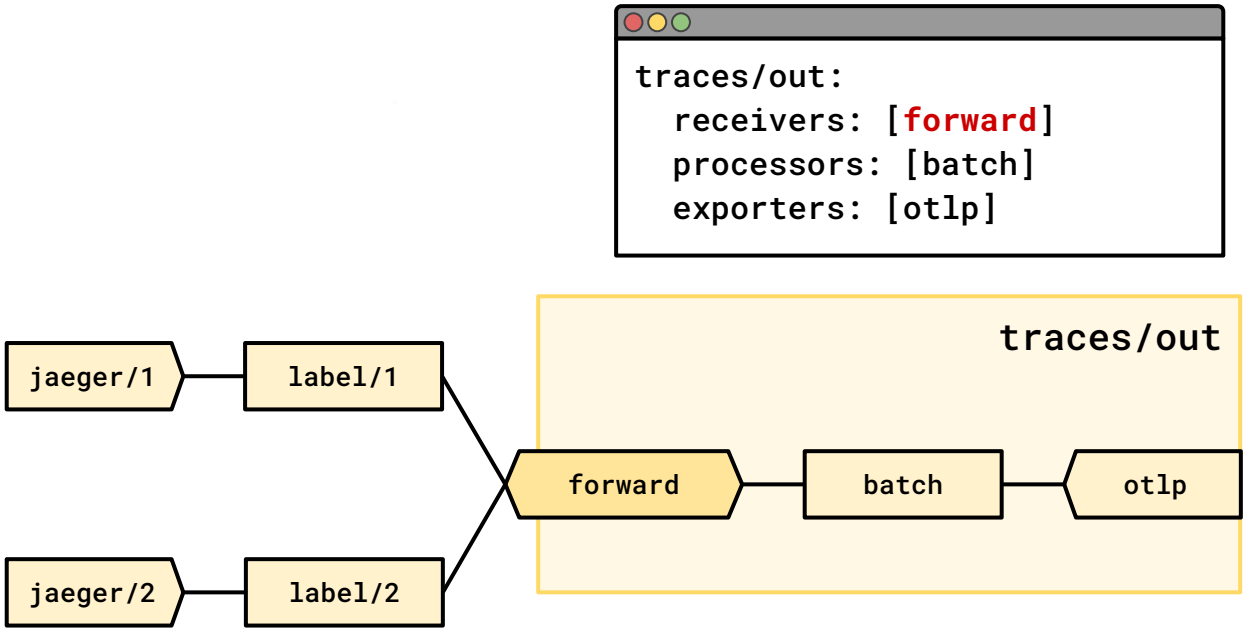
Forward Connector


```
traces/1:
  receivers: [jaeger/1]
  processors: [label/1]
  exporters: [forward]

traces/2:
  receivers: [jaeger/2]
  processors: [label/2]
  exporters: [forward]
```



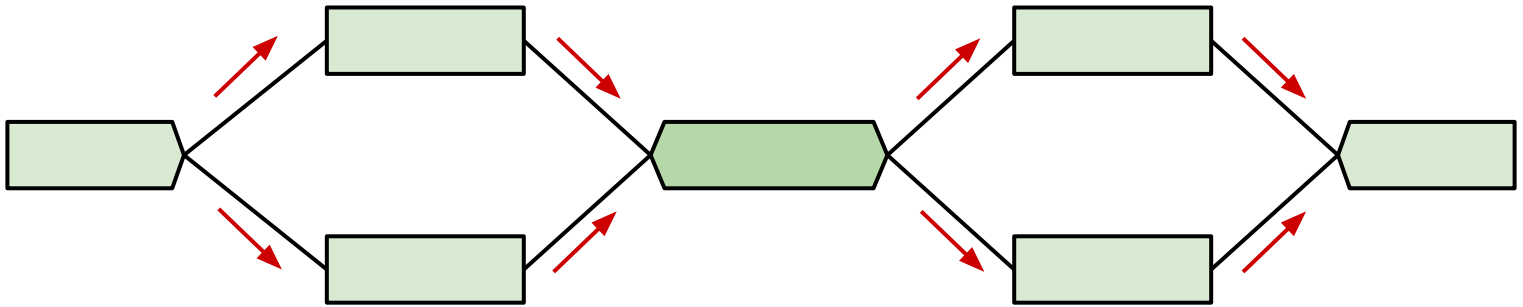
Forward Connector



Connector Capabilities

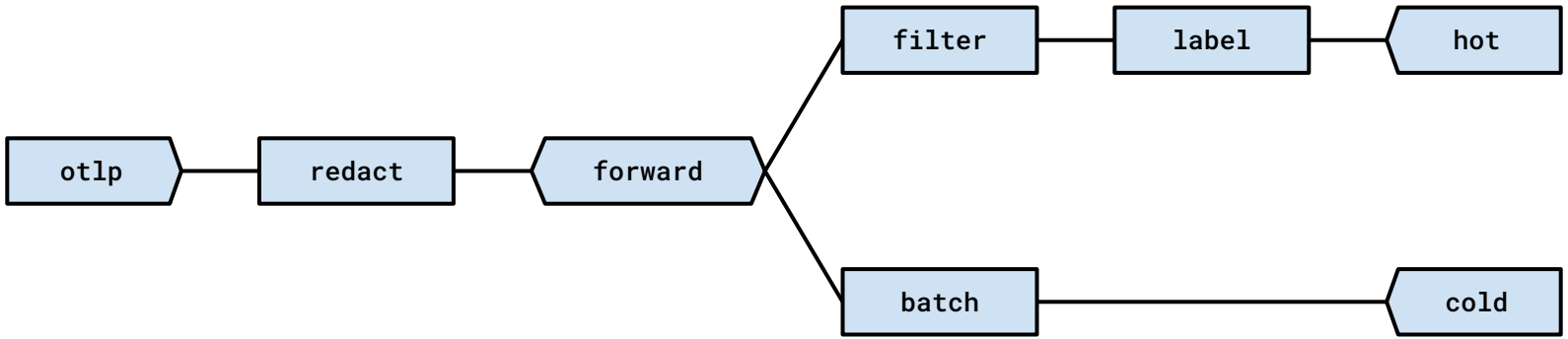
KubeCon CloudNativeCon Europe 2023

1. Sequential pipelines



Scenario 2

- Expensive analytics tool
- Must preserve all logs
- Must redact PII immediately
- Reduce duplication between hot/cold storage



Scenario 2

- Expensive analytics tool
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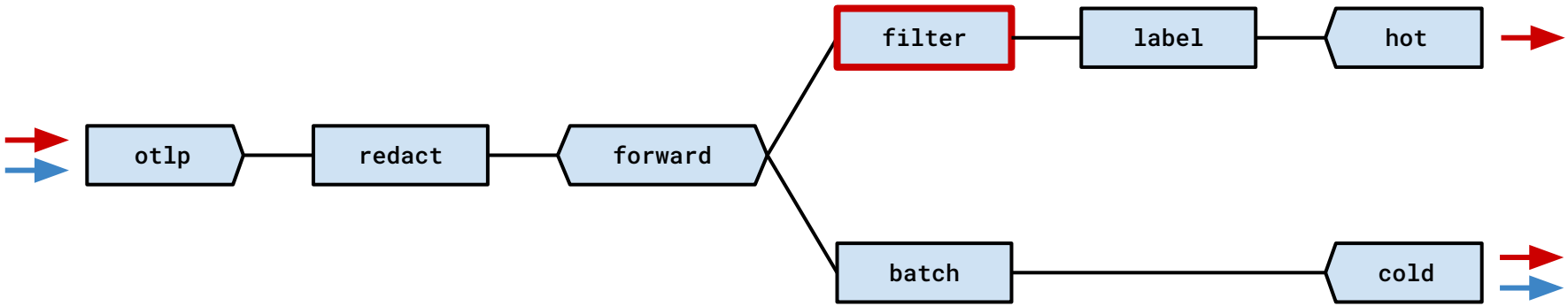
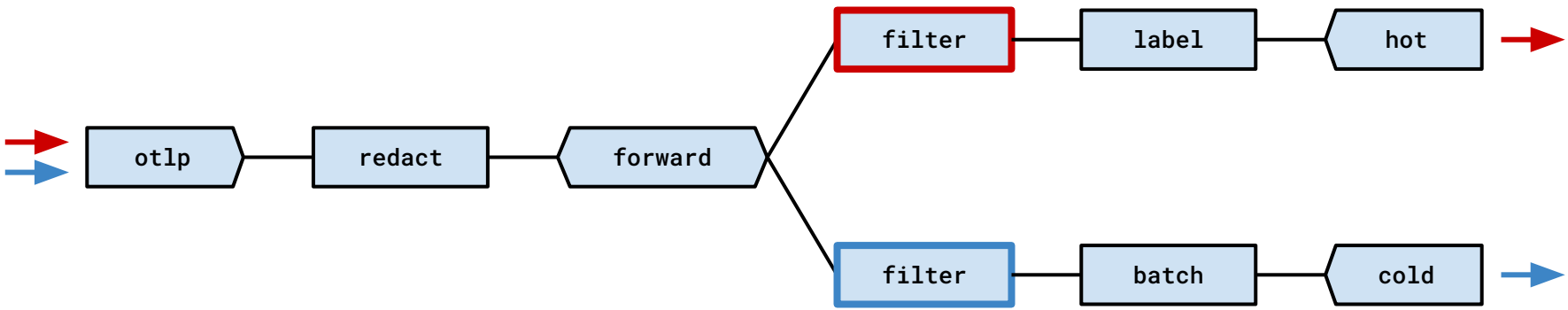
- Must redact PII immediately
- Reduce duplication between hot/cold storage

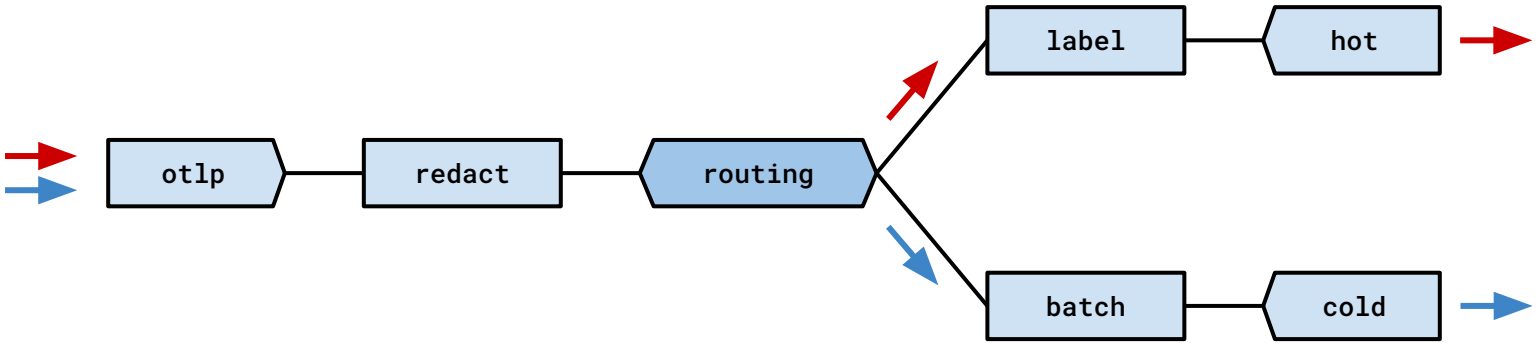


Scenario 2

- Expensive analytics tool
- Must preserve all logs
- Must redact PII immediately
- Reduce duplication between hot/cold storage

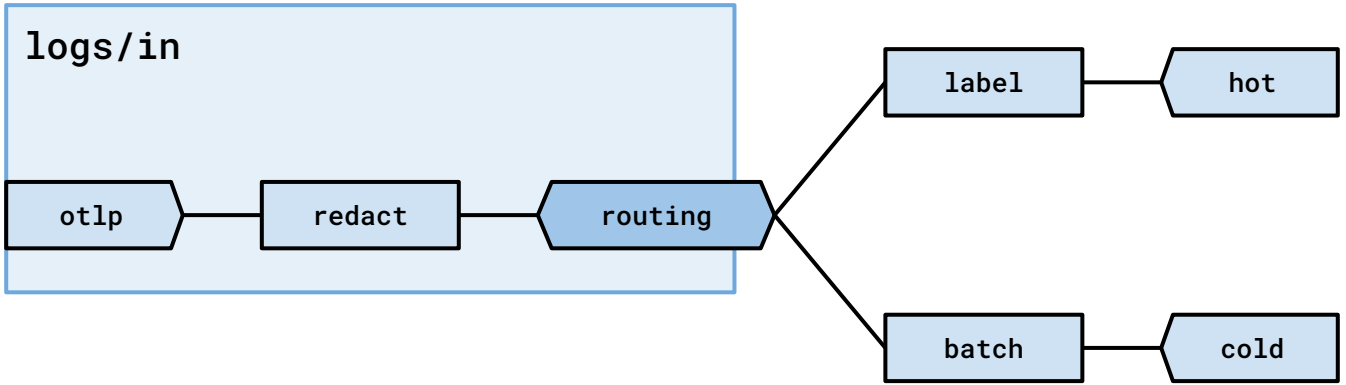


Routing Connector



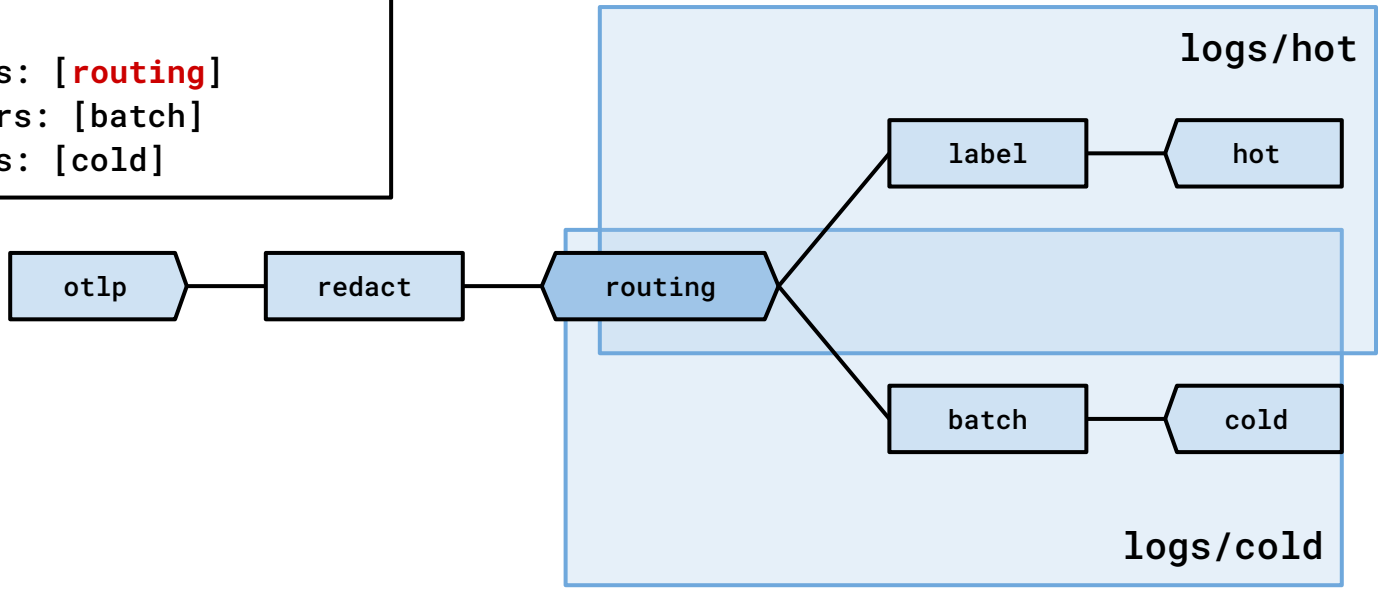
Routing Connector

```
logs/in:
  receivers: [otlp]
  processors: [redact]
  exporters: [routing]
```



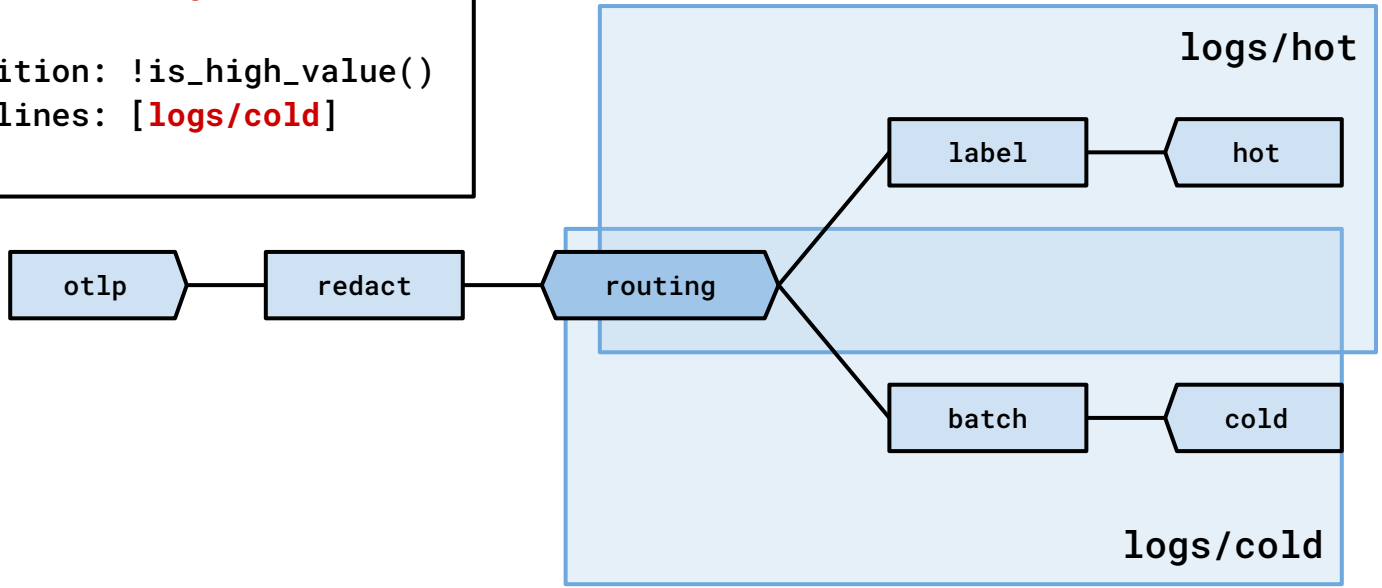
Routing Connector

```
logs/hot:
  receivers: [routing]
  processors: [label]
  exporters: [hot]

logs/cold:
  receivers: [routing]
  processors: [batch]
  exporters: [cold]
```



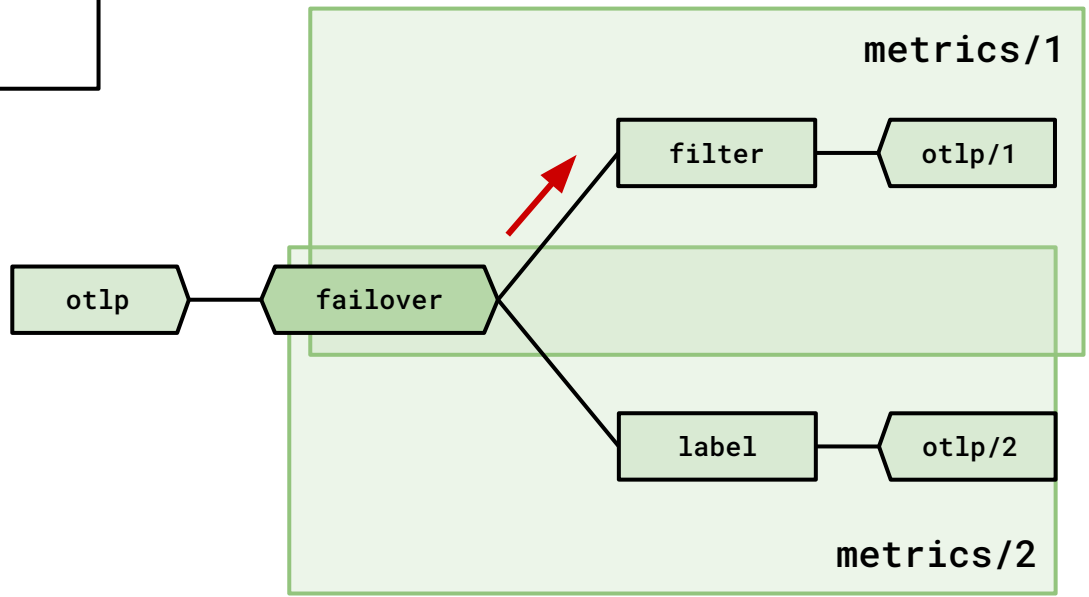
Routing Connector

```
connectors:
  routing:

    - condition: is_high_value()
      pipelines: [logs/hot]

    - condition: !is_high_value()
      pipelines: [logs/cold]
```



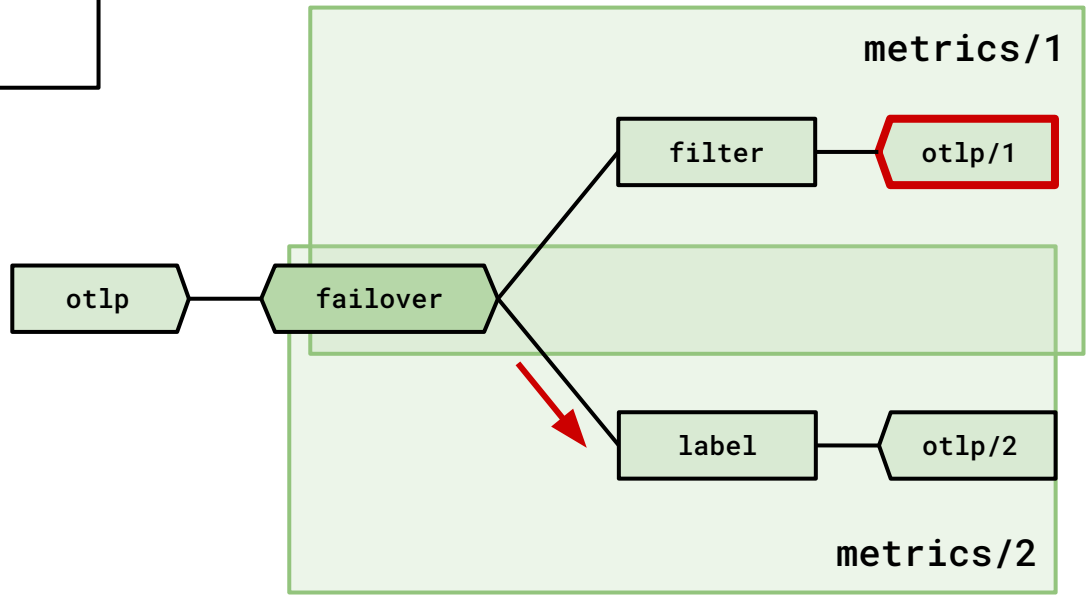
Failover Connector

```
connectors:
  failover:
    priority:
      - [metrics/1]
      - [metrics/2]
```



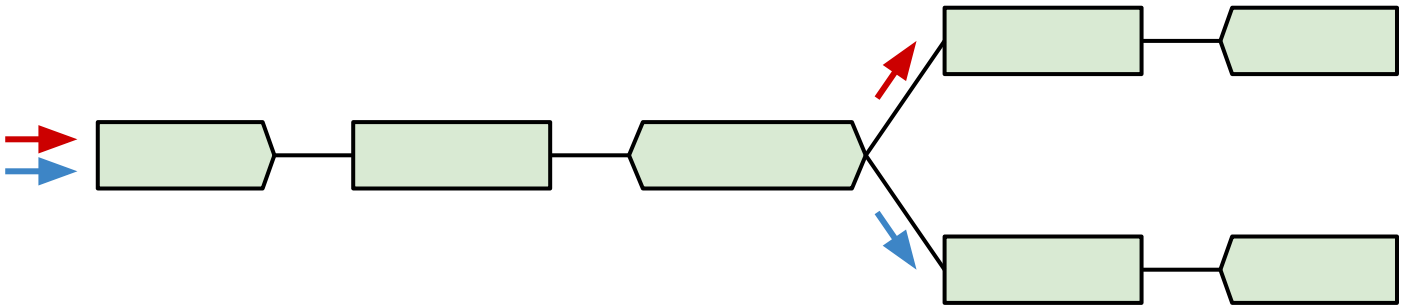
Failover Connector

```
connectors:
  failover:
    priority:
      - [metrics/1]
      - [metrics/2]
```



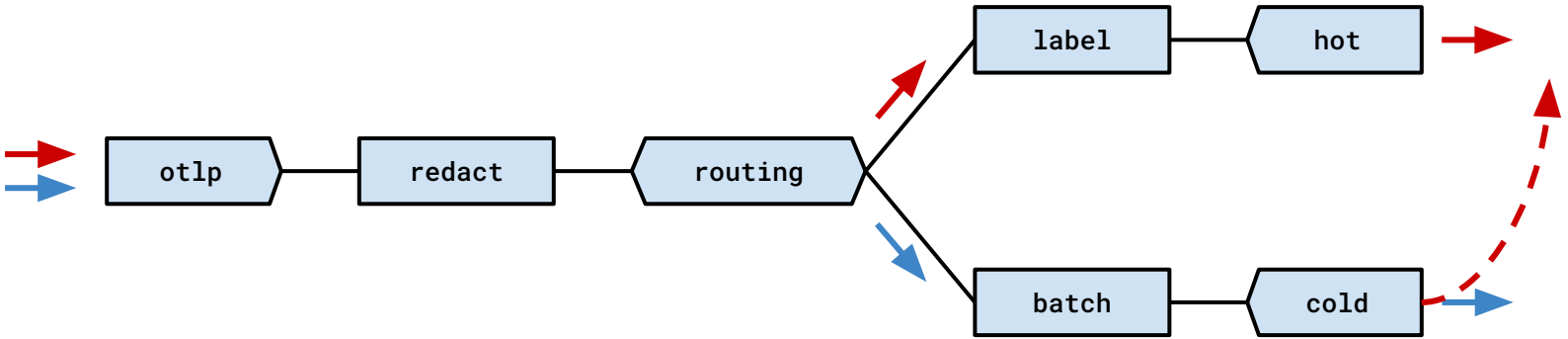
Connector Capabilities

1. Sequential pipelines
2. **Conditional data flow**

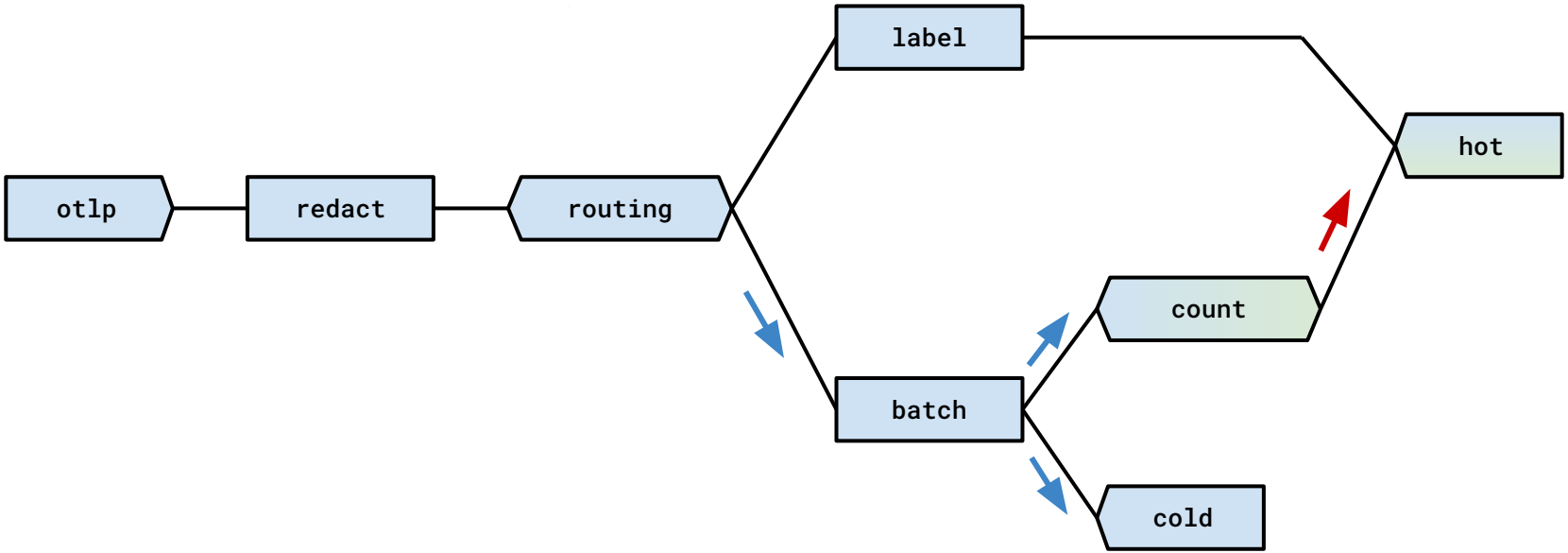


Scenario 3

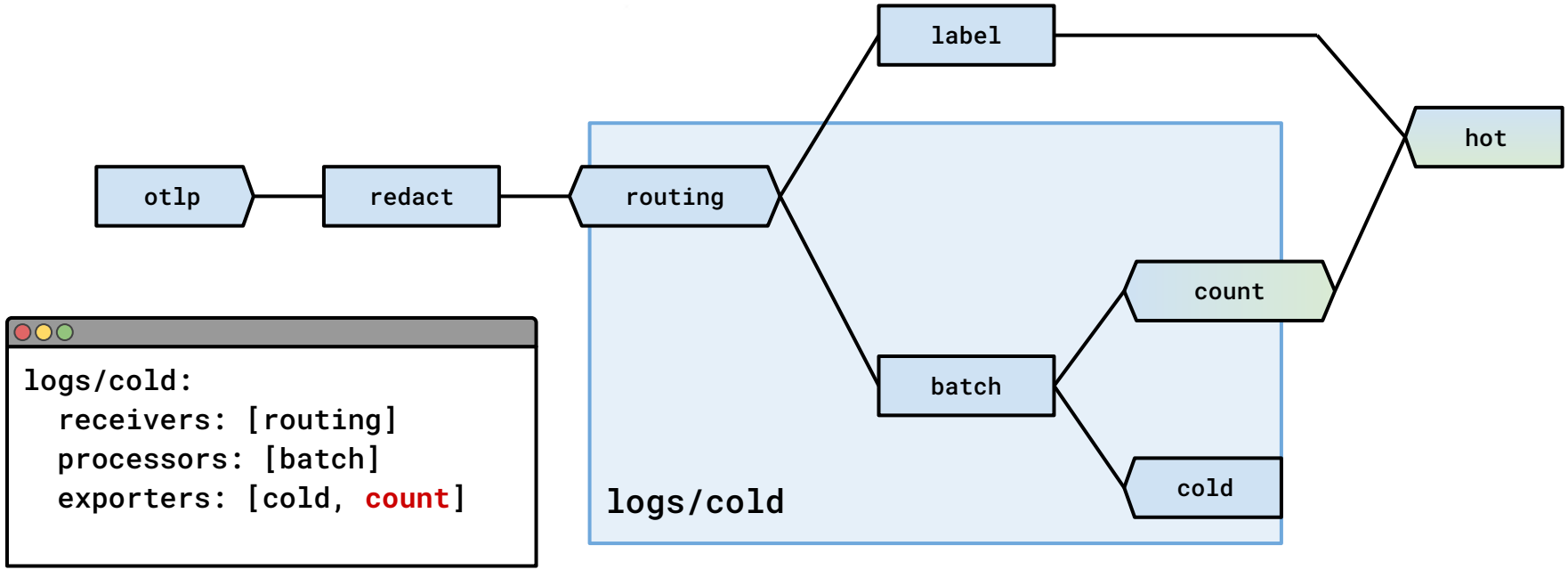
- Expensive analytics tool
- Must preserve all logs
- Must redact PII immediately
- Reduce duplication between hot/cold storage
- Characterize archived logs



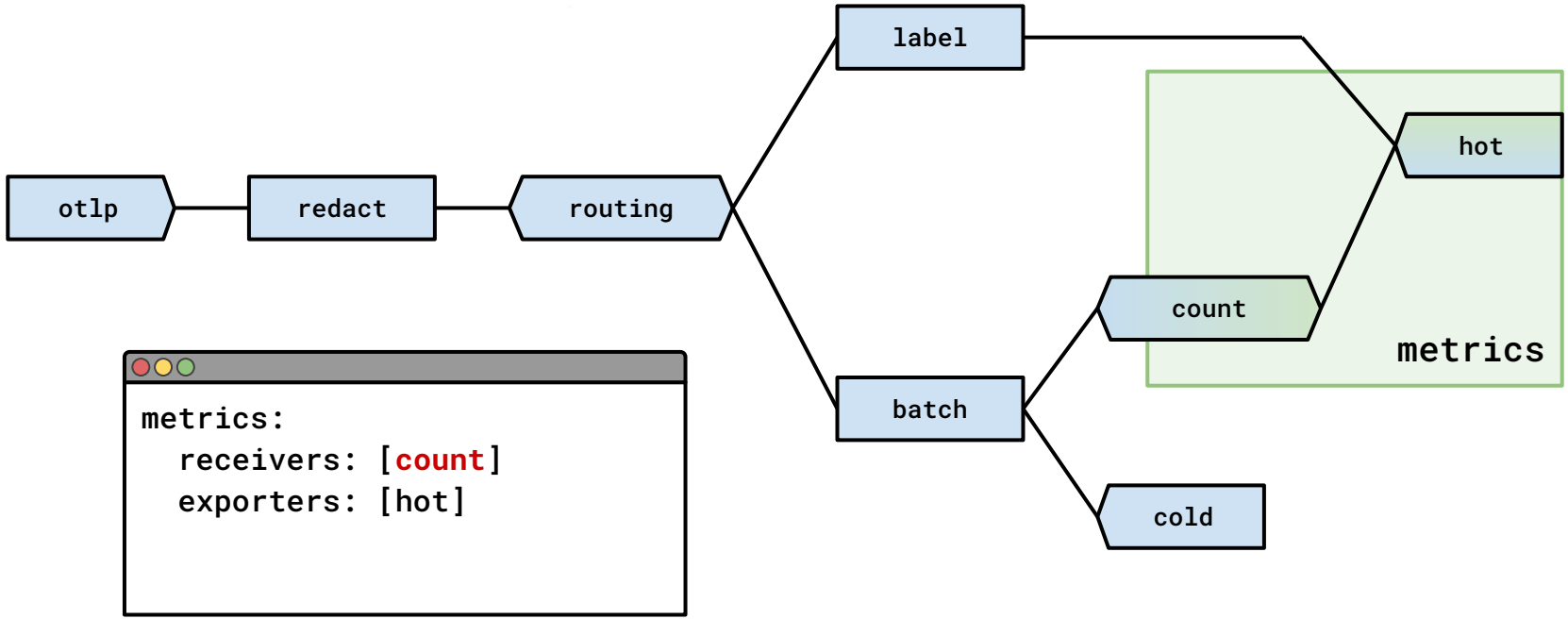
Count Connector



Count Connector



Count Connector



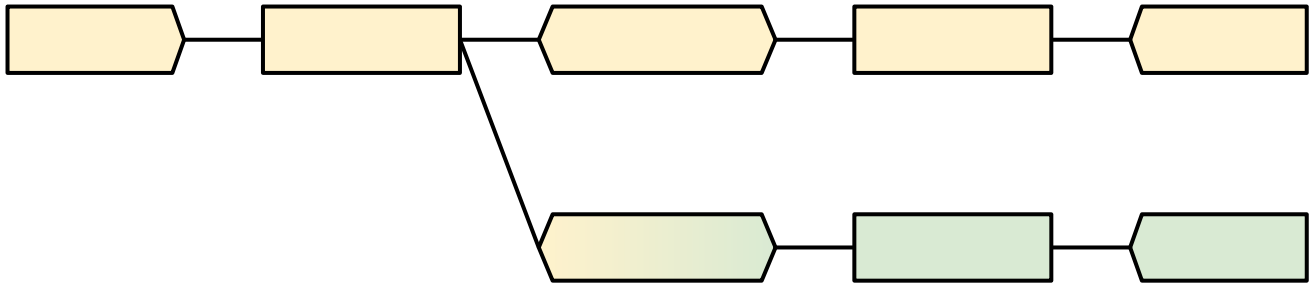
Data Type Support

forward		receiver		
		logs	metrics	traces
exporter	logs	✔		
	metrics		✔	
	traces			✔

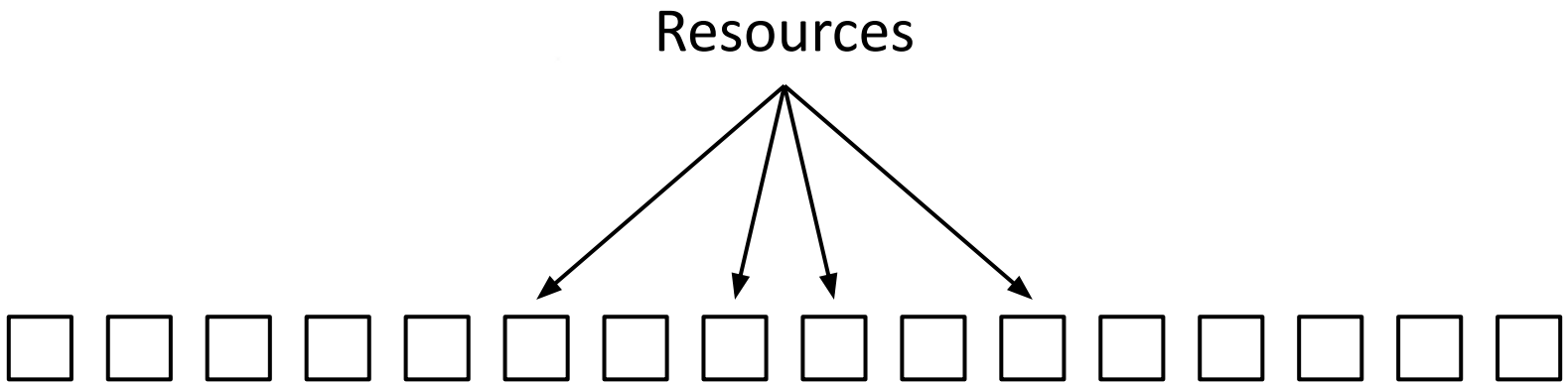
count		receiver		
		logs	metrics	traces
exporter	logs		✔	
	metrics		✔	
	traces		✔	

Connector Capabilities

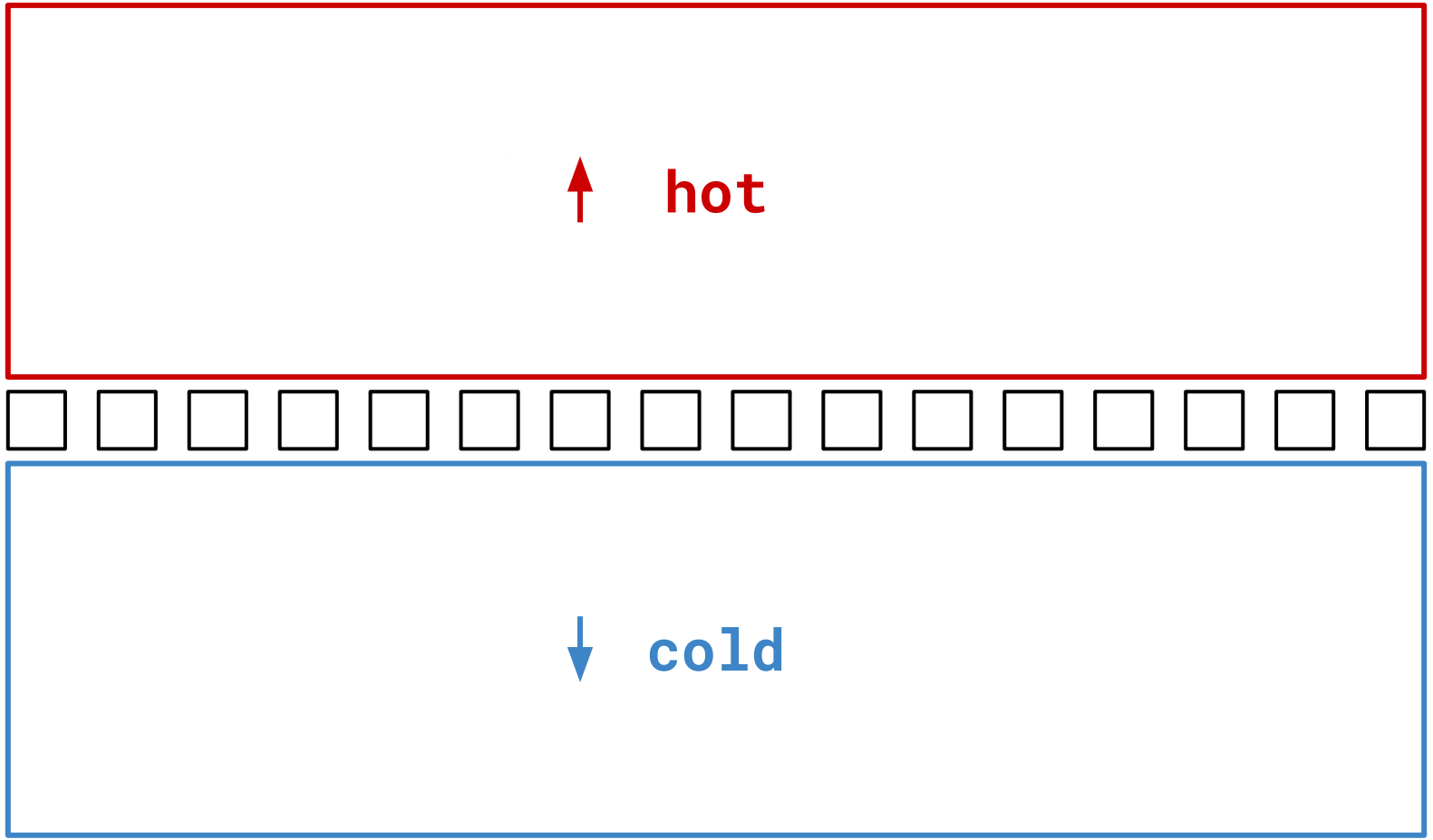
1. Sequential pipelines
2. Conditional data flow
3. **Generated data streams**



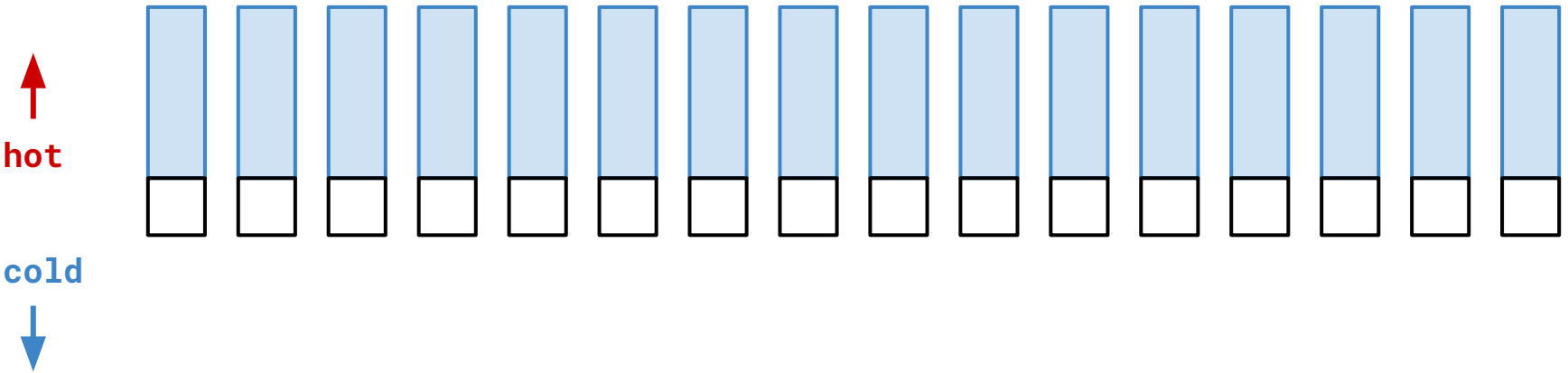
Scenarios 1-3



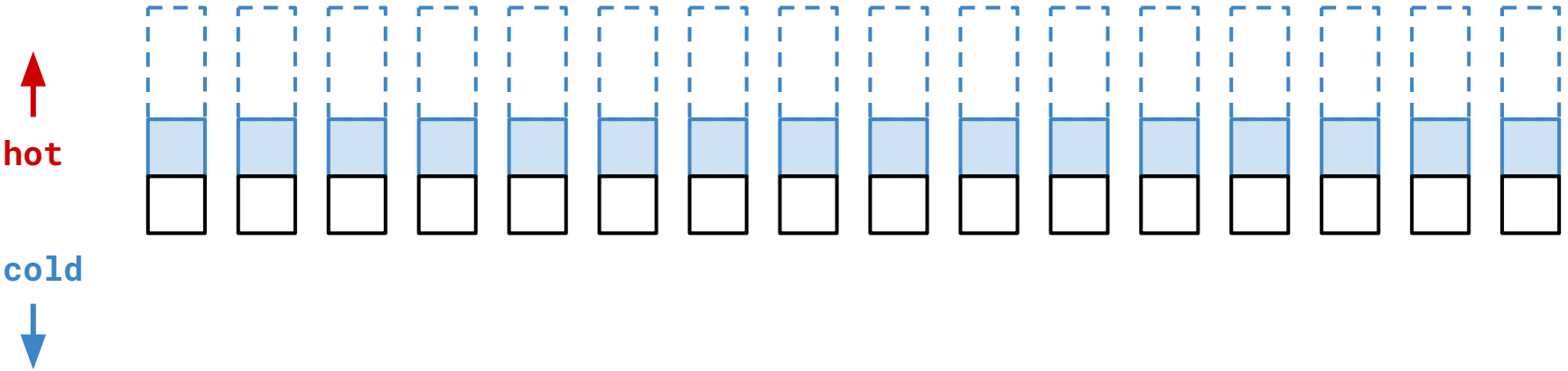
Scenarios 1-3



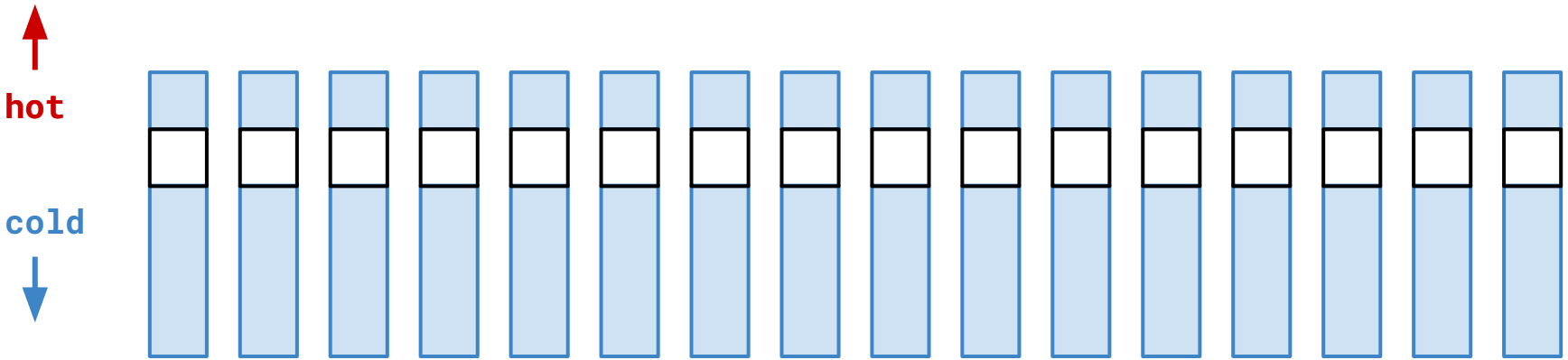
Scenarios 1-3



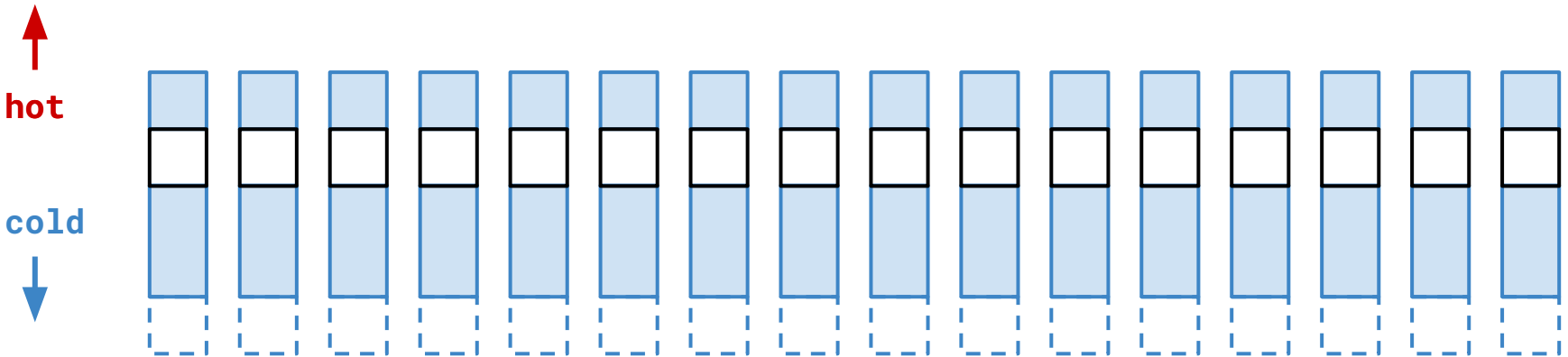
Scenarios 1-3



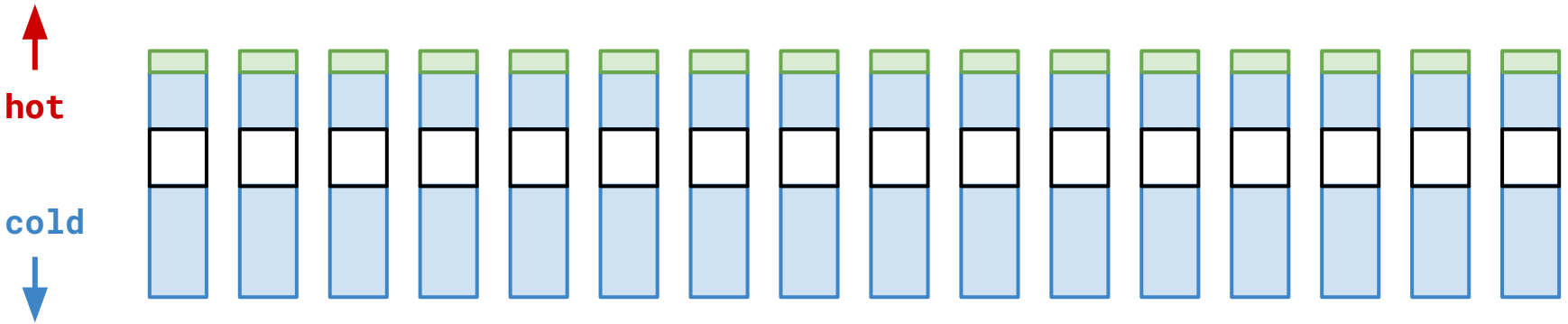
Scenarios 1-3



Scenarios 1-3



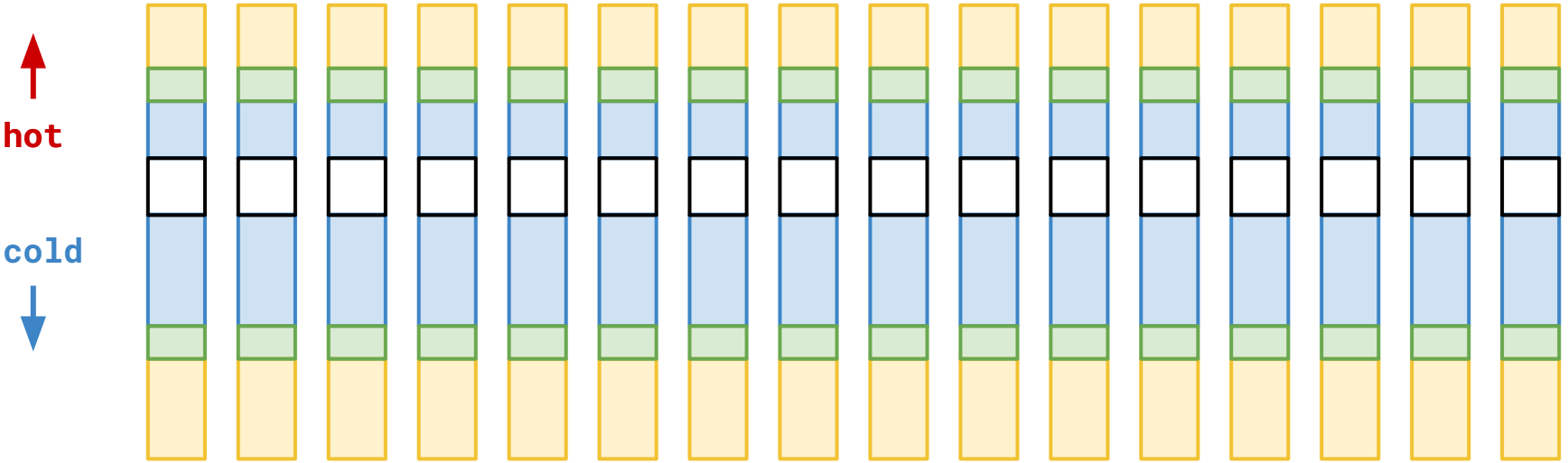
Scenarios 1-3



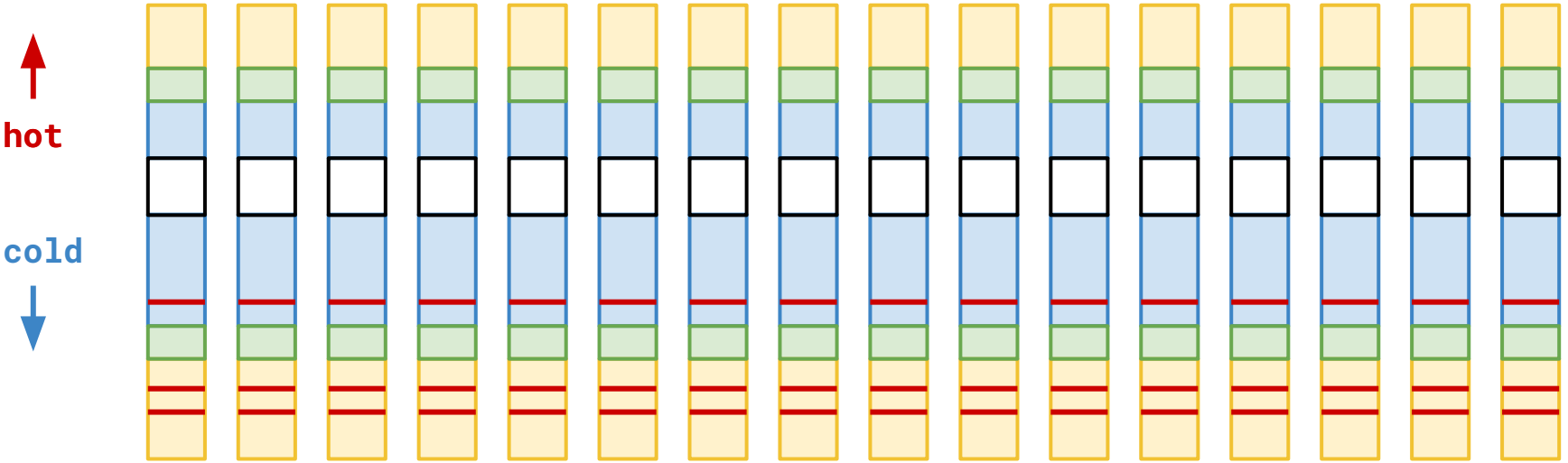
Scenario 4

- Expensive analytics tool
- Must preserve all logs
- Must redact PII immediately
- Reduce duplication between hot/cold storage
- Characterize archived logs
- All of the above for metrics and traces

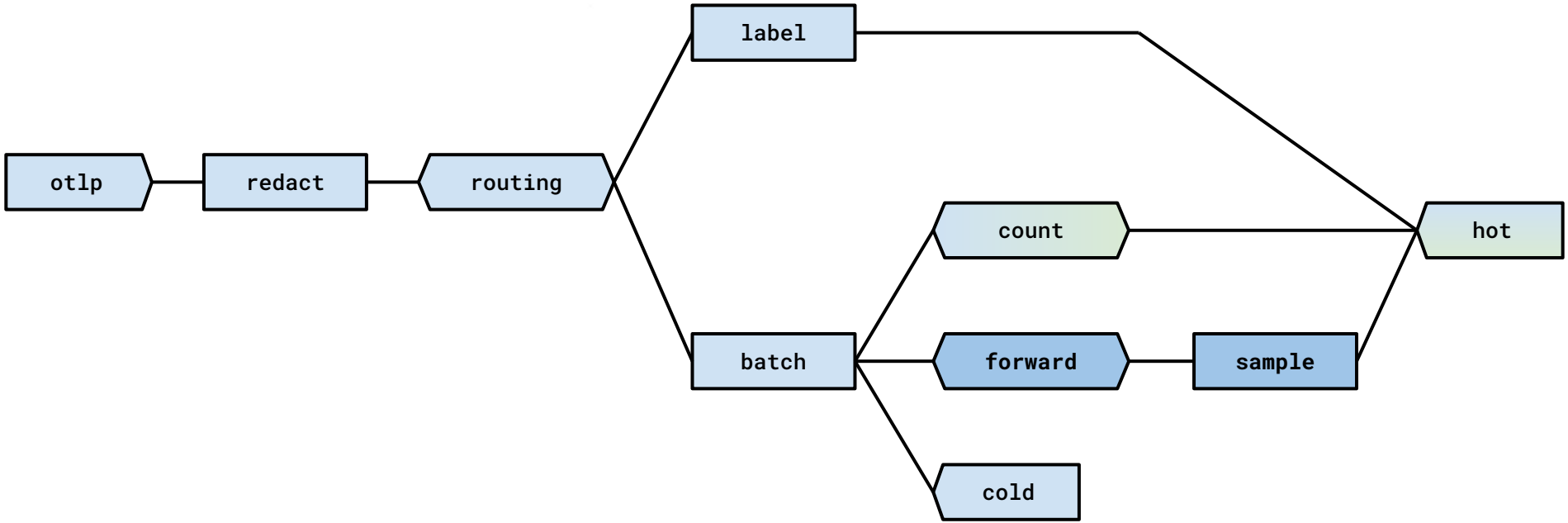
Scenario 4



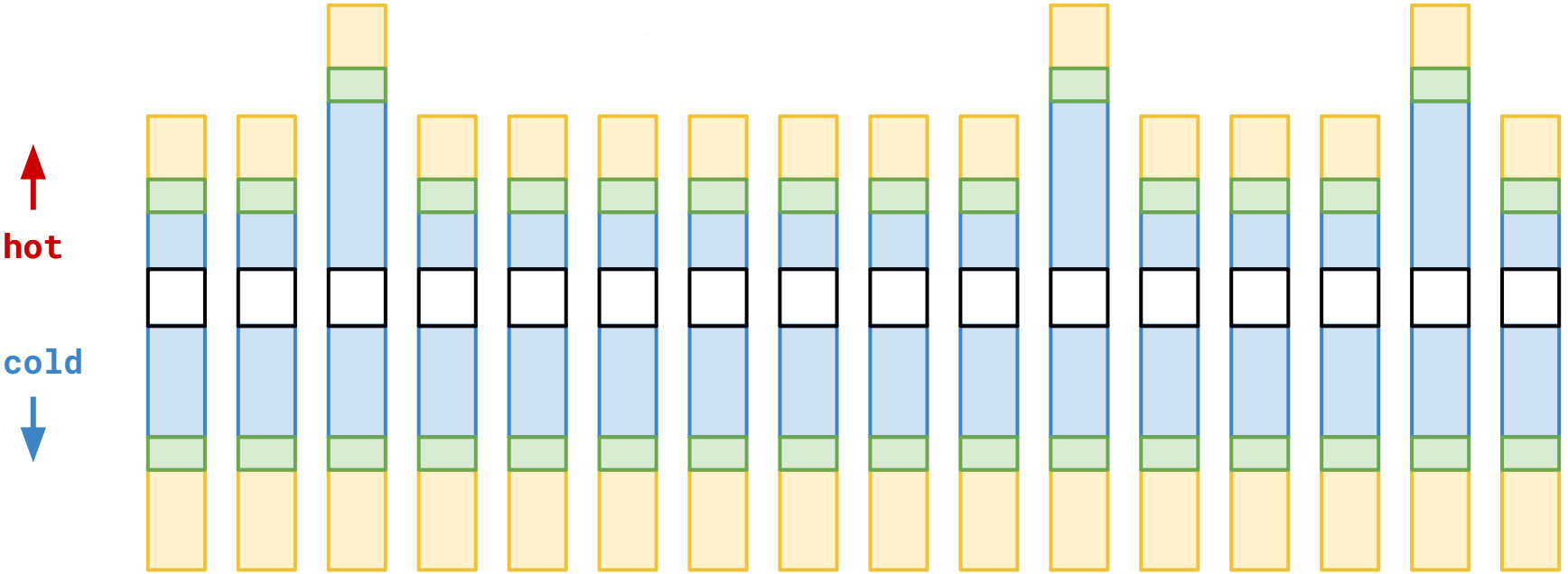
Scenario 4



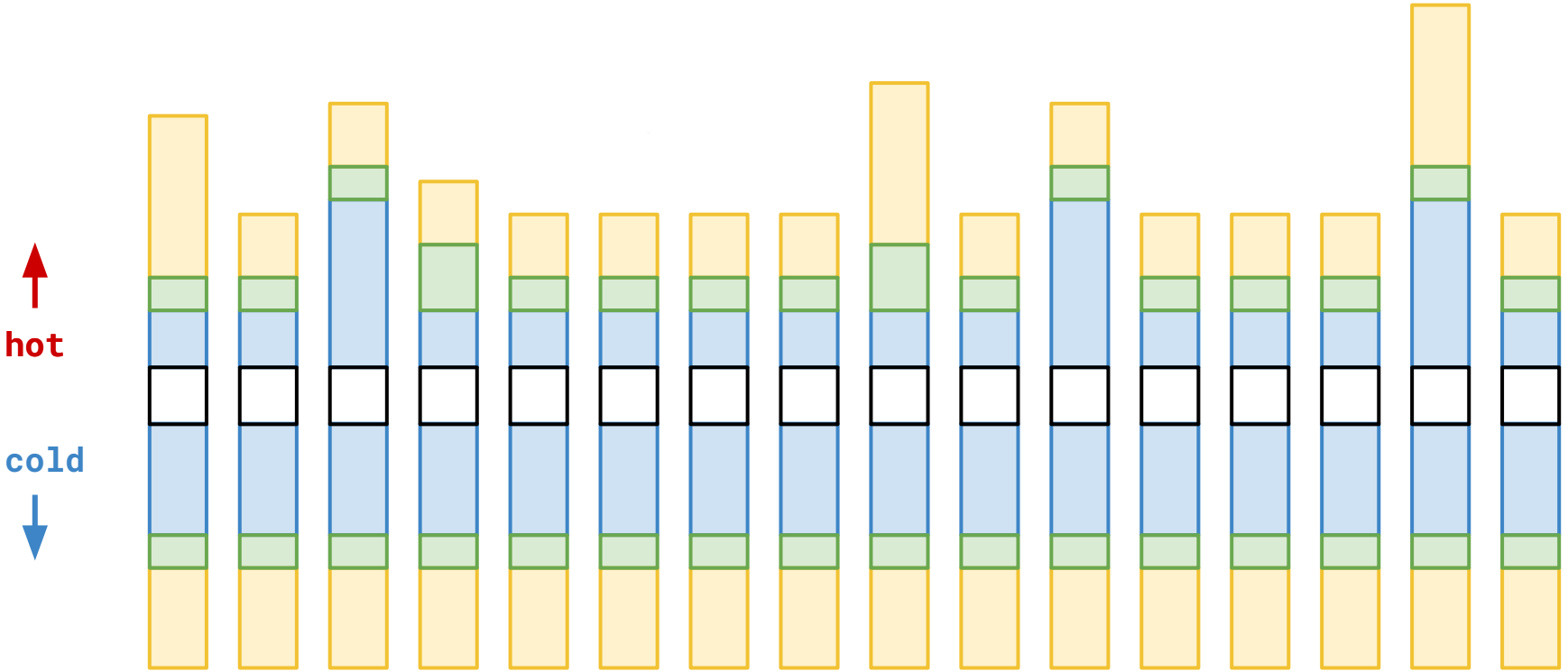
Scenario 4


label
otlp
redact
routing
count
hot
batch
forward
sample
cold

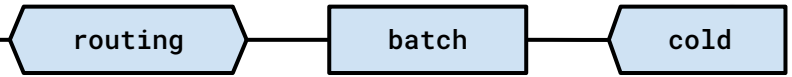
Scenario 4



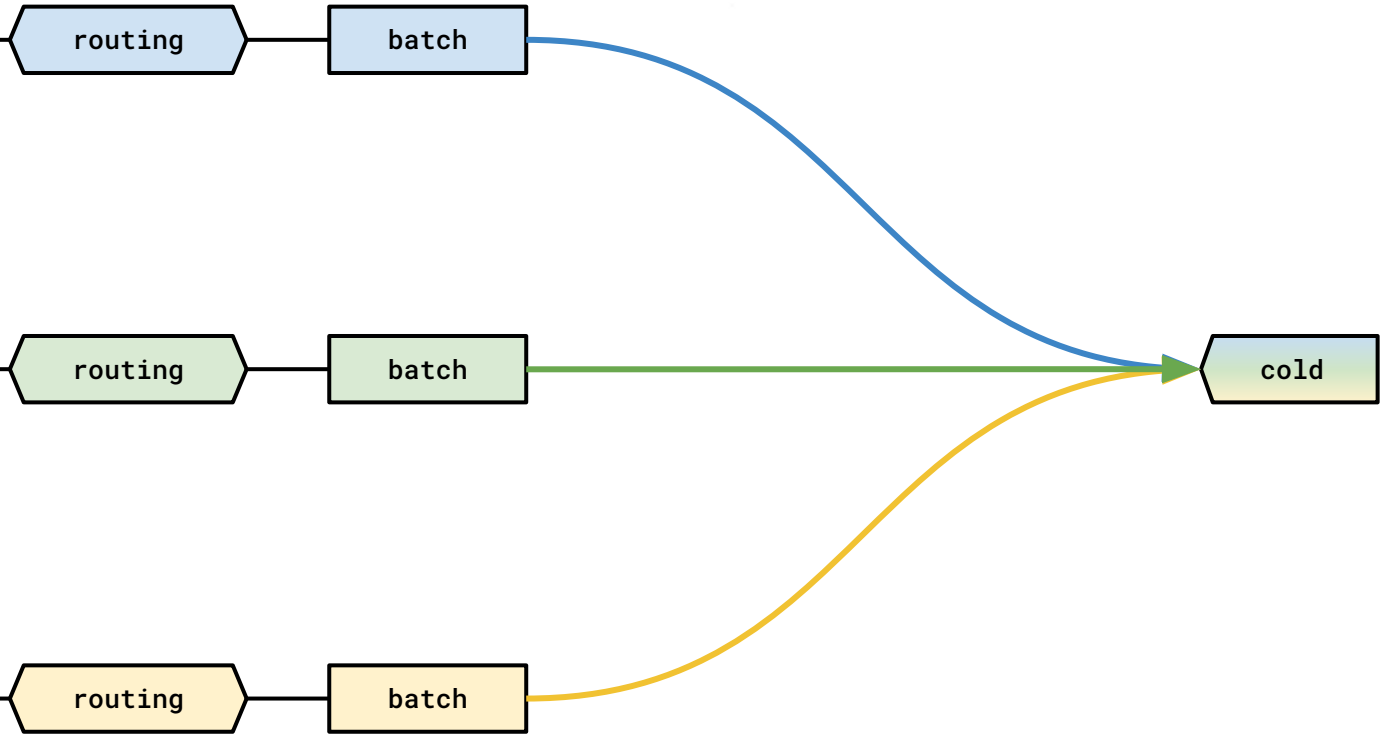
Scenario 4



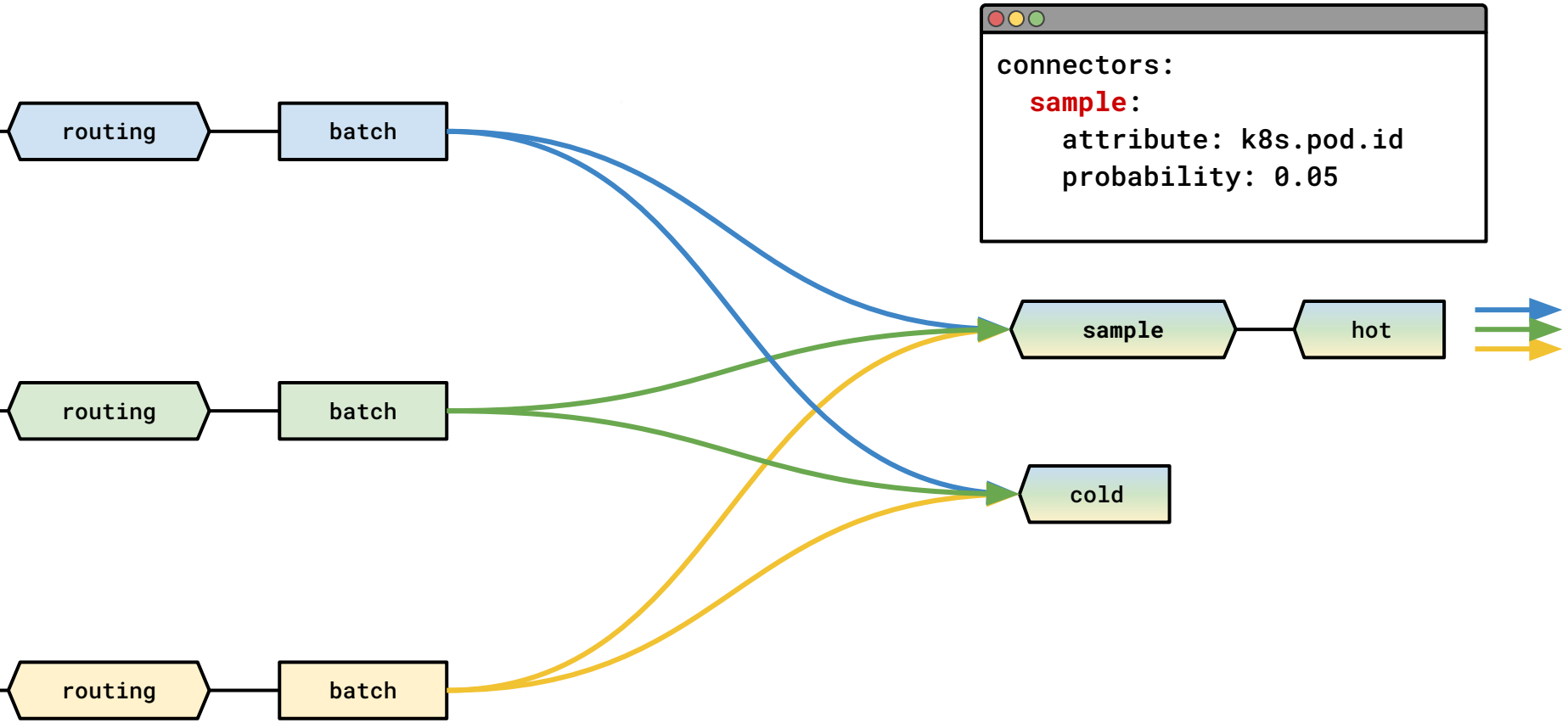
Resource Sampling Connector



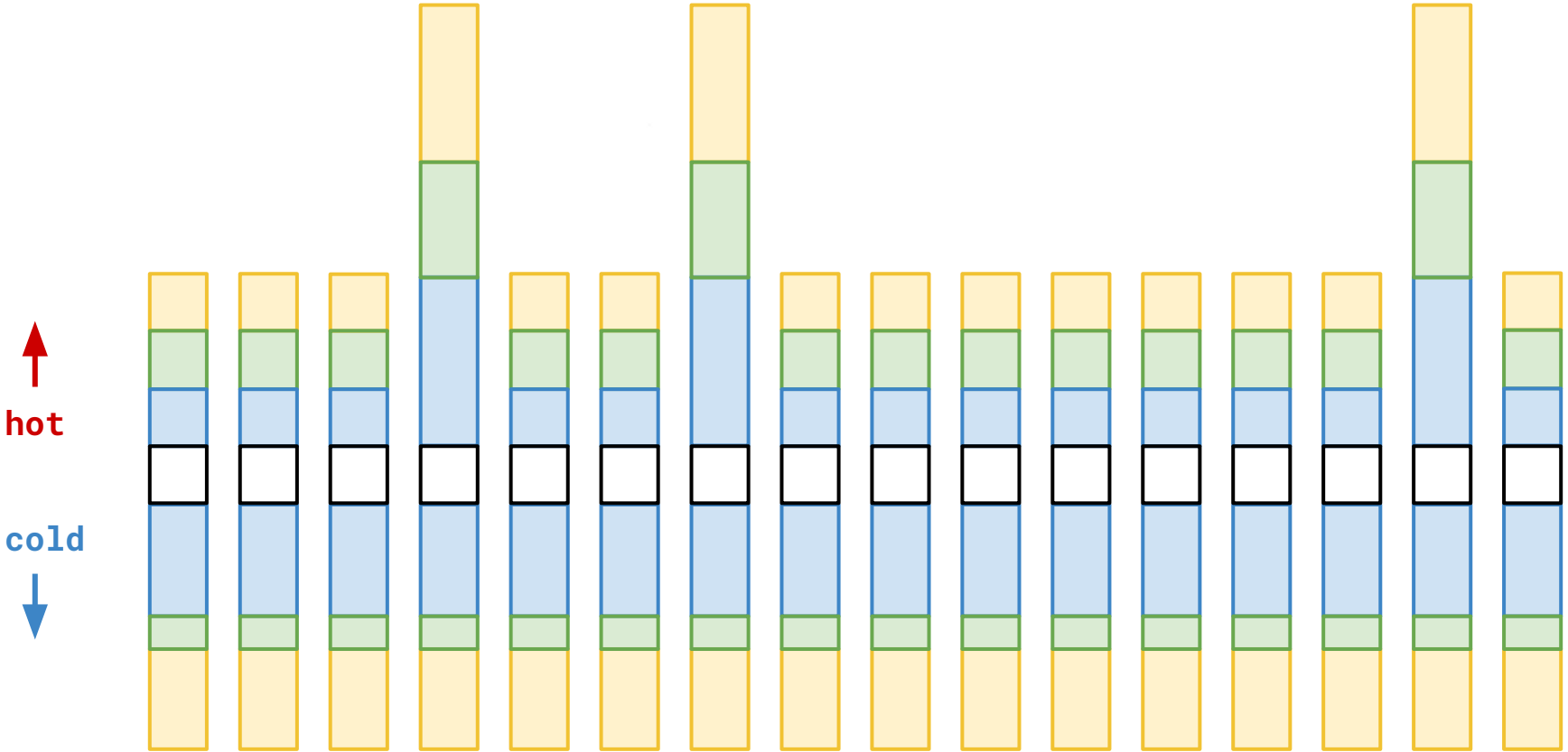
Resource Sampling Connector



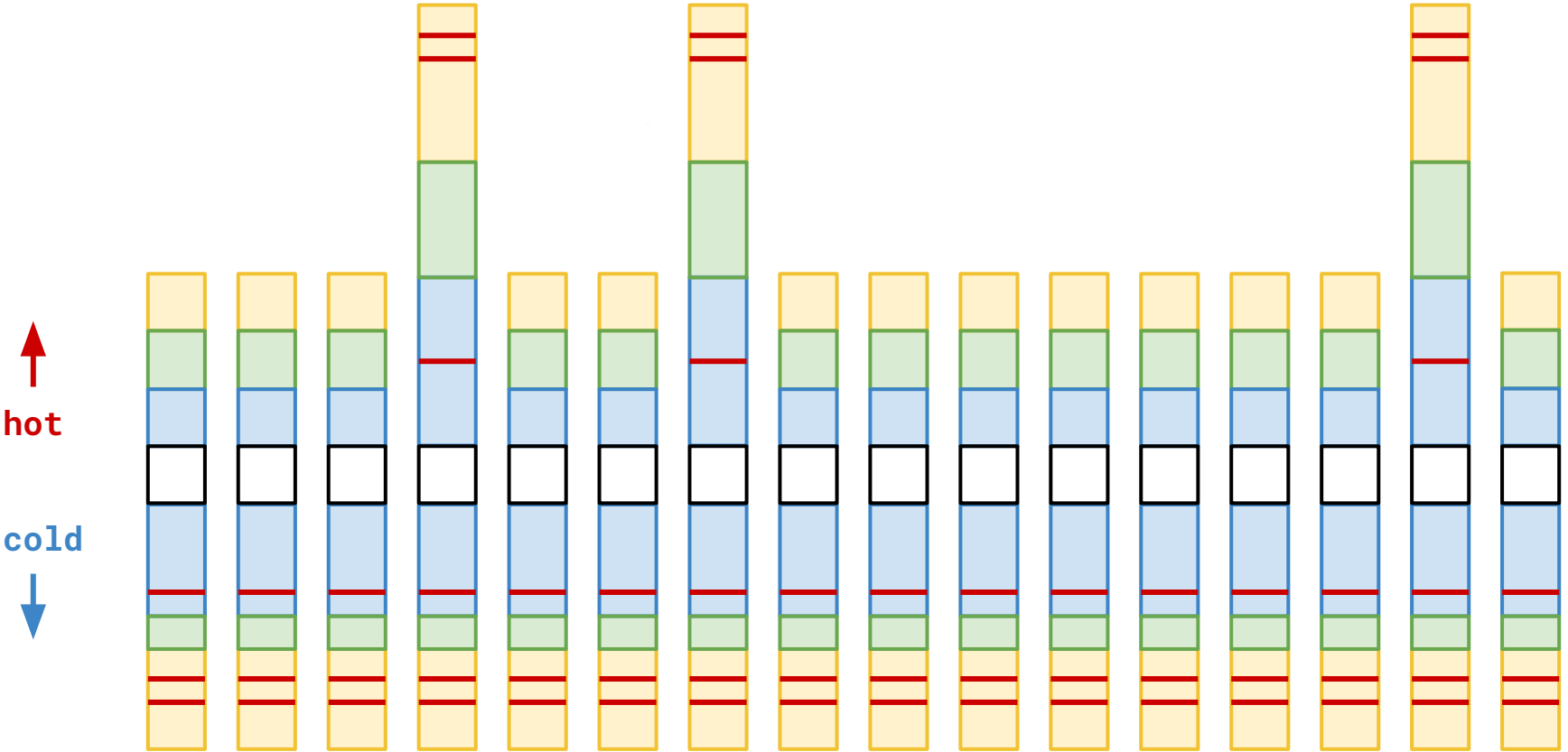
Resource Sampling Connector



Scenario 4

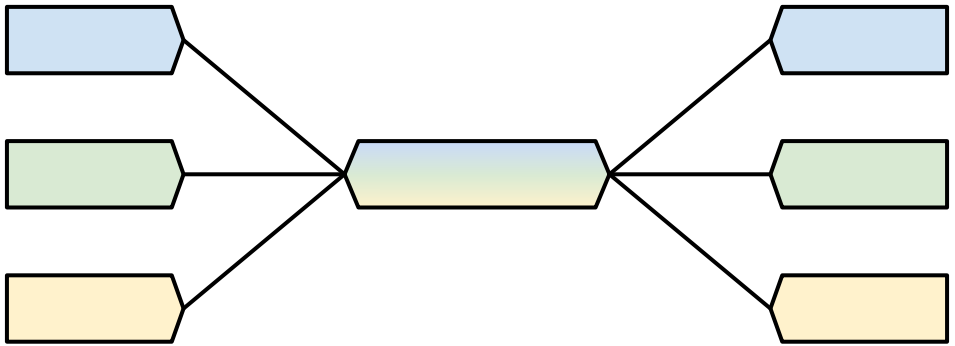


Scenario 4



Connector Capabilities

1. Sequential pipelines
2. Conditional data flow
3. Generated data streams
4. **Correlated processing**



Pipelines Mechanics

Requirements

Receiver 

Exporter 

Data Type 

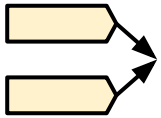
Shared Components

Receivers MAY be shared

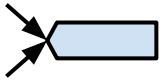
Processors are NOT shared

Exporters MAY be shared

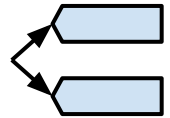
Merge

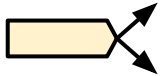


After multiple receivers

Before shared exporter 

Replicate

Before multiple exporters 



After shared receiver

Pipelines Mechanics

Requirements

Receiver 

Exporter 

Data Type 

Shared Components

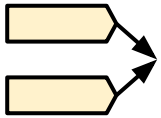
Receivers MAY be shared

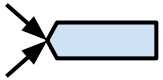
Processors are NOT shared

Exporters MAY be shared

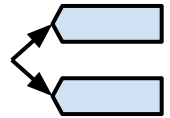
Connectors MUST be shared

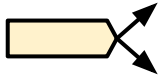
Merge

 After multiple receivers

Before shared exporter 

Replicate

Before multiple exporters 

 After shared receiver

Pipelines Mechanics

Requirements

Receiver 

Exporter 

Data Type 

Shared Components

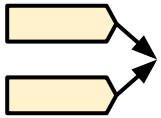
Receivers MAY be shared

Processors are NOT shared

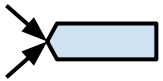
Exporters MAY be shared

Connectors MUST be shared

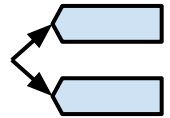
Merge

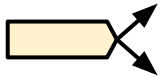


After multiple **receivers**

Before shared **exporter** 

Replicate

Before multiple **exporters** 



After shared **receiver**

Connector Capabilities

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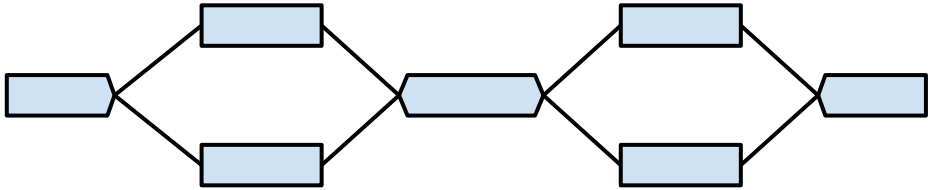
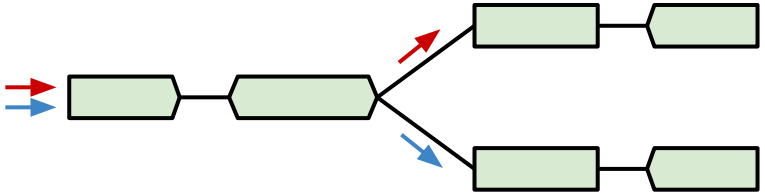
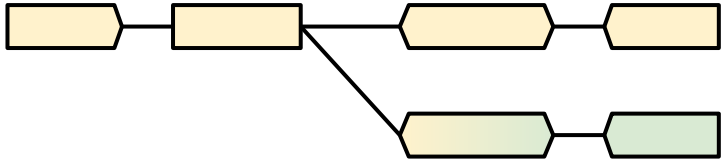
Sequential pipelines



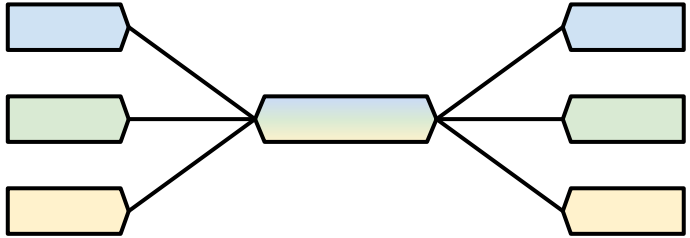
Conditional data flow



Generated data streams



Correlated processing



Thank You

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Questions / Comments


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CNCF

Shout Out: Bogdan Drutu