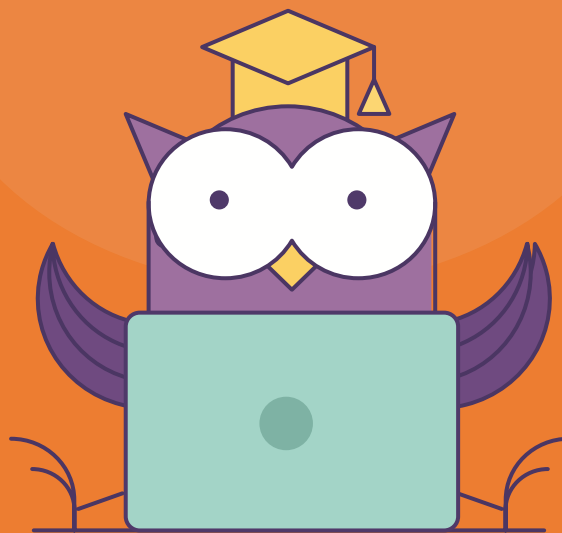


Меня хорошо слышно && видно?



Напишите в чат, если есть проблемы!

Ставьте  если все хорошо

Prometheus. Grafana.

Архитектор ПО



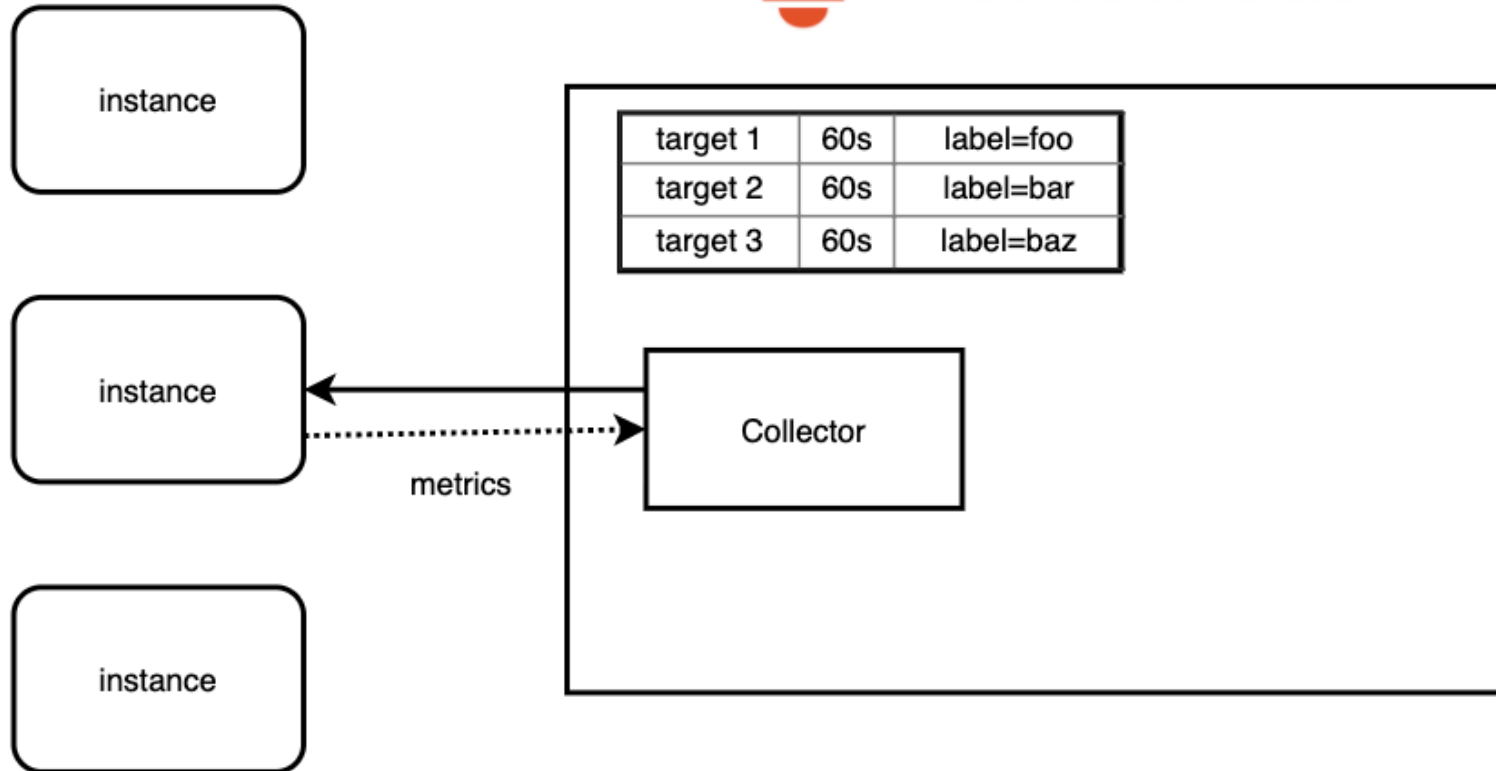
Карта вебинара

- Метрики Prometheus
- PromQL
- Service Monitors
- Demo

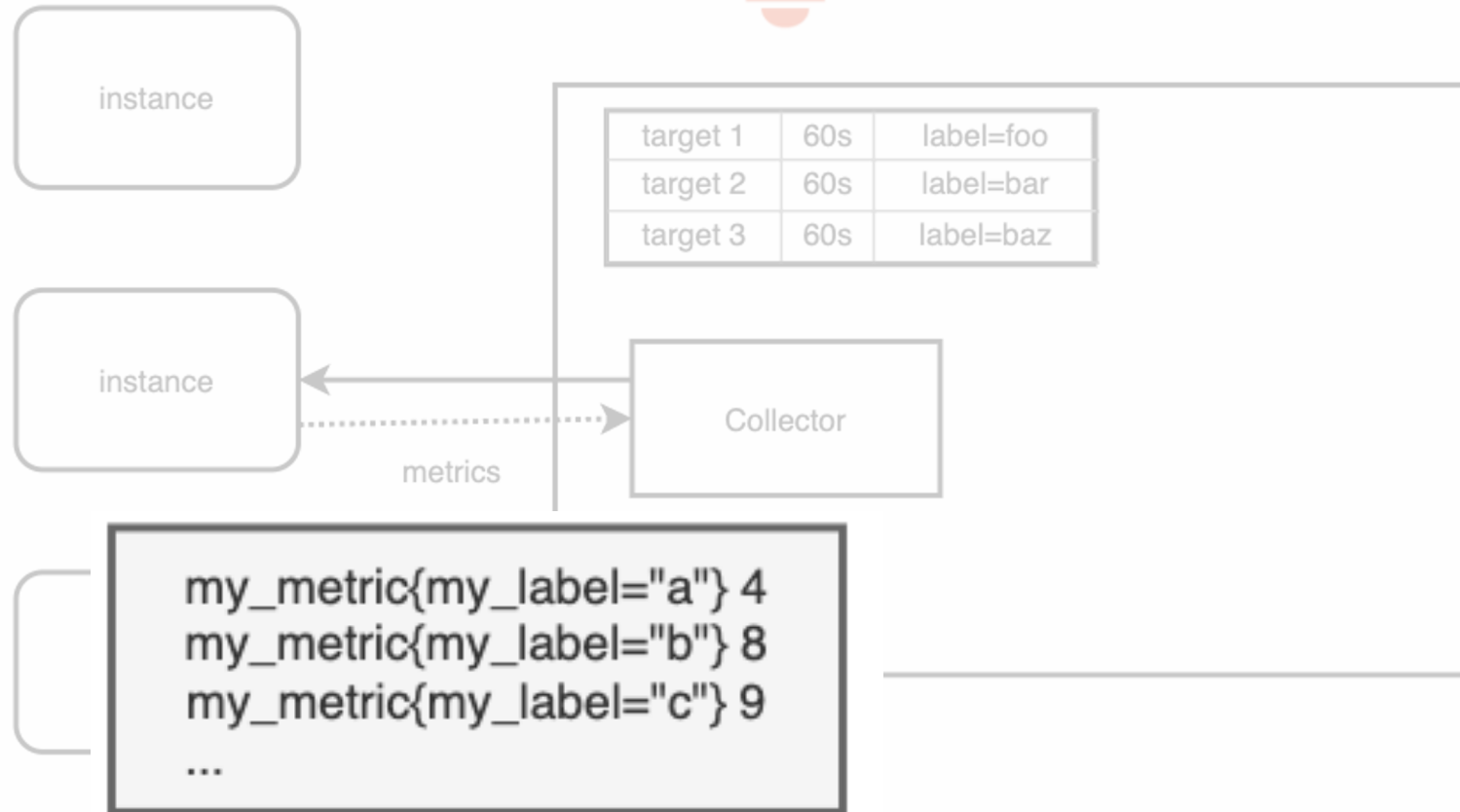
01

Prometheus

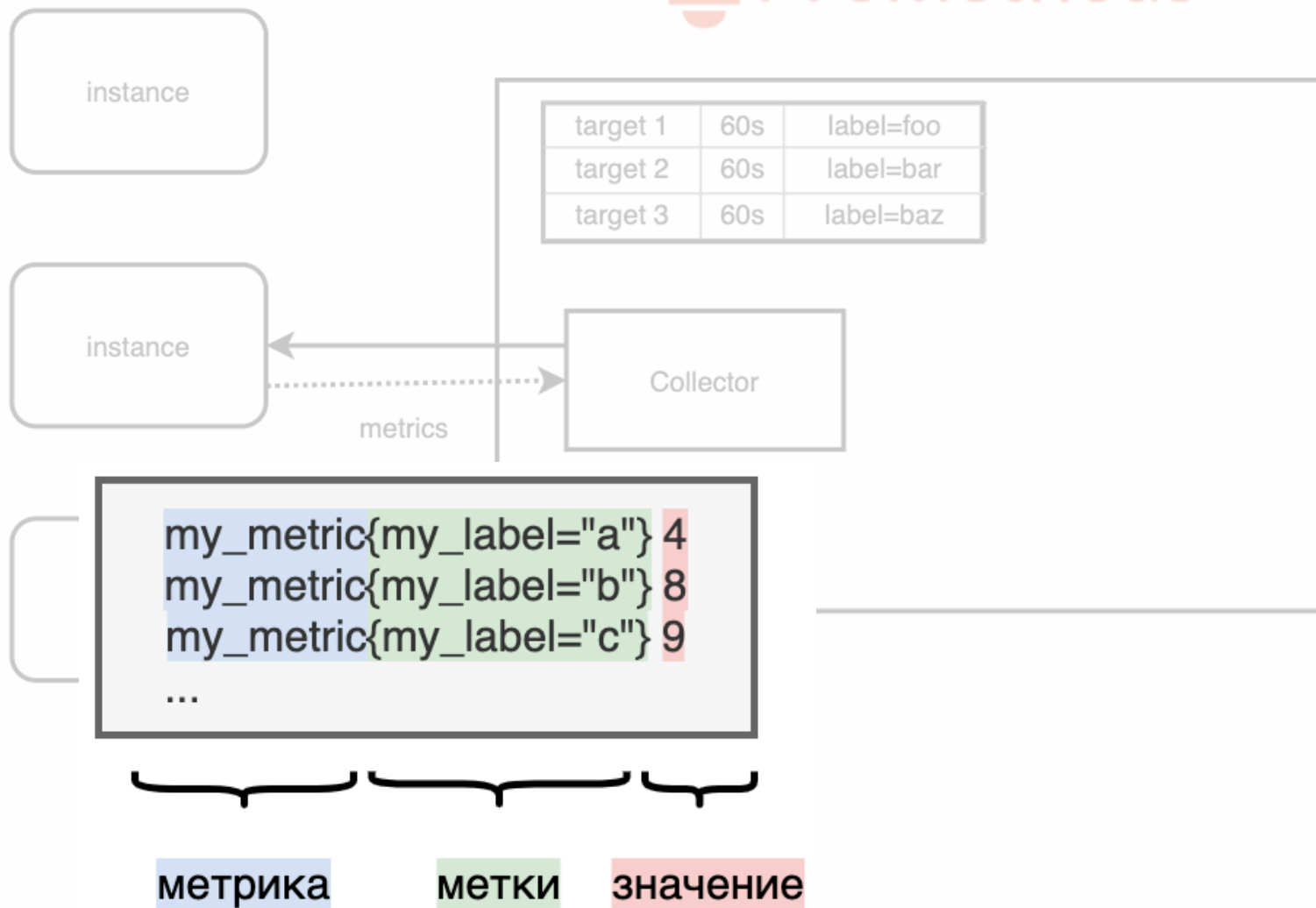
Как работает Prometheus



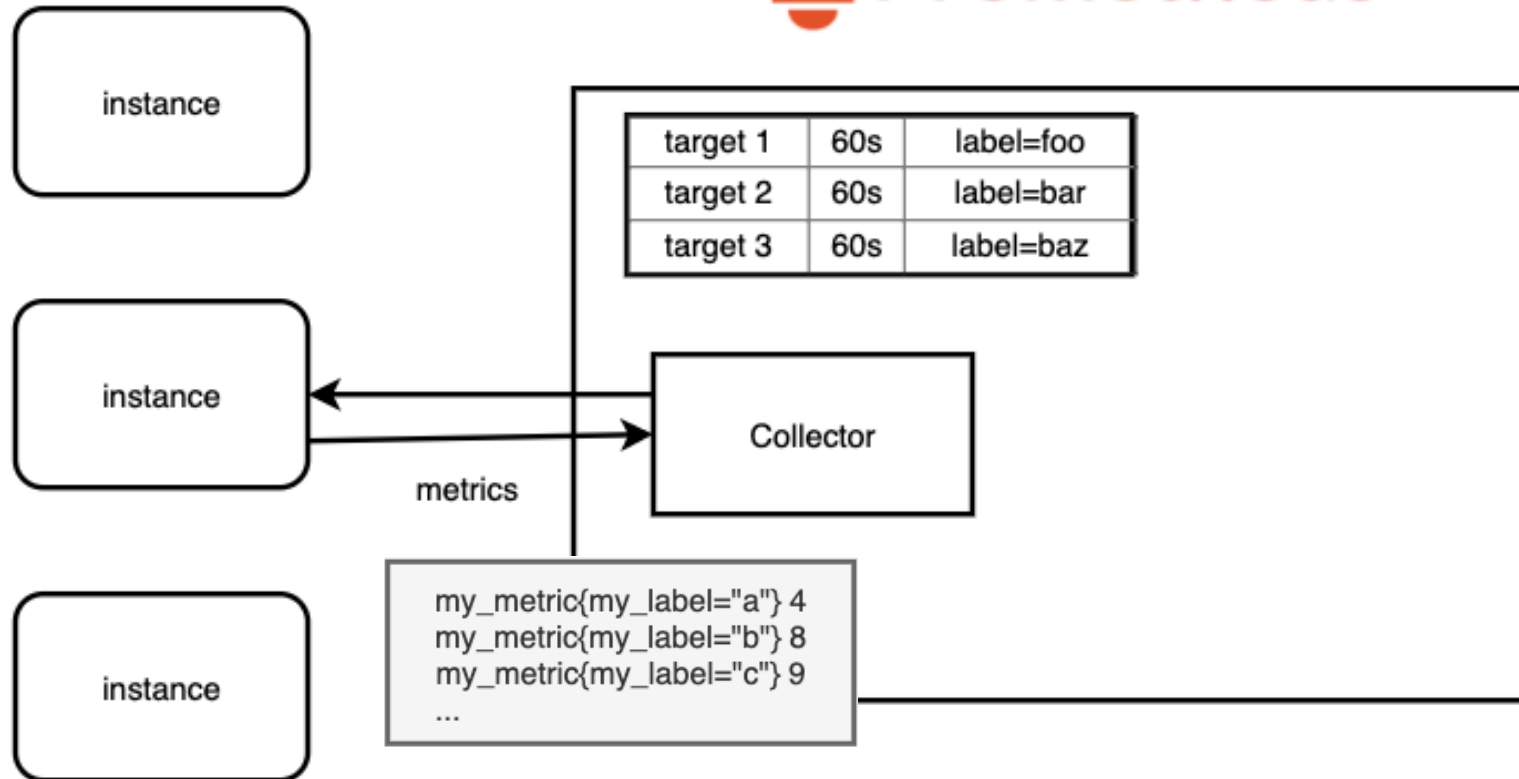
Как работает Prometheus



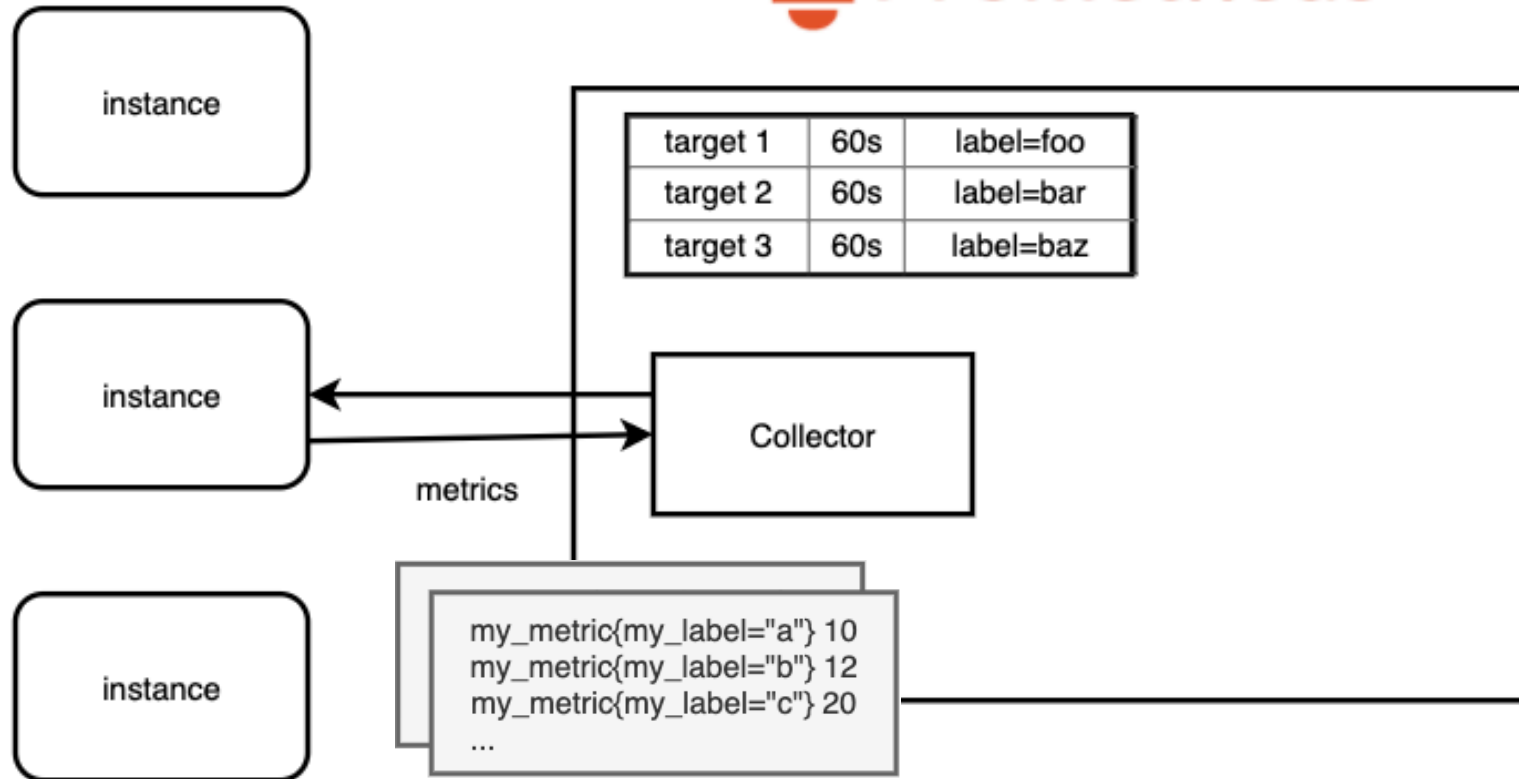
Как работает Prometheus



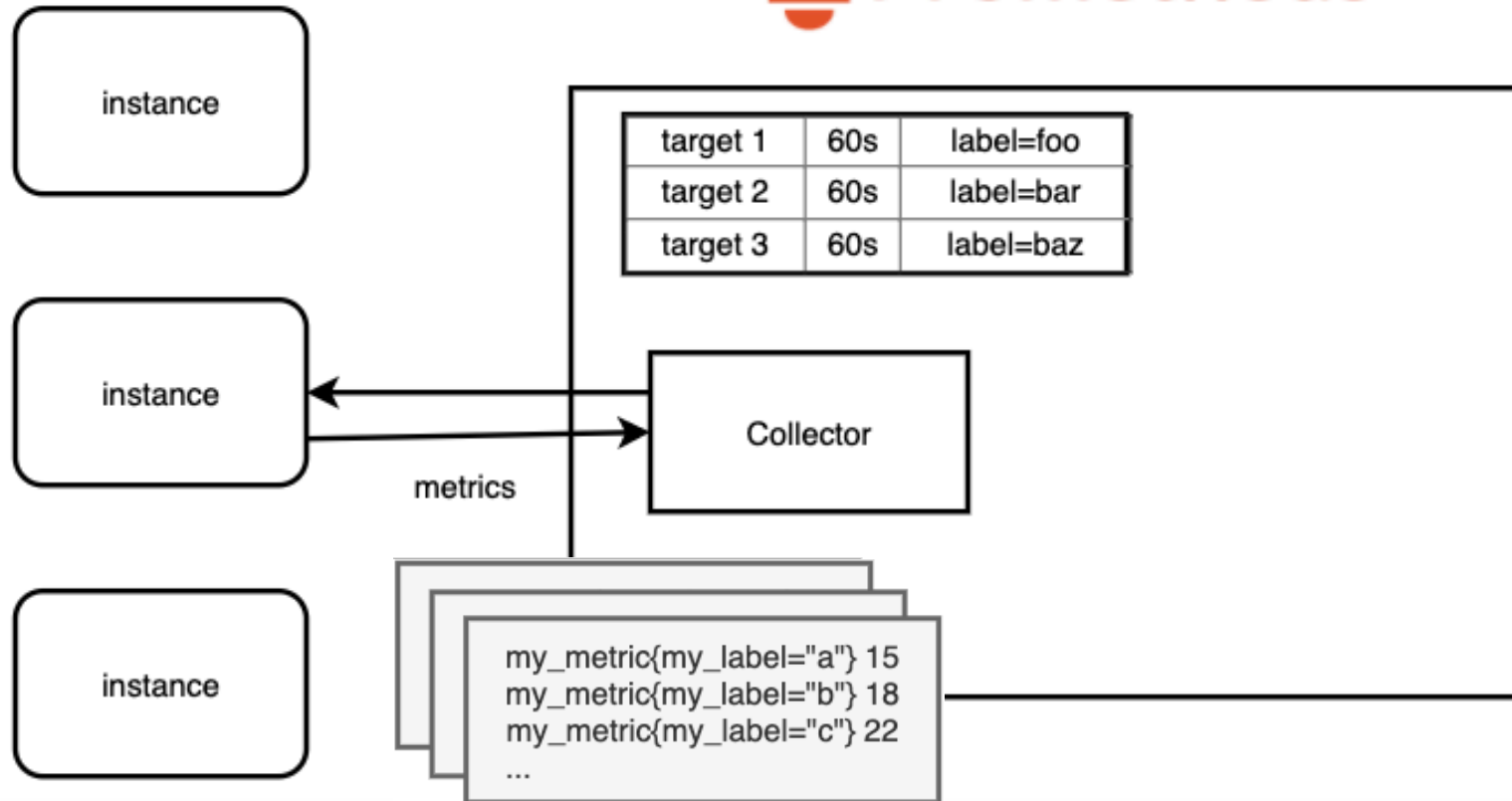
Как работает Prometheus



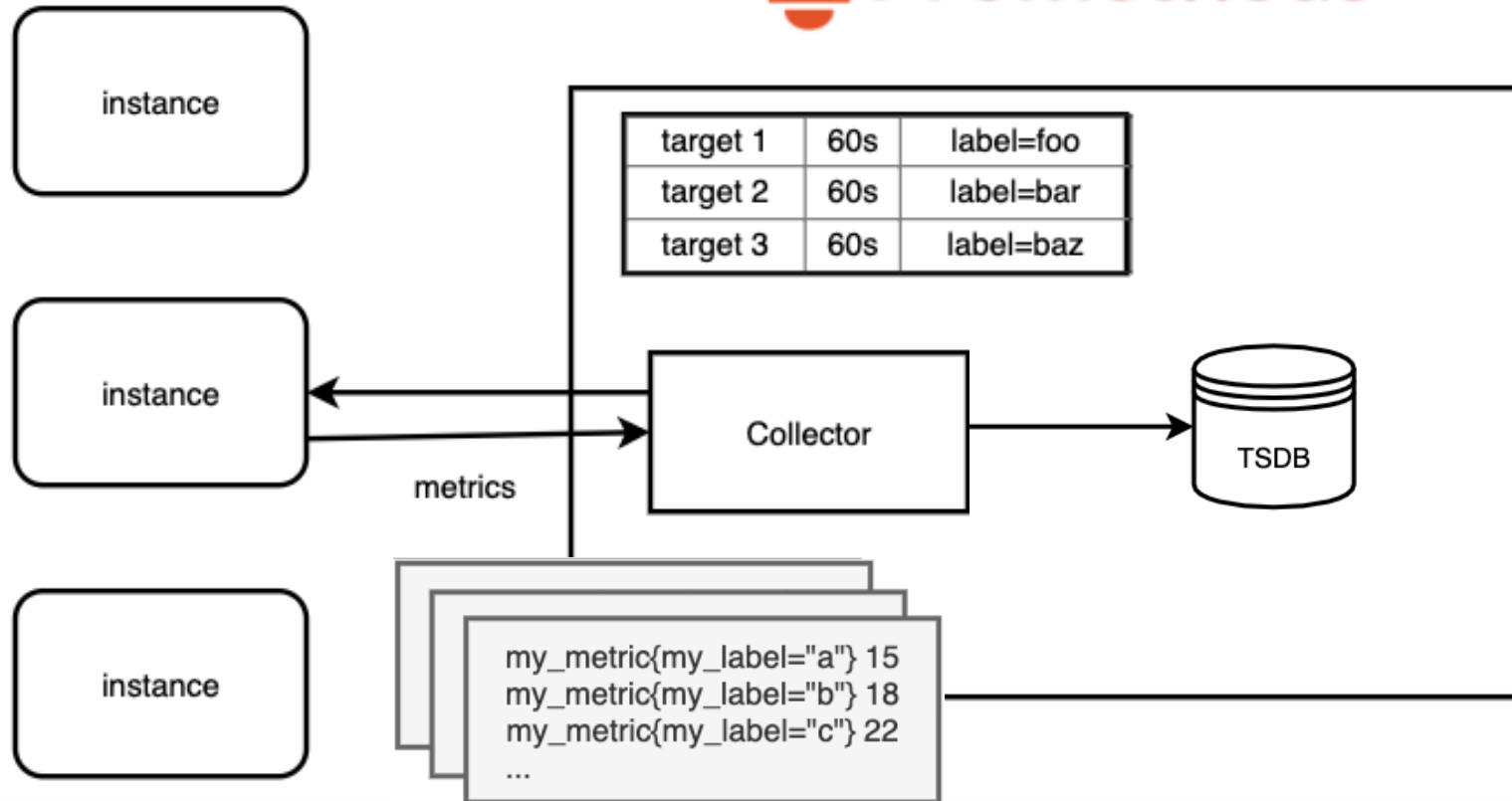
Как работает Prometheus



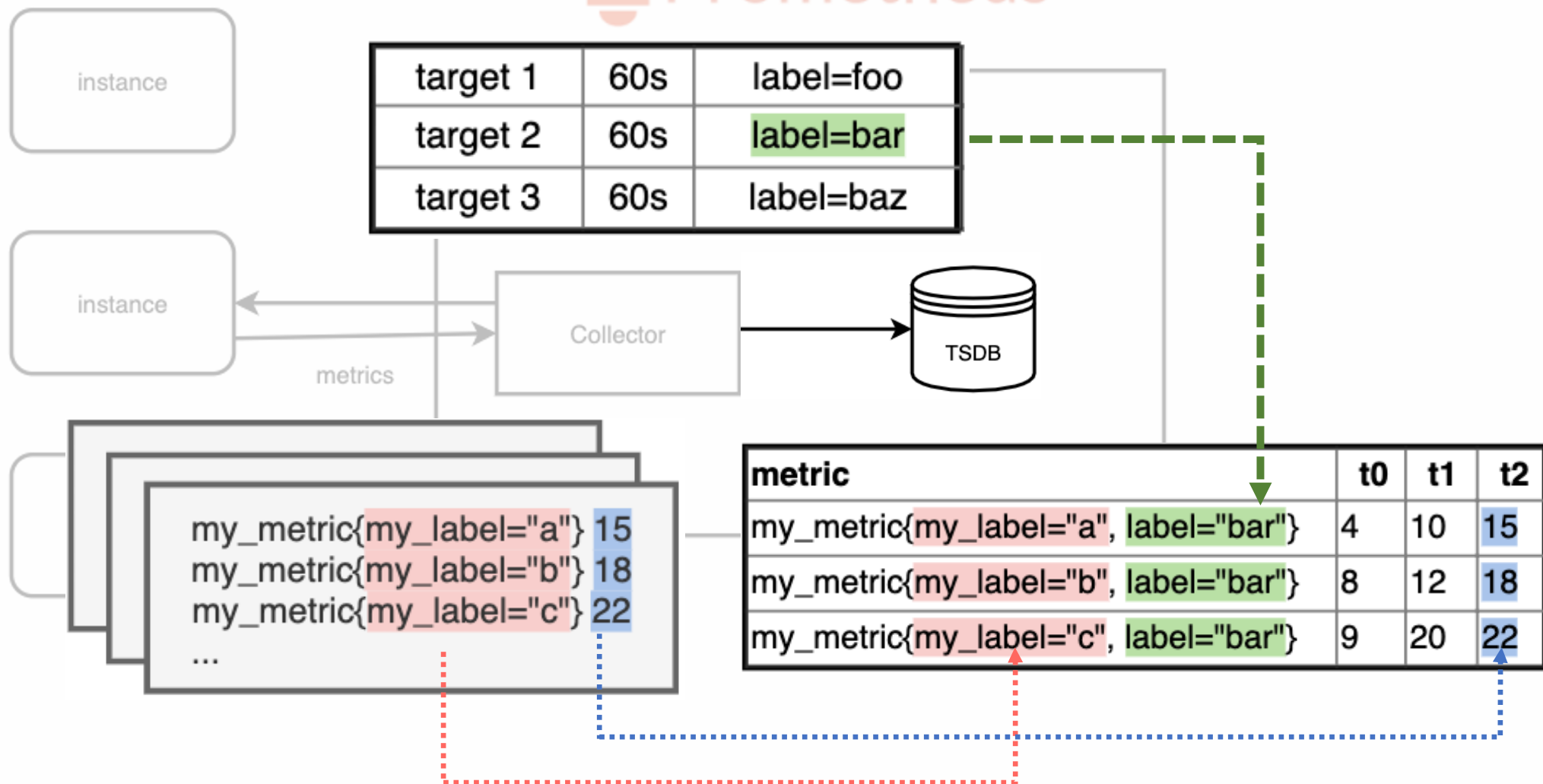
Как работает Prometheus



Как работает Prometheus



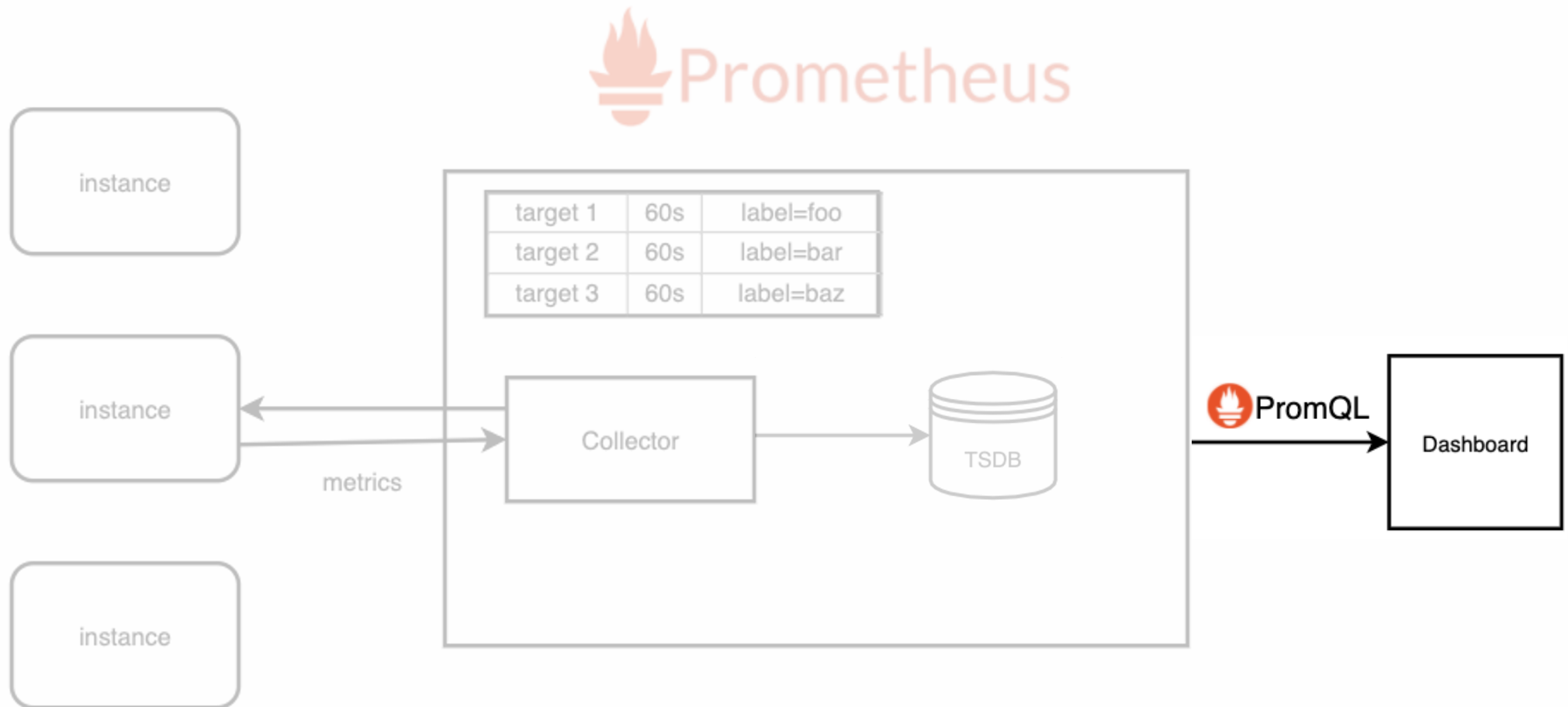
Как работает Prometheus



02

PromQL

Как работает Prometheus



PromQL



PromQL



my_metric

Execute

PromQL



PromQL



Execute

	t0	t1	t2	t3
my_metric{my_label="a"}	4	10	15	10
my_metric{my_label="b"}	8	12	18	18
my_metric{my_label="c"}	9	20	22	11
my_metric{my_label="d"}	10	15	26	20

PromQL



PromQL



my_metric{my_label="a"}

Execute

	t0	t1	t2	t3
my_metric{my_label="a"}	4	10	15	10
my_metric{my_label="b"}	8	12	18	18
my_metric{my_label="c"}	9	20	22	11
my_metric{my_label="d"}	10	15	26	20

PromQL



PromQL



my_metric{my_label="a"}

Execute

	t0	t1	t2	t3
my_metric{my_label="a"}	4	10	15	10

PromQL



PromQL



my_metric{my_label=~"a|b"}

Execute

	t0	t1	t2	t3
my_metric{my_label="a"}	4	10	15	10
my_metric{my_label="b"}	8	12	18	18
my_metric{my_label="c"}	9	20	22	11
my_metric{my_label="d"}	10	15	26	20

PromQL



PromQL



my_metric{my_label=~“a|b”}

Execute

	t0	t1	t2	t3
my_metric{my_label=“a”}	4	10	15	10
my_metric{my_label=“b”}	8	12	18	18

PromQL



PromQL



`http_requests{host="foo.io", status=~"2.+"}{`

Execute

	t0	t1	t2	t3
http_requests	4	10	15	25

PromQL



PromQL



http_requests{host="foo.io", status=~"2.+"}
(Note: The original image contains a typo '2.+' which has been corrected to '2.+')

Execute

	<div>60c60c60c60c</div>			
	t0	t1	t2	t3
http_requests	4	10	15	25

PromQL



PromQL



http_requests{host="foo.io", status=~"2.+"}[2m]

Execute

	<div>60c60c60c60c</div>			
	t0	t1	t2	t3
http_requests	4	10	15	25

2m

PromQL

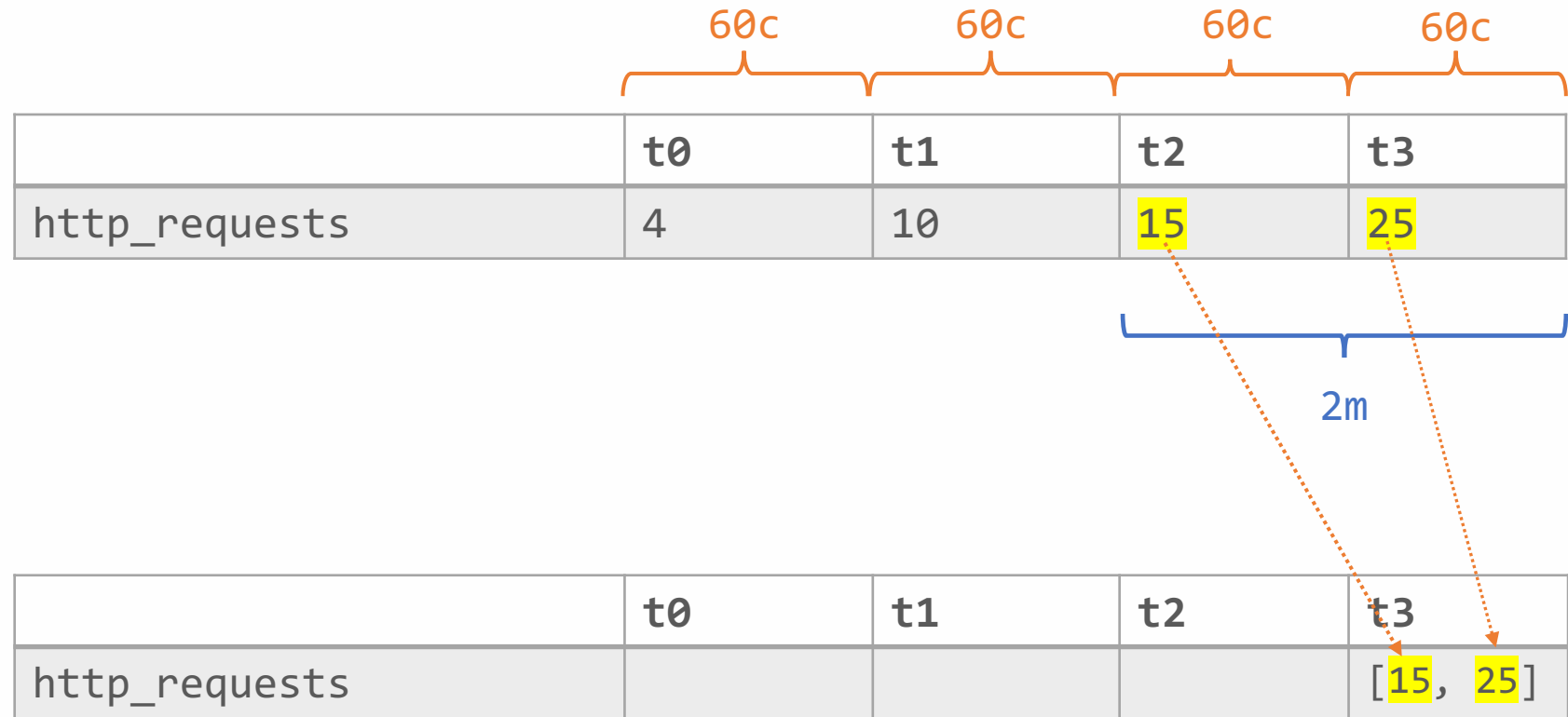


PromQL



http_requests{host="foo.io", status=~"2.+"}[2m]

Execute



PromQL

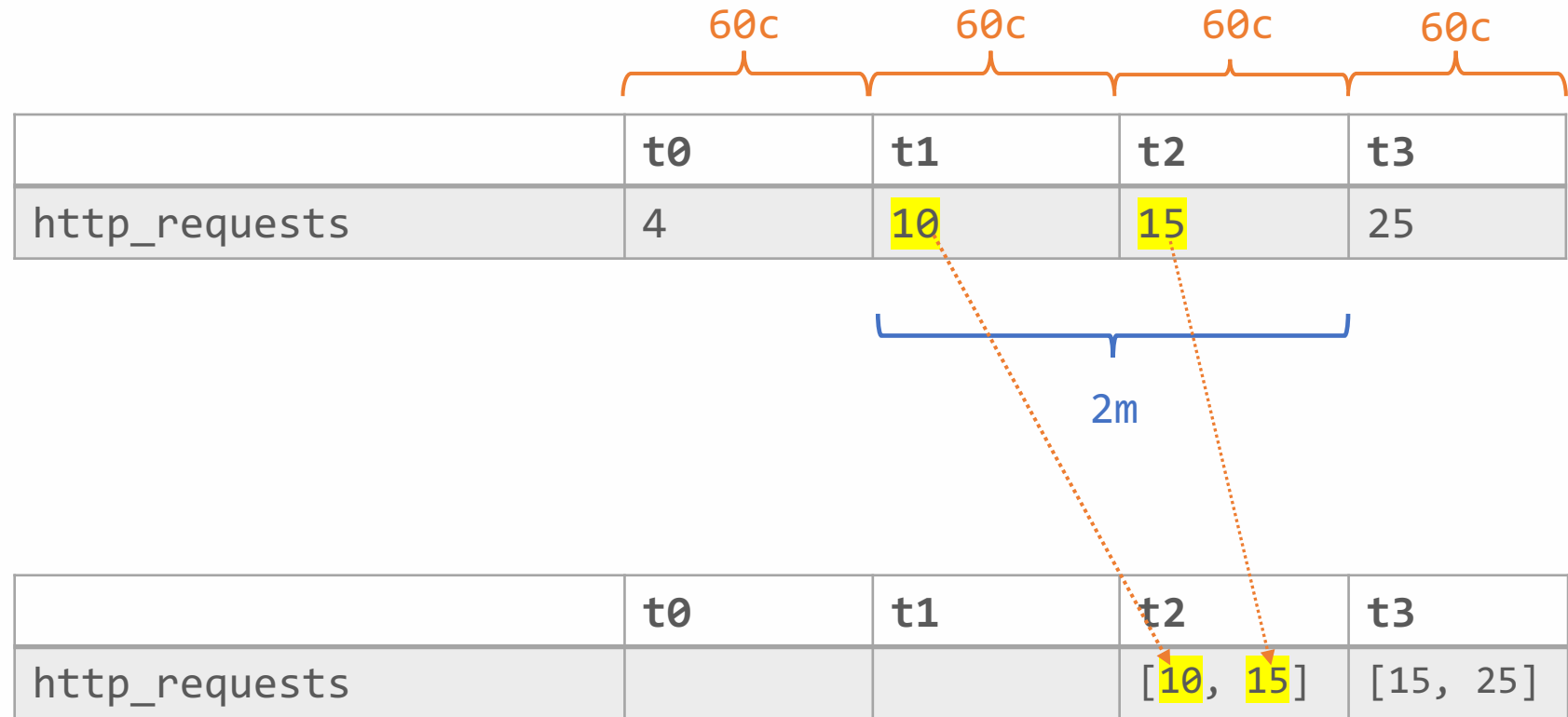


PromQL



http_requests{host="foo.io", status=~"2.+"}[2m]

Execute



PromQL

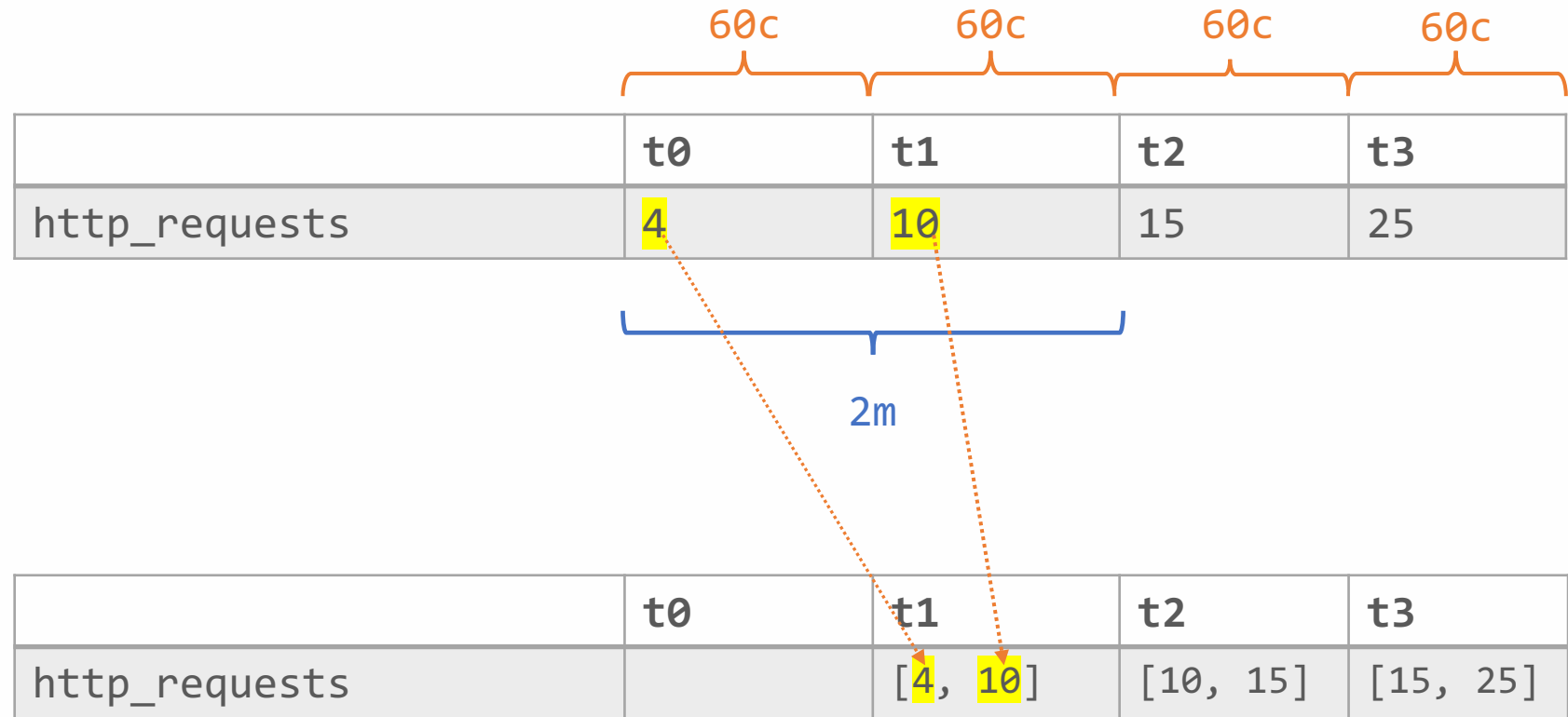


PromQL



http_requests{host="foo.io", status=~"2.+"}[2m]

Execute



PromQL

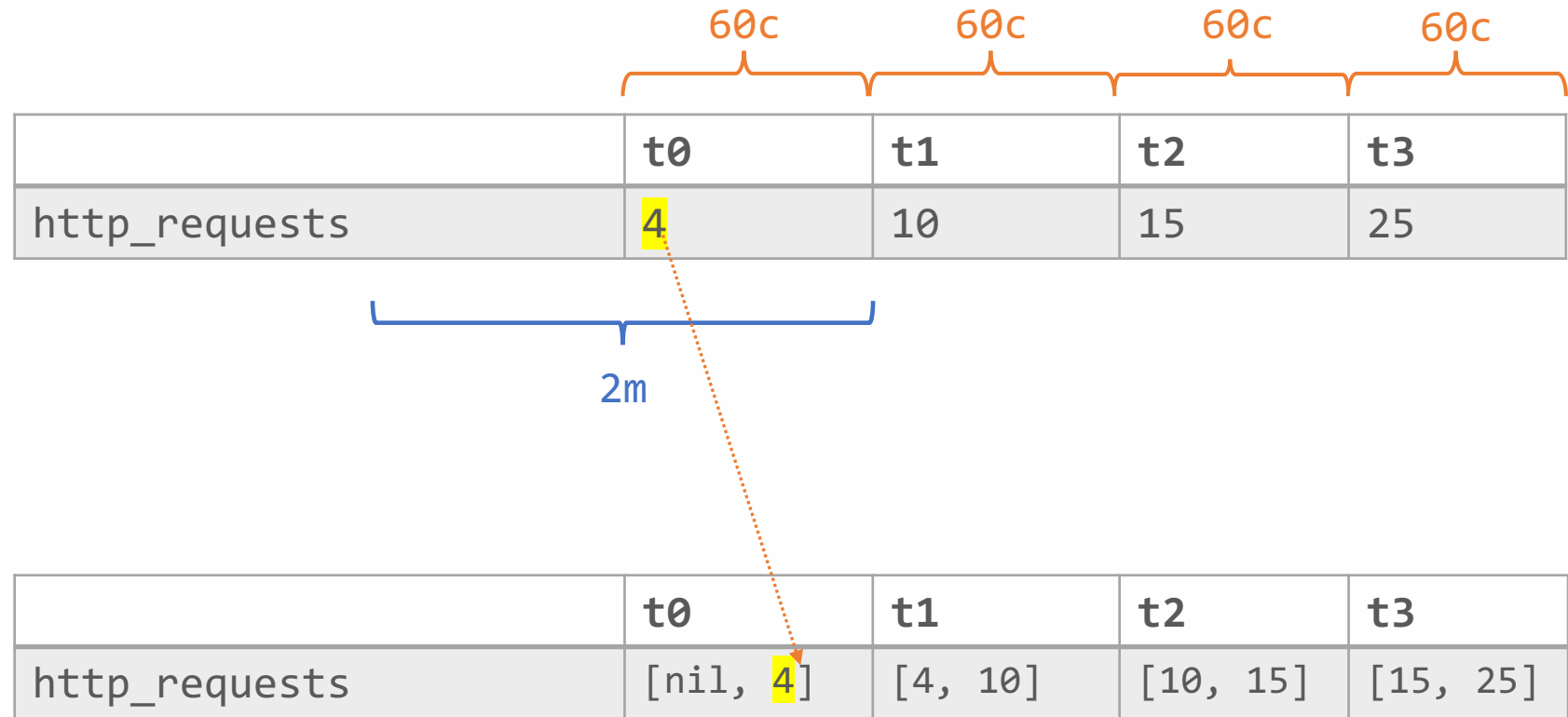


PromQL



http_requests{host="foo.io", status=~"2.+"}[2m]

Execute



PromQL



PromQL



`http_requests{host="foo.io", status=~"2.+"}[2m]`

Execute

	t0	t1	t2	t3
http_requests	4	10	15	25

Range Vector

	t0	t1	t2	t3
http_requests	[nil, 4]	[4, 10]	[10, 15]	[15, 25]

PromQL



PromQL



`increase(http_requests{host="foo.io", status=~"2.+"}[2m])`

Execute

Range Vector

	t0	t1	t2	t3
http_requests	[nil, 4]	[4, 10]	[10, 15]	[15, 25]

PromQL



PromQL



`increase(http_requests{host="foo.io", status=~"2.+"}[2m])`

Execute

Range Vector

	t0	t1	t2	t3
http_requests	[nil, 4]	[4, 10]	[10, 15]	[15, 25]

	t0	t1	t2	t3
http_requests	nil	6	5	10

PromQL



PromQL



http_requests

Execute

	t0	t1	t2	t3
http_requests{host="bar.io", status="2xx"}	40	100	150	250
http_requests{host="bar.io", status="5xx"}	8	12	18	18
http_requests{host="foo.io", status="2xx"}	90	200	220	300
http_requests{host="foo.io", status="5xx"}	10	15	20	25
http_requests{host="baz.io", status="2xx"}	50	150	170	270
http_requests{host="baz.io", status="2xx"}	1	2	4	6

PromQL



PromQL



http_requests[2m]

Execute

	t0	t1	t2	t3
http_requests{host="bar.io", status="2xx"}	[nil, 40]	[40, 100]	[100, 150]	[150, 250]
http_requests{host="bar.io", status="5xx"}	[nil, 8]	[8, 12]	[12, 18]	[18, 18]
http_requests{host="foo.io", status="2xx"}	[nil, 90]	[90, 200]	[200, 220]	[220, 300]
http_requests{host="foo.io", status="5xx"}	[nil, 10]	[10, 15]	[15, 20]	[20, 25]
http_requests{host="baz.io", status="2xx"}	[nil, 50]	[50, 150]	[150, 170]	[170, 270]
http_requests{host="baz.io", status="2xx"}	[nil, 1]	[1, 2]	[2, 4]	[4, 6]

PromQL



PromQL



increase(http_requests[2m])

Execute

	t0	t1	t2	t3
http_requests{host="bar.io", status="2xx"}	nil	60	50	100
http_requests{host="bar.io", status="5xx"}	nil	4	6	0
http_requests{host="foo.io", status="2xx"}	nil	110	20	70
http_requests{host="foo.io", status="5xx"}	nil	5	5	5
http_requests{host="baz.io", status="2xx"}	nil	100	20	100
http_requests{host="baz.io", status="2xx"}	nil	1	2	2

PromQL



PromQL



`sum(increase(http_requests[2m]))`

Execute

	t0	t1	t2	t3
http_requests{}	nil	280	103	277

PromQL



PromQL



sum by (host) (increase(http_requests[2m]))

Execute

	t0	t1	t2	t3
http_requests{host="bar.io"}	nil	64	56	100
http_requests{host="foo.io"}	nil	115	25	75
http_requests{host="baz.io"}	nil	101	22	102

PromQL



PromQL



sum by (host) (increase(http_requests{status="5xx"}[2m]))

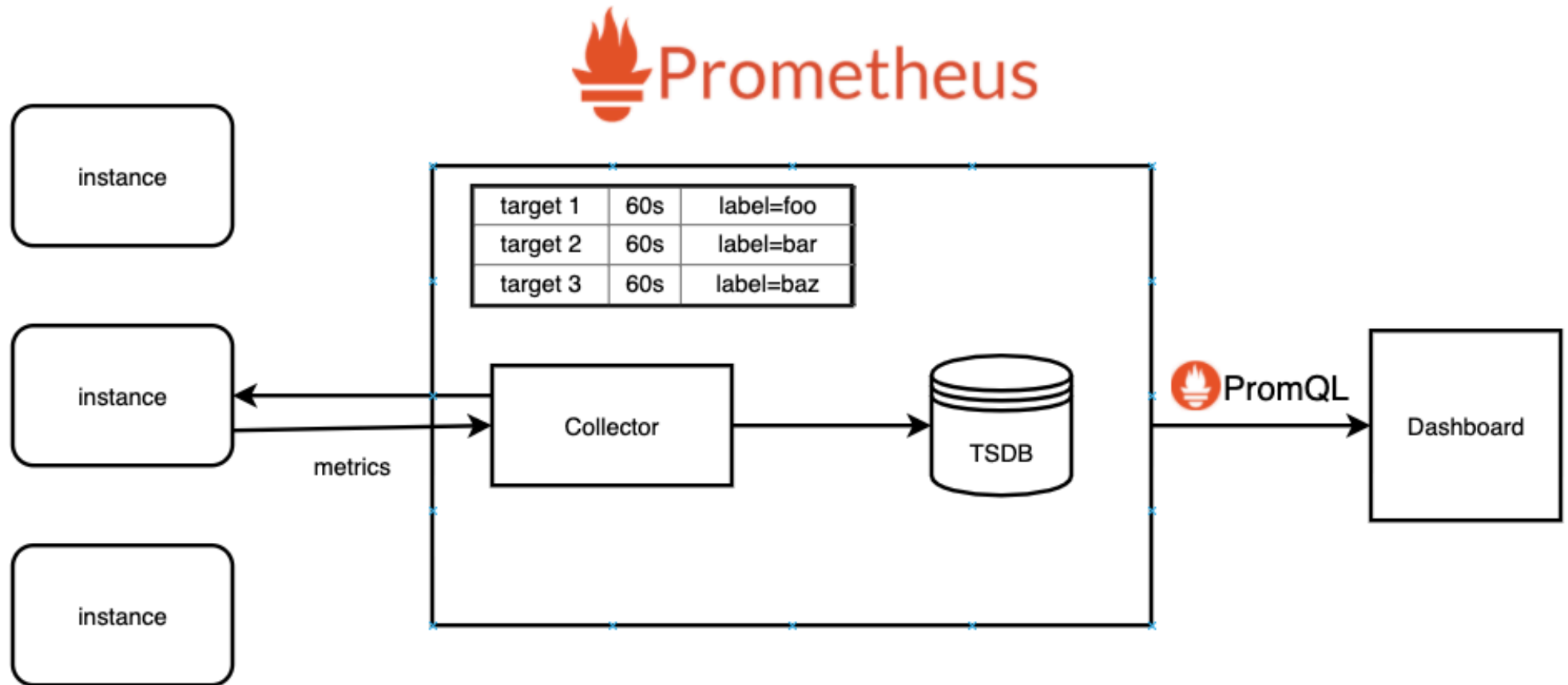
Execute

	t0	t1	t2	t3
http_requests{host="bar.io"}	nil	4	6	0
http_requests{host="foo.io"}	nil	5	5	5
http_requests{host="baz.io"}	nil	1	2	2

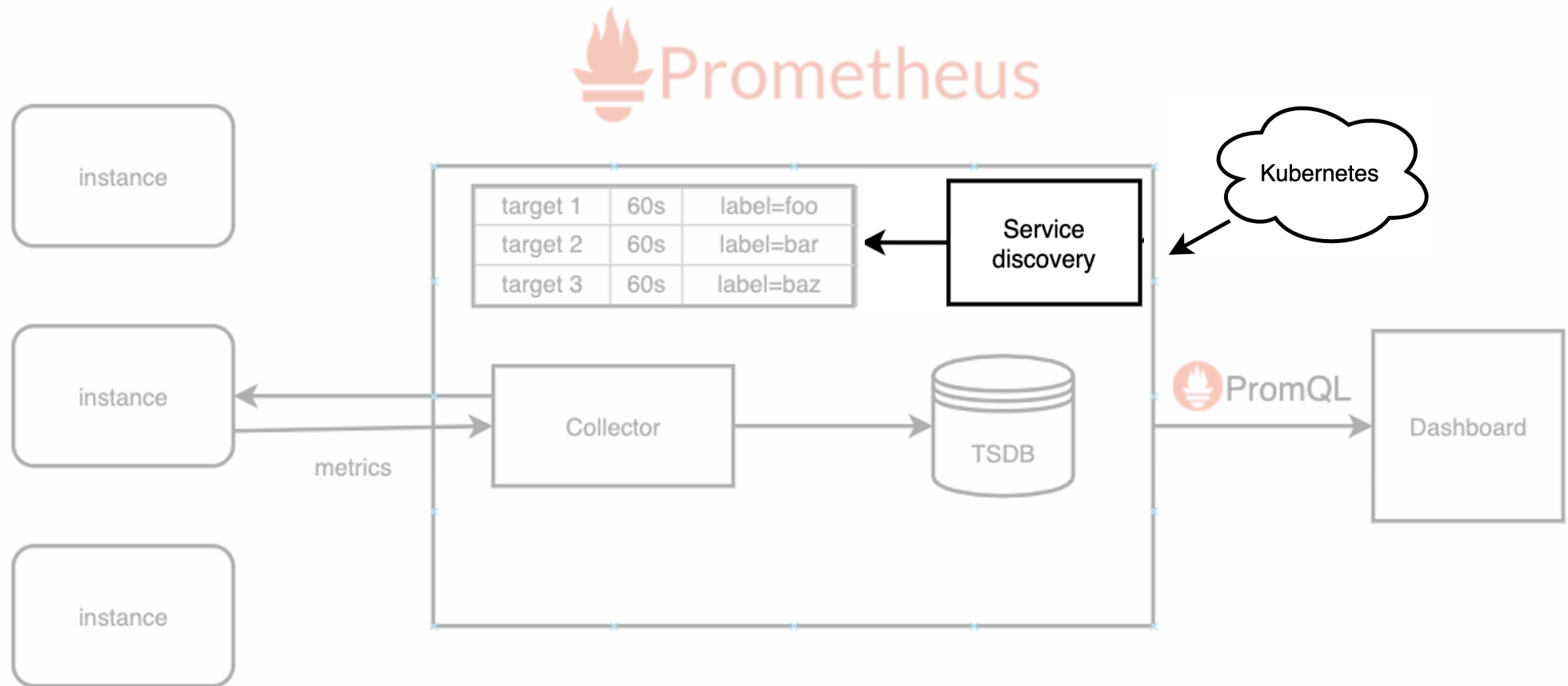
03

Prometheus Operator

Как работает Prometheus



Как работает Prometheus



Как работает Prometheus

target 1	60s	label=foo
target 2	60s	label=bar
target 3	60s	label=baz



http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

Как работает Prometheus

target 1	60s	label=foo
target 2	60s	label=bar
target 3	60s	label=baz



foo service

http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

Service discovery в Prometheus

foo service

http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"



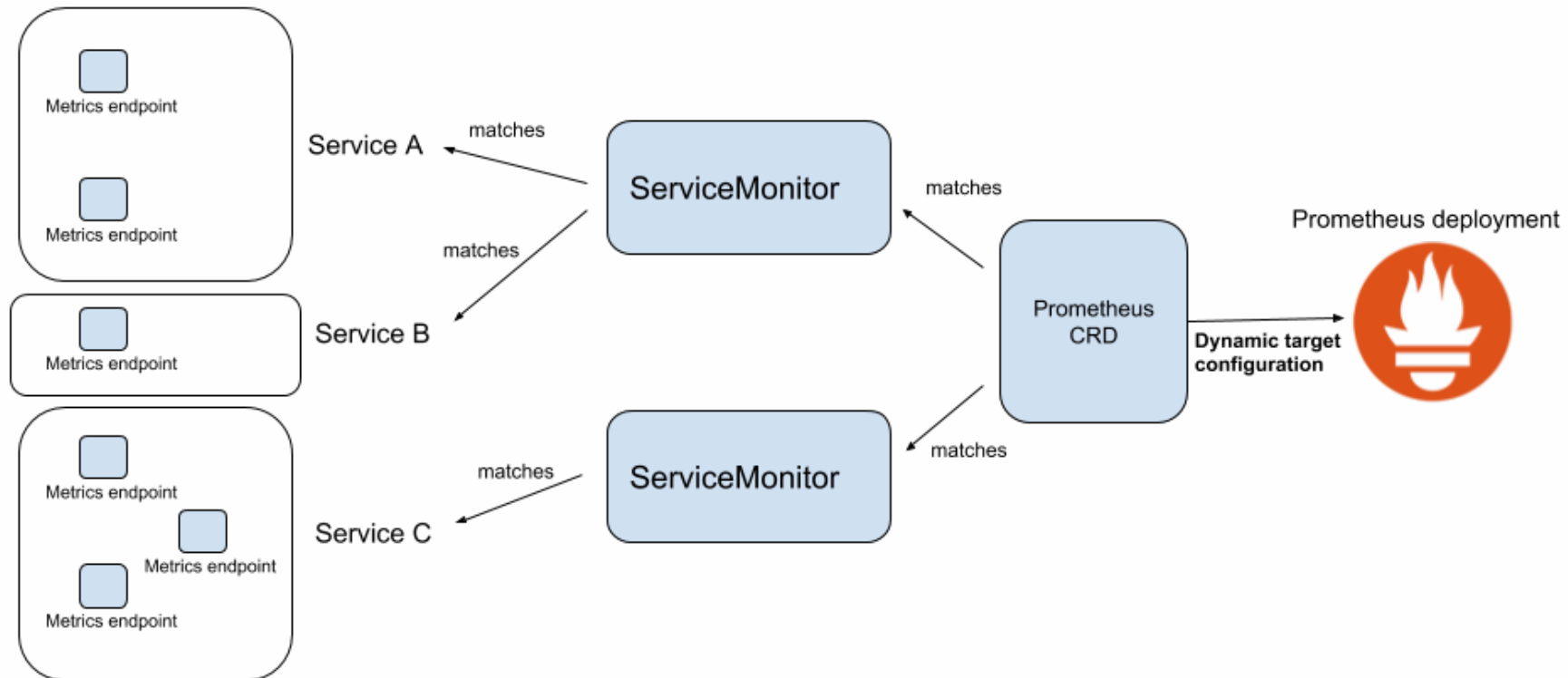
Prometheus конфиг:

```
scrape_configs:  
  - job_name: foo  
    scrape_interval: 60s  
    kubernetes_sd_configs:
```

```
      - endpoints: [__address__]  
        namespace: production  
      - endpoints: [__address__]  
        namespace: production  
      - endpoints: [__address__]  
        namespace: production
```

Prometheus Operator in Kubernetes

Оператор решает проблему нативной интеграции Прометеуса в Kubernetes и возможность динамической переконфигурации с помощью ресурсов Kubernetes.



Prometheus Operator in Kubernetes

foo service

http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
  labels:
    app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

Prometheus Operator in Kubernetes

foo service

http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
  labels:
    app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

+

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: foo-monitor
  labels:
    app: foo
spec:
  endpoints:
    - port: 9093
      scheme: http
      path: /metrics
      interval: 60s
  selector:
    matchLabels:
      app: foo
  namespaceSelector:
    matchNames:
      - production
```

Prometheus Operator in Kubernetes

foo service

<code>http://172.17.0.15:9093/metrics</code>	<code>60s</code>	<code>service="foo"</code> <code>namespace="production"</code>
<code>http://172.17.0.16:9093/metrics</code>	<code>60s</code>	<code>service="foo"</code> <code>namespace="production"</code>
<code>http://172.17.0.17:9093/metrics</code>	<code>60s</code>	<code>service="foo"</code> <code>namespace="production"</code>

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
labels:
  app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

+

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: foo-monitor
labels:
  app: foo
spec:
  endpoints:
    - port: 9093
      scheme: http
      path: /metrics
      interval: 60s
  selector:
    matchLabels:
      app: foo
  namespaceSelector:
    matchNames:
      - production
```

Prometheus Operator in Kubernetes

foo service

http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
labels:
  app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

+

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: foo-monitor
labels:
  app: foo
spec:
  endpoints:
    - port: 9093
      scheme: http
      path: /metrics
      interval: 60s
  selector:
    matchLabels:
      app: foo
  namespaceSelector:
    matchNames:
      - production
```

Prometheus Operator in Kubernetes

foo service

<code>http://172.17.0.15:9093/metrics</code>	60s	<code>service="foo"</code> <code>namespace="production"</code>
<code>http://172.17.0.16:9093/metrics</code>	60s	<code>service="foo"</code> <code>namespace="production"</code>
<code>http://172.17.0.17:9093/metrics</code>	60s	<code>service="foo"</code> <code>namespace="production"</code>

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
  labels:
    app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

+

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: foo-monitor
  labels:
    app: foo
spec:
  endpoints:
    - port: 9093
      scheme: http
      path: /metrics
      interval: 60s
  selector:
    matchLabels:
      app: foo
  namespaceSelector:
    matchNames:
      - production
```


Prometheus Operator in Kubernetes

foo service

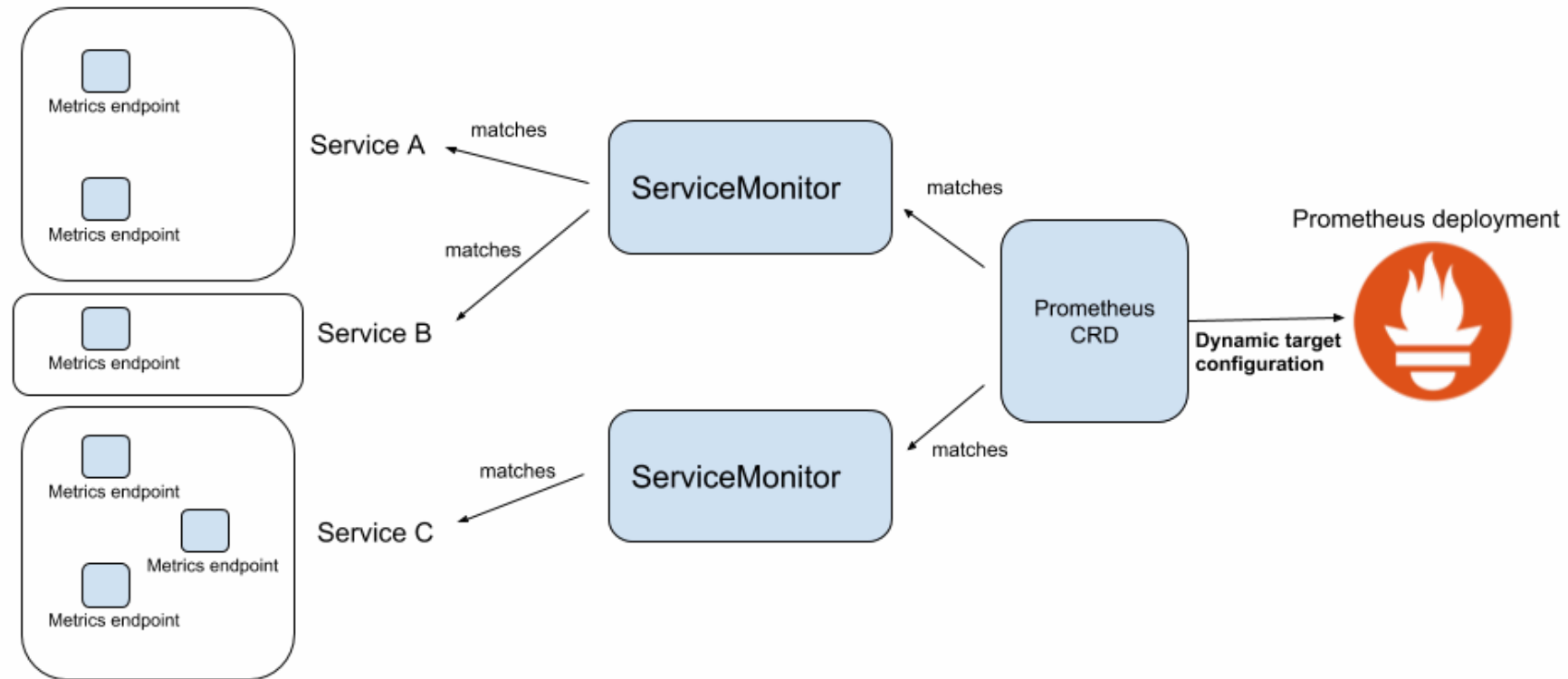
http://172.17.0.15:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.16:9093/metrics	60s	service="foo" namespace="production"
http://172.17.0.17:9093/metrics	60s	service="foo" namespace="production"

```
apiVersion: v1
kind: Service
metadata:
  name: foo
  namespace: production
  labels:
    app: foo
spec:
  ports:
    - port: 80
      targetPort: 8000
      protocol: TCP
      name: web
    - port: 9093
      targetPort: 9000
      protocol: TCP
      name: metrics
  selector:
    app: foo
  type: ClusterIp
```

+

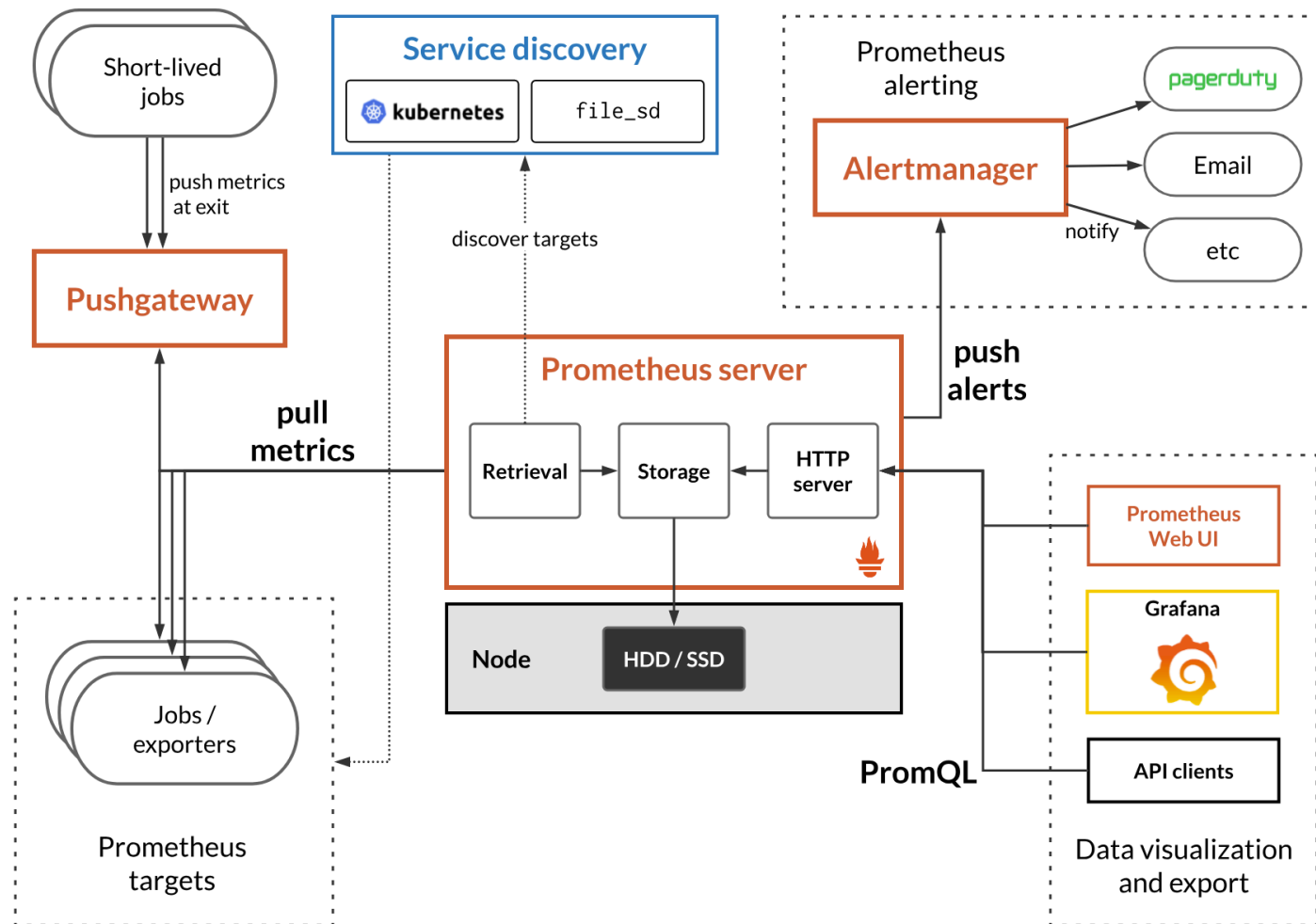
```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: foo-monitor
  labels:
    app: foo
spec:
  endpoints:
    - port: 9093
      scheme: http
      path: /metrics
      interval: 60s
  selector:
    matchLabels:
      app: foo
  namespaceSelector:
    matchNames:
      - production
```

Prometheus Operator in Kubernetes



Архитектура prometheus

Архитектура прометеуса



Опрос

<https://otus.ru/polls/10259/>

**Спасибо
за внимание!**

