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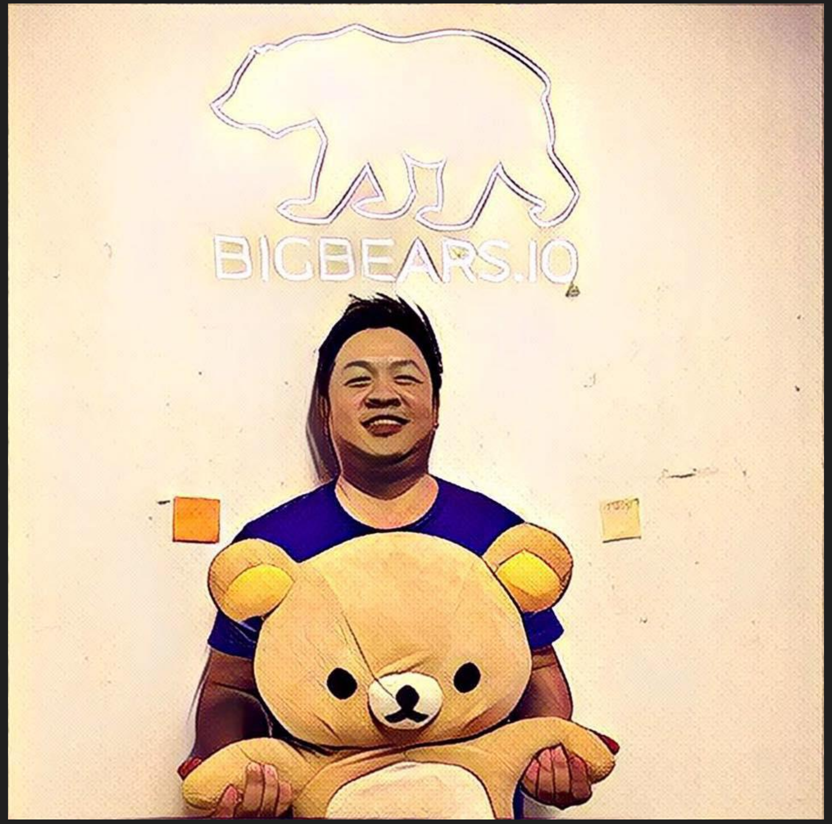
GIVING ASP.NET WEBSITE VISIBILITY WITH REALTIME METRICS

MAHASAK PIJITTUM

BEARCHITECT



MAHASAK PIJITTUM

- BEARCHITECT @ BigBears.IO
- Senior Software Engineer @ Agoda
- Chief Party Officer @ ตุ่นนินจา
- พ่อบ้านใจกล้า @ Home
- ป๋า...

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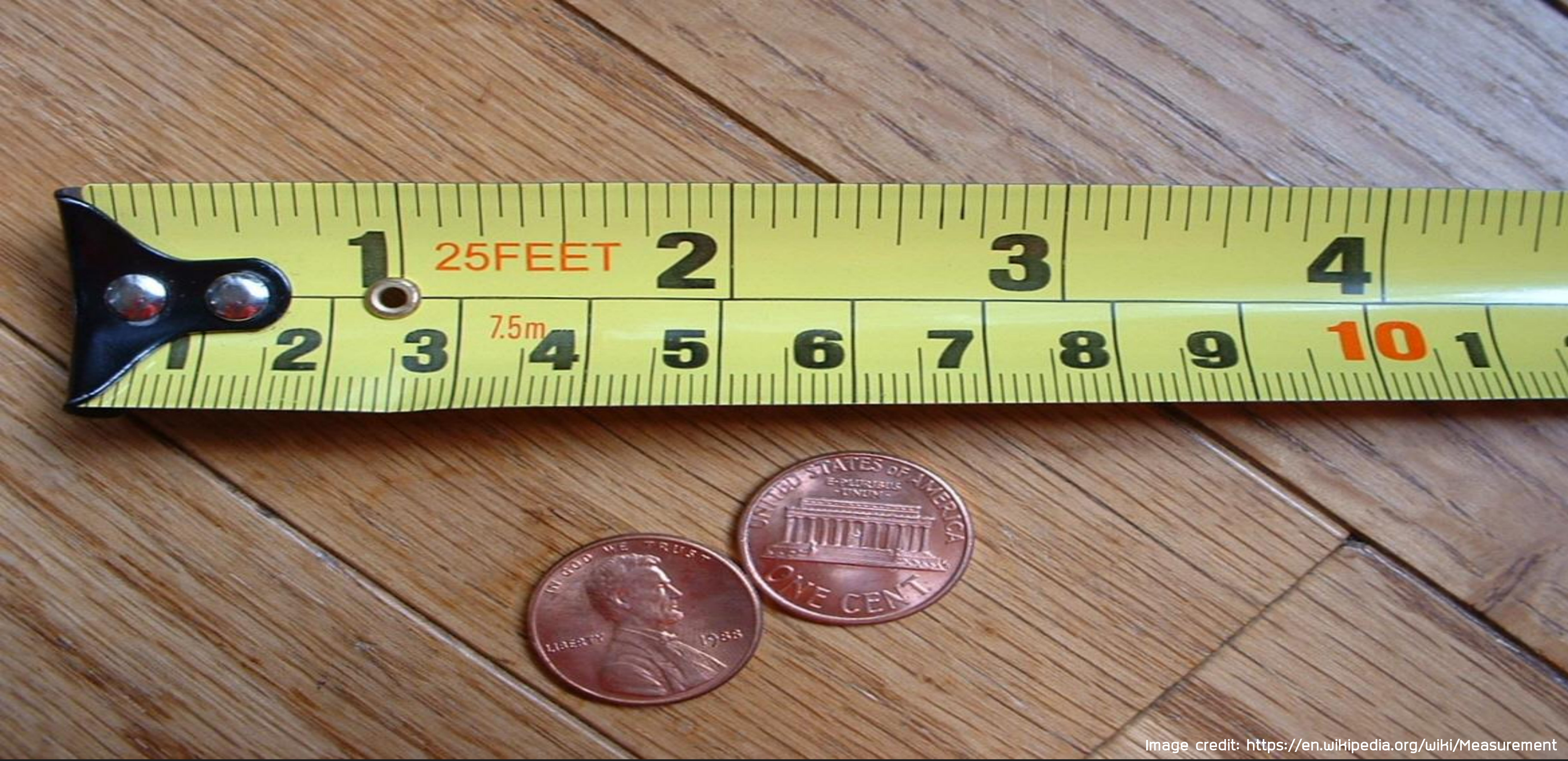

Image credit: https://en.wikipedia.org/wiki/Measurement

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Why Measurement

Why Measurement

TRACK SUCCESS	Track your growth and identify your challenges
IMPROVE	You can't improve what you can't measure
SET EXPECTATIONS	Where your expectation are in next 3 months
HELP DECISION	You can't decide without information

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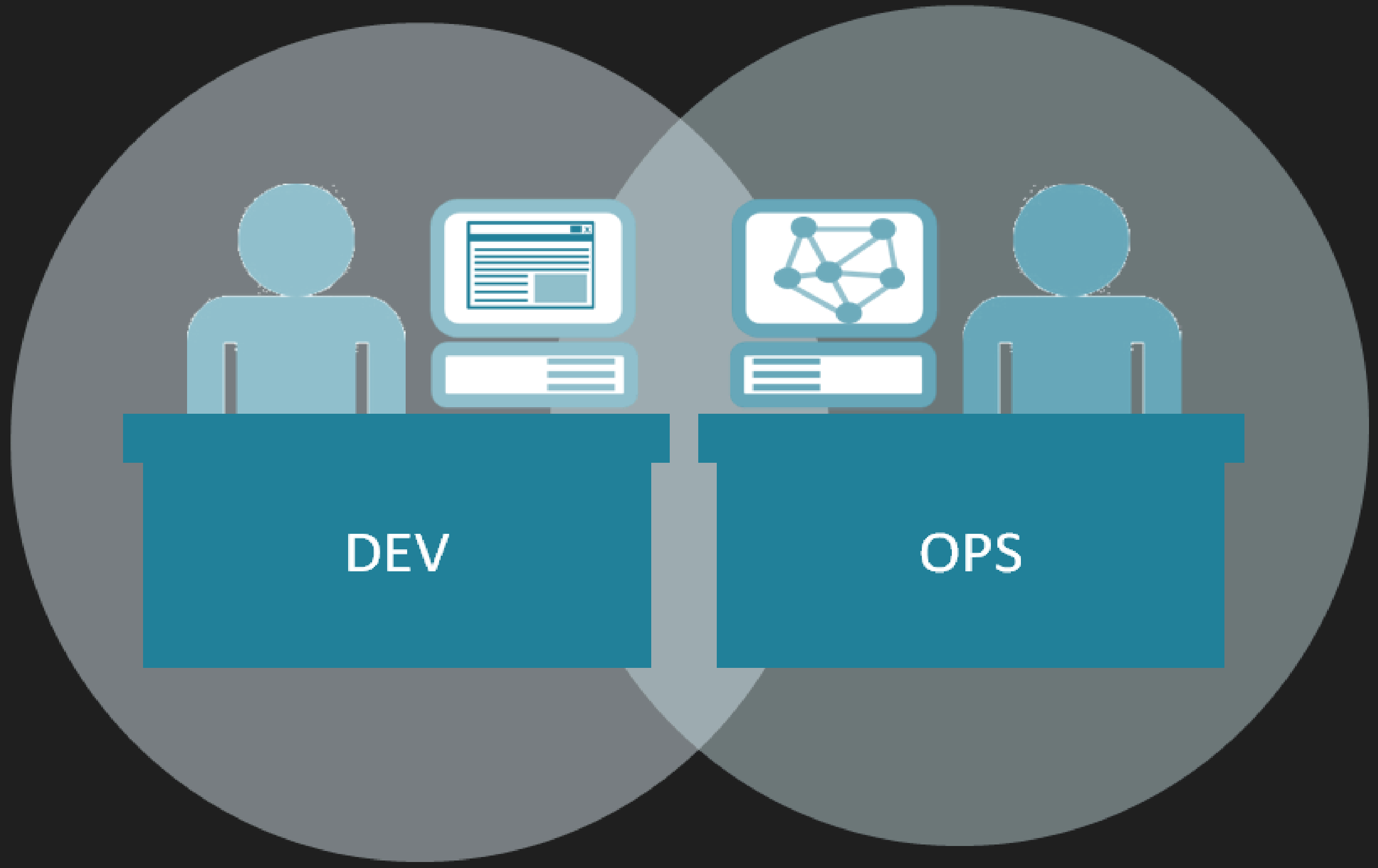

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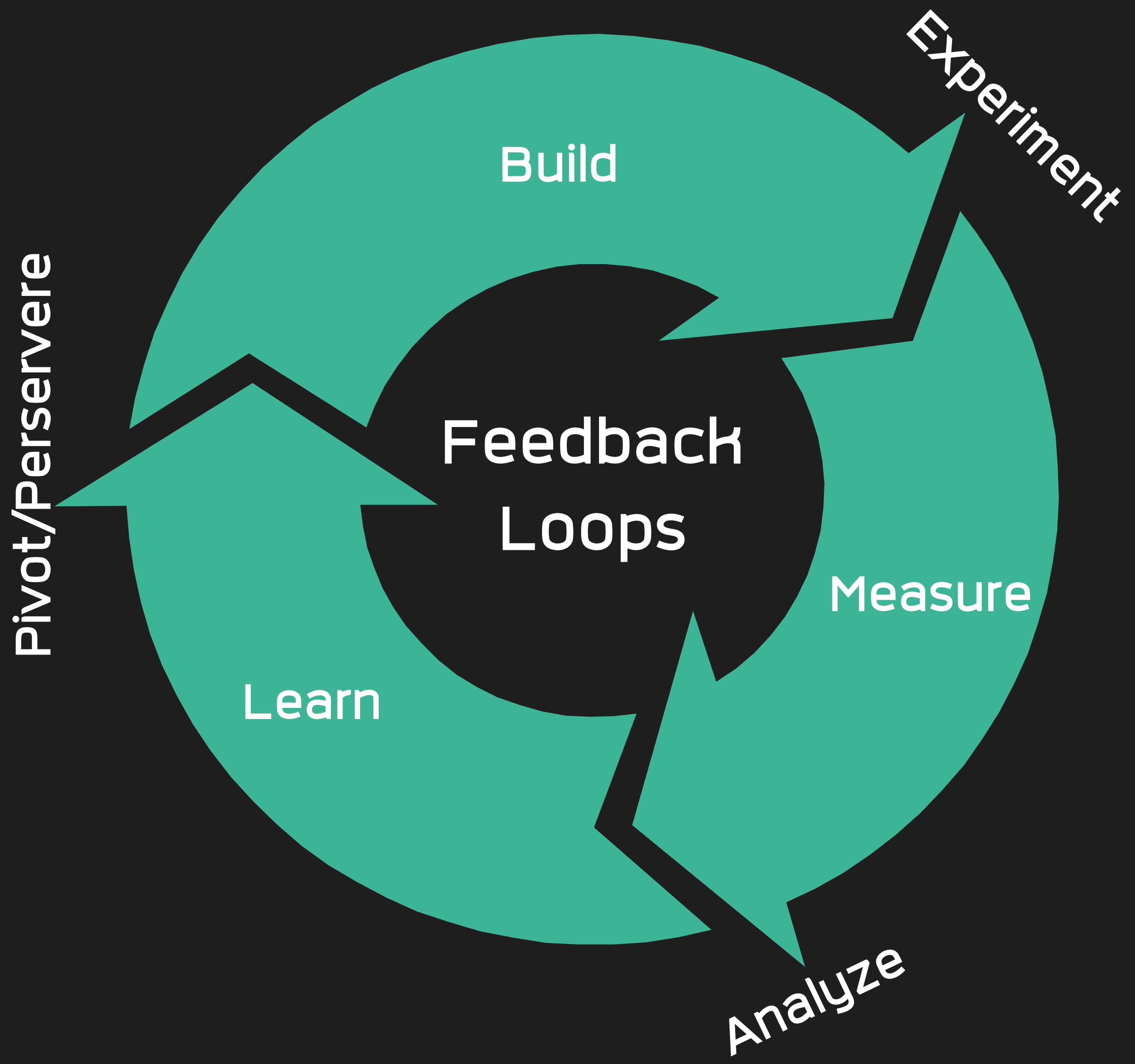
Who Loves Measurement

Data-Driven Strategy Concepts



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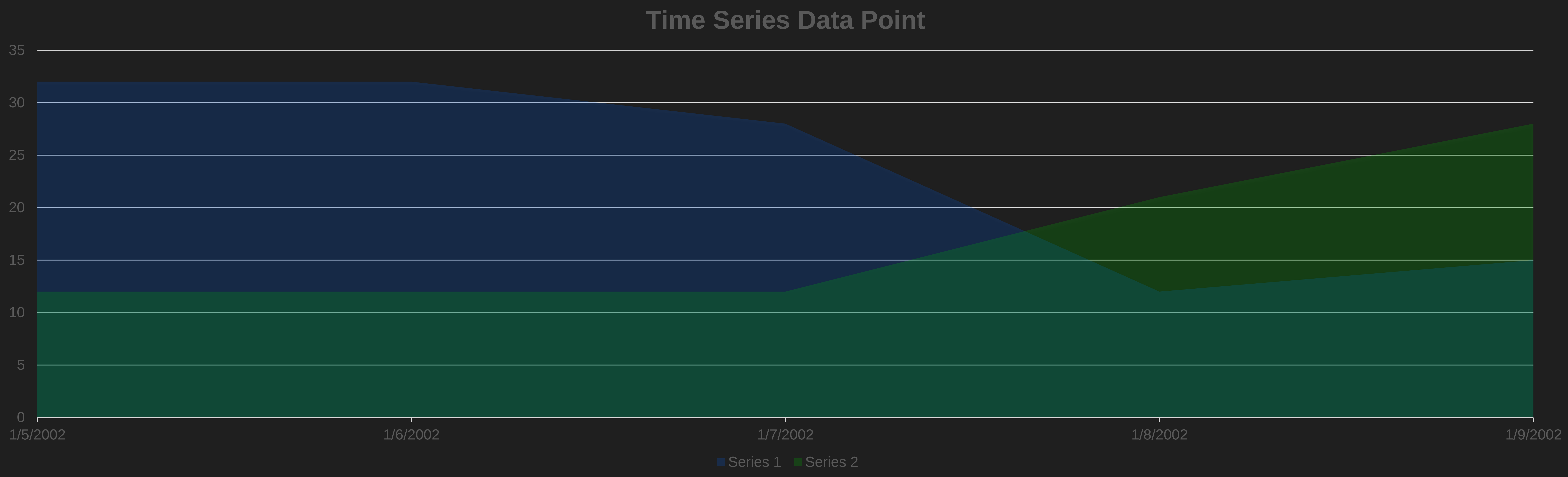
Information that represent "data point" for each point in time



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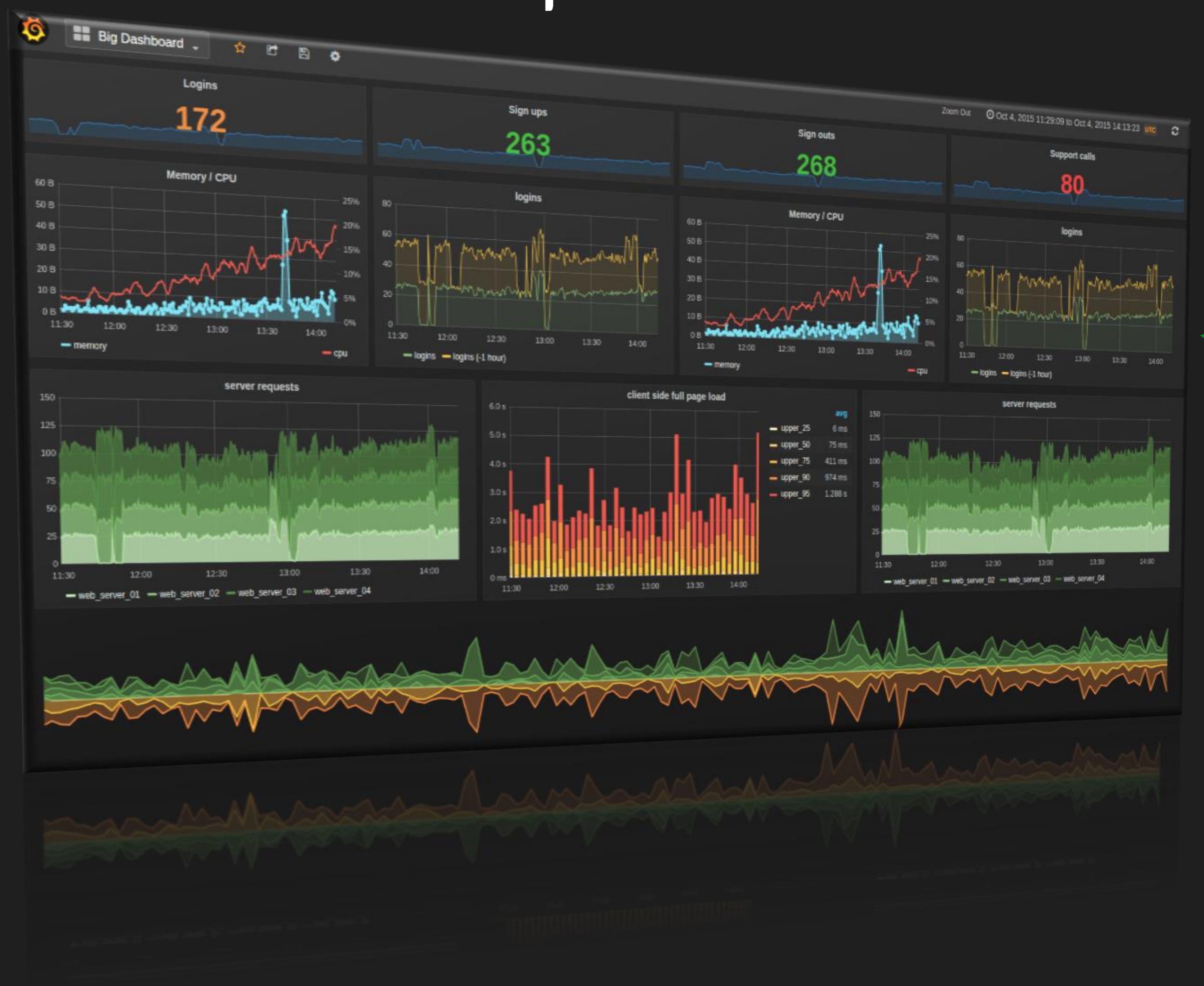
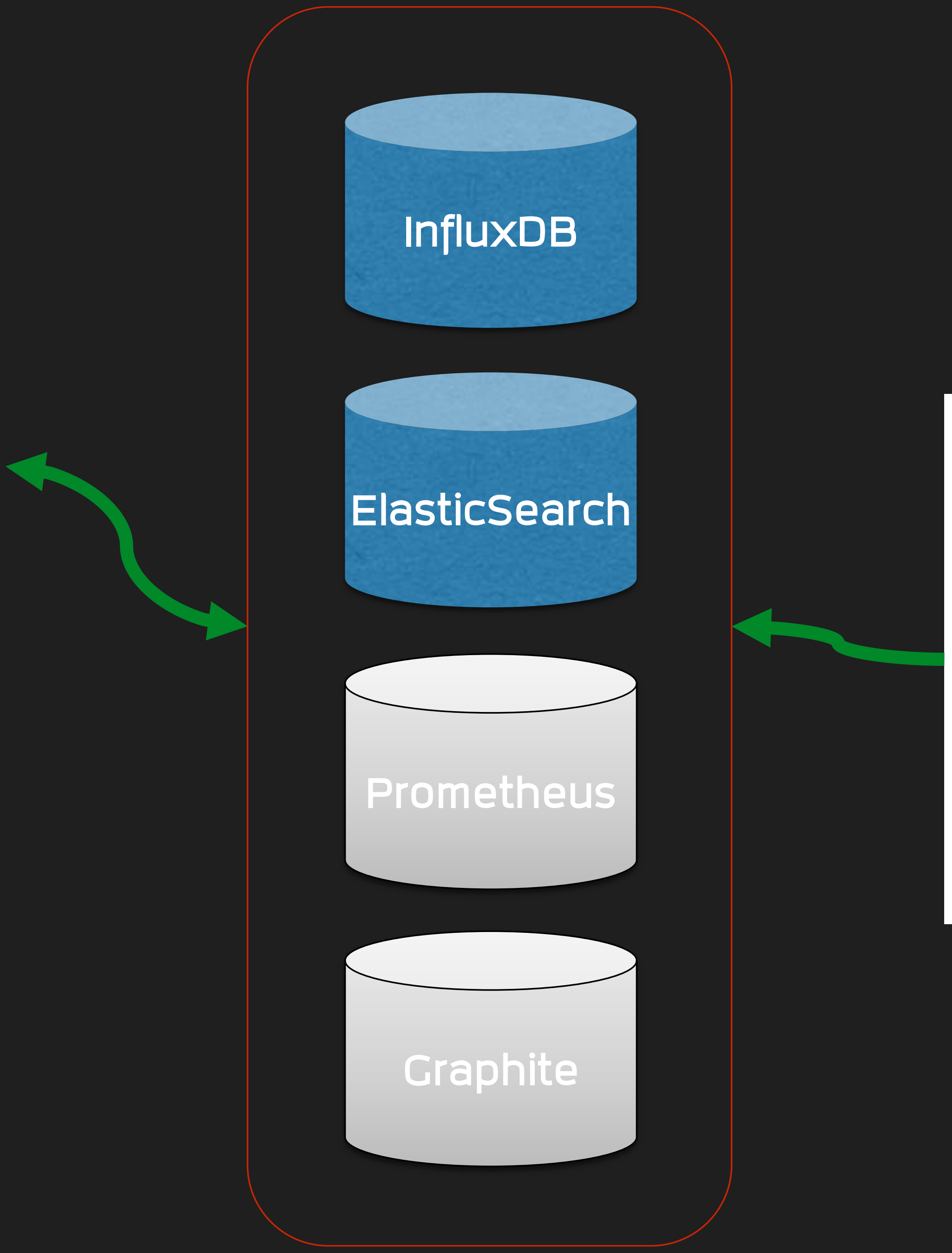
Time Series Database

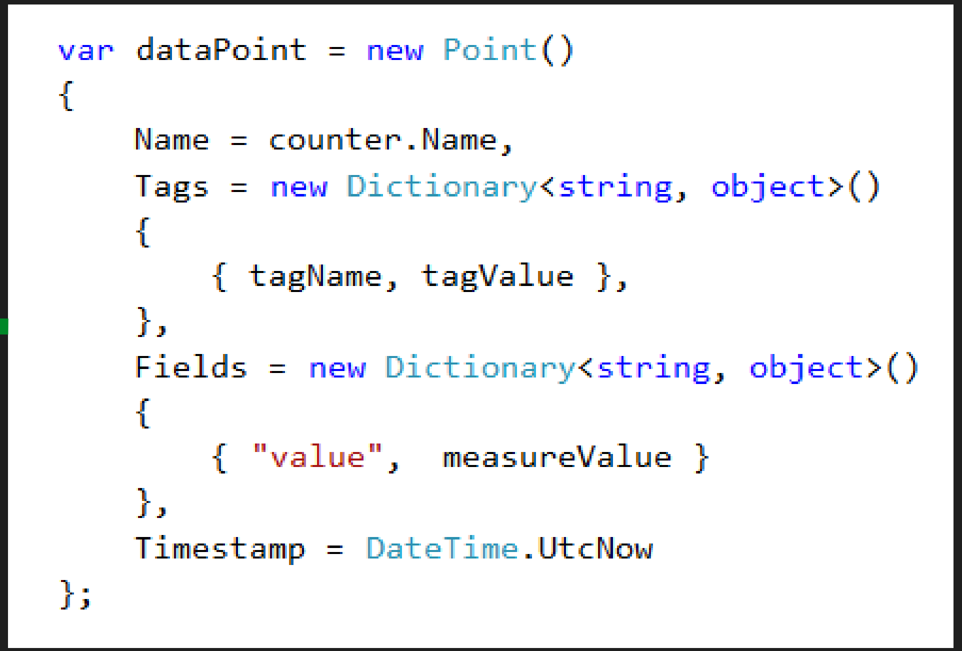
Grafana



Time Series Database



Metrics/Data Point



```
var dataPoint = new Point()
{
    Name = counter.Name,
    Tags = new Dictionary<string, object>()
    {
        { tagName, tagValue },
    },
    Fields = new Dictionary<string, object>()
    {
        { "value",  measureValue }
    },
    Timestamp = DateTime.UtcNow
};
```

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What you need

NuGet Packages

Metrics.Net	https://github.com/Recognos/Metrics.NET Install-Package Metrics.NET
InfluxData.Net	https://github.com/pootzko/InfluxData.Net Install-Package InfluxData.Net

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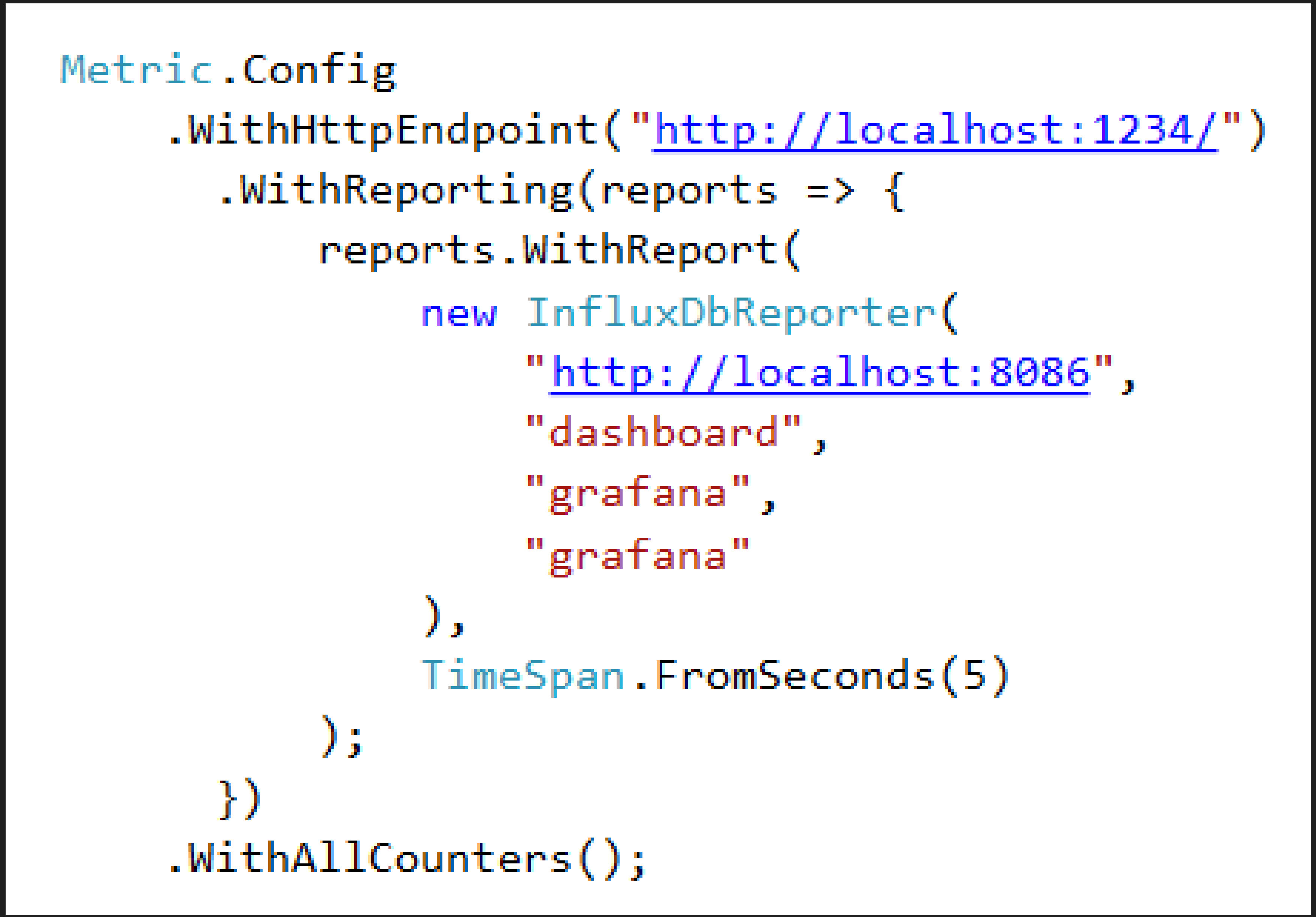
What you need



```
Metric.Config
    .WithHttpEndpoint("http://localhost:1234/")
      .WithReporting(reports => {
          reports.WithReport(
              new InfluxDbReporter(
                  "http://localhost:8086",
                  "dashboard",
                  "grafana",
                  "grafana"
              ),
              TimeSpan.FromSeconds(5)
          );
      })
    .WithAllCounters();
```

<- Visualization (Not for production)

<- Data Point Reporter

<- Reporting Interval

<- Measurement(s) to report

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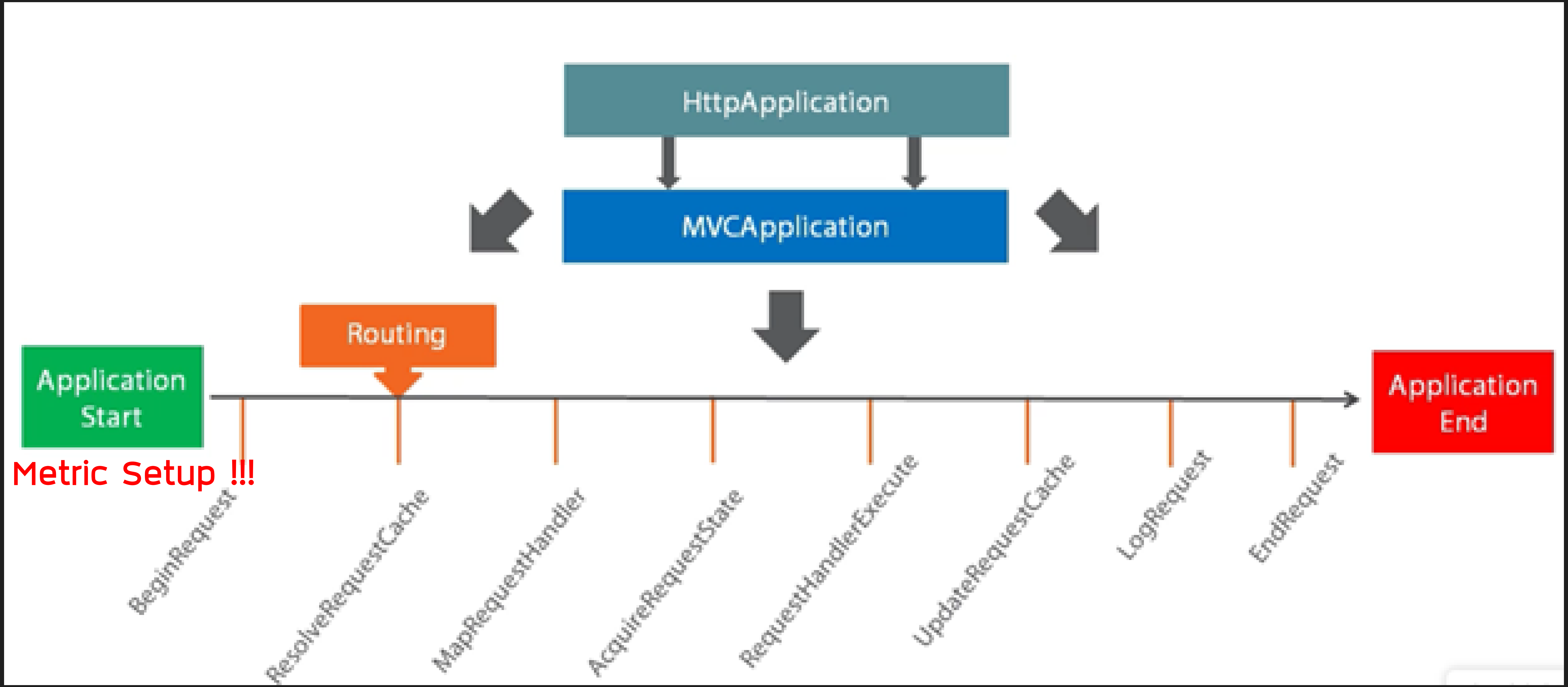
How to Measure



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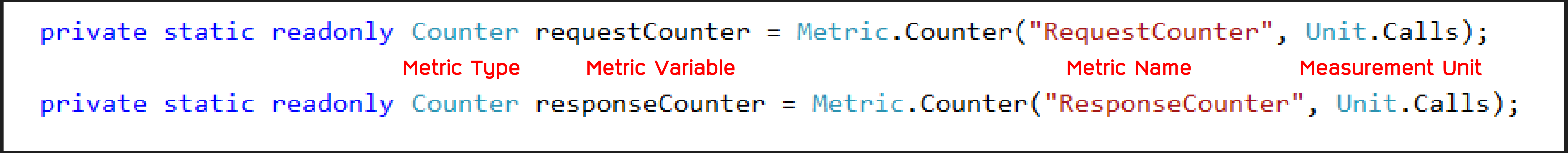
How to Measure



```
private static readonly Counter requestCounter = Metric.Counter("RequestCounter", Unit.Calls);
                        Metric Type  Metric Variable                 Metric Name         Measurement Unit
private static readonly Counter responseCounter = Metric.Counter("ResponseCounter", Unit.Calls);
```

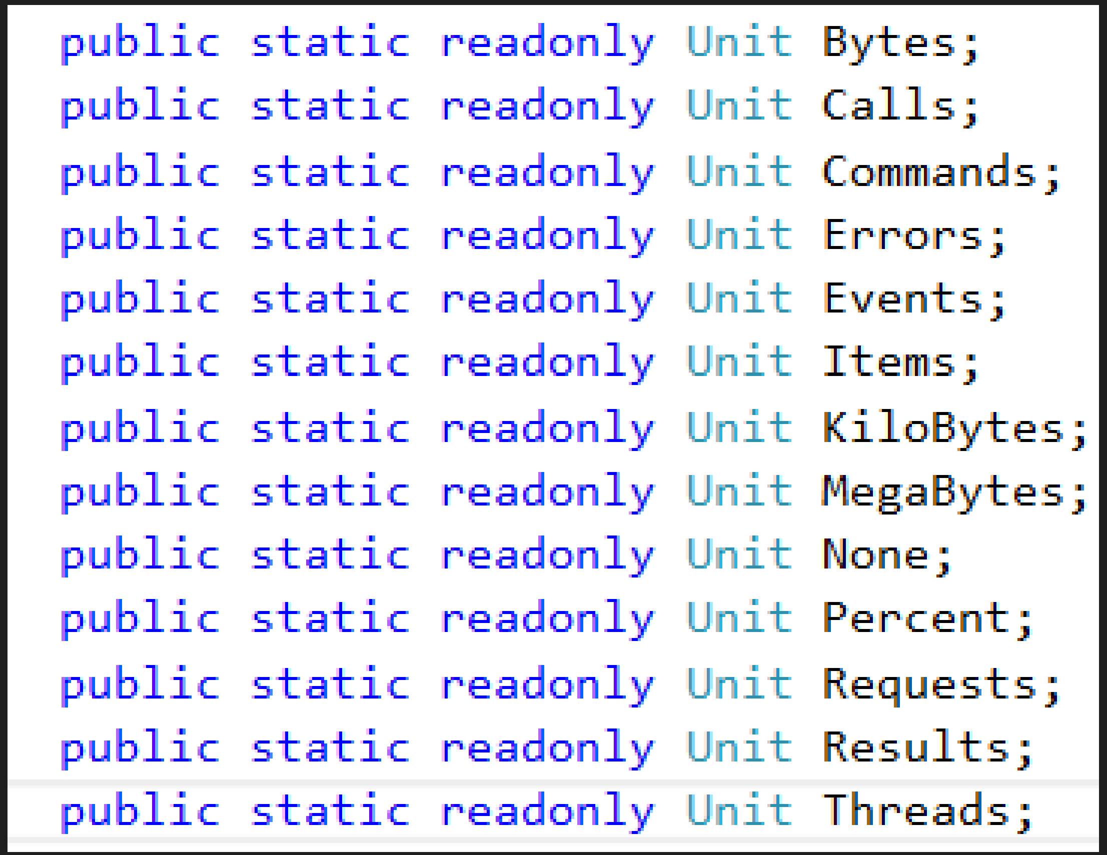
COUNTER 64-bit integer values that can be incremented and decremented

METER measures the rate at which an event occurs. (Counter, Mean, 1/5/15 minute rates)

HISTOGRAM measures the distribution of values and calculate Stats(Mean, Std.Dev, Median, Percentiles)

GUAGE represents an instantaneous value

TIMER a histogram of the duration of a type of event and a meter of the rate of its occurrence



```
public static readonly Unit Bytes;
public static readonly Unit Calls;
public static readonly Unit Commands;
public static readonly Unit Errors;
public static readonly Unit Events;
public static readonly Unit Items;
public static readonly Unit KiloBytes;
public static readonly Unit MegaBytes;
public static readonly Unit None;
public static readonly Unit Percent;
public static readonly Unit Requests;
public static readonly Unit Results;
public static readonly Unit Threads;
```

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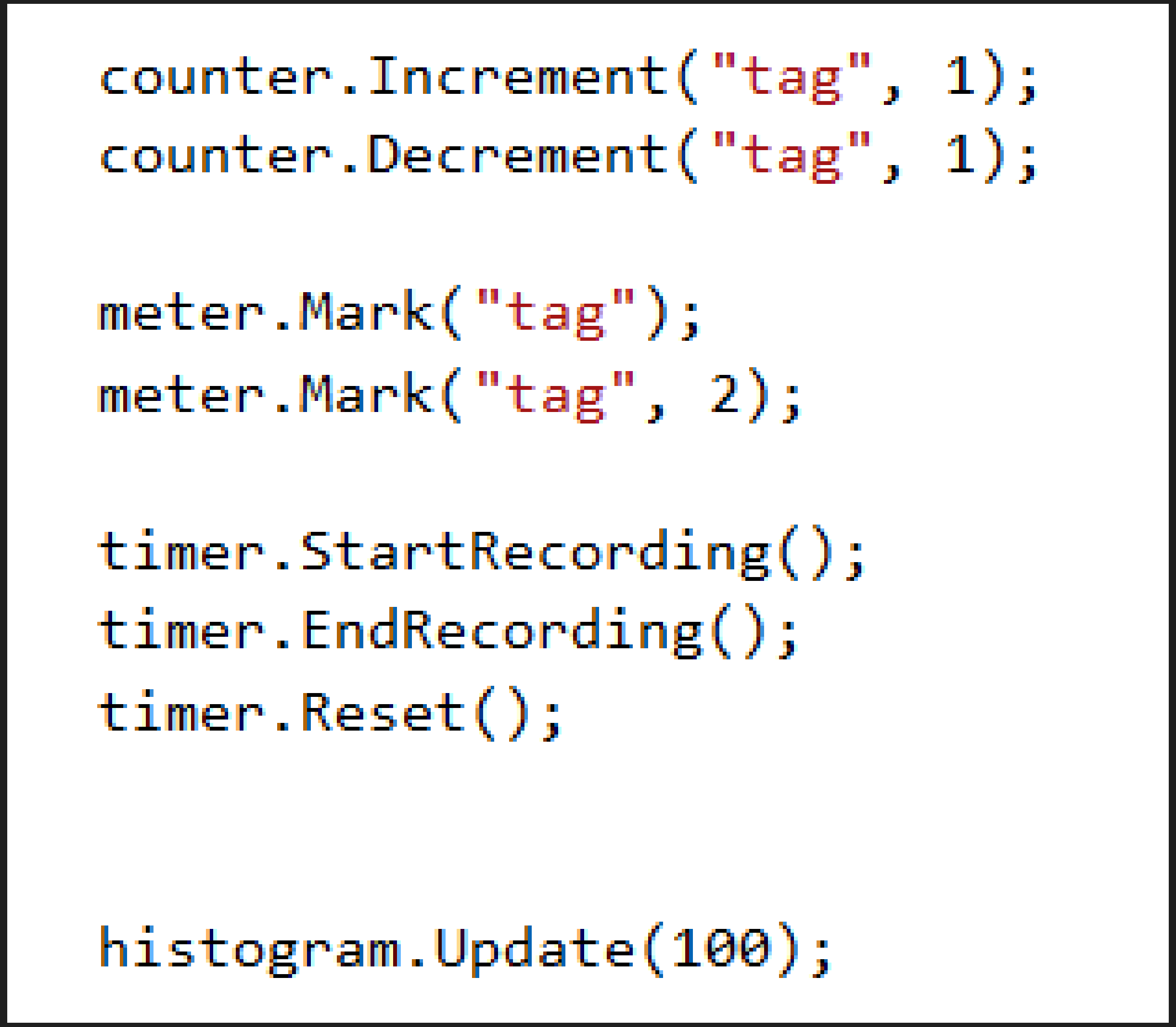
How to Measure



```
counter.Increment("tag", 1);
counter.Decrement("tag", 1);

meter.Mark("tag");
meter.Mark("tag", 2);

timer.StartRecording();
timer.EndRecording();
timer.Reset();


histogram.Update(100);
```

<- Counter

<- Meter

<- Timer

<- Histogram

How to Measure

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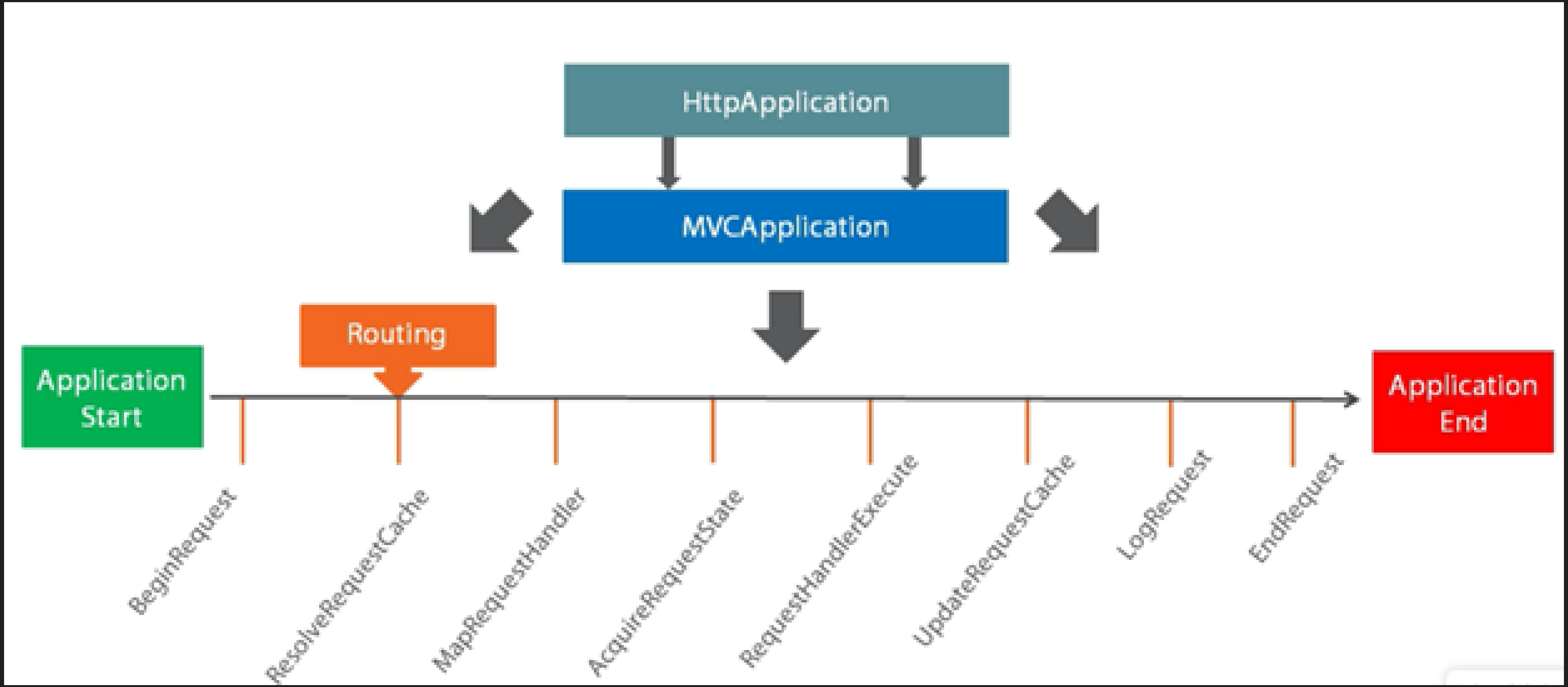

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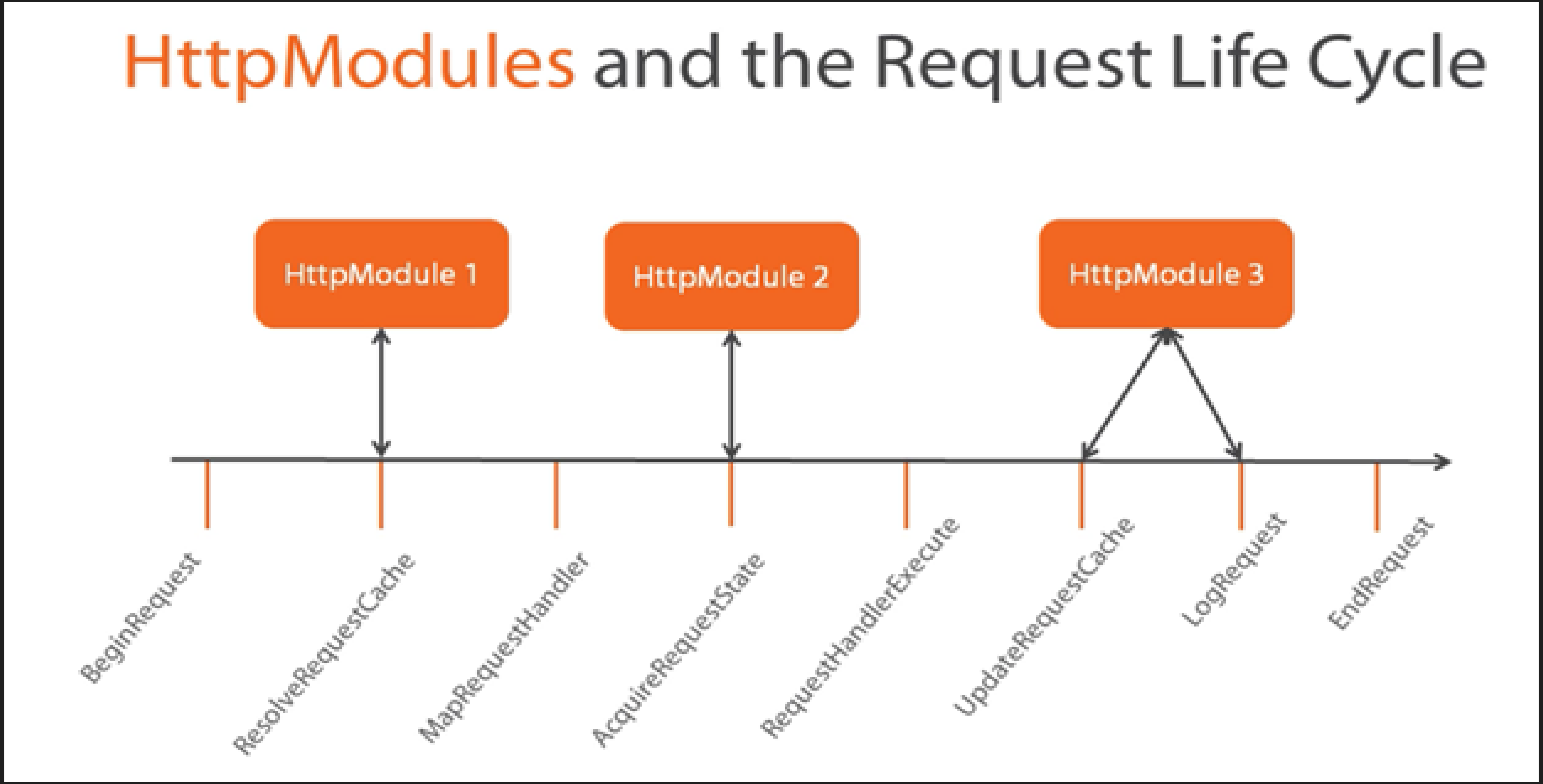
Where to measure



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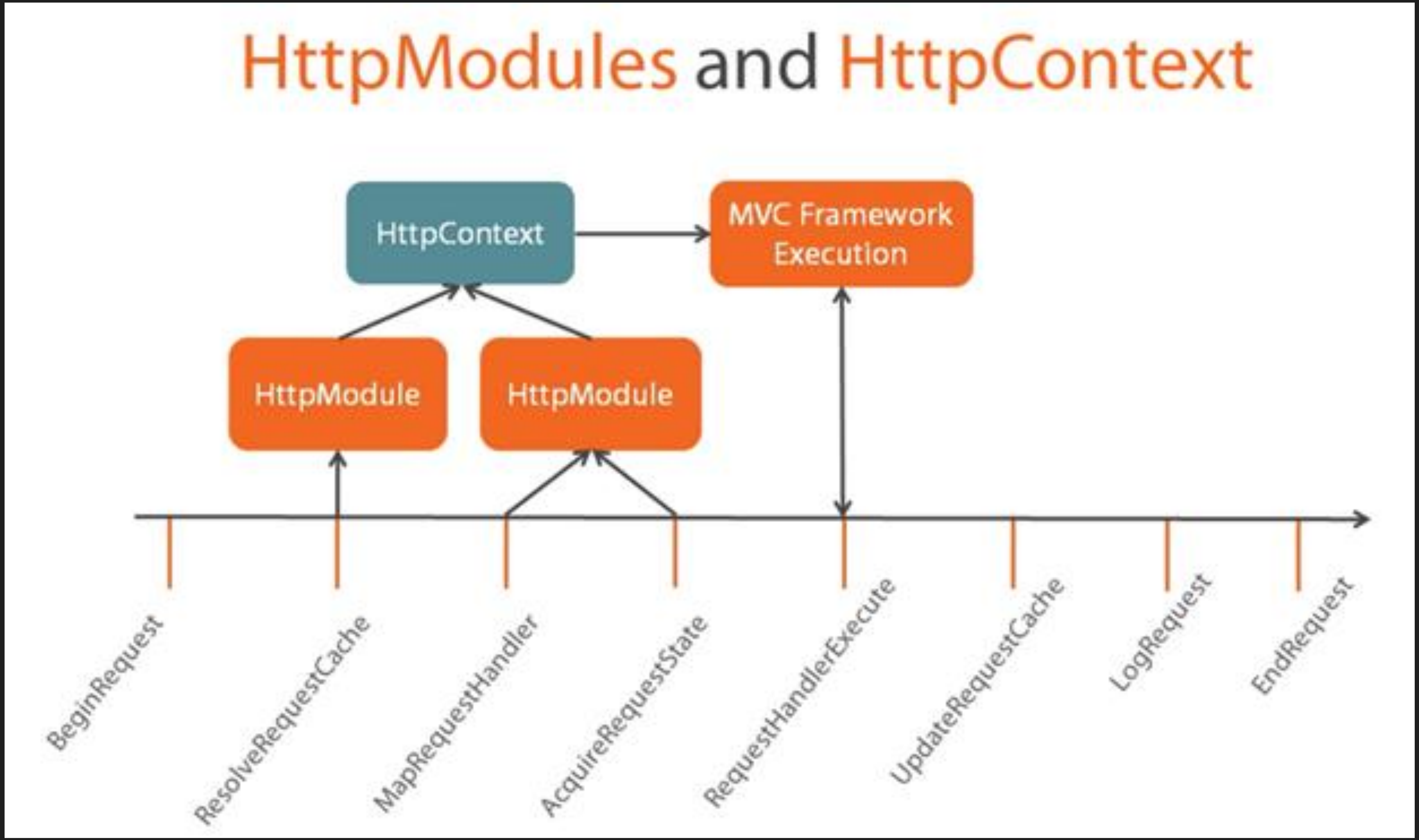

Where to measure

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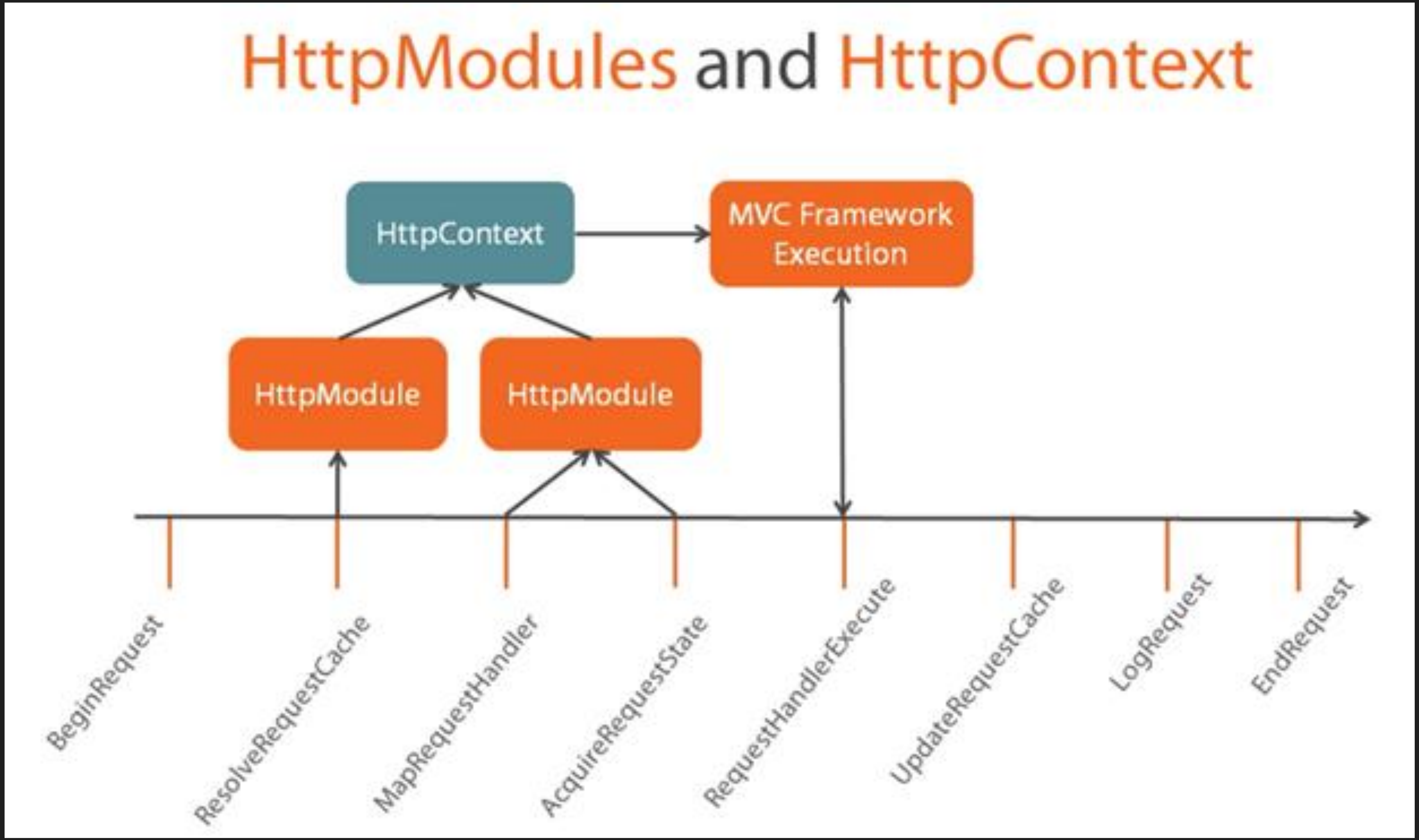

Where to measure

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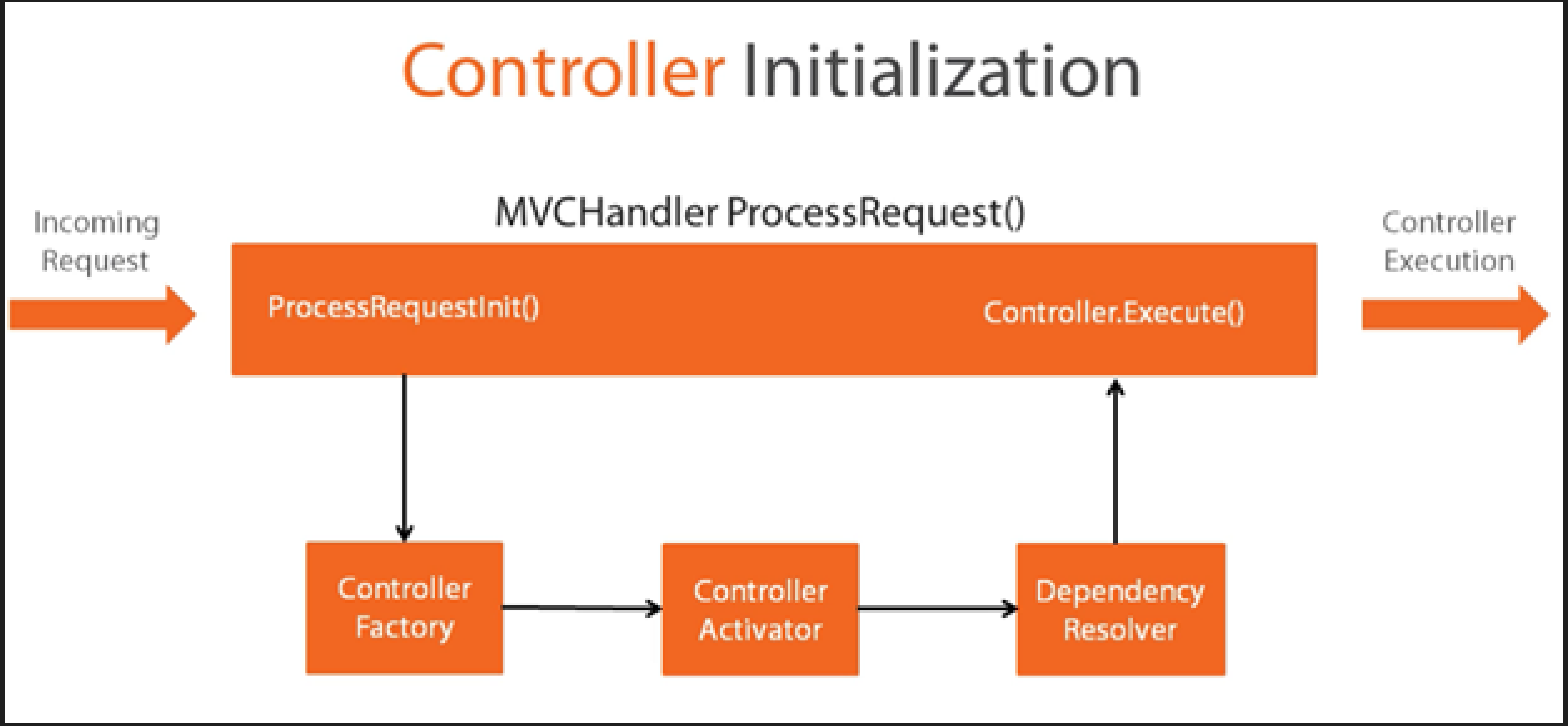

Where to measure

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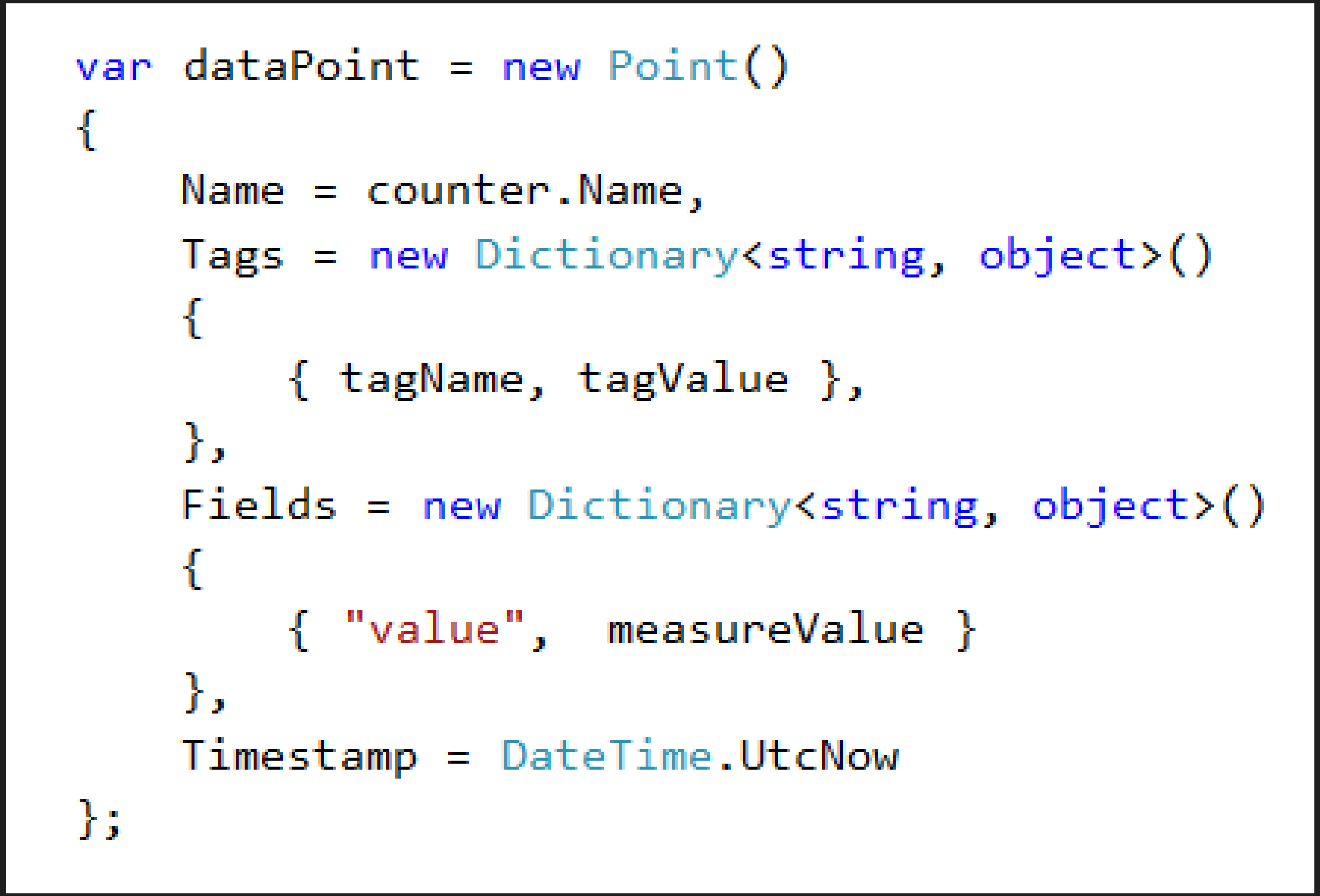
How to Report



```
var dataPoint = new Point()
{
    Name = counter.Name,
    Tags = new Dictionary<string, object>()
    {
        { tagName, tagValue },
    },
    Fields = new Dictionary<string, object>()
    {
        { "value",  measureValue }
    },
    Timestamp = DateTime.UtcNow
};
```

<- Measurement Name

<- Tags and its values

<- Fields and its values

<- Point of time

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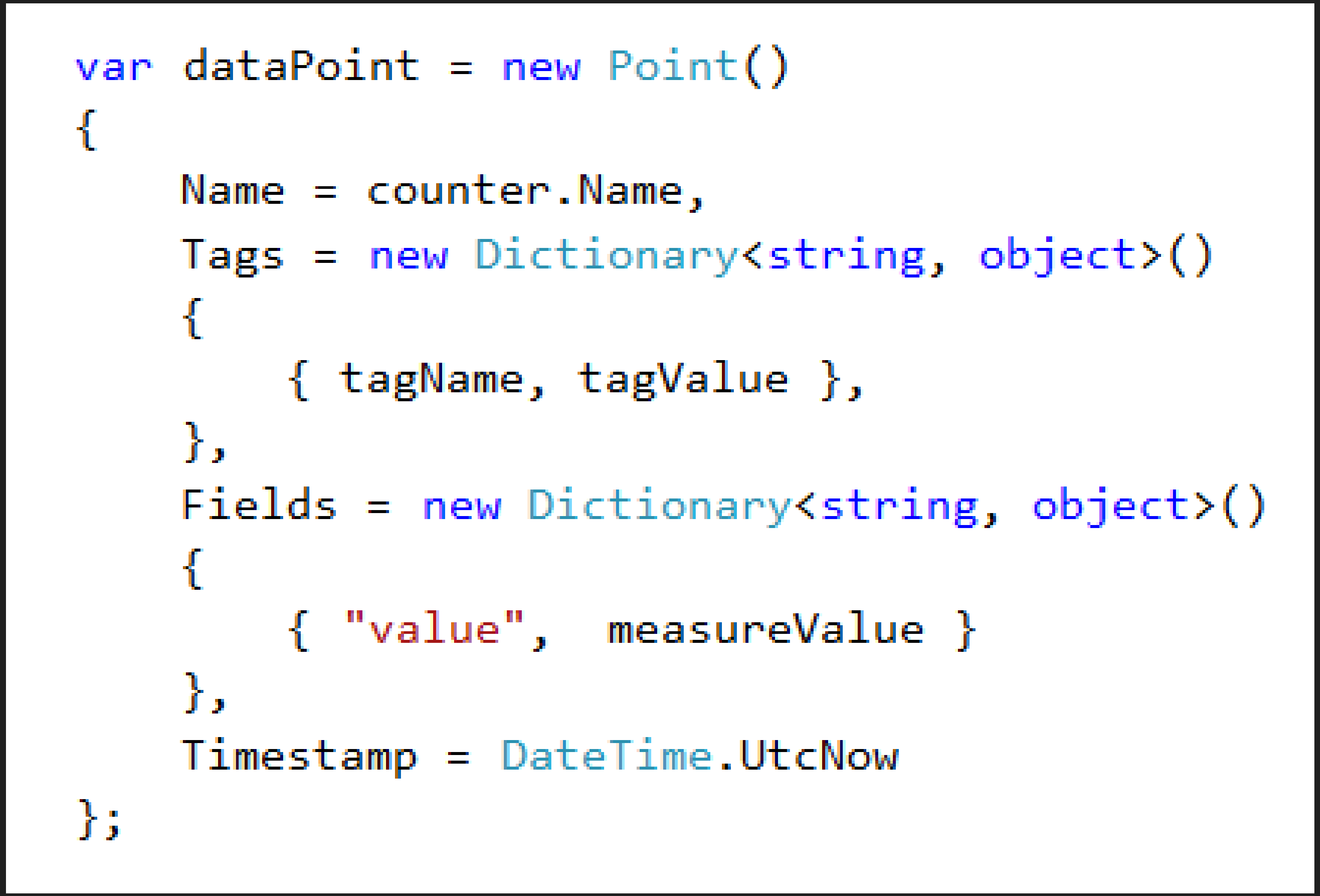

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    },
    Fields = new Dictionary<string, object>()
    {
        { "value",  measureValue }
    },
    Timestamp = DateTime.UtcNow
};
```

<- Measurement Name

<- Tags and its values

<- Fields and its values

<- Point of time

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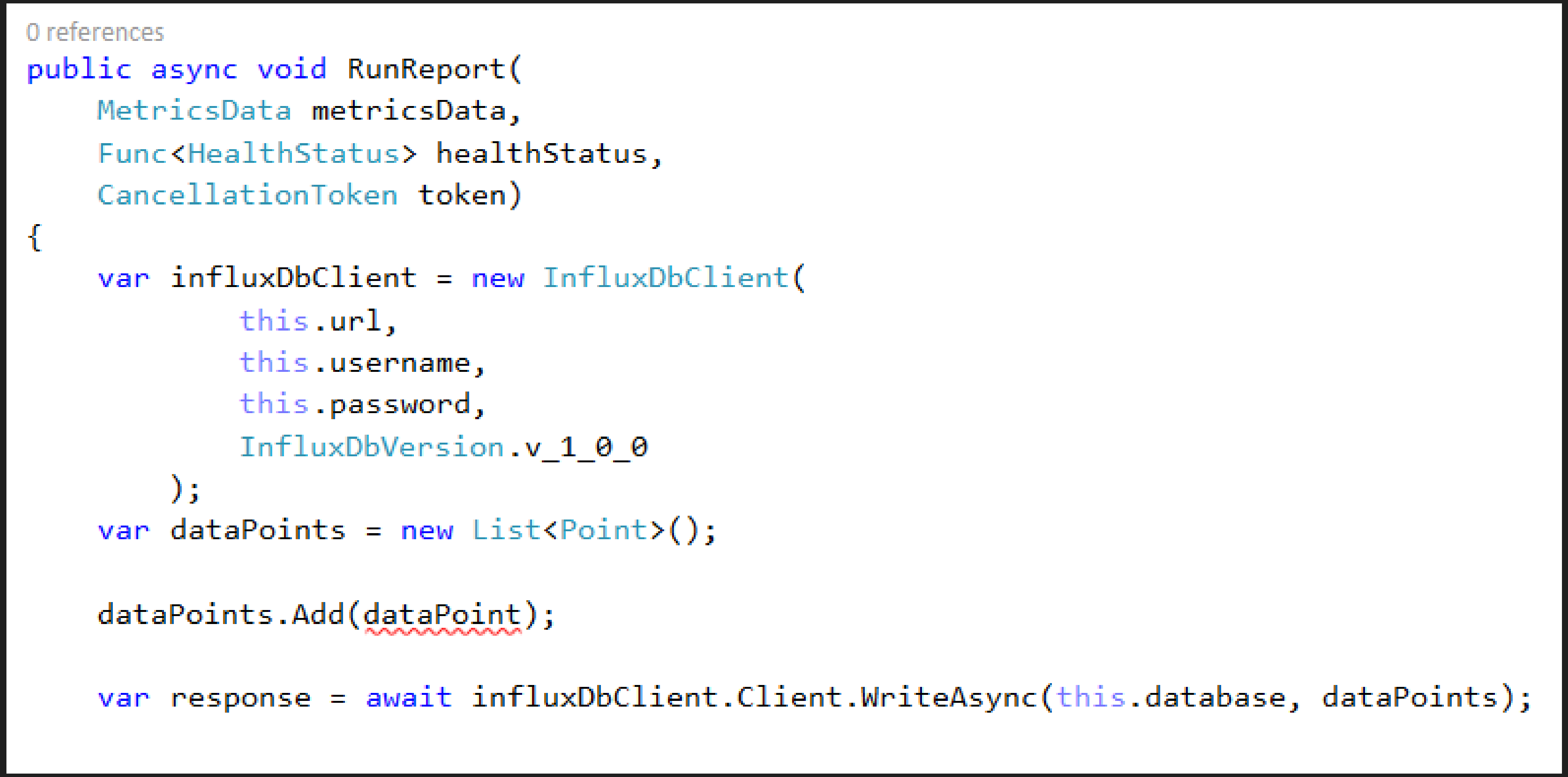
How to Report


```
0 references
public async void RunReport(
    MetricsData metricsData,
    Func<HealthStatus> healthStatus,
    CancellationToken token)
{
    var influxDbClient = new InfluxDbClient(
            this.url,
            this.username,
            this.password,
            InfluxDbVersion.v_1_0_0
        );
    var dataPoints = new List<Point>();

    dataPoints.Add(dataPoint);

    var response = await influxDbClient.Client.WriteAsync(this.database, dataPoints);
```

<- Custom Reporter

<- Connect to InfluxDb

<- Collect Data points

<- Send to InfluxDb

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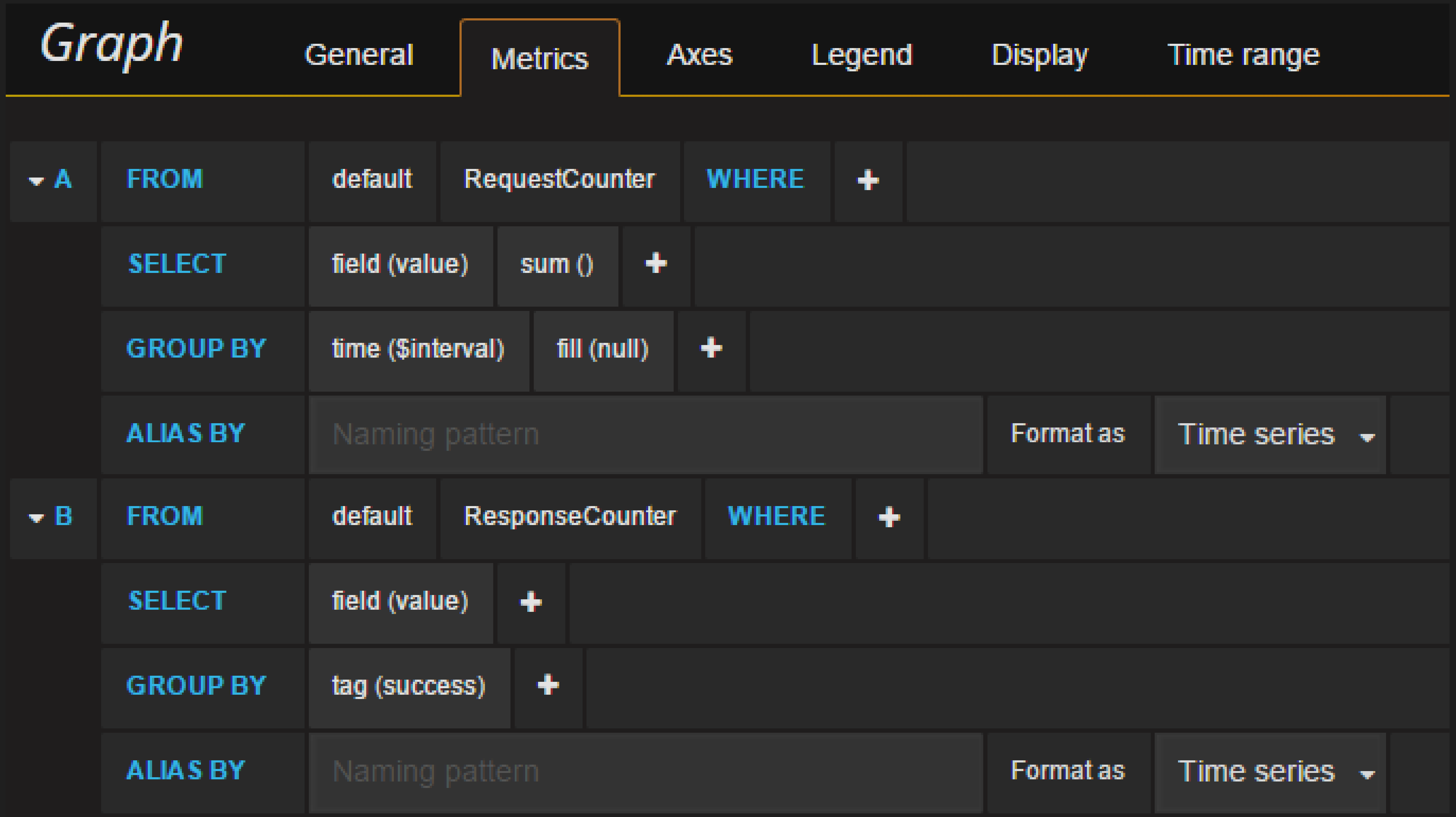
How to Report



Graph — General | Metrics | Axes | Legend | Display | Time range

```
A  FROM      default  RequestCounter  WHERE  +
   SELECT    field (value)  sum ()  +
   GROUP BY  time ($interval)  fill (null)  +
   ALIAS BY  Naming pattern          Format as  Time series
B  FROM      default  ResponseCounter  WHERE  +
   SELECT    field (value)  +
   GROUP BY  tag (success)  +
   ALIAS BY  Naming pattern          Format as  Time series
```

<- Measurement Name

<- Fields and aggregation

<- Tags and its values

<- Alias

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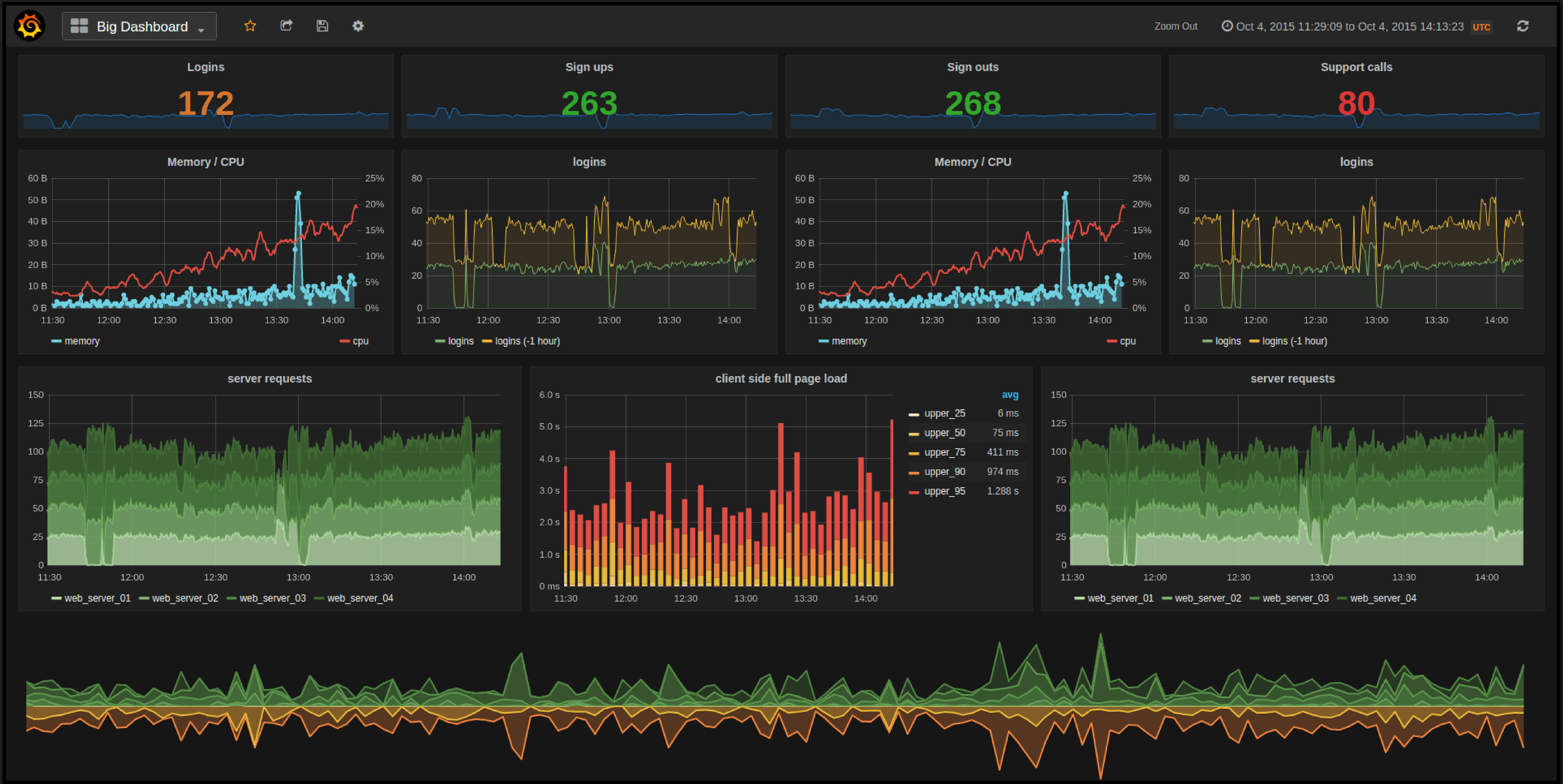
How to use Metrics



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How to use Metrics

DEMONSTRATION

https://github.com/bigbearsio/GrafanaDemo

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