

## **Kafka test setup (kafkaDelay3Full)**

Technology: Kafka Streams

Producer Delay (Send next message): 3ms

Full data set (qty): 8760

Processed values (qty): 1

Number of tests performed: 10

Start: Timestamp from Producer

End: Timestamp from Consumer

Unit: The results are given in seconds

## **Kafka median values**

End Subtract Start: 157.85399999999998

## **Kafka standard deviation**

End Subtract Start: 12.292242291787126

Lower Bound: 117.92447312463861

UpperBound: 191.67792687536138

Number of data in the std range: 10

Number of data outside the std range: 0

## **Kafka interquartile range**

End Subtract Start: 26.424499999999995

## **Kafka mean**

End Subtract Start: 154.8012

## **Kafka median (PM2.5)**

Median value: 13.721

## **Time of each sample**

168.107      164.804      168.624

140.405      141.531      168.332

140.632      161.978      153.73

139.869

## **Kafka test setup (kafkaDelay0Full)**

Technology: Kafka Streams

Producer Delay (Send next message): 0ms

Full data set (qty): 8760

Processed values (qty): 1

Number of tests performed: 10

Start: Timestamp from Producer

End: Timestamp from Consumer

Unit: The results are given in seconds

## **Kafka median values**

End Subtract Start: 46.434

## **Kafka standard deviation**

End Subtract Start: 7.677165841637135

Lower Bound: 21.3327024750886

Upper Bound: 67.39569752491141

Number of data in the std range: 10

Number of data outside the std range: 0

## **Kafka interquartile range**

End Subtract Start: 5.1967500000000015

## **Kafka mean**

End Subtract Start: 44.364200000000004

## **Kafka median (PM2.5)**

Median value: 13.721

## **Time of each sample**

27.122      43.279      47.243

48.136      45.625      50.948

33.437      53.256      45.325

49.271

## **Kafka test setup (kafkaDelay0Half)**

Technology: Kafka Streams

Producer Delay (Send next message): 0ms

Full data set (qty): 4380

Processed values (qty): 1

Number of tests performed: 10

Start: Timestamp from Producer

End: Timestamp from Consumer

Unit: The results are given in seconds

## **Kafka median values**

End Subtract Start: 45.6485

## **Kafka standard deviation**

End Subtract Start: 10.832403258741802

Lower Bound: 7.9675902237746

Upper Bound: 72.96200977622541

Number of data in the std range: 10

Number of data outside the std range: 0

## **Kafka interquartile range**

End Subtract Start: 9.823750000000004

## **Kafka mean**

End Subtract Start: 40.464800000000004

## **Kafka median (PM2.5)**

Median value: 16.5958

## **Time of each sample**

38.714      47.505      49.474

38.437      19.103      49.963

48.563      21.466      43.792

47.631

## **Spark test setup (sparkDelay3Full)**

Technology: Spark Structured Streaming  
Producer Delay (Send next message): 3ms  
Full data set (qty): 8760  
Processed values (qty): 1  
Number of tests performed: 10  
Start: Timestamp from Producer  
End: Timestamp from Consumer  
Unit: The results are given in seconds

## **Spark median values**

End Subtract Start: 208.6245

## **Spark standard deviation**

End Subtract Start: 51.85474453519176  
Lower Bound: 59.296466394424755  
Upper Bound: 370.42493360557535  
Number of data in the std range: 10  
Number of data outside the std range: 0

## **Spark interquartile range**

End Subtract Start: 94.38650000000001

## **Spark mean**

End Subtract Start: 214.86070000000004

## **Spark median (PM2.5)**

Median value: 13.7189

## **Time of each sample**

143.764	199.399	159.706
155.038	266.889	217.85
263.861	187.228	302.563
252.309		

## **Spark test setup (sparkDelay0Full)**

Technology: Spark Structured Streaming  
Producer Delay (Send next message): 0ms  
Full data set (qty): 8760  
Processed values (qty): 1  
Number of tests performed: 10  
Start: Timestamp from Producer  
End: Timestamp from Consumer  
Unit: The results are given in seconds

## **Spark median values**

End Subtract Start: 95.396

## **Spark standard deviation**

End Subtract Start: 17.40712427829479  
Lower Bound: 42.345027165115624  
Upper Bound: 146.78777283488438  
Number of data in the std range: 10  
Number of data outside the std range: 0

## **Spark interquartile range**

End Subtract Start: 28.747

## **Spark mean**

End Subtract Start: 94.5664

## **Spark median (PM2.5)**

Median value: 13.717499999999998

## **Time of each sample**

96.661	100.519	76.937
116.684	90.336	71.084
94.131	119.409	111.872
68.031		

## **Spark test setup (sparkDelay0Half)**

Technology: Spark Structured Streaming  
Producer Delay (Send next message): 0ms  
Full data set (qty): 4380  
Processed values (qty): 1  
Number of tests performed: 10  
Start: Timestamp from Producer  
End: Timestamp from Consumer  
Unit: The results are given in seconds

## **Spark median values**

End Subtract Start: 95.1185

## **Spark standard deviation**

End Subtract Start: 12.689197874176285  
Lower Bound: 57.82130637747115  
Upper Bound: 133.95649362252885  
Number of data in the std range: 10  
Number of data outside the std range: 0

## **Spark interquartile range**

End Subtract Start: 19.673999999999992

## **Spark mean**

End Subtract Start: 95.8889

## **Spark median (PM2.5)**

Median value: 16.5958

## **Time of each sample**

90.2	101.942	84.183
114.496	113.084	73.273
84.578	95.604	106.896
94.633		