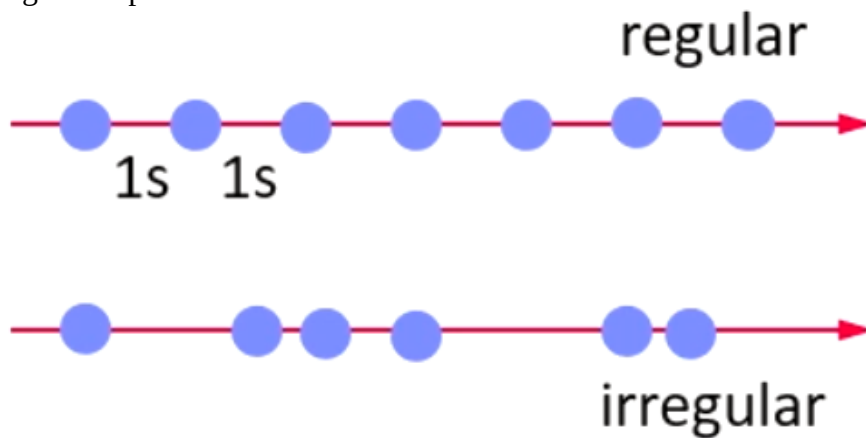


Overview

- time series is sequence of data entries
 - usually in periodic intervals
 - e.g. data every second

Time series X is a sequence of data points x_i for a specific measurement identity (e.g., sensor) and time granularity

- time intervals
 - regular - periodic/equidistant
 - irregular - aperiodic



-
- allow dedicated storage and analysis techniques
- used in following domains
 - IoT
 - sensor networks
 - smart production/telemetry
 - stock trading
 - server/application metrics
 - event/log streams
- applications
 - monitoring
 - anomaly detection
 - time series forecasting

InfluxDB Example

Compression (of blocks)

- **Compress up to 1000 values per block** (Type | Len | Timestamps | Values)
- **Timestamps:** Delta + Run-length encoding for regular time series;
Simple8B or uncompressed for irregular
- **Values:** double delta for FP64, bits for Bool, double delta + zig zag for INT64,
Snappy for strings

Query Processing

- SQL-like and functional APIs for
filtering (e.g., range) and aggregation
- Inverted indexes

```
SELECT percentile(90, user)
FROM cpu WHERE time>now()-12h
AND "region"='west'
GROUP BY time(10m), host
```

Posting lists:

Measurement to fields:

cpu → [user,sys,idle]

host → [A, B]

Region → [west, east]

cpu → [1,2,3,4,5,6]

host=A → [1,2,3]

host=B → [4,5,6]

region=west → [1,2,3]

[[Data Models]]