# Key-Value Stores and Streams

Streaming data may involve a flexible set of measures arriving at unpredictable times. Structures that may be useful for streaming data include the tall structure (like for event data) or a key value store. With a tall structure measure variables, may be associated with identifier variables (such as a sensor identifier) and attribute variables (such as time of measurement, time of receipt, location of measurement).

Measures may involve datatypes note currently described in DDI (images, sound recording, etc.) but envisioned for future updates such as for Qualitative data.

An example sensor observation from the W3C Semantic Sensor Network Ontology (SSN) (<https://www.w3.org/TR/vocab-ssn/#iphone_barometer-sosa>) is of a barometric pressure taken by an iPhone. The SSN RDF for the Observation is:

<Observation/346344> rdf:type sosa:Observation ;

sosa:observedProperty <sensor/35-207306-844818-0/BMP282/atmosphericPressure> ;

sosa:hasFeatureOfInterest <earthAtmosphere> ;

sosa:madeBySensor <sensor/35-207306-844818-0/BMP282> ;

sosa:hasSimpleResult "1021.45 hPa"^^cdt:ucum ;

sosa:resultTime "2017-06-06T12:36:12Z"^^xsd:dateTime .

A tall representation for the data might look like this, where the value atmosphericPressurehPa is a code that points to a variable that links to the Concept “earthAtmosphere” in units of hectoPascal (hPa).

|  |  |  |  |
| --- | --- | --- | --- |
| SensorID | Property | Time | ResultingValue |
| sensor/35-207306-844818-0/BMP282 | atmosphericPressurehPa | 2017-06-06T12:36:12Z | 1021.45 |

A Key-Value representation might look like this. The SensorID and Property are concatenated into a single Key. The Key could be decomposed into the SensorID and Property components as needed.

|  |  |  |
| --- | --- | --- |
| Key | Time | ResultingValue |
| sensor/35-207306-844818-0/BMP282/atmosphericPressure | 2017-06-06T12:36:12Z | 1021.45 |