GridAPPSD Sensor Simulator

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Contents

The *GridAPPSD's Sensor Simulator* simulates real devices based upon the magnitude of "prestine" simulated values. This service has been specifically designed to work within the gridappsd platform container. The *GridAPPSD* platform will start the service when it is specified as a dependency of an application or when a service configuration is specified within the GridAPPSD Visualization. The image below shows a portion of the configuration options available through the service configuration panel.

Python Application Usage

The python application using this service should require *gridappsd-sensor-simulator* as a requirement. In addition, the following python code shows how to get the correct topic for the service.

Service Configuration

The sensor-config in the above image shows an example of how to configure a portion of the system to have sensor output. Each mrid (*_99db0dc7-ccda-4ed5-a772-a7db362e9818*) will be monitored by this service and either use the default values or use the specified values during the service runtime.

```
{
    "_99db0dc7-ccda-4ed5-a772-a7db362e9818": {
        "nominal-value": 100,
        "perunit-confidence-band": 0.01,
        "aggregation-interval": 30,
        "perunit-drop-rate": 0.01
    },
    "_ee65ee31-a900-4f98-bf57-e752be924c4d":{},
    "_f2673c22-654b-452a-8297-45dae11b1e14": {}
}
```

The other options for the service are:

- default-perunit-confidence-band

- default-aggregation-interval

- default-perunit-drop-rate

- passthrough-if-not-specified

These options will be used when not specified within the sensor-config block.

Note: Currently the nominal-value is not looked up from the database. At this time services aren't able to tell the platform when they are "ready". This will be implemented in the near future and then all of the nominal-values will be queried from the database.

Request Example

The following is a full request example for use within the context of the main GridAPPSD api. This example uses the 123 node system with 3 sensors simulated. Also for this example those are the only measurements that will be published to the output sensor output topic.

```json
{
    "power_system_config": {
        "GeographicalRegion_name": "_73C512BD-7249-4F50-50DA-D93849B89C43",
        "SubGeographicalRegion_name": "_1CD7D2EE-3C91-3248-5662-A43EFEFAC224",
        "Line_name": "_C1C3E687-6FFD-C753-582B-632A27E28507"
    },
    "application_config": {
        "applications": []
    },
    "simulation_config": {
        "start_time": "1570041113",
        "duration": "120",
        "simulator": "GridLAB-D",
        "timestep_frequency": "1000",
        "timestep_increment": "1000",
        "run_realtime": false,
        "simulation_name": "ieee123",
        "power_flow_solver_method": "NR",
        "model_creation_config": {
            "load_scaling_factor": "1",
            "schedule_name": "ieeezipload",
            "z_fraction": "0",
            "i_fraction": "1",
            "p_fraction": "0",
            "randomize_zipload_fractions": false,
            "use_houses": false
        }
    },
    "test_config": {
        "events": [],
```

```
        "appId": ""
    },
    "service_configs": [{
        "id": "gridappsd-sensor-simulator",
        "user_options": {
            "sensors-config": {
                "_99db0dc7-ccda-4ed5-a772-a7db362e9818": {
                    "nominal-value": 100,
                    "perunit-confidence-band": 0.02,
                    "aggregation-interval": 5,
                    "perunit-drop-rate": 0.01
                },
                "_ee65ee31-a900-4f98-bf57-e752be924c4d": {},
                "_f2673c22-654b-452a-8297-45dae11b1e14": {}
            },
            "random-seed": 0,
            "default-aggregation-interval": 30,
            "passthrough-if-not-specified": false,
            "default-perunit-confidence-band": 0.01,
            "default-perunit-drop-rate": 0.05
        }
    }]
}
```

Further information about the GridAPPSD platform can be found at https://gridappsd.readthedocs.org.