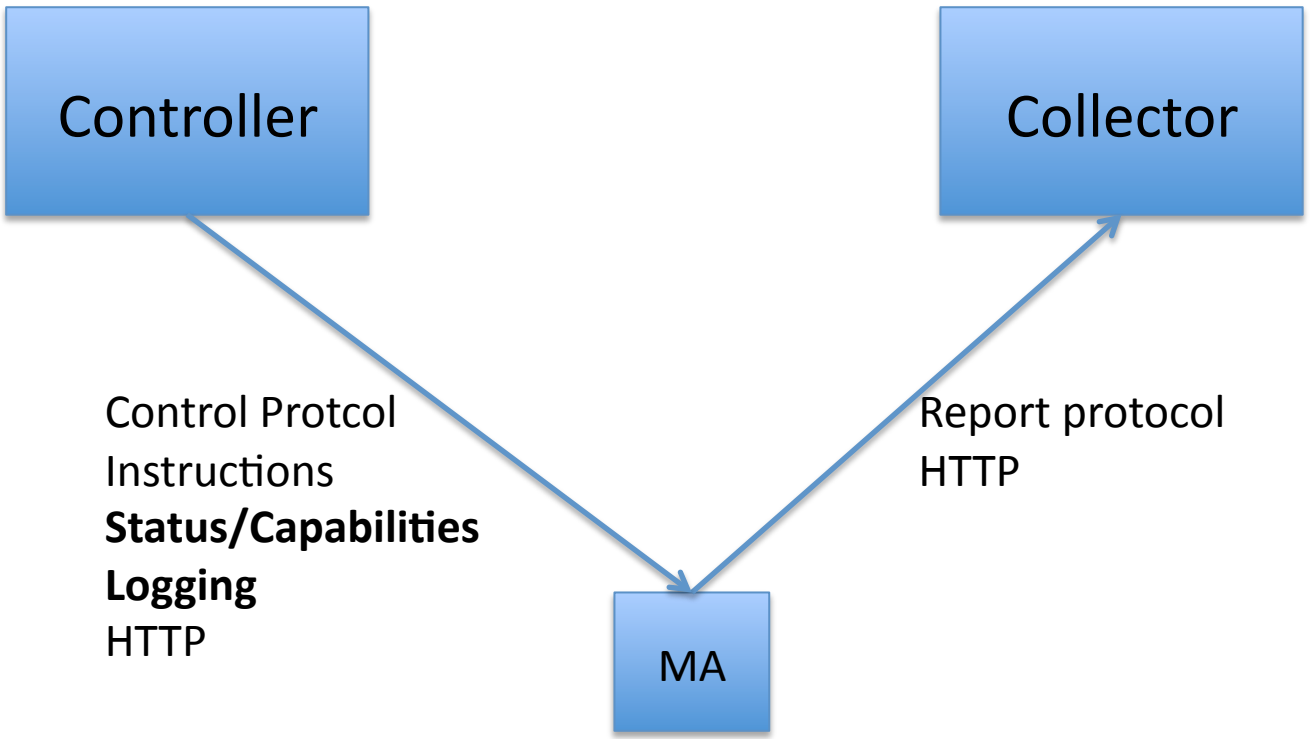
Large MeAsurement Platform Protocol based on HTTP

draft-bagnulo-lmap-http-01

M. Bagnulo, T. Burbridge, S. Crawford, J. Schoenwaelder, V. Bajpai

LMAP WG – IETF88

Big Picture



HTTP used a Transport
Data Model expressed in JSON

Simple example

- Simple scenario with these elements:
  - a Controller with FQDN controller.example.org,
  - a Collector with FQDN collector.example.org, and
  - a MA with UUID f47ac10b-58cc-4372-a567-0e02b2c3d479
- Test to be performed:
  - A UDP latency test, without cross-traffic, that reports the 99th percentile mean of a burst of packets sent following a Poisson distribution that lasts for 30 seconds and with rate 5 packets per second. The destination address is 192.0.2.1 and the destination and source port are 50000. We want to repeat this test for 7 days every hour. Report the results every hour.

Channel

- Defines a communication channel between the MA and other element of LMAP framework
  - with the Collector to report results back,
  - with the Controller to retrieve Instructions or report status/capabilities and logging information
    - Target: URL
    - Certificate: X.509 Certificate
    - Communication Timing: Timing

MA pre-configuration and configuration

- Before MA deployment
  - Channel with the Controller
  - MA ID (depends on the scenario)
- After deployment
  - Retrieves set of channels for
    - Instructions
    - Status/capabilities
    - Logging
    - Report

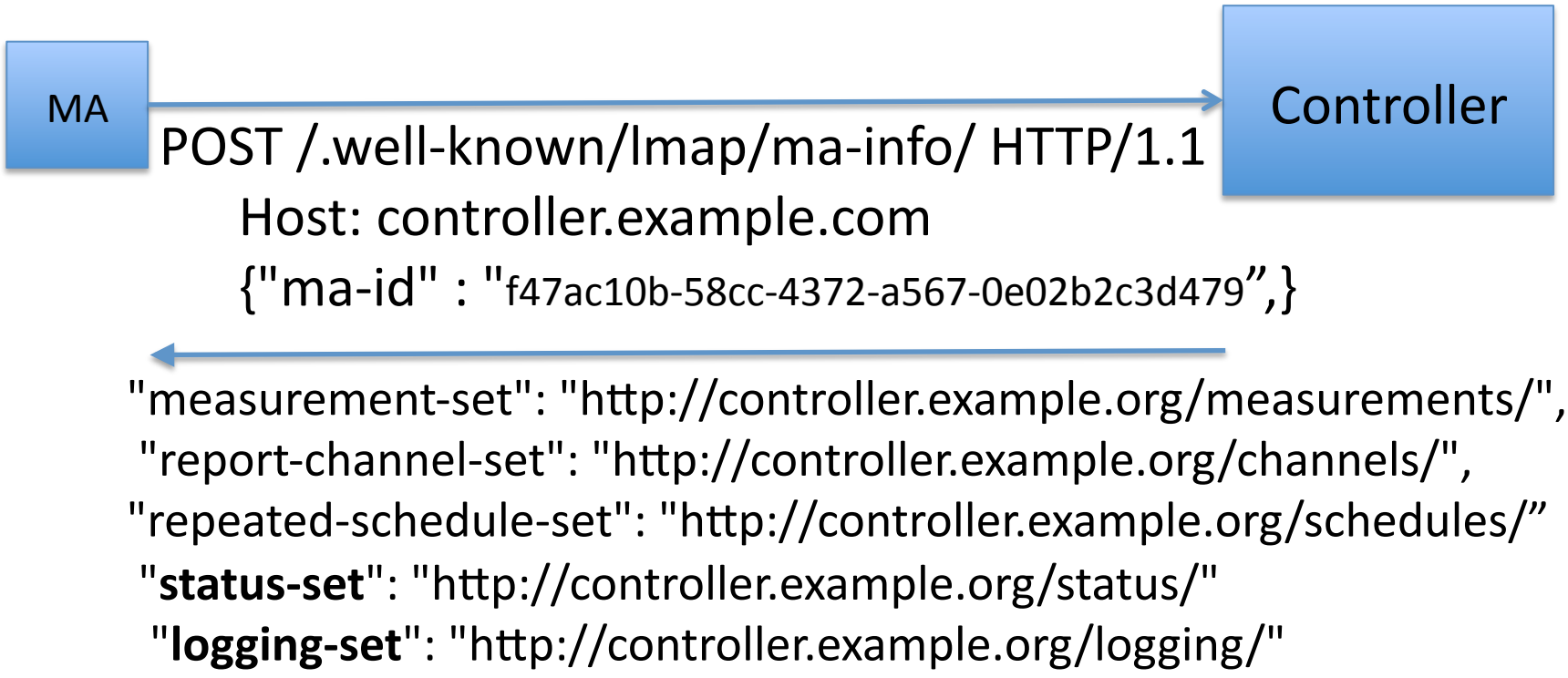
Pre-configuration in the example

- Target: http://controller.example.org/.well-known/lmap/ma-info/
- Timing: Inmediate

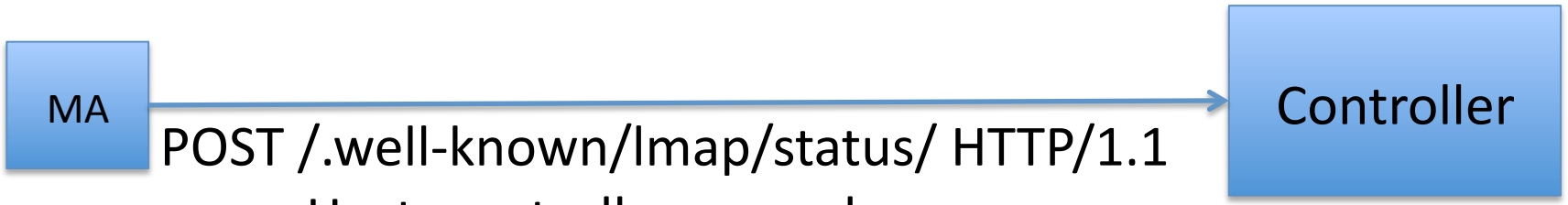
GET versus POST

- We are using POST to avoid overloading the URLs with MA and other information

Control Protocol: Retrieving Channels

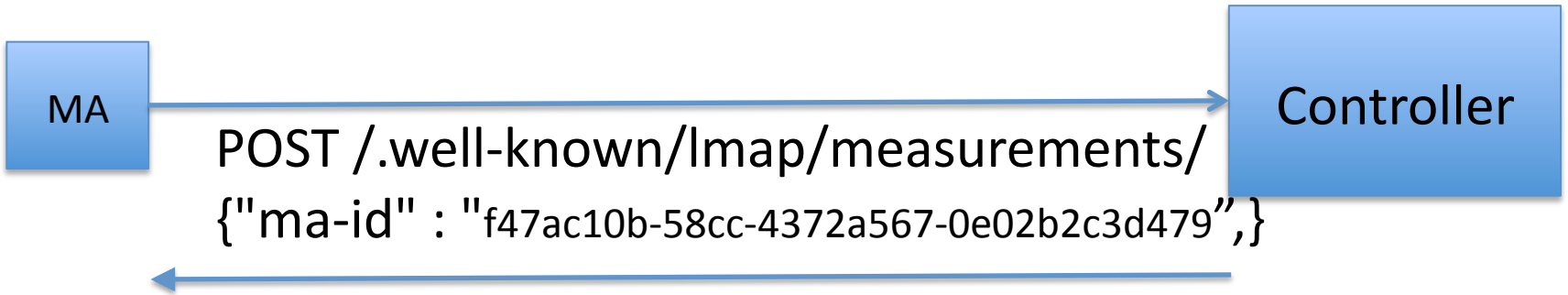


Control Protocol: Status information



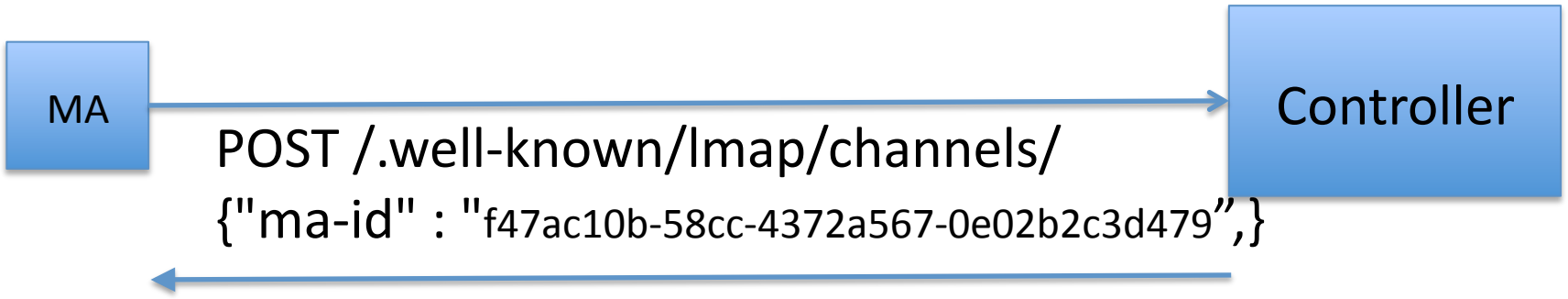

```
POST /.well-known/lmap/status/ HTTP/1.1
        Host: controller.example.com
{"ma-id" : "f47ac10b-58cc-4372a567-0e02b2c3d479",
         "ma-interfaces: [
             {"if-name" : eth0
              "if-type" : ethernetCsmacd
              "ip-adddress" :{
                   "protocol": v4
                   "address": 10.1.1.1}
              }]
          "supported-measurements":[
              {"metric": UDP_Latency}]
    }
```

Control Protocol: Retrieving Instructions



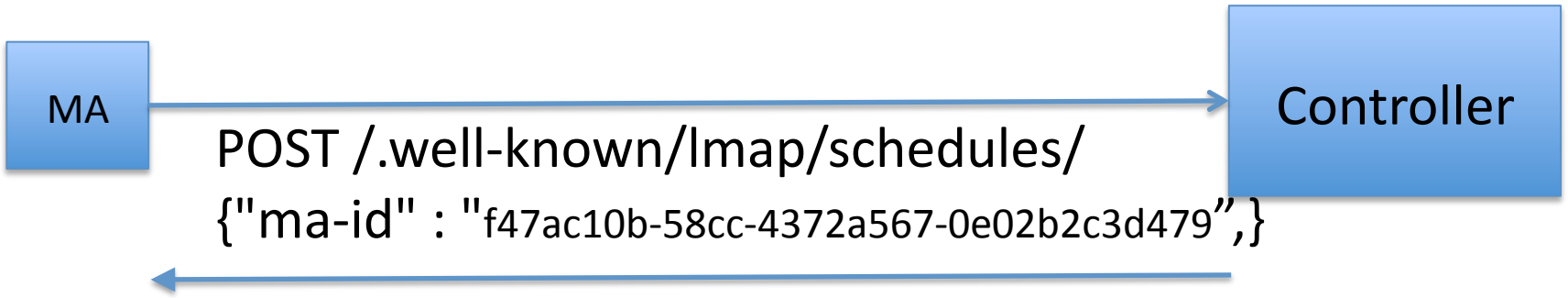

```
"tests": [{ "name": "latency",
            "metric": "UDP_Latency",
            "options": [{ "environment": "No-cross-traffic",
                          "Output-type": "Xth-percentile-mean",
                          "X": "99",
                          "Scheduling": "Poisson",
                          "rate": "5",
                          "duration": "30.000",
                         "destination-ip": {"version": "4", "value": "192.0.2.1"},
                         "destination-port": "50000",
                         "source-port": "50000"
                          "if-name" : eth0 } ] }
```

Control Protocol: Retrieving Instructions




```
"name": "internal channels",
        "version": "1.0",
        "description": "hourly report to main database collector",
        "reports": { "name": "hourly report",
                     "description": "hourly report to main database",
                     "collector": "http://collector.example.org/results/
                                   f47ac10b-58cc-4372-a567-0e02b2c3d479",
                    "timing": {
                               "timing_type": "calendar",
                               "timing-config": {
                               "minutes": ["22"],
                               "seconds": ["40"]}
```

Control Protocol: Retrieving Instructions




```
"name": "hourly measurements",
        "version": "1.0",
        "schedules": [{
            "name": "Hourly",
            "tests": ["latency"],
            "reports" :["hourly report"],
            "timing": {
               "timing_type": "calendar",
               "timing-config": {
                  "minutes": ["05"],
                  "seconds": ["30"]}
```

Next..

- The MA perfomrs the test
  - Sends the UDP packets
  - Receives replies
  - Calculates the 99% mean
- It is now ready to report the results back to the collector

Report Protocol

POST //collector.example.org/results/f47ac10b-58cc-4372-a567-0e02b2c3d479


```
"name": "hourly measurements",
{ "report-date": "utc-milliseconds",
  "reporting-agent": "f47ac10b-58cc-4372-a567-0e02b2c3d479",
  "results": {"test-name": "latency",
              "test-agent": "f47ac10b-58cc-4372-a567-0e02b2c3d479",
              "test-parameters": { "name": "latency",
                  "description": "UDP round trip latency",
                  "metric": "UDP_Latency",
                  "options": [ {"environment": "No-cross-traffic",
                       "Output-type": "Xth-percentile-mean", "X": "99",
                       "Scheduling": "Poisson","rate": "5", "duration": "30.000",
                      "destination-ip": {"version": "4", "value": "192.0.2.1"},
                      "source-IP-address": {"version": "4", "value": "198.151.100.34"},
                      "destination-port": "50000", "source-port": "50000",
                      "start-time": "utc-milliseconds", "end-time": "utc-milliseconds"}]},
              "test-results": {"Xth-percentile-mean": "10"}}}
```