

Sample Mapping #	Mapping Type	Topics/Substitutions	API	Template-Source	Target-Payload	Expected Result
1	JSON	<pre> st:      /plant1/# tt:      /plant1/+/+ tts:     /plant1/line1/device1_measure1_Type  sub: 1.[ * TOPIC_LEVEL_[0]&amp;"_&amp;_TOPIC_LEVEL_[1]&amp;"_&amp;\$substringBefore(_ TOPIC_LEVEL_[2],"_") -&gt; source.id ] 2.[ \$substringAfter(_TOPIC_LEVEL_[2],"_") -&gt; type ] 3.[ \$now() -&gt; time ] 4.[ value -&gt; measure1_Type.V.value ] </pre>	M	<pre> {   "mea": [     {       "tid": "uuid_01",       "psid": "Crest",       "devicePath": "path01_80_X03_VVB001StatusB_Crest",       "values": [         {           "value": 4.6,           "timestamp": 1648562285347         }       ]     },     {       "tid": "uuid_02",       "psid": "Crest",       "devicePath": "path01_80_X03_VVB001StatusB_Crest",       "values": [         {           "value": 5.6,           "timestamp": 1648563285347         }       ]     }   ],   "_TOPIC_LEVEL_": {     "devices",     "device_best_01"   } } </pre>	<pre> {   "measure1_Type": {     "v": {       "value": 110,       "unit": "C"     }   },   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_TemperatureMeasurement" } </pre>	For the device with external id: plant1_line1_device1 a measurement c8y_TemperatureMeasurement should be created. The device is created implicitly.
2	JSON	<pre> st:      devices/# tt:      devices/+ tts:     devices/device_best_01  sub: 1.[ * _TOPIC_LEVEL_[1] -&gt; source.id ] 2.[ mea.values[0].value -&gt; c8y_ProcessLoadMeasurement.L.value ] 3.[ \$map(\$map(mea.values[0].timestamp, \$number), function(\$v, \$i, \$a) { \$fromMillis(\$v) }) -&gt; time ] </pre>	M	<pre> {   "mea": [     {       "tid": "uuid_01",       "psid": "Crest",       "devicePath": "path01_80_X03_VVB001StatusB_Crest",       "values": [         {           "value": 4.6,           "timestamp": 1648562285347         }       ]     },     {       "tid": "uuid_02",       "psid": "Crest",       "devicePath": "path01_80_X03_VVB001StatusB_Crest",       "values": [         {           "value": 5.6,           "timestamp": 1648563285347         }       ]     }   ],   "_TOPIC_LEVEL_": {     "devices",     "device_best_01"   } } </pre>	<pre> {   "c8y_ProcessLoadMeasurement": {     "L": {       "value": 110,       "unit": "%"     }   },   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_ProcessLoadMeasurement" } </pre>	For the device with external id: device_best_01 multiple measurements should be created. The device is created implicitly.

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3	JSON	st: device/# tt: device/express/+, tts: device/express/berlin_01  sub: 1.[ * _TOPIC_LEVEL_[2]->id ] 2.[ customType->type ] 3.[ operator&"-%&line->name ] 4.[ capacity->capacity ]	I	<pre>{   "line": "Bus-Berlin-Rom",   "operator": "EuroBus",   "customFragment": {     "customFragmentValue": "Express"   },   "capacity": 64,   "customArray": [     "ArrayValue1",     "ArrayValue2"   ],   "customType": "type_International" }</pre>	<pre>{   "c8y_IsDevice": {},   "com_cumulocity_model_Agent": {},   "name": "Bus Name",   "type": "type_bus",   "capacity": 100,   "id": "909090" }</pre>	Create device with: 1.external id: berlin_01 2.name: EuroBus-Bus-Berlin-Rom 3.type: type_International
4	JSON	st: event/# tt: event/+ tts: event/berlin_01  sub: 1.[ * _TOPIC_LEVEL_[1] -> source.id] 2.[ txt->text ] 3.[ msg_type->type ] 4.[ \$now()->time ]	E	<pre>{   "msg_type": "c8y_BusStopEvent",   "txt": "Bus stopped at petrol station today!",   "td": "2022-09-08T16:21:53.389+02:00",   "ts": "1665473038000" }</pre>	<pre>{   "source": {     "id": "909090"   },   "text": "This is a new test event.",   "time": "2022-08-05T00:14:49.389+02:00",   "type": "c8y_GeneralBusEvent" }</pre>	Event for existing device should be created  mention [ \$fromMillis(\$number(deviceTimestamp))>time ]
5	JSON	st: measurement/# tt: measurement/+gazoline tts: measurement/berlin_01/gazoline  sub: 1.[ * _TOPIC_LEVEL_[1] -> source.id ] 2.[ fuel->c8y_FuelMeasurement.F.value ] 3.[ \$now()->time ]	M	<pre>{   "fuel": 65,   "ts": "2022-08-05T00:14:49.389+02:00",   "mea": "c8y_FuelMeasurement" }</pre>	<pre>{   "c8y_FuelMeasurement": {     "L": {       "value": 110,       "unit": "l"     }   },   "time": "2022-10-18T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_FuelMeasurement" }</pre>	Add c8y_FuelMeasurement to bus.
6	JSON	st: multiarray/devices tt: multiarray/devices tts: multiarray/devices  sub: 1.[ * device->id ], choose option "Expand Array" 2.[ types.type_A->type ] 3.[ \$map(used_name, function(\$v, \$i, \$a) { \$contains(\$v,'dl') ? \$join(['Special_i0', \$string(\$i)]) : \$join([\$string(\$v), \$string(\$i)]) } )->name ], choose option "Expand Array"	I	<pre>{   "device": [     "d1_id",     "d2_id"   ],   "types": {     "type_A": "type_A",     "type_B": "type_B"   },   "used_name": [     "Pressure_d1",     "Pressure_d2"   ] }</pre>	<pre>{   "c8y_IsDevice": {},   "name": "Vibration Sensor",   "type": "maker_Vibration_Sensor" }</pre>	New Devices: 1.Pressure_d21 2.Special_i00 should be created.  All device have the same type "type_A"

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7	JSON	st:       arrayType/devices tt:       arrayType/devices tts:      arrayType/devices  sub: 1. [ \$substringBefore(\${0}.devicePath,"_AL") -> source.id ] 2. [ \${}.values[0].value -> c8y_TemperatureMeasurement.T.value ] , choose option "Expand Array" 3. [ \$map(\$map(\${}.values[0].timestamp, \$number), function(\$v) { \$fromMillis(\$v)}) -> time ] , choose option "Expand Array"	M	<pre>{   {     "tid": "5e4bac9f-b47a-499e-8601-68fc16a9847c",     "psid": "Crest",     "devicePath": "c2818e07-4c09-42f0-ba24-ddb712573ab5_AL1352_192168221_80_X03_VVB001StatusB_Crest",     "processDataUnit": "20",     "values": [       {         "value": 4.6,         "timestamp": 1648562285347       }     ]   },   {     "tid": "5e4bac9f-b47a-499e-8601-68fc16a9847c",     "psid": "Crest",     "devicePath": "c2818e07-4c09-42f0-ba24-ddb712573ab5_AL1352_192168221_80_X03_VVB001StatusB_Crest",     "processDataUnit": "20",     "values": [       {         "value": 5.6,         "timestamp": 1648562285347       }     ]   } }</pre>	<pre>{   "c8y_TemperatureMeasurement": {     "T": {       "value": 110,       "unit": "C"     }   },   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_TemperatureMeasurement" }</pre>	Create one device with the name: device_c8y_Serial_c2818e07-4c09-42f0-ba24-ddb712573ab5 and for this device create two measurements of type: "c8y_TemperatureMeasurement"
8	JSON	st:       eventObject/# tt:       eventObject/+ tts:      eventObject/berlin_01  sub: 1. [ _TOPIC_LEVEL_[1] -> source.id ] 2. [ txt -> text ] 3. [ msg_type -> type ] 4. [ \$now() -> time ] 5. [ model -> customProperties ] , Choose Repair Strategy: REMOVE_IF_MISSING	E	<pre>{   "msg_type": "c8y_BusStopEvent",   "txt": "Bus stopped at petrol station today!",   "td": "2022-09-08T16:21:53.389+02:00",   "model": {     "name": "MAN e-Bus"   },   "_TOPIC_LEVEL_": [     "eventObject",     "berlin_01"   ] }</pre>	<pre>{   "source": {     "id": "909090"   },   "text": "This is a new test event.",   "time": "2022-08-05T00:14:49.389+02:00",   "type": "c8y_TestEvent",   "customProperties": "dummy" }</pre>	Create event for device
9	JSON	st:       measurementObject/# tt:       measurementObject/+gazoline tts:      measurementObject/berlin_01/gazoline sub: 1.[ * _TOPIC_LEVEL_[1] -> source.id ] 2.[ mea -> type ] 3.[ \$now() -> time ] 4.[ fuel*3.78541 -> c8y_FuelMeasurement.Tank.value ] 5.[ oil?({"Motor\": {"value\":"oil", \"unit\":"l\"}}):null] -> c8y_OilMeasurement ] Choose Repair Strategy: REMOVE_IF_MISSING	M	<pre>{   "fuel": 65,   "oil": 4.5,   "ts": "2022-08-05T00:14:49.389+02:00",   "mea": "c8y_FuelMeasurement" }</pre>	<pre>{   "c8y_FuelMeasurement": {     "Tank": {       "value": 110,       "unit": "l"     }   },   "c8y_OilMeasurement": "undefined",   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_FuelMeasurement" }</pre>	This mapping makes use of the option "REMOVE_IF_MISSING". The incoming payload can contain either properties: "fuel", "oil" or both. Depending on this the relevant fragments in the Cumulocity measurement are created.
13	GENERIC_BINARY	st:       binary/+ tt:       binary/+ tts:      binary/berlin_01 sub:  1.[ * _TOPIC_LEVEL_[1] -> deviceId ] 2.[ \$join([text," ", \$now()]) -> description ]	E	<pre>Hex Code: 5846207370c3a47420303821</pre>	<pre>{   "source": {     "id": "909090"   },   "text": "This is a new test event.",   "time": "2022-08-05T00:14:49.389+02:00",   "type": "c8y_TestEvent" }</pre>	Snoop recorded message

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14	JSON	st: operation/# tt: operation/+ tts: operation/berlin_01 sub:  1.[ * _TOPIC_LEVEL_[1] -> deviceId ] 2.[ \$join([text,"_",\$now()]) -> description ]	O	{ "text": "Special operation restart" } 	{ "deviceId": "909090", "description": "New camera operation!", "type": "maintenance_operation" } 	Create operation "maintenance_operation" for device with externalId berlin_01
15	JSON	st: binaryEvent/+ tt: binaryEvent/+ tts: binaryEvent/berlin_01 sub:  1. [ "Temp: "%\$parseInteger(\$string("0x" & \$substring(message,0,2)), "0") & "C" -> text ] 2. [ * _TOPIC_LEVEL_[1] -> deviceId ] 3. [ \$now() -> time ]	E	Hex Code: 5a75207370c3a47420303821 	{ "source": { "deviceId": "909090" }, "text": "This is a new test event.", "time": "2022-08-05T00:14:49.389+02:00", "type": "c8y_TestEvent" } 	Send c8y_TestEvent to device with externalId berlin_01
17	JSON	st: device/update/+ tt: device/update/+ tts: device/update/berlin_01  sub: 1.[ * _TOPIC_LEVEL_[2] -> id ] 2.[ customType->type ]	I	{ "customType": "type_Overnight" } 	{ "type": "type_any" } 	Update type of existing device.
18	PROTOBUF_STATIC	st: protobuf/measurement tt: protobuf/measurement tts: protobuf/measurement sub: Defined in cumulocity-dynamic-mqtt-mapper/mqtt-mapping-service/src/main/java/mqtt/mapping/processor/processor/fixed/StaticProtobufProcessor.java	M	Send message in protobuf format:  option java_package = "mqtt.mapping.processor.protobuf"; option java_outer_classname = "MeasurementProto"; message CustomMeasurement { int64 timestamp = 1; float value = 2; string unit = 3; string externalIdType = 4; string externalId = 5; string measurementType = 6; }  Use test client: cumulocity-dynamic-mqtt-mapper/mqtt-mapping-service/src/test/java/mqtt/mapping/ProtobufPahoClient.java	{ "c8y_GenericMeasurement": { "Module": { "value": 110, "unit": "1" } }, "time": "2022-08-05T00:14:49.389+02:00", "source": { "deviceId": "909090" }, "type": "c8y_GenericMeasurement_type" } 	Use test client: cumulocity-dynamic-mqtt-mapper/mqtt-mapping-service/src/test/java/mqtt/mapping/ProtobufPahoClient.java to create a new measurement for bus "berlin_01"

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19	PROCESSOR_EXTENSION	st:        protobuf/event tt:        protobuf/event tts:       protobuf/event sub: Defined in cumulocity-dynamic-mqtt-mapper/mqtt-mapping-extension/src/main/java/mqtt/mapping/processor/extension/external/ProcessorExtensionCustomEvent.java	E	Send message in protobuf format:  syntax = "proto3"; package processor.protobuf;  option java_package = "mqtt.mapping.processor.extension.external"; option java_outer_classname = "CustomEventOuter";  message CustomEvent { int64 timestamp = 1; string txt = 2; string unit = 3; string externalIdType = 4; string externalId = 5; string eventType = 6; }  Use test client: cumulocity-dynamic-mqtt-mapper/mqtt-mapping-extension/src/test/java/mqtt/mapping/ProtobufPahoClient.java	<pre>{   "c8y_GenericMeasurement": {     "Module": {       "value": 110,       "unit": "l"     }   },   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_GenericMeasurement_type" }</pre>	Use test client: cumulocity-dynamic-mqtt-mapper/mqtt-mapping-extension/src/test/java/mqtt/mapping/ProtobufPahoClient.java to create a new event for bus "berlin_01"
20	JSON	st:        panel tt:        panel tts:       panel  sub: 1.[ * deviceId->source.id ] 2.[ \$fromMillis(\$number(deviceTimestamp))->time ] 3.[ temperature->c8y_TemperatureMeasurement.T.value ]	I.M	<pre>{   "deviceId": "863859042393327",   "version": "1",   "deviceType": "20",   "deviceTimestamp": "1665473038000",   "deviceStatus": "BTR",   "temperature": 90 }</pre>	<pre>{   "c8y_TemperatureMeasurement": {     "T": {       "value": 110,       "unit": "C"     }   },   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_TemperatureMeasurement" }</pre>	Devices with external id: 863859042393327 does not exist and is implicitly created. For this device an new measurement is created.
21	JSON	st:        panel tt:        panel tts:       panel  sub: 1.[ deviceId->source.id ] 2.[ [ \$now()->time ] ] 3.[ 'New device status: ' & deviceStatus & '!'->text]	E	<pre>{   "deviceId": "863859042393327",   "version": "1",   "deviceType": "20",   "deviceTimestamp": "1665473038000",   "deviceStatus": "BTR",   "temperature": 90 }</pre>	<pre>{   "source": {     "id": "909090"   },   "text": "New device status: BTR!",   "time": "2022-11-24T00:14:49.389+02:00",   "type": "c8y_GeneralPanelEvent" }</pre>	For this device an new event is created.
23	JSON	st:        flexM/# tt:        flexM/+gazoline tts:       flexM/berlin_01/gazoline  sub: 1.[ deviceId->source.id ] 2.[ Measurementname & "_type" -> type ] 3.[ Measurementname = "Airsensor" ? {Seriesname:{ "value": value, "unit": unit}} : null -> Airsensor ]] 4.[ Measurementname = "Liquidsensor" ? {Seriesname:{ "value": value, "unit": unit}} : null -> Liquidsensor ] 5.[ \$now() -> time ]	M	<pre>{   "Measurementname": "Airsensor",   "Seriesname": "Humidity",   "value": 10,   "unit": "%" }</pre>	<pre>{   "Airsensor": "dummy",   "Liquidsensor": "dummy",   "time": "2022-08-05T00:14:49.389+02:00",   "source": {     "id": "909090"   },   "type": "c8y_measurementtype" }</pre>	Depending on the content in the payload: 1. is "Airsensor" present 2. is "Liquidsensor" present either mapping 3. or 4. is evaluated and the relevant fragment in the measurement is created.

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24	JSON	st: alarm/tires tt: alarm/tires tts: alarm/tires  sub: 1.[ bus_id->source.id ] 2.[ msg_type->type ] 3.[ tx->text ]	A	{ "msg_type": "c8y_FlatTireAlarm", "tx": "Left rear tire loses air!", "bus_id": "berlin_01" }	{ "source": { "id": "909090" }, "type": "c8y_FlatTireAlarm", "text": "Left rear tire loses air!", "severity": "MAJOR", "status": "ACTIVE", "time": "2022-03-19T12:03:27.845Z" }	An alarm should be created for the device berlin_01.
25	PROCESSOR_EXTENSION	st: measurementExt tt: measurementExt tts: measurementExt  sub: Events for mqtt-mapping-extension: CustomMeasurement Extension for PROCESSOR_EXTENSION: mqtt-mapping-externsion  Defined in cumulocity-dynamic-mqtt-mapper/mqtt-mapping-extension/src/main/java/mqtt/mapping/processor/extension/external/ProcessorExtensionCustomMeasurement.java	M	{ "temperature": 120.5, "unit": "Celsius", "time": "2023-07-12T16:21:53.389+02:00", "externalId": "berlin_01", "unexpected": 17.5 }	{ "source": { "id": "909090" }, "time": "2022-08-05T00:14:49.389+02:00", "type": "c8y_Temperature", "c8y_Temperature": "dummy", "c8y_Fragment_to_remove": "remove_me" }	A measasement should be created for the device berlin_01. The fragment "c8y_Fragment_to_remove" is not included in the created measurement, as the repair strategy is "REMOVE_IF_NULL". In addition the reapar strategy "CREATE_IF_MISSING" is used. This is required to map the node "unexpected" to the target fragment "c8y_Unexpected". This is created, due to the used reapir strategy.
26	JSON	st: v2/things/# tt: v2/things/+ tts: v2/things/berlin_01  1. [* _TOPIC_LEVEL_[2] -> source.id ] 2. [ \$now() -> time ] 3. [ values{key: {'Measurement':{'value':value, 'key': 'U'}}} -> \$ ]	M	{ "values":[ { "key":"velocidad_cabecal", "value":136.34 }, { "key":"temperature", "value":25 } ] }	{ "time":"2022-08-05T00:14:49.389+02:00", "source":{ "id":"909090" }, "type":"c8y_FlexibleMeasurement" }	A measasement with two fragments: 1. velocidad cabecal 2. temperature is created. It demonstrates the use of a substitution using "\$" as a target. Tis results in merging the extracted content with the predefined target template.
27	JSON	st: v3/things/# tt: v3/things/+ tts: v3/things/berlin_01  1. [* _TOPIC_LEVEL_[2] -> source.id ] 2. [ \$now() -> time ] 3. [ values[.key: {'Measurement':{'value':value, 'key': 'U'}}] ] (set attribute <b>expand2Array</b> = true)	M	{ "values":[ { "key":"velocidad_cabecal", "value":136.34 }, { "key":"temperature", "value":25 } ] }	{ "time":"2022-08-05T00:14:49.389+02:00", "source":{ "id":"909090" }, "type":"c8y_FlexibleMeasurement" }	Two measasements with different fragments: 1. velocidad cabecal 2. temperature are created. It demonstrates the use of a substitution using "\$" as a target. Tis results in merging the extracted content with the predefined target template in combination with the attribute <b>"expand2Array"</b> . See as well mapping 26.

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51	JSON OUTBOUND	pt: evt/outbound/# tts: evt/outbound/berlin_01 filter outbound: bus_event NOTE: for outbound mappings no tt (template topic) is defined.  sub: 1.[ source.id -> _TOPIC_LEVEL_[2] ] 2.[ type -> eventType ] 3.[ \$now() -> time ] 4.[ bus_event -> bus_event ] 5.[ source.id -> deviceId ]	E	<pre>{   "source": {     "id": "38268445"   },   "type": "c8y_BusEvent",   "text": "Bus was stopped",   "time": "2022-08-05T00:14:49.389+02:00",   "bus_event": "stop_event" }</pre>	<pre>{   "deviceId": "909090",   "description": "This is a new test event.",   "time": "2022-08-05T00:14:49.389+02:00",   "eventType": "TestEvent",   "bus_event": "stop_event",   "_TOPIC_LEVEL_": [     "evt",     "outbound",     "berlin_01"   ] }</pre>	Publish mqtt msg. with event on topic 'evt/outbound/berlin_01' Use following command to create sample event: c8y events create --device 'YOUR_DEVICE_ID' --data 'bus_event="stop_event", text="Bus was stopped today!", type="c8y_BusEvent"'
52	JSON OUTBOUND	pt: opp/outbound/# tts: opp/outbound/berlin_01 filter outbound: bus_opp NOTE: for outbound mappings no tt (template topic) is defined.  sub: 1. [ deviceId -> _TOPIC_LEVEL_[2] ] 2. [ bus_opp -> description ] 3. [ * deviceId -> c8y_Id ] (resolve2ExternalId = false)	O	<pre>{   "deviceId": "909090",   "bus_opp": "New engine restart operation!" }</pre>	<pre>{   "c8y_Id": "909090",   "description": "dummy operation",   "type": "bus_operation",   "_TOPIC_LEVEL_": [     "opp",     "outbound",     "berlin_01"   ] }</pre>	Publish mqtt msg. with operation on topic 'opp/outbound/berlin_01' Use following command to create sample event: c8y operations create --device 'YOUR_DEVICE_ID' --data 'bus_opp="New engine restart operation!'" Note: The option "resolve2ExternalId = false" ensures that the C8Y internal device id is used in substitution 3.