GEOTAB

W3C Gen2 access control model

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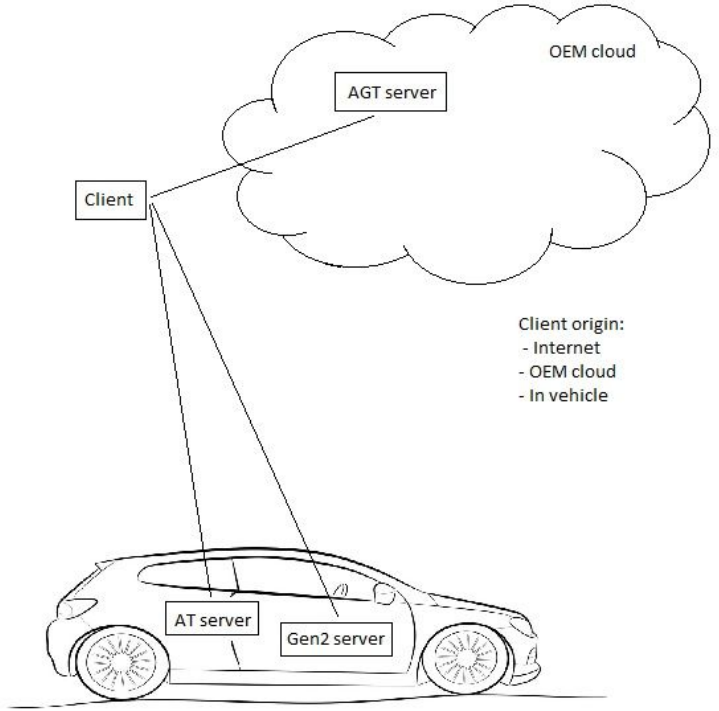
W3C Gen2 access control overview

- Access control communication flow
  - Client - AGT server => Access Grant Token
  - Client - AT server => Access Token
  - Client - Gen2 server => Vehicle data



RBAC automotive modelling

```
Roles:

    -  Independent app, off-board
    -  OEM app, off-board
    -  Independent app, on-board
    -  OEM app, on-board
    -  OBD2 client
    -  Vehicle passenger
    -  Vehicle driver
    -  Vehicle owner
    -  Independent shop, remote access
    -  OEM shop, remote access
    -  Independent shop, proximity access
    -  OEM shop, proximity access
    -  OEM
```

Role-to-Permission table entry

```
    -  "RoleXPermission":
          -  "path": "path1", "access": "<read-only/read-write>"
          -  ...
          -  "path": "pathN", "access": "<read-only/read-write>"
```

- The table defines the maximum Permission scope for a Role. In the request to obtain AT token a subset of this, with associated purpose, is the typical scenario(?).

Communication flow details

1. Client requests Role to AGT server.
    - Input:
        - Client Id credentials for authentication
        - Requested role
        - VIN
    - Output:
        - AGT token:
            - Client Id
            - Role
            - VIN
            - Expiry time

2. Client requests IP access to vehicle. Off-board clients only.
    - Input:
        - AGT token
    - Output:
        - Vehicle URL
        - TLS credentials?

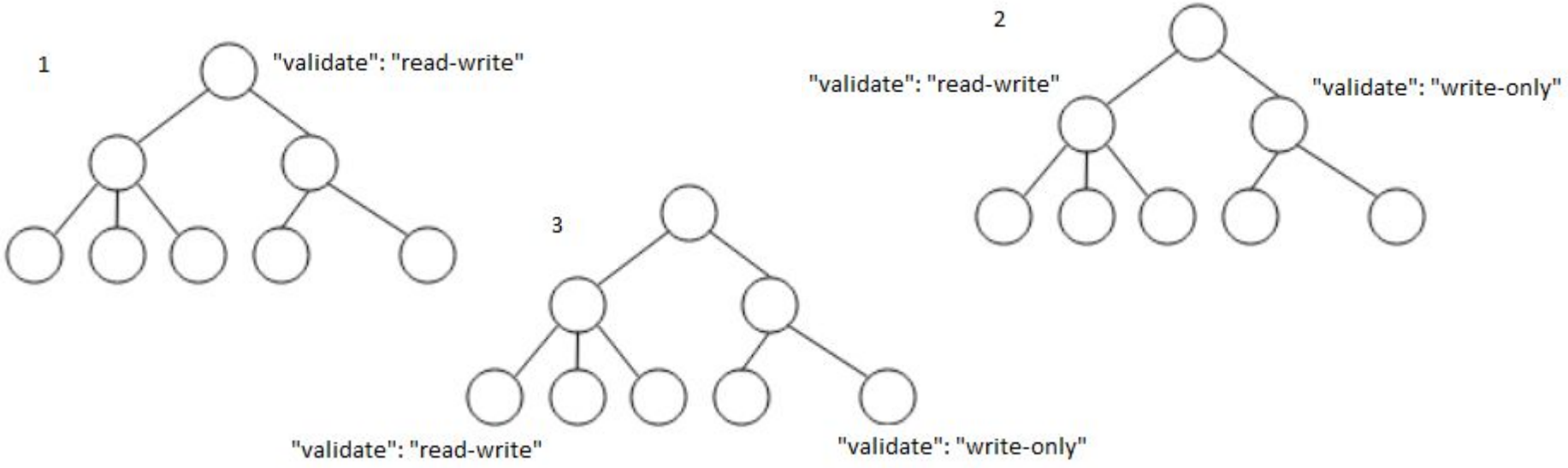
3. Client requests Permission to AT server.
    - Input:
        - AGT token
        - Requested permission
        - Purpose
    - Output:
        - AT token:
            - Client Id
            - Role
            - VIN
            - Permission
            - Purpose
            - Expiry time

4. Client requests data to Gen2 server.
    - Input:
        - Action
        - Path
        - AT token
    - Output: // After positive signature validation in request to AT server.
        - Value(s)

Design issues

- Why not only have one authorization server, the AGT server?
  - Client request typically require only subset of Role permission.
  - Permission shall be associated with Purpose.
  - Different expiry times on AGT and AT tokens.
  - Gen2 server shall not be required to communicate off-board for token validation.

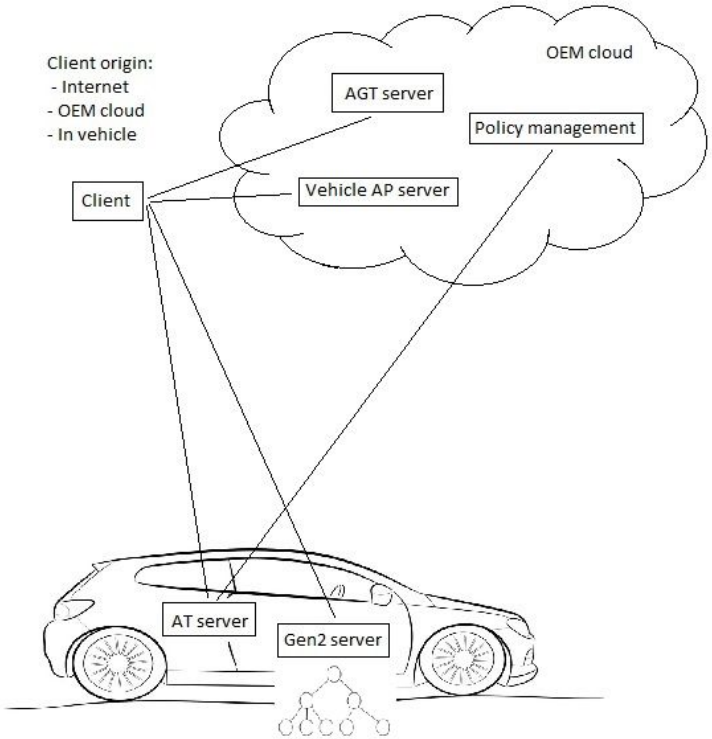
Access control tagging



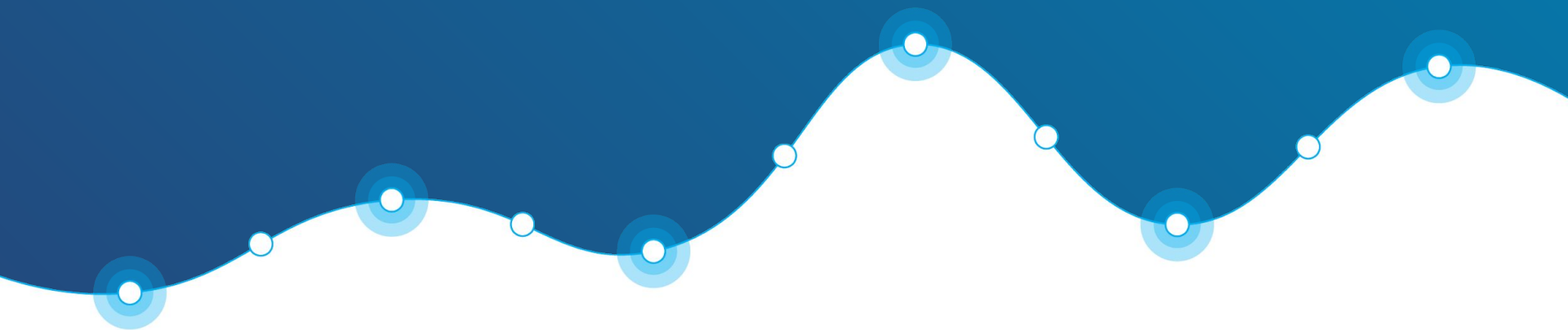
- 1: Complete tree requires valid token for both read and write requests
- 2: Two right-most leaves require valid token for write requests, the other leaves for both read and write requests.
- 3: Center leave nodes do not require any token for read/write requests, right-most require valid token for write requests, left-most for both read and write requests.

W3C Gen2 access control overview - complete

- A flexible access control model
  - No control / Write-only control / Read-write control
  - Role, Permission and Purpose modelling
    - RBAC type modelling
    - Privacy / Consent policy support
      - Can support a GDPR scenario?



Access control by default, or by design?



Arguments for access control by design

- Including tokens in a request increases request message size from about 100 chars to about 400 chars.
- On-board clients may be seen as more trusted, and hence may not require access control to all nodes.
- Client origin can be restricted to OEM cloud or on-board only, thus increasing their trustworthiness.
- Transport protocols shall always be secured, by e. g. running on top of TLS. A client must obtain communication credentials. And vehicle AP data.
- System development/debugging may be simplified by disabling access control.
- One line of metadata in the root node realizes default access control.

Do all of these VSS nodes require access control?

Vehicle.Body.BodyType

Vehicle.Body.RefuelPosition

Vehicle.Cabin.Door.Count

Vehicle.Cabin.Infotainment.HMI.CurrentLanguage:

Vehicle.Cabin.Infotainment.HMI.DateFormat:

Vehicle.Cabin.Infotainment.HMI.DayNightMode:

Vehicle.Cabin.Infotainment.HMI.DistanceUnit:

Vehicle.Cabin.Infotainment.HMI.EVEconomyUnits:

Vehicle.Cabin.Infotainment.HMI.FuelEconomyUnits:

Vehicle.Cabin.Infotainment.HMI.TemperatureUnit:

Vehicle.Cabin.Infotainment.HMI.TimeFormat

Vehicle.Cabin.Seat.DriverPosition

Vehicle.Cabin.Seat.RowCount

Vehicle.Chassis.Axle.Count

Vehicle.Chassis.Axle.RowX.TireDiameter:

Vehicle.Chassis.Axle.RowX.TireWidth:

Vehicle.Chassis.Axle.RowX.WheelCount:

Vehicle.Chassis.Axle.RowX.WheelDiameter:

Vehicle.Chassis.Axle.RowX.WheelWidth:

Vehicle.Chassis.CurbWeight:

Vehicle.Chassis.GrossWeight:

Vehicle.Chassis.Height:

Vehicle.Chassis.Length:

Vehicle.Chassis.TowWeight

Vehicle.Chassis.Wheelbase:

Vehicle.Chassis.Width:

Vehicle.Drivetrain.BatteryManagement.ChargingInlet

Vehicle.Drivetrain.FuelSystem.FuelType:

Vehicle.Drivetrain.FuelSystem.HybridType:

Vehicle.Drivetrain.FuelSystem.Range:

Vehicle.Drivetrain.FuelSystem.TankCapacity:

Vehicle.Drivetrain.InternalCombustionEngine.Configuration:

Vehicle.Drivetrain.InternalCombustionEngine.Displacement:

Vehicle.Drivetrain.InternalCombustionEngine.FuelType:

Vehicle.Drivetrain.Transmission.DriveType:

Vehicle.Drivetrain.Transmission.GearCount:

Vehicle.VehicleIdentification.Brand:

Vehicle.VehicleIdentification.Model:

Vehicle.VehicleIdentification.Year:

Vehicle.VehicleIdentification.bodyType:

Vehicle.VehicleIdentification.dateVehicleFirstRegistered:

Vehicle.VehicleIdentification.meetsEmissionStandard:

Vehicle.VehicleIdentification.productionDate:

Vehicle.VehicleIdentification.purchaseDate:

Vehicle.VehicleIdentification.vehicleConfiguration:

Vehicle.VehicleIdentification.vehicleModelDate:

Vehicle.VehicleIdentification.vehicleSeatingCapacity:

Vehicle.VehicleIdentification.vehicleSpecialUsage:

Vehicle.VehicleIdentification.vehicleinteriorColor:

Vehicle.VehicleIdentification.vehicleinteriorType:

Vehicle.accelerationTime:

Vehicle.cargoVolume:

Vehicle.emissionsCO2

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