Reporting Phase in OpenADR: Per-Device Data and Incentive Logic

In a cloud-based VEN architecture such as Samsung SmartThings or LG ThinQ, the VEN typically manages multiple devices. While only one VEN is registered with the VTN, the reporting phase (`oadrUpdateReport`) must provide telemetry on a per-device basis to enable accurate tracking, analysis, and incentives.

# 1. Per-Device Reporting

Each report interval sent to the VTN must include a device-specific identifier. In OpenADR 2.0b, this is often done using the `resourceID` field. This allows the VTN to know which device generated which data.

Typical fields in a per-device report:

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| --- | --- |
| Field | Description |
| resourceID | Unique ID for the device (e.g., Samsung AC) |
| startTime | Start of the reporting interval |
| duration | Length of the interval |
| powerReal | Actual power draw in kW |
| energyReal | Total energy used in kWh |
| temperature | Room or coil temperature (if available) |
| deviceStatus | On/Off state or operation mode |

# 2. VTN Criteria for Incentives

Once the VTN receives performance reports, it evaluates each device's behavior based on pre-set criteria. This determines whether the device (or its user) qualifies for incentives or recognition.

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| --- | --- |
| VTN Criteria | Usage |
| Event participation | Whether the VEN opted in and participated |
| Target vs. Actual power | Whether the device reduced power to the expected level |
| Duration compliance | Whether the action was sustained for the full DR event |
| Total energy saved | kWh reduction compared to the baseline |
| Device/User ID (resourceID) | To identify who gets rewarded |

# Conclusion

To ensure accurate Demand Response tracking and fair incentive distribution, all VENs that control multiple devices must report data on a per-device basis and include unique identifiers. This data allows the VTN to calculate energy savings, verify compliance, and credit users accordingly.