Centralised and Decentralised Clouds

managing processing in the context of sensitive data

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What have I built and why?

What: a middleware which supports:

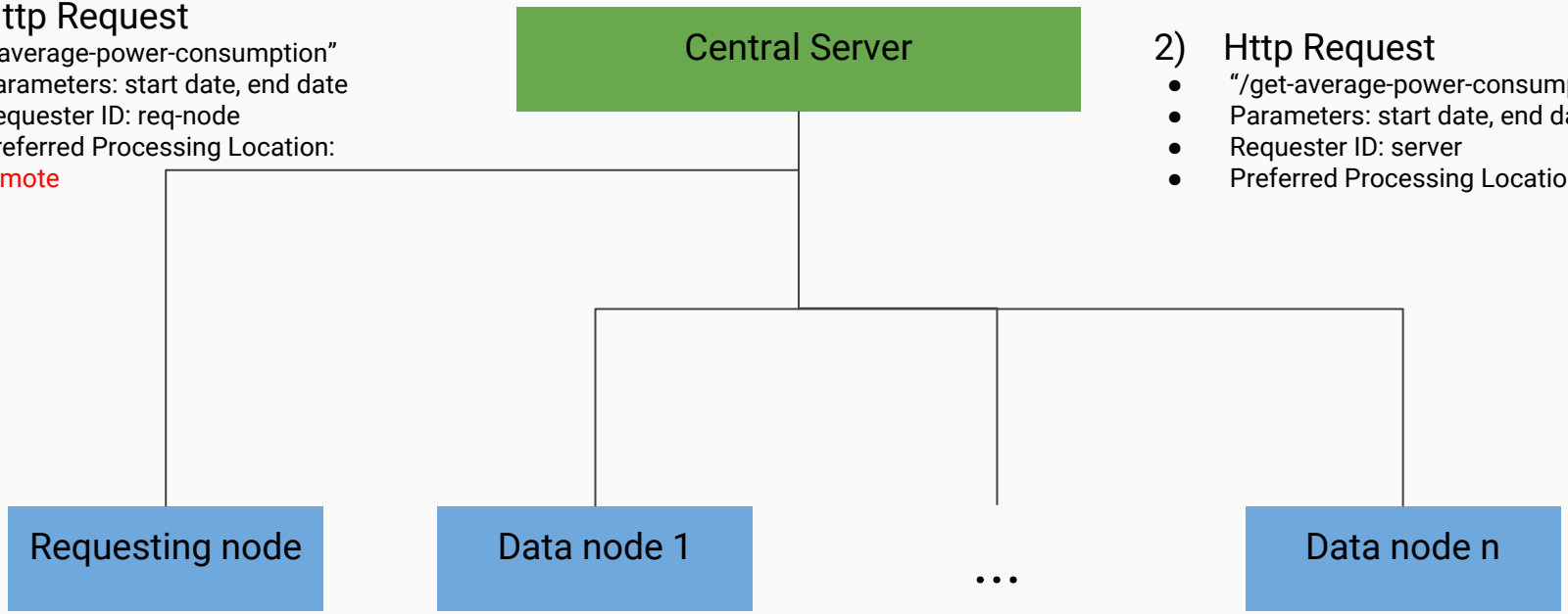
- Request policies for where you would prefer processing to happen
- Computation policies for what a node can compute
- Data policies for what information can be released from a database

Why: control over processing of data

- Nodes in the internet are not homogeneous (i.e. IOT)
- Some people want to keep control of their data

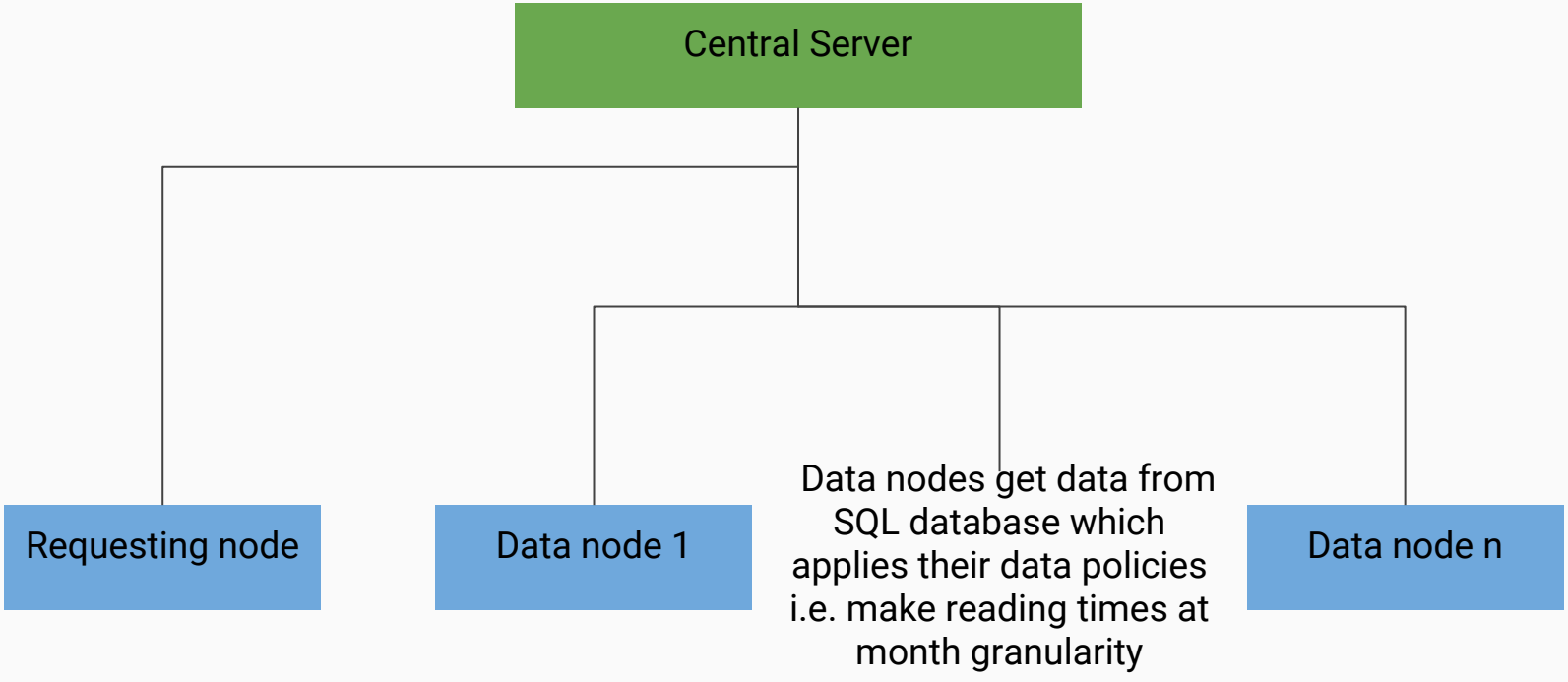
An example: aggregate energy usage

1) Http Request
- "/average-power-consumption"
- Parameters: start date, end date
- Requester ID: req-node
- Preferred Processing Location: remote

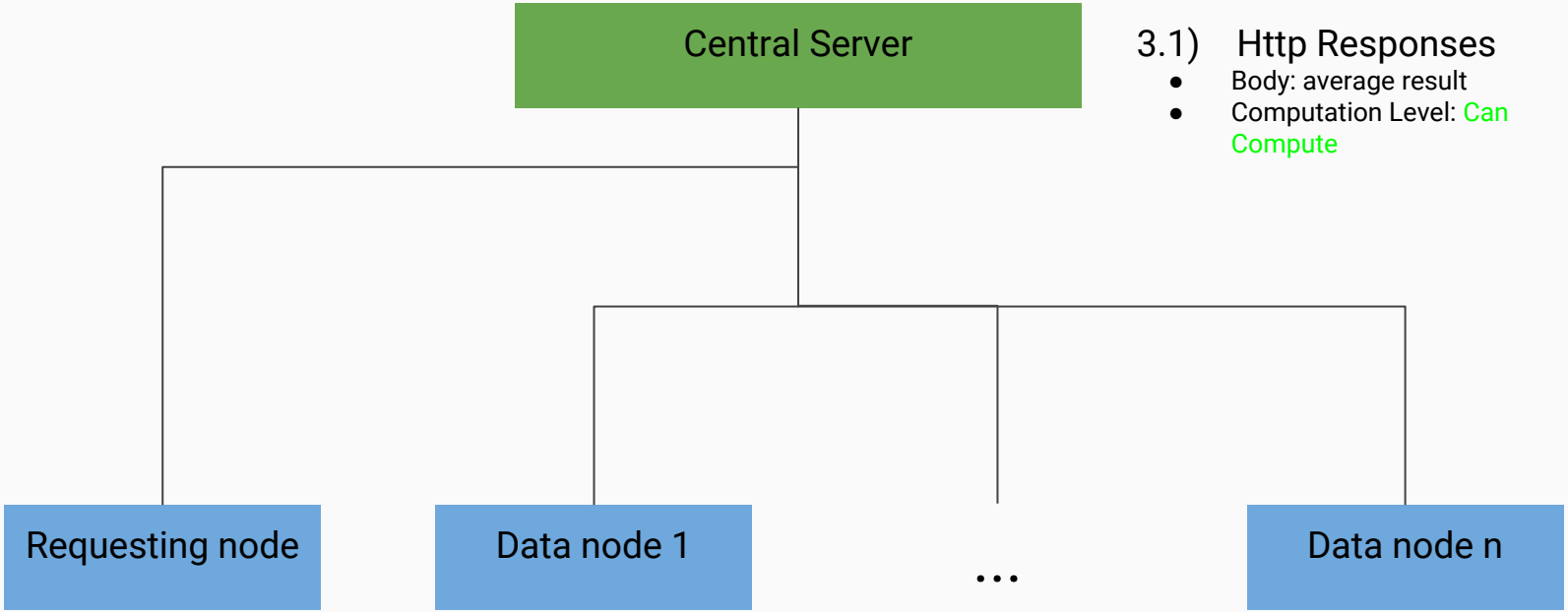


2) Http Request
- "/get-average-power-consumption"
- Parameters: start date, end date
- Requester ID: server
- Preferred Processing Location: remote

An example: aggregate energy usage



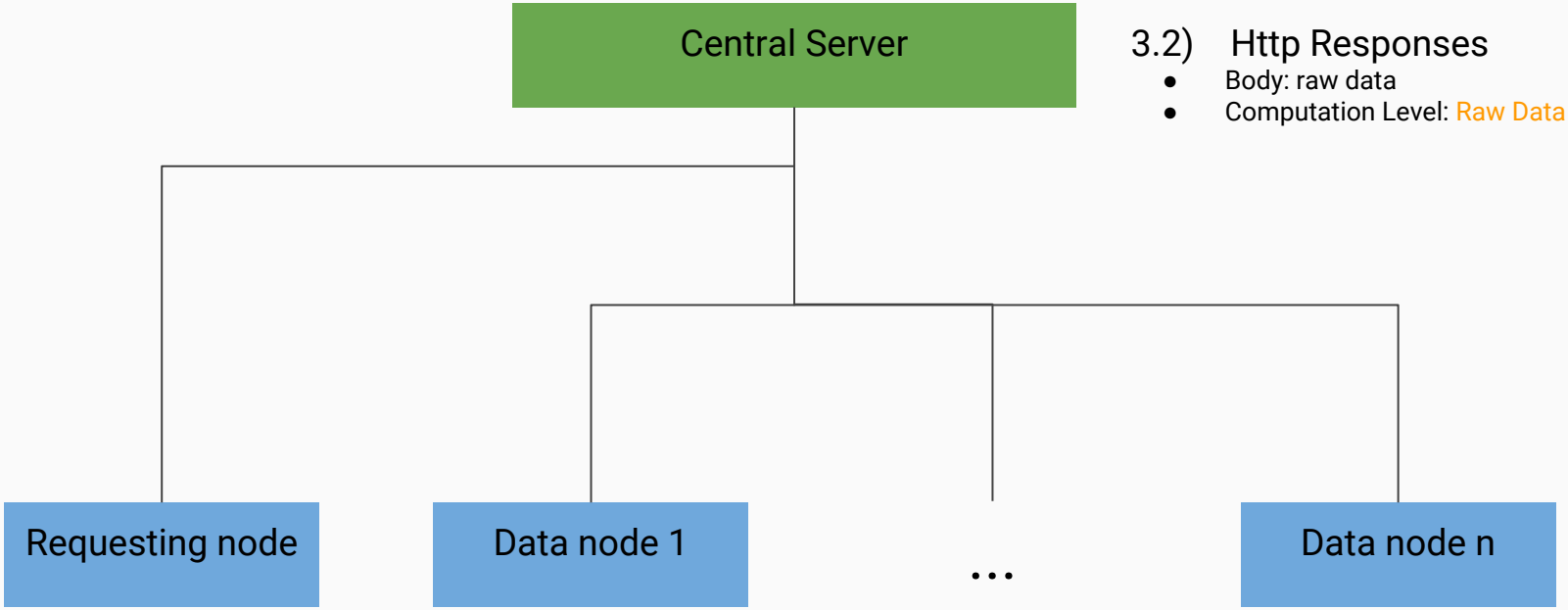
An example: aggregate energy usage



3.1) Http Responses

- Body: average result
- Computation Level: Can Compute

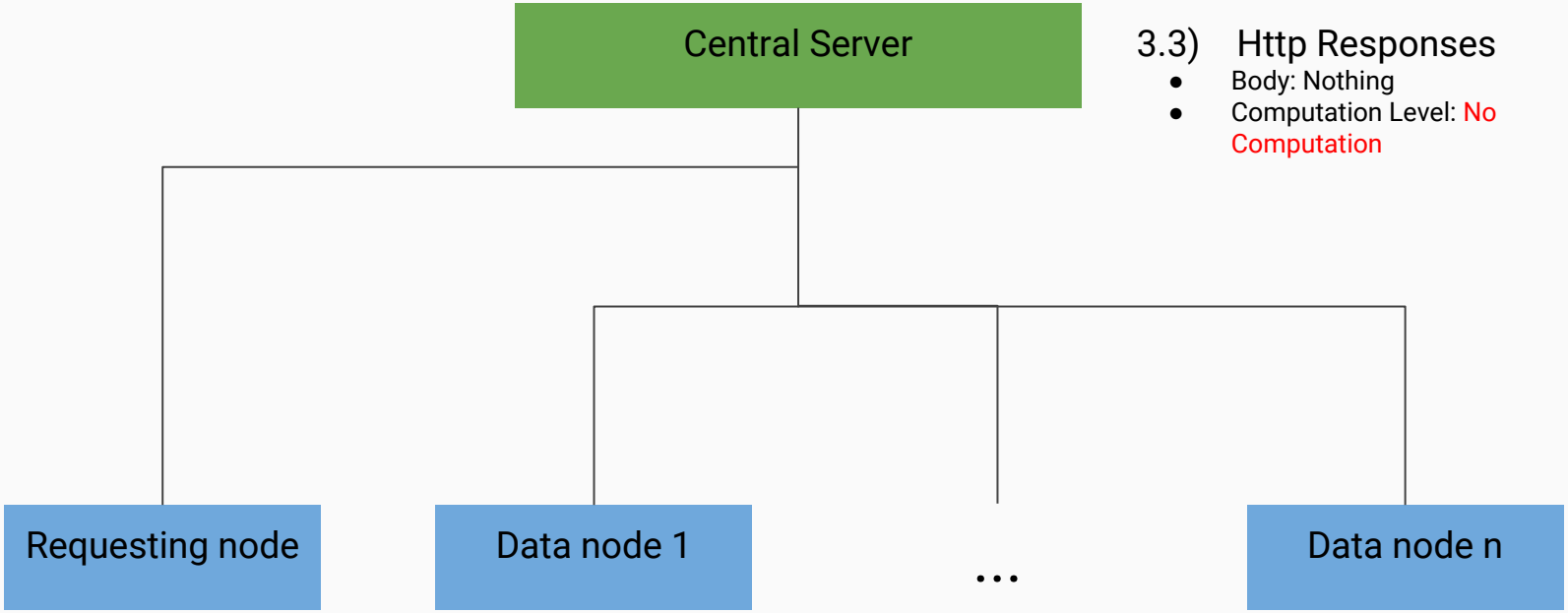
An example: aggregate energy usage



3.2) Http Responses

- Body: raw data
- Computation Level: Raw Data

An example: aggregate energy usage

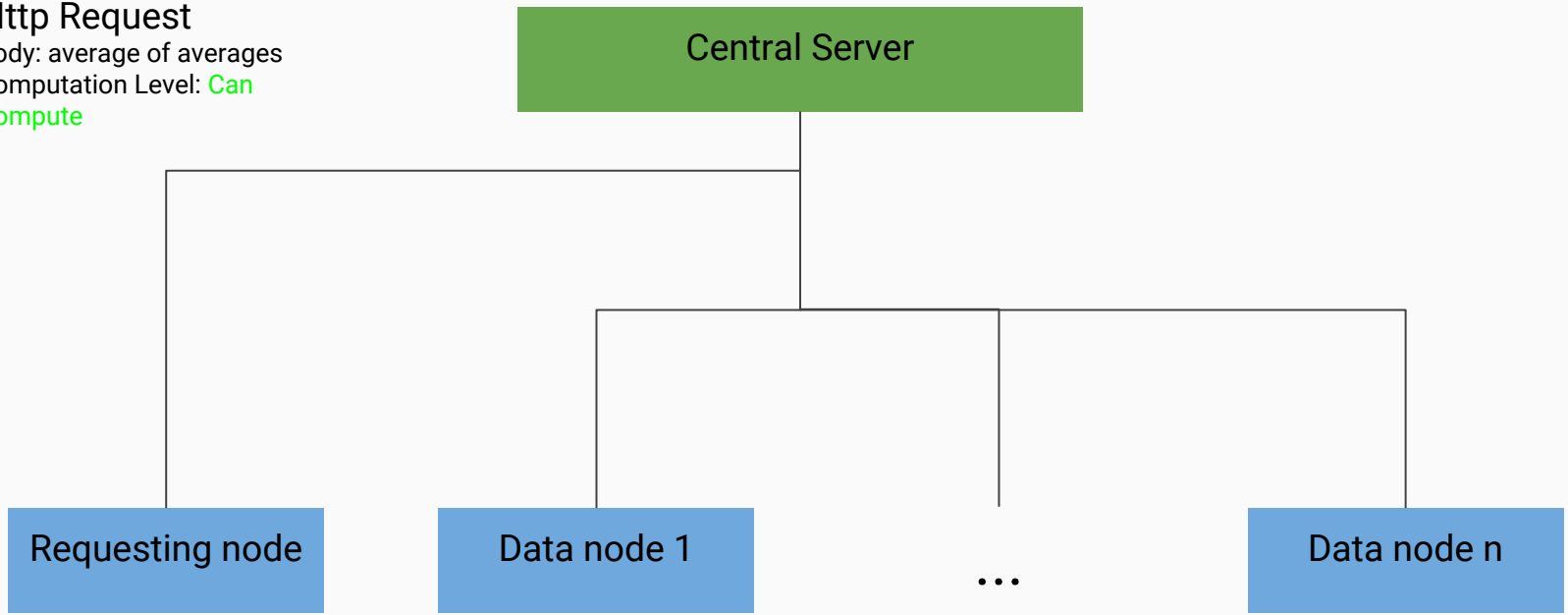


3.3) Http Responses

- Body: Nothing
- Computation Level: No Computation

An example: aggregate energy usage

4) Http Request
- Body: average of averages
- Computation Level: Can Compute



Progress: on schedule

Completed	Yet to complete
Implement a middleware which can support all three types of policies Implement an example to isolate the effect of data policies Extend the example to use computation/request policies Compare the latency of the first example to a baseline without the middleware	Implement an example to isolate the effect of the computation/request policies Take data to evaluate the performance overhead of the middleware compared to a baseline system without it Evaluate the expressiveness of the middleware policies by finding example real life failures where a system like this could have helped