



Automotive Use Cases

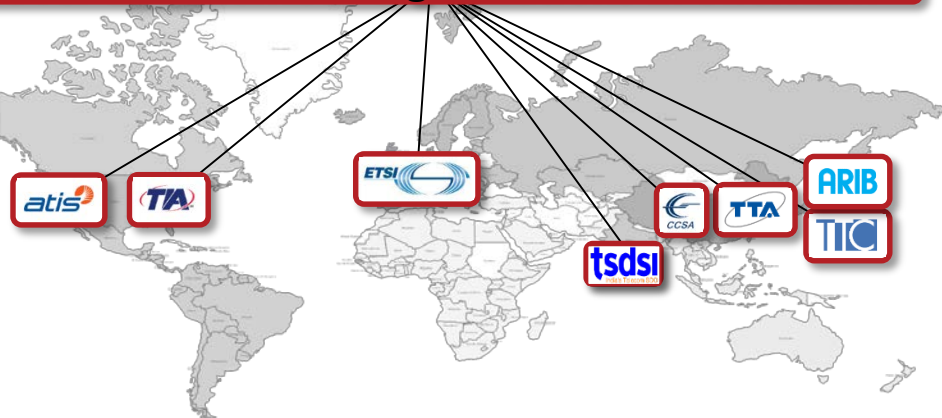
Josef J. Blanz

What is oneM2M?



Global partnership initiative: Consolidate M2M/IoT communications standardization
=> Avoid different standards on M2M/IoT in different regions

Over 200 member organizations in oneM2M

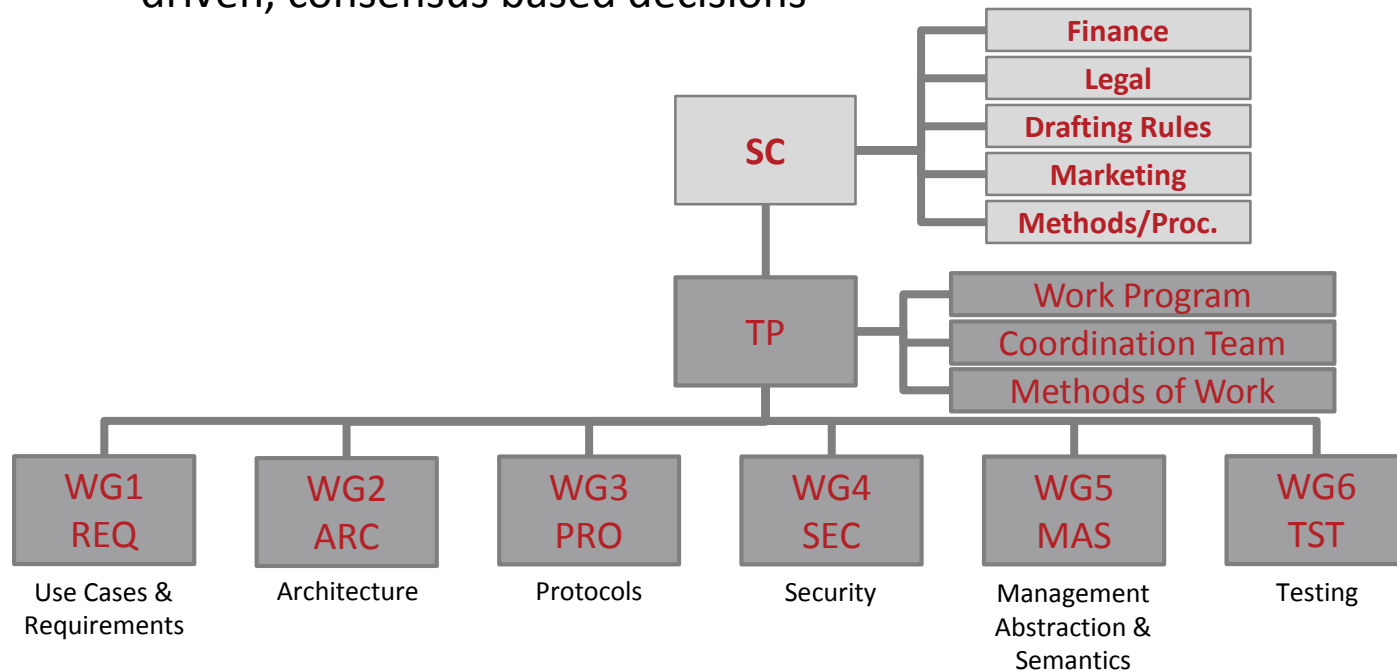


- **Partners Type 1**
ARIB, ATIS, CCSA, ETSI, TTA, TTC & TSDSI:
All major Telecom SDOs around globe
 - Members (e.g. companies) participate in oneM2M via admitting Partner Type 1
 - IPR policy of admitting Partner Type 1 organization is binding for members
 - Partner Type 1 organizations are committed to transpose specifications into standards
- **Partners Type 2**
BBF, Continua (PCHA), HGI, New Generation M2M Consortium, OMA, Global Platform
 - Fora/Associations/Consortia can participate & contribute in oneM2M under compatible IPR regime

Internal Structure of oneM2M



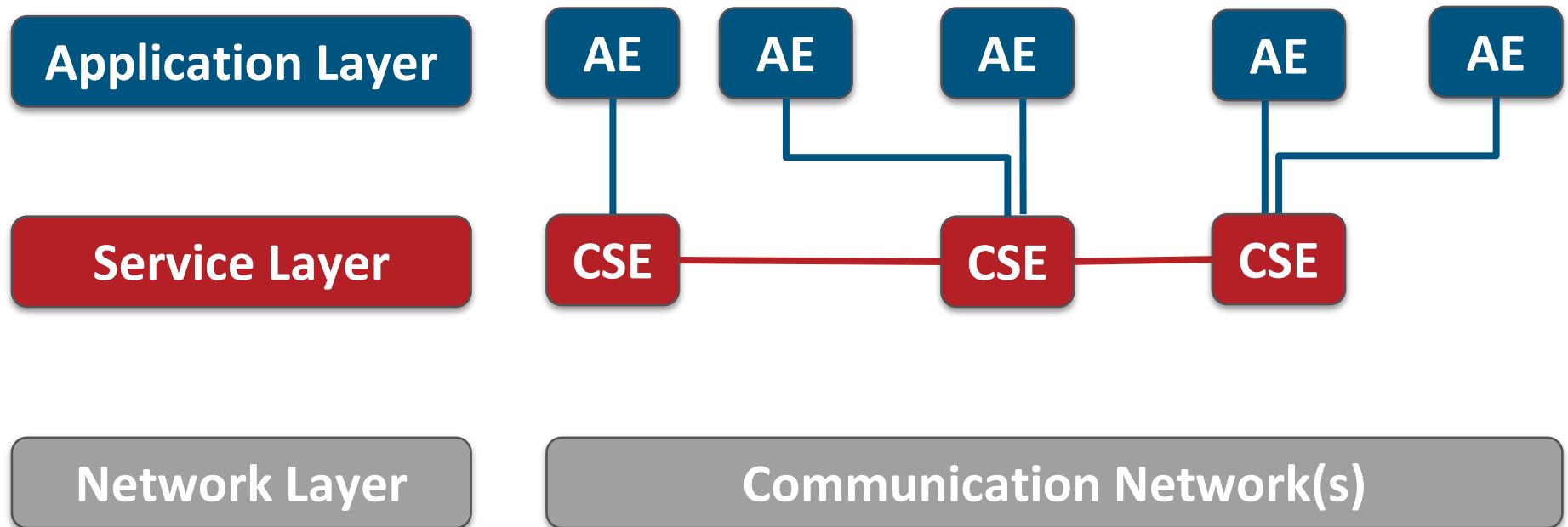
- Steering Committee (SC)
 - Handling procedural, organizational, legal, and budget issues
- Technical Plenary (TP)
 - Contains all Working Groups, executes all technical work
 - Focused work program organized into work items, contribution driven, consensus based decisions



Some oneM2M Stats



- More than 200 individual members and partners (see www.oneM2M.org)
- Partners Type 1: ARIB, ATIS, CCSA, ETSI, TIA, TTC, TTA, TSDSI (Telecom SDOs)
- Partners Type 2: BBF, Continua, HGI, OMA, NGM2MC, Global Platform
- Guests: IEEE, IERC, IPSO Alliance, KSGA;
- Associated Members: NIST, MISP, US-DoT
- About 75-100 regularly attending members in meetings
- Active contributors across telecommunications and IT industries, input from verticals
- A total of 6 one-week technical plenaries a year / several WG calls in-between
 - Typically between 100 and 150 delegates in TP meeting weeks
 - > 30 deliverables (normative specifications and technical reports) started so far
 - Recently in the order of 250 contributions / 300 revisions per F2F meeting



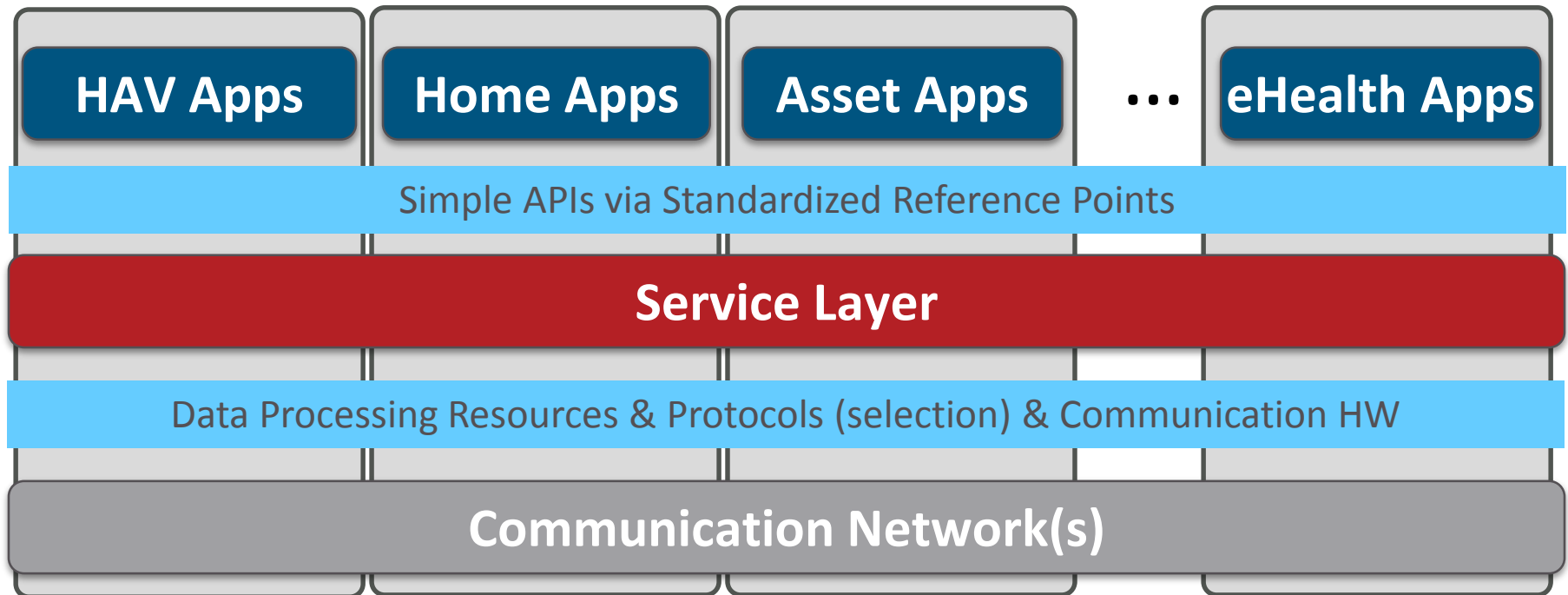
AE: Application Entity
CSE: Common Services Entity

Application Layer

Service Layer

Network Layer

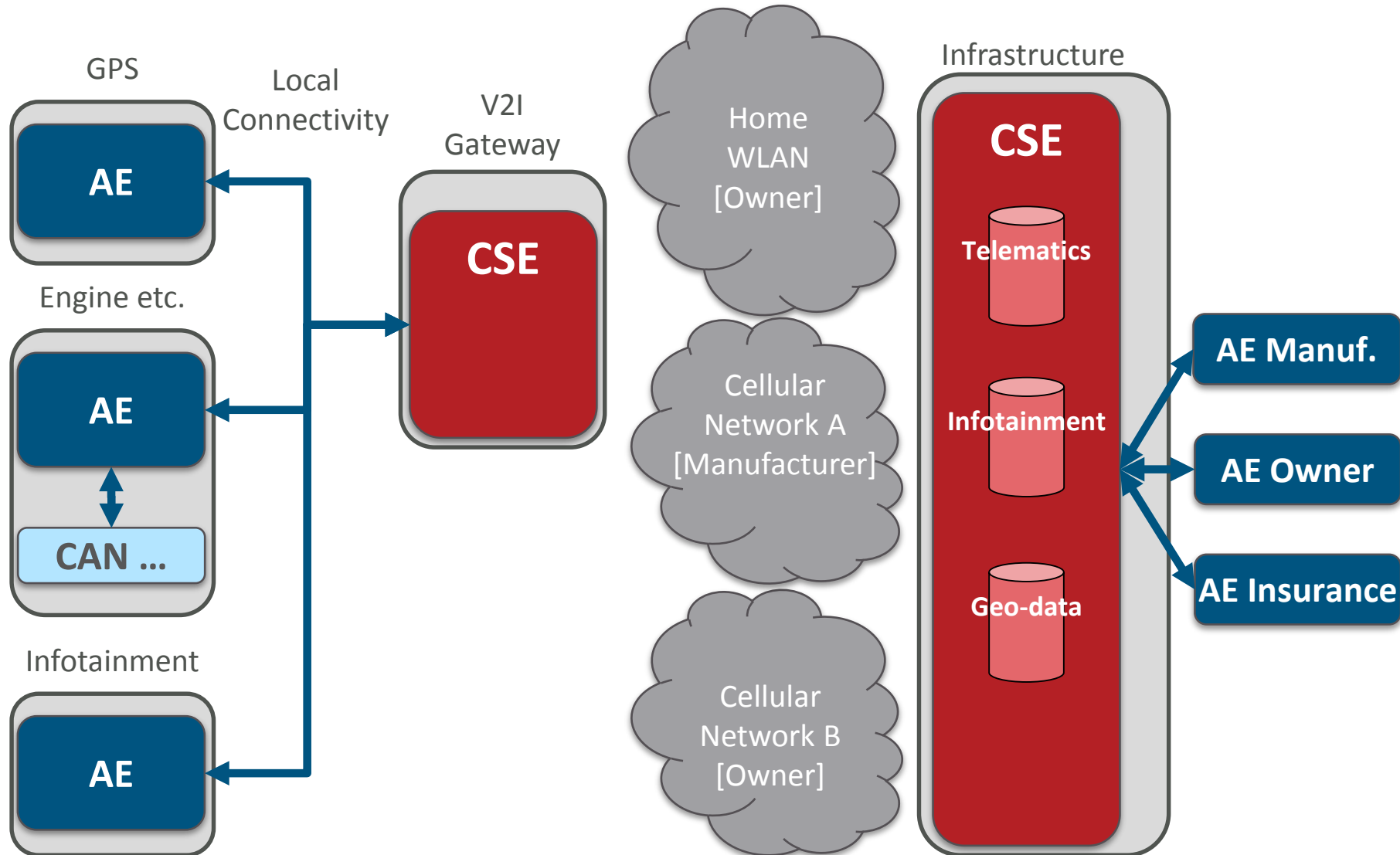
- Middleware
- Between Apps & processing/communication HW
- Integrated into sensors, actors, things, routers, cloud etc.
- Connects producers & consumers securely
- Hides complexity of NW usage from Apps
- Controls when communication happens
- Increases efficiency of data transport
- Stores and shares data
- Supports access control
- Notifies about events
- Talks to groups of things
- Manages devices on large scale



Horizontal layer of functions commonly needed across different segments

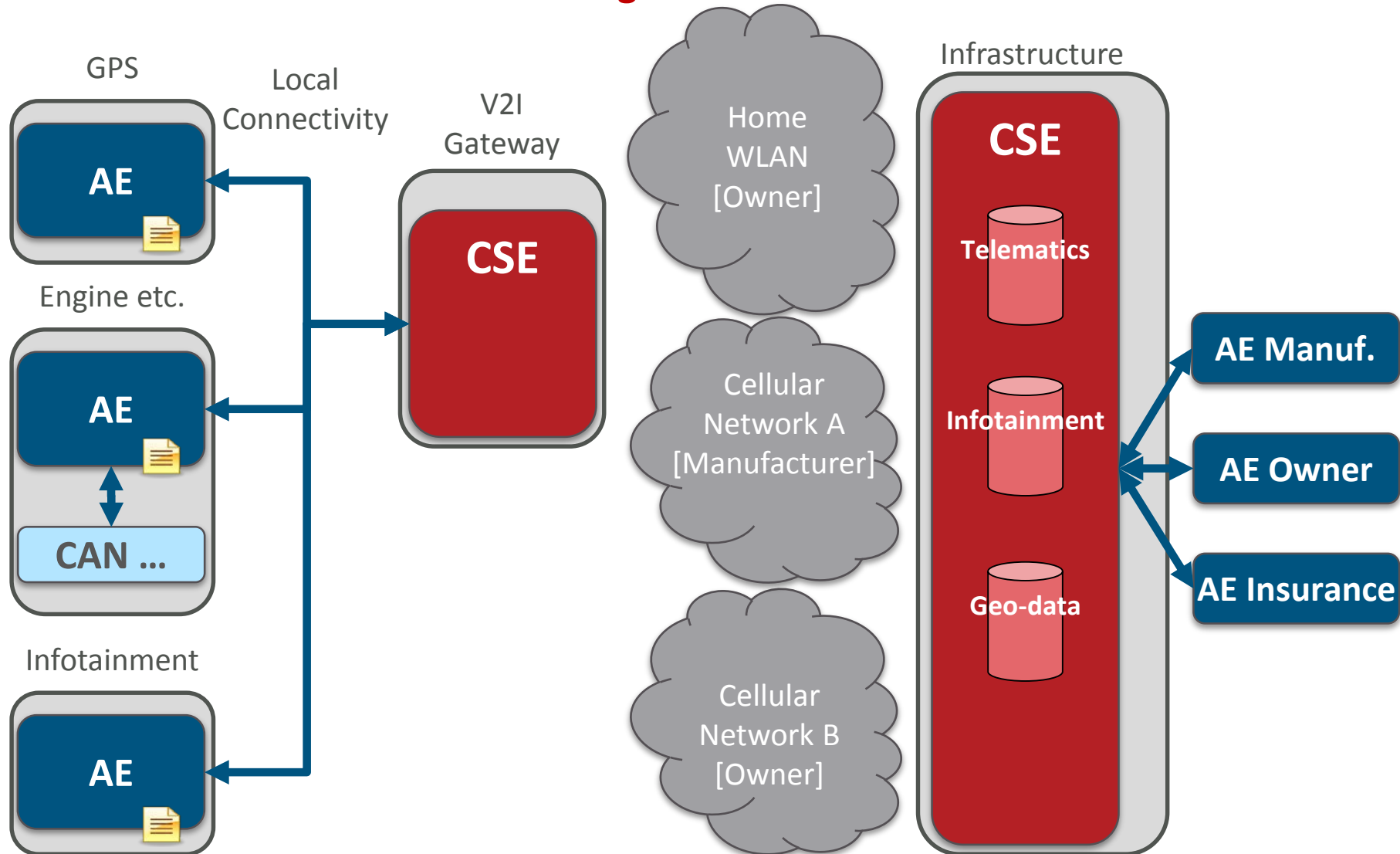
Similar: Generic OS versus use case-specific application

Efficient Data Sharing



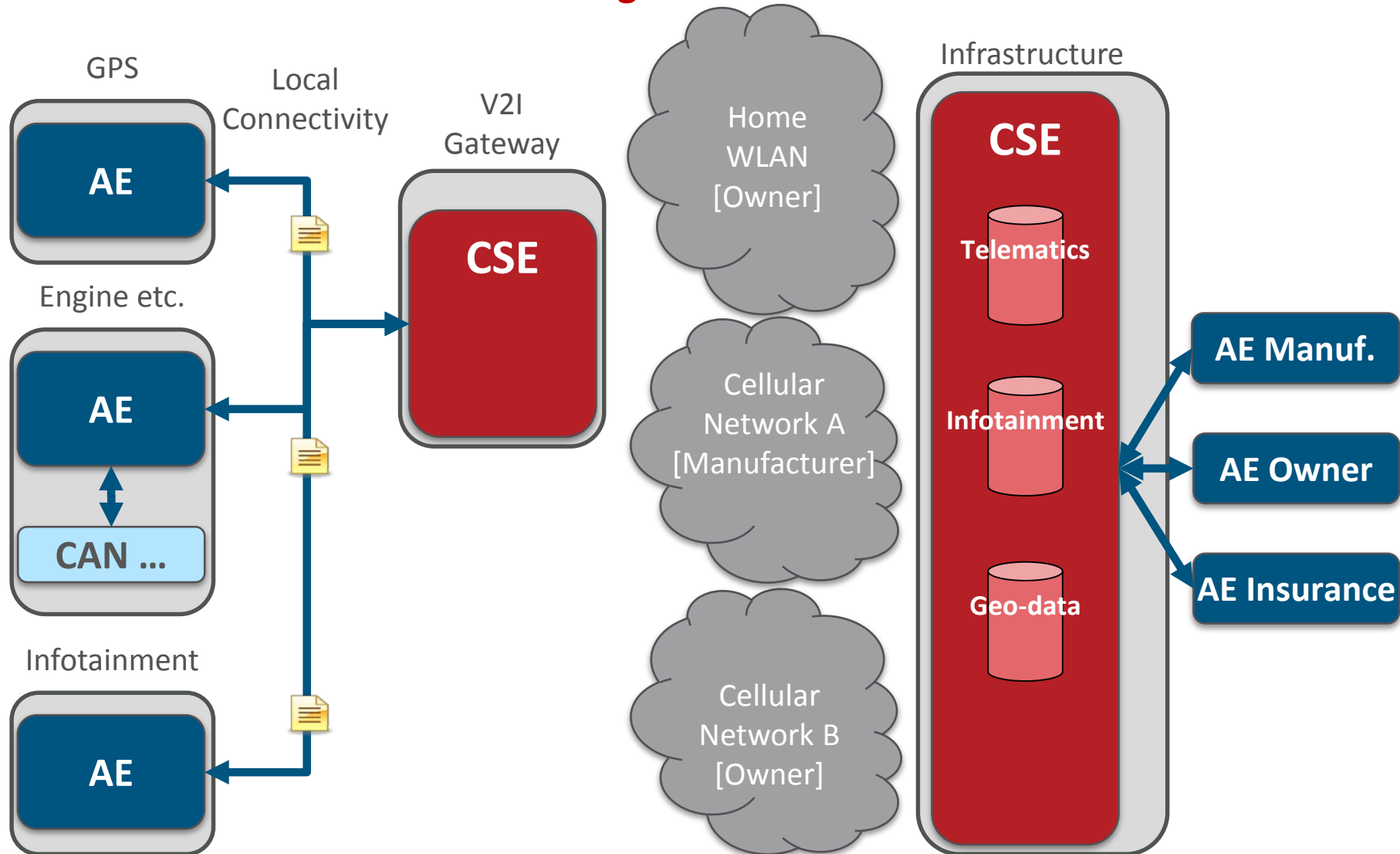
Efficient Data Sharing

At Home: In Owner's WLAN Coverage



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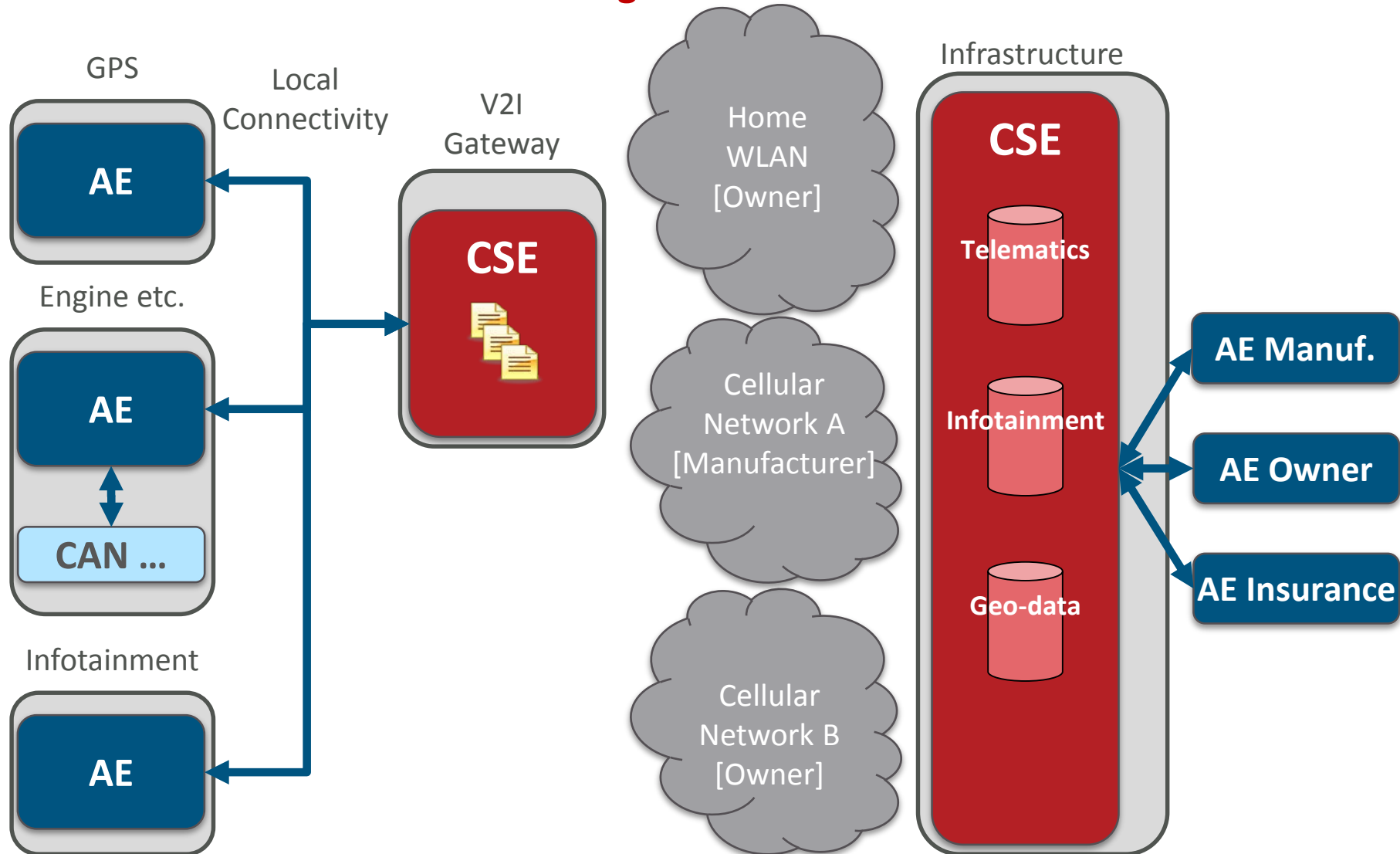




The diagram illustrates a V2I Gateway architecture. On the left, under 'Local Connectivity', three Autonomous Entities (AE) are shown: 'GPS', 'Engine etc.', and 'Infotainment'. The 'Engine etc.' AE is connected to a 'CAN ...' module. A blue line with arrows indicates data flow from these AEs to a central 'V2I Gateway' box containing a 'CSE' (Context Service Entity). The gateway is connected to three network clouds: 'Home WLAN [Owner]', 'Cellular Network A [Manufacturer]', and 'Cellular Network B [Owner]'. On the right, under 'Infrastructure', a large red box contains a 'CSE' with three data stores: 'Telematics', 'Infotainment', and 'Geo-data'. Arrows point from this infrastructure CSE to three external entities: 'AE Manuf.', 'AE Owner', and 'AE Insurance'.

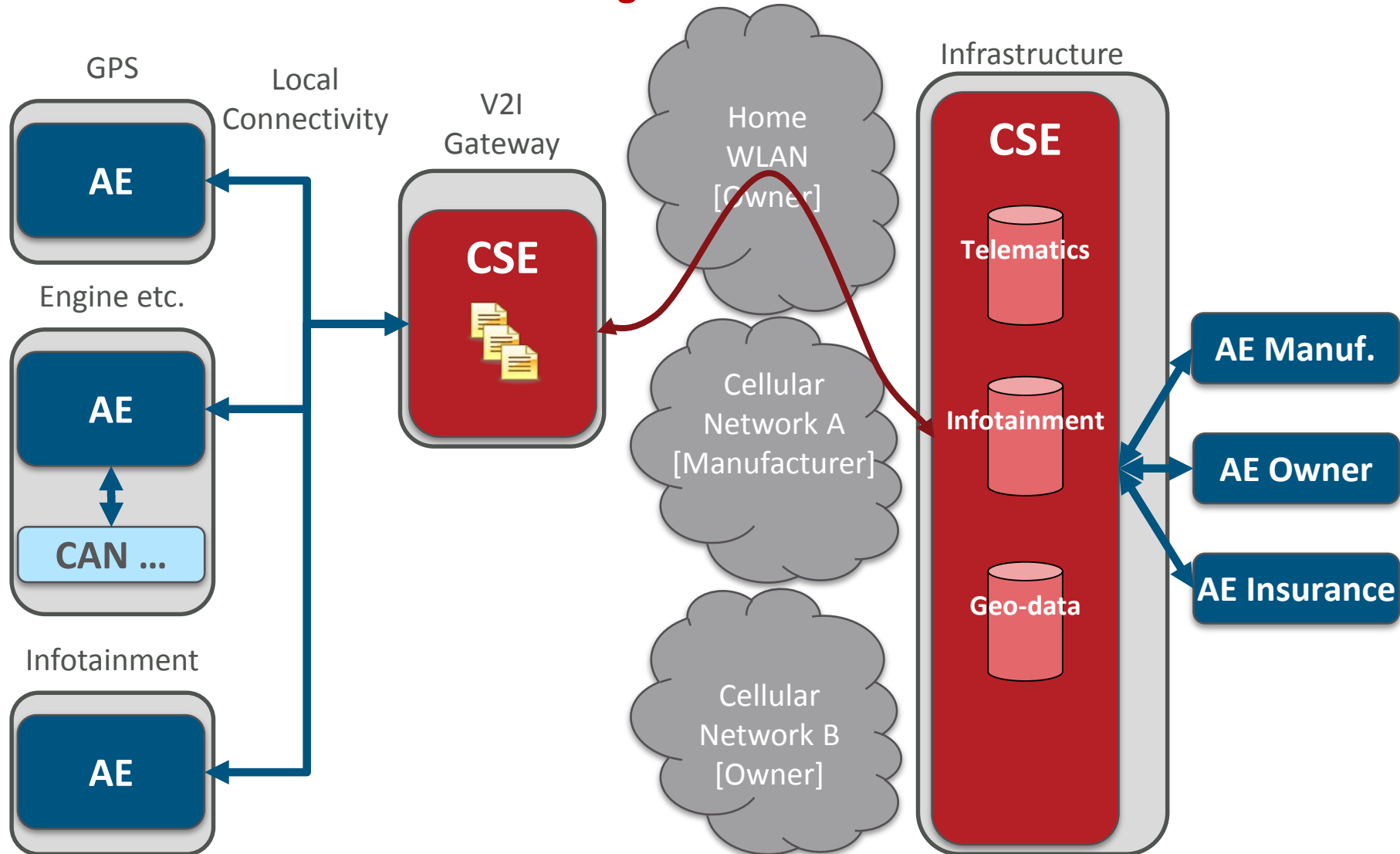
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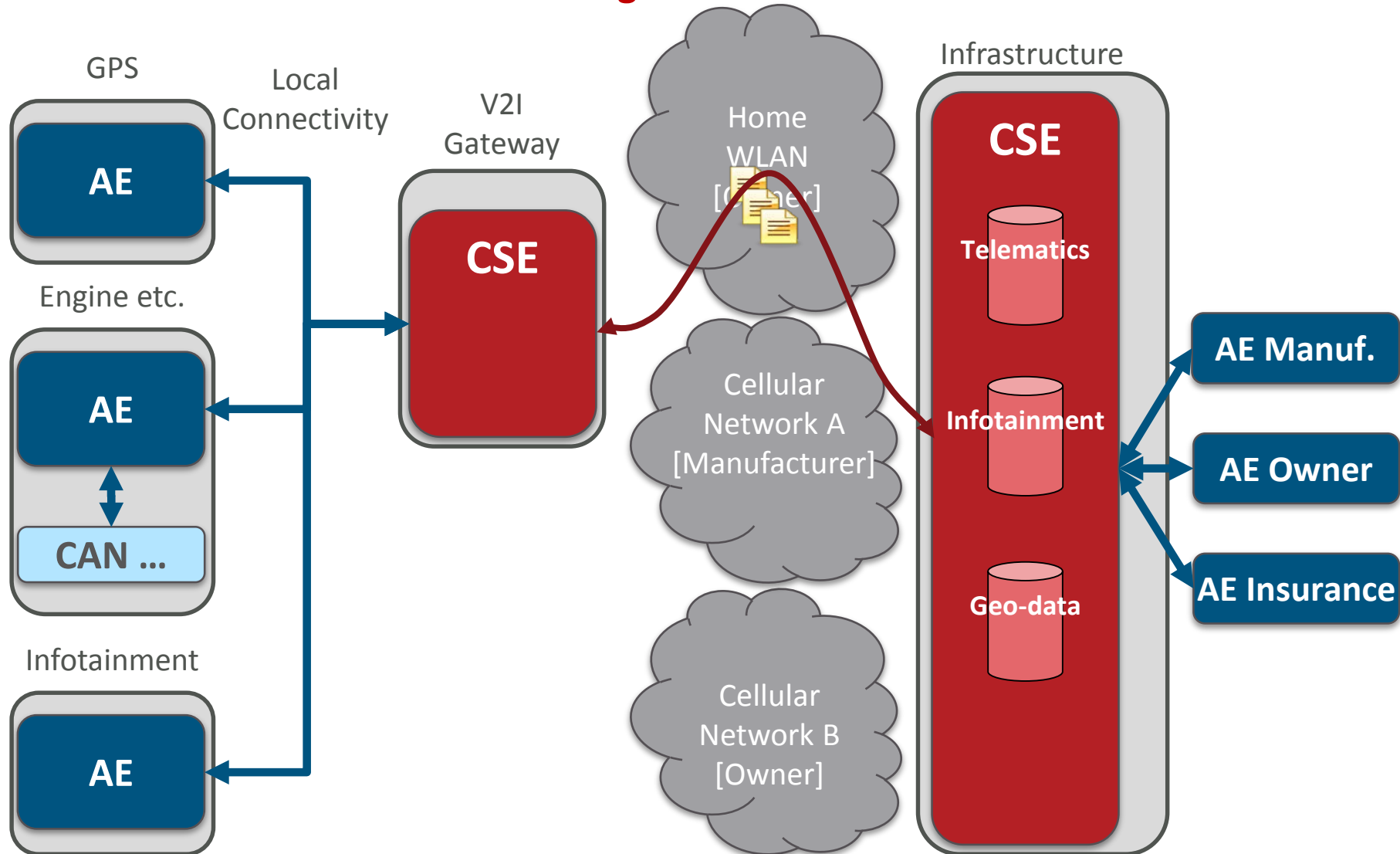
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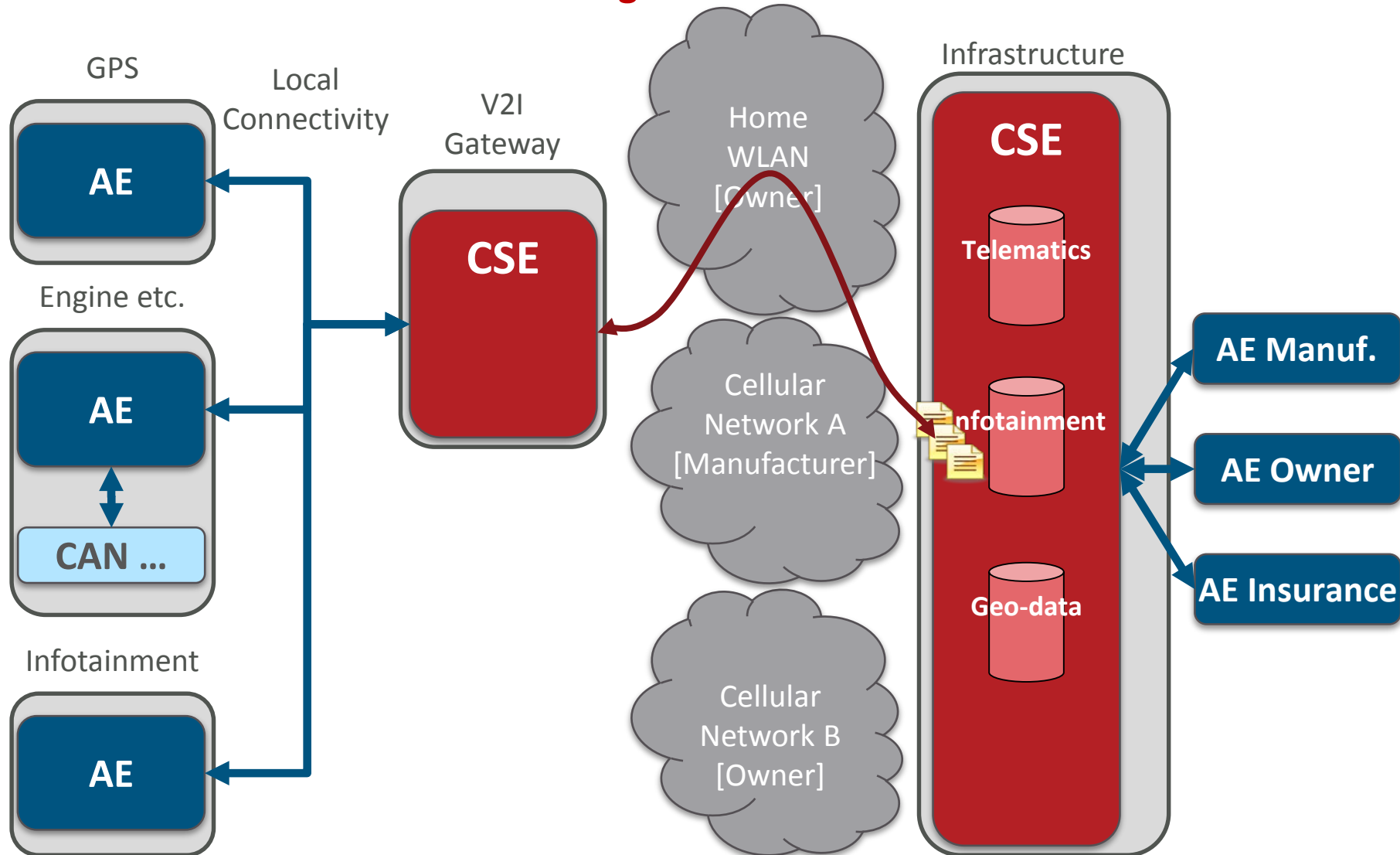


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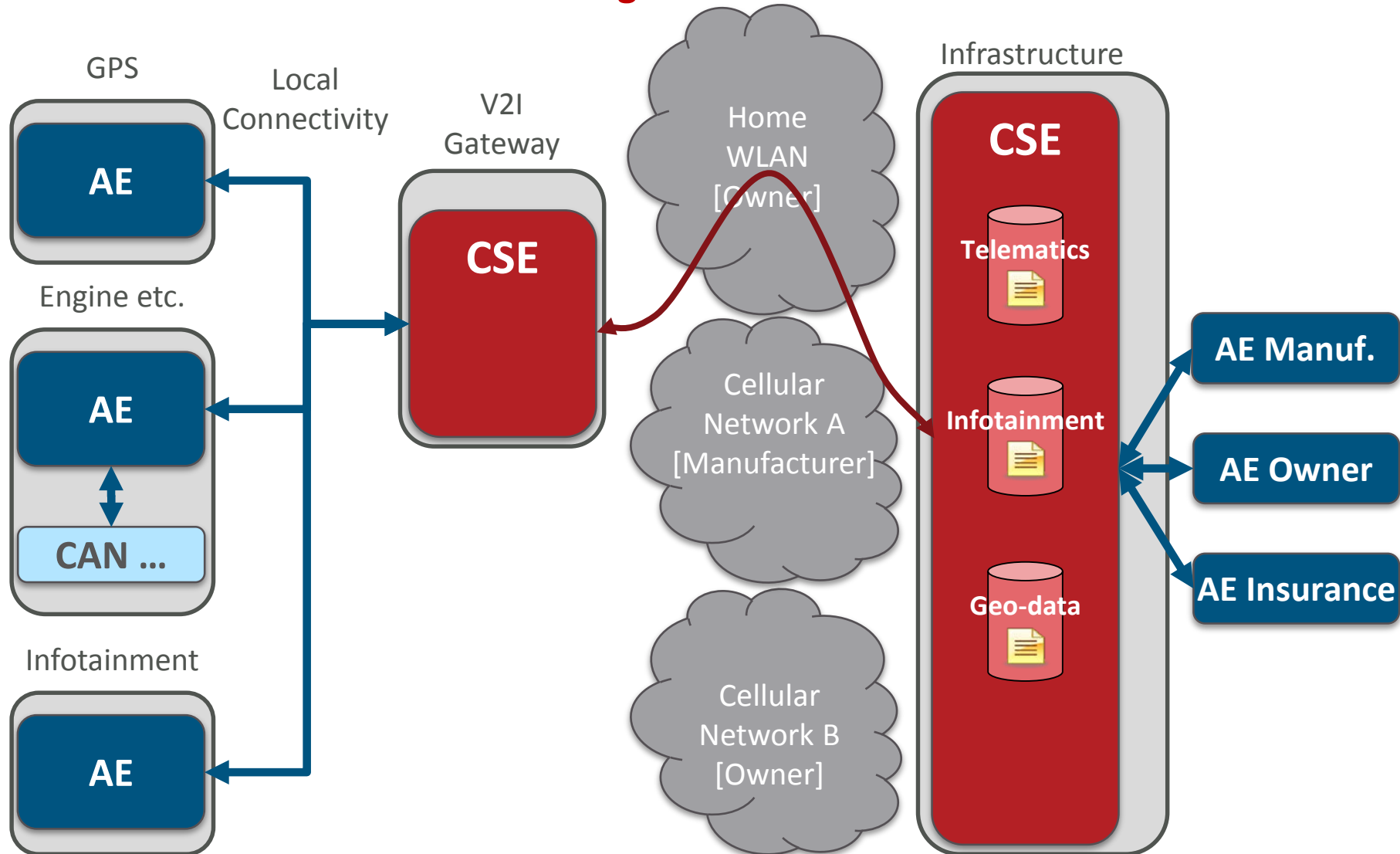
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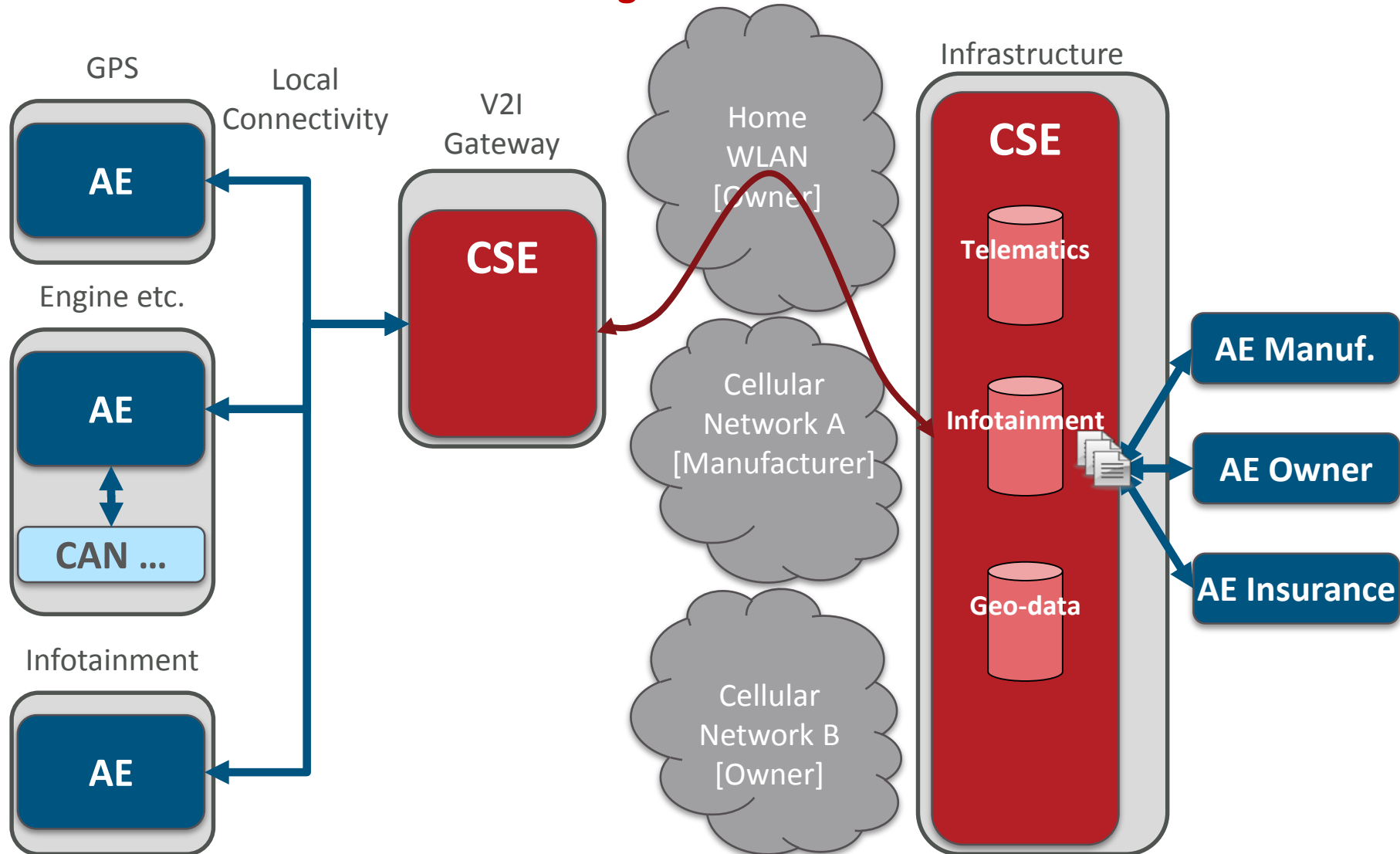
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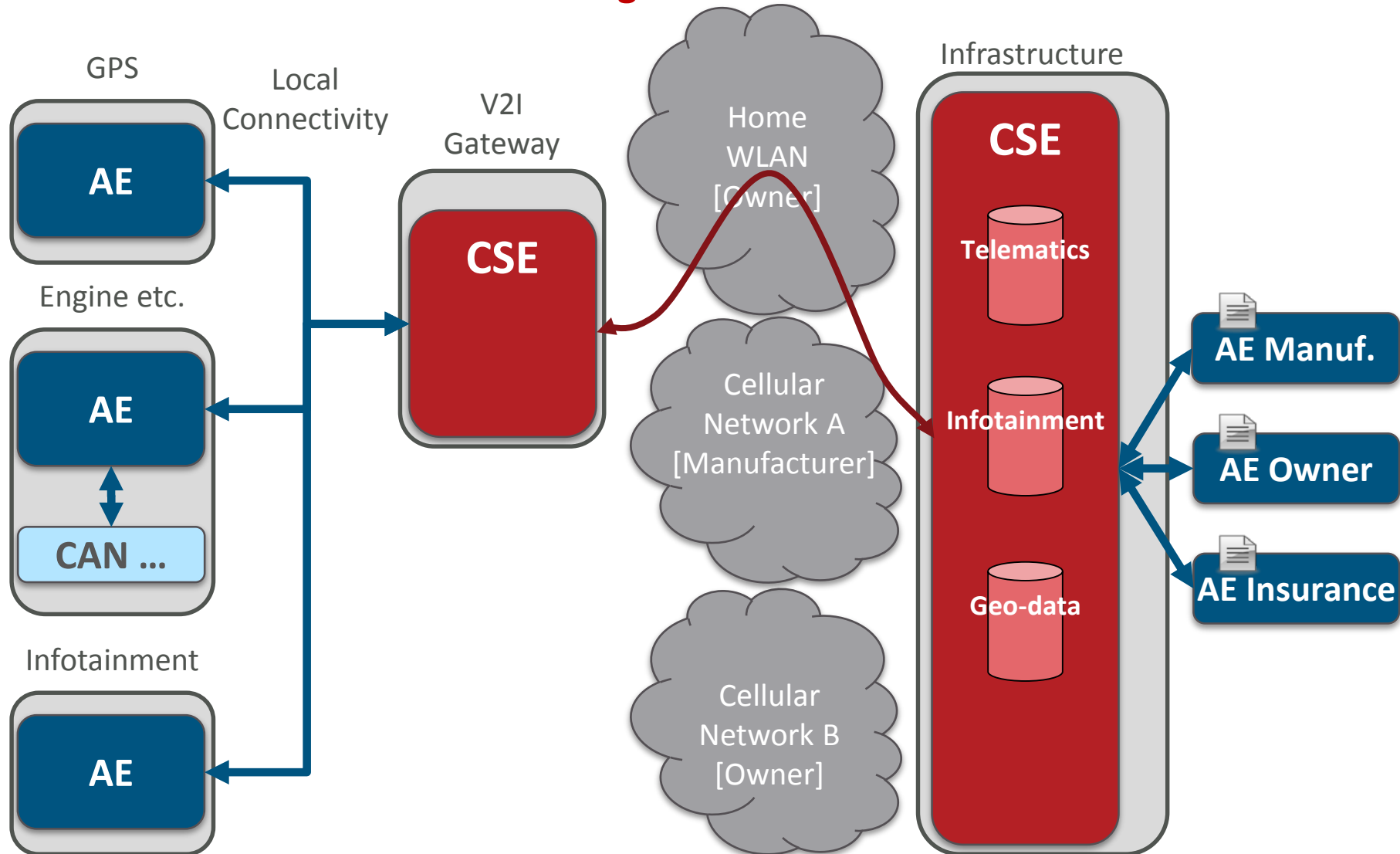




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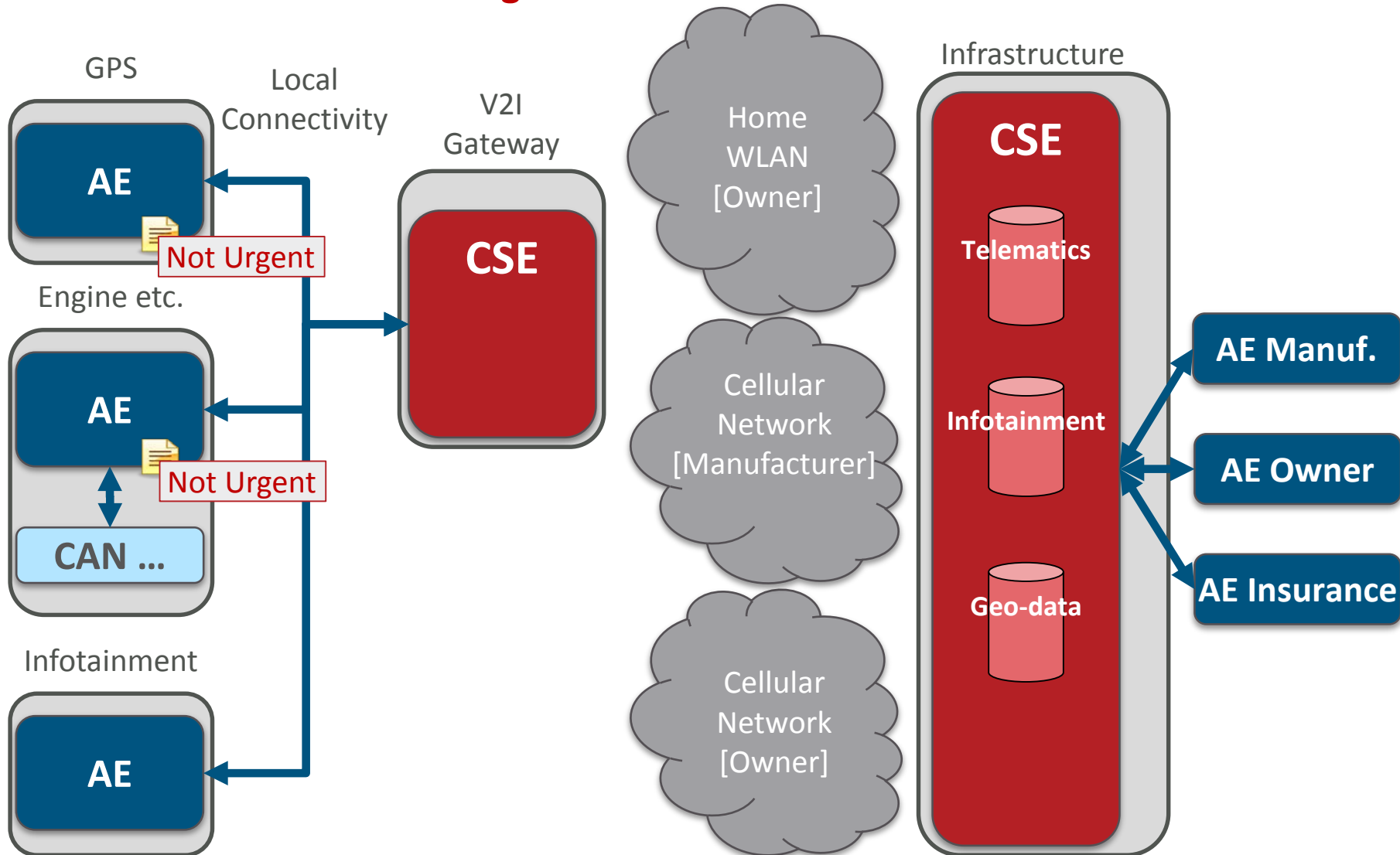
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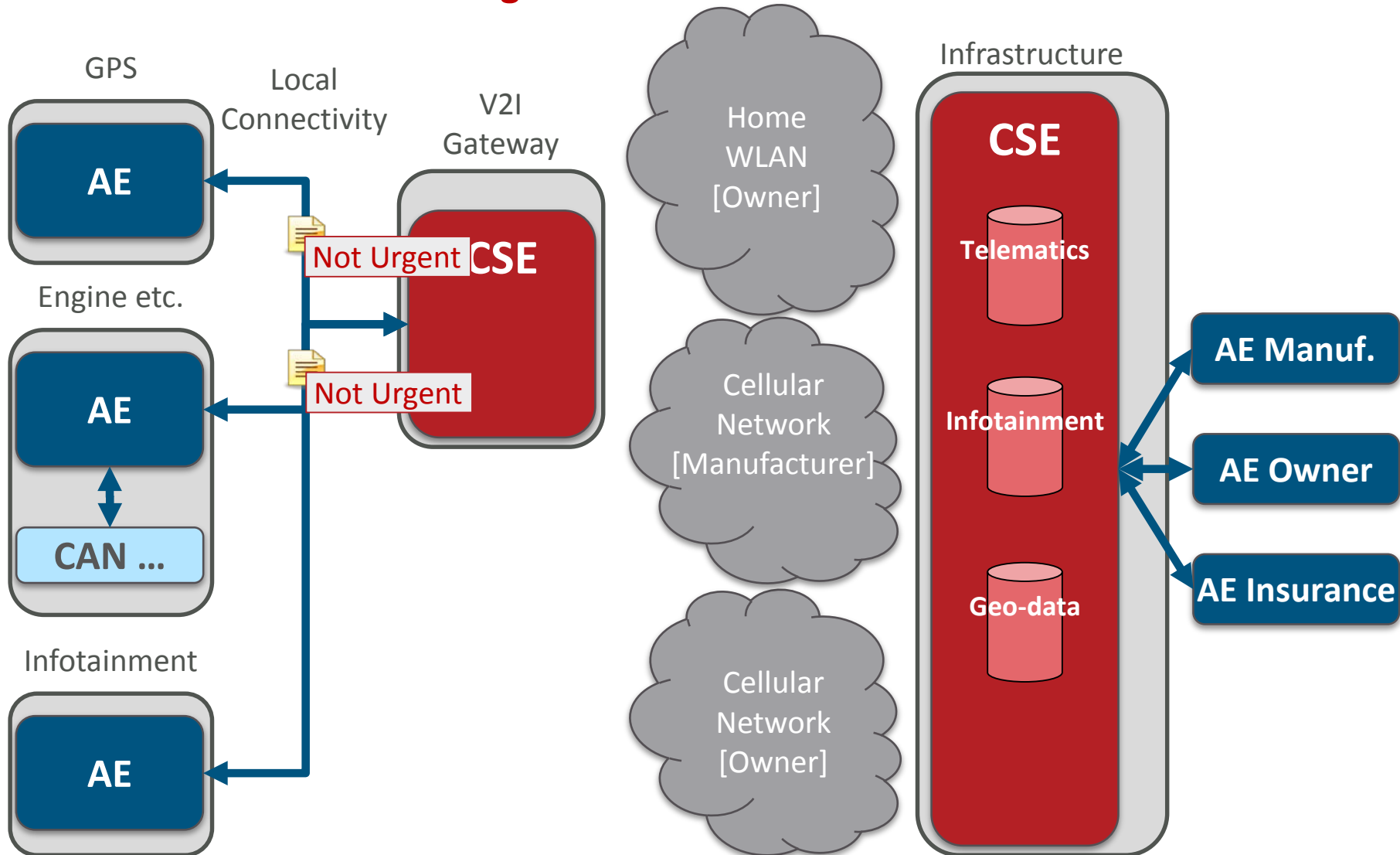
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On the road: Cellular Coverage



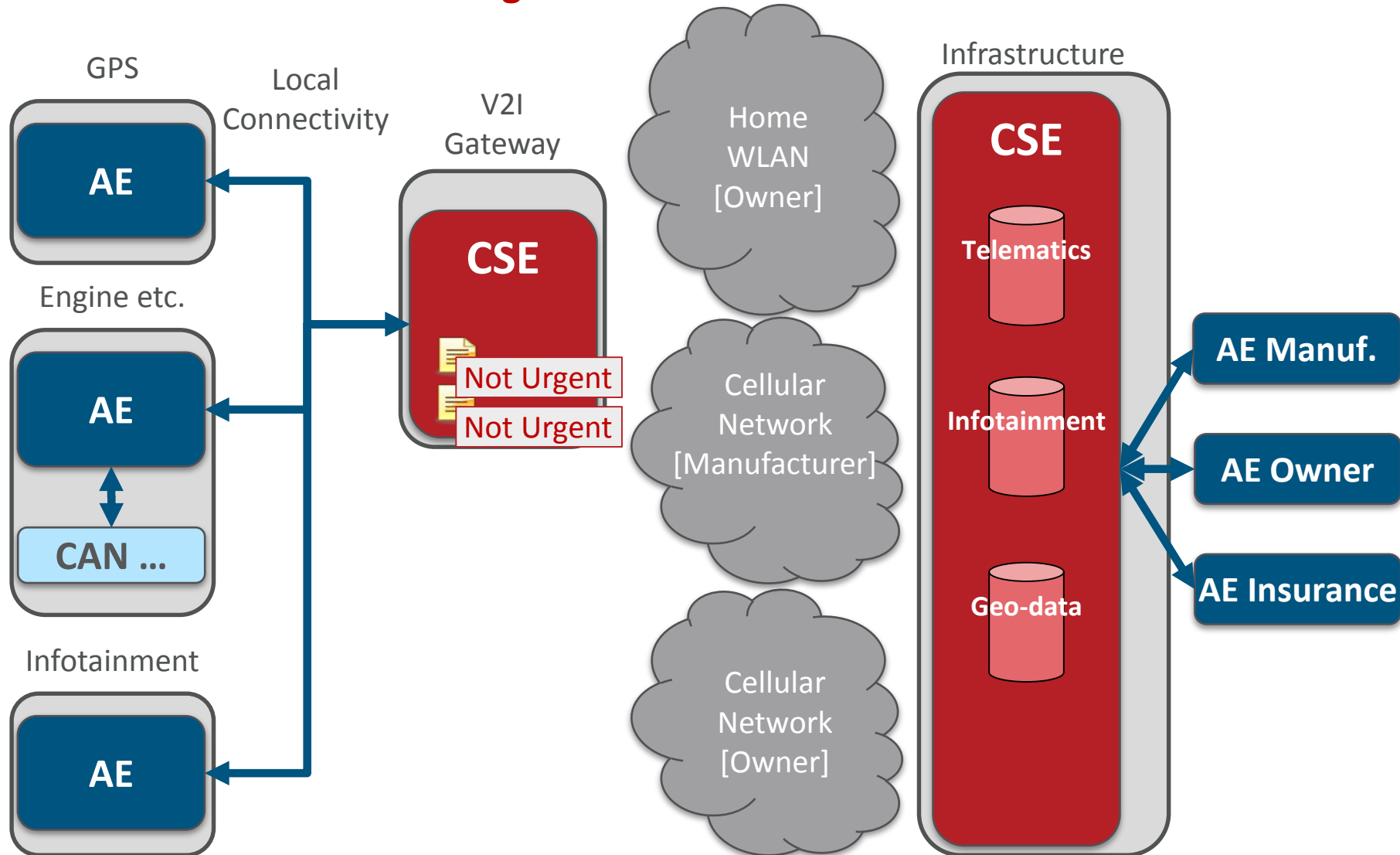
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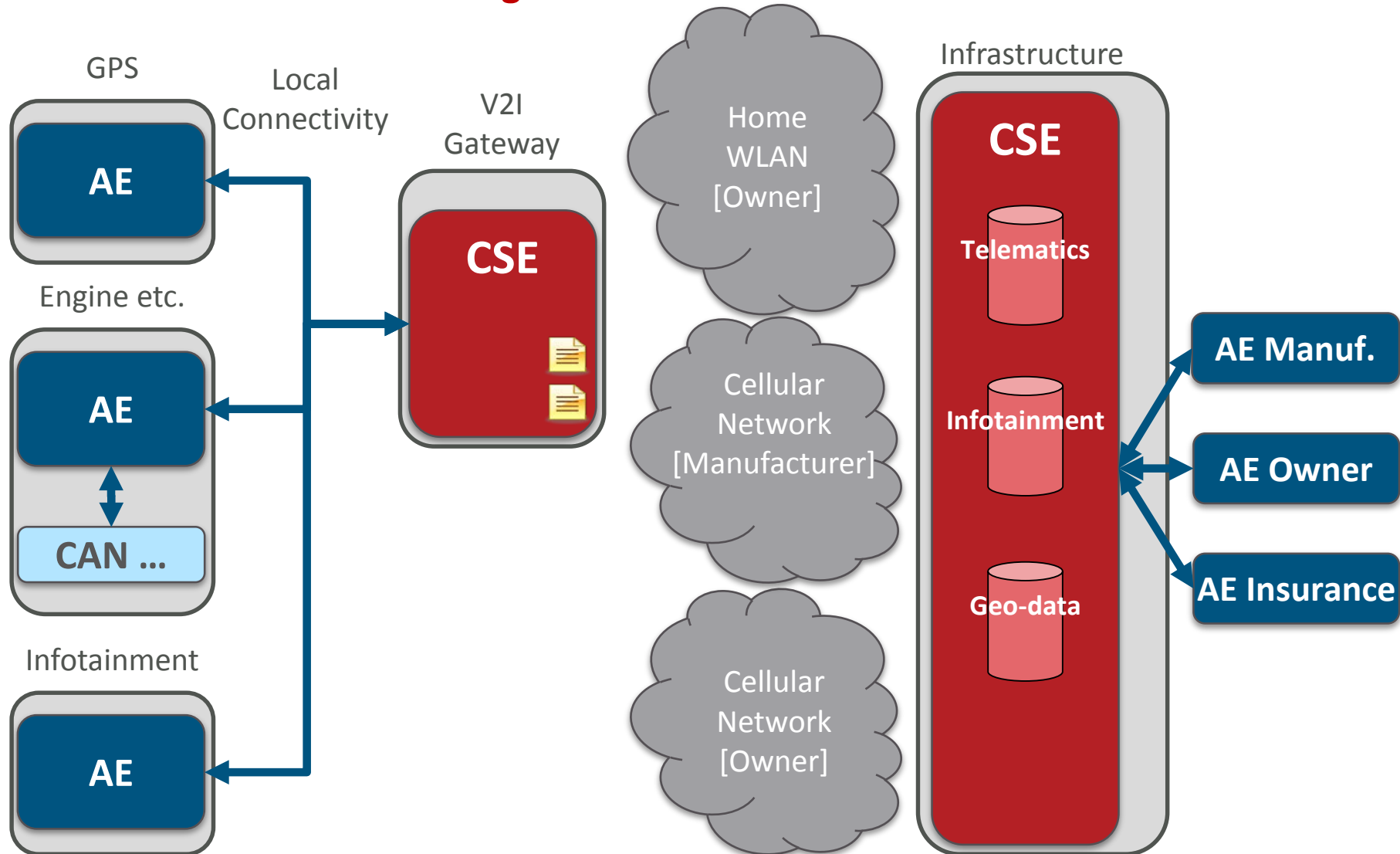
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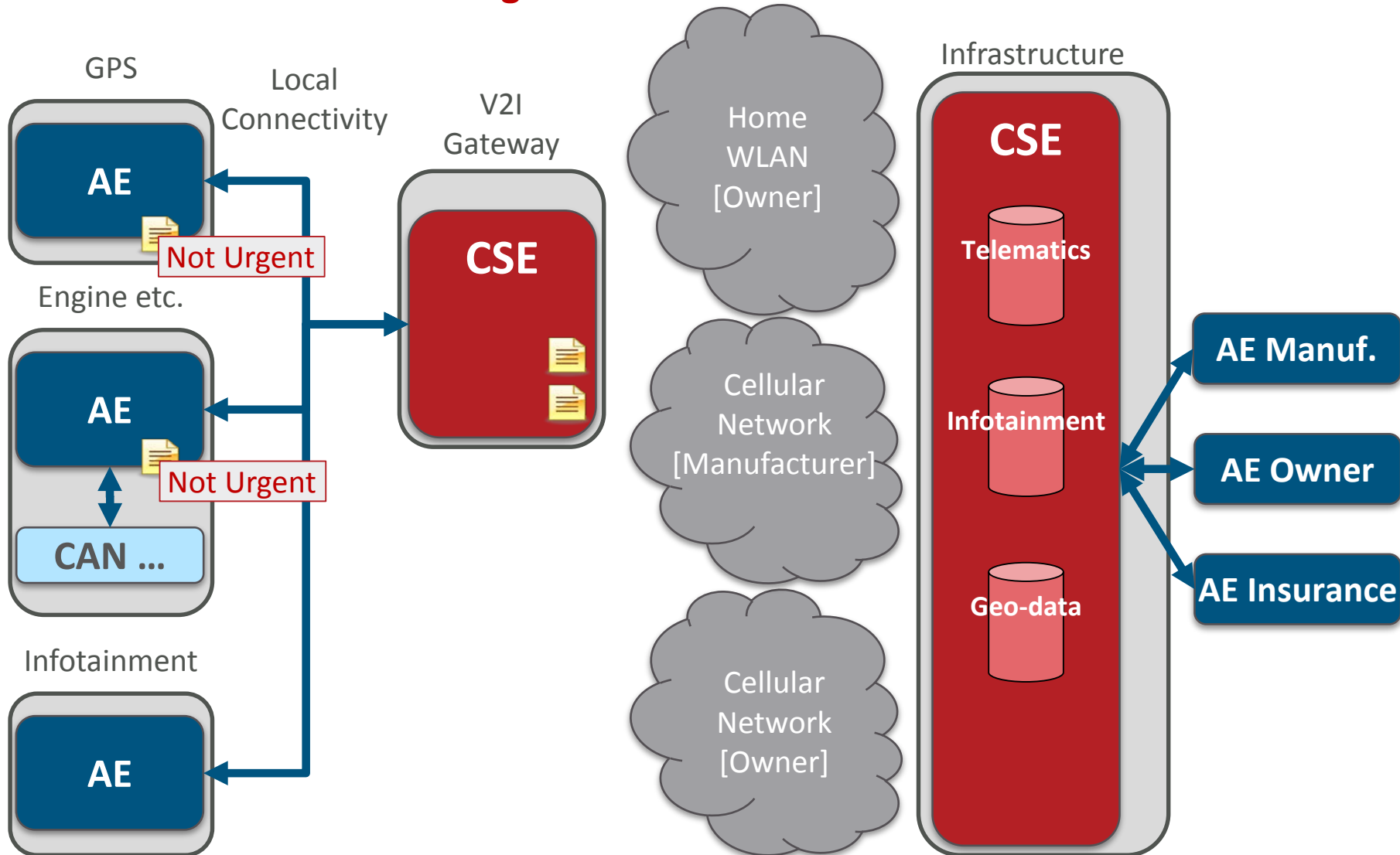
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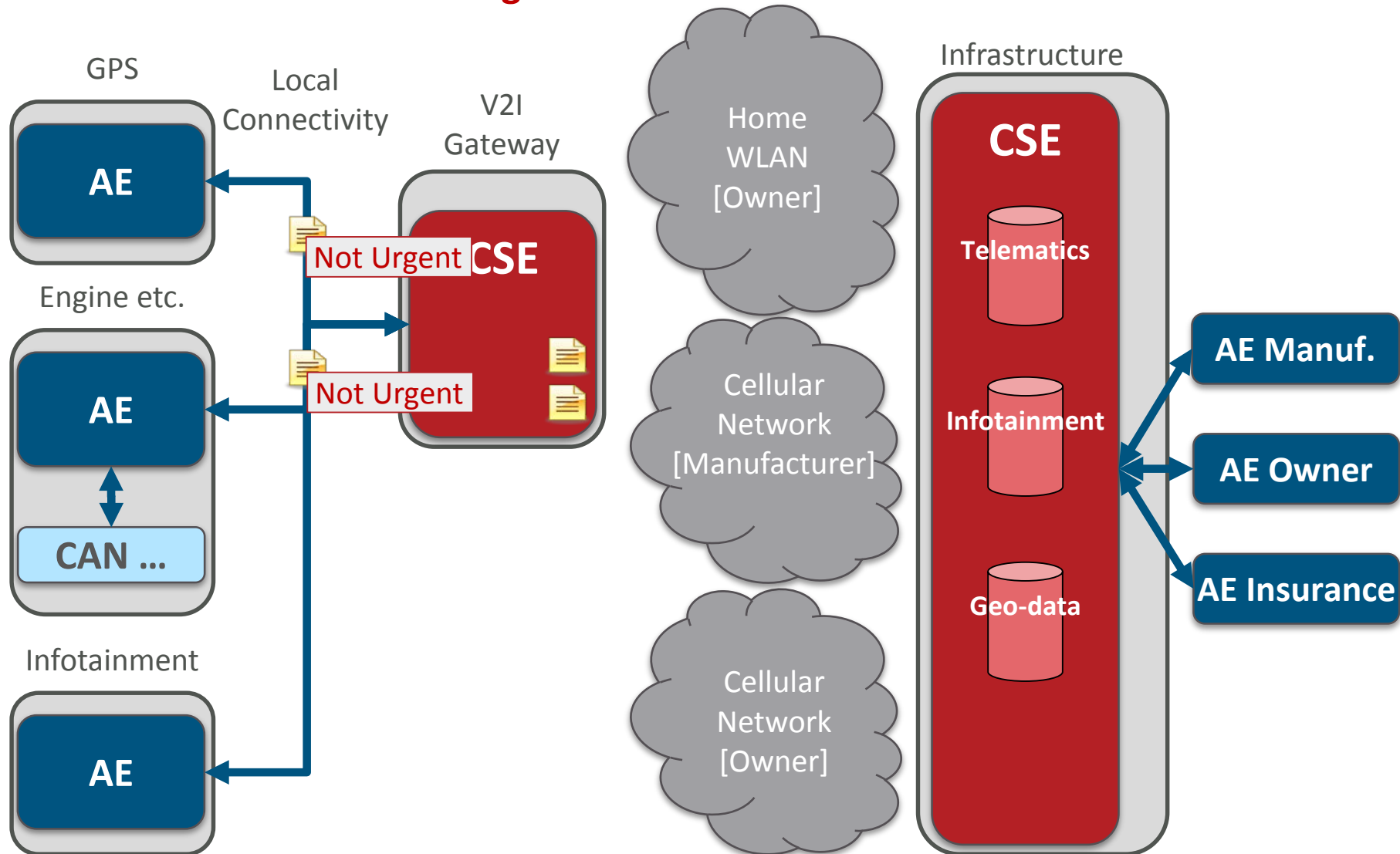
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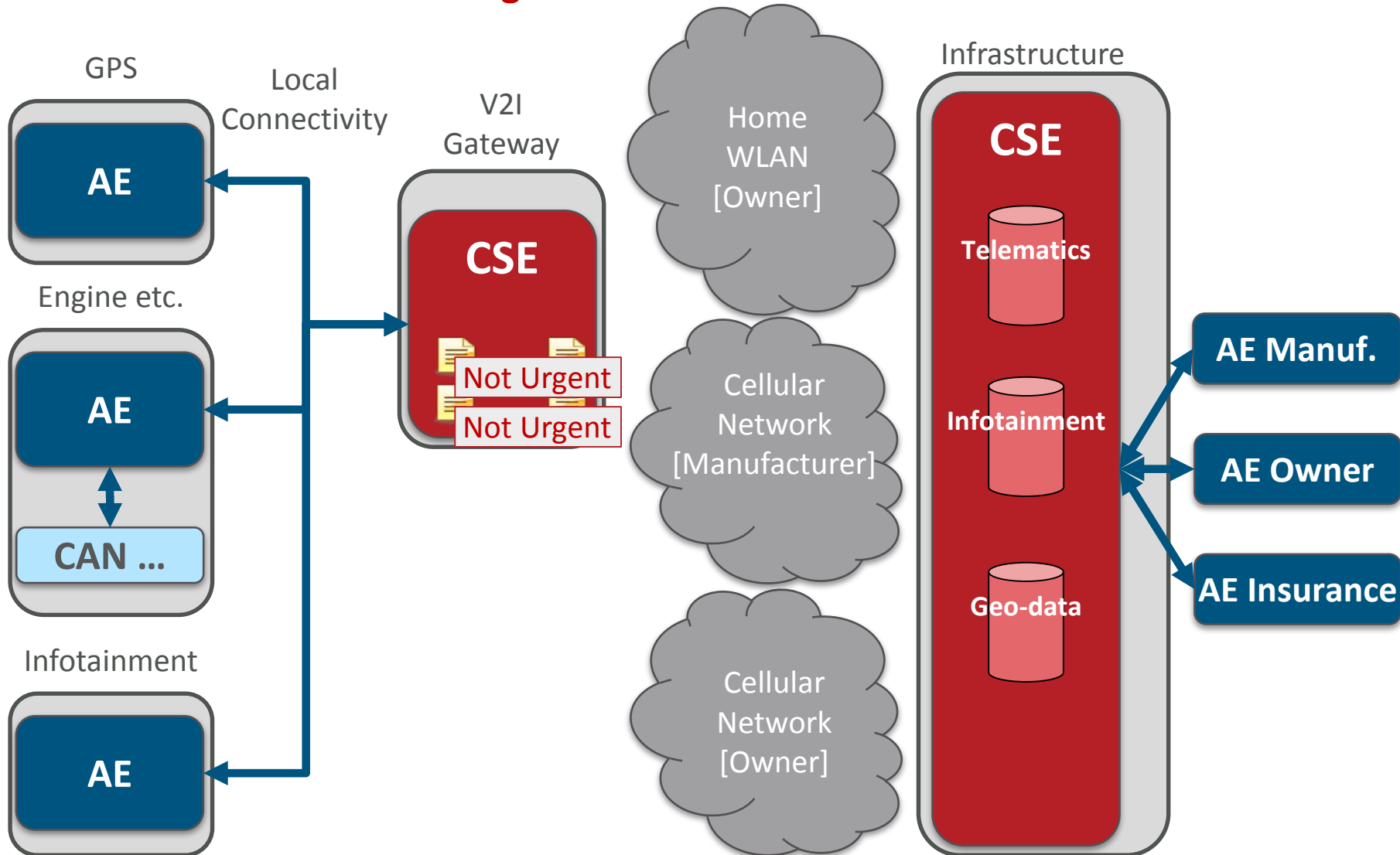
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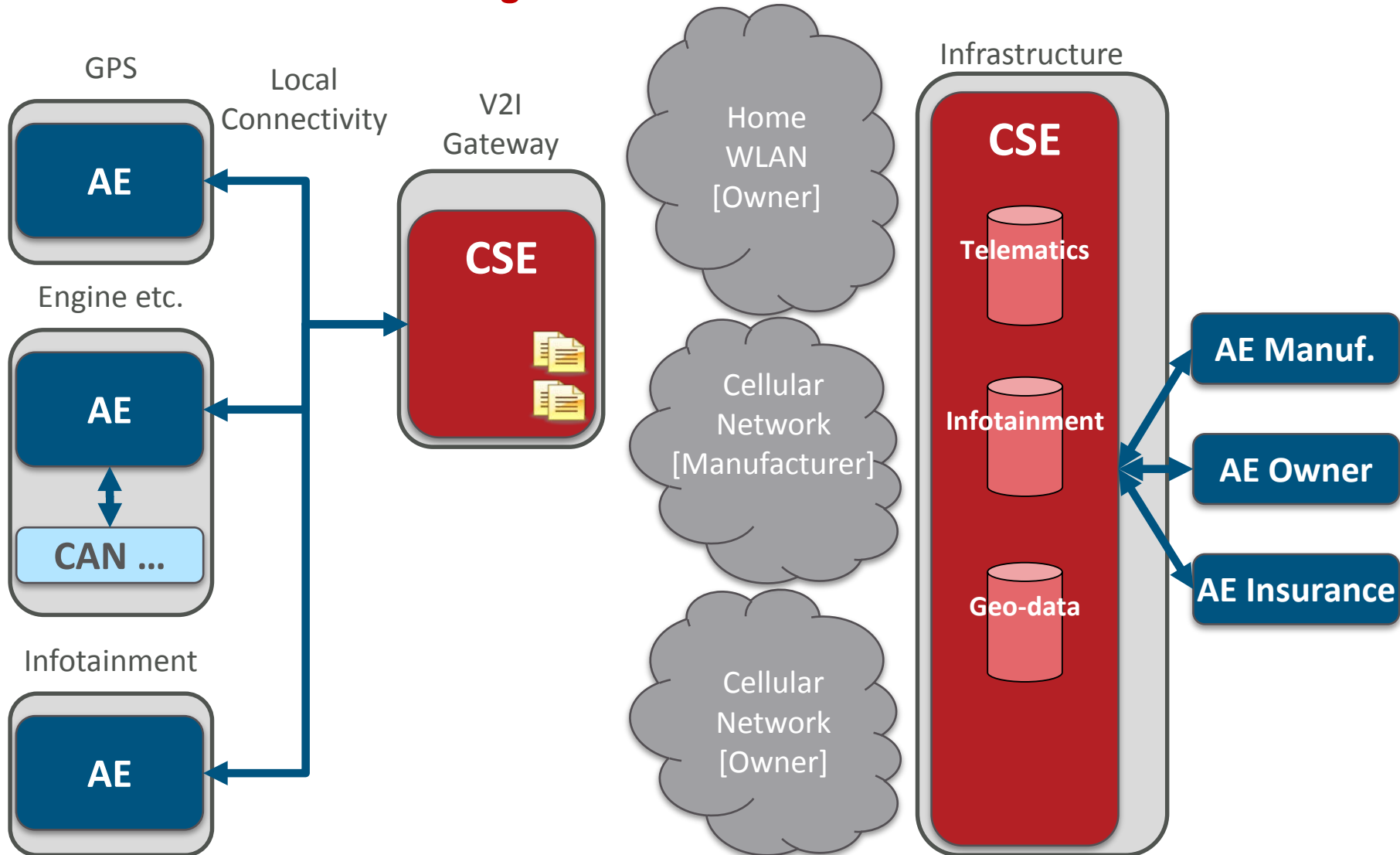
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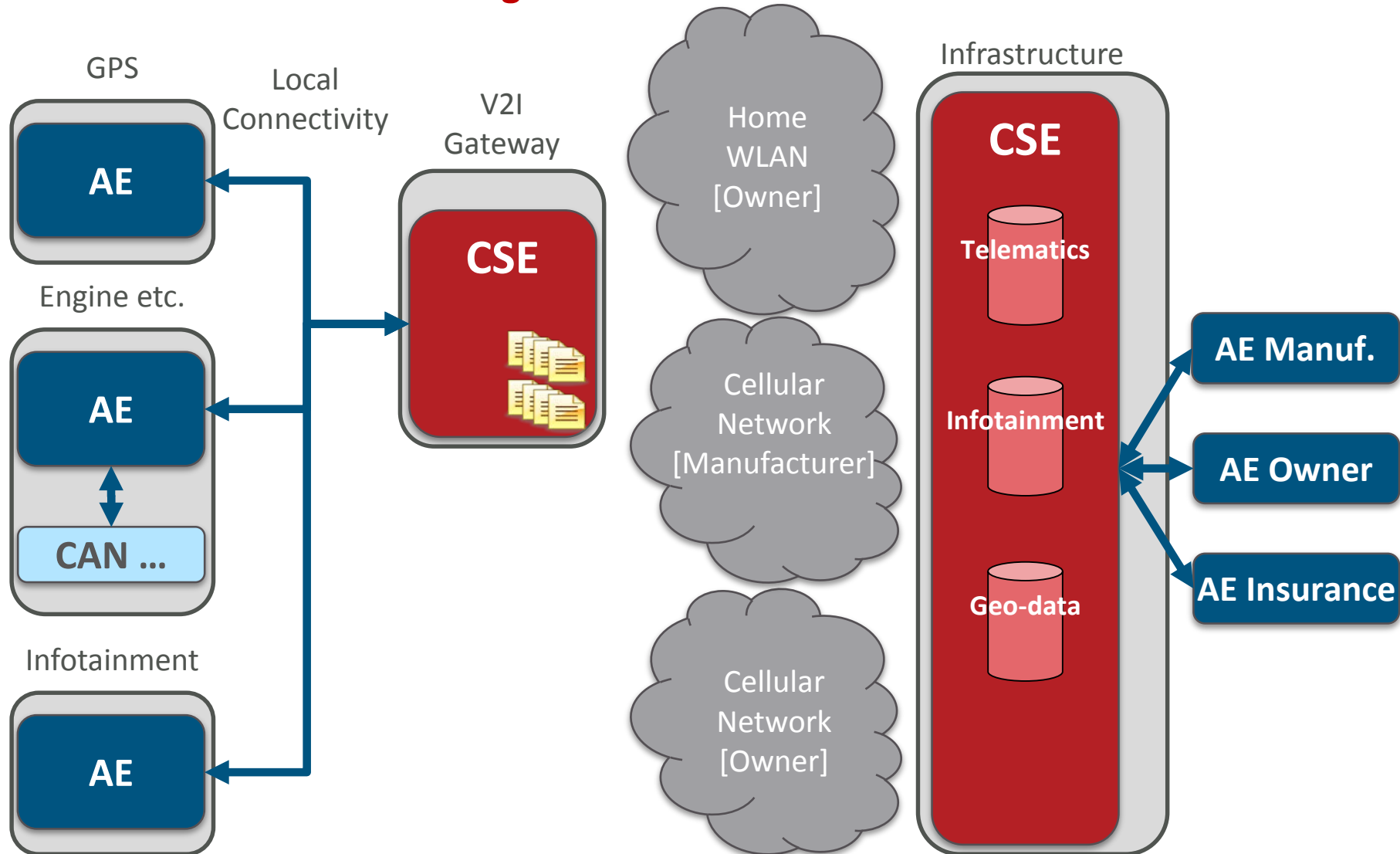
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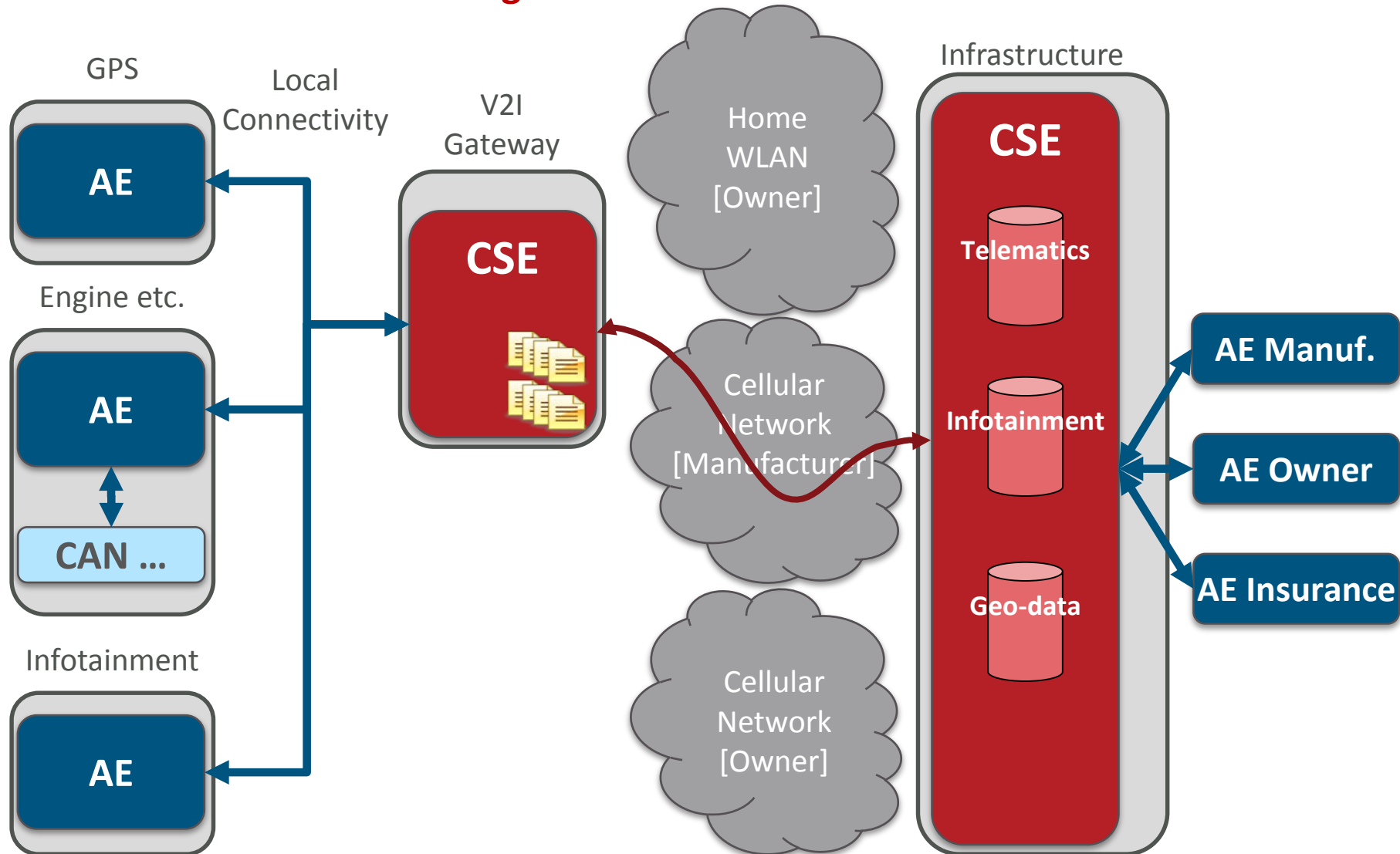
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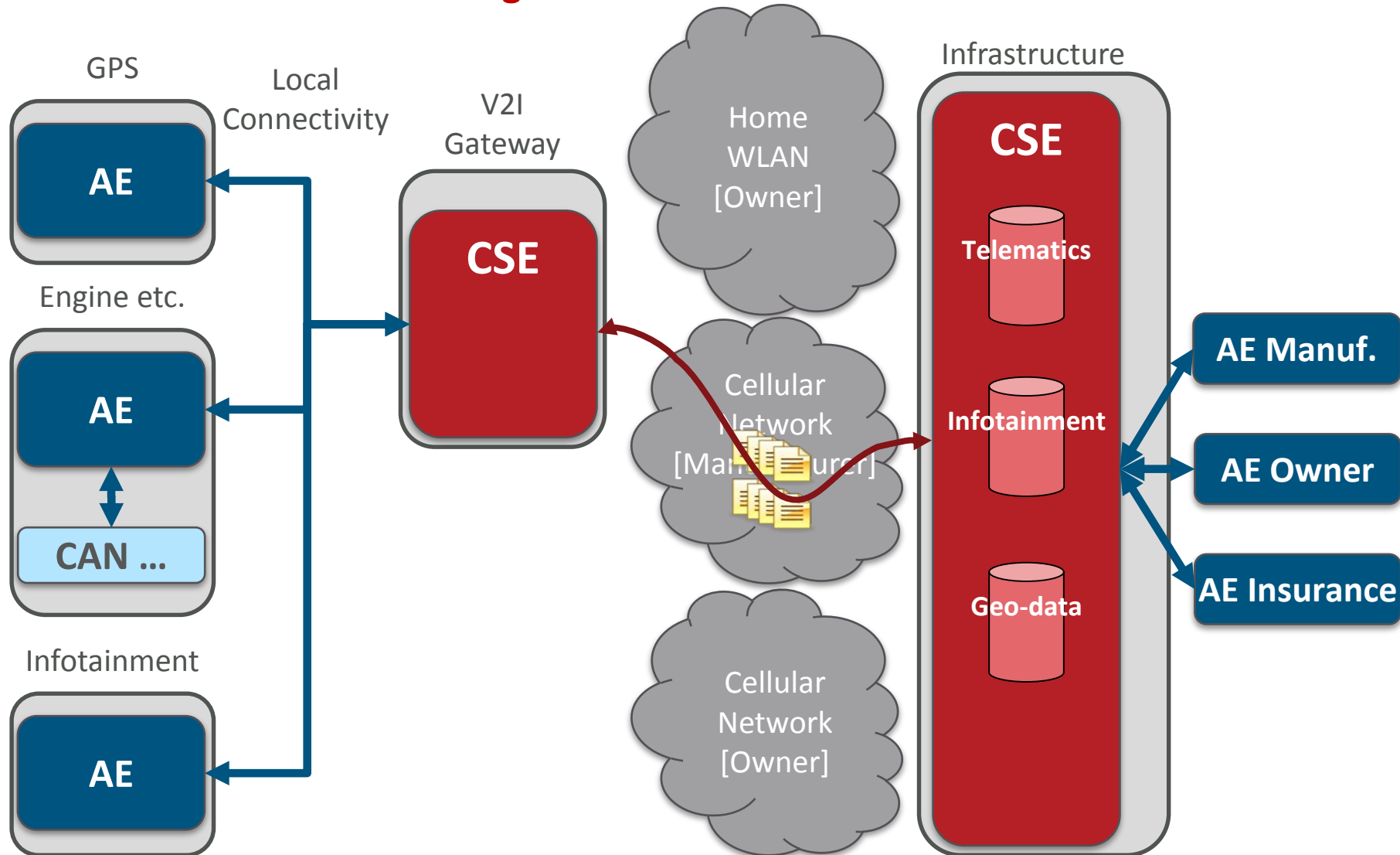
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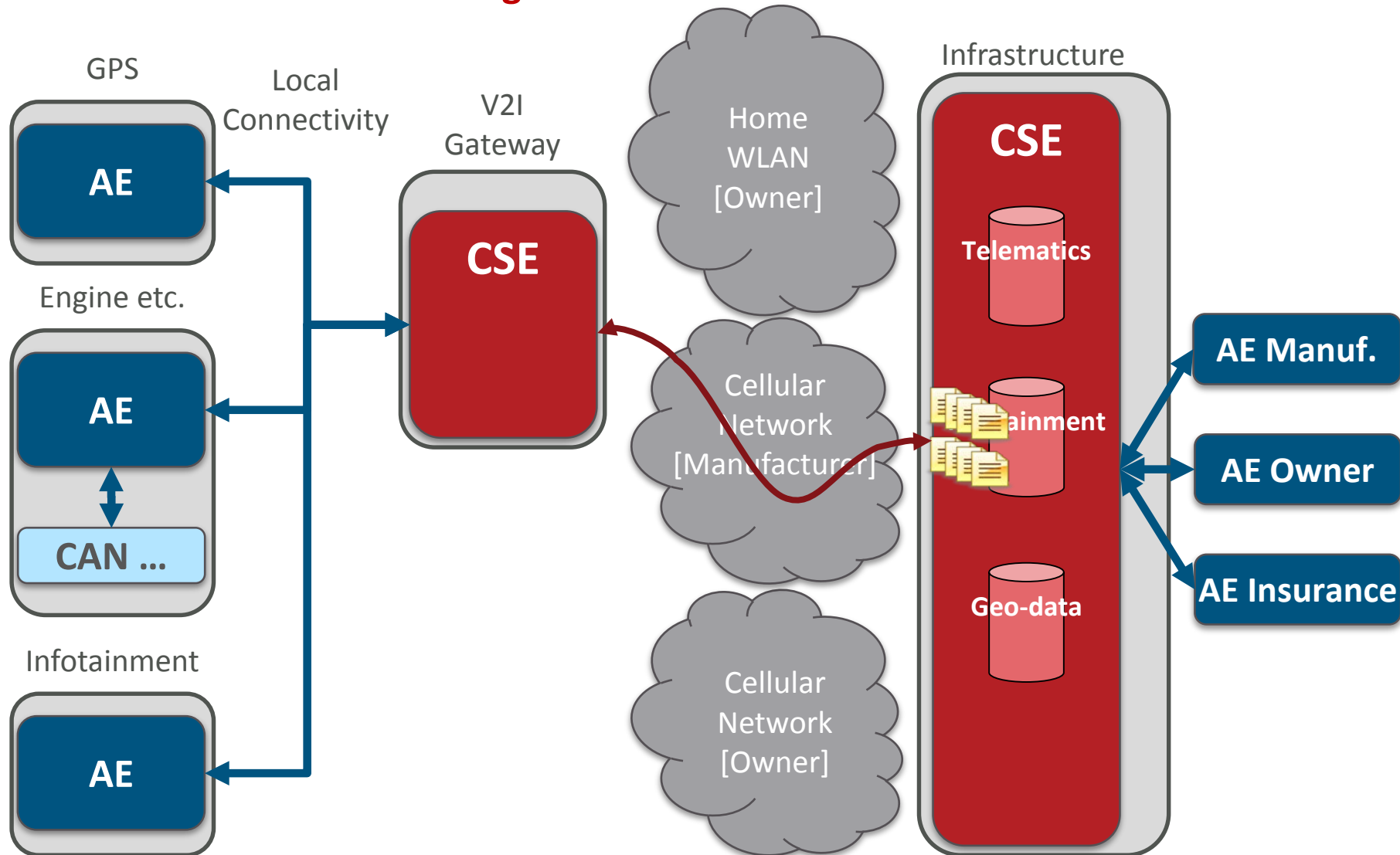
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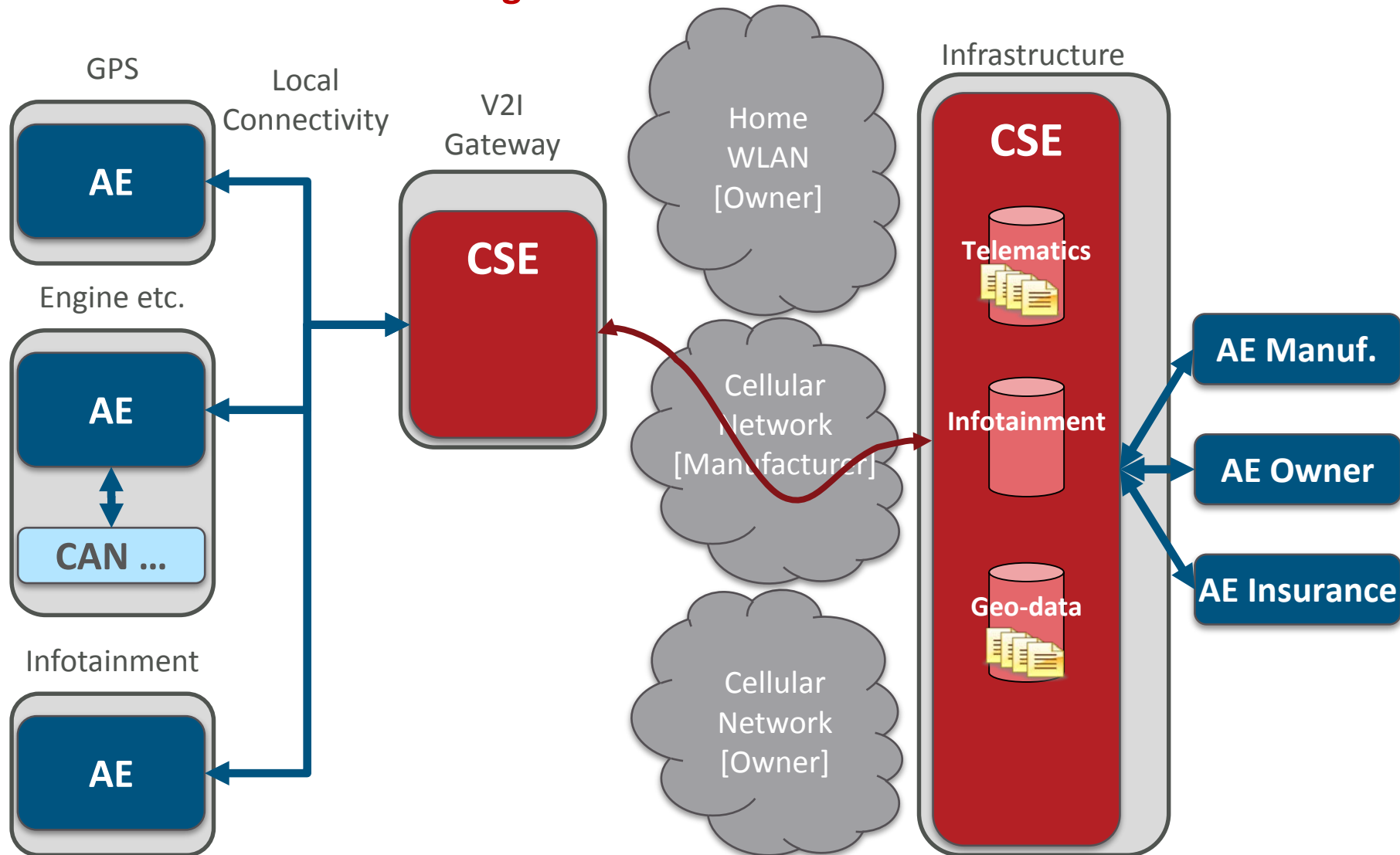
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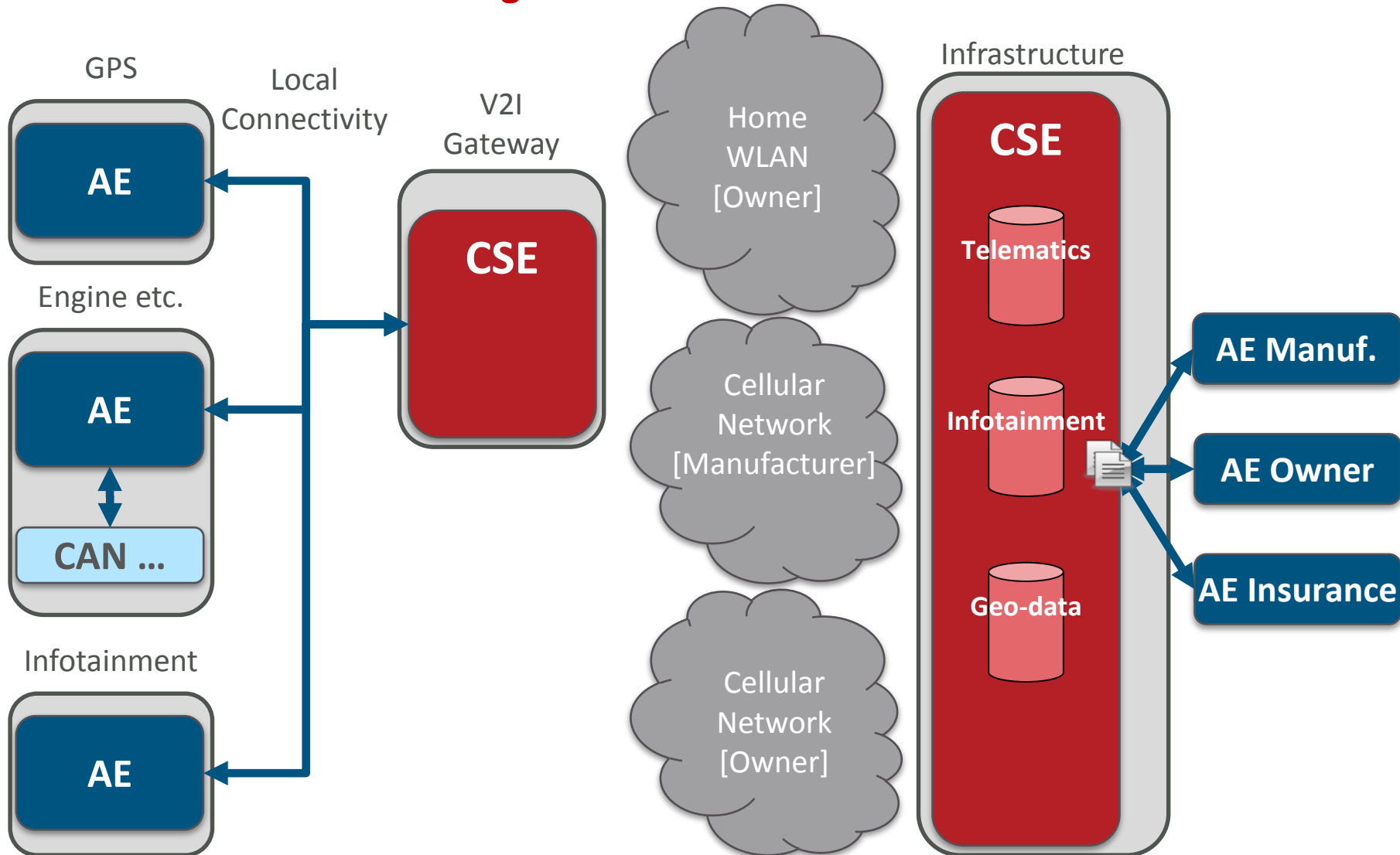
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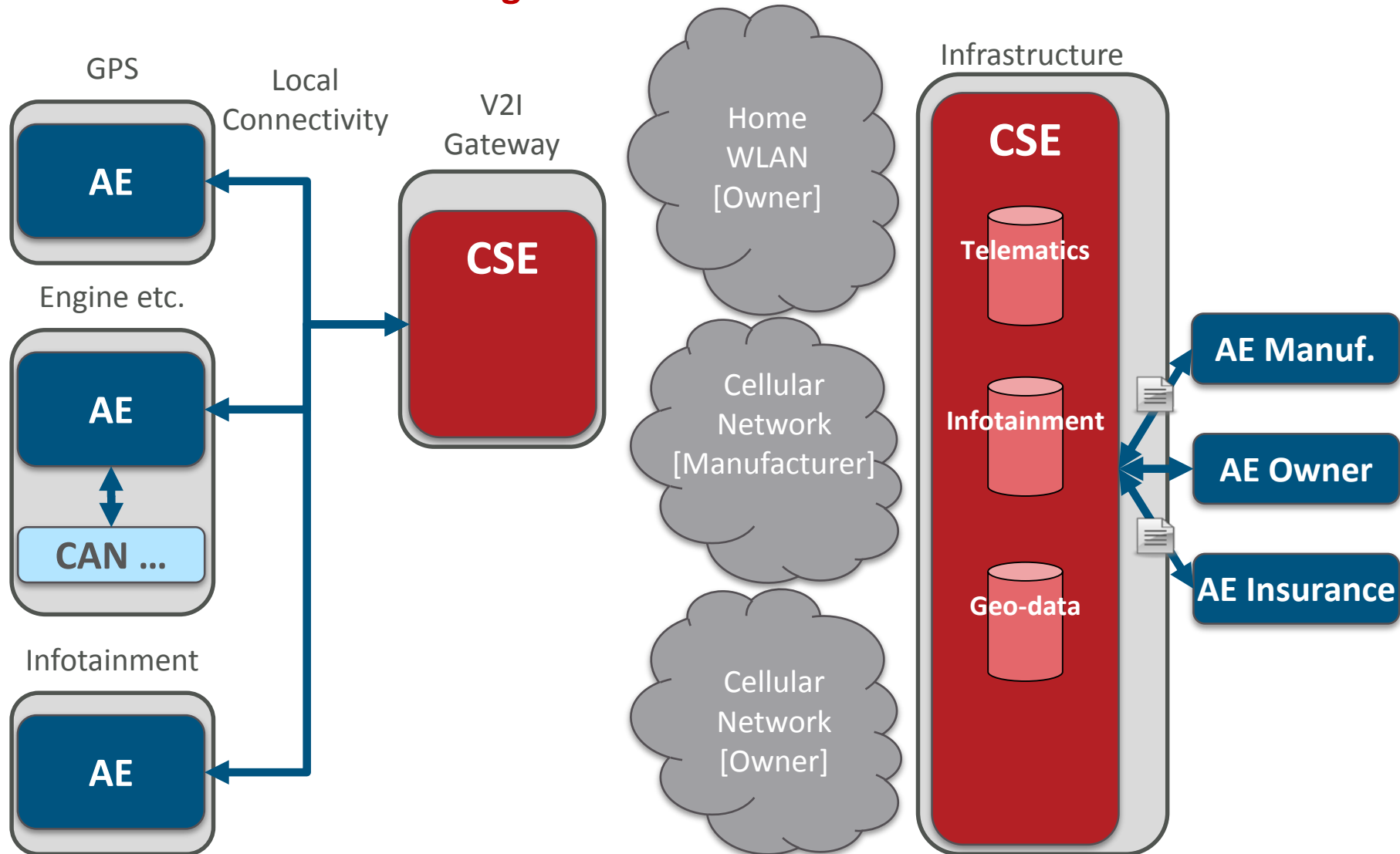
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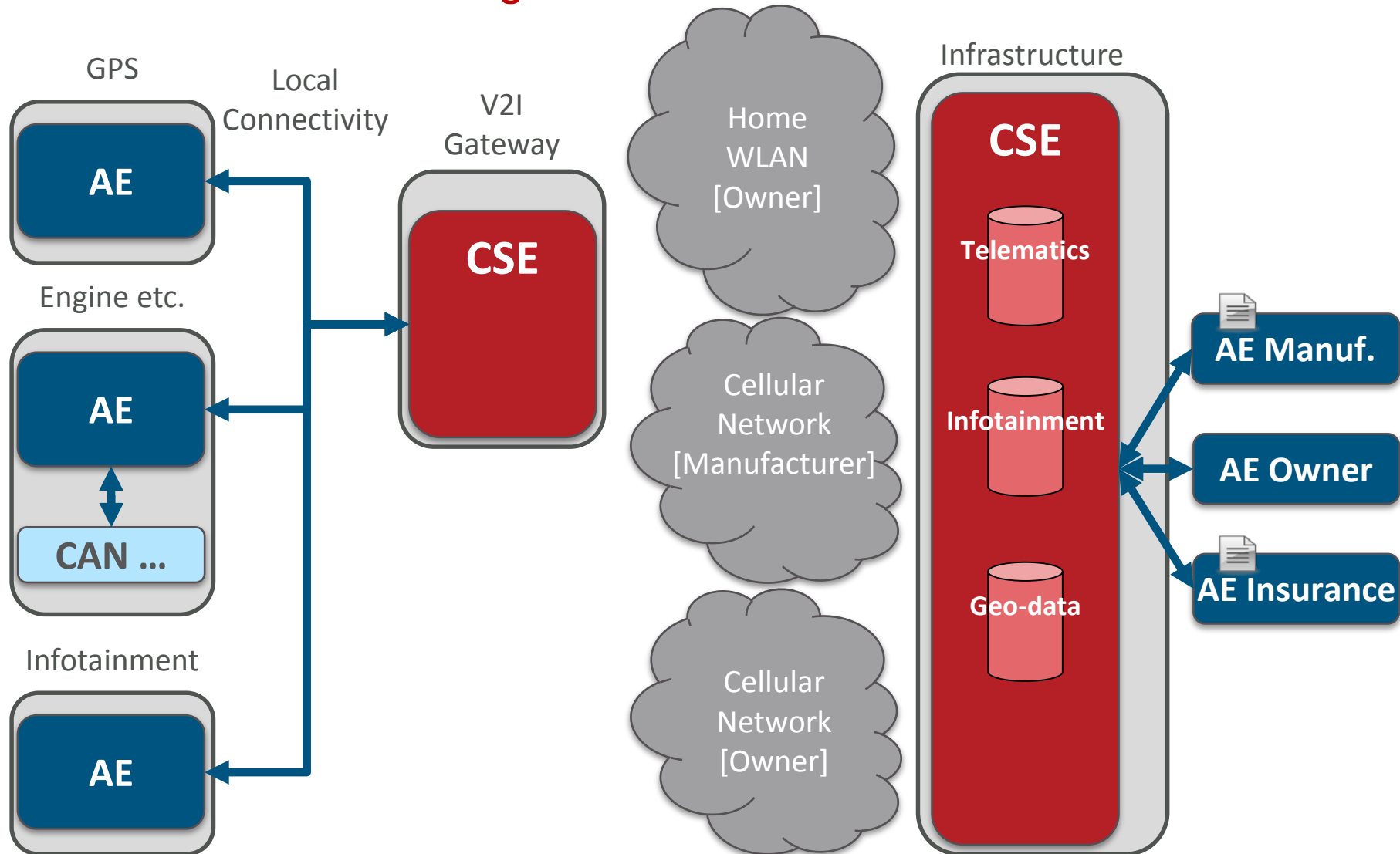
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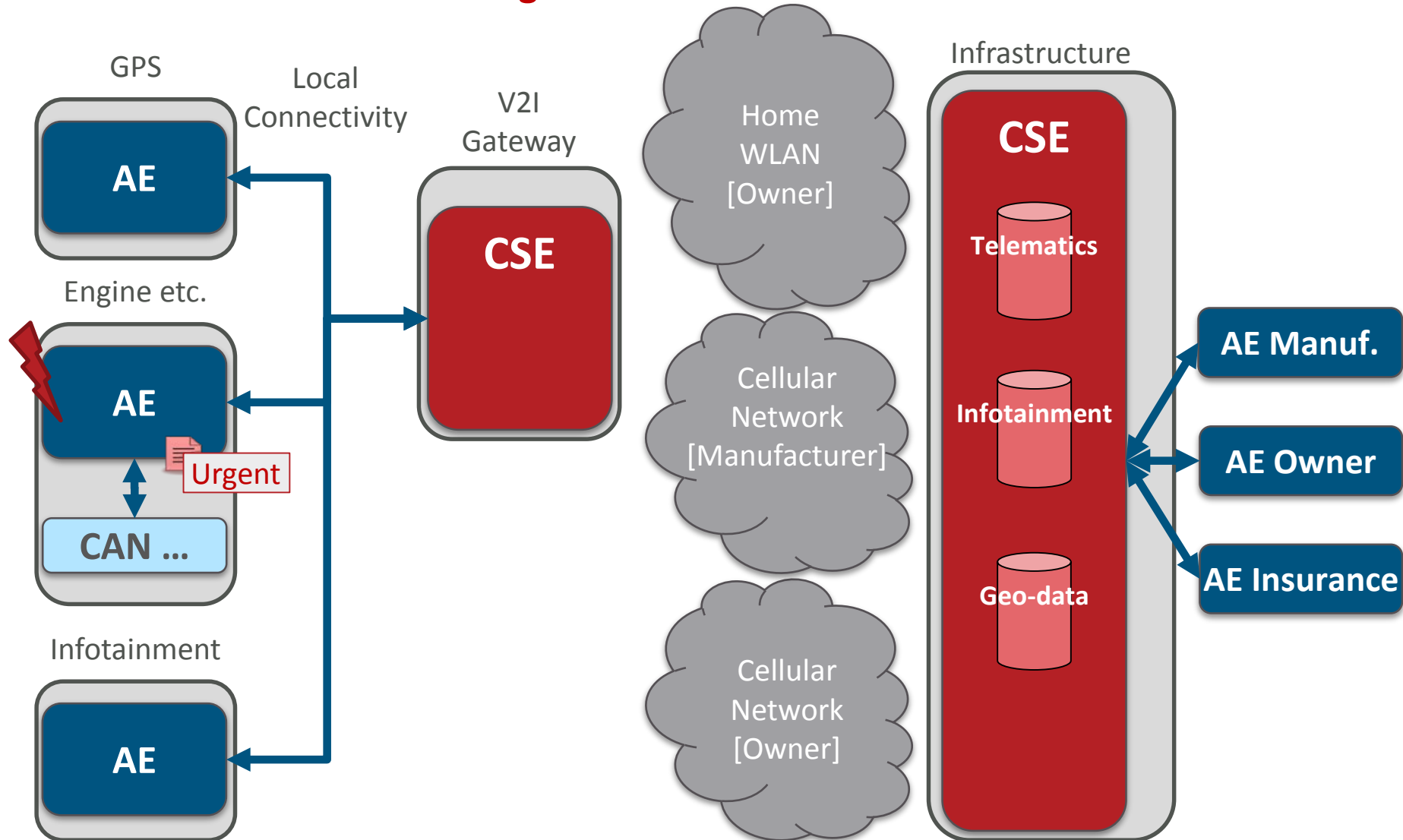
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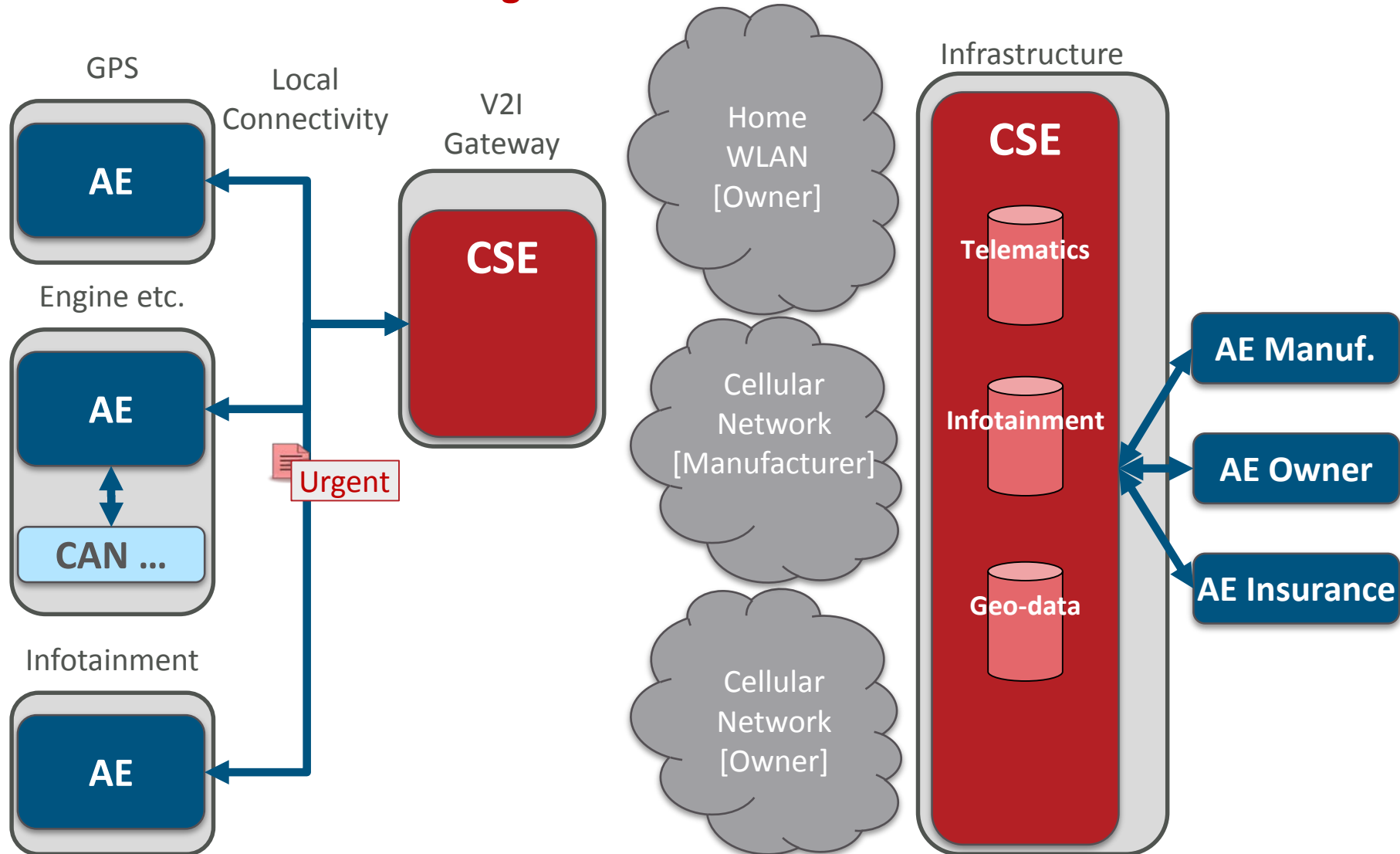
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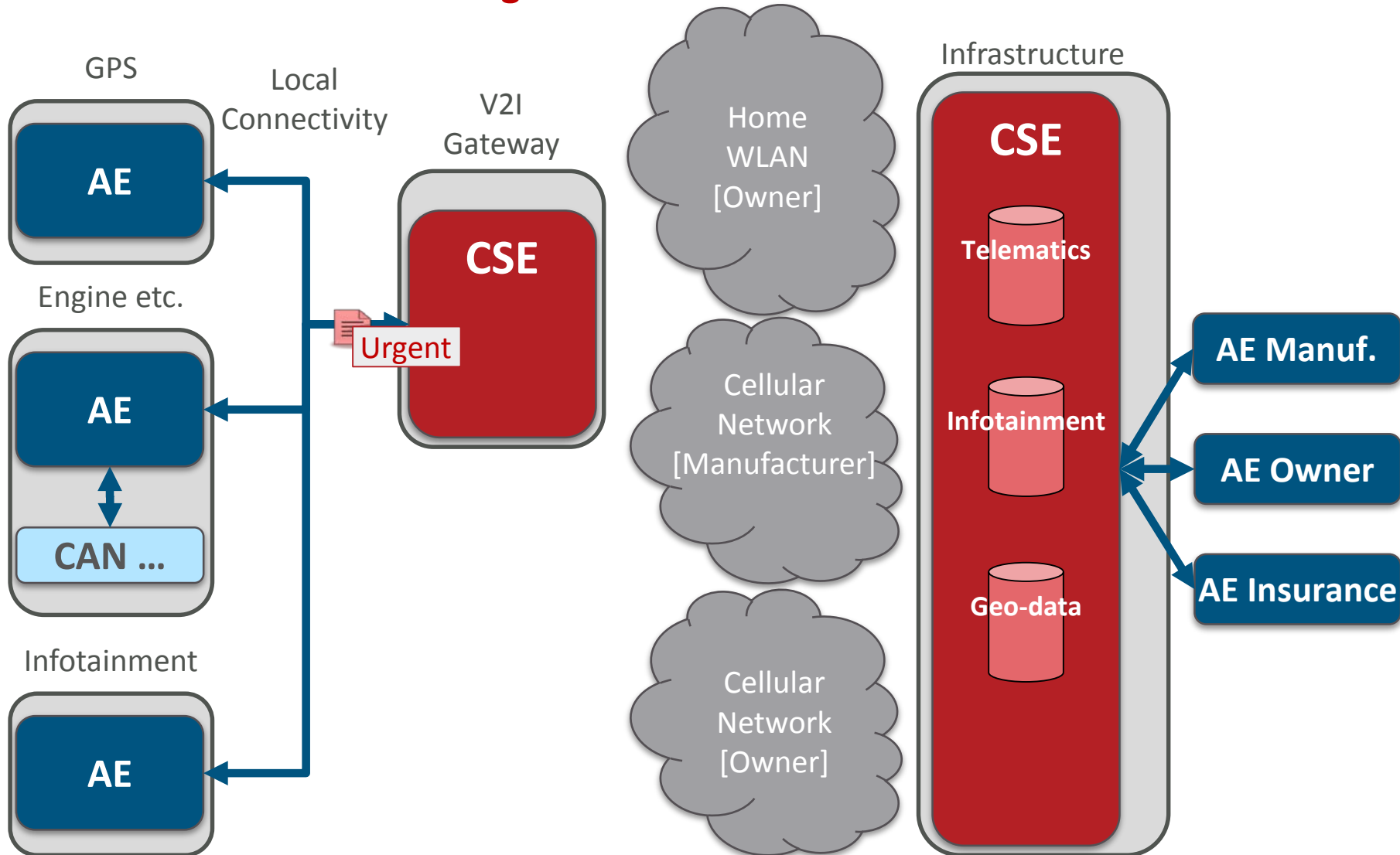
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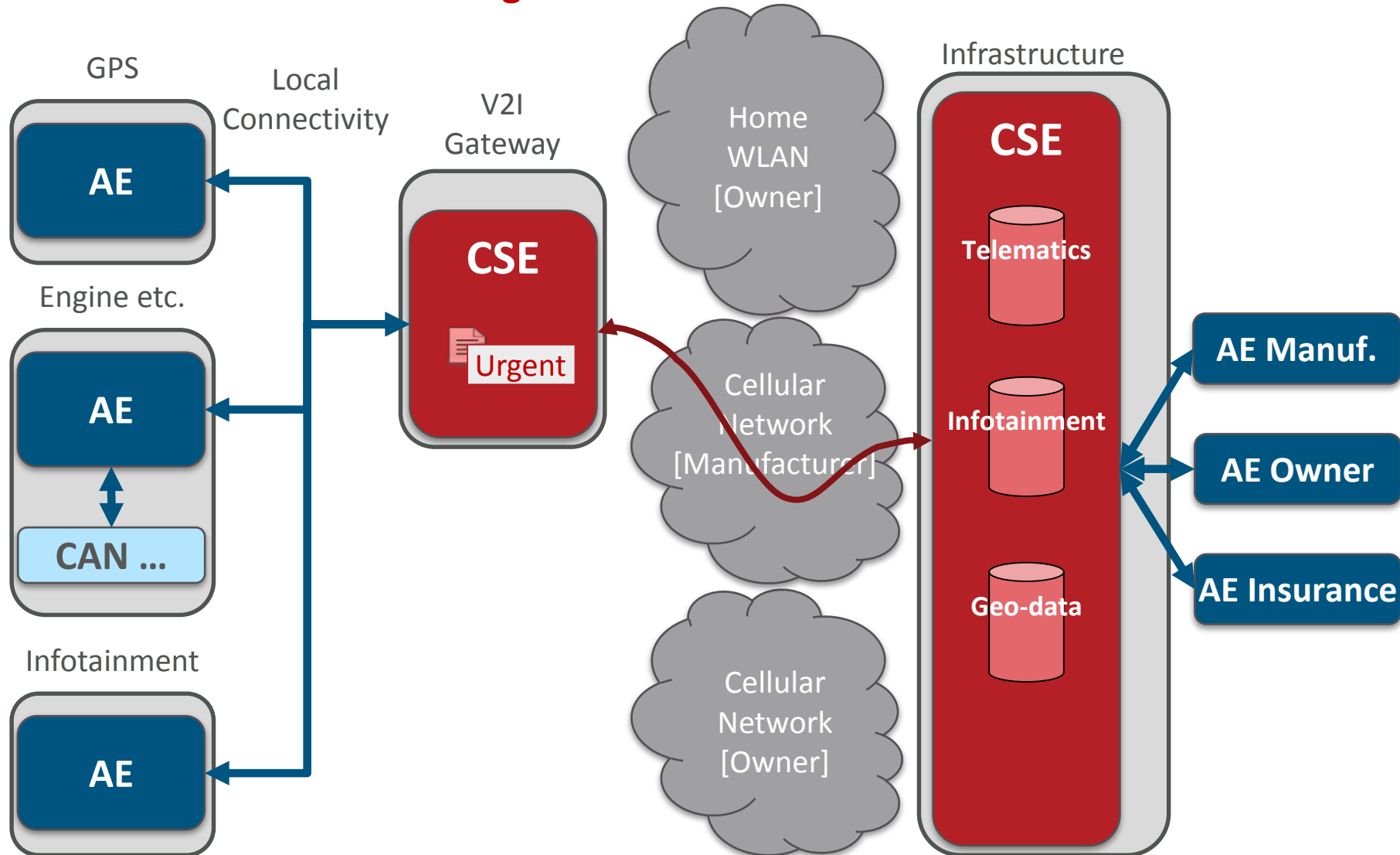
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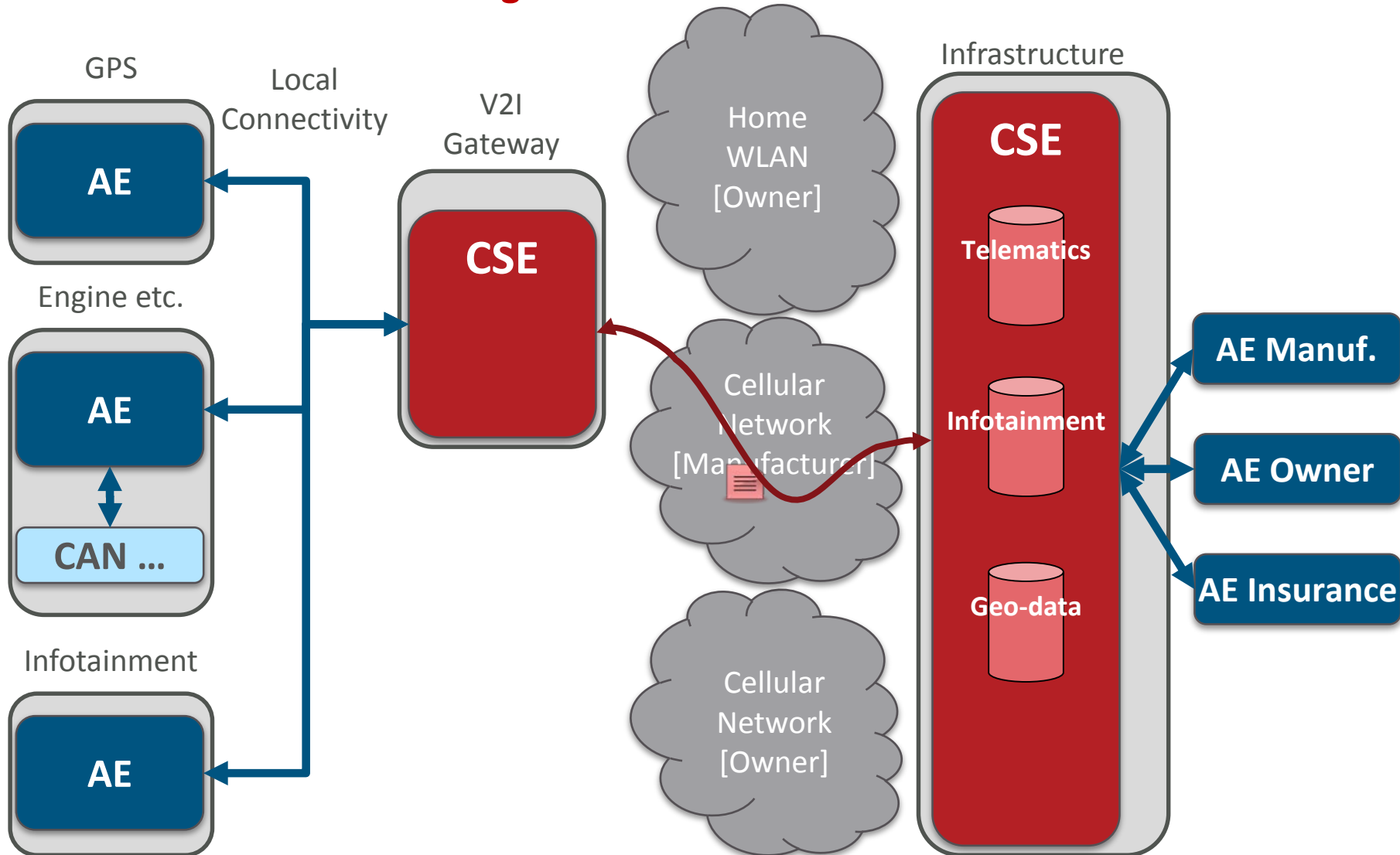
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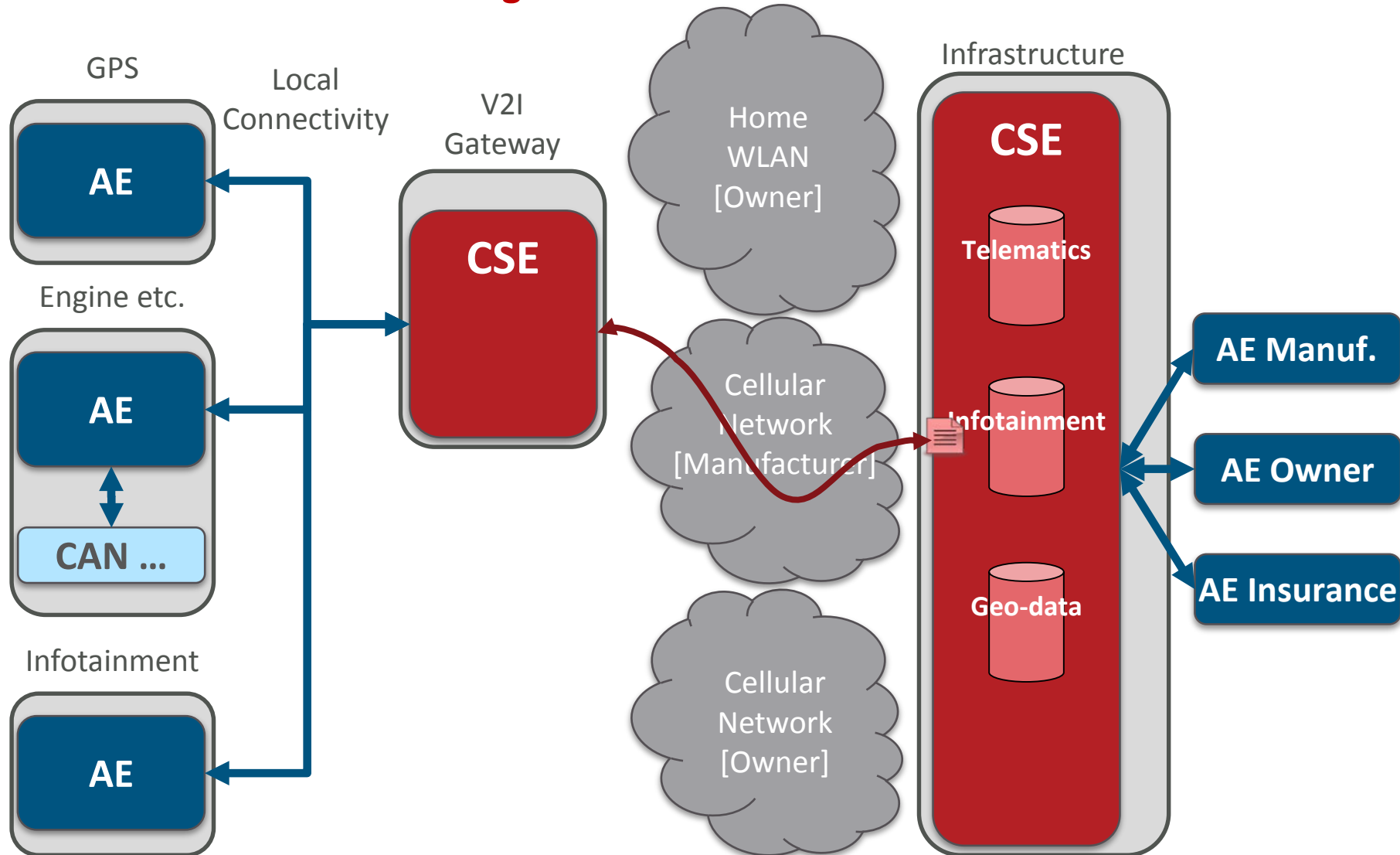
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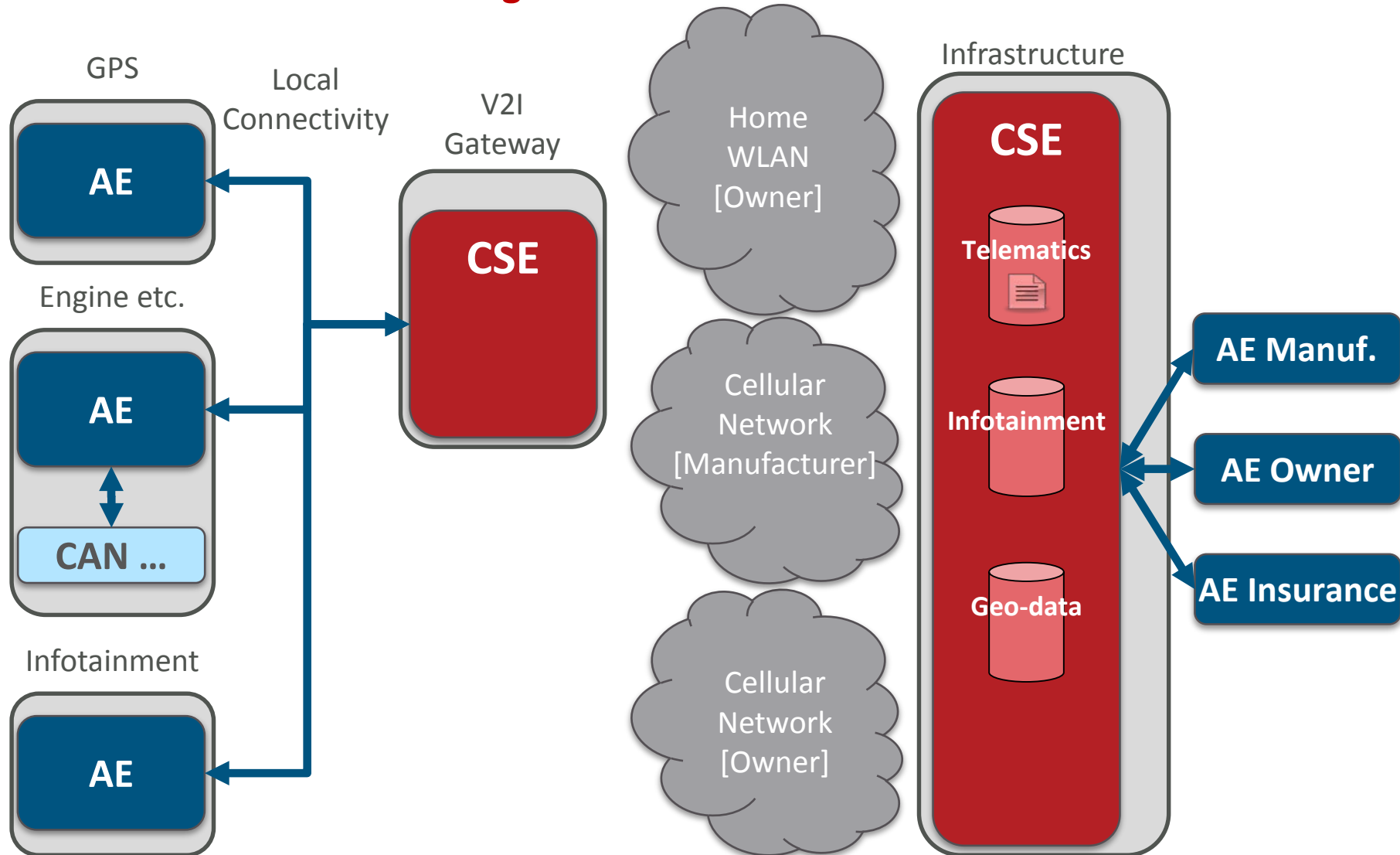
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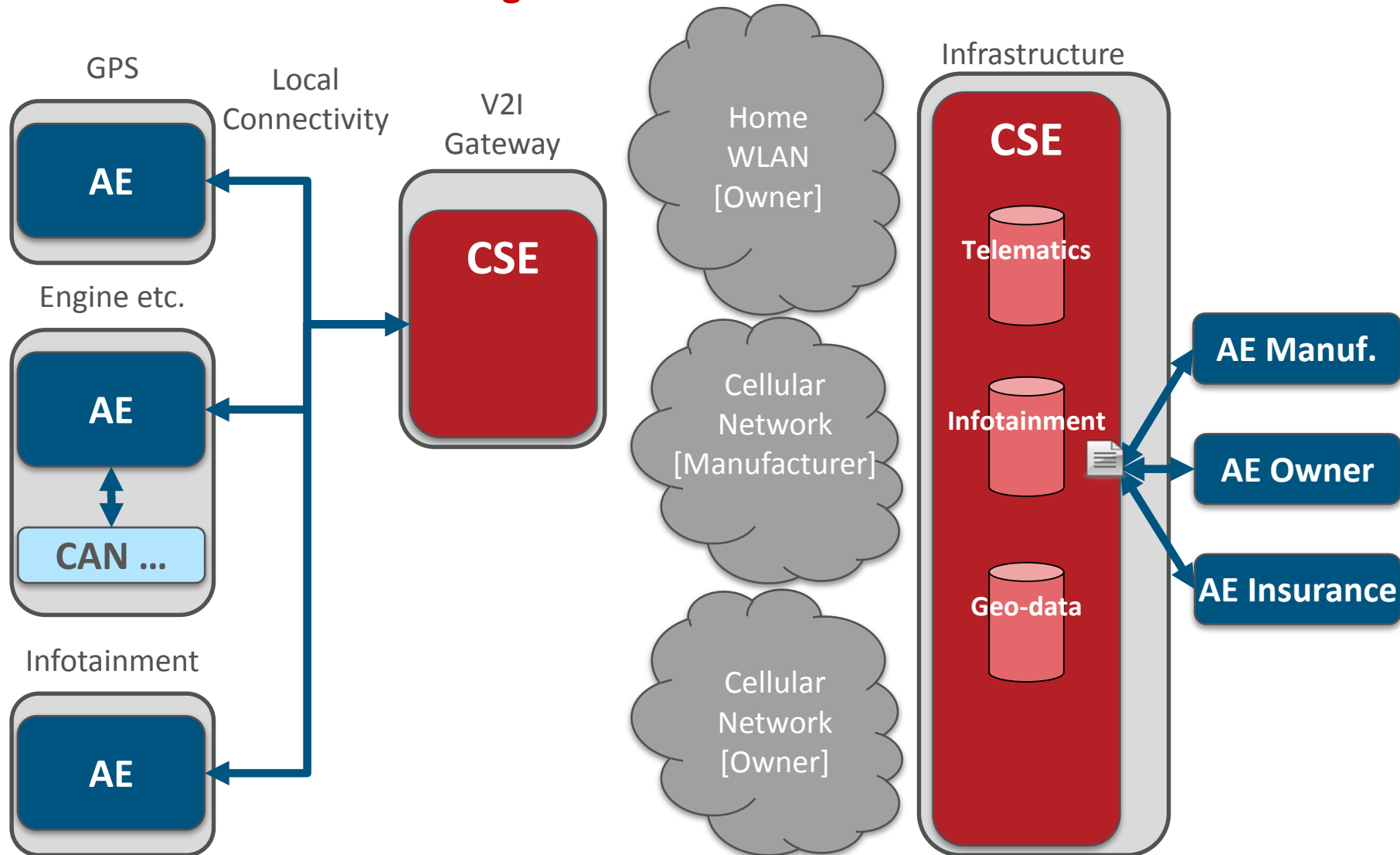
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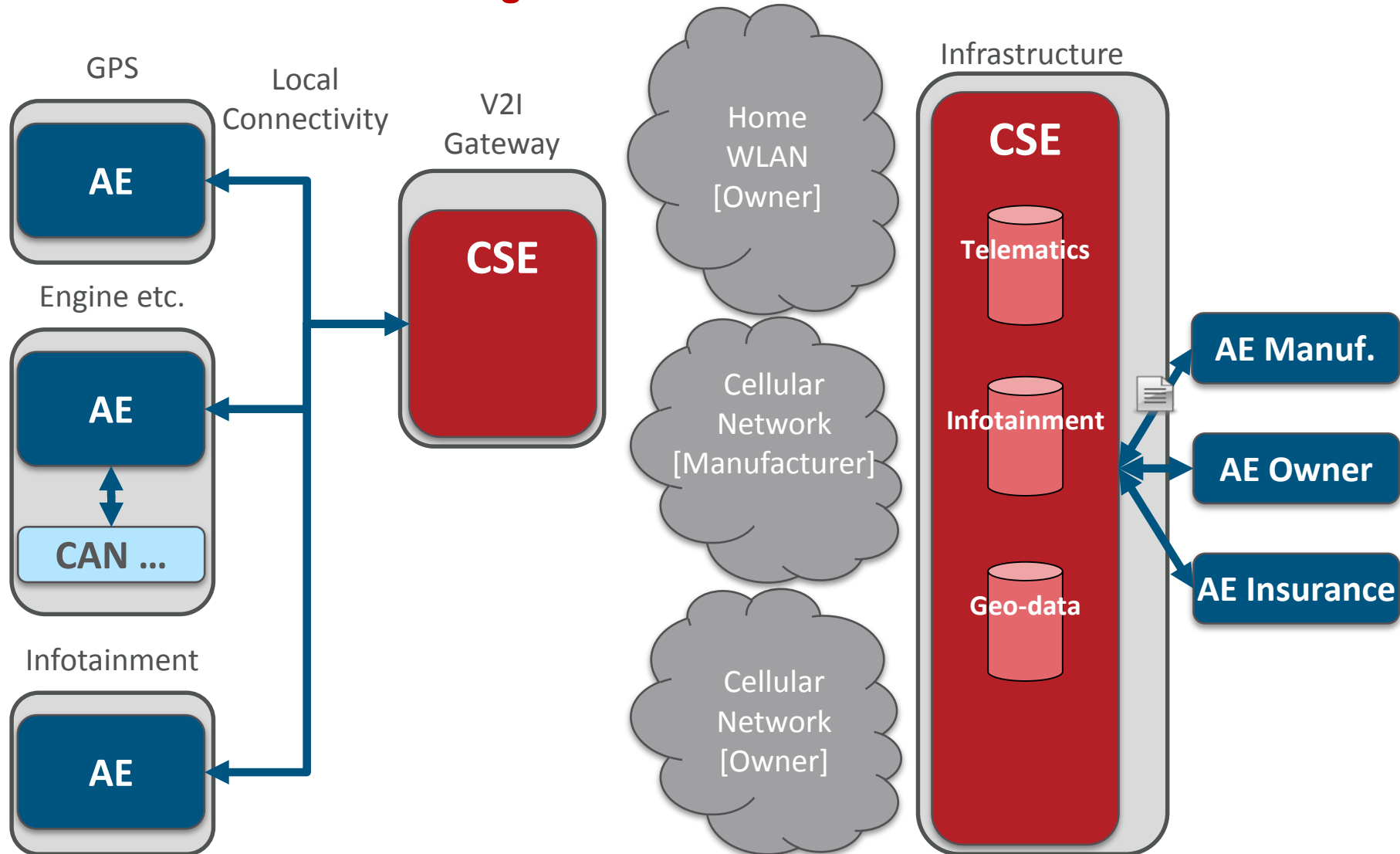
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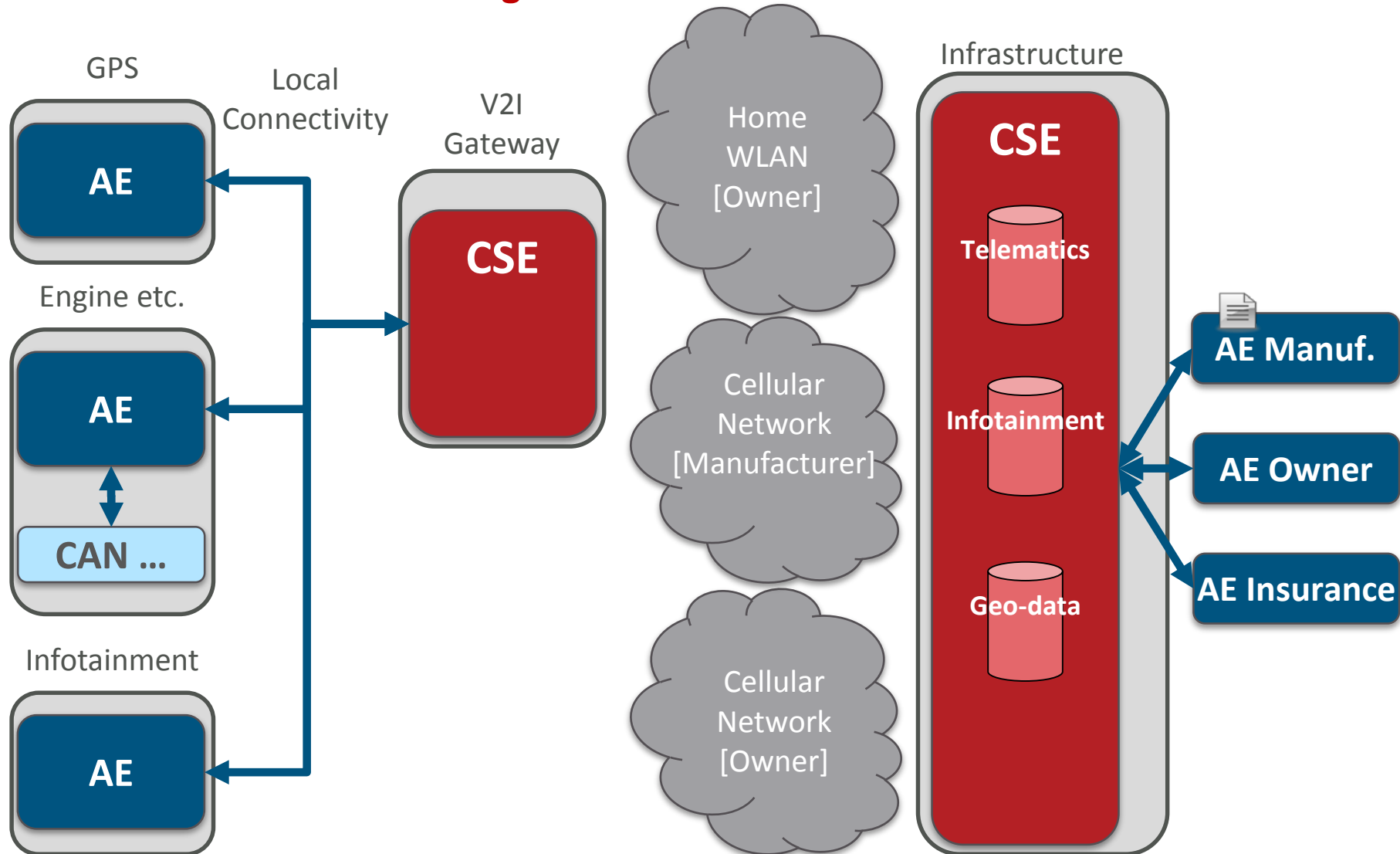
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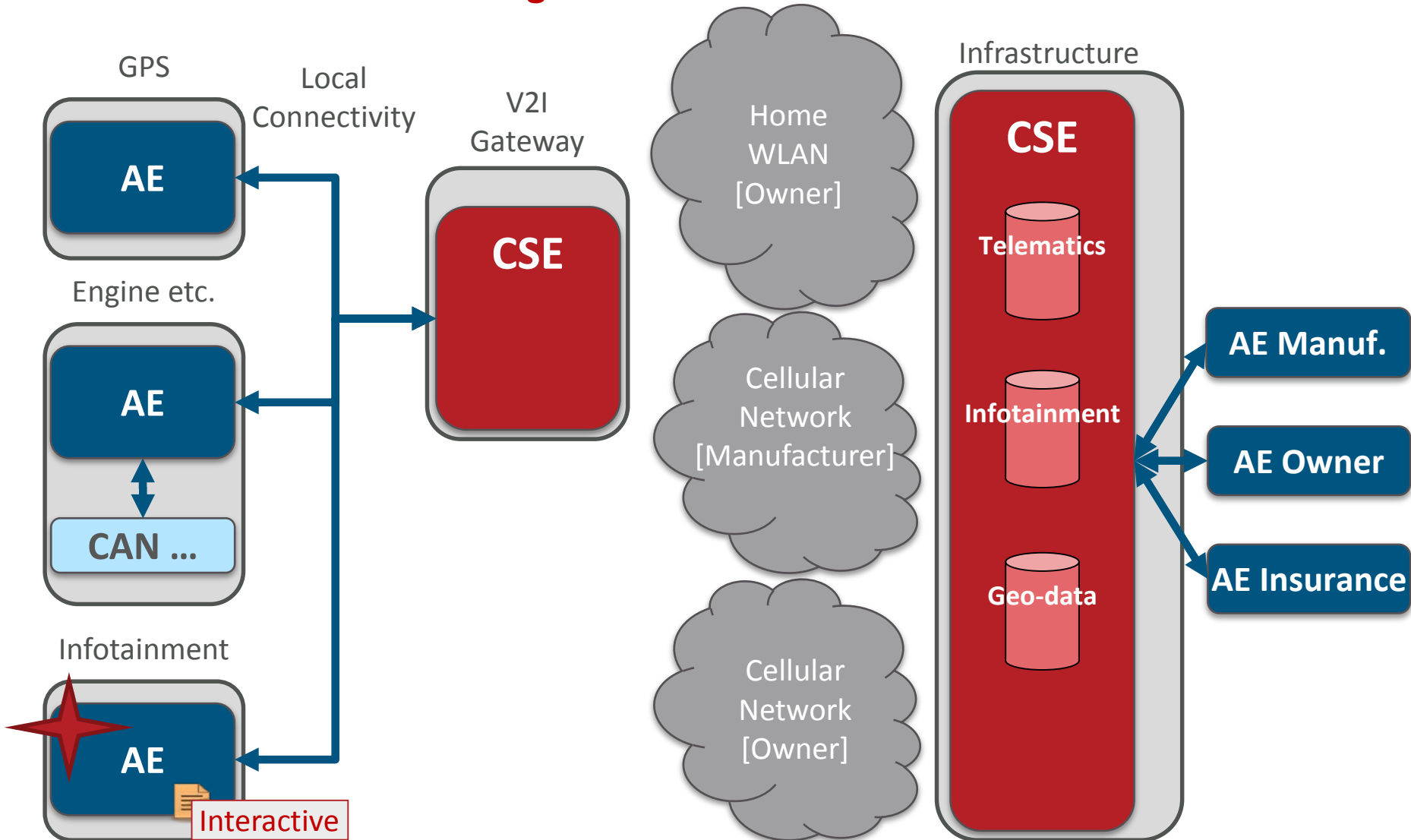
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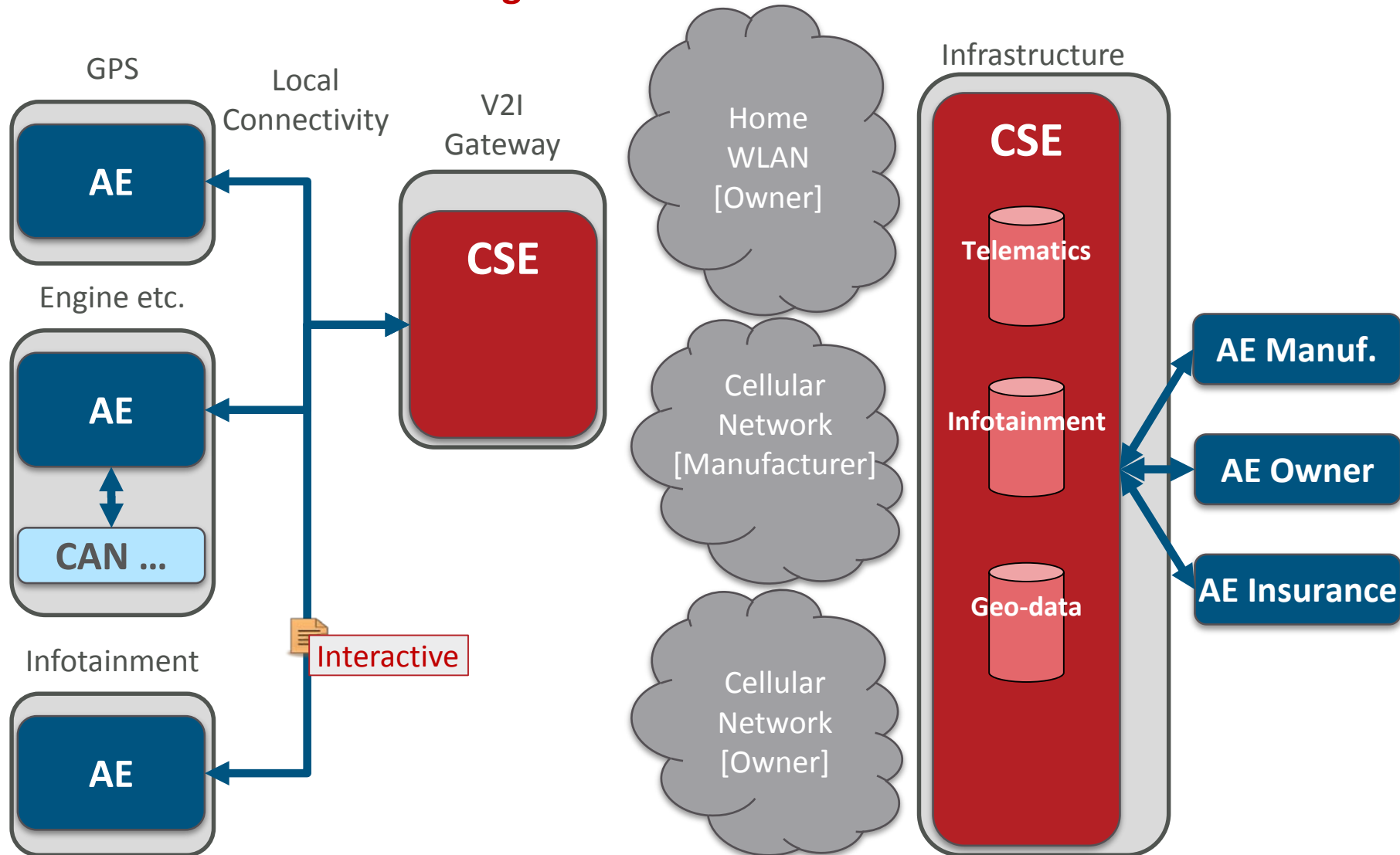
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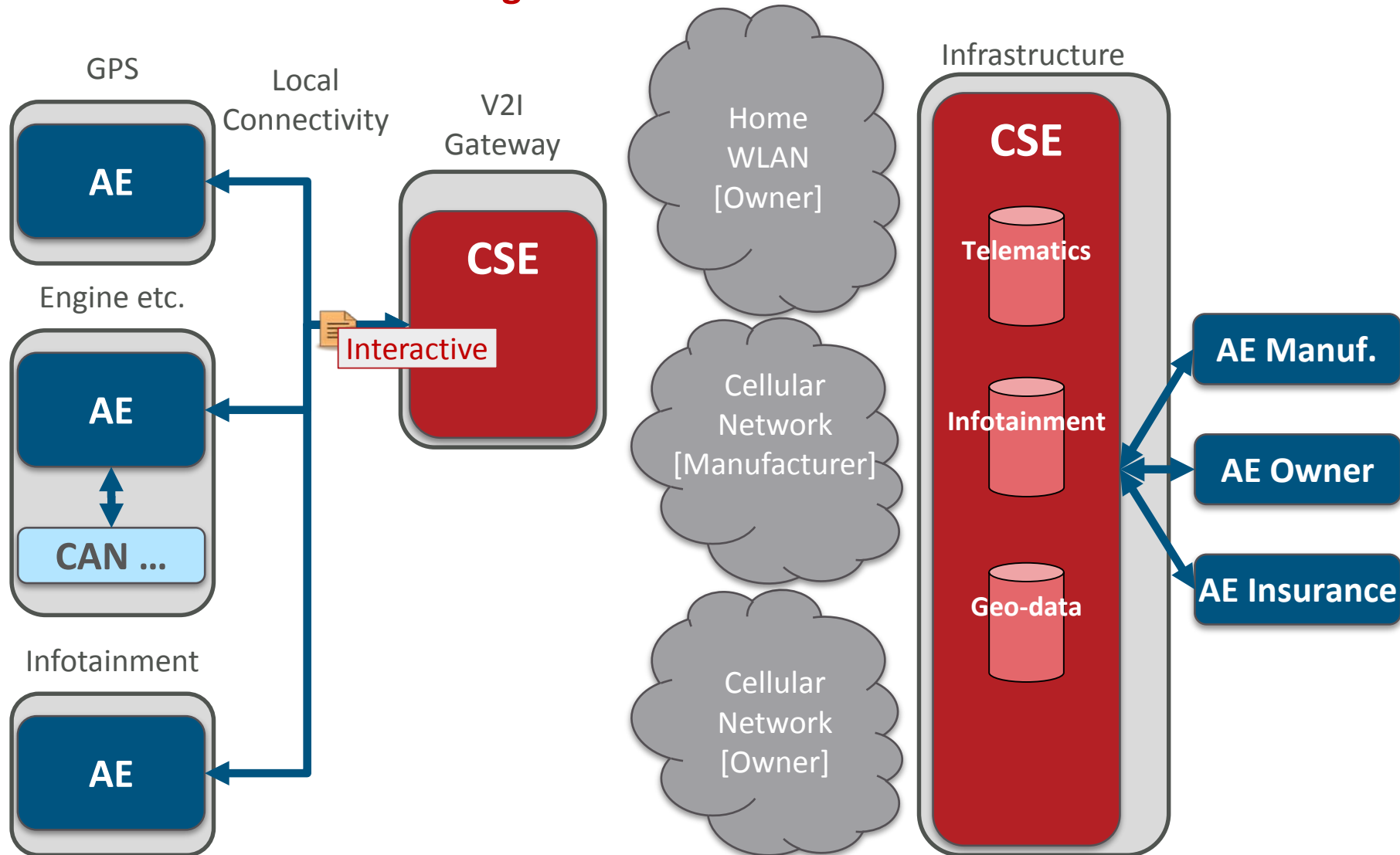
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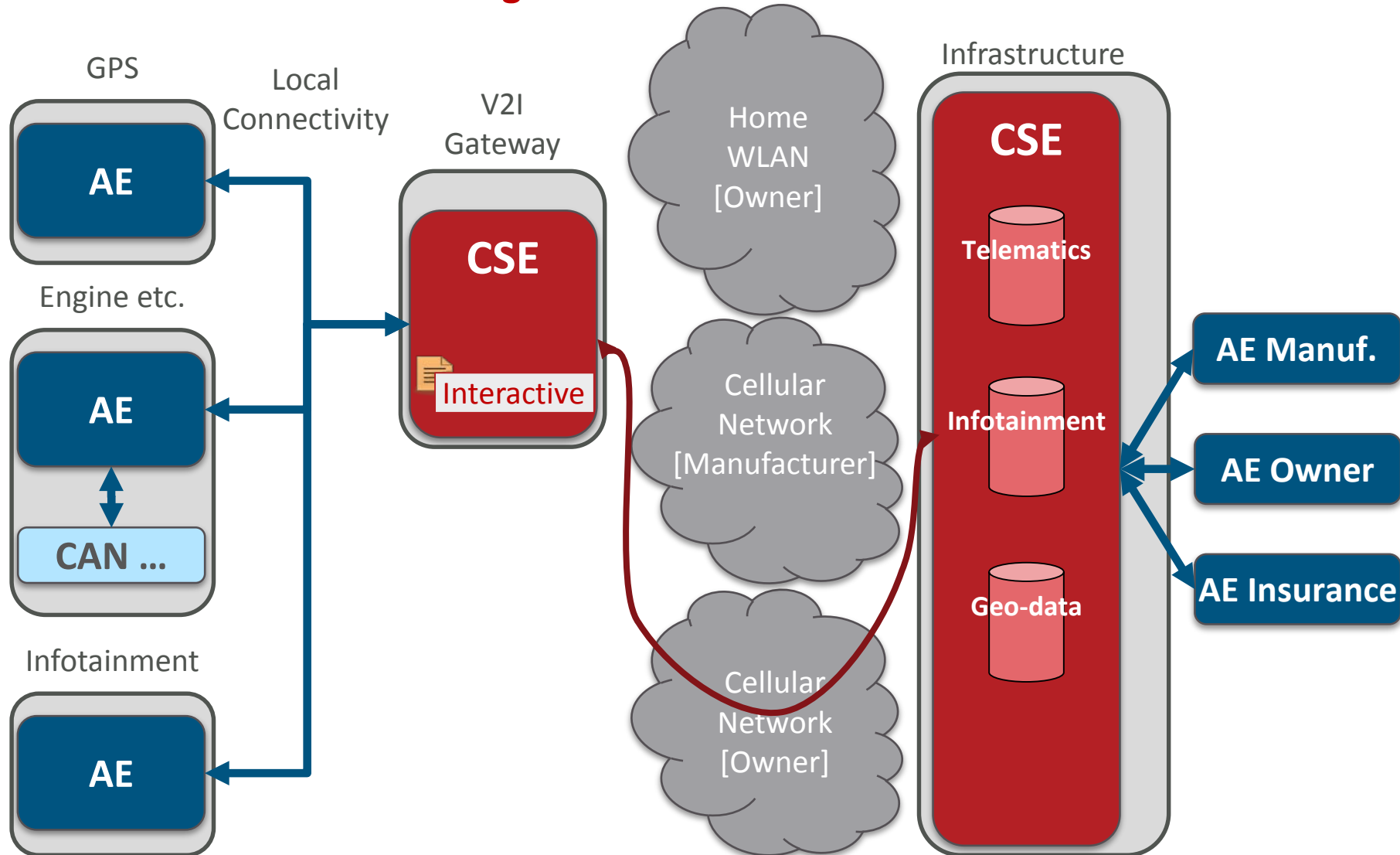
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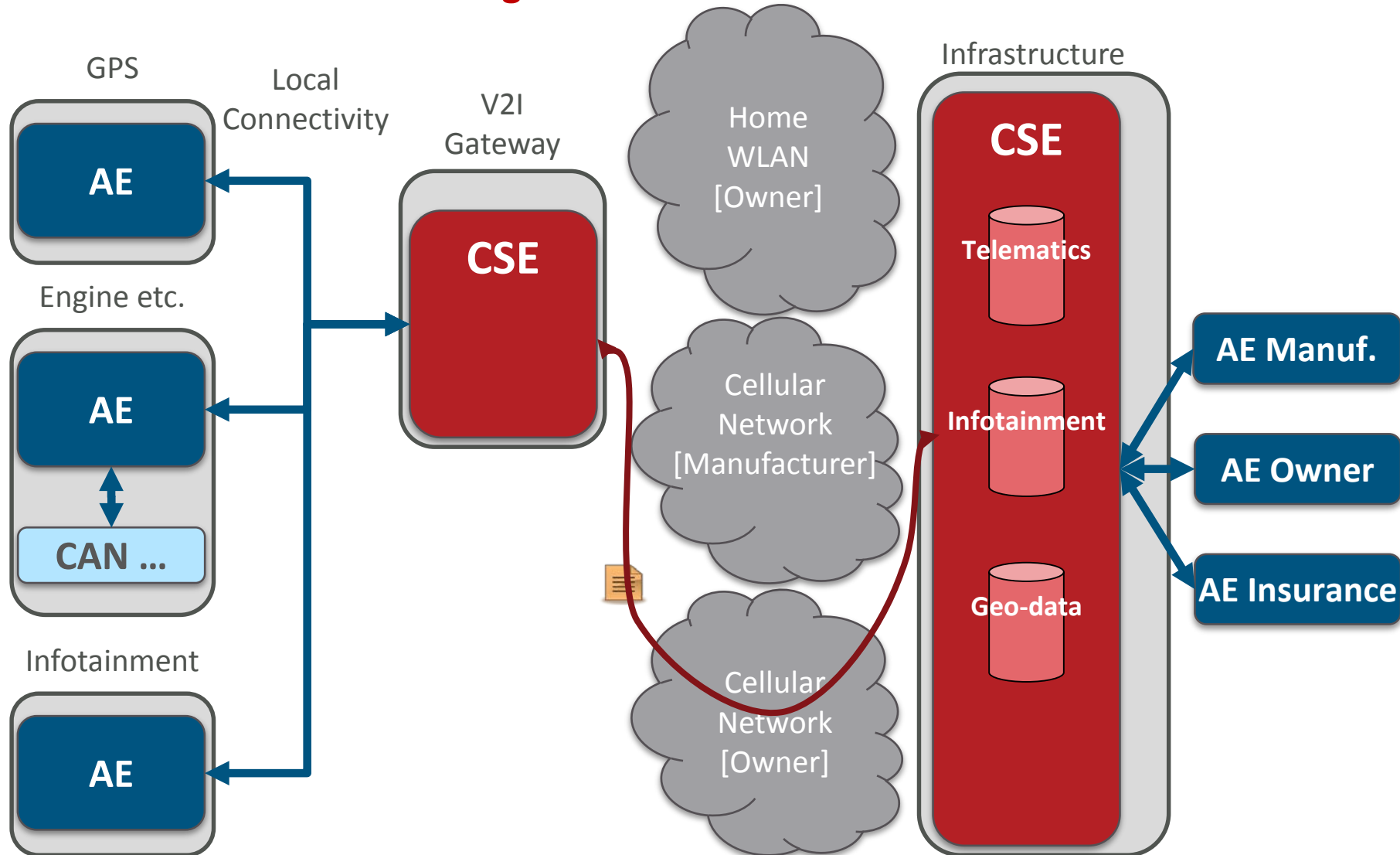
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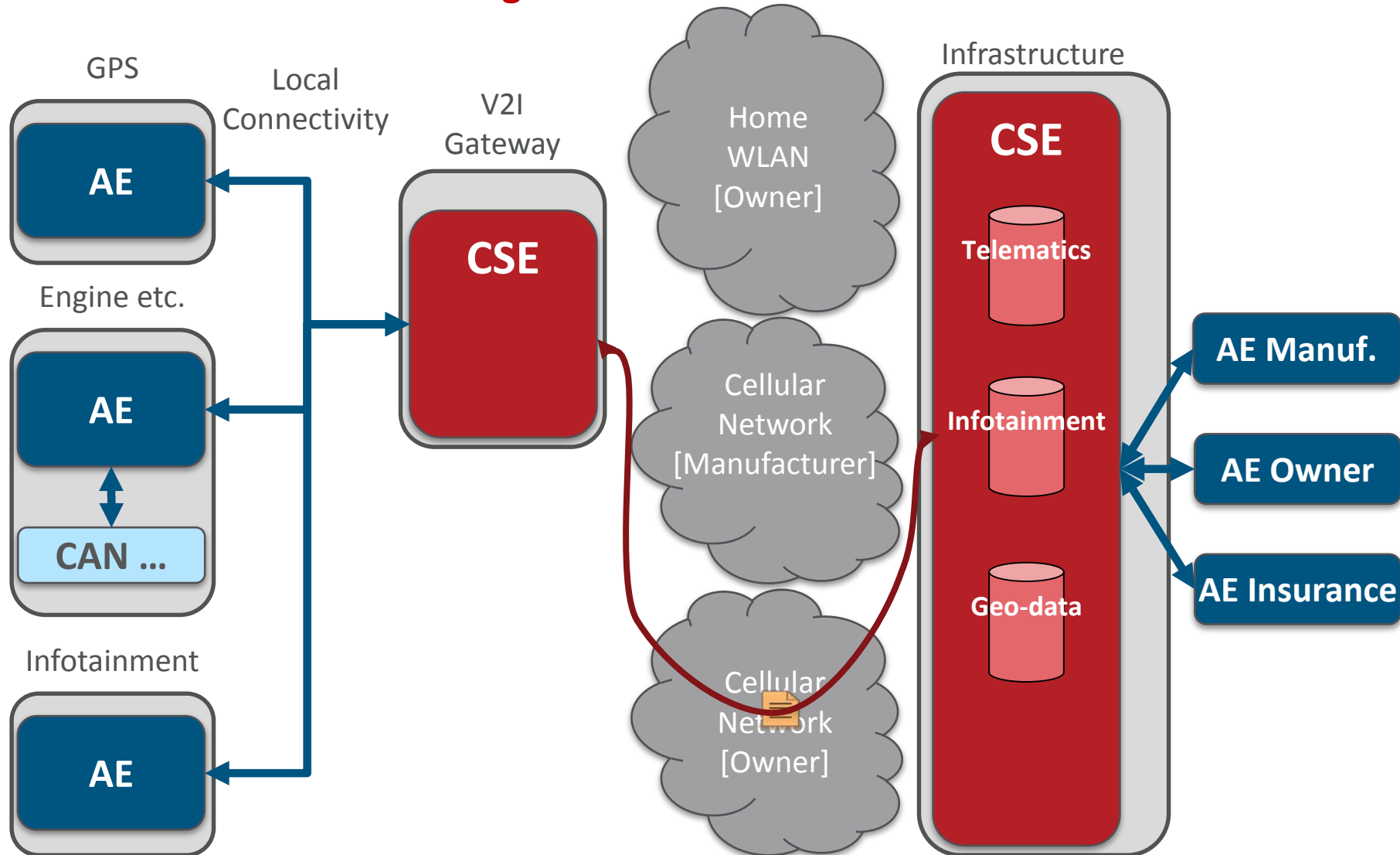
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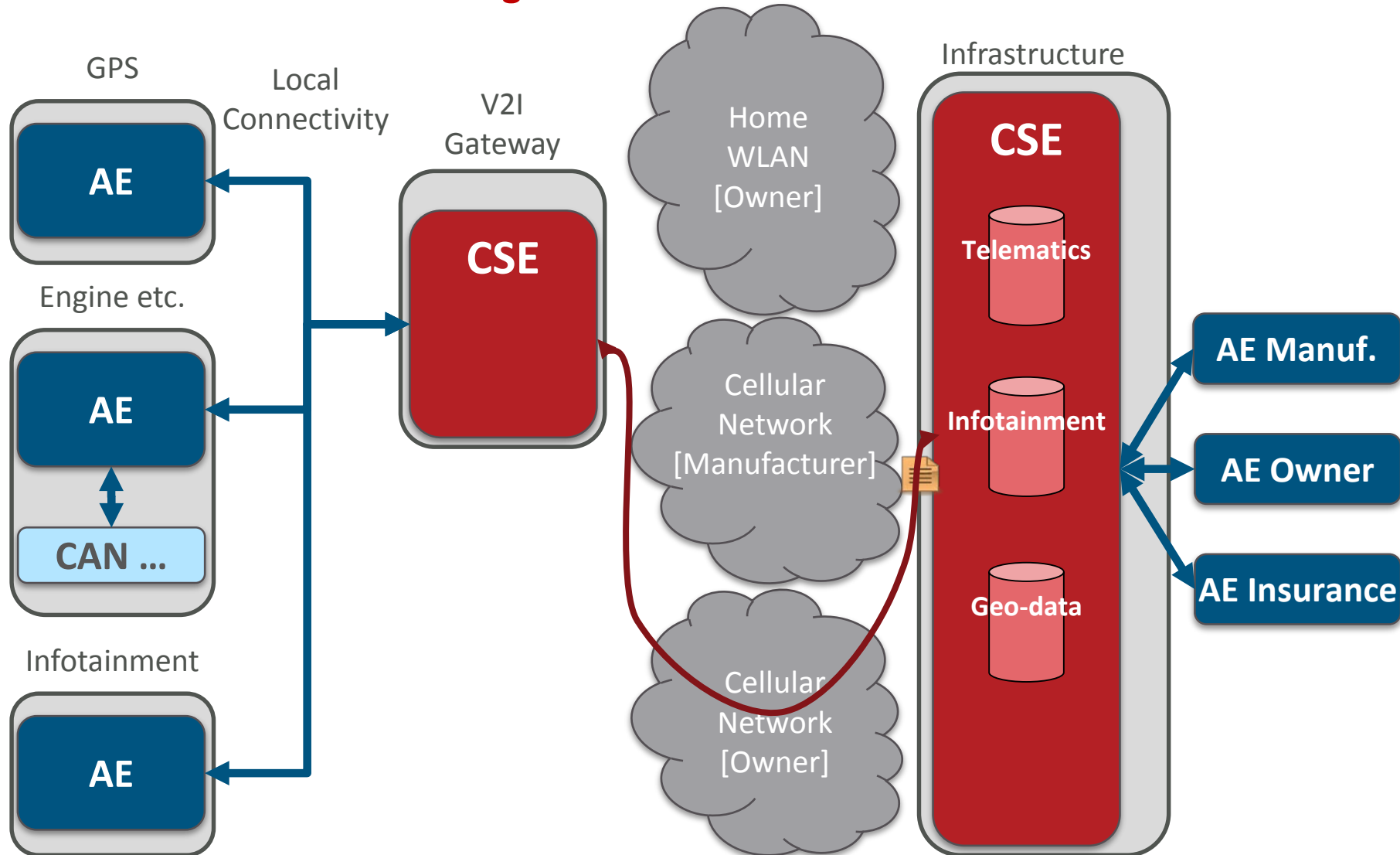
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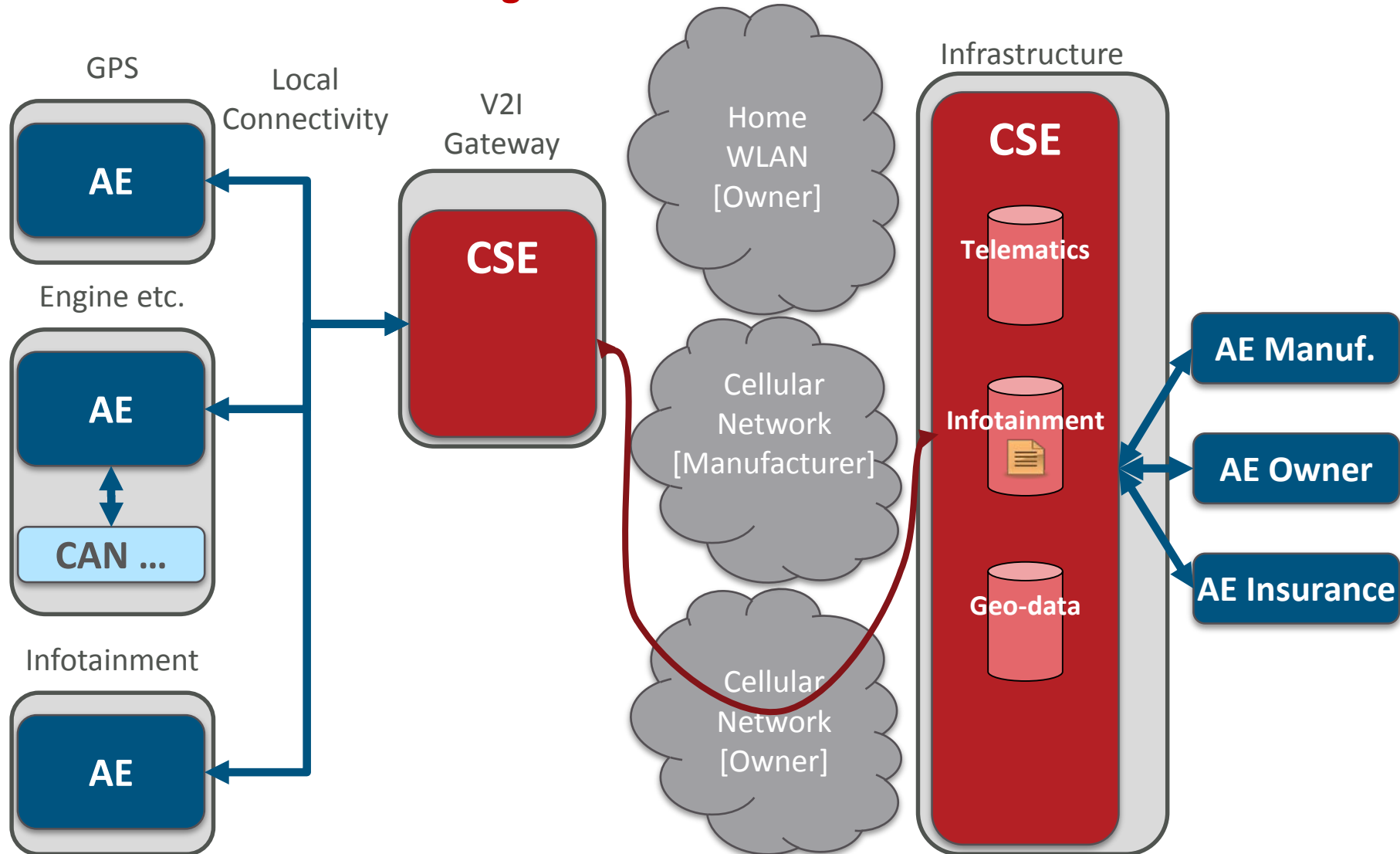
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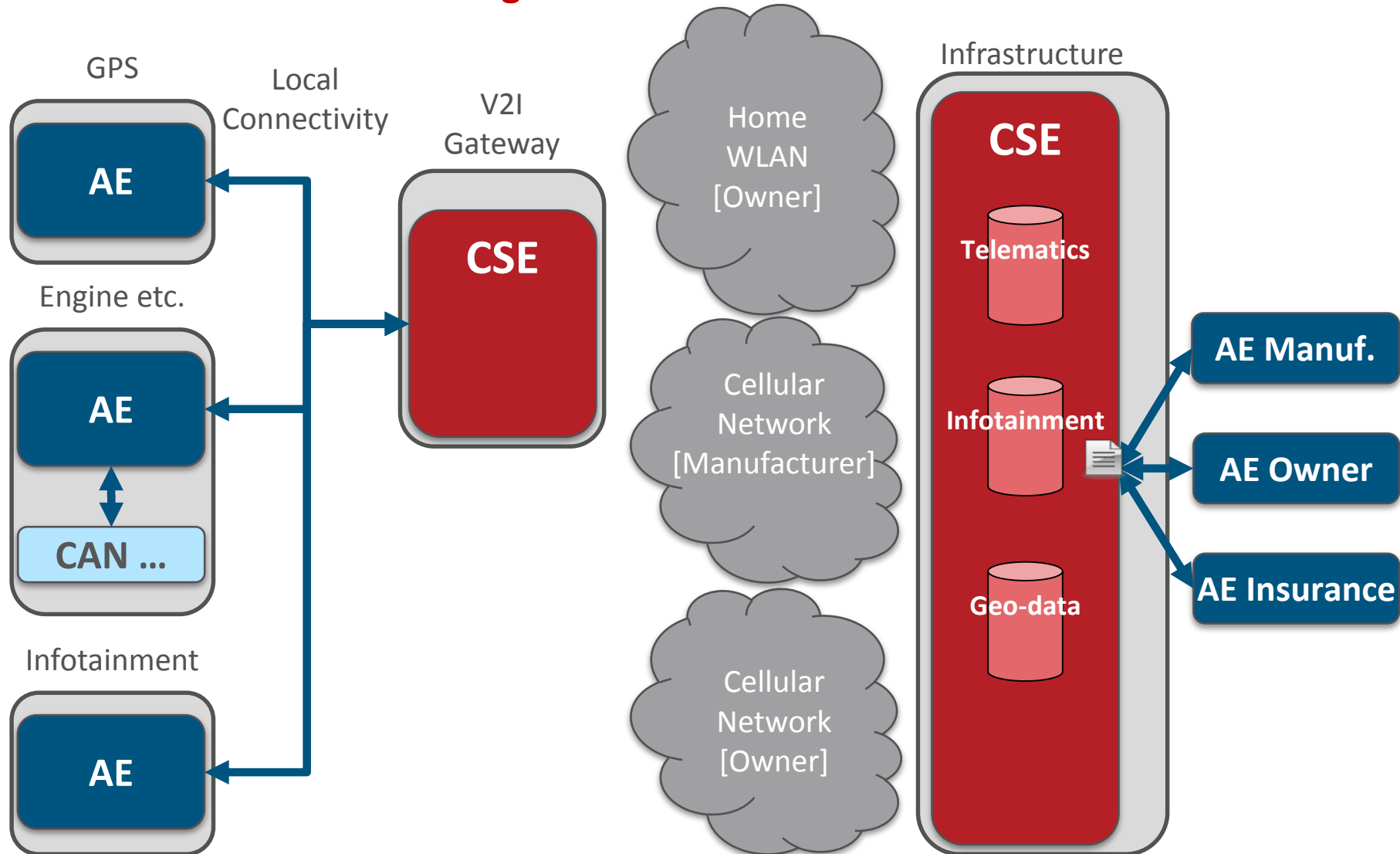
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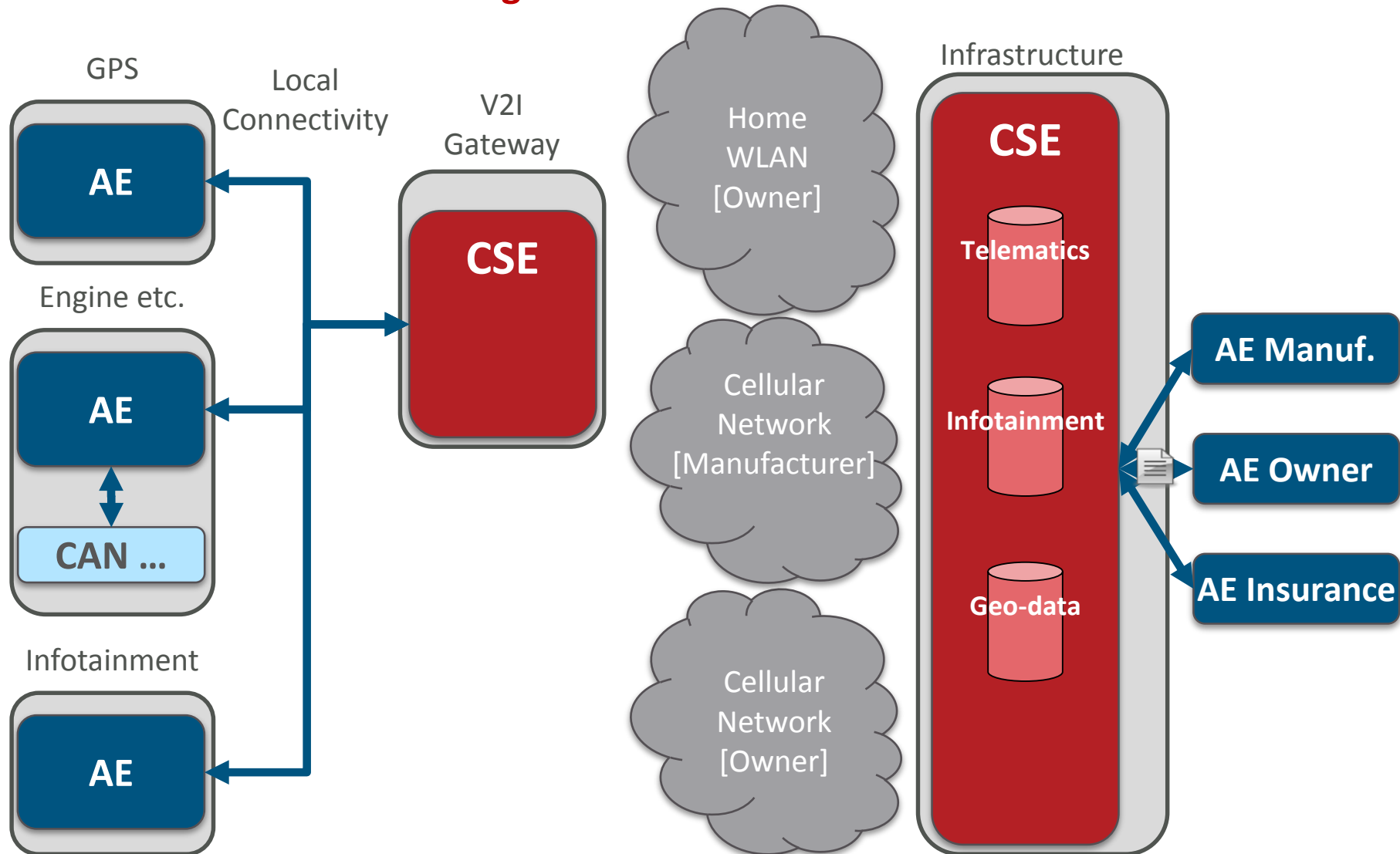
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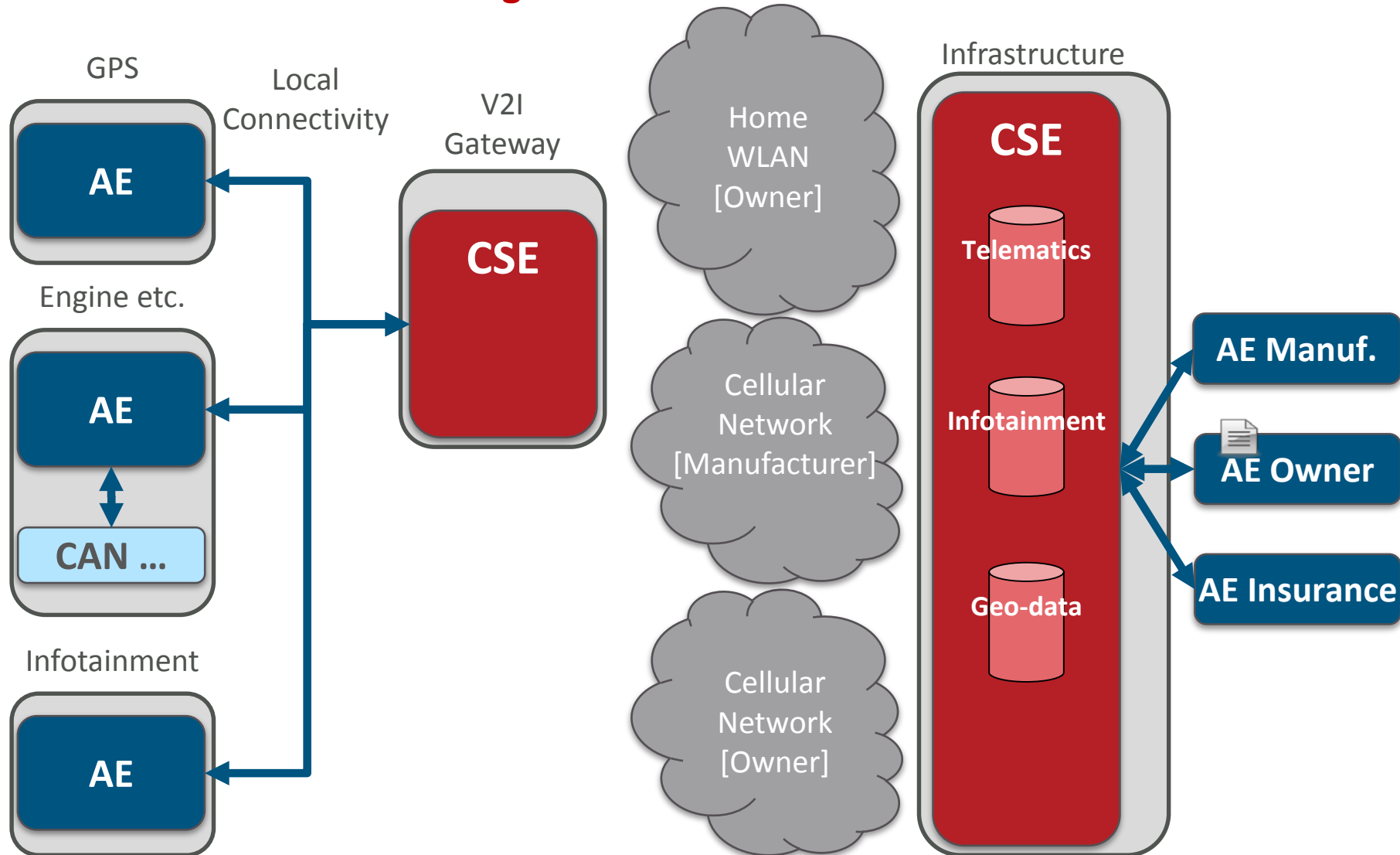
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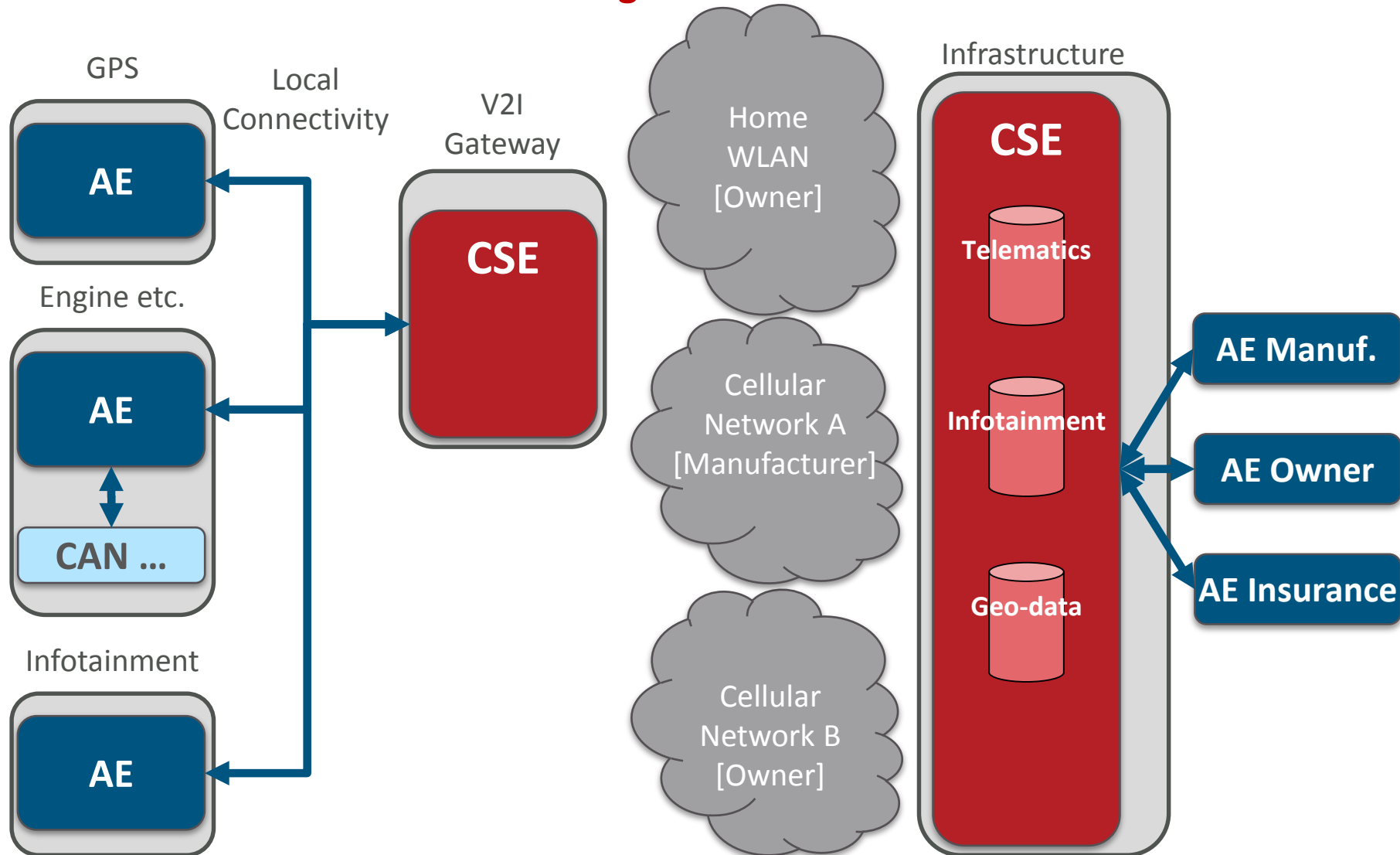
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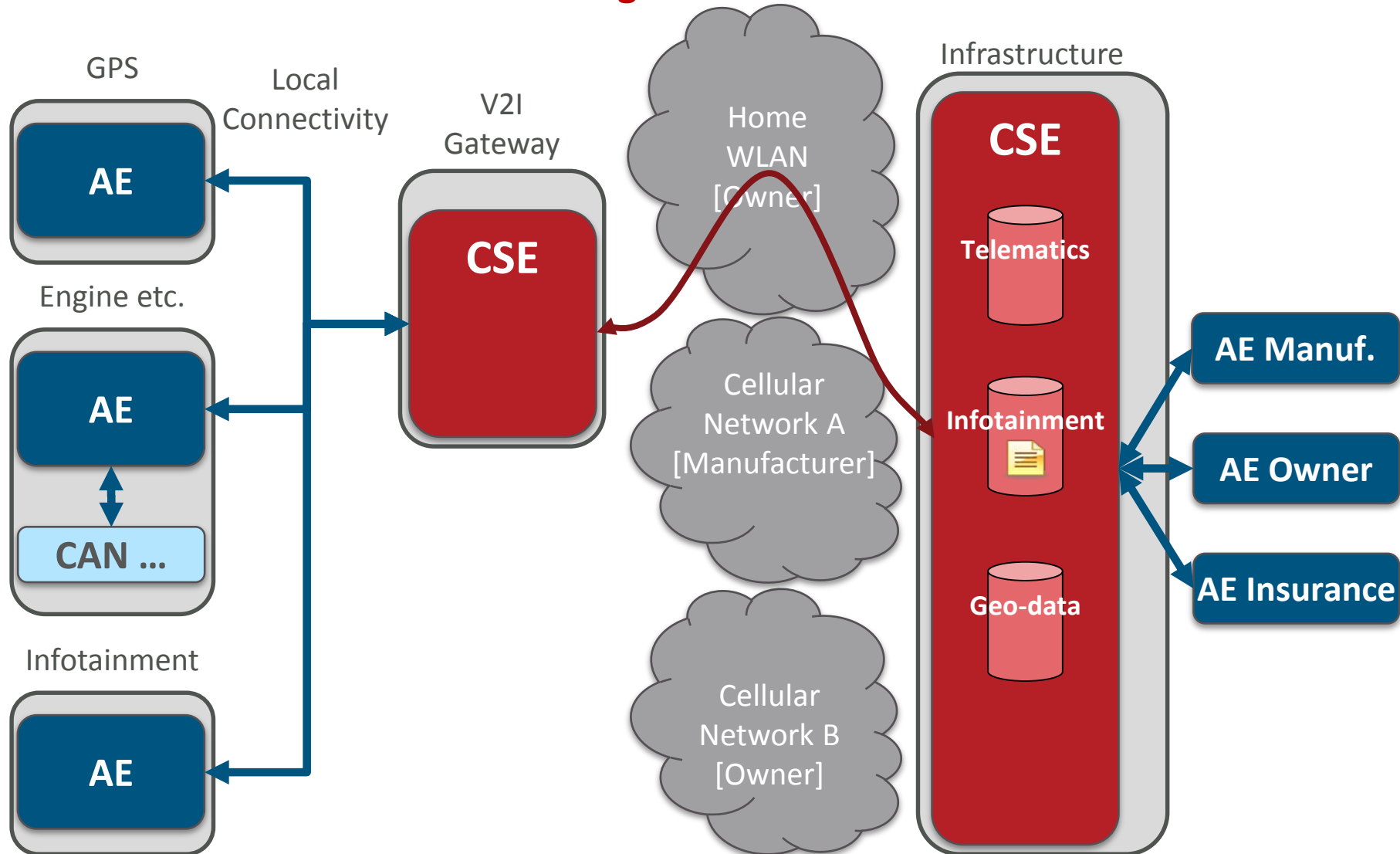
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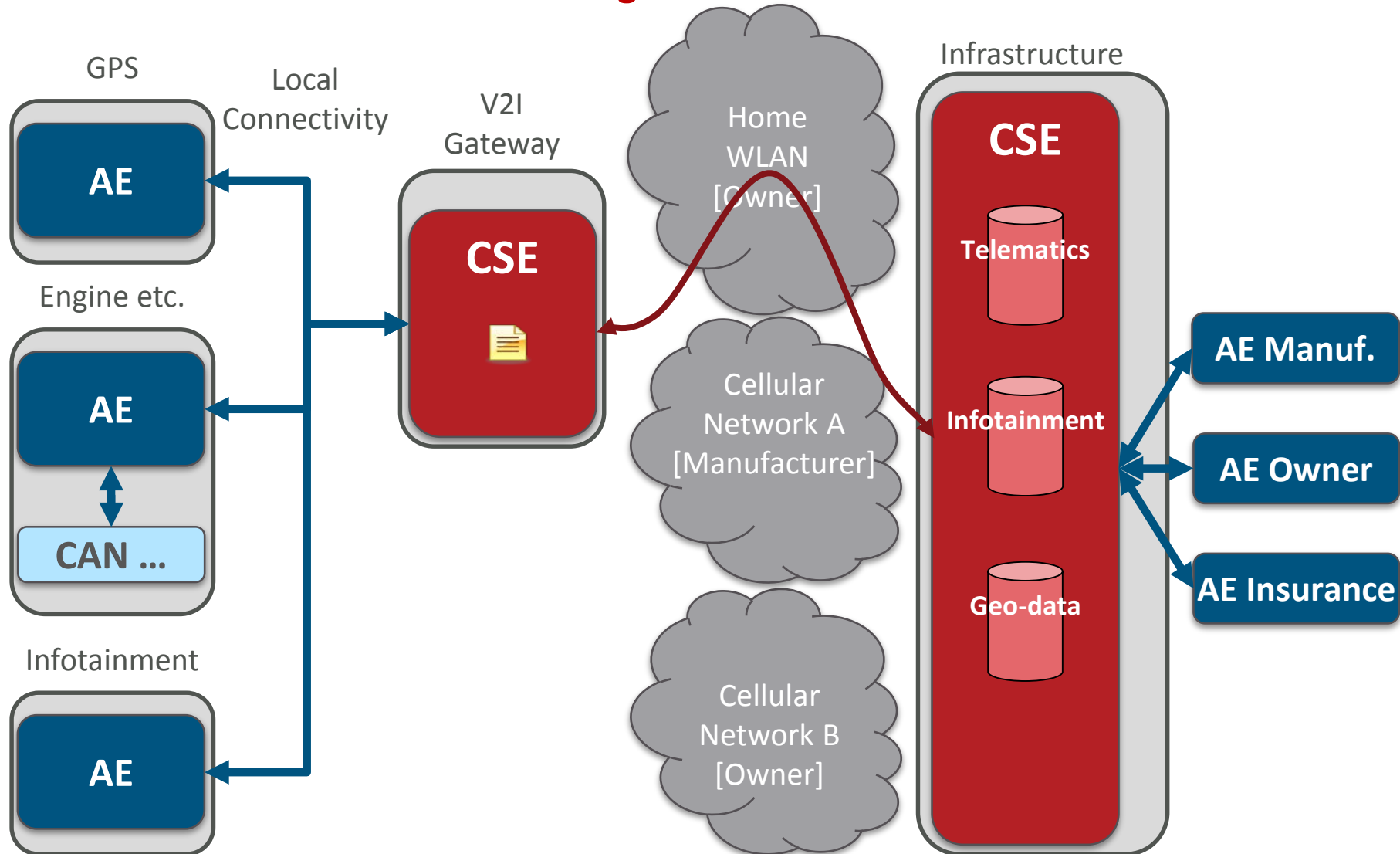




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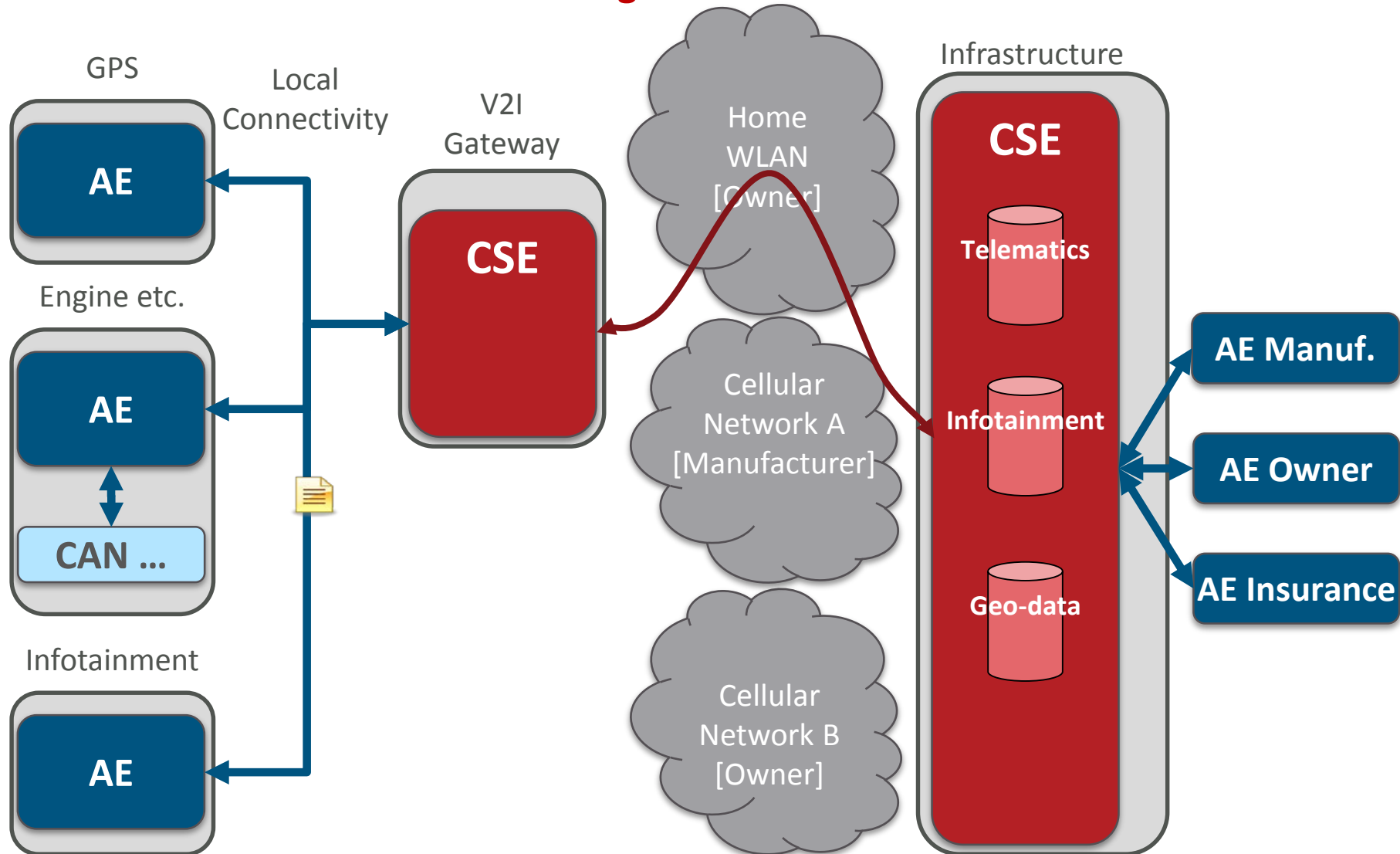


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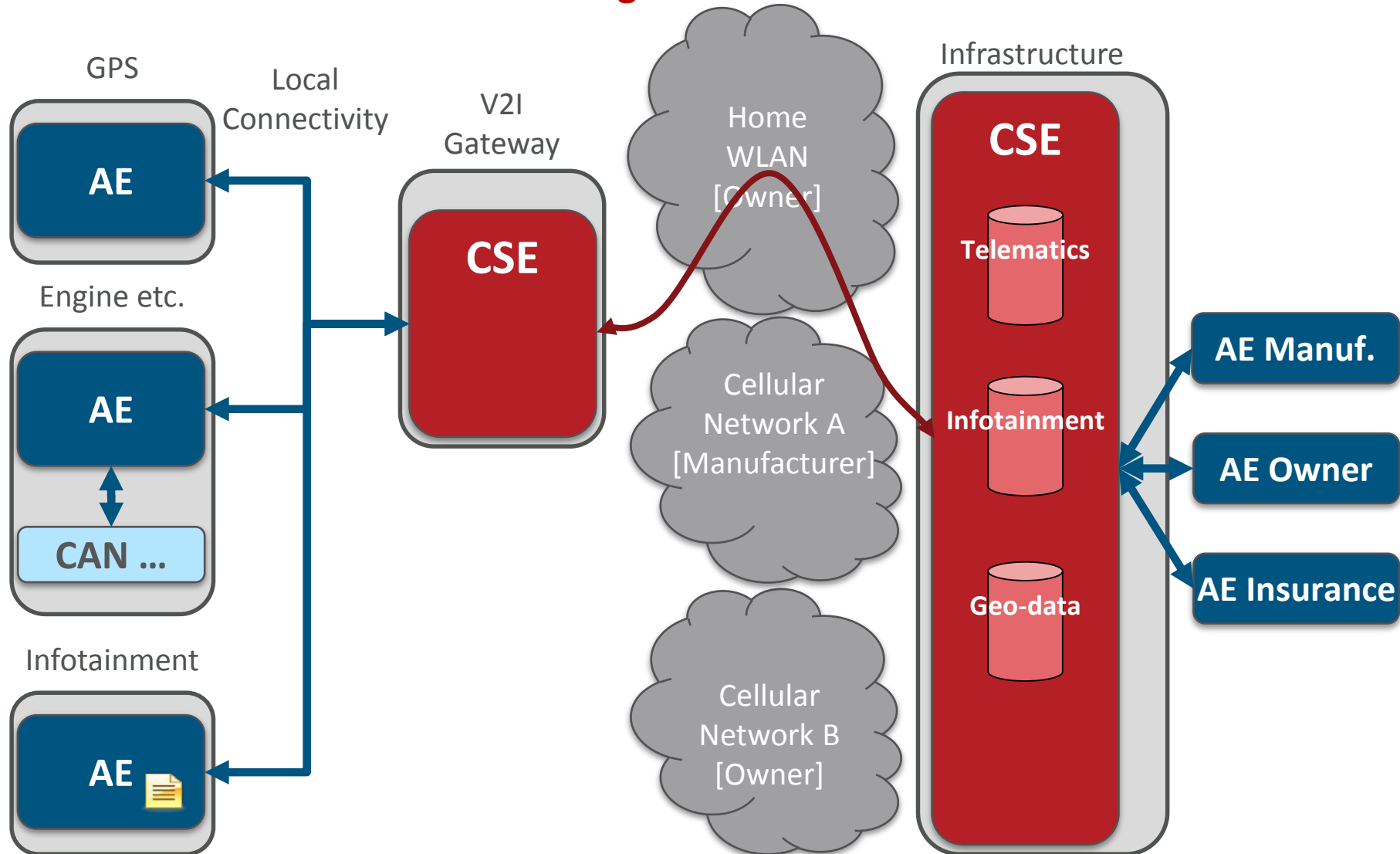
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Why **is it important?**

Cost ↓

Fragmentation ↓

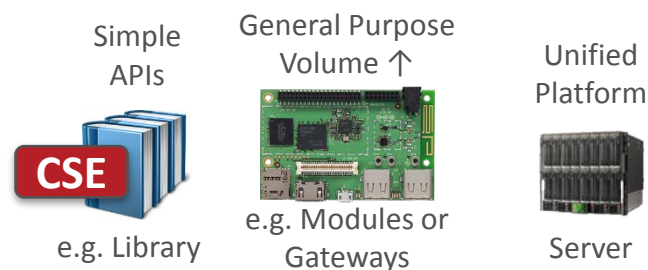
Opportunities ↑

Reduced CAPEX

- Lower complexity of development
 - Functions provided by the M2M SL do not need to be developed in a proprietary way, think “library”
 - Programmer does not need to be a communications expert
- Standardized protocols & APIs
 - simplifies application development, testing and interworking of components
- Horizontal SL reduces deployment cost
 - No need for vertical/segment-specific platforms
 - Shared infrastructure, still isolated well and secure
 - Allows for scaling; same components in different industries
- Higher component volumes
- Faster Time to Market

CAPEX Impact

Application Development



Developer:

- CSE functions ready to use
- No module/network expert needed
- App development independent of underlying transport
- Standard message exchanges
- Focus on use case logic
- Faster development process



Service Deployment



- Only one platform
- Serves commonly needed functions to different use cases and applications
- Shared infrastructure & core service across different customers / verticals



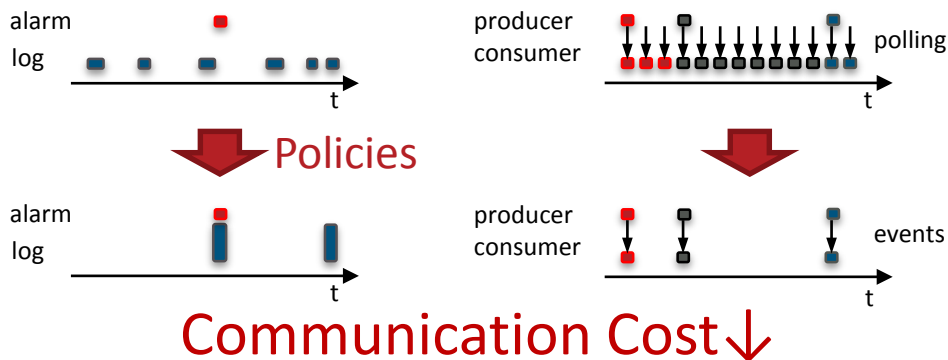
Lower CAPEX

Reduced OPEX

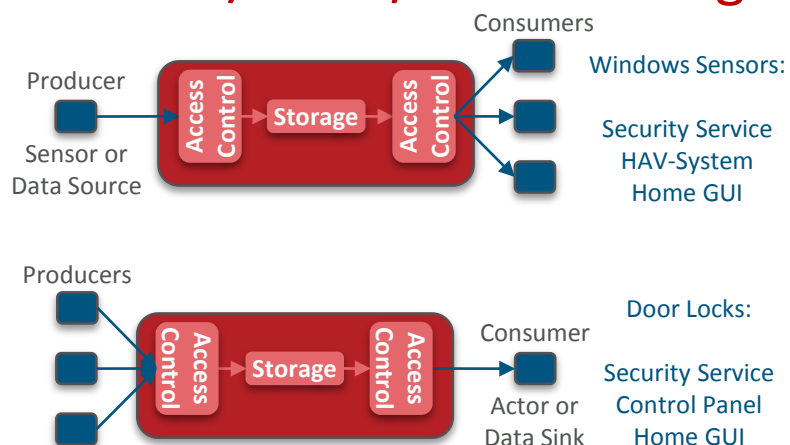
- Communication Efficiency
 - Policy-Driven Communication
 - Store-and-forward with Scheduling and Access Selection
 - Allows to adjust to cost / efficiency needs
 - Event Communication
 - Only send information when relevant events happen
- Sensor/Actor/Data Sharing
 - Produce once, consume multiple times
Share sensors / actors across use cases
- Flexibility
 - Utilize best transport network to meet business needs
 - Applications do not need to be aware of connectivity options supported by devices
- Same service layer for different verticals / segments
 - Reduces cost of operation
 - Possibility to share infrastructure with other verticals and only pay for service used

OPEX Impact

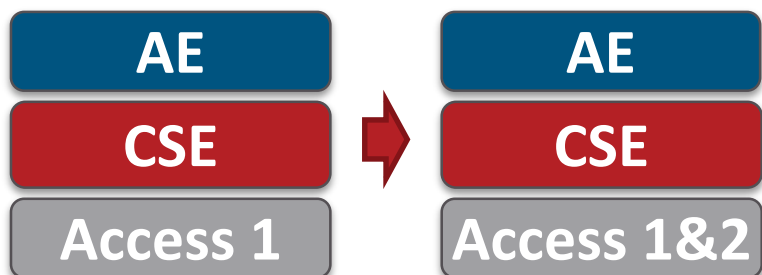
NW Efficiency & Protection



Sensor/Actor/Data Sharing



Flexible Choices



**Lower
OPEX**

Single Platform

- Minimize maintenance expenses
- Shared infrastructure
- Scalable to volume/processing needed

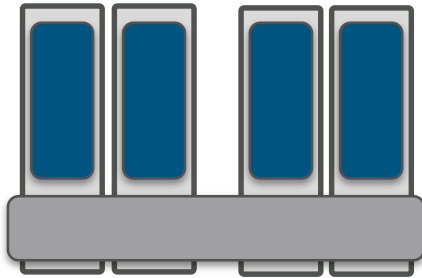


Horizontal Opportunities

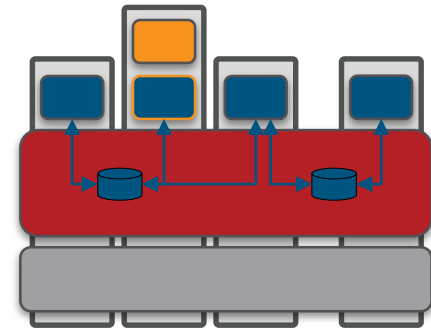
- Share sensors/actors/events/data across applications or verticals
 - Allows for new business models / added value
 - Governed by access control
- Unified horizontal M2M/IoT data & event communication and sharing platform
 - Streamlined communication and sharing functions
 - Easy interworking with vertical/application-specific standards
 - Developer can just focus on application logic
 - Does not need to implement communications / data sharing details
- Address new markets and products
 - Due to reduction in CAPEX/OPEX and complexity, M2M & IoT solutions can be addressing use cases where development cost and time was prohibitive so far

Motivation for Transition

Vertical Silos



Interconnected Silos



- Intra-Vertical or Intra-Use Case
 - Lower cost
 - CAPEX & OPEX impact as explained, easier to maintain, focus only on Apps
 - Larger eco system: More choices
 - Transition from one SP to another SP using same standard
 - Chose from different SW/HW vendors that offer standard compliant products
 - Select products that match with individual requirements, minimize cost for customization
- Inter-Vertical or Inter-Use Case
 - All of the motivators above, plus:
 - New opportunities
 - Shared access to sensors/actors/events/data allows for new business models / added value
 - X-access allows for synergies between so-far isolated silos

Thanks!

Topologies

