Power EnJoy

DD

Design Document

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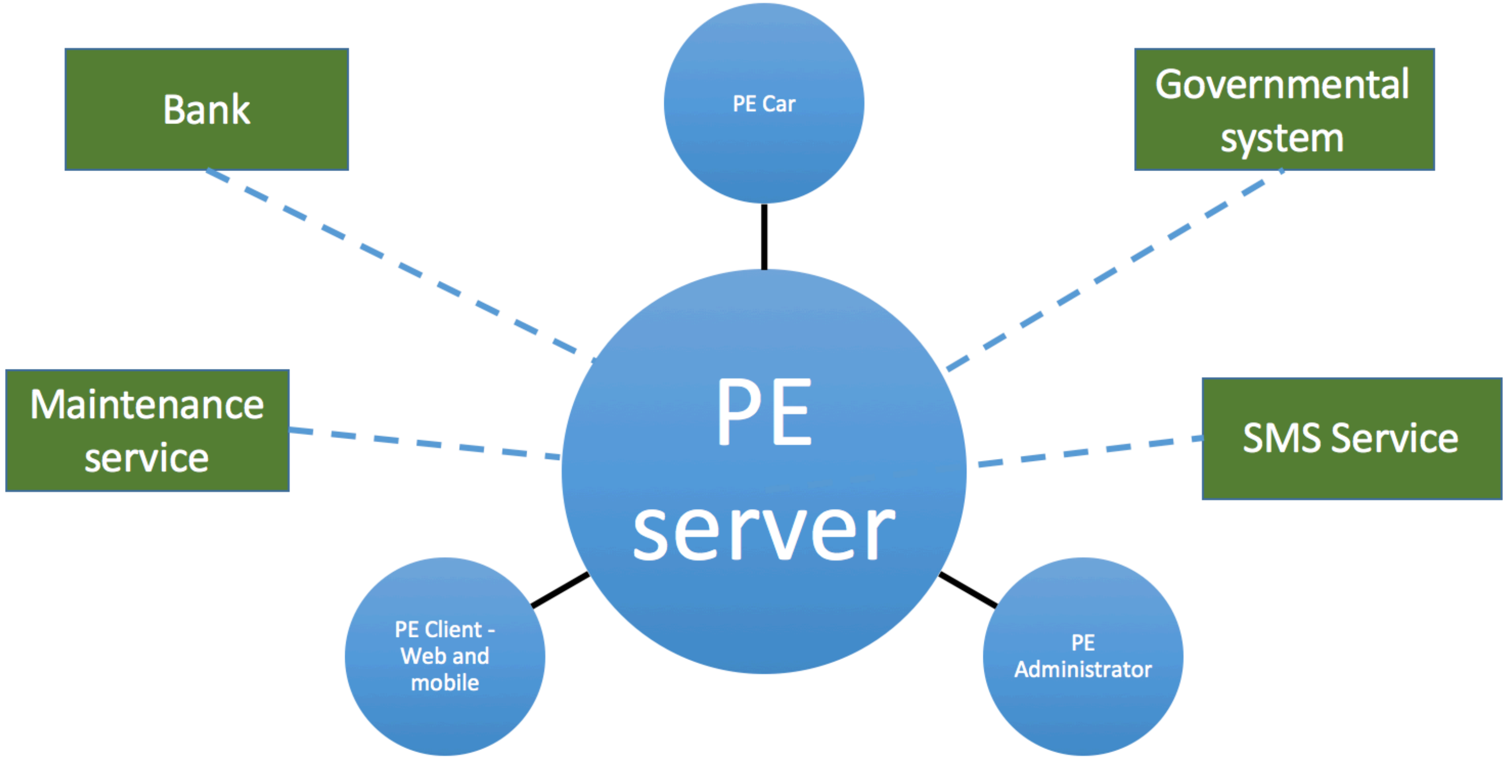
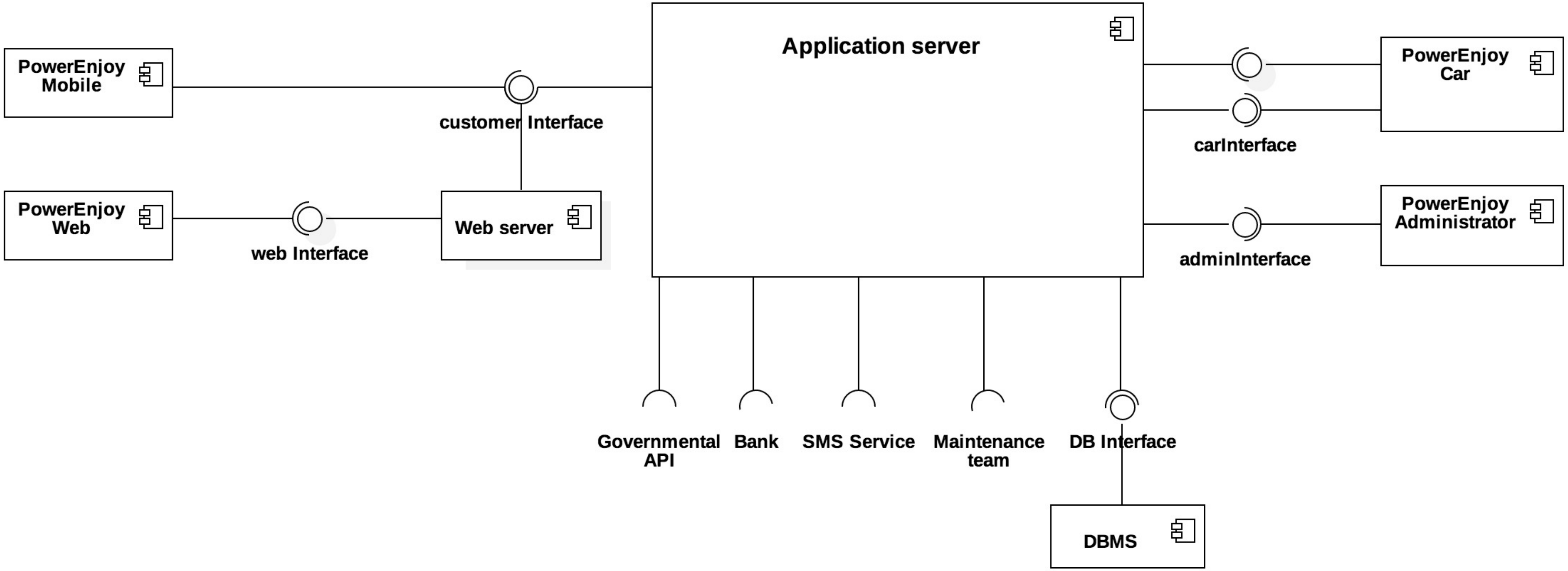
13/12/16

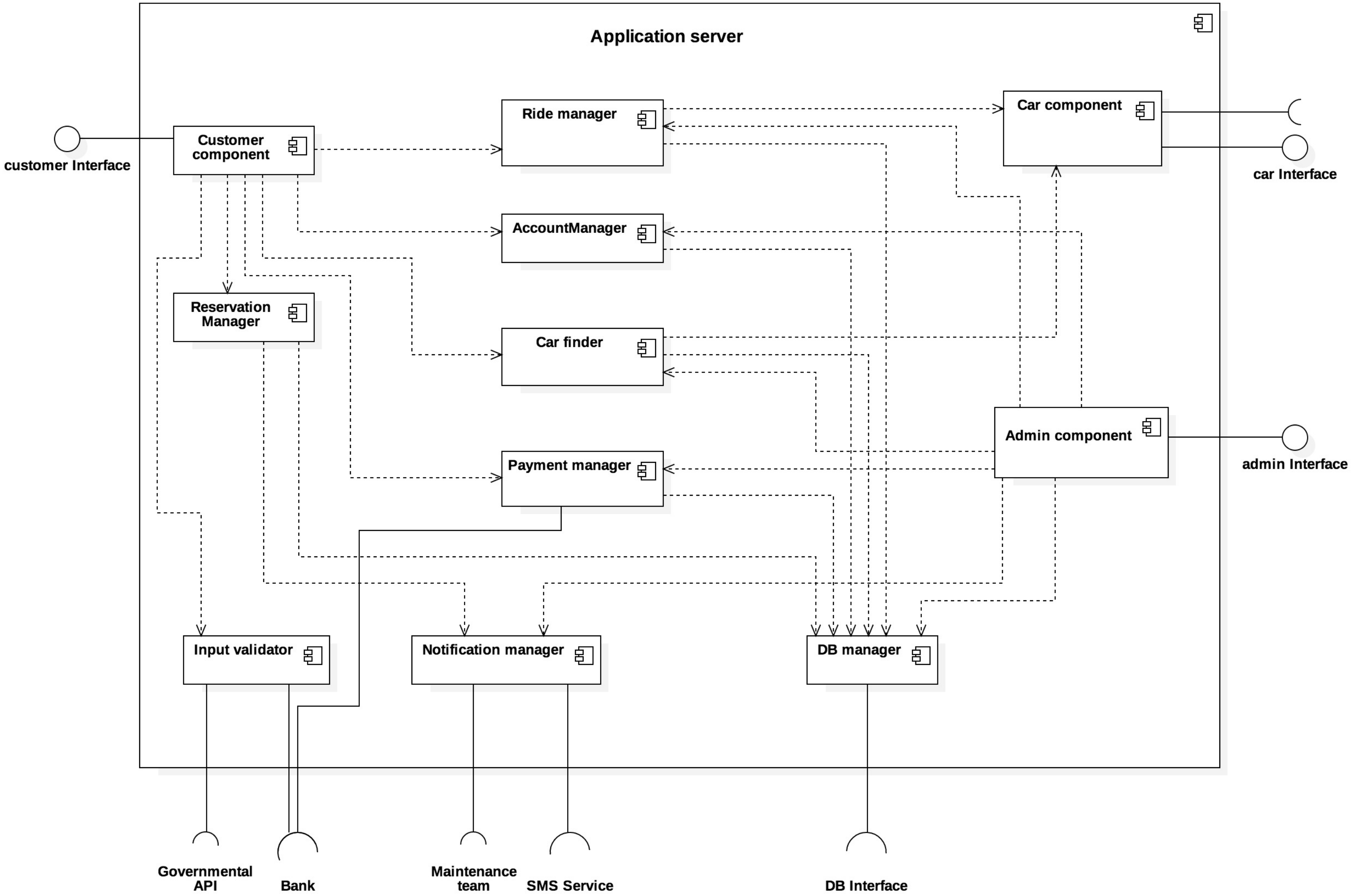
Overview


Bank
PE Car
Governmental system
Maintenance service
PE server
SMS Service
PE Client - Web and mobile
PE Administrator

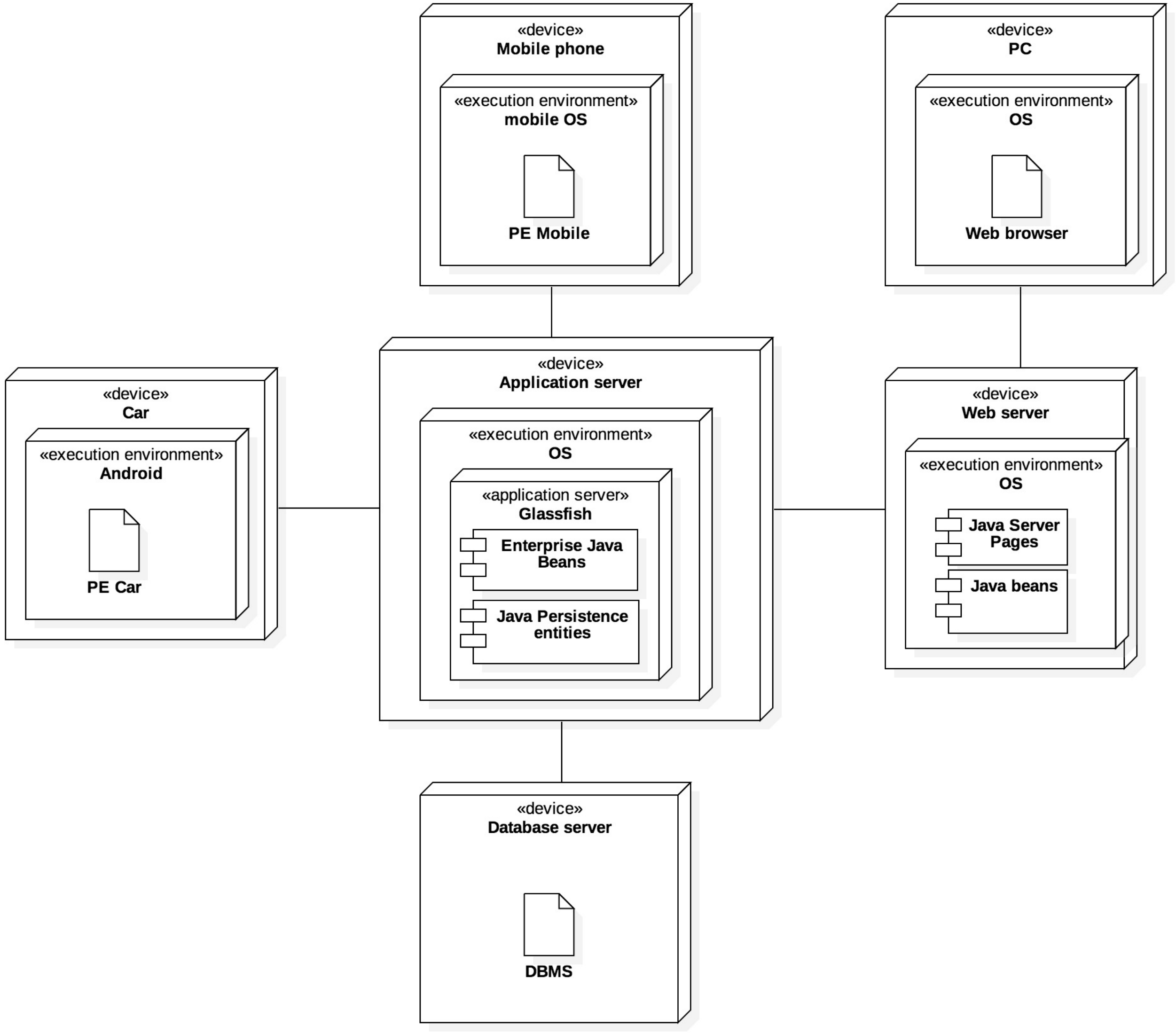
Component view



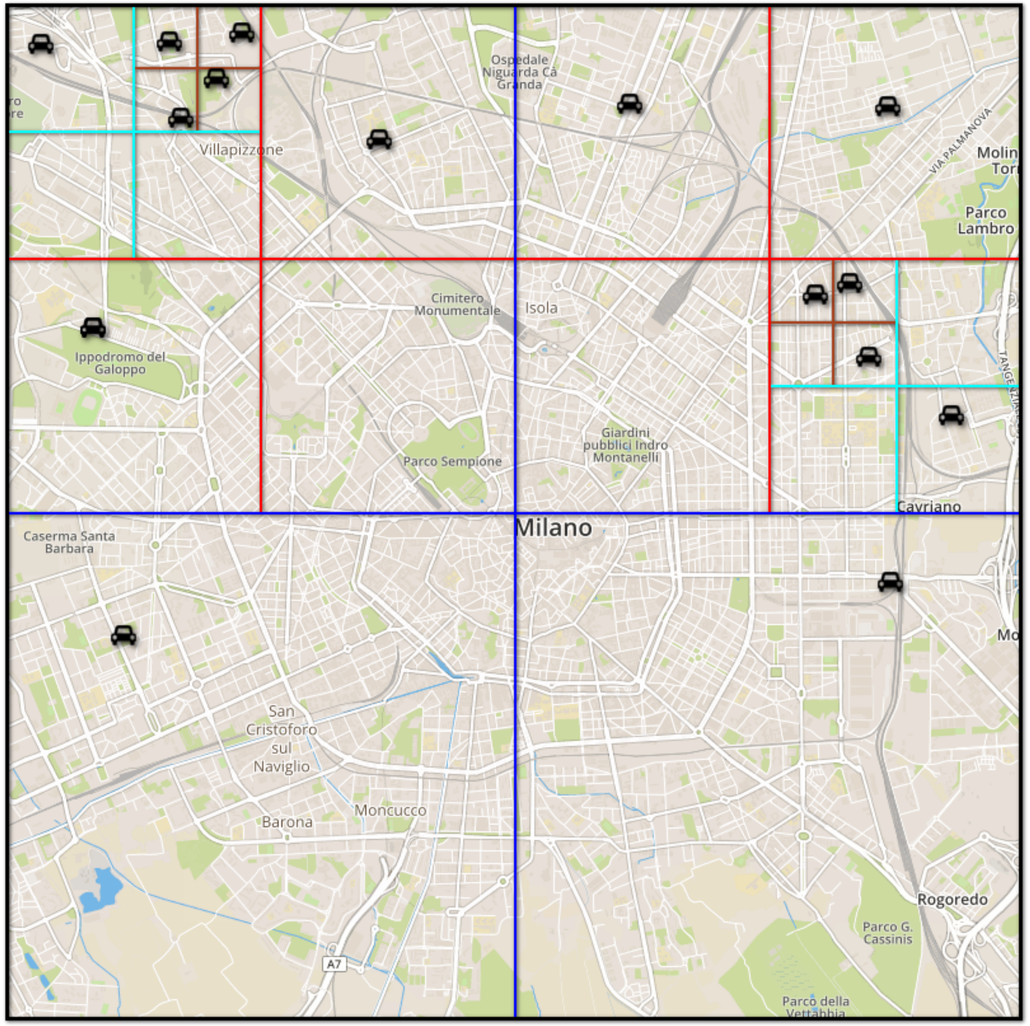
Application server

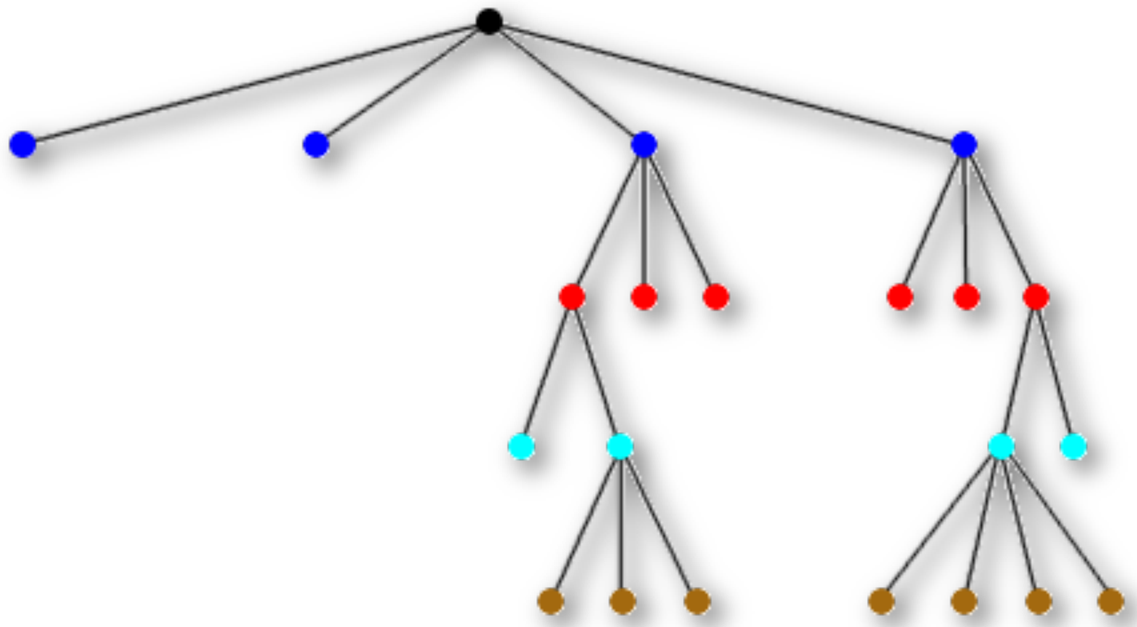


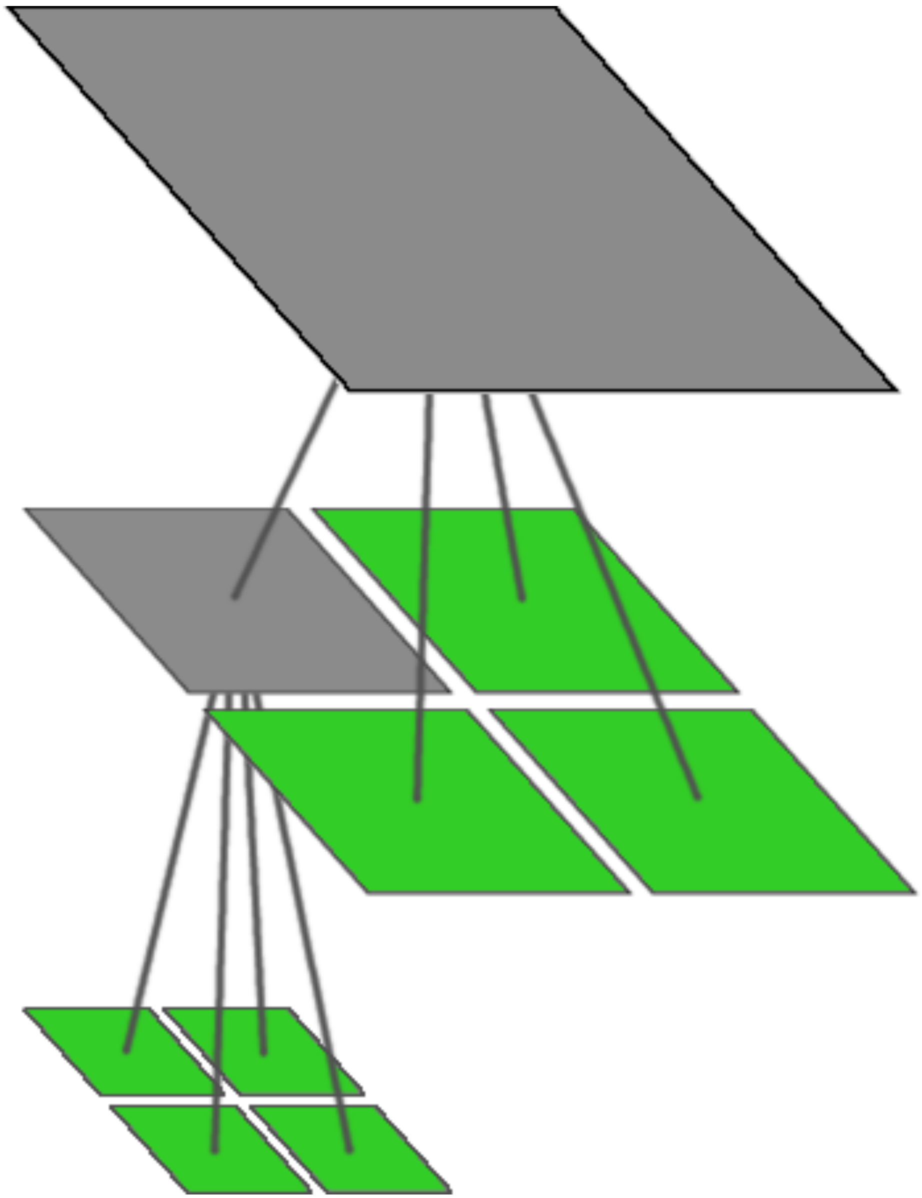
Deployment view



Quad trees


Ospedale Niguarda Cà Granda
Villapizzone
VIA PALMANOVA
Molin Torr
Parco Lambro
Cimitero Monumentale
Isola
Ippodromo del Galoppo
Giardini pubblici Indro Montanelli
Parco Sempione
Cavriano
Milano
Caserma Santa Barbara
San Cristoforo sul Naviglio
Moncucco
Barona
A7
Rogoredo
Parco G. Cassinis
Parco della Vettabbia





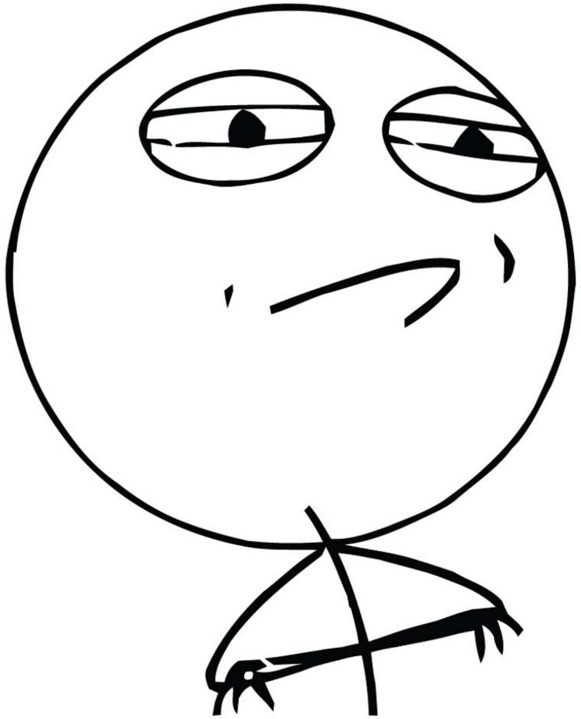
Insert

```
procedure QuadInsert(C, X)
    // Try to insert car C at node X in quadtree
    // By construction, each leaf will contain either
    // 1 or 0 cars
    if the subtree rooted at X has more than 1 car then
       determine in which child Y of node X the car C is in

       // Y is either the top left, top right, bottom left,
       // or the bottom right “quadrant”

       QuadInsert(C, Y)

    else if the subtree rooted at X has exactly 1 car then
       // X is a leaf
       create four children for node X in the Quadtree

       // X is not a leaf anymore
       move the car in X into the child in which it lies


       let Y be child in which car C lies
       QuadInsert(C, Y)
    else
       // X is a leaf
       store car C in node X
    endif

end
```

List all cars in a given area

```
procedure QuadList(S, X)

    // S is the “query square”, that is: the interesting area
    // X is the root node, initially is set to root
    answer = [] // empty list

    Y = S ∩ area(X) // intersection between S and the area of X

    if Y ≠ ∅ // non-empty intersection

        if X is a leaf

            answer += [all cars that are inside Y]    // 0 or 1 car

        else

            answer += QuadList(S, top left of X)
            answer += QuadList(S, top right of X)
            answer += QuadList(S, bottom left of X)
            answer += QuadList(S, bottom right of X)

        endif

    endif

    return answer
```

We’re done.



Any questions?